PART 2

Table A1.2.1 Transportation Statistics in 1988 – 1995

Year	Passenger				Cargo(ton)			
	Ferry	Sea	Air	Total	Ferry	Sea	Air	Total
1988	25,617,923	2,349,046	8,068,554	36,035,523	5,173,710	84,108,728	96,044	89,378,482
1989	28,664,857	3,142,763	8,942,540	40,750,160	4,503,698	76,903,906	107,942	81,515,546
1990	31,624,598	3,696,039	8,719,253	44,039,890	6,330,354	94,885,523	112,247	101,328,124
1991	32,194,981	5,774,951	9,166,637	47,136,569	7,280,586	119,532,314	114,995	126,927,895
1992	37,264,399	6,745,940	9,527,207	53,537,546	7,613,139	132,671,279	117,084	140,401,502
1993	39,004,338	7,135,427	10,102,101	56,241,866	9,407,521	129,538,673	114,715	139,060,909
1994	44,940,901	10,112,344	11,661,102	66,714,347	8,921,167	147,079,817	148,837	156,149,821
1995	45,513,415	11,767,216	12,948,854	70,229,485	10,803,478	146,698,671	177,881	157,680,030

Note : Number of sea shipping passenger in 1988 is estimated from PELNI data.

Share of each tranport mode

Year	Passenger				Cargo			
	Ferry	Sea	Air	Total	Ferry	Sea	Air	Total
1988	71.1	6.5	22.4	100.0	5.8	94.1	0.1	100.0
1989	70.3	7.7	21.9	100.0	5.5	94.3	0.1	100.0
1990	71.8	8.4	19.8	100.0	6.2	93.6	0.1	100.0
1991	68.3	12.3	19.4	100.0	5.7	94.2	0.1	100.0
1992	69.6	12.6	17.8	100.0	5.4	94.5	0.1	100.0
1993	69.4	12.7	18.0	100.0	6.8	93.2	0.1	100.0
1994	67.4	15.2	17.5	100.0	5.7	94.2	0.1	100.0
1995	64.8	16.8	18.4	100.0	6.9	93.0	0.1	100.0

Growth rate(%)

Year	Passenger				Cargo			
	Ferry	Sea	Air	Total	Ferry	Sea	Air	Total
1988	-	-	-	-	-	-	-	-
1989	111.9	133.8	110.8	113.1	87.0	91.4	112.4	91.2
1990	110.3	117.6	97.5	108.1	140.6	123.4	104.0	124.3
1991	101.8	156.2	105.1	107.0	115.0	126.0	102.4	125.3
1992	115.7	116.8	103.9	113.6	104.6	111.0	101.8	110.6
1993	104.7	105.8	106.0	105.1	123.6	97.6	98.0	99.0
1994	115.2	141.7	115.4	118.6	94.8	113.5	129.7	112.3
1995	101.3	116.4	111.0	105.3	121.1	99.7	119.5	101.0

Source: Ferry — *General Description of Ferry Figure Development in Indonesia*
Directorate General of Land Communication
Directorate of Traffic and River, Lake and Ferry Transportation
Jakarta, October 1996

Sea Vessel — Communication Department
Directorate General of Sea Communication
Directorate of Sea Transportation Traffic 1995

Air — Statistics of Air Transportation 1995
Bureau of Statistics Centers
Jakarta, Indonesia

Table A1.3.1 Population

Unit : thousand

Province	1988	1990	1995	1998	2000	2003	2004	2008	2013	2018	2019
Aceh	3,262.8	3,400.8	3,860.0	4,114.4	4,282.9	4,530.3	4,603.3	4,970.8	5,268.0	5,567.1	5,629.9
North Sumatra	9,983.1	10,286.8	11,145.3	11,617.0	11,915.1	12,405.7	12,605.7	13,328.9	13,742.9	14,241.9	14,402.3
West Sumatra	3,891.0	4,010.3	4,328.2	4,511.8	4,631.6	4,811.6	4,889.1	5,085.7	5,317.7	5,505.4	5,567.5
Riau	3,019.3	3,301.2	3,924.6	4,330.1	4,615.5	4,977.4	5,057.6	5,593.1	6,456.0	6,657.3	6,732.6
Jambi	1,859.5	2,029.3	2,383.4	2,613.7	2,774.2	2,980.2	3,020.3	3,329.6	3,645.8	3,927.2	3,974.5
South Sumatra	5,979.4	6,344.4	7,232.7	7,775.8	8,142.4	8,656.0	8,793.5	9,486.3	10,231.2	10,880.8	11,003.5
Bengkulu	1,061.3	1,187.3	1,415.0	1,566.1	1,673.2	1,805.6	1,834.7	2,033.6	2,243.3	2,428.5	2,455.9
Lampung	5,794.9	6,041.9	6,680.3	7,056.0	7,320.6	7,669.1	7,792.7	8,240.5	8,740.9	9,164.5	9,267.8
Jakarta	7,896.8	8,259.6	9,160.5	9,704.6	10,054.0	10,592.1	10,703.1	11,455.5	12,272.1	13,034.7	13,185.9
West Java	33,926.2	35,520.1	39,336.3	41,696.1	43,283.3	45,534.1	46,011.2	49,252.9	52,770.3	56,055.6	56,533.9
Central Java	28,254.6	28,569.8	29,658.1	30,236.2	30,550.9	31,188.5	31,513.3	32,070.8	32,837.4	33,482.0	33,768.3
Yogyakarta	2,912.9	2,915.2	2,916.7	2,908.0	2,897.3	2,867.0	2,854.4	2,826.0	2,814.2	2,810.8	2,810.5
East Java	32,139.8	32,545.4	33,855.9	34,569.4	34,972.2	35,740.0	36,114.5	36,830.2	37,786.6	38,602.4	38,931.7
Bali	2,742.5	2,782.6	2,902.2	2,966.9	3,006.2	3,075.2	3,118.9	3,176.5	3,266.1	3,343.3	3,381.7
West Nusa Tenggara	3,279.8	3,380.8	3,654.8	3,811.1	3,913.6	4,072.9	4,130.7	4,324.0	4,558.1	4,772.9	4,827.7
East Nusa Tenggara	3,168.0	3,277.4	3,582.8	3,754.1	3,865.0	4,043.0	4,100.5	4,321.5	4,582.5	4,823.8	4,879.2
East Timor	721.9	751.2	843.1	891.2	920.9	974.7	988.5	1,055.6	1,132.2	1,203.9	1,217.7
West Kalimantan	3,088.3	3,247.6	3,651.8	3,892.5	4,053.1	4,287.0	4,370.0	4,660.5	4,998.7	5,292.4	5,374.2
Central Kalimantan	1,303.3	1,404.8	1,637.3	1,785.1	1,887.2	2,022.8	2,063.4	2,249.9	2,459.1	2,647.7	2,686.0
South Kalimantan	2,484.5	2,606.5	2,900.4	3,081.3	3,202.3	3,373.1	3,440.6	3,648.9	3,897.3	4,115.5	4,175.1
East Kalimantan	1,670.6	1,888.4	2,331.0	2,636.0	2,855.9	3,115.4	3,177.9	3,556.5	4,007.3	4,401.8	4,465.6
North Sulawesi	2,415.5	2,483.6	2,652.3	2,754.5	2,821.2	2,917.2	2,957.7	3,065.6	3,190.0	3,289.4	3,331.5
Central Sulawesi	1,602.7	1,711.3	1,947.5	2,098.1	2,202.4	2,339.1	2,371.6	2,566.9	2,772.4	2,953.0	2,981.7
Southeast Sulawesi	1,254.2	1,357.3	1,594.0	1,744.2	1,849.3	1,986.2	2,013.7	2,216.3	2,426.4	2,611.8	2,639.3
South Sulawesi	6,769.2	6,996.6	7,577.8	7,922.5	8,149.3	8,480.7	8,598.4	8,995.8	9,438.6	9,805.2	9,900.7
Maluku	1,767.0	1,851.0	2,094.7	2,235.7	2,330.6	2,467.9	2,502.9	2,693.1	2,907.1	3,107.8	3,143.5
Irian Jaya	1,507.5	1,638.6	1,956.3	2,151.0	2,284.6	2,471.5	2,506.6	2,754.0	3,084.1	3,368.8	3,407.5
TOTAL	173,791.6	179,829.9	195,283.2	204,423.4	210,457.6	219,384.3	222,149.9	233,568.0	246,546.3	258,103.5	260,623.1

Actual Results → Forecast by Indonesia → Forecast by study team

Source : Population Forecast of Indonesia by provinces and regions, Statistics of Indonesia

Table A1.3.2 GRDP with Oil and Gas at 1993 Constant Prices

Unit : million rupiah

Province	1988	1990	1995	1998	2000	2003	2004	2008	2013	2018	2019
Aceh	8,139,397	9,285,583	11,151,072	15,161,886	17,408,596	21,418,030	23,033,889	30,811,885	45,543,986	69,775,633	75,936,164
North Sumatra	17,312,875	14,516,609	21,802,508	27,352,545	32,362,042	41,647,909	45,466,841	64,580,456	102,892,341	169,912,357	187,708,383
West Sumatra	4,330,752	4,969,606	7,015,847	8,853,889	10,383,908	13,168,669	14,334,971	20,006,923	31,184,134	50,378,709	55,411,515
Riau	13,969,156	15,731,976	18,614,777	22,476,270	25,123,215	29,689,417	31,503,561	39,938,481	55,202,080	79,087,306	84,916,957
Jambi	1,675,403	2,029,695	2,853,881	3,618,750	4,244,097	5,390,455	5,858,970	8,177,203	12,745,537	20,590,718	22,647,720
South Sumatra	8,682,986	9,393,917	12,546,280	15,427,930	17,935,199	22,480,399	24,326,844	33,358,982	50,862,255	80,378,223	88,019,173
Bengkulu	957,741	1,305,826	1,608,127	1,921,746	2,198,674	2,690,657	2,888,506	3,836,481	5,620,589	8,534,746	9,270,771
Lampung	3,659,140	4,269,895	6,400,493	8,376,596	10,032,607	13,150,224	14,444,043	21,023,799	34,535,303	58,799,728	65,356,389
Jakarta	33,783,263	40,250,301	60,638,217	68,394,616	77,277,934	92,812,374	99,015,952	128,263,264	182,316,333	268,042,195	289,374,042
West Java	36,390,438	43,087,111	60,840,114	67,991,875	74,786,410	87,426,964	92,434,790	115,503,547	156,790,605	220,599,410	236,021,480
Central Java	24,420,506	27,817,366	39,125,323	41,541,846	45,270,302	51,499,142	53,956,693	65,016,958	84,338,783	113,393,456	120,223,798
Yogyakarta	3,067,983	3,409,386	4,741,903	5,553,524	6,331,188	7,706,551	8,258,494	10,890,905	15,814,905	23,800,154	25,909,386
East Java	34,569,202	40,123,592	57,047,812	64,635,162	72,507,594	86,150,037	91,578,870	116,937,696	163,090,114	235,754,894	253,604,907
Bali	3,748,370	4,408,254	6,602,400	8,285,374	9,682,993	12,233,543	13,273,550	18,395,519	28,421,190	45,512,684	49,971,318
West Nusa Tenggara	1,750,517	2,076,508	2,955,628	3,537,476	4,054,447	4,974,950	5,345,523	7,125,188	10,485,230	15,992,618	17,389,134
East Nusa Tenggara	1,475,527	1,666,899	2,477,954	2,895,241	3,312,453	4,053,658	4,351,731	5,779,920	8,467,801	11,858,177	13,368,555
East Timor	325,954	390,354	620,186	711,688	814,245	996,443	1,069,713	1,420,781	2,081,497	3,160,709	3,433,655
West Kalimantan	3,749,021	4,304,526	6,062,230	8,577,434	10,579,403	14,391,616	16,352,926	24,933,812	44,079,289	80,768,208	91,302,846
Central Kalimantan	2,195,619	2,470,637	3,608,697	4,505,328	5,283,883	6,711,094	7,294,393	10,190,583	15,868,140	25,635,357	28,196,316
South Kalimantan	3,112,014	3,572,399	5,404,995	6,581,893	7,665,074	9,633,069	10,433,497	14,357,900	21,988,279	34,902,097	38,153,739
East Kalimantan	17,529,657	13,721,863	18,401,173	24,059,739	23,624,772	28,069,819	29,838,667	38,101,292	53,138,804	76,814,792	82,630,709
North Sulawesi	1,854,991	2,152,798	3,271,945	4,105,374	4,806,347	6,088,479	6,611,843	9,195,544	14,269,872	22,952,114	25,227,814
Central Sulawesi	1,158,001	1,370,184	2,037,859	2,489,350	2,878,588	3,579,478	3,863,216	5,241,624	7,886,531	12,298,897	13,432,366
Southeast Sulawesi	832,417	1,039,856	1,471,962	1,795,984	2,062,115	2,537,048	2,728,452	3,649,786	5,394,860	8,265,191	8,994,929
South Sulawesi	5,199,050	5,909,172	8,737,060	11,731,317	14,099,498	18,577,573	20,440,895	29,960,126	49,644,636	85,263,077	94,935,591
Maluku	1,776,652	2,075,023	2,756,559	3,651,613	4,305,269	5,511,550	6,006,397	8,471,791	13,379,836	21,902,177	24,133,702
Irian Jaya	3,012,192	3,580,355	6,123,137	6,494,677	7,404,131	9,012,577	9,658,057	12,736,581	18,493,997	27,833,555	30,183,290
TOTAL	228,578,926	264,759,695	375,148,139	437,129,122	496,734,301	601,721,826	641,435,466	847,897,039	1,234,346,025	1,873,202,132	2,036,170,717

Actual Results → Forecast by Study Team

Source : Statistics of Indonesia

Table A1.3.3 GRDP/Cap without Oil and Gas at 1993 Constant Prices

Unit : Rupiah/capita

Province	1988	1990	1995	1998	2000	2003	2004	2008	2013	2018	2019
Aceh	1,023,492	1,124,431	1,482,145	1,856,360	2,155,295	2,702,349	2,934,176	4,056,716	6,341,987	10,400,095	11,470,294
North Sumatra	1,193,723	1,377,309	1,915,956	2,302,488	2,661,568	3,294,121	3,542,540	4,837,758	7,372,667	11,751,683	12,037,278
West Sumatra	1,113,909	1,239,211	1,620,962	1,962,532	2,242,852	2,738,418	2,929,489	3,921,963	5,827,927	9,056,645	9,841,232
Riau	1,291,209	1,399,645	1,845,568	2,193,733	2,478,733	3,032,538	3,286,978	4,362,402	6,576,092	10,446,675	11,501,668
Jambi	891,735	976,716	1,178,904	1,347,850	1,489,788	1,759,035	1,881,709	2,384,093	3,392,016	5,058,307	5,486,905
South Sumatra	1,149,733	1,193,301	1,474,176	1,663,725	1,862,926	2,216,869	2,369,439	3,048,679	4,372,724	6,586,011	7,150,282
Bengkulu	885,715	931,379	1,136,486	1,227,065	1,314,395	1,488,477	1,572,682	1,880,256	2,489,045	3,476,596	3,731,179
Lampung	631,437	706,714	958,115	1,187,343	1,371,153	1,713,352	1,852,257	2,544,109	3,927,809	6,352,570	6,975,925
Jakarta	4,278,110	4,873,154	6,619,531	7,047,160	7,687,148	8,751,587	9,240,209	11,157,689	14,740,344	20,337,529	21,749,700
West Java	987,885	1,117,911	1,477,078	1,526,131	1,634,743	1,818,933	1,904,978	2,276,537	2,824,224	3,741,375	3,968,839
Central Java	821,874	926,655	1,250,812	1,302,524	1,410,225	1,577,714	1,638,893	1,950,142	2,184,729	3,291,793	3,463,488
Yogyakarta	1,053,232	1,169,520	1,625,777	1,909,674	2,185,728	2,684,885	2,890,051	3,840,813	5,582,146	8,375,707	9,075,218
East Java	1,075,314	1,232,709	1,682,955	1,868,382	2,072,323	2,405,861	2,531,069	3,161,774	4,283,766	6,035,488	6,431,405
Bali	1,366,770	1,595,003	2,274,964	2,792,774	3,222,214	3,974,285	4,252,170	5,773,238	8,647,560	13,472,151	14,610,494
West Nusa Tenggara	533,733	614,279	808,698	928,195	1,036,268	1,220,102	1,291,724	1,642,363	2,285,306	3,314,774	3,559,979
East Nusa Tenggara	465,753	508,624	691,625	771,205	857,261	1,001,495	1,060,127	1,333,020	1,835,720	2,636,889	2,829,416
East Timor	451,535	519,540	735,602	798,357	884,413	1,021,143	1,080,994	1,341,458	1,826,379	2,597,143	2,786,829
West Kalimantan	1,213,960	1,294,556	1,660,066	2,204,165	2,611,924	3,378,447	3,692,137	5,336,768	8,770,267	15,104,303	16,778,694
Central Kalimantan	1,684,605	1,758,711	2,204,054	2,524,043	2,800,955	3,314,981	3,532,073	4,511,109	6,412,894	9,582,521	10,379,968
South Kalimantan	1,236,338	1,352,793	1,853,056	2,118,598	2,374,760	2,829,510	3,054,551	3,890,260	5,560,268	8,323,268	8,983,935
East Kalimantan	3,419,659	3,418,634	4,217,086	4,559,187	4,919,526	5,690,004	6,052,739	7,437,109	10,222,691	14,948,439	16,047,751
North Sulawesi	767,964	866,896	1,237,626	1,490,526	1,704,308	2,085,091	2,233,500	2,990,383	4,445,543	6,905,586	7,508,509
Central Sulawesi	720,294	800,668	1,046,397	1,186,503	1,307,438	1,528,664	1,627,345	2,035,448	2,826,442	4,170,918	4,453,235
Southeast Sulawesi	663,684	766,171	923,439	1,029,682	1,115,390	1,275,918	1,353,529	1,641,369	2,208,970	3,128,378	3,368,481
South Sulawesi	768,040	844,578	1,152,981	1,491,008	1,731,055	2,188,903	2,375,720	3,321,232	5,229,148	8,610,257	9,486,904
Maluku	993,620	1,107,667	1,309,191	1,646,997	1,873,186	2,279,537	2,456,132	3,246,633	4,797,959	7,413,588	8,096,752
Irian Jaya	1,371,593	1,930,453	3,000,971	2,893,494	3,117,737	3,521,915	3,728,380	4,448,250	5,863,645	8,116,954	8,709,570
TOTAL	1,150,756	1,298,971	1,751,939	1,947,699	2,161,938	2,533,985	2,687,395	3,400,258	4,755,459	6,989,233	7,544,614

Actual Results → Forecast by study team

Source : Statistics of Indonesia

Table A1.5.1 Demand Forecast Formula for Passenger

		R2	2004	2019
1	P = 4,906,971 x ($Year$) - 7,920,397,310	0.9748	1.13E+08	1.87E+08
2	P = 62,676 x ($GRDP1/Cap$) - 47,843,482	0.9782	1.33E+08	4.42E+08
3	LN (P) = 1.981 x ($GRDP1/Cap$) – 0.987	0.9868	1.61E+08	1.09E+09
4	P = 58.515 x ($GRDP2/Cap$) – 31,696,427	0.9854	1.26E+08	4.10E+08
5	LN (P) = 1.614 x ($GRDP2/Cap$) – 5.118	0.9897	1.43E+08	7.54E+08

Source : Study Team

P : Passenger

GRDP1/Cap : GRDP with oil and gas per person

GRDP2/Cap : GRDP without oil and gas per person

Table A1.5.2 Demand Forecast Formula for Cargo

		R2	2004	2019
1	C = 11,642,325 x ($Year$) - 23,061,635,113	0.9197	2.70E+08	4.44E+08
2	C = 0.557 x ($GRDP1$) - 41,221,857	0.9011	3.16E+08	1.09E+09
3	LN (C) = 1.4075 x ($GRDP1$) – 8.832	0.8887	3.64E+08	1.85E+09
4	C = 135.627 x ($GRDP1/Cap$) – 92,920,399	0.9042	2.99E+08	9.67E+08
5	LN (C) = 1.8464 x ($GRDP1/Cap$) – 7.754	0.8871	3.64E+08	2.29E+09

Source : Study Team

C : Cargo

GRDP1 : GRDP with oil and gas

GRDP2/Cap : GRDP without oil and gas per person

A2.1.1 Route Distance and Operation Hours of Ferry

1. Population in Indonesia is forecast to increase by 1.3 times from 1995 to 2019 and Gross Regional Domestic Product per capita (GRDP/Cap) 4.3 times during the same period. This dramatic growth will lead to motorization and in turn increase the importance of ferry transportation.

2. Ferry carries both passengers and vehicles, and offer a fast turnround time through the Ro-Ro system. In other words, loading and unloading times are shortened and fewer workers are required as drivers take their own vehicles on board. When ferry operation properly arranged, 80% of the total travel time is spent at sea while 20% is spent at the port.

3. Cargo handling for conventional cargo vessel consumes much time and money. The time and cost of cargo handling is fixed for each voyage regardless of distance. Therefore short distance transportation by conventional cargo vessel is less economical even though capital and operating costs are low. Even an ocean-going conventional cargo vessel has a sea time rate of only 60%.

4. As voyage distance and time by ferry increases, cost for vehicle and its driver carried by ferry, which mean capital charges on the vehicle including interest and depreciation, and personnel expenses, also rises.

5. A consignor has to bear not only ferry fee but also expenses for the vehicle and its driver although the driver does not run the vehicle.

6. Several measures are adopted to cut down the cost. For examples, vehicles can be carried without drivers. In this case, a vehicle is driven onto the ferry boat but the driver does not get on the ferry boat at the departure port. Another driver unloads the vehicle from the ferry at the destination port.

7. Carrying a vehicle is less economical over long distances because of wasted tractor space. Therefore, a tractor is separated from the chassis after loading it and gets off the ferry boat at the departure port. Another tractor unloads the chassis at the destination port. The ferry fee goes down because the occupation area is reduced and the tractor can be used for other purposes.

8. Container transportation is the most advanced form of this kind of transportation. Containers are generally handled by gantry crane or ship crane. In case of a Ro-Ro vessel, a tractor carries containers to a boat and a forklift unloads them, and then the tractor gets off the vessel.

9. Container transportation generally requires mooring facilities, a vast container yard, gantry cranes and so on. The initial cost of these facilities and equipment is very large. And container handling itself involves a substantial operation cost in which the largest part is occupied by personnel expenses. Therefore for container service to be economical, the demand and transport distance must be sufficiently large. When these conditions are met, container transportation is more economical than ferry transportation.

10. Cargo handling cost is quite low in Indonesia at present because personnel expenses remain at a low level. The voyage distance where ferry transportation is more economical than other modes is not very far. But personnel expenses will increase rapidly in the future in line with the growth of GRDP per capita in Indonesia. Then the voyage distance will extend. It is observed that maximum voyage distance by ferry operation is about 550 NM in developed countries including Japan.

11. Many long distance ferries (more than 200 NM) have gone into service in Japan. There exist ten (10) routes of which distance ranges from 200 NM to 350 NM, eight (8) routes from 350 NM to 550 NM and five (5) routes over 550 NM. Maximum distance is 685 NM. A lot of passengers and cargoes have been carried on these long distance routes.

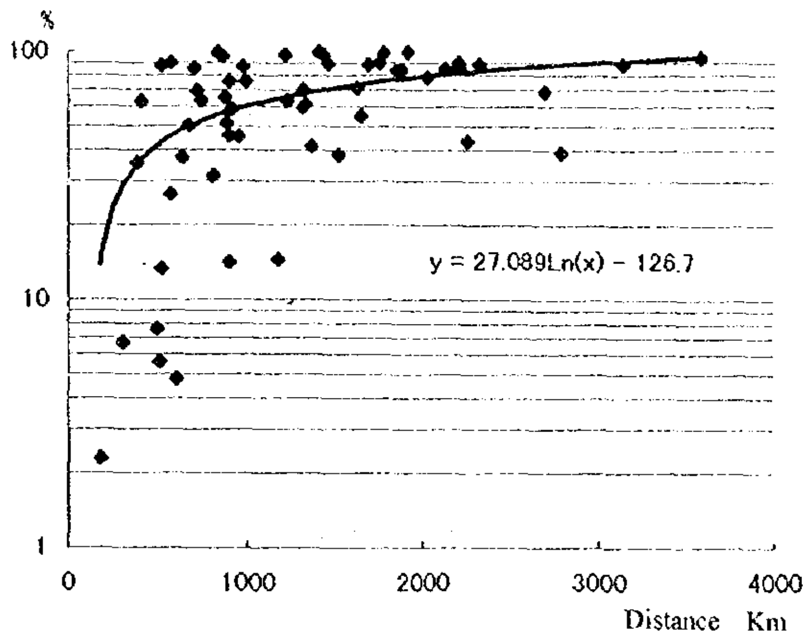
12. On the other hand, operation cycle time should be kept within twenty four (24) hours, because service times (departure and arrival) are set at fixed times every day. Regular and punctual service is indispensable for social and economic development in Indonesia.

13. Average cruising speeds of ferry boats in Indonesia are under twenty (20) knots at present. It is likely that ferry boats with higher speed will go into service on the long distance ferry routes. In Japan, long distance (more than 200 NM) ferry boats have twenty (20) to thirty (30) knots.

14. Loading and unloading requires four (4) hours and the maximum cruising time

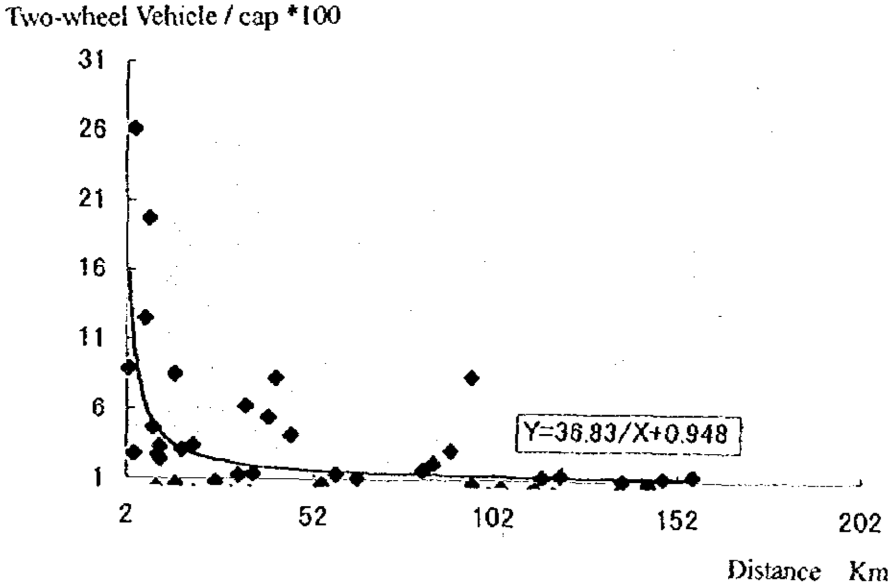
is twenty (20) hours. Therefore one day voyage distance is from 400 NM to 600 NM based on a voyage time of twenty (20) hours and speed of from twenty (20) to thirty (30) knots.

15. Based on the above-mentioned items, JICA study team proposed that maximum voyage time be within twenty (20) hours and that the maximum voyage distance be within five hundred and fifty (550) NM.



Source : Study Team

Figure A2.2.1 Share of Air Transportation



Source : Study Team

Figure A2.2.2 Two-wheel Vehicle / Cap and Distance

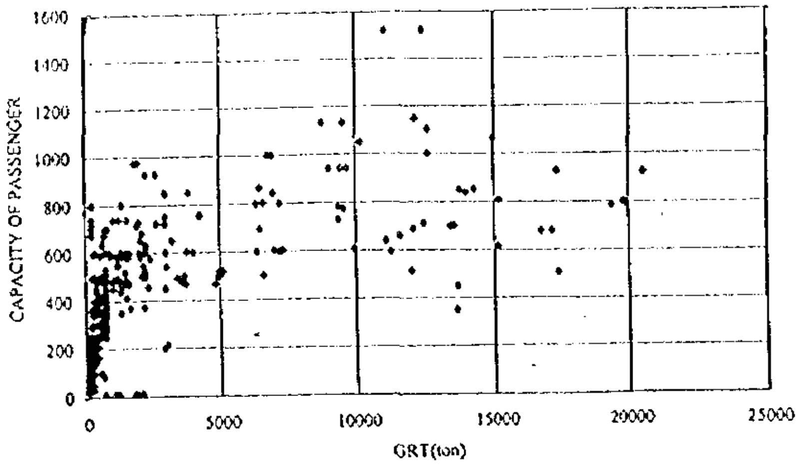


Figure A2.3.1 Vessel Size and Passenger Capacity

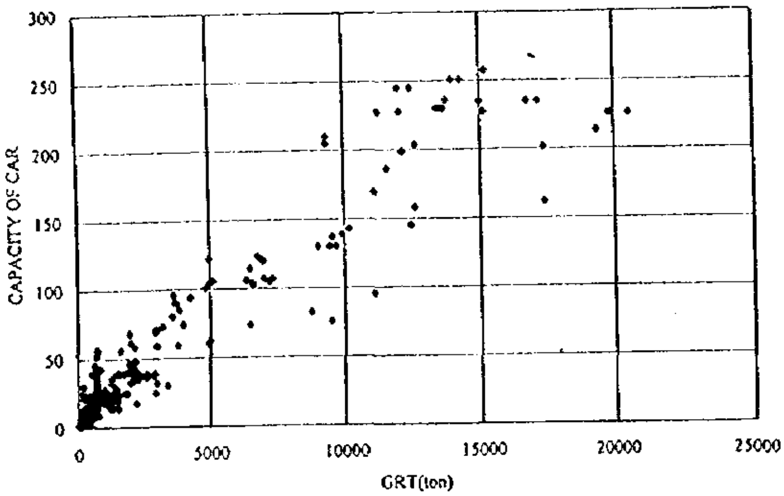


Figure A2.3.2 Vessel Size and Car Capacity

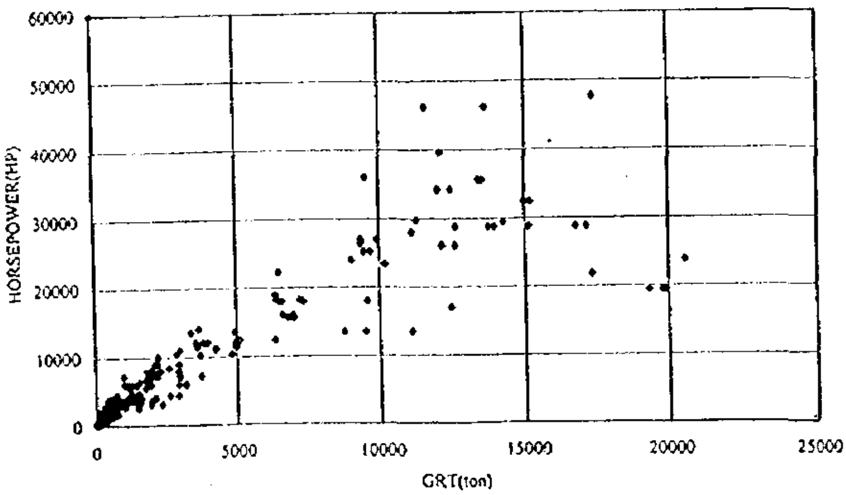


Figure A2.3.3 Vessel Size and Horsepower

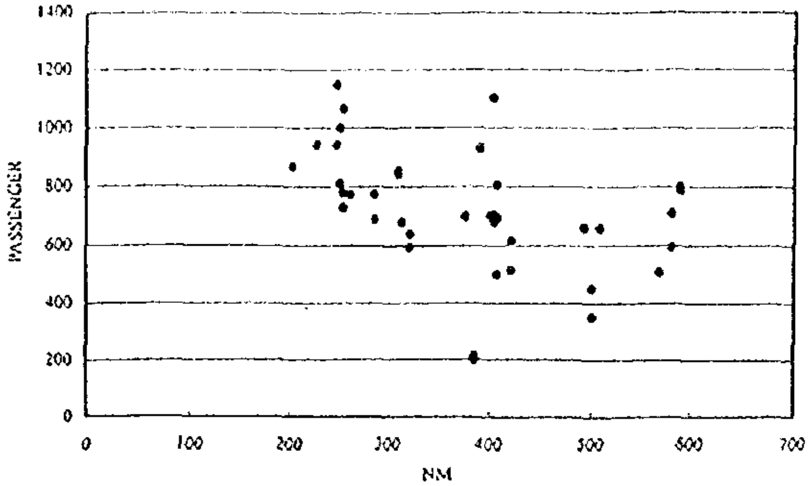


Figure A2.3.4 Route Distance and Ferry Vessel Passenger Capacity

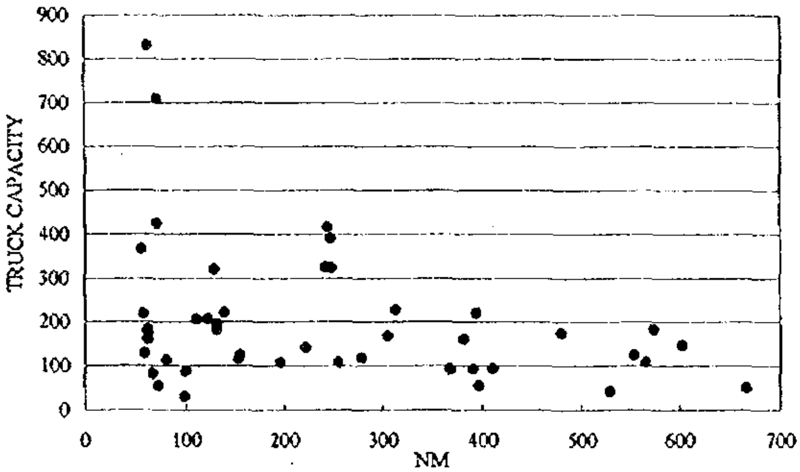


Figure A2.3.5 Route Distance and Ferry Vessel Truck Capacity

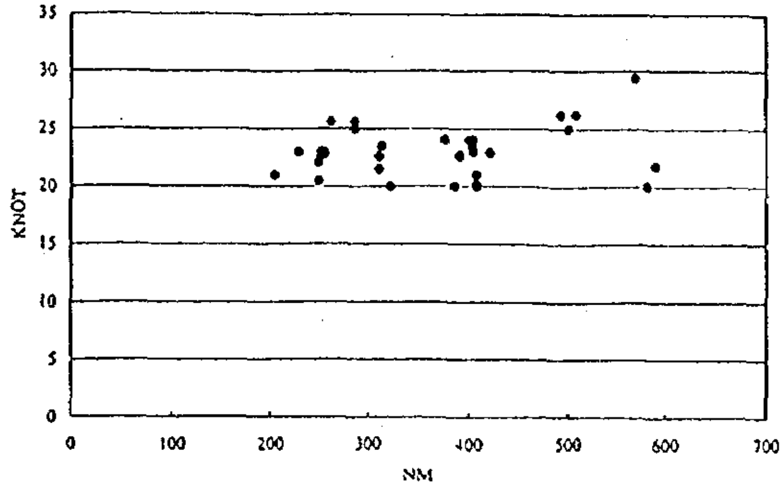


Figure A2.3.6 Route Distance and Ferry Vessel Speed

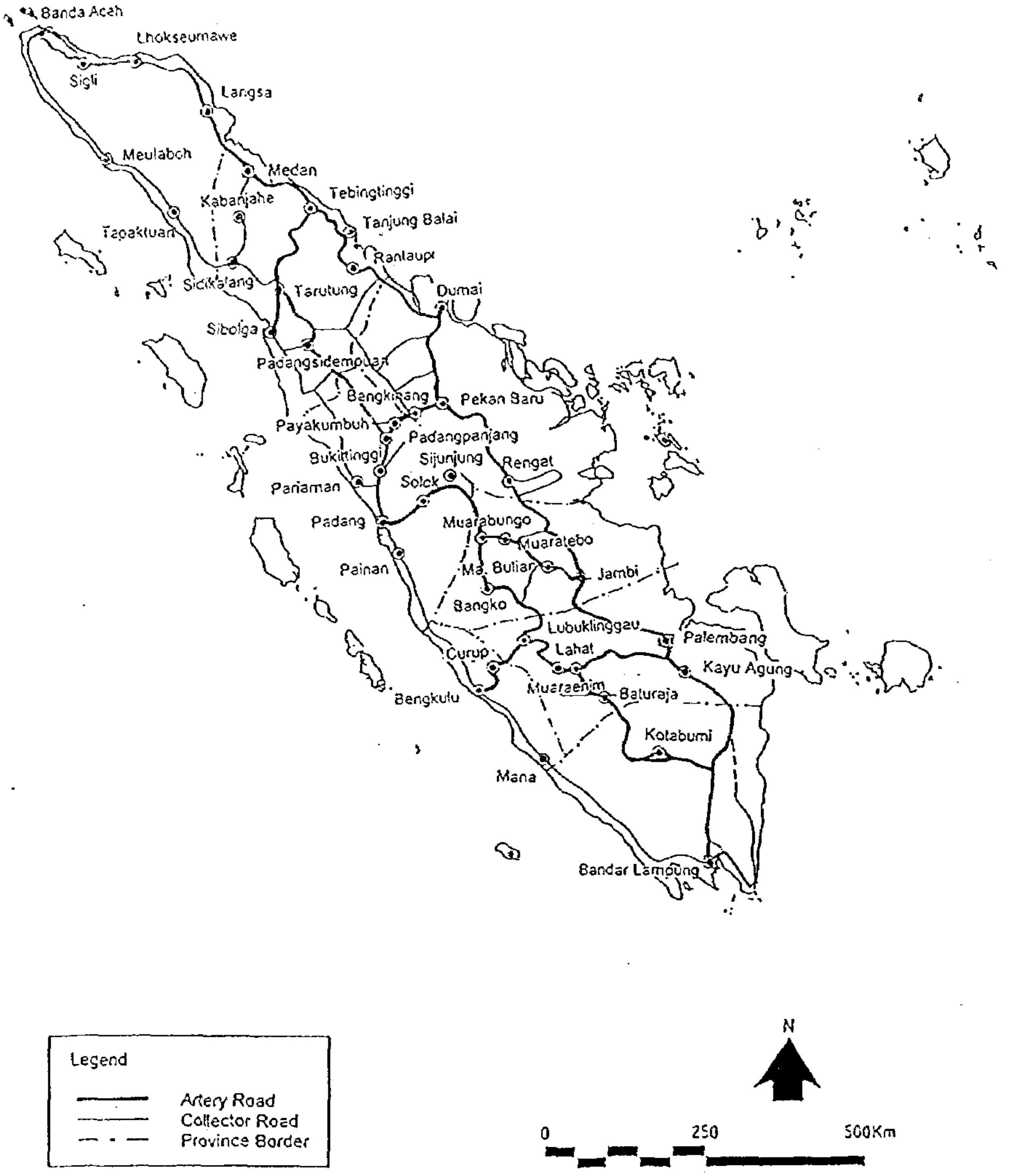


Figure A2.3.7 Principal Road in Sumatra

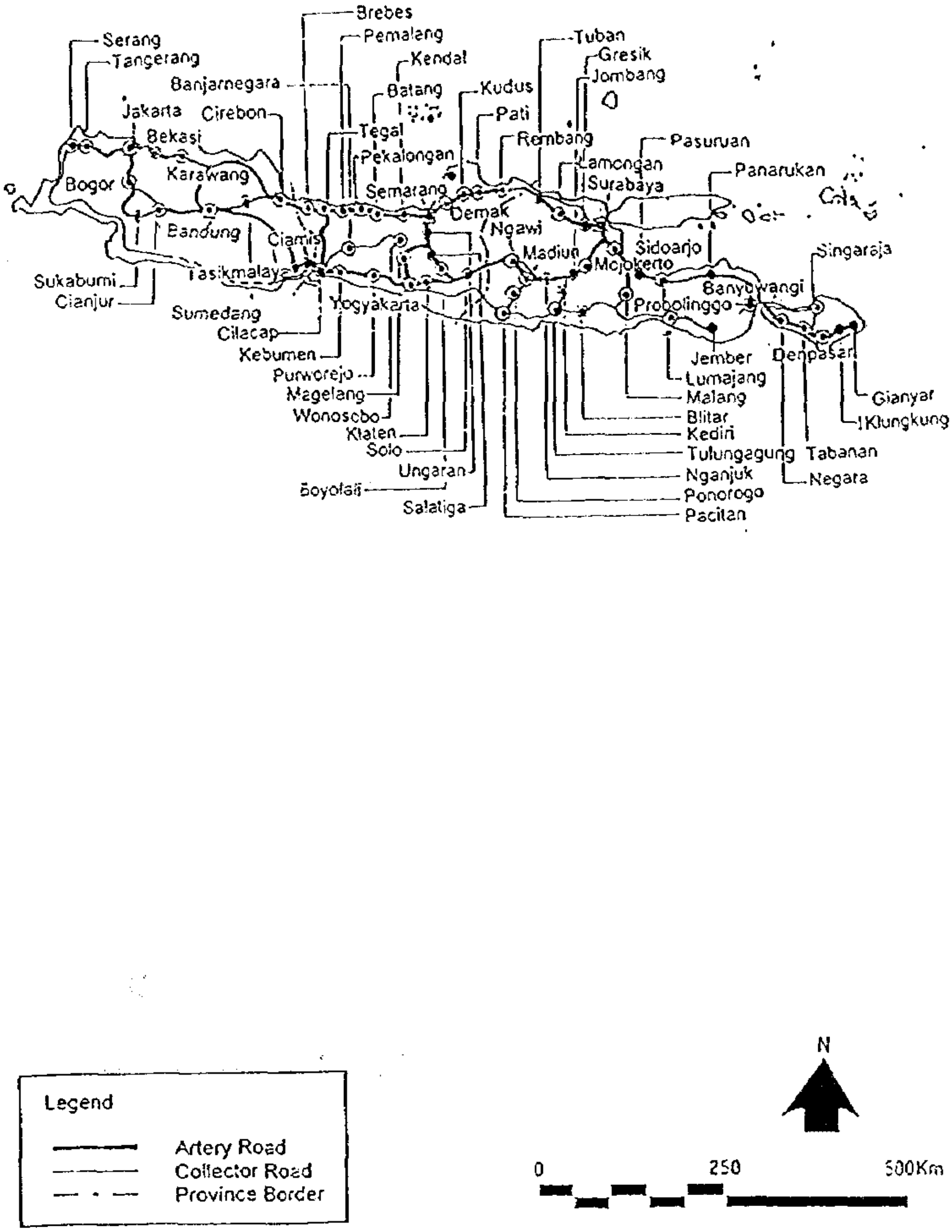


Figure A 2.3.8 Principal Road in Java

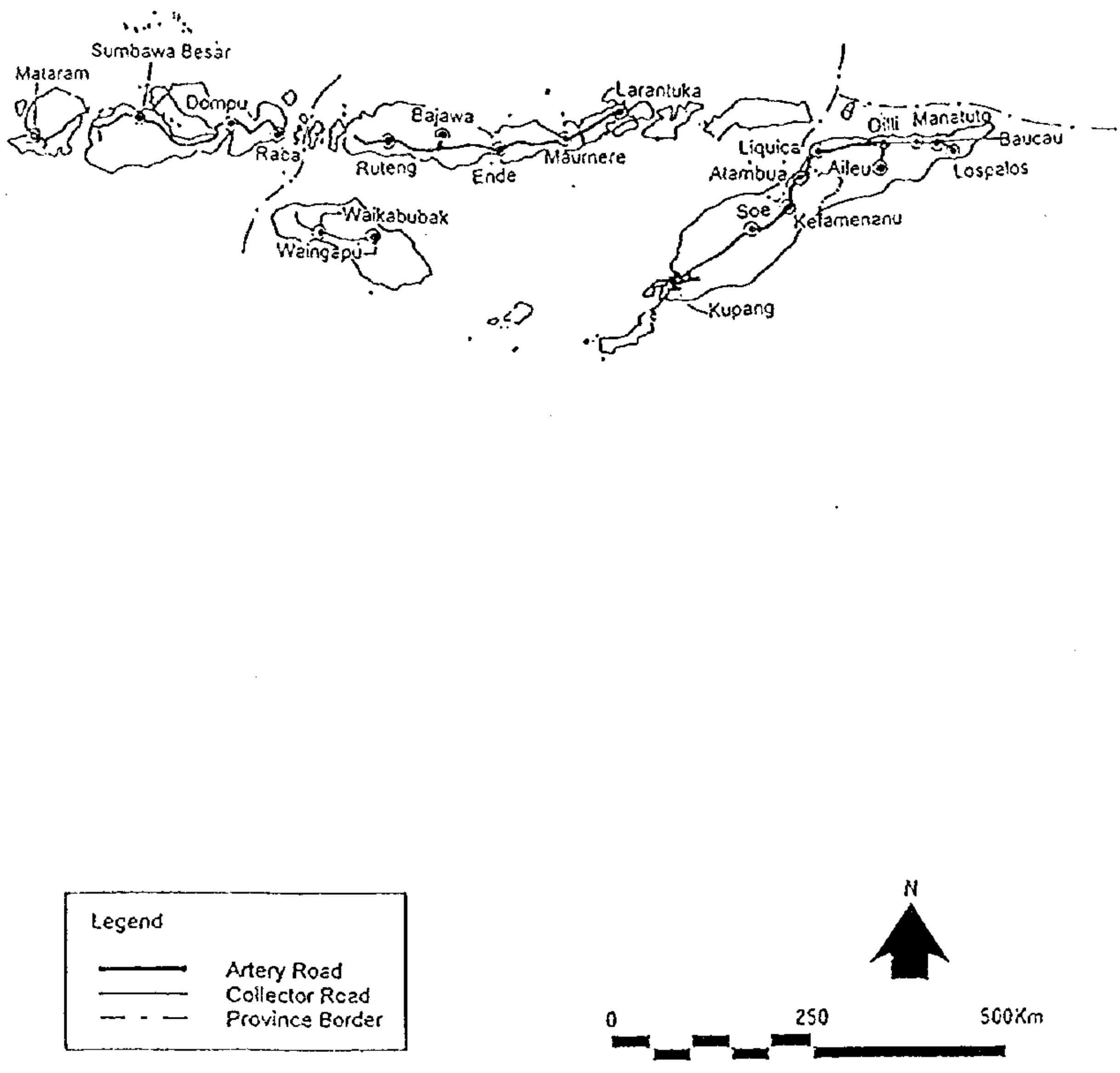


Figure A2.3.9 Principal Road in Bali, NTB, NTT and East Timor

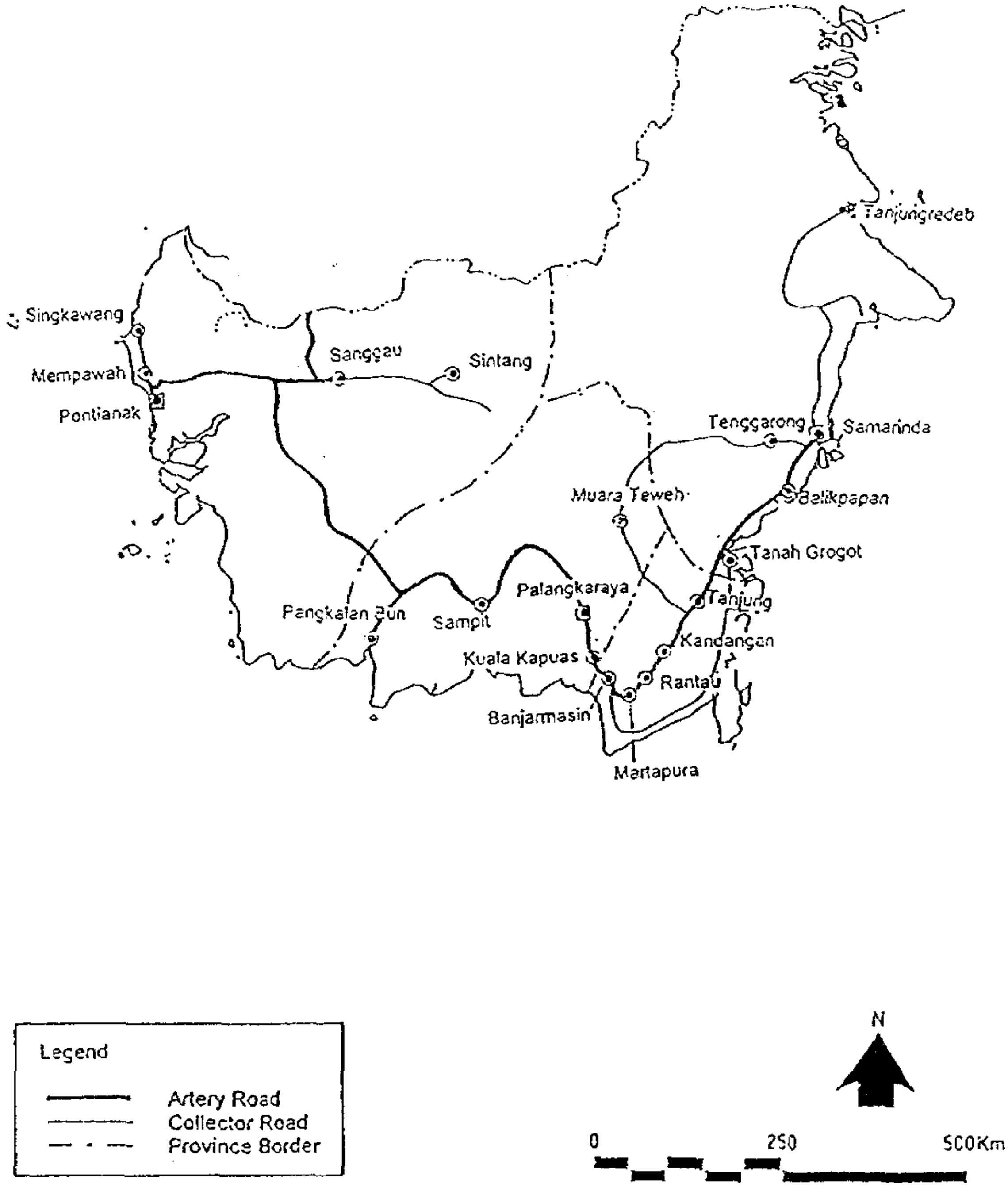


Figure A2.3.10 Principal Road in Kalimantan

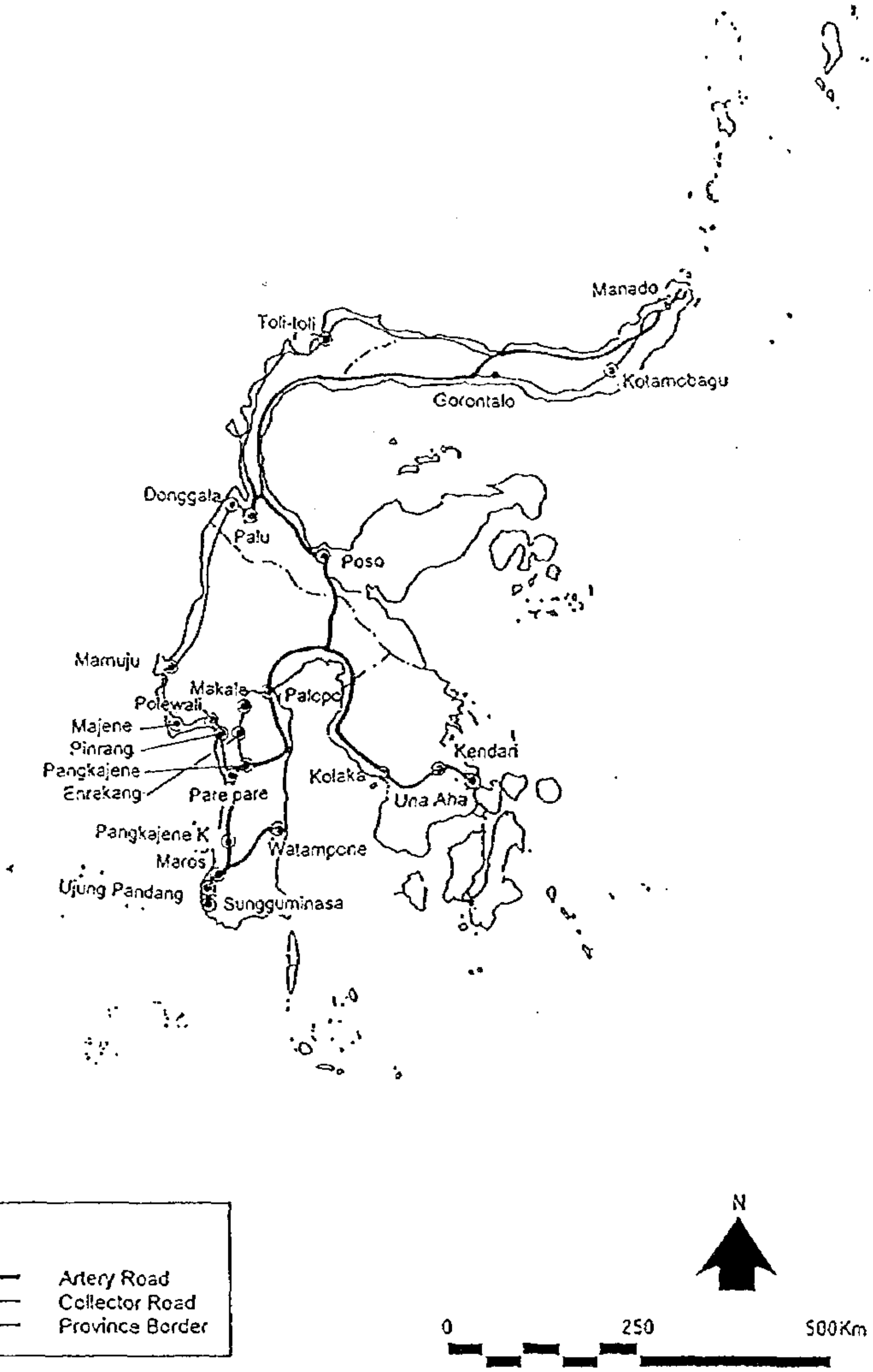


Figure A2.3.11 Principal Road in Sulawesi

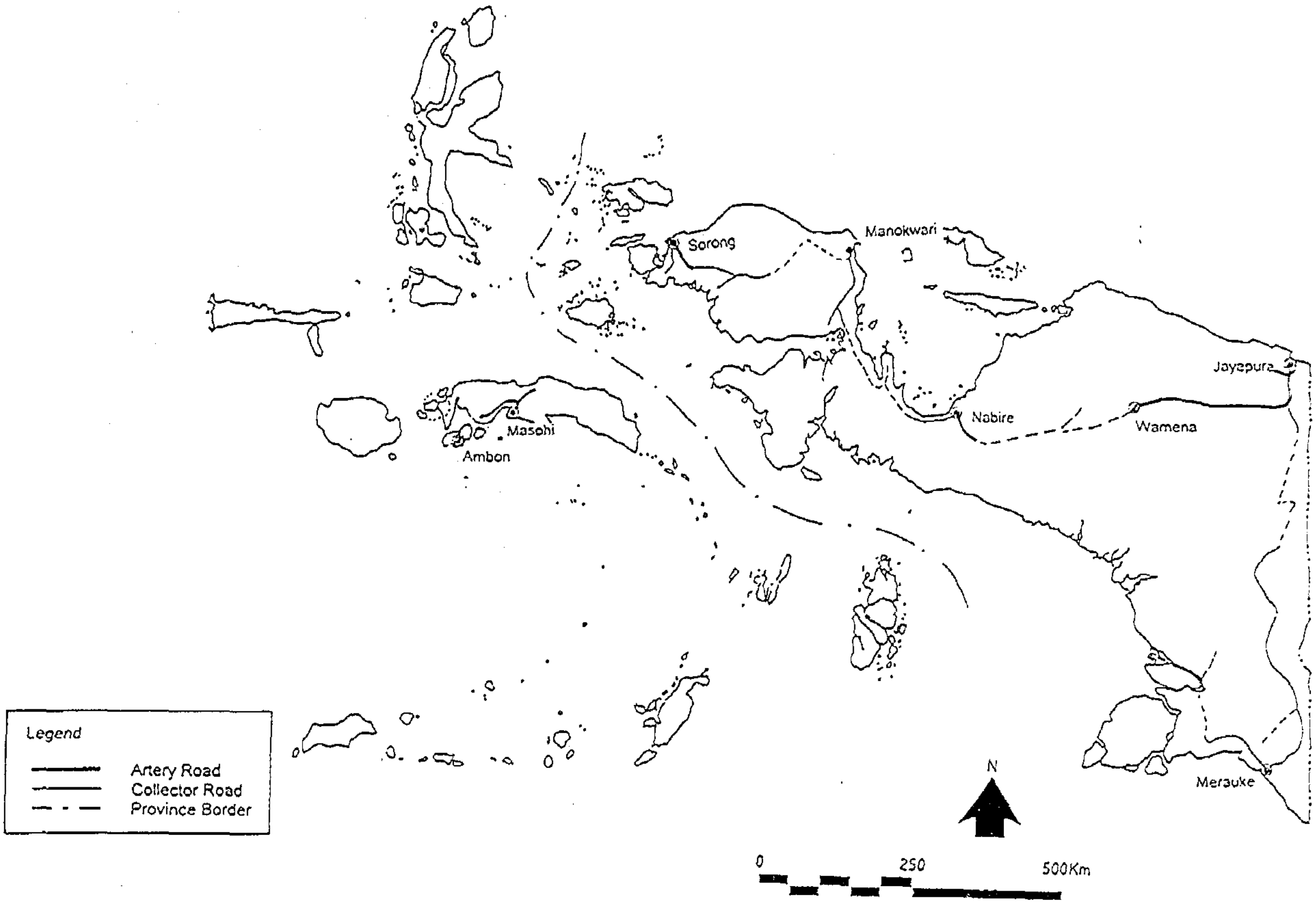


Figure A2.3.12 Principal Road in Maluku and Irian Jaya

Figure A2.3.13 Railway Route in Indonesia

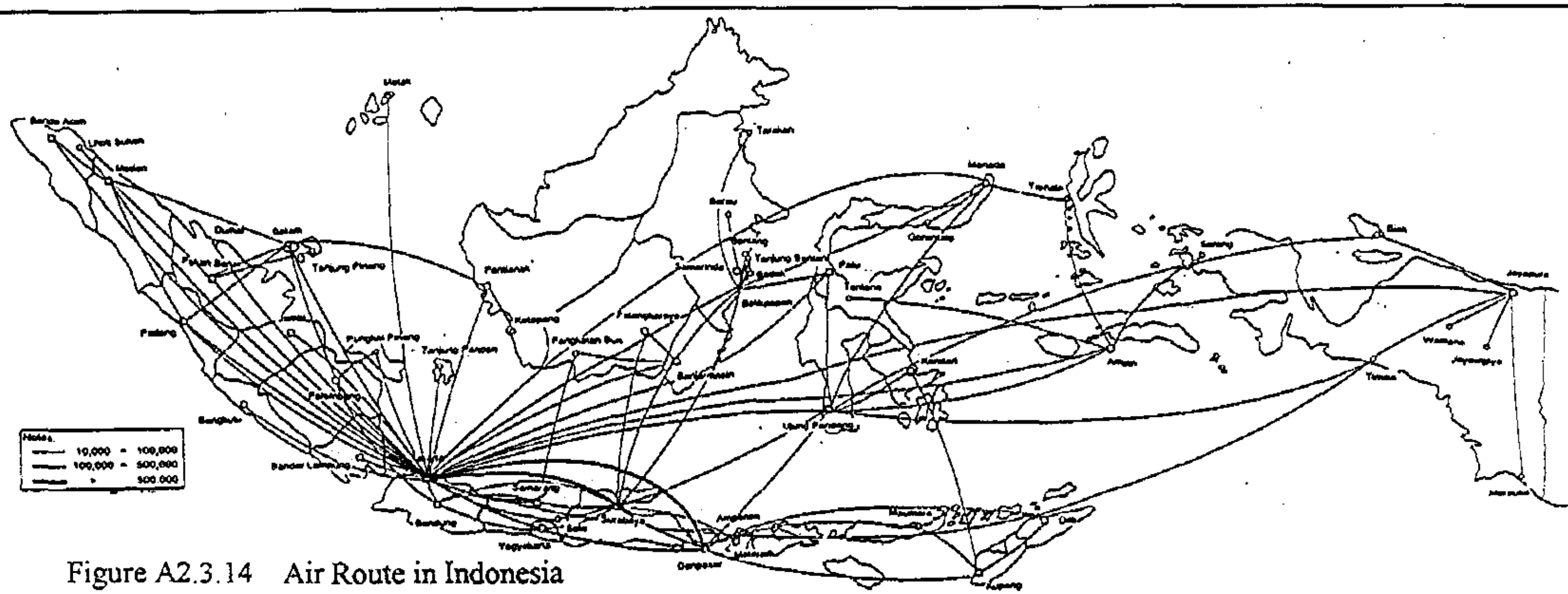


Figure A2.3.14 Air Route in Indonesia

A3.1.1 Formulas and Coefficient of Demand forecast

1. Shares of Air Transportation

$$Y = 27.089 \times Ln(X) - 126.7$$

Where, X : Distance (km)

Y : Share of air transportation (%)

2. Passenger Demand in Maluku and Irian Jaya

$$Pxyi = a \{ (PAxi \times PAyi)^{0.5} \times (GCxi + GCyi)^{0.75} \} + b$$

$Pxyi$: Ferry passenger between areas x and y in the year i

$PAxi$: Population of area x in the year i

$PAyi$: Population of area y in the year i

$Gcxi$: GRDP/capita of area x in the year i

$GCyi$: GRDP/capita of area y in the year i

	a	b
Maluku	4.6084	- 6,024
Maluku and Irian Jaya	2.3078	-12,378
Irian Jaya	5.3768	-23,042

3. Ferry Cargo for Long Distance Routes

$$C/P = a \times Y + b$$

C : Ferry cargo (ton)

P : Ferry passenger

Y : Year

a : 0.0071537 (constant)

b : -14.039 (constant)

Year	Cargo/Passenger
2004	0.297(ton / capita)
2008	0.325
2013	0.361
2019	0.404

4. Ferry Cargo for Short and Middle Distance Routes

$C / P = \mathrm{a} \times Y + \mathrm{b}$

C	: Ferry cargo (ton)
P	: Ferry passenger
Y	: Year
a	: 0.006175 (constant)
b	: -12.2273 (constant)

Year	Cargo/Passenger
2004	0.198 (ton / capita)
2008	0.223
2013	0.225
2019	0.291

5. Four-wheel Vehicles for Long Distance Routes

$C_1/V_1 = \mathrm{a} \times Y + \mathrm{b}$

C_1/V_1	: Average cargo volume per one four wheel vehicle on the long distance ferry route
Y	: Year
a	: 0.038441 (constant)
b	: - 74.4184 (constant)

6. Four-wheel Vehicles for Short and Middle Distance Routes

$C_2/V_2 = \mathrm{a} \times Y + \mathrm{b}$

C_2/V_2	: Average cargo volume per one four wheel vehicle on the middle and short distance ferry route
Y	: Year
a	: 0.062293 (constant)
b	: - 74.4184 (constant)

7. Cargo Volume per a Truck

Unit : ton / truck

Year	2004	2008	2013	2019
Long distance routes	4.76	5.04	5.39	5.81
Short & middle distance routes	3.18	3.63	4.20	4.88

8. Two-wheel Vehicle Demand Forecast

$$V_2 = 1/100 * (36.83/D + 0.948) * P$$

V_2 : the number of two-wheel vehicles

D : distance of ferry route

P : the number of ferry passenger

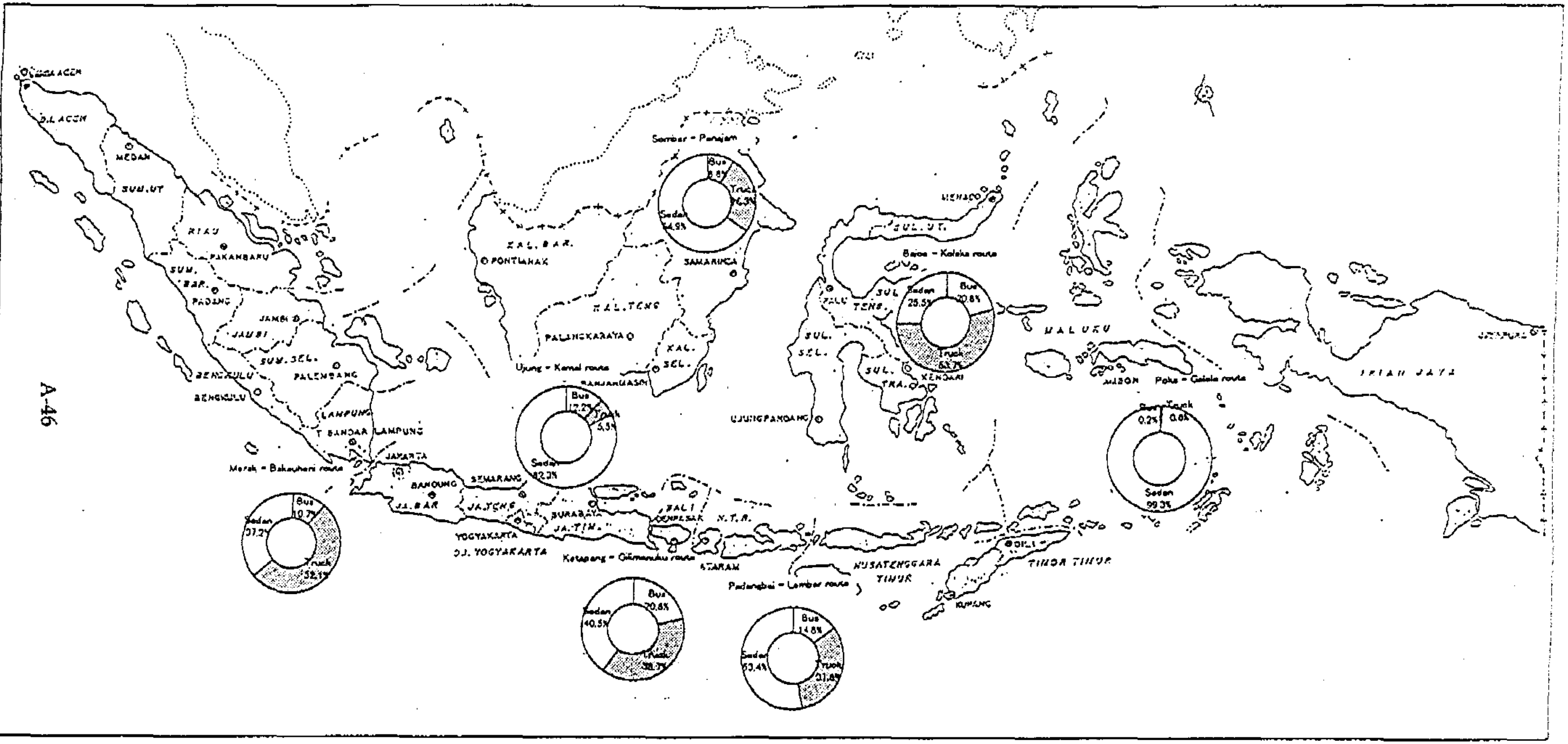


Figure A3.1.1 Share of Trucks, Buses and Sedans & Pickups by Each Route

Table A3.1.1(1) PT. PELNI Passenger OD in 1993

Province		Aceh	North Sumatera		West Sumatera	Riau			Jambi	South Sumatera	Bengkulu	Lampung	Jakarta	West Java	Central Java	Yogyakarta	East Java
			Belawan	Gn. Sitoli	Sibolga	Padang	Dumai	Kijang		Muntok	Bengkulu		Tg. Priok	Cirebon	Semarang		Surabaya
Aceh																	
North Sumatera	Belawan												23,827	0	0		5,152
	Gn. Sitoli				513	3,376							2,823		2		
West Sumatera	Sibolga			3,934	0	111							2,793		33		
Riau	Padang			2,711	277								6,451		26		
	Dumai							13,188		601			7,794				894
	Kijang						16,785			3,809			48,619				5,603
Jambi																	
South Sumatera	Muntok						654	3,466					21,134				988
Bengkulu	Bengkulu																
Lampung																	
Jakarta	Tg. Priok		69,223	2,270	1,879	3,464	4,928	62,521		15,205					23		5,316
West Java	Cirebon																43
Central Java	Semarang				15	28							15				158
Yogyakarta																	
East Java	Surabaya		9,645				1,125	18,539		787			3,870	33	134		
	Meneng																
Bali	Benoa																35
	Pd. Bai																
West Nusa Tenggara	Bima																673
	Lembar													13			4,119
	Badas																277
East Nusa Tenggara	Labuan Bajo																11
	Maumere																195
	Ende																7,109
	Waingapu																3,193
	Larantuka												32				262
	Kalabahi																872
	Kupang												707				11,780
East Timor	Dili												299	14			5,979
West Kalimantan	Pontianak			82	1,091	880							58,945	8,028	48,332		82
Central Kalimantan	Kumai														11,461		11,599
	[illegible]																
South Kalimantan	B. Masin				176	28							276	7,699	45,629		66,903
	PT. Laut																11,840
East Kalimantan	B. Papan		2,033				52	31		22			6,581				139,422
	Samarinda																
	Tarakan																18,121
	Nunukan																422
North Sulawesi	Bitung		664				42	83		53			25,083				13,147
	Tahuna																195
	Lirung																24
	Kwandang						2	4					3,632				1,045
	Gorontalo																315
	Kolonodale																326
Central Sulawesi	Pantoloan		407				33	21		15			2,281				24,265
	Toli-Toli		53										1,079				2,998
	Luwuk																725
	Banggai												276				
	Poso																
Southeast Sulawesi	Kendari												10		9		5,962
	Bau-Bau		924				346	6,223		246			27,576				11,320
South Sulawesi	U. Pandang		2,556				830	3,332		1,150			81,794	30	52		121,597
	Pare-Pare																791
Maluku	Ternate		125										4,221				5,427
	Ambon		443				108	254		49			14,212		1		28,441
	Banda												23				18
	Saumlaki													1			21
	Tual												28	6			939
	Dobo													5			647
Irian Jaya	[illegible]													10			233
	Fak-Fak						2						61	30			625
	Kaimana													1			217
	Sorong						195	60		20			2,984	60	5		9,826
	Manokwari												2,589				2,504
	Biak												678		18		1,646
	Serui												4		9		540
	Nabire												3		10		1,879
	Jayapura												9,778		23		2,624
	Agats																
	[illegible]																
Total		0	96,077	9,013	3,951	9,889	24,604	104,246	0	19,453	0	0	417,259	15,929	106,055	0	543,781

Province			Bali		West Nusa Tenggara			East Nusa Tenggara							East Timor	West Kalimantan	Central Kalimantan		South Kalimantan		East Kalimantan
		Meneng	Benoa	Pd. Bai	Bima	Lembar	Badas	Lab. Bajo	Maumere	Ende	Waingapu	Larantuka	Kalabahi	Kupang	Dili	Pontianak	Kumai	[illegible]	B. Masin	PT. Laut	B. Papan
Aceh																					
North Sumatera	Belawan	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	1,525
	Gn. Sitoli															330			4		
West Sumatera	Sibolga															1,441			349		
Riau	Padang															1,504			165		
	Dumai																				49
	Kijang																				27
Jambi																					
South Sumatera	Muntok																				15
Bengkulu	Bengkulu																				
Lampung																					
Jakarta	Tg. Priok													727	706	47,774			304		8,387
West Java	Cirebon														206	5,840			10,252		
Central Java	Semarang															55,964	10,343		43,964		
Yogyakarta																					
East Java	Surabaya		130		485	62	3	2	298	6,509	2,859	34	874	10,788	11,498	639	11,783		86,923	8,481	133,071
	Meneng																				
Bali	Benoa				565				128	2,119	2,139		190	3,999	2,506		1				
	Pd. Bai																				
West Nusa Tenggara	Bima		247			277			11	1,613	3,076		165	2,026	2,921		2		1,819		
	Lembar														707	197			4,896		
	Badas																				
East Nusa Tenggara	Labuan Bajo						2												1		
	Maumere				13	62				11	28		1,729	466	2,165				31		
	Ende				1,036	2,642			9		1,713		742	7,677	2,473				1,160		
	Waingapu				2,291	2,459			22	1,262			186	7,017	466				28		
	Larantuka						31	18							54				2		
	Kalabahi				128	249			1,327	123	214			665	2,376				31		
	Kupang				1,976	4,148			314	7,158	7,665		681		1,895				218		
East Timor	Dili				2,089	3,261	38	5	1,831	2,143	492	112	2,267	1,663					66		
West Kalimantan	Pontianak					81									29				1,559		
Central Kalimantan	Kumai																			74	
	[illegible]																				
South Kalimantan	B. Masin		1,341		471	1,456	12		24	268	143		16	122	177	1,572					
	PT. Laut		50																		32
East Kalimantan	B. Papan																			12	
	Samarinda																				
	Tarakan																			43	12,918
	Nunukan																			119	1,155
North Sulawesi	Bitung		392		57												4				12,199
	Tahuna		22		7																
	Lirung																				
	Kwandang																				430
	Gorontalo		364		89																
	Kolonodale		233		147												1				
Central Sulawesi	Pantoloan																				10,068
	Toli-Toli																			23	1,272
	Luwuk		1,749		412																
	Banggai																				
	Poso																				
Southeast Sulawesi	Kendari		3,201		311	5										43			48		
	Bau-Bau																				
South Sulawesi	U. Pandang		3,073		20,105	6,565			13,893	40	101		630	3,757	10,542	877	24		520		32,090
	Pare-Pare																			7,380	7,824
Maluku	Ternate																				
	Ambon					13	232							140	2,777	61			114		
	Banda					2									24	2			9		
	Saumlaki														9						
	Tual					37						15	87		742	1			41		
	Dobo					21	4					38			129				6		
Irian Jaya	[illegible]					10									112				15		
	Fak-Fak					9		2				7			81	89			2		
	Kaimana					23		1				3			26				9		
	Sorong											1		33	112	2			14		
	Manokwari													24	10				59		
	Biak					11								84	4	3			13		
	Serui																		13		
	Nabire					1										26			39		
	Jayapura													71	31	10			28		
	Agats																				
	[illegible]																				
Total		0	11,318	0	29,382	21,364	322	30	12,852	21,045	17,899	210	6,463	39,629	41,119	117,273	22,139	0	132,049	16,447	241,363

Table A3.1.1(2) PT. PELNI Passenger OD in 1993

Province		East Kalimantan				North Sulawesi					Central Sulawesi					Southeast Sulawesi		South Sulawesi		Maluku						Irian Jaya											Total
		Samarinda	Tarakan	Nunukan	Bitung	Tahuna	Lirung	Kwandang	Gorontalo	Kolonodale	Pantoloan	Toli-Toli	Luwuk	Banggai	Poso	Kendari	Bau-Bau	U. Pandang	Pare-Pare	Ternate	Ambon	Banda	Saumlaki	Tual	Dobo	Merauke	Fak-Fak	Kaimana	Sorong	Manokwari	Biak	Serui	Nabire	Jayapura	Agats	Bintuni	
Aceh																																					0
North Sumatera	Belawan	0	0	0	512	0	0	0	0	0	456	56	0	0		0	932	1,702	0	75	447	0	0	0	0	0	0	0	0	0	0	0	0	0			84,774
	Gn. Sitoli																																				9,071
West Sumatera	[illegible]																																				8,211
Riau	[illegible]																																				11,136
	Dumai				18						4						82	633			77						4		320								23,675
	Kijang				109			2			12						4,493	3,972			158								47								81,679
Jambi																																					0
South Sumatera	Muntok				17			1			12						152	1,768			9								4								20,264
Bengkulu	Bengkulu																																				0
Lampung																																					0
Jakarta	Tg. Priok		16		26,354			3,351			8,040	893		166		1	8,763	87,919		4,006	15,829	23		12			33		4,671	1,851	1,235			10,187			393,179
West Java	Cirebon																	48			3			12	13	75	9		67								12,537
Central Java	Semarang															86		40			31								54	23	96	33	294	111			110,927
Yogyakarta																																					0
East Java	Surabaya		19,380	332	11,487	408		792	235	1,301	28,362	2,642	367			3,031	11,339	117,246	268	3,635	26,233	68	19	855	693	1,330	176	15	11,418	2,638	2,213	490	1,223	5,407			517,961
	Meneng																																				0
Bali	Benoa				509	32			239	619			1,364			2,999		4,334						104													21,897
	Pd. Bae																																				0
West Nusa Tenggara	Bima				71				471	19			121			339		10,029																			22,749
	Lembar															49		5,863			79	2		52	34	16							2				19,920
	Badas																																				222
East Nusa Tenggara	Labuan Bajo																																				14
	Maumere																	24,231																			28,181
	Ende																	251																			23,663
	Waingapu																	102																			19,930
	Larantuka																						1	5	27	6	3		6								407
	Kalabahi																	889																			5,826
	Kupang																	3,897			159								30	8	131						40,655
East Timor	Dili																	8,927			2,529	31	16	251	139	141			35	20	5			19			36,468
West Kalimantan	Pontianak																	461			39	2				2	27		40	2	5	1	7	25			119,939
Central Kalimantan	Kumai																		137																		23,271
	Sampit																																				0
South Kalimantan	B. Masin															63		711			162	4		29	6	13			50	23	30	10	73	74			127,573
	KT. Baru		64	33								33							7,936																		19,992
East Kalimantan	B. Papan		14,145	1,379	11,330			317			8,532	1,191						31,082	8,069																		224,220
	Samarinda																																				0
	Tarakan			2,873							29,070	1,129						46,556	179																		110,830
	Nunukan		115									904							6,955																		9,611
North Sulawesi	Bitung					2,133	1,184	213	297	393	8,860	1,785	1,995	414		731	646	10,604		12,264	4,824								11,369	2,730	1,244			6,182			119,899
	Tahuna				4,179				389	73			99			42		290																			5,552
	Lirung				1,934	672			24	2			7			1		21																			2,085
	Kwandang				134						77							3,894		282									149	36				144			9,820
	Gorontalo				270	233	16			941			452			363		462																			3,210
	Kolonodale				368	32			206				323			1,016		118																			3,340
Central Sulawesi	Pantoloan		835		8,530			113				10,715						12,059																			76,272
	Toli-Toli		1,861	830	1,876						12,219							4,246	1,281																		27,042
	Luwuk				2,168	56	3		573	634						4,393		787																			11,492
	Banggai				558												508	310		363									77	39	13			35			2,179
	Poso																																				0
Southeast Sulawesi	Kendari				781	48	69		594	602			1,121					3,220			251								242	113	64	62	59	218			17,891
	Bau-Bau				657									409				21,266		819	24,071	2		53			14		3,416	245	122			982			150,436
South Sulawesi	U. Pandang		56,180		11,137	189	13	3,580	466	32	14,290	3,234	592	456		2,013	19,796			5,433	18,574	11		692	761	1,876			12,138	3,569	2,733	1,025	2,579	14,147			489,394
	Pare-Pare		97	7,319								683																									24,498
Maluku	Ternate				10,925			359						132			1,354	5,616			16,383								4,119	961	409			1,731			51,857
	Ambon				5,342											874	23,587	17,795		13,487		4,181	35	8,223	2,523	481	57		12,963	1,335	976	226	337	1,609			143,968
	Banda																2	29			4,825			363	231	46			2								5,997
	Saumlaki																							78	4	10											170
	Tual																15	315			8,287	231	129		2,986	868	1,133	1,100	1,209								18,333
	Dobo																	666			2,811	209	16	3,696		256											8,486
Irian Jaya	Merauke																	390			192	26		1,168	39		137	63	497								3,386
	Fak-Fak																44	387			342	117	5	923	114			3,767	7,670								14,569
	Kaimana																	172			277	29		978	119		3,707		1,276								2,351
	Sorong				10,685			137						26		203	3,152	9,792		4,212	12,804	14	11	1,095	249		7,770	223		10,638	4,321	776	976	11,542			97,780
	Manokwari				2,298			50						20		153	292	2,909		878	1,138						11,671				7,449	669	1,271	10,421			44,285
	Biak				1,369											90	141	1,796		354	908								3,815	7,972		707	3,180	9,031			32,029
	Serui															53		294			120								813	743	637		1,662	5,735			11,796
	Nabire															113		1,549			244								950	1,130	2,920	1,519		4,093			18,430
	Jayapura				5,388			137						18		89		9,892		1,401	1,267								11,867	10,335	11,780	6,029	3,802				74,399
	Agats																																				0
	Bintuni																																				0
Total		0	92,671	12,786	159,033	3,683	1,287	9,074	3,069	3,117	110,401	23,269	6,746	1,671	0	16,721	75,338	457,196	24,816	49,697	143,855	4,961	232	18,793	7,930	5,172	24,763	5,170	90,385	44,485	36,310	11,597	15,934	81,110	0	0	3,373,115

Table A3.1.2 Air Passenger and Cargo Records

Route		1987	1988	1989	1990	1991	1992	1993	1994	1995
Air Passenger										
	Surabaya - Banjarmasin	210,357	n.a	226,018	183,116	180,900	176,814	186,789	210,907	232,851
	Surabaya - Balikpapan	n.a	n.a	n.a	n.a	273,249	268,034	295,340	338,753	382,403
	Surabaya - Ujung Pandan	172,450	n.a	183,238	149,118	142,069	160,425	179,887	214,072	265,409
	Surabaya - Palangkaraya	n.a	n.a	5,174	5,028	3,711	4,382	8,378	16,319	28,100
	Jakarta - Pontianak	n.a	n.a	n.a	n.a	273,249	268,034	295,340	338,753	382,403
	Ujung Pandan - Ambon	82,555	n.a	94,684	56,348	58,995	58,698	65,130	74,477	72,398
	Pontianak - Batam	n.a	n.a	n.a	n.a	6,129	6,919	7,322	7,134	10,347
	Ujung Pandan - Kendari	46,950	n.a	50,285	41,714	43,581	47,875	54,387	60,542	n.a
	Temate - Ambon	17,284	n.a	13,946	13,724	15,102	26,198	18,571	26,064	21,902
	Ambon - Sorong	11,711	n.a	13,061	17,428	17,858	17,931	19,928	17,931	22,208
	Ambon - Biak	2,835	n.a	3,712	8,302	8,713	7,115	7,092	7,117	7,135
	Biak - Manokwari	n.a	n.a	n.a	12,997	14,628	13,160	11,199	11,347	12,239
Air Cargo (ton)										
	Surabaya - Banjarmasin	3194	n.a	2528	3812	4522	4148	3804	5103	4894
	Surabaya - Balikpapan	2220	n.a	2394	2577	2627	2591	2947	4058	5186
	Surabaya - Ujung Pandan	3312	n.a	3409	3256	3108	2673	3160	4401	5318
	Surabaya - Palangkaraya	n.a	n.a	12	185	26	21	122	130	156
	Jakarta - Pontianak	1694	n.a	2164	2505	3232	3090	2746	2679	3079
	Ujung Pandan - Ambon	2047	n.a	2404	2441	1696	1447	1580	1959	1912
	Pontianak - Batam	n.a	n.a	n.a	n.a	19	16	33	28	65
	Ujung Pandan - Kendari	475	n.a	559	663	665	744	719	648	n.a
	Temate - Ambon	97	n.a	72	59	56	54	60	88	54
	Ambon - Sorong	124	n.a	227	196	228	268	231	249	274
	Ambon - Biak	n.a	n.a	n.a	103	91	131	115	150	69
	Biak - Manokwari	n.a	n.a	17	31	46	55	27	30	15

Table A3.1.3 Passenger OD in 1993

Province	Aceh	North Sumatra	West Sumatra	Riau	Jambi	South Sumatra	Bengkulu	Lampung	Jakarta	West Java	Central Java	Yogyakarta	East Java	Bali
Aceh	183,974	42,210	2,540	3,595	0	983	0	154	108,032	28,576	7,111	2,770	6,783	2,238
North Sumatra	42,143	312,700	30,945	37,268	249	21,647	2,804	6,605	397,044	122,109	49,339	20,278	26,852	57,259
West Sumatra	2,588	32,180	41,012	17,172	0	6,883	64	201	346,641	115,672	22,589	8,050	6,692	2,110
Riau	3,111	59,735	21,921	524,600	10,467	43,577	1,387	429	199,115	74,297	53,779	12,007	89,426	10,094
Jambi	0	3,978	2,062	7,436	0	16,236	140	97	65,042	16,427	48,078	13,364	15,995	98
South Sumatra	3,917	19,483	8,500	34,844	21,562	323,613	10,073	15,099	683,247	336,677	153,826	86,218	128,924	7,767
Bengkulu	0	1,032	868	102	730	11,986	0	115	50,645	28,500	11,596	3,415	7,689	78
Lampung	140	281	459	1,922	4,864	14,507	22,212	0	1,486,676	1,433,349	393,905	103,487	183,624	20,116
Jakarta	114,119	346,499	379,432	210,729	93,301	671,107	52,298	2,070,068	0	30,080	239,614	146,853	684,579	327,392
West Java	32,097	105,787	124,806	57,168	39,794	398,553	41,779	1,623,381	42,633	6,378	72,881	23,600	84,774	147,913
Central Java	14,295	30,797	48,037	41,817	51,859	196,614	32,251	344,122	269,765	110,352	159,326	208	95,143	338,465
Yogyakarta	4,442	5,518	9,970	8,718	3,780	94,199	8,804	153,163	132,884	16,509	775	0	41,341	187,798
East Java	2,559	36,847	6,999	41,520	33,872	106,641	23,332	233,438	447,596	50,445	103,790	4,265	17,574,538	1,980,218
Bali	93	3,567	5,685	7,469	91	5,058	69	10,050	215,346	114,924	309,714	143,465	2,087,394	6,527
West Nusa Tenggara	25	1,790	0	306	0	7,439	0	0	166,180	17,629	14,106	21,688	219,495	385,112
East Nusa Tenggara	88	1,690	0	1,562	0	6,709	0	0	262,239	23,735	9,166	11,765	64,821	45,671
East Timor	33	323	0	13	62	0	0	1,839	49,421	23,587	1,289	858	4,326	3,819
West Kalimantan	84	4,554	4,300	18,792	7,593	2,742	26	3,716	174,150	47,498	21,453	5,118	16,840	459
Central Kalimantan	22	274	80	275	0	34	0	745	24,976	11,574	17,283	3,486	61,525	1,313
South Kalimantan	978	233	1,595	3,693	117	2,965	57	344	76,287	26,595	23,087	12,219	127,439	9,296
East Kalimantan	742	12,902	514	3,892	154	21,743	27	135	128,021	30,065	32,321	14,466	167,004	6,891
North Sulawesi	86	2,253	53	27	30	1,698	8	1,680	51,301	17,352	3,278	942	32,011	28,610
Central Sulawesi	72	533	230	0	0	92	0	10	12,791	9,384	2,873	2,104	31,795	8,074
Southeast Sulawesi	0	273	28	104	124	1,595	0	1,832	31,280	2,778	4,713	115	11,069	7,022
South Sulawesi	843	8,980	777	2,656	1,949	12,772	661	2,881	102,043	24,093	13,155	10,471	79,481	42,995
Maluku	0	5,174	4,751	21	0	129	0	2,206	61,633	24,456	12,804	3,378	38,617	5,296
Irian Jaya	22	4,309	1,287	3,245	0	3,763	0	29	80,333	33,519	16,656	4,275	30,326	2,389
TOTAL	407,062	1,046,107	696,872	1,054,945	270,390	1,971,283	195,994	4,480,553	5,665,334	2,810,102	1,820,704	658,864	21,918,752	3,638,222

Province	West Nusa Tenggara	East Nusa Tenggara	East Timor	West Kalimantan	Central Kalimantan	South Kalimantan	East Kalimantan	North Sulawesi	Central Sulawesi	Southeast Sulawesi	South Sulawesi	Maluku	Irian Jaya	TOTAL
Aceh	31	399	33	105	0	84	642	119	160	0	717	11	24	391,289
North Sumatra	5,761	146	461	5,028	401	2,343	16,549	4,667	306	2,421	4,733	1,469	4,597	1,196,119
West Sumatra	1,421	348	0	2,179	64	167	2,029	73	1,002	39	3,750	451	1,760	617,075
Riau	8,151	3,272	13	7,417	30	3,757	2,878	70	0	51	4,292	0	3,951	1,139,826
Jambi	0	158	58	7,034	0	108	2,330	32	0	173	3,127	0	0	201,993
South Sumatra	3,297	1,719	0	7,854	652	1,270	5,146	1,363	133	2,168	6,760	1,350	66	1,865,529
Bengkulu	0	0	0	24	0	27	42	9	0	0	78	0	0	116,937
Lampung	6,122	2,304	0	19,246	0	371	451	3,635	19	1,343	2,980	1,636	0	3,709,656
Jakarta	175,127	57,586	98,600	132,532	22,144	66,372	154,974	62,423	28,496	10,195	86,877	98,350	84,166	6,483,917
West Java	38,392	15,376	22,176	46,409	10,943	32,170	72,653	12,135	8,064	7,052	25,136	24,994	22,346	3,137,190
Central Java	22,184	12,957	1,849	11,992	23,570	42,290	36,369	4,678	2,300	1,566	18,722	3,222	17,848	1,933,018
Yogyakarta	11,199	10,641	3,847	36,773	3,057	7,548	22,593	1,185	1,455	85	6,602	2,324	6,990	776,359
East Java	195,875	44,410	8,810	13,988	38,992	157,978	158,935	26,842	28,767	11,935	82,910	42,064	28,609	21,490,114
Bali	342,676	35,900	7,550	445	695	6,427	5,139	6,272	10,183	4,385	43,122	6,881	4,261	3,364,004
West Nusa Tenggara	330,199	39,371	1,932	1,072	0	3,634	802	834	841	657	15,960	46	573	1,429,697
East Nusa Tenggara	38,841	413,649	16,846	340	366	636	8,298	154	197	430	14,194	562	3,068	928,559
East Timor	1,822	7,205	6,112	0	0	0	24	61	40	47	8,184	61	1,160	112,284
West Kalimantan	900	330	0	121,489	10,032	10,357	7,338	40	0	16	237	395	2,769	461,068
Central Kalimantan	86	622	0	3,318	93,846	64,103	4,860	812	681	32	1,877	0	6,375	300,400
South Kalimantan	3,806	453	0	2,650	36,639	163,731	85,303	926	1,023	12,082	2,492	20,223	13,901	648,156
East Kalimantan	3,828	7,416	0	12,566	3,919	62,257	552,061	13,341	18,853	2,536	119,918	244	2,053	1,240,091
North Sulawesi	409	40	44	2,232	0	893	14,820	290,668	50,205	367	26,534	75,326	21,482	622,400
Central Sulawesi	884	188	36	0	6,891	358	15,694	32,926	190,820	3,444	55,575	2,412	513	397,694
Southeast Sulawesi	897	95	703	317	39	87	1,310	205	4,872	101,883	241,828	21,321	3,229	437,727
South Sulawesi	15,516	9,311	8,314	259	627	7,203	134,479	30,769	54,168	251,235	133,217	45,098	30,401	1,035,354
Maluku	267	1,915	821	392	0	10,665	773	70,723	3,879	20,791	35,265	1,200,177	40,811	1,544,950
Irian Jaya	1,107	837	57	79	36	22	1,989	15,404	1,917	3,722	30,449	40,133	366,032	640,427
TOTAL	1,408,797	668,670	178,262	437,959	272,985	644,881	1,308,505	600,369	408,381	444,652	977,557	1,588,739	666,906	36,241,866

Table A3.1.4 Main Hinterland for Long-term Development Plan Routes

Ferry Routes	Main Hinterland	
Surabaya – Banjarmasin	East Java	South Kalimantan
Jakarta – Pontianak	Jakarta and West Java	West Kalimantan
Surabaya – Ujung Pandan	East Java, Central Java Yogyakarta	South Sulawesi, Southeast Sulawesi, Central Sulawesi
Kendari – Ambon	South Sulawesi, Southeast Sulawesi	Ambon
Ambon – Sorong	Ambon	Sorong
Selayar – Labuhan Bajo	South Sulawesi	West Nusa Tenggara, East Nusa Tenggara
Manokwari – Biak	Manokwari	Biak
Wahai – Babang	Seram Island	Bacan Island
Patani - Sorong	Central part of Halmahera Island, Temate Island	Sorong

Source : Study Team

Table A3.2.1(1) Evaluation of Ferry Routes

Number	Route		Distance	Passenger 1995	Passenger 2004	Passenger 2019	Ferry port facilities: Mooring facility	Ferry port facilities: Loading facility	Ferry port facilities: Possibility of extension	Possibility of privatization	Road condition	Road connection	Social-economic condition: 1955 Population (Kabupaten, Kotamadya)	Social-economic condition: 1955 Population (Kabupaten, Kotamadya)	Social-economic condition: National development policy	Social-economic condition: Classification	Evaluation
(Existing routes)																	
1	Merak	Bakauheni	MS	13,579,295	AA	AA	O-O	O-O	X-O	O	A-A		1,640,600	1,854,300	A	1	X
2	Ketapang	Gilimanuk	MS	4,859,458	AA	AA	O-O	O-O	O-O	O	A-A		1,472,900	554,900	A	1	X
3	Padangbai	Lembar	MS	976,560	AA	AA	O-O	O-O	O-O	O	A-A		350,100	652,700	A	1	X
4	Balikpapan	Mamuju	MS	38,157			O-O	O-O	O-O	X	A-B		416,200	238,800	A	1	X
5	Ternate	Bitung	MS	30,158			O-O	O-O	O-O	X	C-A		59,281	107,100	A	1	X
101	Balohan	Malahayati	MS	103,083	AA	AA	O-X	X-X	O-O	O	C-A		24,700	291,300	B	3	X
102	Meulaboh	Sinabang	MS	28,861			O-O	O-O	O-O	X	A-C		387,400	*-	B	3	X
103	Ajibata	Tomok	MS				O-O	O-O	O-O	X	A-B		812,300	712,900	B	3	X
104	Sibolga	Nias	MS	95,351		AA	X-X	X-X	X-X	O	A-C		238,800	619,200	B	3	X
106	Padang	Sikakap	MS	23,636			O-O	O-O	O-O	X	A-C		521,700	*-	B	3	X
108	T Pungkur	Tg Uban	MS	13,315			O-O	O-O	O-O	X	C-C		403,600	458,800	B	3	X
109	Palembang	Kayuarang	MS	32,773	AA	AA	O-O	O-O	O-O	O	A-C		1,352,300	569,800	B	3	X
110	Sadai	Tg Pandan	MS	8,201			O-O	O-O	O-O	X	C-C		569,800	204,600	B	3	X
111	Jambi	K Tungkal T Pinang	MS				O-O	X-X	O-O	X	A-C		410,400	569,800	B	3	X
112	M Tebo	Kuamang Kuning	MS	1,223							C-C*		362,800	*-	C	3	X
113	Ds. Pantas	Betung bedarah	MS	1,932							C-C*		397,200	*-	C	3	X
114	Pangkal Balam	T. Pandan	MS	981							C-C		569,800	204,600	B	3	X
201	Marina Jakarta	P. Kelapa	MS	9,126			X-X	X-X	X-X	O	A-C		9,160,000	*-	B	3	X
202	Marina Jakarta	P. Tidung	MS	23,080			X-X	X-X	X-X	O	A-C		9,160,000	*-	B	3	X
203	Kalipucang	Cilacap	MS	127,272	A	AA	O-O	O-O	O-O	O	B-C			1,533,500	B	3	X
204	Cilacap	Sidareja	MS				O-O	O-O	O-O	O	A-B		1,533,500	*-	B	3	X
205	Ujung	Kamal	MS	15,530,920	AA	AA	O-O	O-O	X-O	O	A-C		2,701,300	773,200	B	2,3	X
206	Jangkar	Kalianget	MS	78,811	A	AA	O-O	O-O	O-O	O	A-C		591,600	962,400	B	3	X
207	Kalianget	Kangean	MS	52,058	A	AA	O-O	O-O	O-O	O	C-C		962,400	*-	B	3	X
209	Jakarta	Surabaya	MS				Δ-Δ	Δ-Δ	X-X	O	A-A	O	9,160,500	2,701,300	A	3	X
301	Lombok	Pototano	MS	629,196	AA	AA	O-O	O-O	O-O	O	A-A		920,100	402,300	A	1,3	X
302	Sape	Komodo-L Bajo	MS	43,689			O-O	O-O	O-O	X	A-A		482,500	561,100	A	1,3	X
304	Ende	Waingapu	MS	20,233			O-X	O-X	O-X	X	A-B		228,000	170,800	A	3	X
305	Waingapu	Sabu	MS	7,300			X-O	X-O	X-O	X	B-C		170,800	*596,800	A	3	X
306	Kupang	Ende	MS	39,619			O-O	O-O	O-O	X	A-A		586,800	228,000	A	3	X
307	Kupang	Sabu	MS	28,334			O-O	O-O	O-O	X	A-C		596,800	*-	A	1,3	X
308	Kupang	Rote	MS	99,323			O-O	O-O	O-O	X	A-C		596,800	*-	A	3	X
309	Kupang	Larantuka	MS	59,115			O-O	O-O	O-O	X	A-A		596,800	265,700	A	3	X
310	Larantuka	Waiwerang	MS	479			O-X	O-X	O-O	X	A-B		265,700	*-	A	3	X
311	Lewoleba	Larantuka	MS	28			X-O	X-O	O-O	X	C-C		265,700	*-	A	3	X
312	Waiwerang	Lewoleba	MS	556			X-X	X-X	O-O	X	C-C		265,700	*-	A	3	X
313	Baranring	Lewoleba	MS	1,149			X-X	X-X	O-O	X	C-C		265,700	*-	A	3	X
314	Baranring	Barenusa	MS	931			X-X	X-X	O-O	X	C-C		265,700	155,800	A	3	X
315	Barenusa	Kalabahi	MS	28,456			X-O	X-O	O-O	X	C-C		155,800	*-	A	3	X
316	Balauring	Kalabahi	MS	445			X-O	X-O	O-O	X	C-C		265,700	155,800	A	3	X
317	Kupang	Kalabahi	MS	42,684			O-O	O-O	O-O	X	A-C		596,800	155,800	A	3	X
318	Atapupu	Kalabahi	MS	5,381			X-O	X-O	O-O	X	A-C		180,100	155,800	A	3	X
319	Kupang	Naikliu	MS				O-X	O-X	O-O	X	A-C		596,800	*-	A	3	X
401	Tayan	Trayu	MS	6,527			O-O	O-O	O-O	X	C-C*		489,000	*-	A	3	X
402	R Jaya	Tl Batang	MS	45			O-O	O-O	O-O	X	C-C		873,100	367,600	A	3	X
403	Sekura		MS	201,686	AA	AA	O-O	O-O	O-O	X	C-C		848,200		A		X
404	Karliasa		MS		AA	AA	O-O	O-O	O-O	X	C-C		848,200		A	3	X
405	Kota	Siantan	MS	920,195	AA	AA	O-O	O-O	X-X	X	C-C		873,100	*-	A	3	X
406	Semutai		MS		AA	AA	O-O	O-O	O-O	X	B-B		489,100		A	3	X
407	Tl Batang	Ketapang	MS								C-C		367,000	*-	A	3	X
408	P Pisau	Kalawat(P.Telo Sbr)	MS	5,948			X-X	X-X	O-O	X	A-A		503,300	*-	A	3	X
409	P Telo	Maloeni(P.Telo Sbr)	MS	8,923			O-O	O-O	O-O	X	A-A		503,300	*-	A	3	X
410	Batabein	Tjg Serdang	MS	206,148	AA	AA	O-O	O-O	O-O	X	B-C		383,700	*-	A	3	X
411	Balikpapan	Panajam	MS	521,401	AA	AA	O-O	O-O	O-O	X	A-A		416,200	*-	A	3	X
412	Tarakan	Tg Selor	MS	2,748							C-C		265,500	*-	A	3	X
413	Tarakan	Ancam	MS	458							C-B		265,500	768,700	A	3	X
414	Tarakan	Sembakung	MS	559							C-C		265,500	*-	A	3	X
501	Bitung	Pananaro	MS	3,093			O-O	O-O	O-O	X	A-C		107,100	260,600	A	3	X
502	Pagimana	Gorontalo	MS	36573			O-O	O-O	O-O	X	C-B		*392,200	639,100	A	1,3	X
503	Luwuk	Salakan	MS	8,657			O-O	O-O	O-O	X	C-C		392,200	*-	A	3	X
504	Salakan	Banggai	MS	864			O-X	O-X	O-O	X	C-C		392,200	*-	A	3	X
506	Bajoe	Kolaka	MS	417,085	AA	AA	O-O	X-X	O-O	O	A-A		614,400	147,100	A	1,3	X
507	Bira	Pamatata	MS	87,781			O-O	O-O	O-O	X	C-C		354,300	98,500	A	3	X
508	Torobulu	Tampo	MS	86,376			O-O	O-O	O-O	X	C-C		605,700	253,800	A	3	X
509	Tampo	Maligano	MS				O-X	O-X	O-O	X	C-C		253,800		A	3	X
510	Baubau	Tolandona	MS	94,178			O-O	O-O	O-O	X	C-C		430,700	253,800	A	3	X
603	Bastiong	Sidangole	MS				O-O	O-O	O-O	X	C-C				A		X
603	Ternate	Sidangole	MS	513,841	AA	AA	O-O	O-O	O-O	O	C-C		59,281	208,808	A	3	X
607	Ternate	Rum	MS	81,653			O-O	O-O	O-O	X	C-C		59,281	*-	A	3	X
608	Galala	Namlea	MS	41,318			O-O	X-X	X-O	X	C-C		269,888	106,315	A	3	X
609	Poka	Galala	MS	5,090,394	AA	AA	O-O	X-X	X-X	O	C-C		269,888	*-	A	3	X
610	Hunimua	Waipirit	MS	412,232	AA	AA	O-O	X-X	O-O	O	C-C		269,888	122,899	A	3	X
614	Tual	Elat	MS	12,166			X-X	X-X	O-O	X	C-C		73,631	39,411	A	3	X
615	Tual	Dobo	MS	12,568			X-X	X-X	O-O	X	C-C		73,631	56,916	A	1,3	X
616	Tual	Larat	MS	9,336			X-X	X-X	O-O	X	C-C		73,631	35,685	A	3	X
617	Larat	Saumlaki	MS	4,322			X-X	X-X	O-O	X	C-C		35,685	43,817	A	1,3	X
702	Sorong	Jefman Kalobo	MS	38,555			O-X	O-X	O-O	X	A-C		199,700	26,854	A	3	X
703	Biak	Serui	MS	36,232			O-O	O-O	O-O	X	C-C		86,320	54,635	A	3	X
704	Serui	Nabire	MS	13,070			O-O	O-O	O-O	X	C-A		54,635	224,200	A	3	X
708	Merauke		MS	11,516			X	X	O	X	B		241,100		A	3	X

Table A3.2.1(2) Evaluation of Ferry Routes

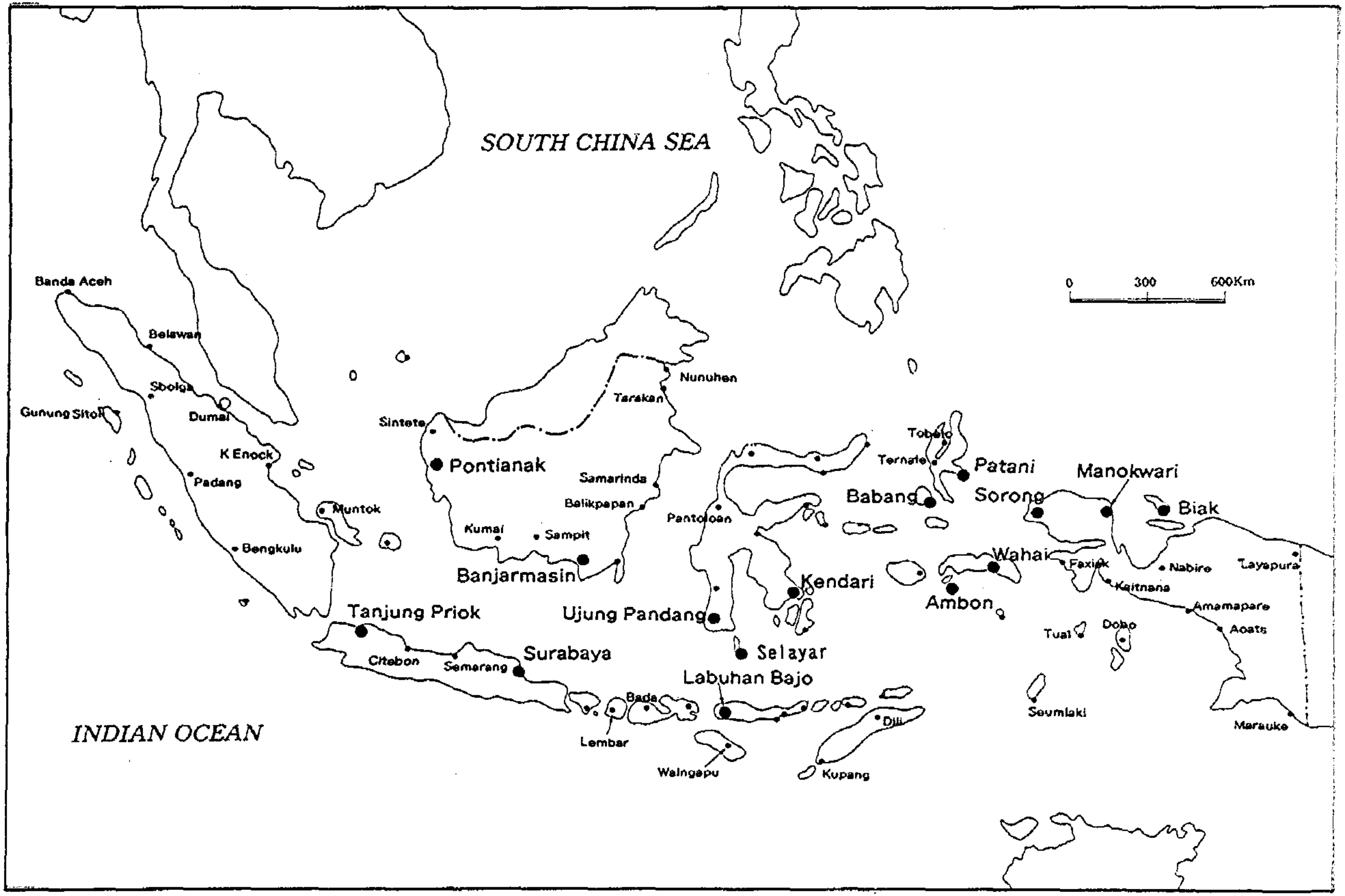
Number	Route		Distance	Passenger 1995	Passenger 2004	Passenger 2019	Ferry port facilities: Mooring facility	Ferry port facilities: Loading facility	Ferry port facilities: Possibility of extension	Possibility of privatization	Road condition	Road connection	Social economic condition: 1955 Population (Kabupaten, Kotamadya)	Social economic condition: 1955 Population (Kabupaten, Kotamadya)	Social economic condition: National development policy	Classification	Evaluation
(New Route)																	
51	Jakarta	Pontianak	L		A	AA	X-X	X-X	O-O	X	C-C		9,160,000	873,100	A	1,2	O
52	Surabaya	Banjarmasin	L		A	AA	X-X	X-X	O-O		C-C		2,701,300	2,900,400	A	1,2	O
53	Surabaya	Balikpapan	L		A	AA	X-X	X-X	O-O		C-C		2,701,300	416,200	A	1,2	O
54	Surabaya	Ujungpandan	L		A	AA	X-X	X-X	O-O		C-C		2,701,300	1,091,800	A	1,2	O
55	Kendari	Ambon(Poka)	L			AA	X-X	X-X	O-O		C-C		605,700	313,100	A	1,2	O
56	Jakarta	Banjarmasin	L			A	X-X	X-X	O-O		C-C		9,160,000	2,900,400	A	1,2	X
57	Semaran	Sampit or Banjarmasin	L			A	X-X	X-X	O-O		C-C		1,318,500	450,500	A	1,2	X
58	Selayar	L. Bajo	MS			A	X-O	X-O	O-O		C-C		99,900	561,100	A	1,2	O
											C-C						
59	Palembang	Batam	L		A	AA	O-X	O-X	O-O		C-C		1,352,300	477,700	B	3	X
60	Jakarta	P Belitung	L		A	AA	X-O	X-O	O-O		C-C		9,160,000	204,600	B	3	X
61	Belawan	Batam	L			A	X-X	X-X	O-O		C-C		1,910,000	478,000	A	3	Δ
351	Waingapu	L. Bajo	MS		*	*	X-O	X-O	O-O		C-C		82,400	561,100	A	3	O
653	Tulehu	Haruku	MS				X-X	X-X	O-O		C-C		269,888	122,899	A	3	X
654	Haria	Wailey	MS				X-X	X-X	O-O		C-C		122,899	147,259	A	3	X
655	Bastiong	Rum	MS				X-X	X-X	O-O		C-C		59,281	-	A	3	X
656	Tolebo	Daruba	MS				O-O	O-O	O-O		C-C		208,818	63,876	A	3	X
657	Air Buaya	Sanana	MS				X-X	X-X	O-O		C-C		106,315	47,528	A	3	O
658	Saketa	Babang	MS				X-X	X-X	O-O		C-C		33,242	59,419	A	3	X
659	Saketa	Payahe	MS				X-X	X-X	O-O		C-C	O	33,242	54,815	A	3	X
660	Ternate	Payahe	MS				O-X	O-X	O-O		C-C		59,281	54,815	A	3	Δ
661	Labuha	Laiwui	MS				X-X	X-X	O-O		C-C		59,419	31,624	A	3	X
662	Dobo	Benjina	MS				X-X	X-X	O-O		C-C		56,916	-	A	3	X
663	Sanana	Falabisahaya	MS				X-X	X-X	O-O		C-C		43,528	31,897	A	3	X
664	Soasiu	Akelamo	MS				X-X	X-X	O-O		C-C		59,281	54,815	A	3	X
665	Falabisahaya	Sanmya	MS				X-X	X-X	O-O		C-C		24,891	28,591	A	3	X
666	Saumlaki	Adaut	MS				X-X	X-X	O-O		C-C		43,817	*	A	3	X
667	Oili	Ilwaki	MS				X-X	X-X	O-O		A-C		158,800	24,650	B	1,3	X
668	Baucau-Wonreli	P Leti-P Moa-P Lakor	MS				X-X	X-X	O-O		C-C		24,850	19,873	A	3	X
669	Tobelo	Subaim	MS				O-X	O-X	O-O		C-C	O	208,818	49,456	A	3	X
670	Tual	Kaimana	MS				O-X	O-X	O-O		C-C		73,631	106,500	A'	1,3	Δ
671	P Banggai-Tikong	Falabisahaya	MS				X-X	X-X	O-O		C-C		28,540	34,897	A	3	X
672	Falabisahaya	Laiwui	MS				X-X	X-X	O-O		C-C		34,897	31,824	A	3	X
673	Wahai	Pabang	MS				X-X	X-X	O-O		C-C		200,000	59,000	A	1,3	O
674	Adaut	Tepa	MS				X-X	X-X	O-O		C-C		43,817	19,873	A	3	X
675	Dobo	Tunika	L				X-X	X-X	O-O		C-C		56,916	106,500	A'	1,3	Δ
676	Ambon	Fakfak	L				X-X	X-X	O-O		C-C		269,888	106,500	A	1,3	O
677	Ruka	Saketa	MS				X-X	X-X	O-O		C-C		54,815	33,242	A	3	X
678	Suru	Fakfak	MS				X-X	X-X	O-O		C-C		54,651	106,500	A	1,3	Δ
679	Laiwui	Opin	MS				X-X	X-X	O-O		C-C		31,624	13,278	A	3	X
680	Suru	Maren	MS				X-X	X-X	O-O		C-C		54,651	*	A	3	X
681	Benjina	Juring	MS				X-X	X-X	O-O		C-C		56,916	*	A	3	X
682	Poka	Bandaneira	MS				O-X	O-X	O-O		C-C		269,888	15,375	A	3	X
683	Bandaneira	Suru	MS				X-X	X-X	O-O		C-C		15,375	54,651	A	3	X
684	Weda	Patani-Gebe	MS				X-X	X-X	O-O		C-C	O	49,456	*	A	1,3	X
685	Gebe	Sorong	MS				X-O	X-O	O-O		C-A		49,456	*	A	1,3	X
686	Tual	Tayando	MS				X-X	X-X	O-O		C-C		73,631	*	A	3	X
687	Subaim	Kao	MS				X-X	X-X	O-O		C-C		49,456	208,818	A	3	X
688	Ambon	Ternate	L				O-X	O-X	O-O		C-C		269,888	59,281	A	1,3	O
689	Ambon	Tual	L				O-X	O-X	O-O		C-C		269,888	73,631	A	1,3	O
690	Patani	Sorong	MS				X-O	X-O	O-O		C-A		49,000	199,700	A	1,3	O
751	Manokwari	Biak	MS				O-X	O-X	O-O		C-C		129,000	86,320	A	1,3	O
752	Tunika	Kaimana	L				X-X	X-X	O-O		C-C	O	83,700	*	A	3	X
753	Kaimana	Fak-Fak	MS				X-X	X-X	O-O		C-C	O	83,700	*	A	3	X
754	Sorong	Fak-Fak	L				O-X	O-X	O-O		A-C	O	199,700	85,700	A	3	X
755	Serui	Waren	MS				O-X	X-X	O-O		C-C		54,642	13,536	A	3	X

A4.1 Plans of the Proposed Terminal Sites and the Alternatives

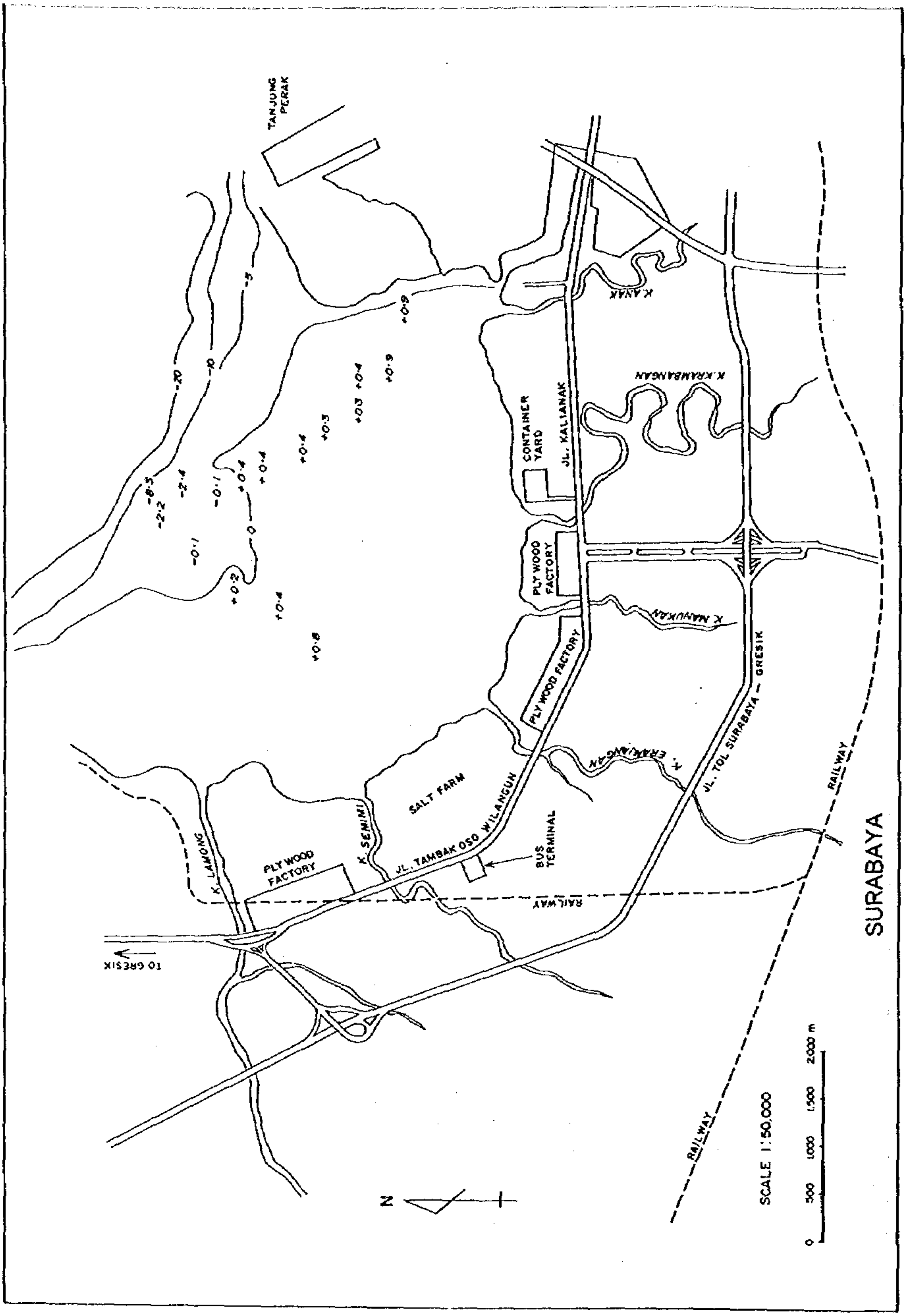
Location Map

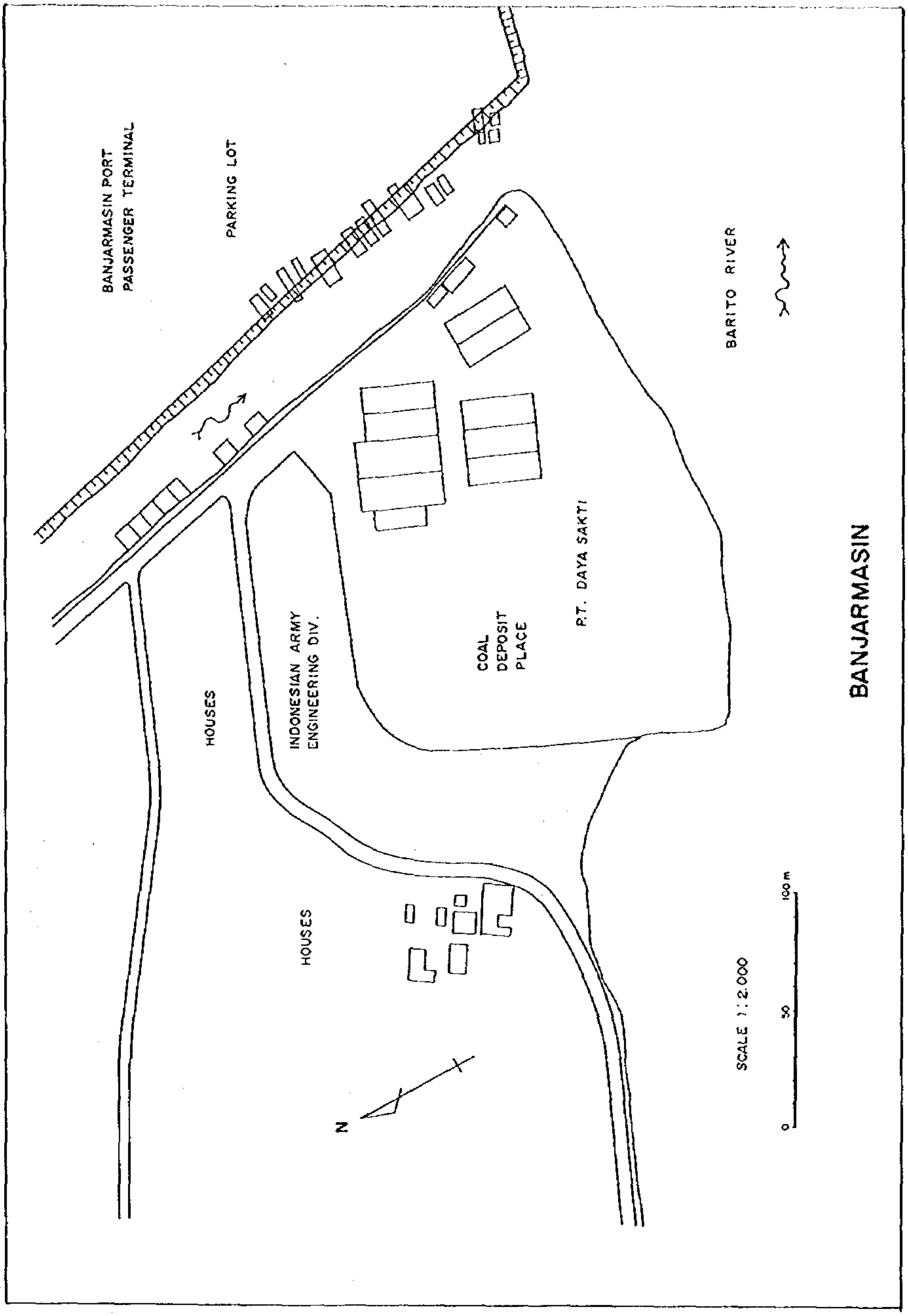
Surabaya (West Java)
Banjarmasin (South Kalimantan)
Kendari (Southeast Sulawesi)
Patumbukan (Selayar)
Labuhan Bajo (Flores)
Hunimua (Ambon / Maluku)
Wahai (Seram / Maluku)
Babang (Bacan / Halmahera)
Sowi (Manokwari / Irian Jaya)
Mokmer (Biak / Irian Jaya)
Klademak (Sorong / Irian Jaya)
Sif (Patani / Halmahera)

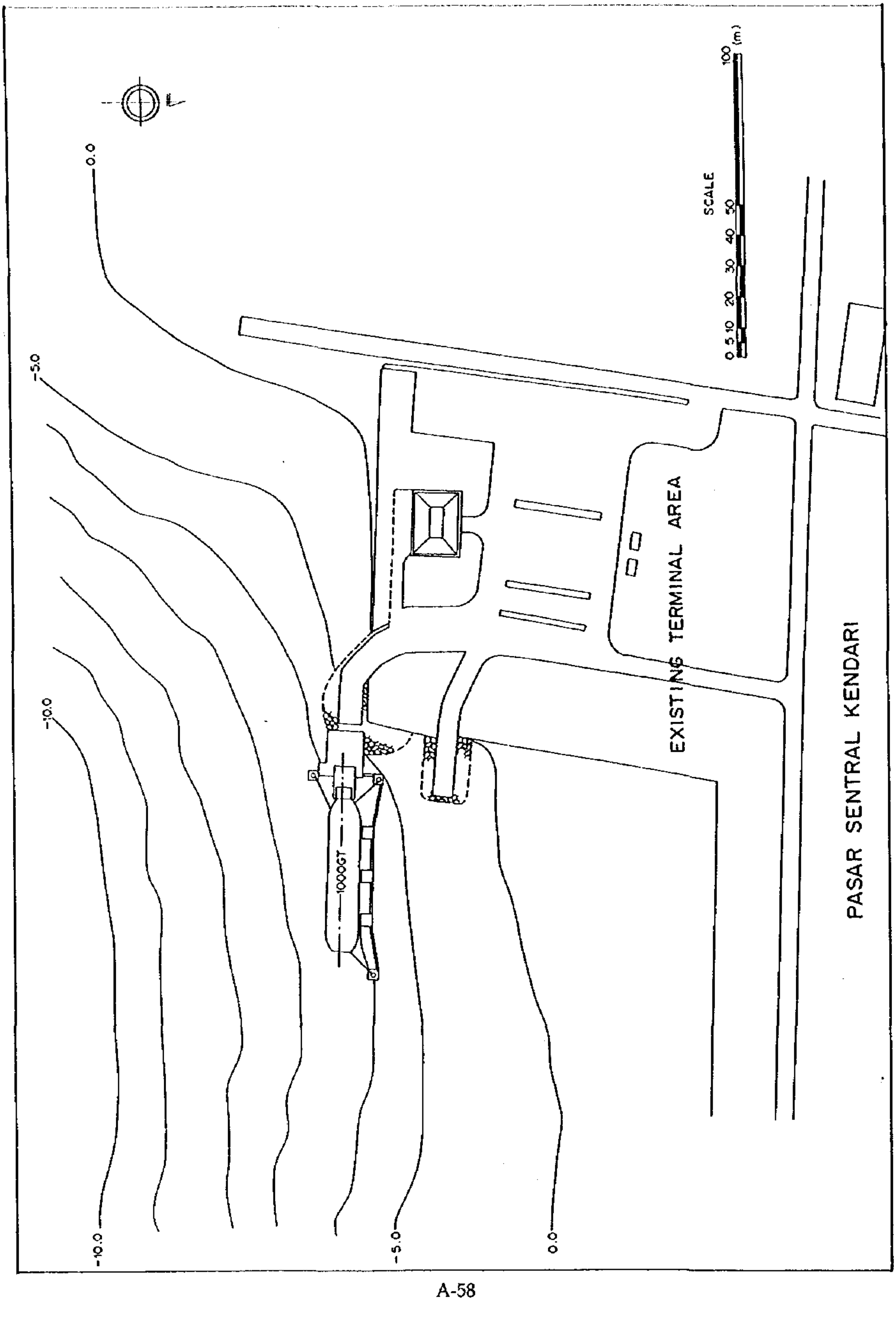
Banjarmasin - ASDP Site
Banjarmasin - Barito Bridge Site
Kendari - Lapuko Site
Ambon - Tulefu Harbor
Ambon - Selale Site
Besi (Seram / Maluku)
Saka (Seram / Maluku)
Labuha (Bacan / Halmahera)
Laiwui (Obi / Halmahera)
Jikotamo (Obi / Halmahera)
Botoyo (Patani / Halmahera)



Location Map

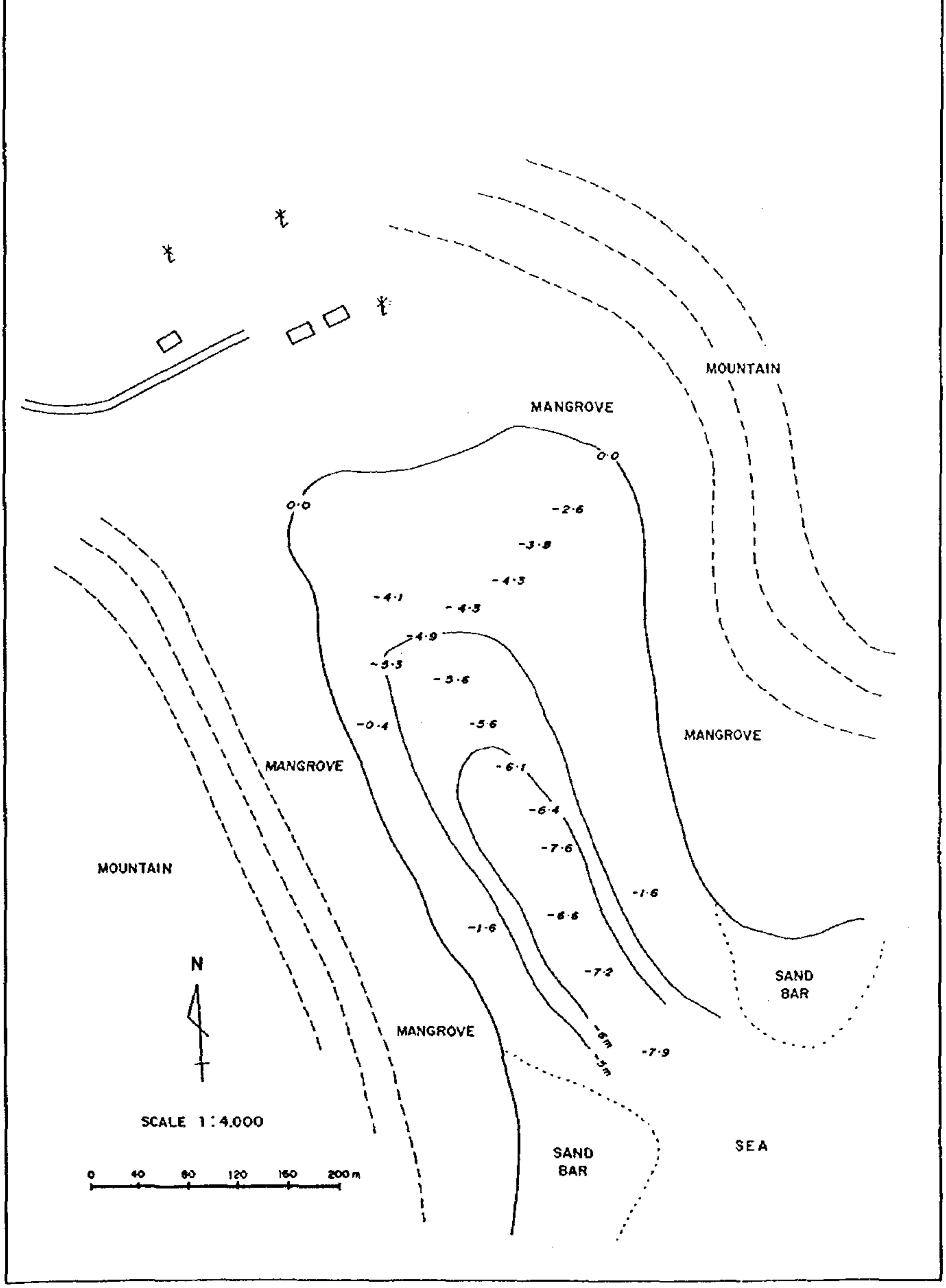

TANJUNG PERAK
K. ANAK
K. KRAMBANGAN
CONTAINER YARD
JL. KALIANAK
PLY WOOD FACTORY
K. MANUKAN
PLY WOOD FACTORY
JL. TOL SURABAYA – GRESIK
SALT FARM
K. SEMIMI
JL. TAMBAK OSO WILANGUN
BUS TERMINAL
PLY WOOD FACTORY
K. LAMONG
RAILWAY
TO GRESIK
RAILWAY
RAILWAY
SURABAYA
N
SCALE 1:50,000
0 500 1000 1500 2000 m

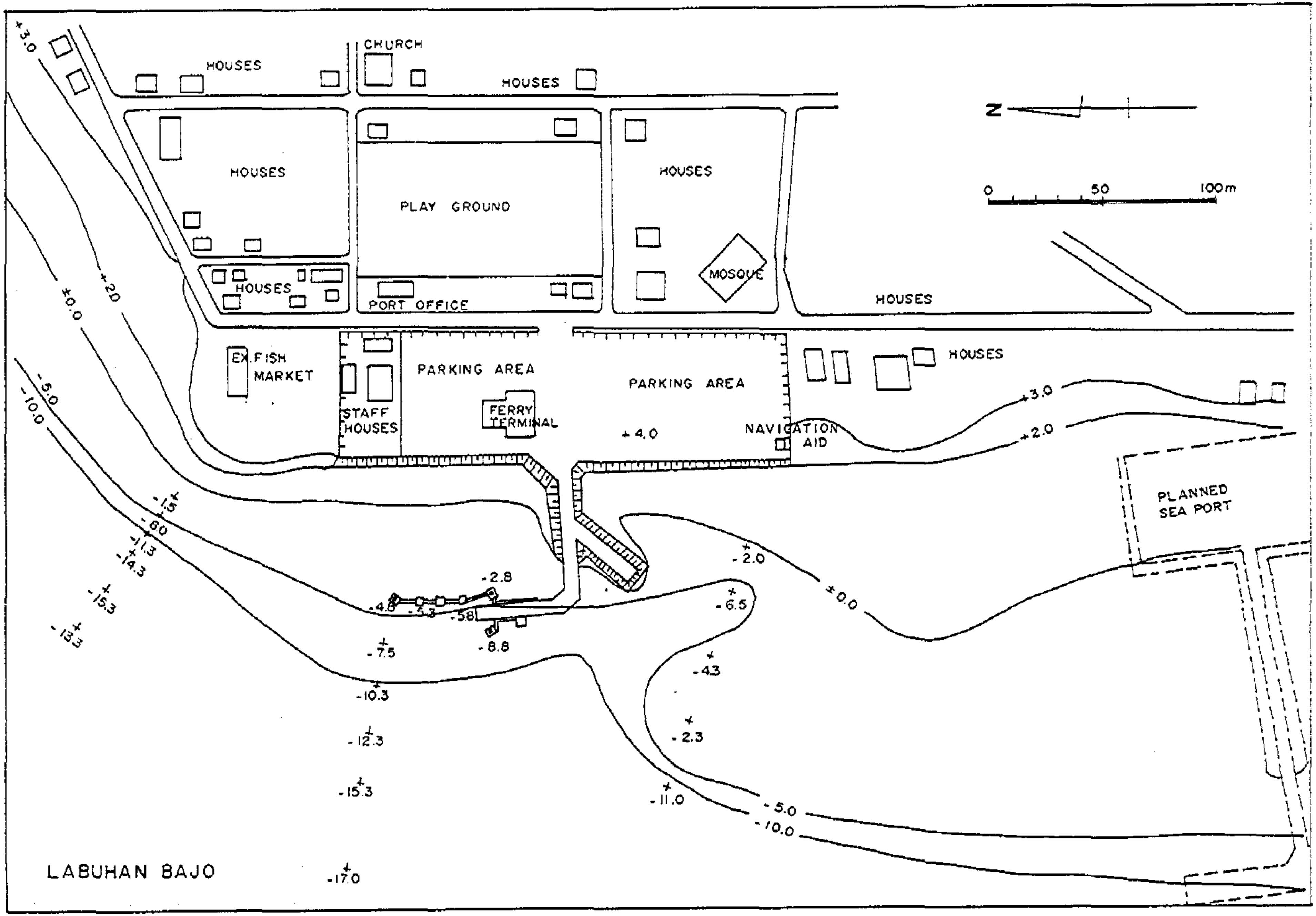

BANJARMASIN PORT
PASSENGER TERMINAL
PARKING LOT
BARITO RIVER
HOUSES
INDONESIAN ARMY
ENGINEERING DIV.
COAL
DEPOSIT
PLACE
P.T. DAYA SAKTI
HOUSES
BANJARMASIN
N
SCALE 1 : 2.000
0
50
100 m

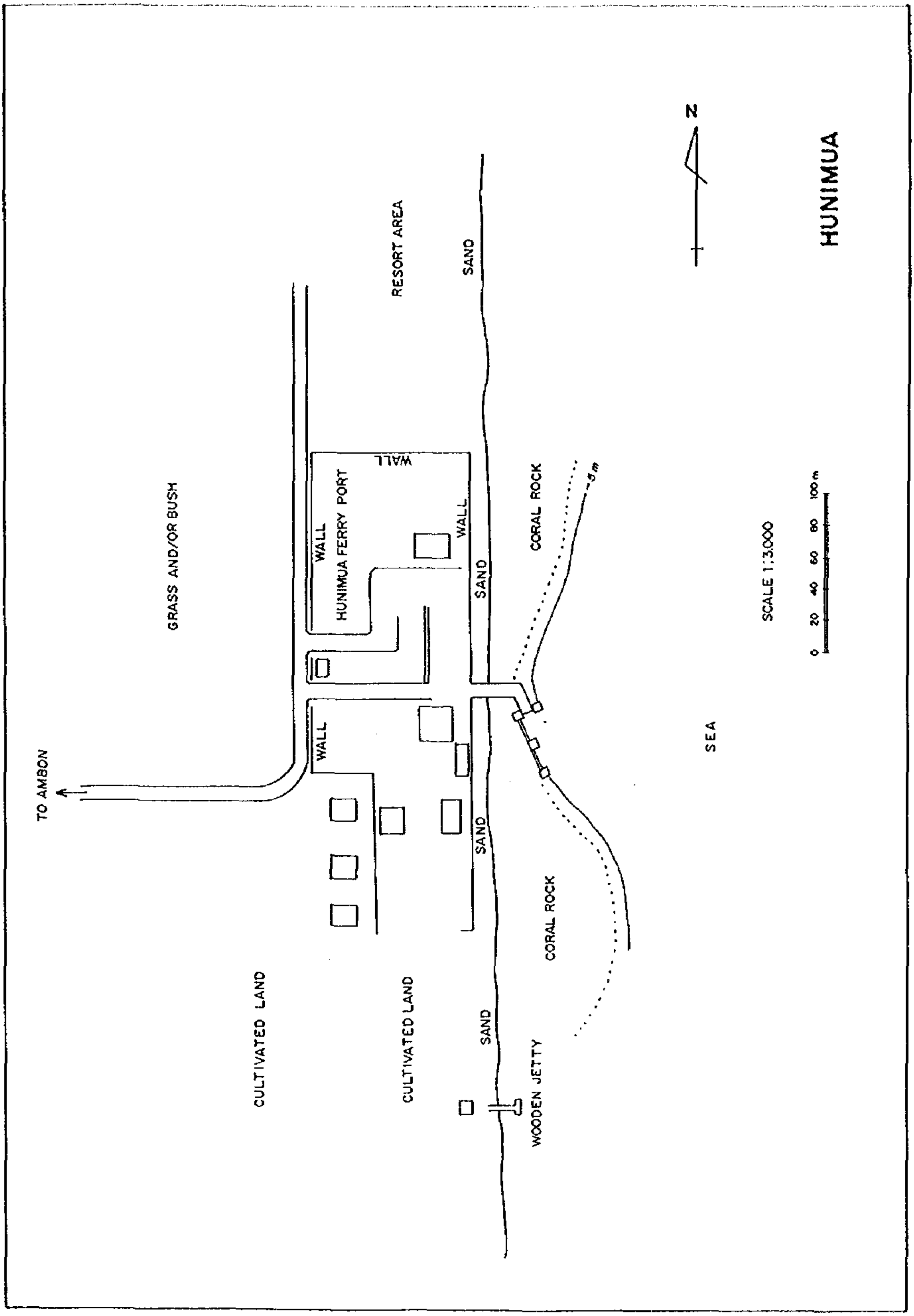


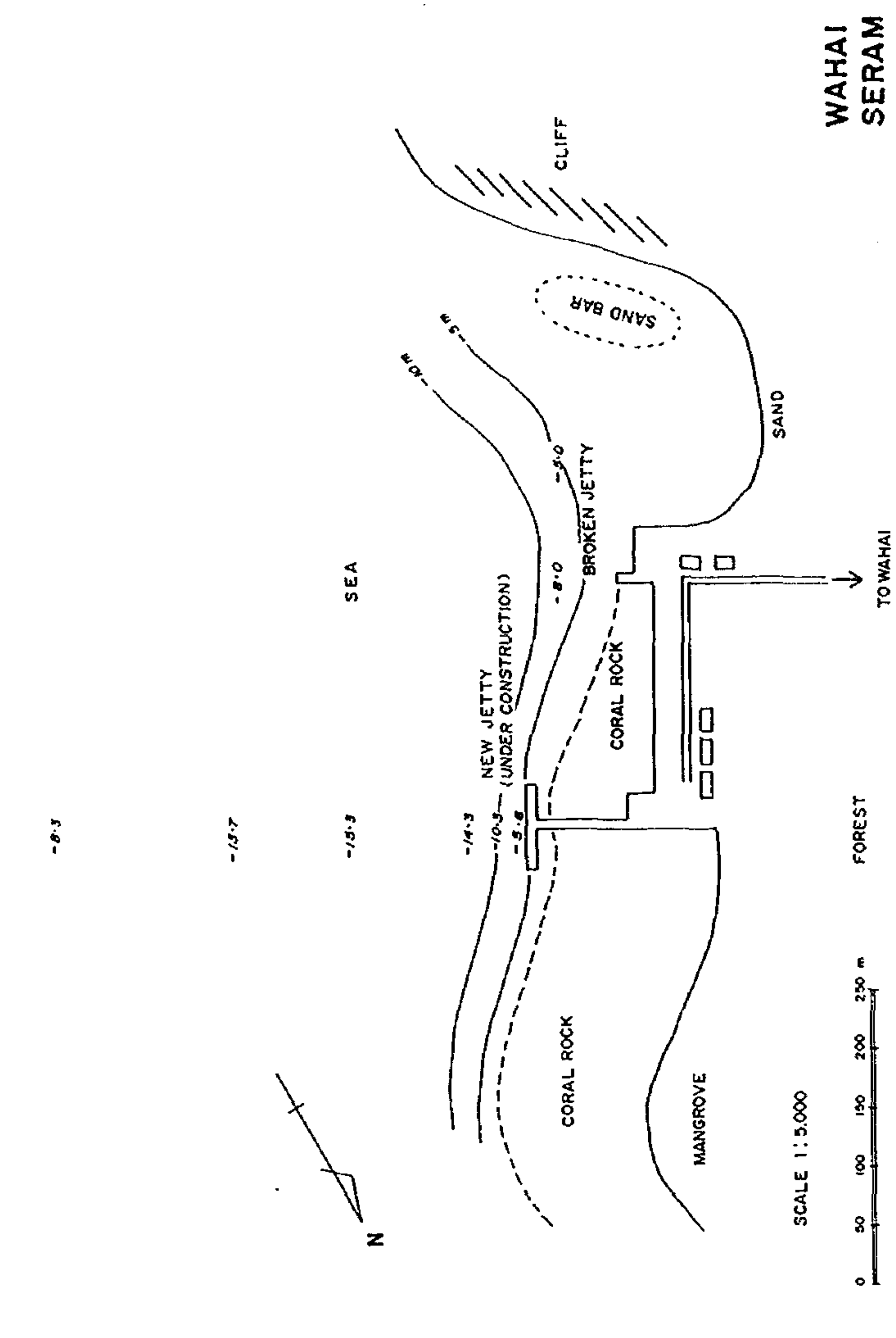
EXISTING TERMINAL AREA
PASAR SENTRAL KENDARI
1000GT
SCALE
0 5 10 20 30 40 50 100 (m)
0.0
-5.0
-10.0
-10.0
-5.0
0.0

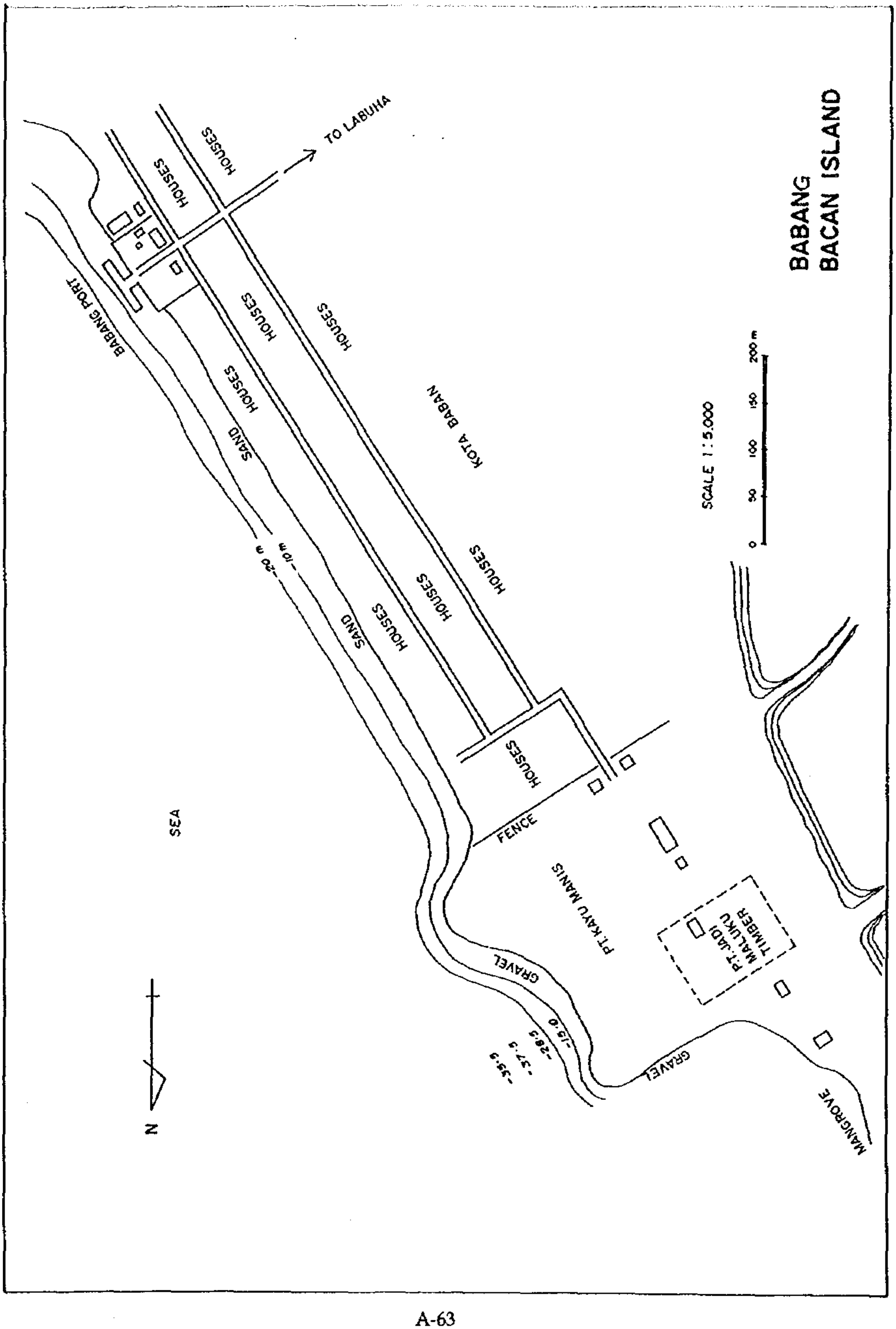
PATUMBUKAN SELAYER

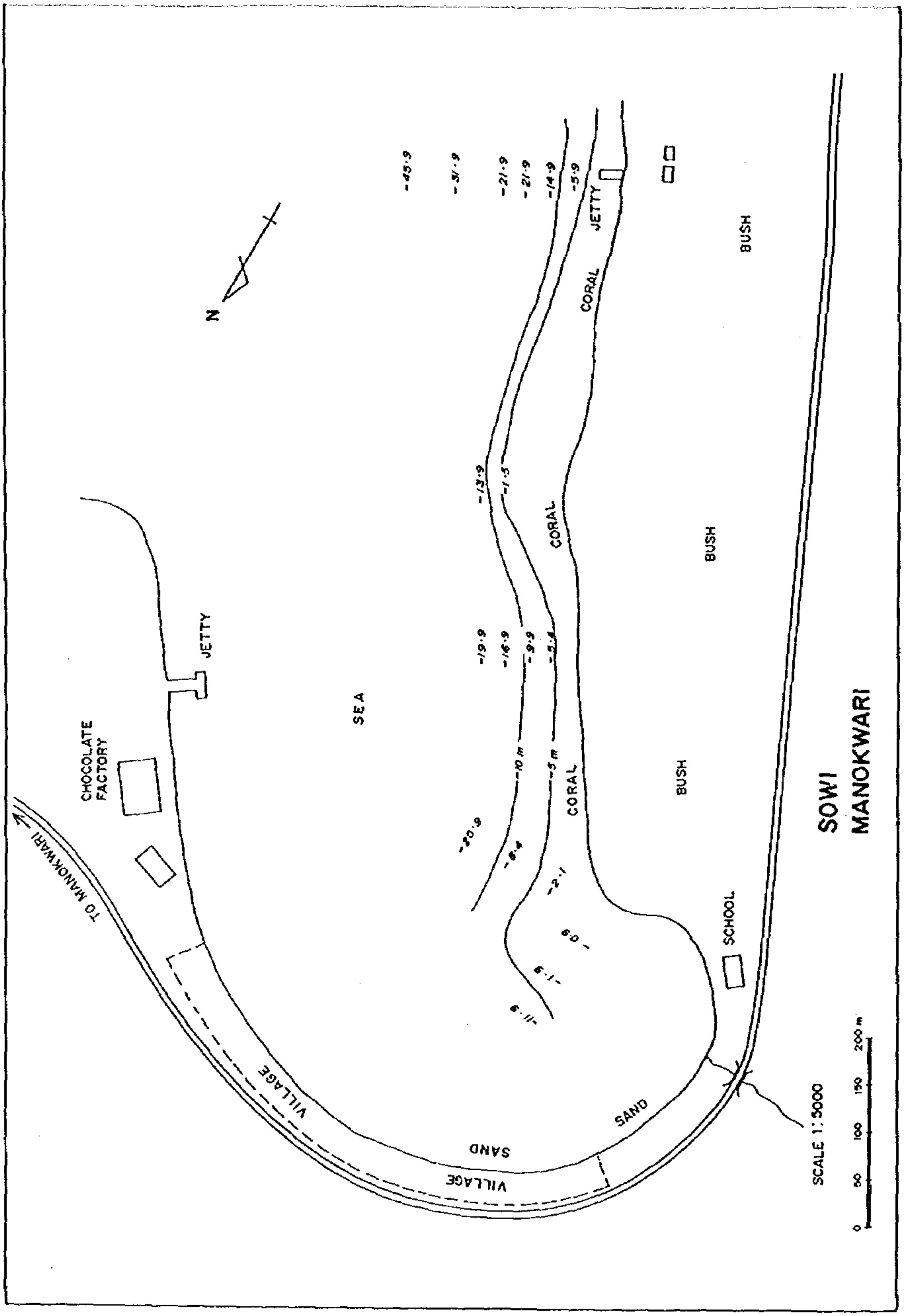



HOUSES
CHURCH
HOUSES
HOUSES
PLAY GROUND
HOUSES
HOUSES
PORT OFFICE
MOSQUE
HOUSES
N
0
50
100m
EX. FISH MARKET
STAFF HOUSES
PARKING AREA
FERRY TERMINAL
PARKING AREA
+4.0
NAVIGATION AID
HOUSES
+3.0
+2.0
+3.0
+20
±0.0
-5.0
-10.0
PLANNED SEA PORT
-1.5
-6.0
-11.3
-14.3
-15.3
-13.3
-2.8
-4.8
-5.3
-5.8
-8.8
-7.5
-10.3
-12.3
-15.3
-17.0
-2.0
±0.0
-6.5
-4.3
-2.3
-11.0
-5.0
-10.0
LABUHAN BAJO

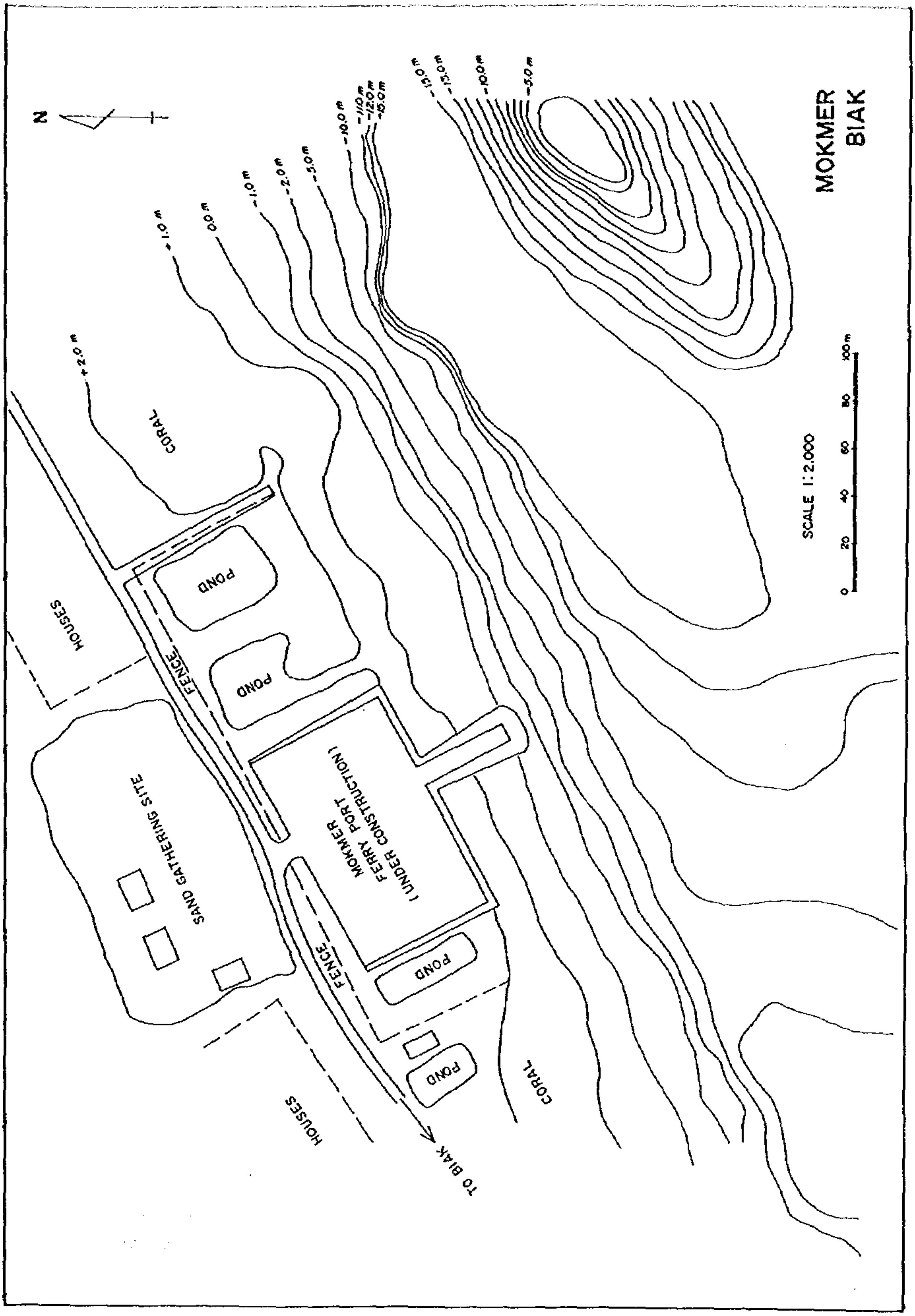

HUNIMUA
N
SCALE 1:3,000
0
20
40
60
80
100 m
RESORT AREA
SAND
GRASS AND/OR BUSH
WALL
HUNIMUA FERRY PORT
WALL
WALL
SAND
CORAL ROCK
5 m
SEA
WALL
TO AMBON
SAND
CORAL ROCK
CULTIVATED LAND
CULTIVATED LAND
SAND
WOODEN JETTY

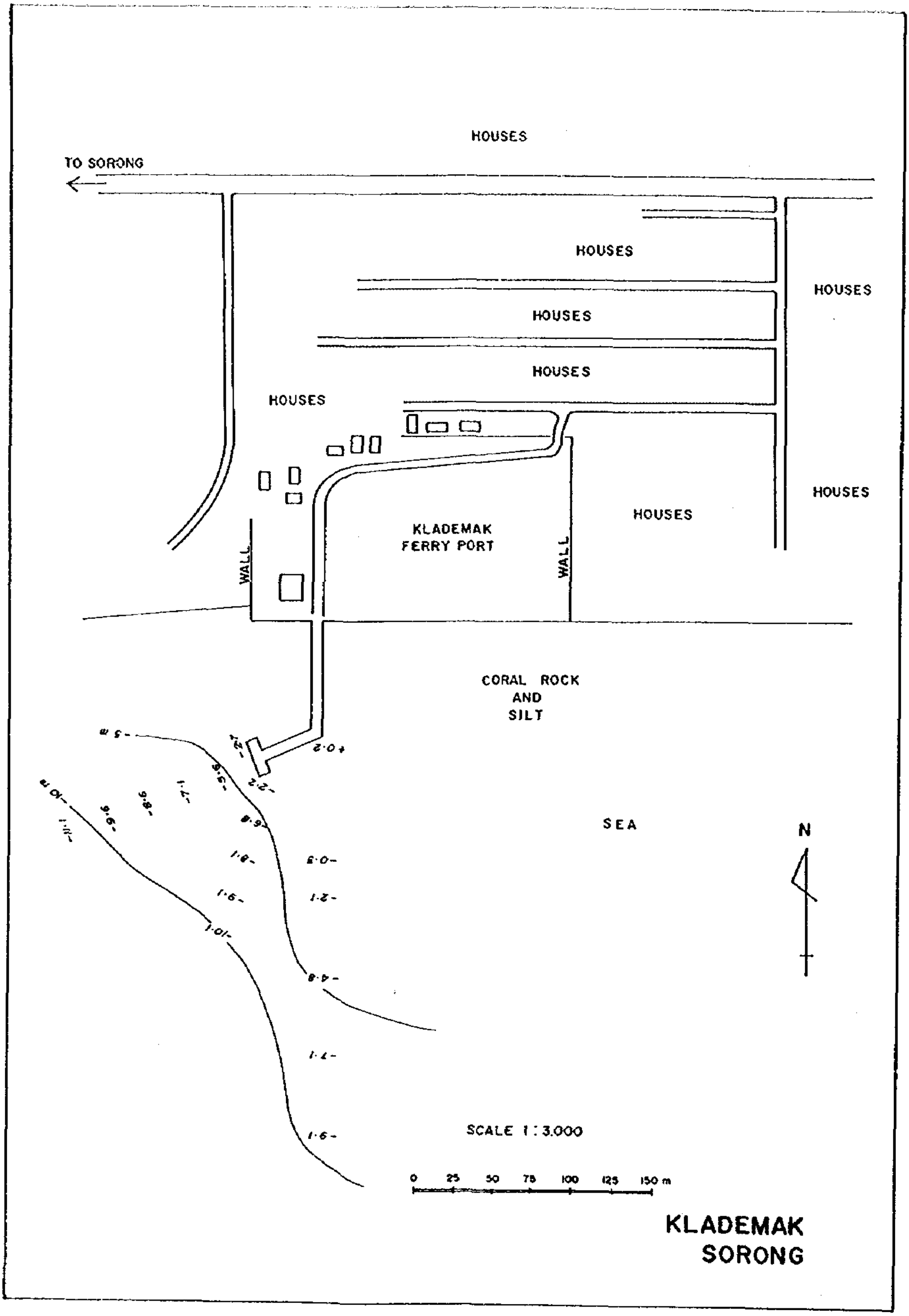

WAHAI
SERAM
CLIFF
SAND BAR
SAND
-5 m
-10 m
-5.0
BROKEN JETTY
-8.0
SEA
NEW JETTY
(UNDER CONSTRUCTION)
CORAL ROCK
TO WAHAI
FOREST
-8.3
-13.7
-15.3
-14.3
-10.5
-5.6
CORAL ROCK
MANGROVE
N
SCALE 1:5,000
0
50
100
150
200
250 m

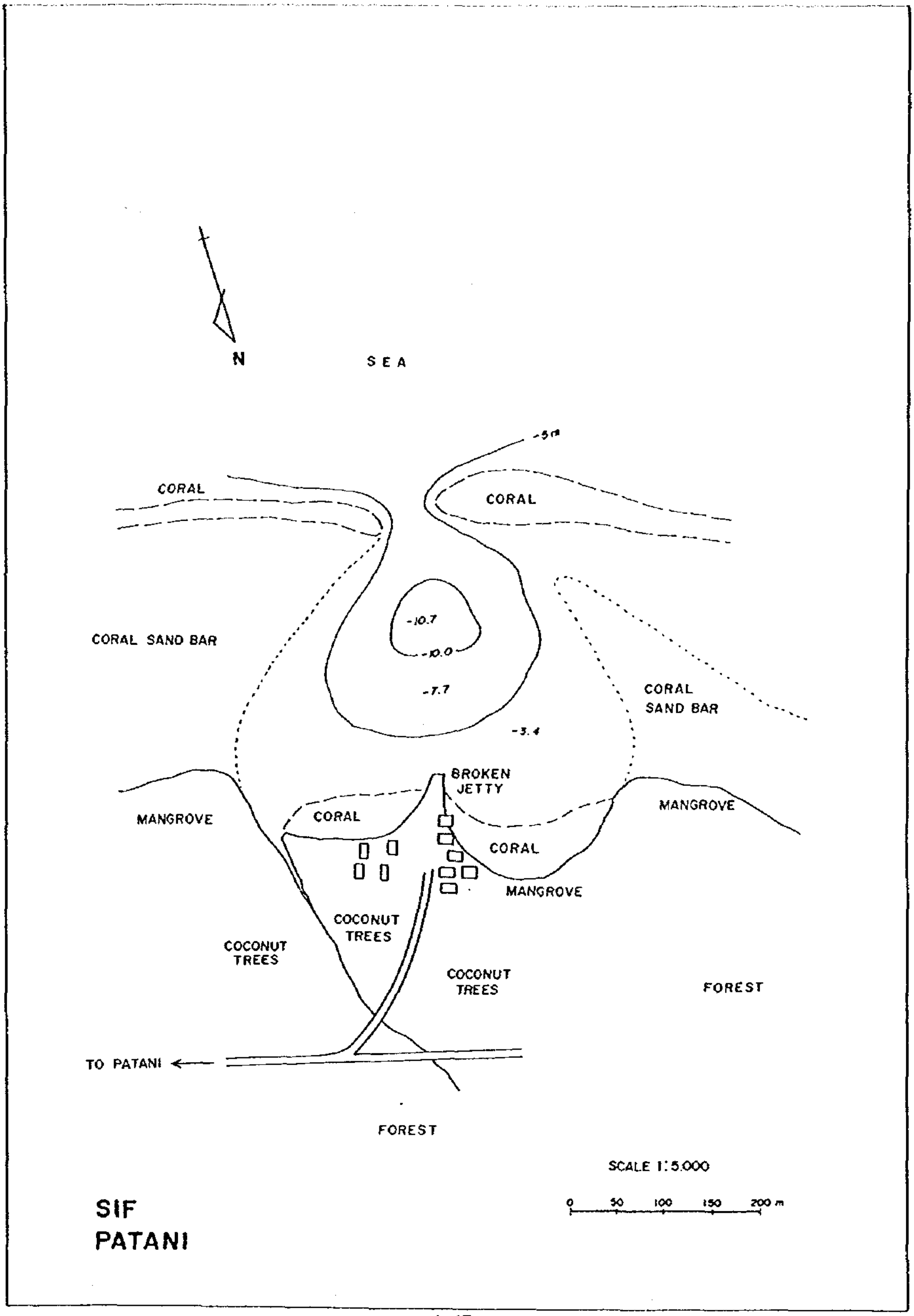

BABANG
BACAN ISLAND
SCALE 1 : 5,000
0
50
100
150
200 m
TO LABUHA
HOUSES
KOTA BABAN
BABANG PORT
SAND
-20 m
-10 m
FENCE
SEA
PT.KAYU MANIS
PT.JADI
MALUKU
TIMBER
GRAVEL
MANGROVE
N



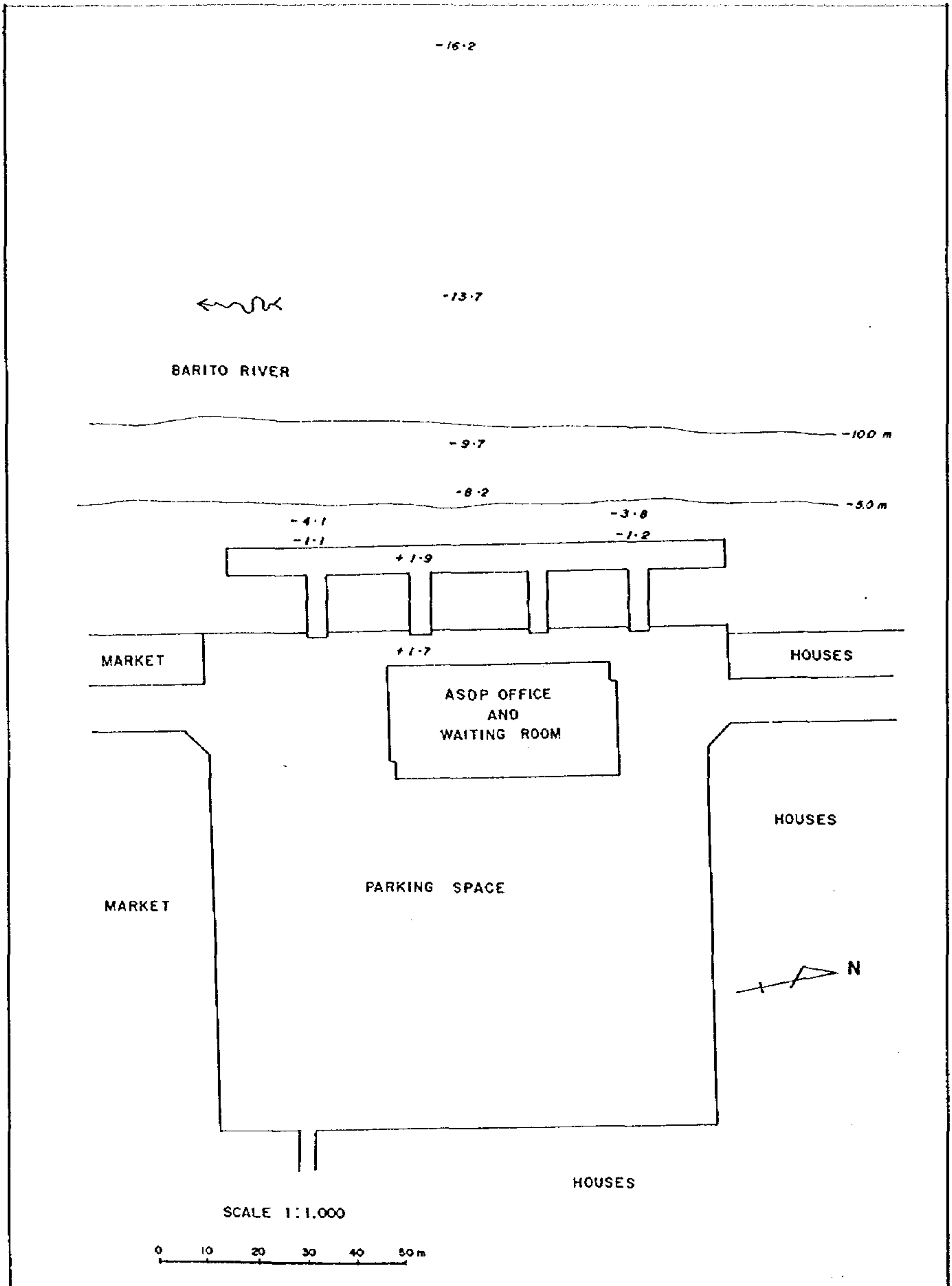
SOWI
MANOKWARI
N
SEA
JETTY
CHOCOLATE FACTORY
TO MANOKWARI
VILLAGE
SAND
SAND
VILLAGE
SCHOOL
CORAL
CORAL
CORAL
JETTY
BUSH
BUSH
BUSH
-45·9
-31·9
-21·9
-21·9
-14·9
-5·9
-13·9
-1·5
-19·9
-16·9
-9·9
-5·4
-10 m
-5 m
-20·9
-8·4
-2·1
-0·9
-1·9
-11·9
SCALE 1: 5000
0
50
100
150
200 m


MOKMER
BIAK
N
SCALE 1:2.000
0 20 40 60 80 100m
+2.0 m
+1.0 m
0.0 m
-1.0 m
-2.0 m
-5.0 m
-10.0 m
-5.0 m
-10.0 m
-13.0 m
-15.0 m
CORAL
POND
POND
POND
POND
HOUSES
HOUSES
FENCE
FENCE
SAND GATHERING SITE
MOKMER PORT
FERRY CONSTRUCTION
(UNDER CONSTRUCTION)
CORAL
TO BIAK

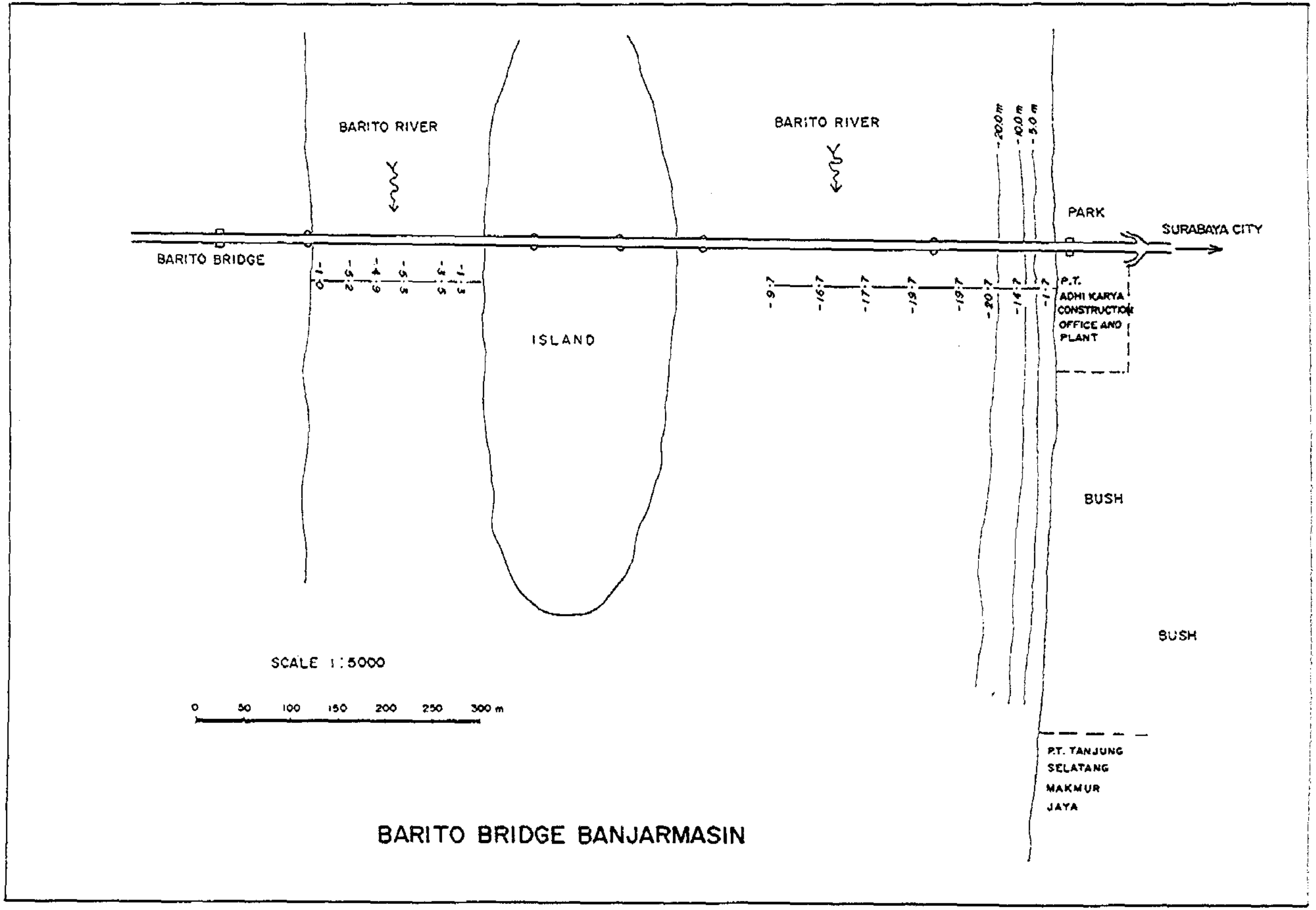

HOUSES
TO SORONG
HOUSES
HOUSES
HOUSES
HOUSES
HOUSES
KLADEMAK
FERRY PORT
WALL
WALL
HOUSES
HOUSES
CORAL ROCK
AND
SILT
SEA
N
SCALE 1 : 3,000
0 25 50 75 100 125 150 m
KLADEMAK
SORONG



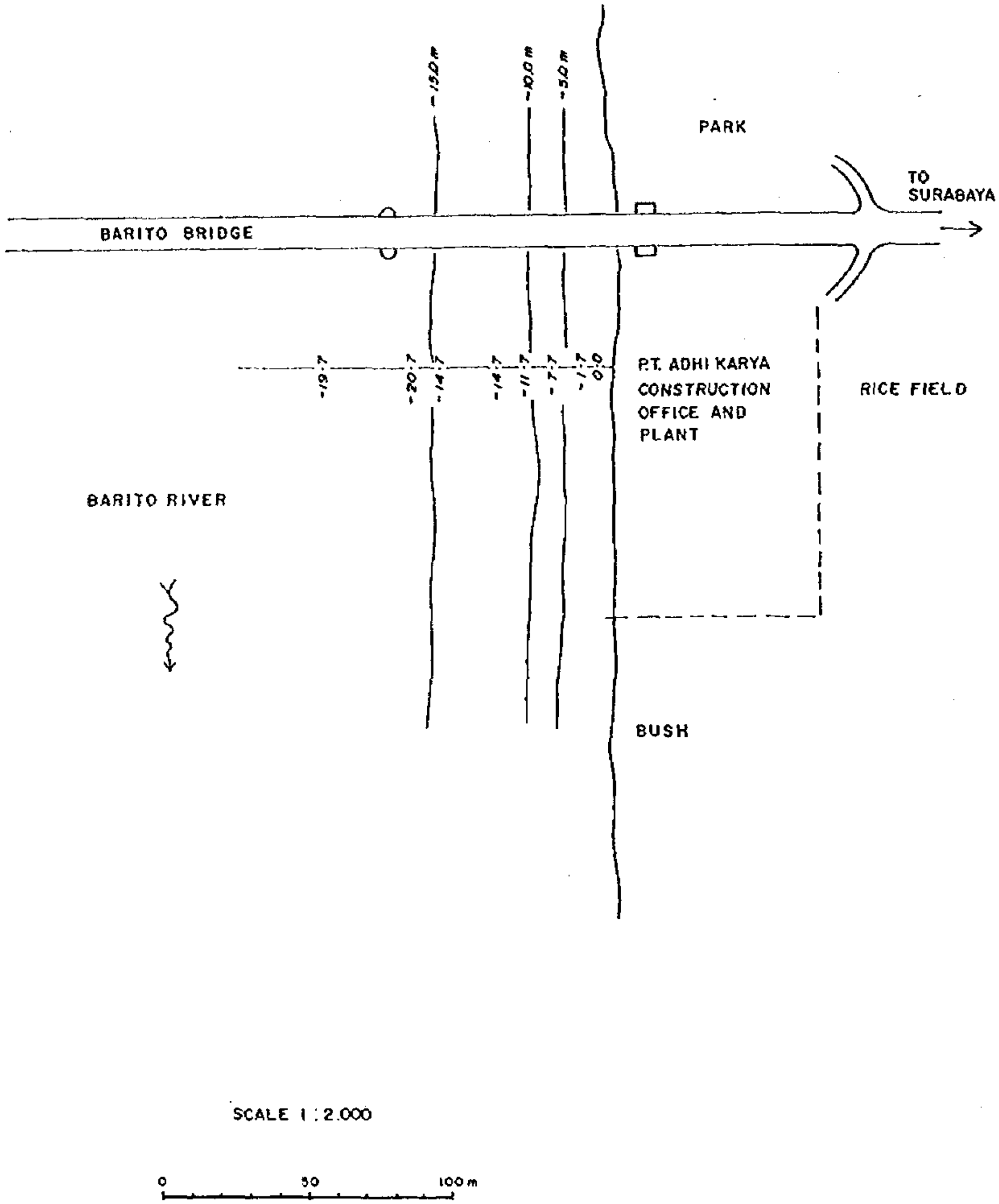
N
SEA
-5m
CORAL
CORAL
-10.7
-10.0
CORAL SAND BAR
-7.7
CORAL
SAND BAR
-3.4
BROKEN
JETTY
MANGROVE
CORAL
MANGROVE
CORAL
MANGROVE
COCONUT
TREES
COCONUT
TREES
COCONUT
TREES
FOREST
TO PATANI
FOREST
SCALE 1:5.000
0 50 100 150 200 m
SIF
PATANI



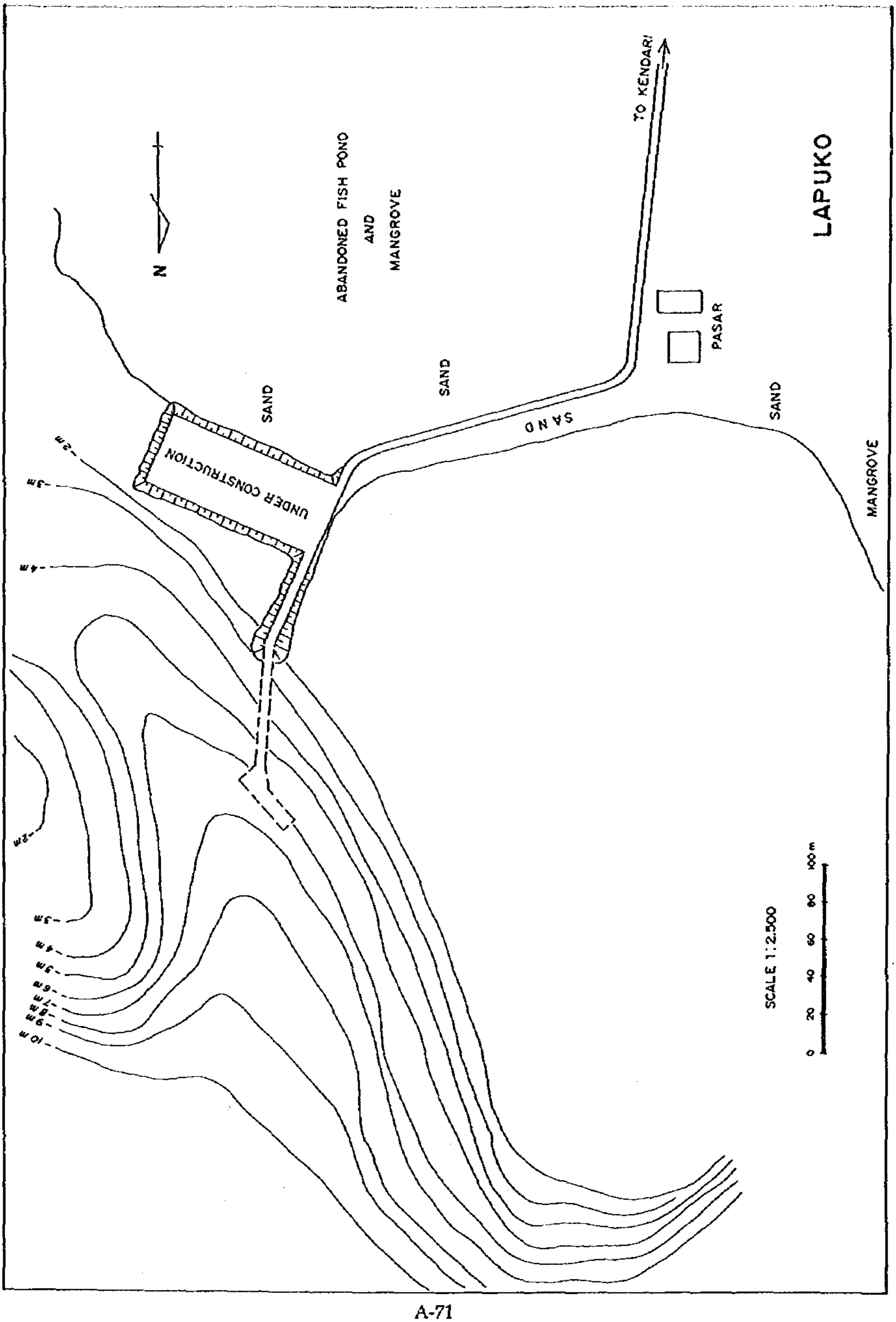
BANJARMASIN ASDP

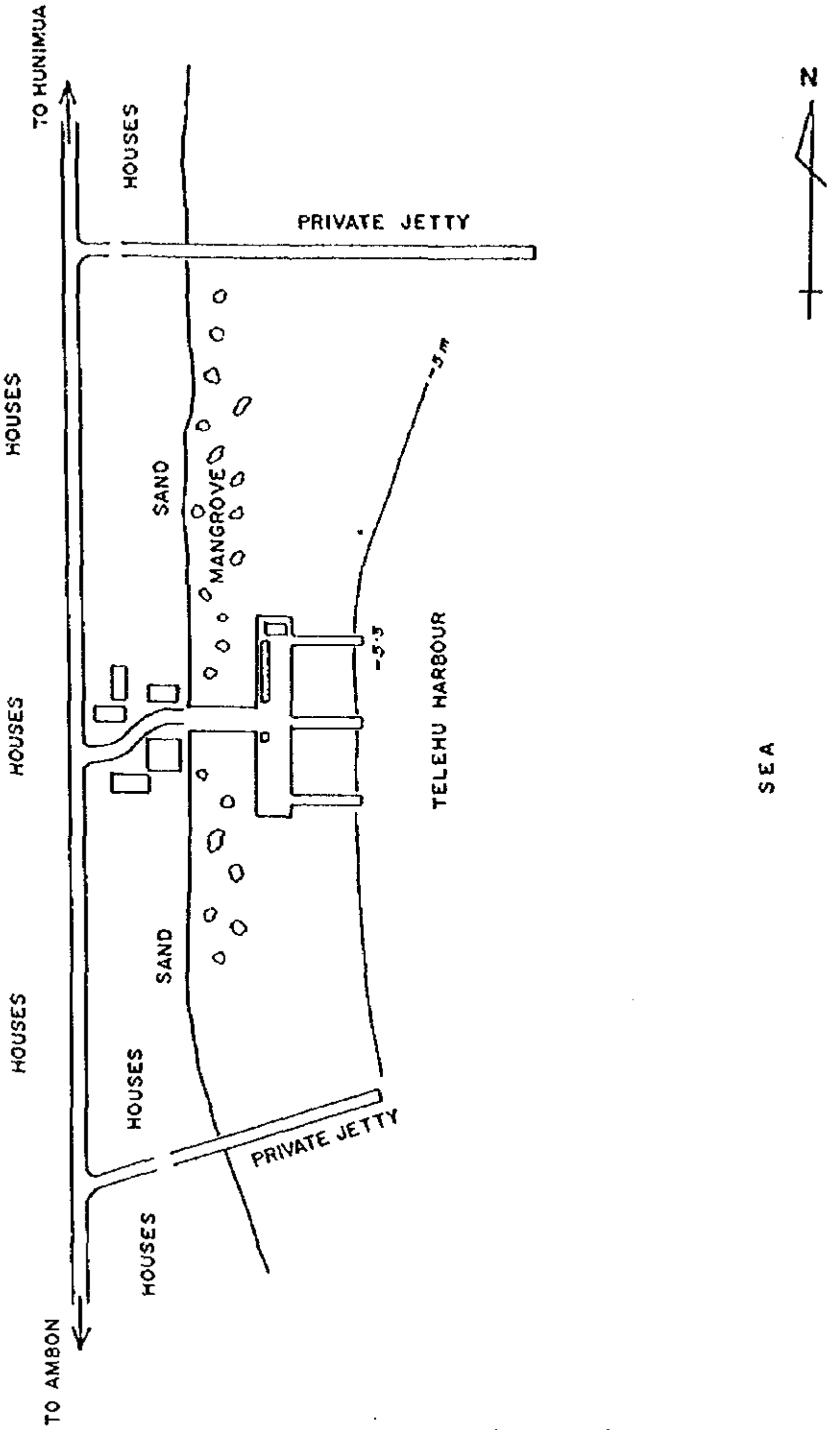


BARITO BRIDGE BANJARMASIN



BARITO BRIDGE BANJARMASIN

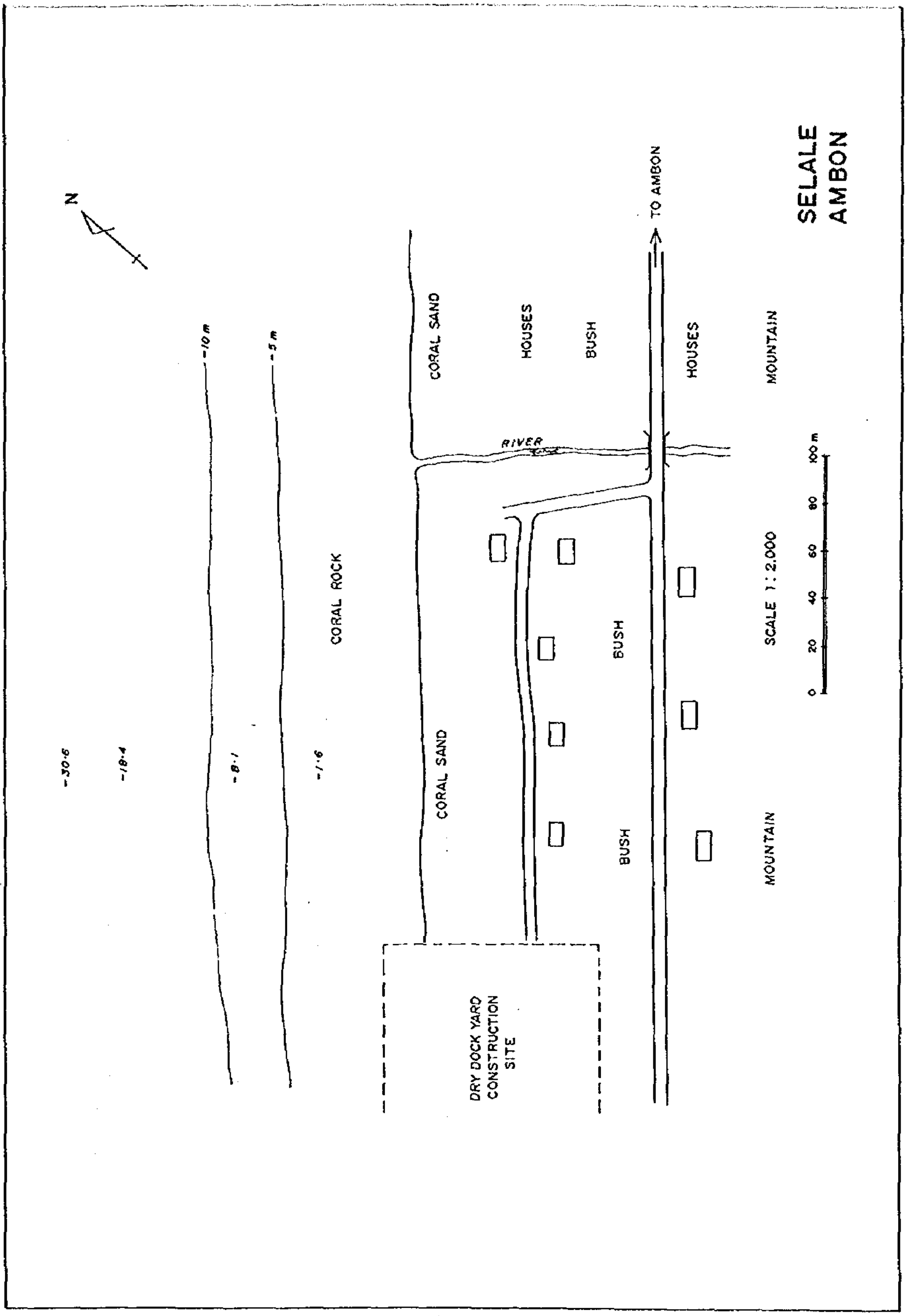

LAPUKO
TO KENDARI
N
ABANDONED FISH POND
AND
MANGROVE
PASAR
SAND
SAND
SAND
SAND
MANGROVE
UNDER CONSTRUCTION
-2m
-3m
-4m
-2m
-3m
-4m
-5m
-6m
-7m
-8m
-9m
-10m
SCALE 1:2.500
0
20
40
60
80
100 m

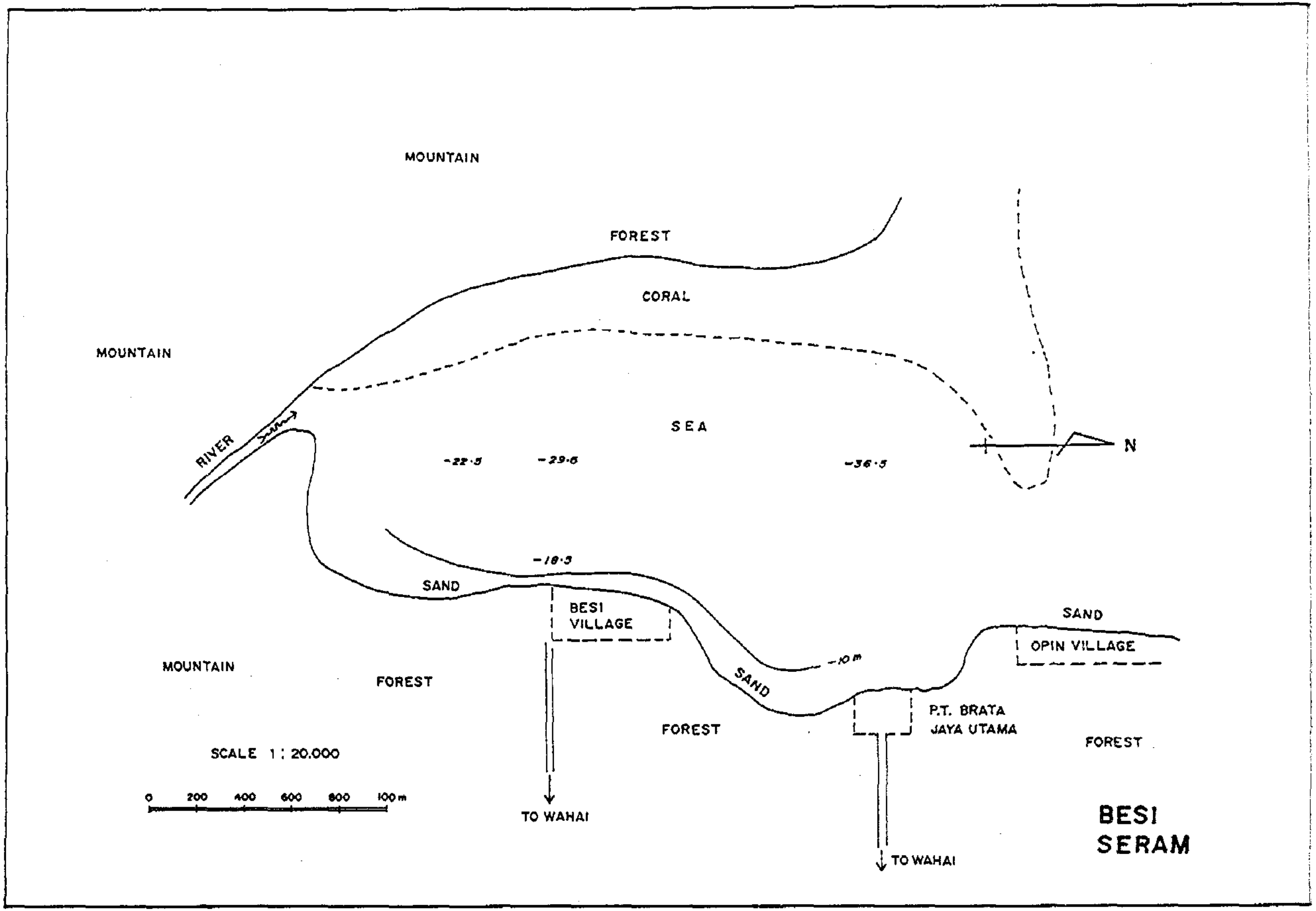


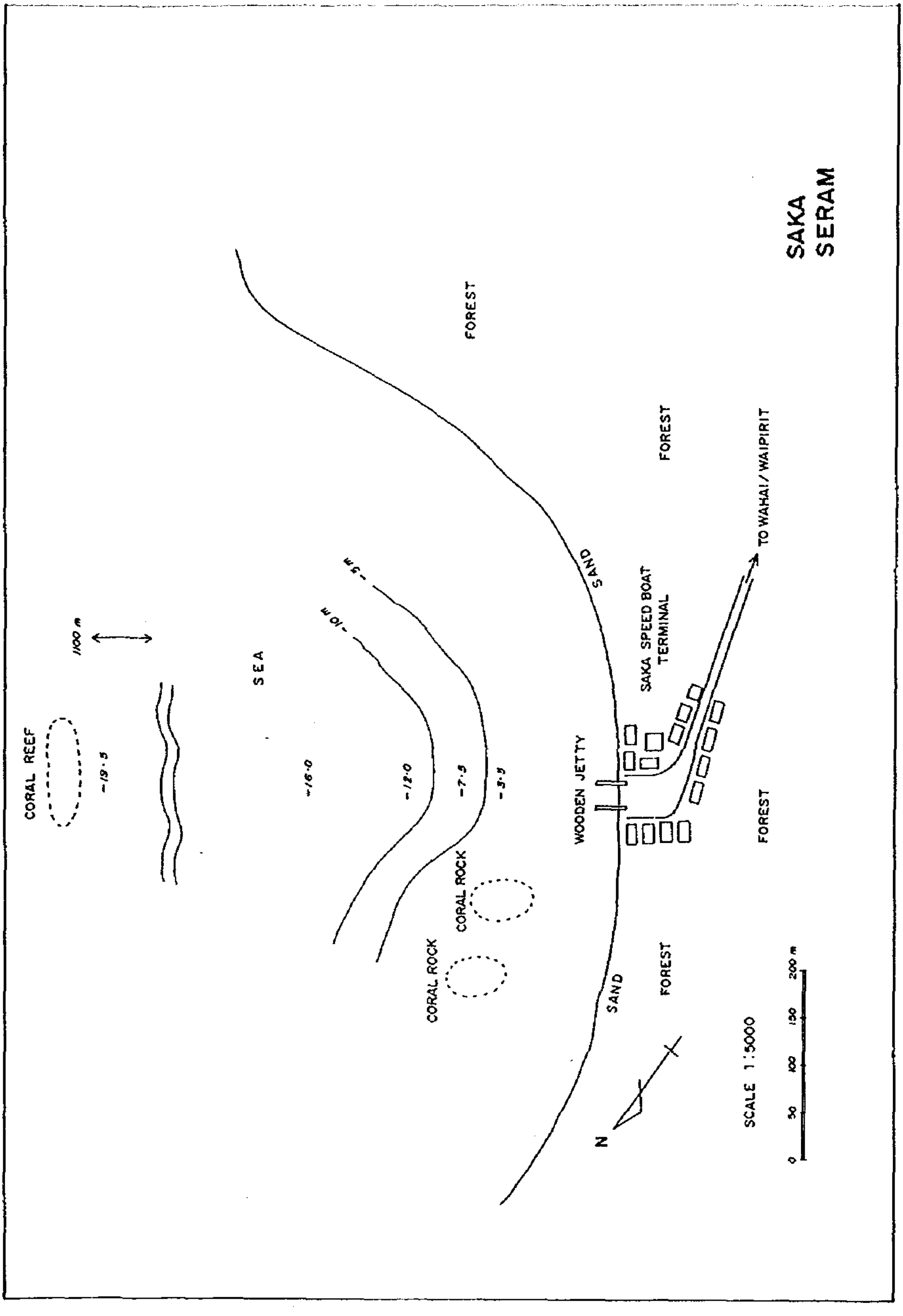
SCALE 1 : 5.000

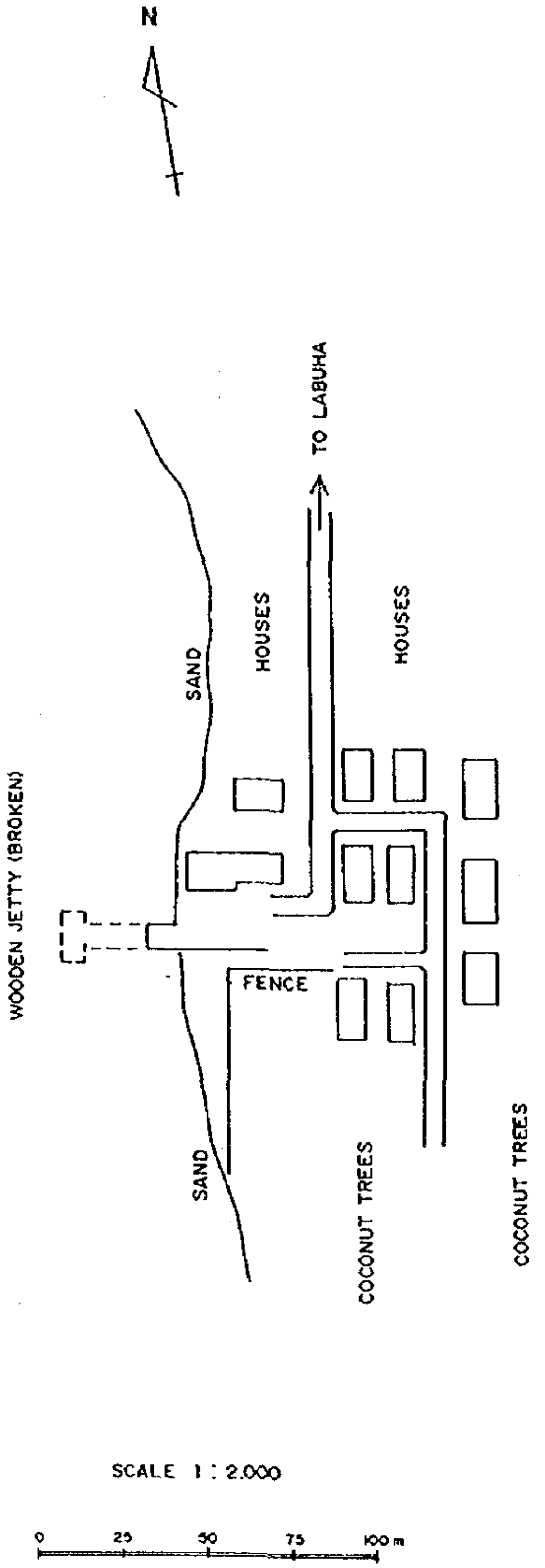
0 50 100 150 200 m

TELEHU HARBOUR
AMBON

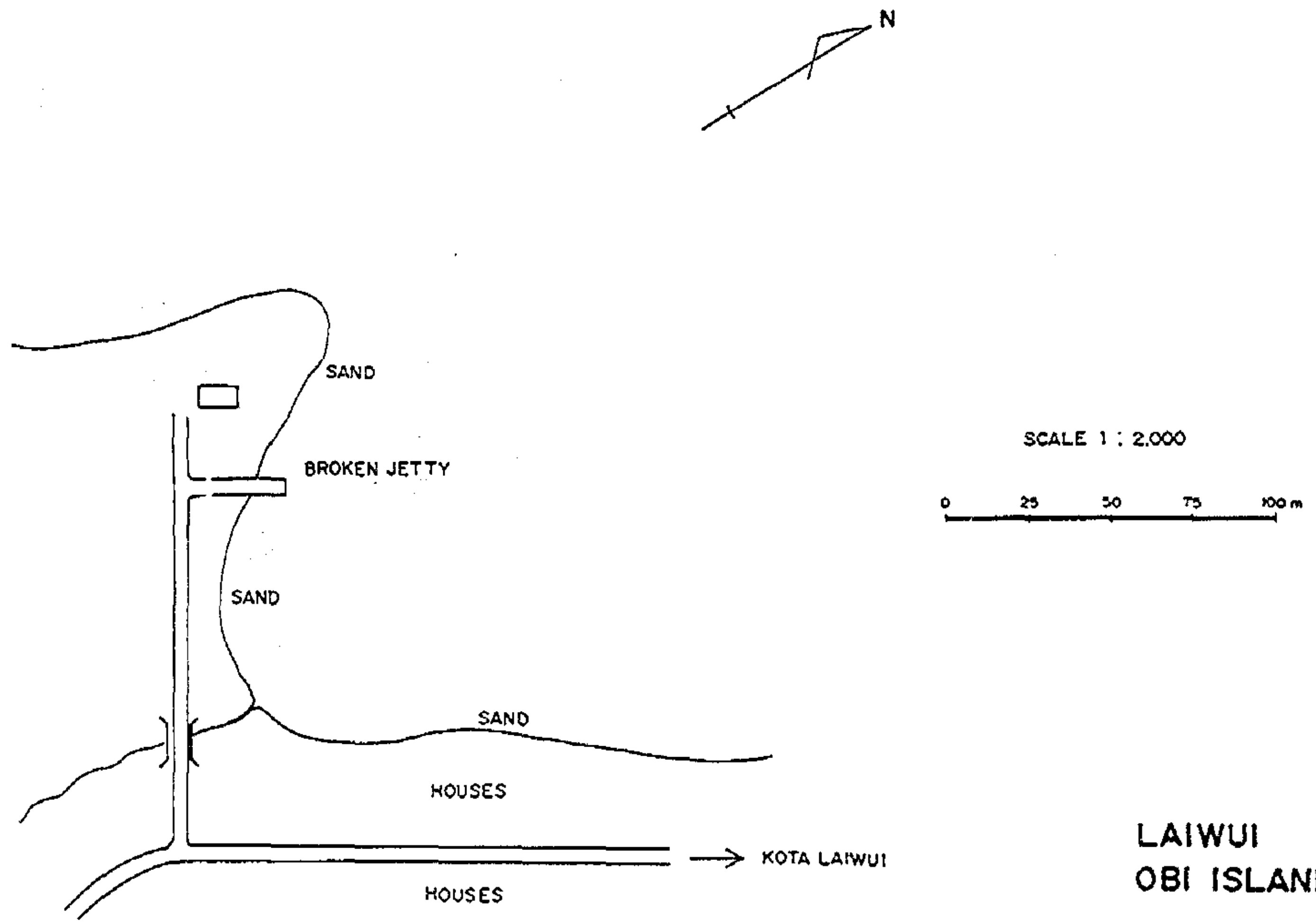

SELALE
AMBON
N
TO AMBON
CORAL SAND
HOUSES
BUSH
HOUSES
MOUNTAIN
-10 m
-5 m
RIVER
SCALE 1 : 2,000
0
20
40
60
80
100 m
CORAL ROCK
BUSH
-30·6
-18·4
-8·1
-1·6
CORAL SAND
BUSH
MOUNTAIN
DRY DOCK YARD
CONSTRUCTION
SITE


MOUNTAIN
MOUNTAIN
FOREST
CORAL
SEA
RIVER
-22.5
-29.6
-36.5
N
-18.5
SAND
BESI
VILLAGE
-10 m
SAND
SAND
OPIN VILLAGE
MOUNTAIN
FOREST
FOREST
P.T. BRATA
JAYA UTAMA
FOREST
SCALE 1 : 20.000
0 200 400 600 800 100 m
TO WAHAI
TO WAHAI
BESI
SERAM

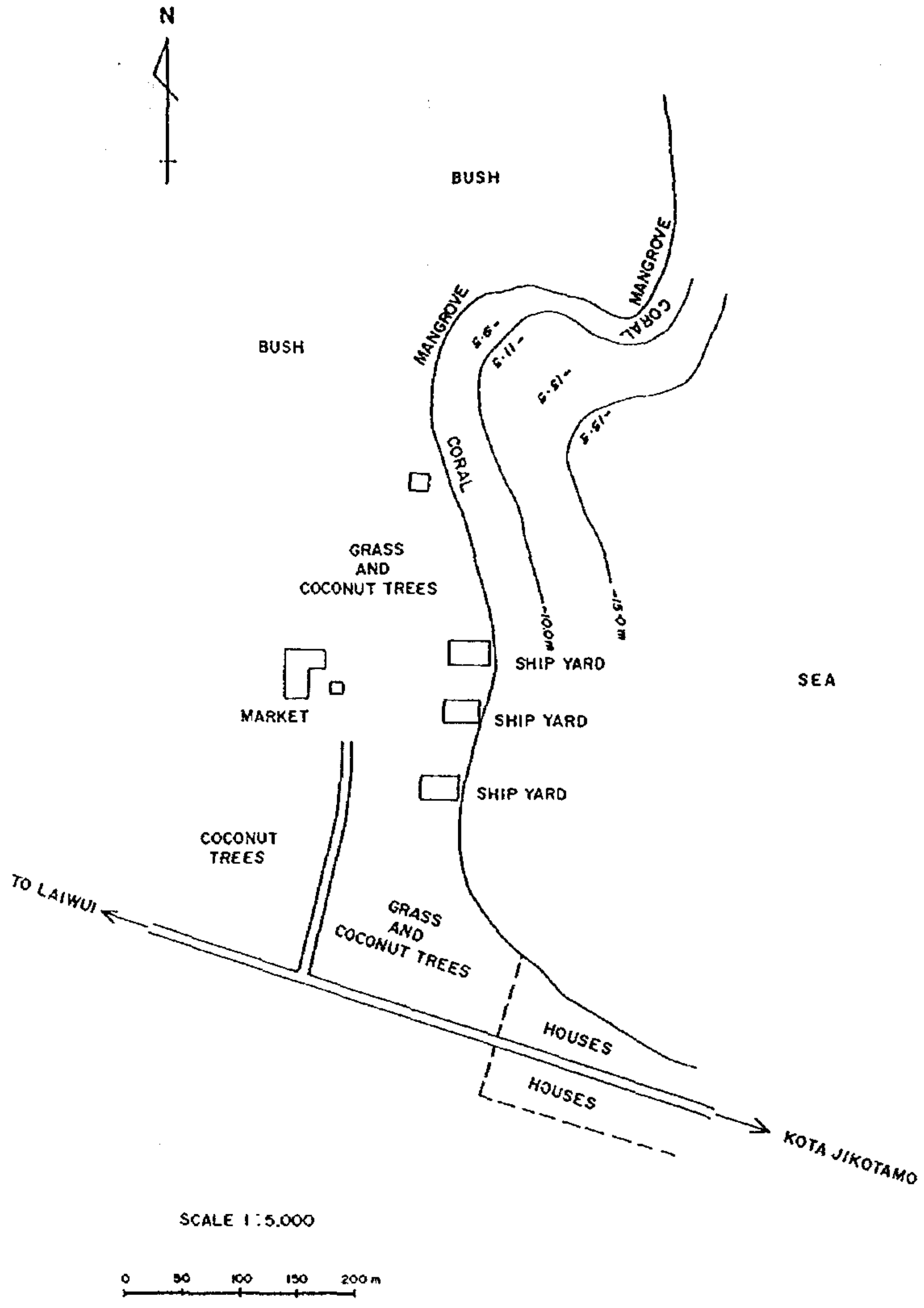

SAKA
SERAM
FOREST
FOREST
TO WAHAI / WAIPIRIT
SAND
SAKA SPEED BOAT
TERMINAL
WOODEN JETTY
FOREST
SEA
1100 m
CORAL REEF
-19.5
-16.0
-12.0
-7.5
-5.5
-10 m
-5 m
CORAL ROCK
CORAL ROCK
SAND
FOREST
SCALE 1:5000
0
50
100
150
200 m
N



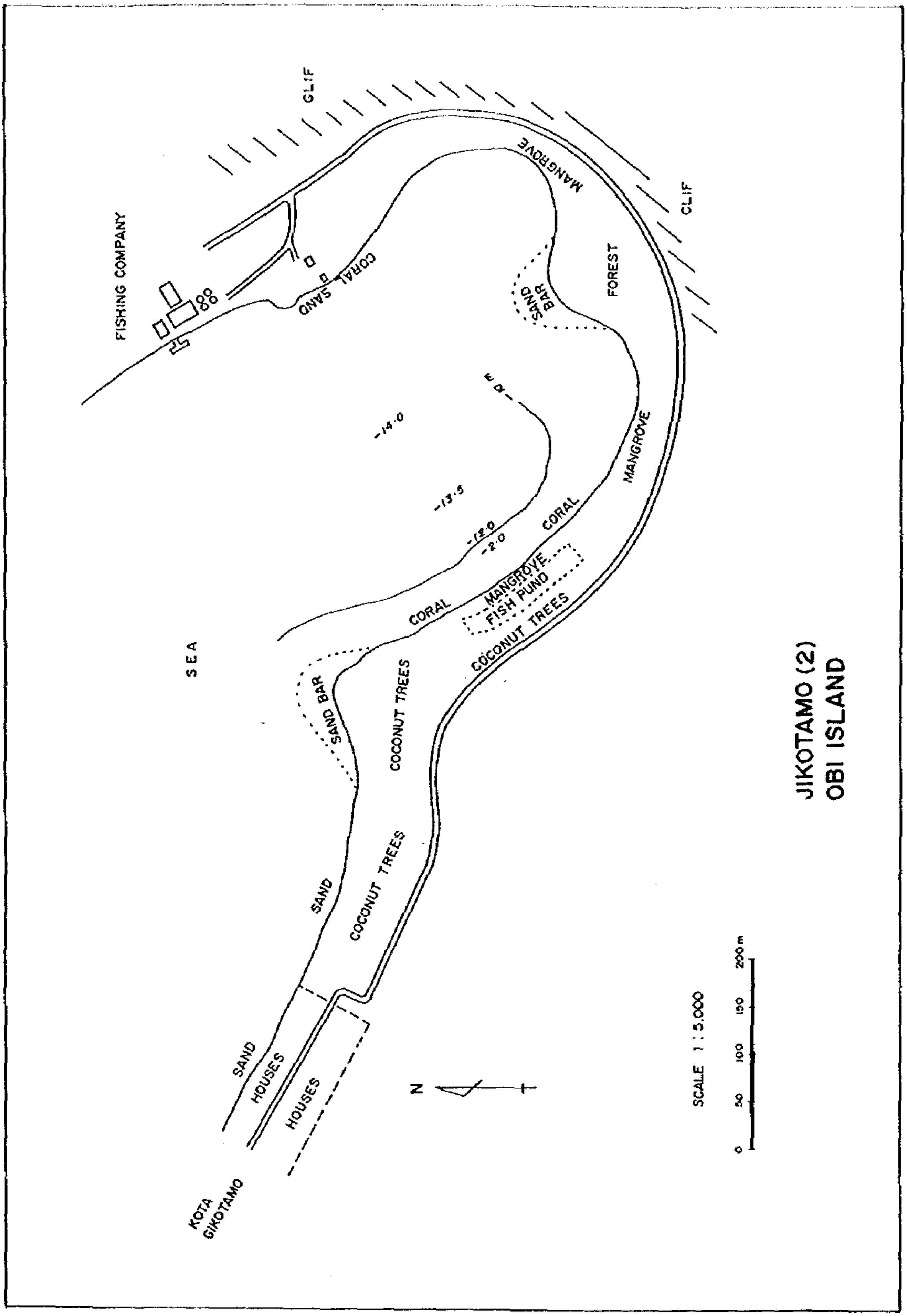
LABUHA
BACAN ISLAND

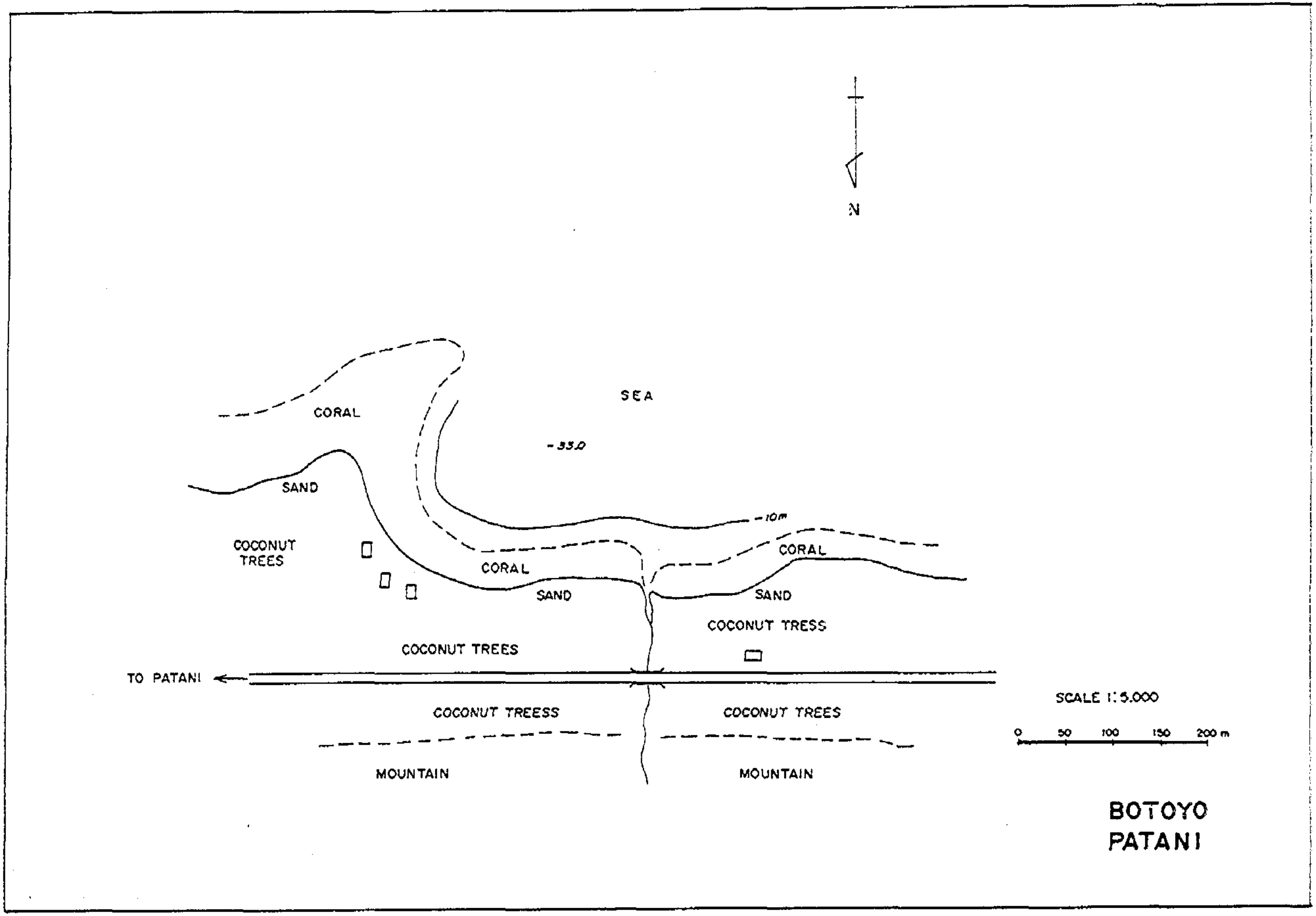


LAIWUI
OBI ISLAND



JIKOTAMO (1)
OBI ISLAND


JIKOTAMO (2)
OBI ISLAND
FISHING COMPANY
CLIF
CLIF
MANGROVE
CORAL SAND
SAND BAR
FOREST
-14.0
-13.5
-12.0
-2.0
CORAL
MANGROVE
MANGROVE
FISH PUND
COCONUT TREES
CORAL
SEA
SAND BAR
COCONUT TREES
COCONUT TREES
SAND
SAND
HOUSES
HOUSES
KOTA GIKOTAMO
N
SCALE 1 : 5,000
0
50
100
150
200 m


N
SEA
CORAL
-33.0
SAND
COCONUT
TREES
-10m
CORAL
CORAL
SAND
SAND
COCONUT TRESS
COCONUT TREES
TO PATANI
COCONUT TREESS
COCONUT TREES
MOUNTAIN
MOUNTAIN
SCALE 1:5.000
0
50
100
150
200 m
BOTOYO
PATANI

A7.1.1 The required area of the passenger terminal and parking area is determined by the following formulas.

(1) Passenger terminal

1) Waiting room (W)

$W = A \times N \times P \times C \times F$

where, W : Required waiting room area (m^2)

A : Required area for one person (generally $1.2m^2$/person is used)

N : Fixed number of passenger per boat

P : Number of boats berthing/deberthing at the same time

C : Concentration ratio (1.0 - 1.6)

F : Fluctuation ratio (1.2)

2) Other rooms

- Kiosk/Canteen (W1): 15% of waiting room
- Administration office (W2): 15% of waiting room
- Other utilities (W3): 25% of (W+W1+W2)
- *Public hall/Passages:* 10% of (W+W1+W2+W3)

(2) Parking area

1) Loading parking area (Lp)

$Lp= A1 \times Nv \times P \times U \times C$

where, Lp : Required loading parking area (m^2)

A1 : Required parking area per vehicle (m^2)

8 ton truck and bus: 60 m^2, 2 ton truck and sedan: 25 m^2

Nv : Fixed number of vehicles per boat

P : Number of boats berthing/deberthing at the same time

U : Utilization ratio (1.0)

C : Concentration ratio (1.0 - 1.6)

2) Waiting parking area (Wp)

$Wp = A2 \times Np \times P \times U \times C \times Uz \times 1/Pv$

where, Lp : Required waiting parking area (m^2)

A2 : Required parking area per vehicle (m^2)

Np : Number of passengers

P : Number of boats berthing/deberthing at the same time

U : Utilization ratio (1.0)

C : Concentration ratio (1.0 - 1.6)

Uz : Utilization ratio of vehicle (1.0)

Pv : Number of passenger per vehicle (8)

Table A7.1.1(1) - (2) *shows the result of calculations.*

Table A7.1.1(1) Required Area of Terminal Building

Routes	Waiting room						Other rooms				Total Area	Remark
	Coefficient					W	W1	W2	W3	W4		
	A	N	P	C	F	(m^2)	(m^2)	(m^2)	(m^2)	(m^2)	(m^2)	
Proposed Routes												
Surabaya - Banjarmasin	1.2	800	2	1.6	1.2	3,686 → 3,700	555	555	1203	602	6,615 → 6,700	
Jakarta - Pontianak	1.2	800	1	1.6	1.2	1,843 → 1,850	278	278	602	301	3,309 → 3,400	
Surabaya - Ujung Pandang	1.2	800	1	1.6	1.2	1,843 → 1,850	278	278	602	301	3,309 → 3,400	
Kendari - Ambon	1.2	600	1	1.3	1.2	1,123 → 1,150	173	173	374	187	2,057 → 2,100	
Ambon - Sorong	1.2	500	1	1.3	1.2	936 → 950	143	143	309	155	1,700 → 1,700	
Selayar - Labuhan Bajo	1.2	500	1	1.3	1.2	936 → 950	143	143	309	155	1,700 → 1,700	
Manokwari - Biak	1.2	500	1	1.3	1.2	936 → 950	143	143	309	155	1,700 → 1,700	
Wahai - Babang	1.2	500	1	1.0	1.2	720 → 750	113	113	244	122	1,342 → 1,400	
Patani - Sorong	1.2	500	1	1.0	1.2	720 → 750	113	113	244	122	1,342 → 1,400	
Other Routes						0						
Kendari - Wawonii	1.2	300	1	1.0	1.2	432 → 450	68	68	147	74	807 → 900	Existing
Ambon - Waiprit	1.2	400	2	1.6	1.2	1,843 → 1,850	278	278	602	301	3,309 → 3,400	Existing
Sorong - Fakfak	1.2	400	1	1.0	1.2	576 → 600	90	90	195	98	1,073 → 1,100	Planned
Labuhan Bajo - Sape	1.2	400	1	1.6	1.2	922 → 950	143	143	309	155	1,700 → 1,700	Existing
Biak - Serui	1.2	300	1	1.3	1.2	562 → 600	90	90	195	98	1,073 → 1,100	Existing
* Ambon - Kendari												
- Sorong	1.2	600	1	1.6	1.2	1,382 → 1,400	210	210	455	228	2,503 → 2,600	
* Sorong - Ambon												
- Patani												
- Fakfak	1.2	500	1	1.6	1.2	1,152 → 1,200	180	180	390	195	2,145 → 2,200	

Table A7.1.1(2) Required Area of Parking Lot

Route	Loading parking area						Waiting parking area								Remark
	Coefficient					Lp	Coefficient							Wp	
	A1	Nv	P	U	C	(m^2)	A2	Np	P	U	C	Uz	Pv	(m^2)	
Proposed Routes															
Surabaya - Banjarmasin	40.8	76	2	1.0	1.6	9,923 → 10,000	25	800	2	1.0	1.6	1.0	8	8,000 → 8,000	
Jakarta - Pontianak	40.8	76	1	1.0	1.6	4,961 → 5,000	25	800	1	1.0	1.6	1.0	8	4,000 → 4,000	
Surabaya - Ujung Pandang	40.8	76	1	1.0	1.3	4,031 → 4,100	25	800	1	1.0	1.3	1.0	8	3,250 → 3,300	
Kendari - Ambon	40.8	61	1	1.0	1.3	3,235 → 3,300	25	600	1	1.0	1.3	1.0	8	2,438 → 2,500	
Ambon - Sorong	40.8	42	1	1.0	1.3	2,228 → 2,300	25	500	1	1.0	1.3	1.0	8	2,031 → 2,100	
Selayar - Labuhan Bajo	40.8	42	1	1.0	1.3	2,228 → 2,300	25	500	1	1.0	1.3	1.0	8	2,031 → 2,100	
Manokwari - Biak	40.8	42	1	1.0	1.3	2,228 → 2,300	25	500	1	1.0	1.3	1.0	8	2,031 → 2,100	
Wahai - Babang	40.8	42	1	1.0	1.0	1,714 → 1,800	25	500	1	1.0	1.0	1.0	8	1,563 → 1,600	
Patani - Sorong	40.8	42	1	1.0	1.0	1,714 → 1,800	25	500	1	1.0	1.0	1.0	8	1,563 → 1,600	
Other Routes															
Kendari - Wawonii	40.8	17	1	1.0	1.0	694 → 700	25	300	1	1.0	1.0	1.0	8	938 → 1,000	Existing
Ambon - Waiprit	40.8	26	2	1.0	1.6	3,395 → 3,400	25	400	2	1.0	1.6	1.0	8	4,000 → 4,000	Existing
Sorong - Fakfak	40.8	26	1	1.0	1.0	1,061 → 1,100	25	400	1	1.0	1.0	1.0	8	1,250 → 1,300	Planned
Labuhan Bajo - Sape	40.8	26	1	1.0	1.6	1,697 → 1,700	25	400	1	1.0	1.6	1.0	8	2,000 → 2,000	Existing
Biak - Serui	40.8	17	1	1.0	1.3	902 → 1,000	25	300	1	1.0	1.3	1.0	8	1,219 → 1,300	Existing
* Ambon - Kendari															
- Sorong	40.8	61	1	1.0	1.6	3,982 → 4,000	25	600	1	1.0	1.6	1.0	8	3,000 → 3,000	
* Sorong - Ambon															
- Patani															
- Fakfak	40.8	42	1	1.0	1.6	2,742 → 2,800	25	500	1	1.0	1.6	1.0	8	2,500 → 2,500	

Table A7.2.1 Basic Premises for Ferry Terminal Development

Item		Description
Convenience		
	Maneuverability of ferry boats	Ease with which entry/departure and berthing/deberthing of ferry boats is possible.
	Land use	Ease with which passengers and vehicles can be transported or parked, from the standpoint of users, and with regard to shape of the reclaimed land and the arrangement of facilities and roads.
	Effectiveness of existing terminal	Effectiveness with which existing terminal can be used.
	Coordination with existing port	Possibility of development within the port area.
Safety		
	Calm waters inside the port	Sufficient width of calm water area secured against invading waves in front of the berth, for ease loading/unloading inside the port.
	Emergency measures	Effectiveness and adaptability of measures to deal with accidents occurring inside the port.
Economy		
	Total construction cost	Minimization of the total construction budget, in consideration of costs for topography, soil conditions, balance between dredging/reclamation volume, etc.
	Graduated investment	Minimization of investment and maximization of effect while conforming to the requirement early start of service (Breakwaters will not be constructed in this point of view).
Flexibility of the plan		
	Adaptability to changing conditions	Whether it is possible to adapt the plan according to changing circumstances.
	Potential for future development	Availability of room for future expansion in order to meet post 2019 future demands.
Environmental protection		
	Impact on the social environment	Harmful effects on the living standards of citizens in terms of noise and vibrations created by ferry terminal activities, and harmful effects on scenery.
	Impact on the natural environment	The effect of pollution on marine life due to the ferry terminal activities.

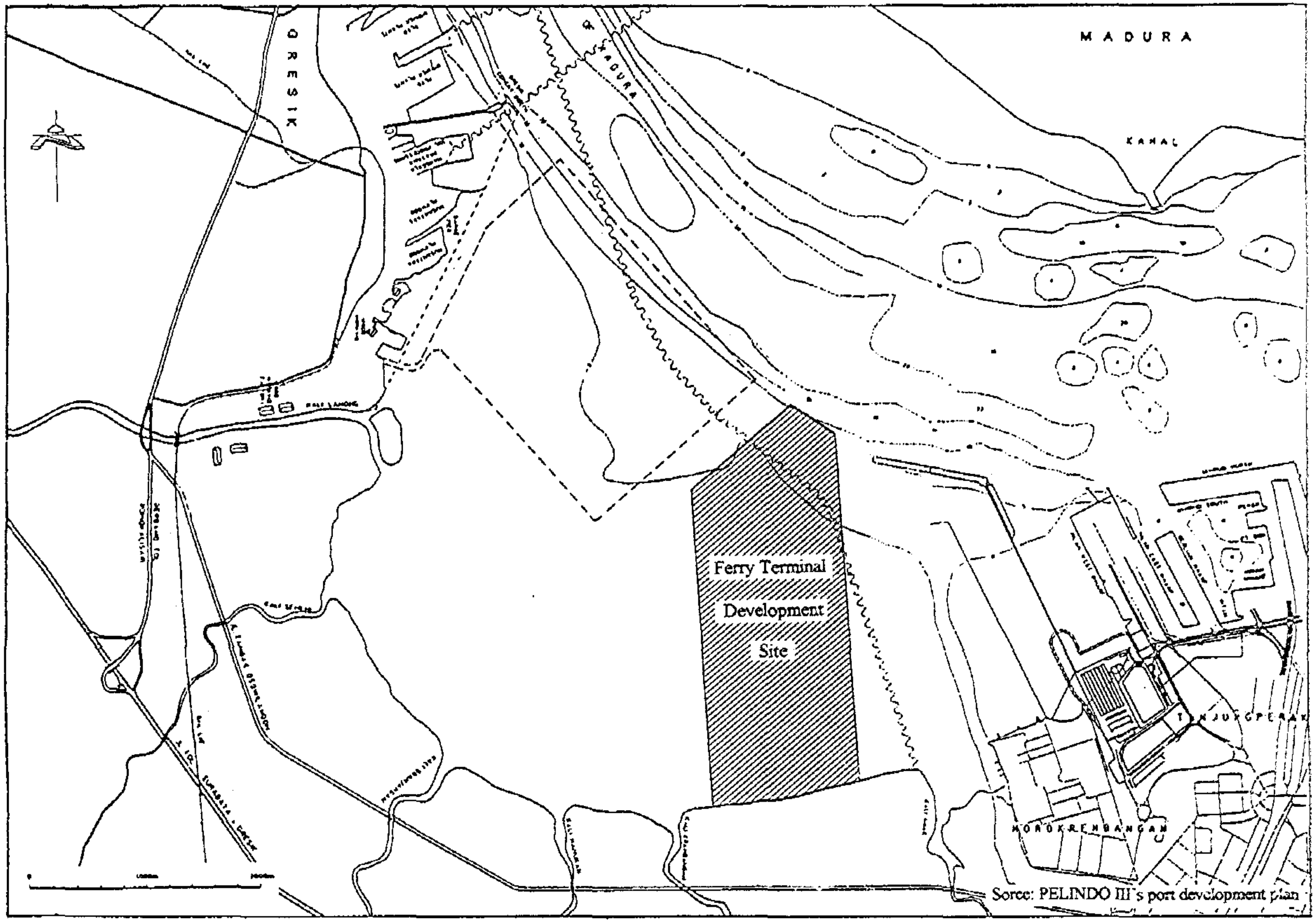


Figure A7.2.1 Location of Ferry Terminal Development Site at Surabaya

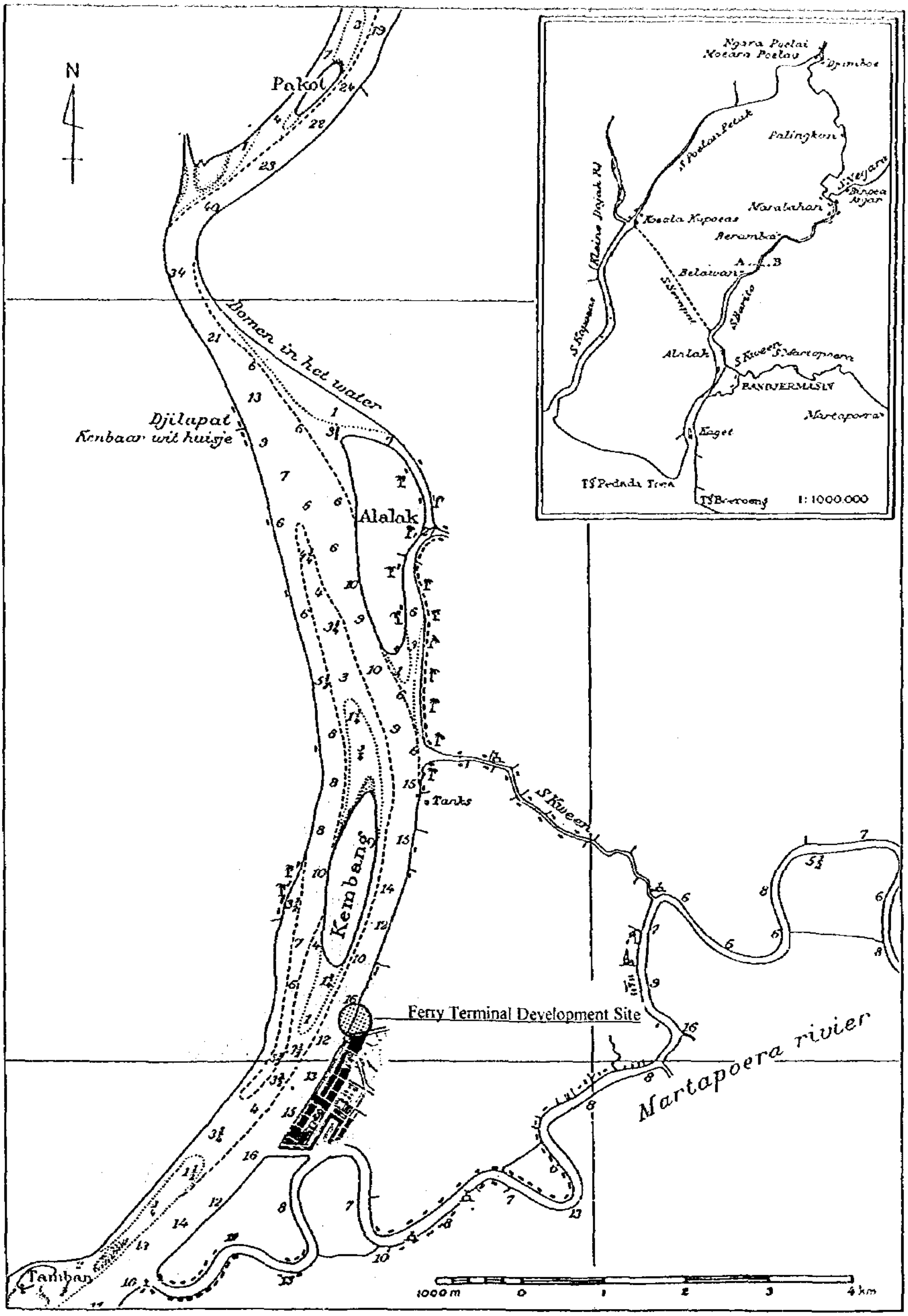


Figure A7.2.2 Location of Ferry Terminal Development Site at Banjarmasin

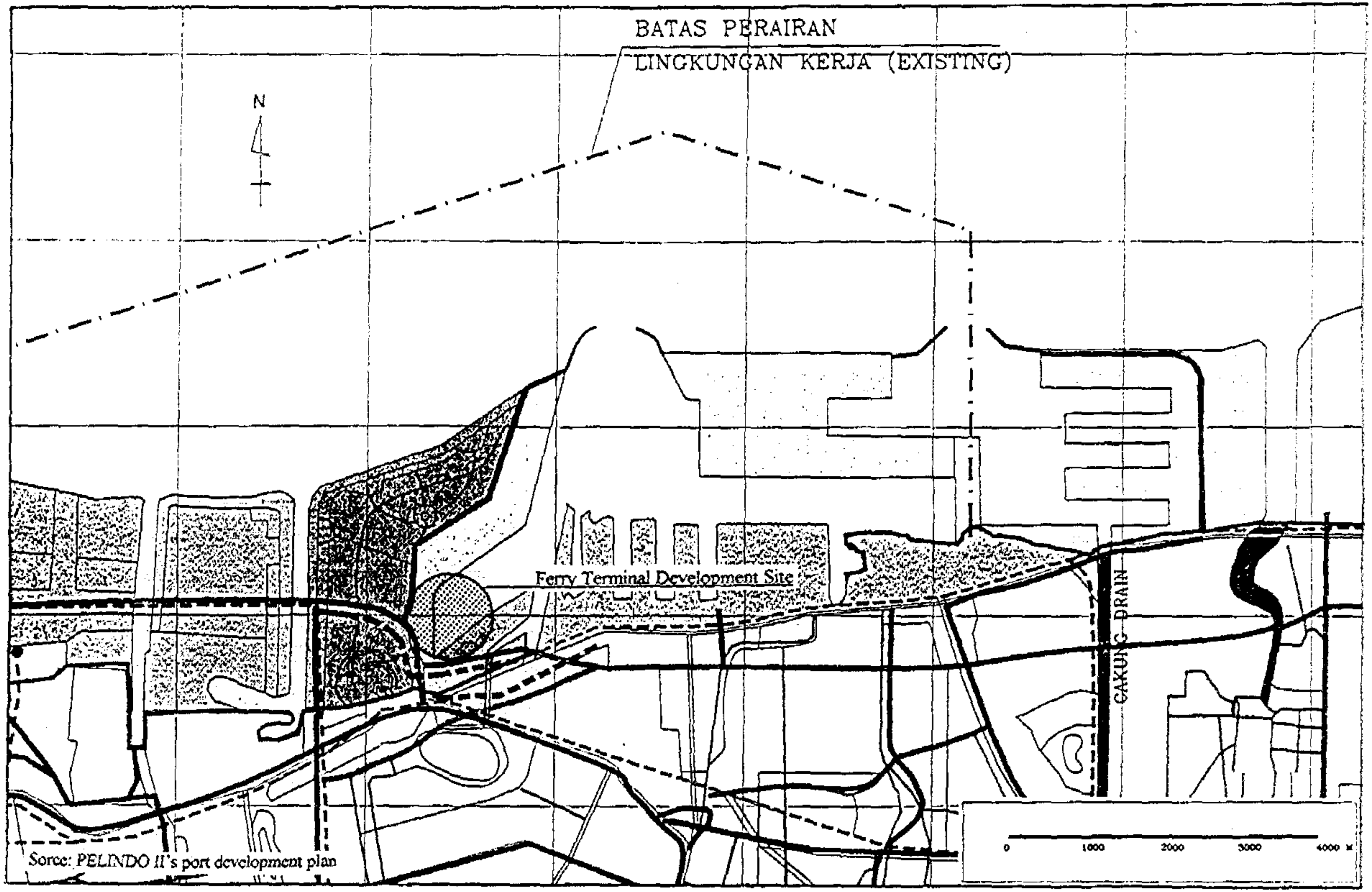


Figure A7.2.3 Location of Ferry Terminal Development Site at Jakarta

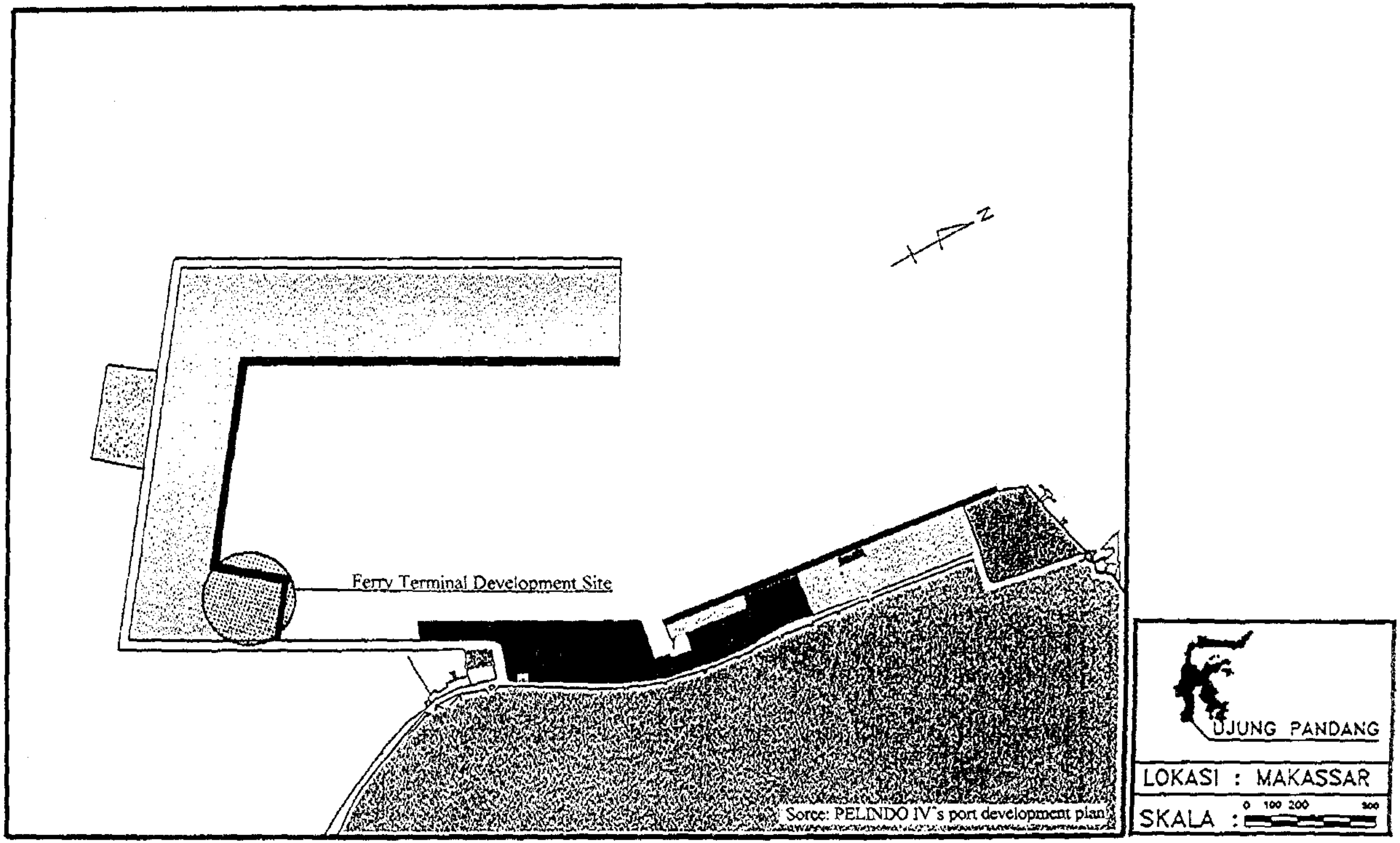


Figure A7.2.4 Location of Ferry Terminal Development Site at Ujung Pandang

Table A8.3.1 Estimation of Construction Cost (Jakarta)

Terminal	Size of Boat (GRT)	Berth	Building (m2)	Parking (m2)	Design Conditions (LWS: DL+0.20 m))
Jakarta	max: 5000, min: 1000	1	3,400	9,000	HWS: +1.40 m; Bearing Strata: -20 m; Crown Height of Berth: +3.00 m

* Prices in 1,000 Rupiah.

Description		Unit	Quantity	Unit Price	Price	Remarks
Mobilization and Demobilization		LS			1,563,945	3 % of Total of the Direct Construction Cost
Deck Type Quay (L=165 m, B=15 m)	Steel Pipe Pile Works	m	5,016	513	2,573,208	D=600mm, t=12mm, L=33m ; Pitch of Piles=5.0 m; 152 piles.
	Corrosion Protection of Piles	no	152	4,000	608,000	
	RC Beams and Slabs	m3	990	917	907,830	A: 2,475 m2 x H 0.4m
	Fender System	unit	17	10,000	170,000	C-400H, 10.0 m Pitch.
	Bollard	no	9	7,000	63,000	35 ton Type; 2 Berth (7 + 6)
Loading Deck (A=1,575 m2)	Steel Pipe Pile Works	m	2,376	513	1,218,888	D=600mm, t=12mm, L=33m ; Pitch of Piles=5.0 m; 72 piles.
	Corrosion Protection of Piles	no	72	4,000	288,000	
	RC Beams and Slabs	m3	630	917	577,710	A: 1,575 m2 x H 0.4m
Movable Bridge		Unit	1	1,230,000	1,230,000	W: 11.0 m x L: 5.0 m, Wheel Load: T-20; 1 Units.
Revetment and Slope Protection (L=385 m)	Armour Rock (100-300 kg/unit)	m3	10,010	69	690,690	26.0 m3/m
	Filling Stone (10 - 20kg/unit)	m3	9,625	69	664,125	25.0 m3/m
	Geotextile	m2	3,080	9	27,720	8.0 m2/m
	Concrete Wall	m3	1,030	526	541,780	6.25 m3/m
Reclamation		m3	400,000	12	4,800,000	47,000 m2 x H Av 8.5m
Terminal Building		m2	3,400	800	2,720,000	A1
Gate House		m2	10	500	5,000	
Pavement (Parking Area)		m2	9,000	42	378,000	A2
Pavement (Passage)		m2	9,050	42	380,100	A3; Width 10.0m
Access Road	Road Pavement	m2	20,000	42	840,000	L=1 km, H=10m.
	Flyover Bridge	m2	4,500	7,210	32,445,000	L=250 m, W=18m. Flyover bridge over railroad USD 2,000/m2.
Drainage		m2	18,050	5	90,250	A0: Terminal Area, 250m x 180m=45,000 m2.
Landscaping		m2	23,550	4	94,200	A0 - (A1+A2+A3)
Fence		m	860	600	516,000	2 x (250 m + 180 m)
Water Supply		m2	3,400	20	68,000	
Electric Power Supply		LS	1	200,000	200,000	
Sewerage System		m2	3,400	10	34,000	
Total				(1)	53,695,446	1,000 Rupiah
Engineering Fee		LS	1	(2)	5,369,545	1,000 Rupiah. 10 % of (1)
Physical Contingency		LS	1	(3)	5,906,499	1,000 Rupiah. 10 % of (1) + (2)
VAT		LS	1	(4)	6,497,149	1,000 Rupiah. 10 % of (1) + (2) + (3)
Grand Total					71,468,639	1,000 Rupiah

Table A8.3.2 Estimation of Construction Cost (Pontianak)

Terminal	Size of Boat (GRT)	Berth	Building (m2)	Parking (m2)	Design Conditions (Datum Level: LWS)
Pontianak	max: 5000, min: 1000	1	3,400	9,000	HWS: +1.80 m; Bearing Strata: -30 m; Crown Height of Berth: +3.50 m

* Prices in 1,000 Rupiah.

Description		Unit	Quantity	Unit Price	Price	Remarks
Mobilization and Demobilization		LS	1		685,636	5 % of Total of the Direct Construction Cost.
Site Clearance and Grading		m2	45,000	3	135,000	250 m x 180 m.
Side Breasting Dolphin	Steel Pipe Pile Works	m	945	834	788,130	D=1000mm, t=12mm, L=35m ; 1 Berth x 3 Dolphin x 9 Piles
	Reinforced Concrete	m3	510	1,183	603,330	
	Corrosion Protection of Piles	no	27	6,600	178,200	
	Fender System	unit	6	10,000	60,000	C-800H, RH, 2 Units x 1 Berth x 3 Dolphin
	Bollard	no	3	7,000	21,000	35 ton Type
Mooring Dolphin	Steel Pipe Pile Works	m	420	834	350,280	D=1000mm, t=12mm, L=35m ; 1 Berth x 3 Dolphin x 4 Piles
	Reinforced Concrete	m3	162	1,183	191,646	
	Corrosion Protection of Piles	no	12	6,600	79,200	
	Bollard	no	3	7,000	21,000	50 ton Type
Cat Walk		m	180	600	108,000	
Loading Deck (L=85, W=15m, A=1275 m2)	Steel Pipe Pile Works	m	1,785	690	1,231,650	D=800mm, t=12mm, L=35m ; Pitch of Piles=5.0 m; 51 piles.
	Corrosion Protection of Piles	no	51	5,300	270,300	
	RC Beams and Slabs	m3	510	1,183	603,330	A: 1,275 m2 x H 0.4m
Movable Bridge		Unit	1	1,230,000	1,230,000	W: 11.0 m x L: 5.0 m, Wheel Load: T-20; 1 Units.
Slope Protection (L=300 m)	Filling Works	m3	16,250	21	341,250	
	Rubble Stone (10 - 20kg/unit)	m3	2,100	64	134,400	
	Armour Rock (100-300 kg/unit)	m3	29,100	64	1,862,400	
	Geotextile	m2	21,600	9	194,400	
Terminal Building		m2	3,400	1,000	3,400,000	A1
Gate House		LS	1	7,000	7,000	
Pavement (Parking Area)		m2	9,000	45	405,000	A2
Pavement (Passage)		m2	9,050	45	407,250	A3; Width 10.0m
Drainage		m2	18,050	6	108,300	A0
Landscaping		m2	23,550	3	70,650	A0 - (A1+A2+A3)
Fence		m	860	650	559,000	2 x (250 + 180) meter.
Water Supply		m2	3,400	20	68,000	
Electric Power Supply		LS	1	250,000	250,000	
Sewerage System		m2	3,400	10	34,000	
Total				(1)	14,398,352	1,000 Rupiah
Engineering Fee		LS	1	(2)	1,439,835	1,000 Rupiah. 10 % of (1)
Physical Contingency		LS	1	(3)	1,583,819	1,000 Rupiah. 10 % of (1) + (2)
VAT		LS	1	(4)	1,742,201	1,000 Rupiah. 10 % of (1) + (2) + (3)
Grand Total					19,164,206	1,000 Rupiah

Table A8.3.3 Estimation of Construction Cost (Surabaya)

Terminal	Size of Boat (GRT)	Berth	Building (m2)	Parking (m2)	Design Conditions (Datum Level: LWS)
Surabaya	max: 5000, min: 1000	3	9,400	25,400	HWS: +3.10 m; Bearing Strata: -60 m; Crown Height of Berth: +5.00 m

* Prices in 1,000 Rupiah.

Description		Unit	Quantity	Unit Price	Price	Remarks
Mobilization and Demobilization		LS	1		4,443,092	3 % of Total of the Direct Construction Cost
Side Breasting Dolphin	Steel Pipe Pile Works	m	5,265	794	4,180,410	D=1000mm, t=12mm, L=65m ; 3 Berth x 3 Dolphin x 9 Piles
	Reinforced Concrete	m3	1,530	996	1,523,880	
	Corrosion Protection of Piles	no	81	6,600	534,600	
	Fender System	unit	18	35,000	630,000	C-800H, RH, 2 Units x 3 Berth x 3 Dolphin
	Bollard	no	9	7,000	63,000	35 ton Type
Mooring Dolphin	Steel Pipe Pile Works	m	2,340	794	1,857,960	D=1000mm, t=12mm, L=65m ; 3 Berth x 3 Dolphin x 4 Piles
	Reinforced Concrete	m3	486	996	484,056	
	Corrosion Protection of Piles	no	36	6,600	237,600	
	Bollard	no	9	7,000	63,000	50 ton Type
Cat Walk		m	540	500	270,000	
Trestle (L=2,500 m)	Steel Pipe Pile Works	m	120,000	523	62,760,000	D=600mm, t=12mm, L=60m ; Pitch of Piles=5.0 m; 2000 piles.
	Corrosion Protection of Piles	no	2,000	4,000	8,000,000	
	RC Beams and Slabs	m3	20,000	996	19,920,000	L:2,500m x B:20.0m x H:0.4m
Loading Deck	Steel Pipe Pile Works	m	29,880	674	20,139,120	D=800mm, t=12mm, L=60m ; Pitch of Piles=5.0 m; 498 piles.
	Corrosion Protection of Piles	no	498	5,300	2,639,400	
	RC Beams and Slabs	m3	4,980	996	4,960,080	A (3 x 18m x 50m) + (65m x 150m); 12,450 m2 x H 0.4m
Movable Bridge		Unit	3	2,200,000	6,600,000	W: 11.0 m x L: 12.0 m, Wheel Load: T-20; 3 Units.
Causeway (L=300 m)	Filling Works	m3	9,420	24	226,080	Sandy Gravel: 31.4 m3/m
	Rubble Stone (10 - 20kg/unit)	m3	4,230	39	164,970	14.1 m3/m
	Armour Rock (100-300 kg/unit)	m3	5,820	39	226,980	19.4 m3/m
	Geotextile	m2	2,160	8	17,280	7.2 m2/m
	Pavement (Carriage Way)	m2	2,100	36	75,600	W: 3.5m x 2 Lanes.
	Pavement (Walk Way)	m2	900	26	23,400	W: 1.5m x Both Sides.
Water Area	Dredging	m3	0	12	0	V=0.5 x 5m x (1,000m x 1,000m)
Terminal Building		m2	9,400	800	7,520,000	A1
Pedestrian Boarding Deck		m2	2,050	800	1,640,000	L=410m; W=5.0m.
Gate House		LS	1	5,000	5,000	
Pavement (Parking Area)		m2	25,400	36	914,400	A2
Pavement (Passage)		m2	9,050	36	325,800	A3; Width 10.0m
Drainage		m2	62,500	5	312,500	A0=250m x 250m
Landscaping		m2	18,650	3	55,950	A0 - (A1+A2+A3)
Fence		m	1,000	600	600,000	2 x (250 + 250) meter.
Water Supply		m2	9,400	20	188,000	
Electric Power Supply		LS	1	800,000	800,000	
Sewerage System		m2	9,400	10	94,000	
Navigation Aids		Unit	2	25,000	50,000	
Total				(1)	152,546,158	1,000 Rupiah

Engineering Fee	LS	1	(2)	15,254,616	1,000 Rupiah. 10 % of (1)
Physical Contingency	LS	1	(3)	16,780,077	1,000 Rupiah. 10 % of (1) + (2)
VAT	LS	1	(4)	18,458,085	1,000 Rupiah. 10 % of (1) + (2) + (3)
Grand Total				203,038,936	1,000 Rupiah

Table A8.3.4 Estimation of Construction Cost (Banjarmasin)

Terminal	Size of Boat (GRT)	Berth	Building (m2)	Parking (m2)	Design Conditions (Datum Level: LWS)
Banjarmasin	max: 5000, min: 1000	2	6,700	18,000	HWS:+2.40 m; Bearing Strata: -40 m; Crown Height of Berth: +4.00 m

* Prices in 1,000 Rupiah.

Description		Unit	Quantity	Unit Price	Price	Remarks
Mobilization and Demobilization		LS			1,163,063	5 % of Total of the Direct Construction Cost
Sheet Pile Quay (L=350 m)	Sheet Pile Works	m	12,250	207	2,535,750	Type IV, L=14.0 m x 875 Sheets.
	Coping Concrete	m3	875	641	560,875	
	Tie Rod and Anchorage	no	70	1,068	74,760	5.0 m Pitch.
	Back-fill Stone	m3	15,750	63	992,250	10 - 50 kg/Unit.
	Geotextile	m2	5,250	9	47,250	
	Foot Protection	m3	2,450	84	205,800	100 - 300 kg/Unit.
	Fender System	unit	25	10,000	250,000	C-400H, 10.0 m Pitch.
	Bollard	no	13	7,000	91,000	35 ton Type; 2 Berth (7 + 6)
Loading Deck (A=3,420 m2)	Steel Pipe Pile Works	m	6,028	535	3,224,980	D=600mm, t=12mm, L=44m ; Pitch of Piles=5.0 m; 137 piles.
	Corrosion Protection of Piles	no	137	4,000	548,000	
	RC Beams and Slabs	m3	1,370	1,174	1,608,380	A: 3,420 m2 x H:0.4m
Movable Bridge		Unit	2	1,730,000	3,460,000	W: 11.0 m x L: 8.0 m, Wheel Load: T-20; 2 Units.
Revetment and Slope Protection (L=120 m)	Armour Rock (100-300 kg/unit)	m3	3,120	84	262,080	26.0 m3/m
	Filling Stone (10 - 20kg/unit)	m3	3,000	68	204,000	25.0 m3/m
	Geotextile	m2	960	9	8,640	8.0 m2/m
	Concrete Wall	m3	750	641	480,750	6.25 m3/m
Dredging and Reclamation		m3	7,500	16	120,000	Dredging of Water area in front of Berth.
Embankment		m3	8,000	21	168,000	Embankment of the eroded river bank.
Terminal Building		m2	6,700	900	6,030,000	A1
Gate House		LS	1	6,000	6,000	
Pavement (Parking Area)		m2	18,000	44	792,000	A2
Pavement (Passage)		m2	9,050	44	398,200	A3; Width 10.0m
Drainage		m2	27,050	6	162,300	A0: Terminal Area, 42,000 m2.
Landscaping		m2	8,250	3	24,750	A0 - (A1+A2+A3)
Fence		m	930	650	604,500	
Water Supply		m2	6,700	20	134,000	
Electric Power Supply		LS	1	200,000	200,000	
Sewerage System		m2	6,700	10	67,000	
Total				(1)	24,424,328	1,000 Rupiah.

Engineering Fee	LS	1	(2)	2,442,433	1,000 Rupiah. 10 % of (1)
Physical Contingency	LS	1	(3)	2,686,676	1,000 Rupiah. 10 % of (1) + (2)
VAT	LS	1	(4)	2,955,344	1,000 Rupiah. 10 % of (1) + (2) + (3)
Grand Total				32,508,781	1,000 Rupiah

Table A8.3.5 Estimation of Construction Cost (Ujung Pandang)

Terminal	Size of Boat (GRT)	Berth	Building (m2)	Parking (m2)	Design Conditions (Datum Level: LWS)
Ujung Pandang	max: 5000, min: 1000	1	2,700	7,400	HWS:+1.80 m; Bearing Strata: -30 m; Crown Height of Berth: +3.50 m

* Prices in 1,000 Rupiah.

Description		Unit	Quantity	Unit Price	Price	Remarks
Mobilization and Demobilization		LS			1,054,118	3 % of Total of the Direct Construction Cost
Deck Type Quay (L=165 m, B=15 m)	Steel Pipe Pile Works	m	3,040	549	1,668,960	D=600mm, t=12mm, L=33m ; Pitch of Piles=5.0 m; 152 piles.
	Corrosion Protection of Piles	no	152	4,000	608,000	
	RC Beams and Slabs	m3	990	1,015	1,004,850	A: 2,475 m2 x H:0.4m
	Fender System	unit	17	10,000	170,000	C-400H, 10.0 m Pitch.
	Bollard	no	9	7,000	63,000	35 ton Type; 2 Berth (7 + 6)
Loading Deck (A=1,575 m2)	Steel Pipe Pile Works	m	1,440	549	790,560	D=600mm, t=12mm, L=33m ; Pitch of Piles=5.0 m; 72 piles.
	Corrosion Protection of Piles	no	72	4,000	288,000	
	RC Beams and Slabs	m3	630	1,015	639,450	A: 1,575 m2 x H:0.4m
Trestle (L=600 m)	Steel Pipe Pile Works	m	9,600	549	5,270,400	D=600mm, t=12mm, L=60m ; Pitch of Piles=5.0 m; 480 piles.
	Corrosion Protection of Piles	no	480	4,000	1,920,000	
	RC Beams and Slabs	m3	4,800	1,015	4,872,000	A:12,000m2 x H:0.4m
Movable Bridge		Unit	1	1,230,000	1,230,000	W: 11.0 m x L: 5.0 m, Wheel Load: T-20; 1 Units.
Reclamation		m3	611,000	16	9,776,000	47,000 m2 x H:Av.13 m
Revetment and Slope Protection (L=385 m)	Armour Rock (100-300 kg/unit)	m3	13,475	65	875,875	35.0 m3/m, L=385m
	Filling Stone (10 - 20kg/unit)	m3	13,090	65	850,850	34.0 m3/m, L=385m
	Geotextile	m2	8,855	9	79,695	23.0 m2/m, L=385m
	Concrete Wall	m3	1,030	549	565,470	6.25 m3/m
Terminal Building		m2	2,700	1,000	2,700,000	A1
Gate House		LS	1	7,000	7,000	
Pavement (Parking Area)		m2	7,400	43	318,200	A2
Pavement (Passage)		m2	9,050	43	389,150	A3; Width 10.0m
Drainage		m2	16,450	5	82,250	A0: Terminal Area, 250m x 180m=45,000 m2.
Landscaping		m2	25,850	3	77,550	A0 - (A1+A2+A3)
Fence		m	860	650	559,000	2 x (250 m + 180 m)
Water Supply		m2	2,700	20	54,000	
Electric Power Supply		LS	1	250,000	250,000	
Sewerage System		m2	2,700	10	27,000	
Total				(1)	36,191,378	1,000 Rupiah.

Engineering Fee	LS	1	(2)	3,619,138	1,000 Rupiah. 10 % of (1)
Physical Contingency	LS	1	(3)	3,981,052	1,000 Rupiah. 10 % of (1) + (2)
VAT	LS	1	(4)	4,379,157	1,000 Rupiah. 10 % of (1) + (2) + (3)
Grand Total				48,170,724	1,000 Rupiah

Table A8.3.6 Estimation of Construction Cost (Kendari)

Terminal	Size of Boat (GRT)	Berth	Building (m2)	Parking (m2)	Design Conditions (Datum Level: LWS)
Kendari	max: 3000, min: 1000	2	2,700	5,800	HWS:+2.60 m; Bearing Strata: -30 m; Crown Height of Berth: +4.50 m

* Prices in 1,000 Rupiah.

Description		Unit	Quantity	Unit Price	Price	Remarks
Mobilization and Demobilization		LS	1		678,747	5 % of Total of the Direct Construction Cost
Side Breasting Dolphin	Steel Pipe Pile Works	m	945	892	812,751	D=800mm, t=12mm, L=35m ; 1 Berth x 3 Dolphin x 9 Piles
	Reinforced Concrete	m3	510	1,557	794,274	
	Corrosion Protection of Piles	no	27	6,890	186,030	
	Fender System	unit	6	45,500	273,000	C-800H, R1, 2 Units x 1 Berth x 3 Dolphin
	Bollard	no	3	9,100	27,300	35 ton Type
Mooring Dolphin	Steel Pipe Pile Works	m	420	892	374,556	D=800mm, t=12mm, L=35m ; 1 Berth x 3 Dolphin x 4 Piles
	Reinforced Concrete	m3	162	1,557	252,299	
	Corrosion Protection of Piles	*no*	12	6,890	82,680	
	Bollard	no	3	9,100	27,300	35 ton Type
Cat Walk		m	180	780	140,400	
Loading Deck (A=900m2)	Steel Pipe Pile Works	m	1,260	701	882,882	D=600mm, t=12mm, L=35m ; Pitch of Piles=5.0 m; 36 piles.
	Corrosion Protection of Piles	no	36	5,200	187,200	
	RC Beams and Slabs	m3	360	1,557	560,664	A: 1900 m2 x H0.4m
Movable Bridge		Unit	1	2,433,000	2,483,000	W: 10.0 m x L: 10.0 m, Wheel Load: T-20; 1 Units.
Land Filling		m3	45,000	27	1,228,500	A0=18,000 m2, Banking Height 5.0m.
Slope Protection (L=160 m)	Filling Works	m3	1,200	27	32,760	
	Rubble Stone (10 - 20kg/unit)	m3	1,760	82	144,144	
	Armour Rock (100-300 kg/unit)	m3	1,760	82	144,144	
	Geotextile	m2	720	12	8,424	
Terminal Building		m2	2,700	1,300	3,510,000	A1
Gate House		LS	1	9,100	9,100	
Pavement (Parking Area)		m2	5,800	57	331,760	A2
Pavement (Passage)		m2	6,000	57	343,200	A3; Width 10.0m
Drainage		m2	11,800	8	92,040	A0
Landscaping		m2	3,500	4	13,650	A0 - (A1+A2+A3)
Fence		m	435	845	367,575	
Water Supply		m2	2,700	26	70,200	
Electric Power Supply		LS	1	130,000	130,000	
Sewerage System		m2	2,700	13	35,100	
Total				(1)	14,253,679	1,000 Rupiah.

Engineering Fee	LS	1	(2)	1,425,368	1,000 Rupiah. 10 % of (1)
Physical Contingency	LS	1	(3)	1,567,905	1,000 Rupiah. 10 % of (1) + (2)
VAT	LS	1	(4)	1,724,695	1,000 Rupiah. 10 % of (1) + (2) + (3)
Grand Total				18,971,647	1,000 Rupiah

Table A8.3.7 Estimation of Construction Cost (Ambon)

Terminal	Size of Boat (GRT)	Berth	Building (m2)	Parking (m2)	Design Conditions (Datum Level: LWS)
Ambon	max: 3000, min: 1000	2	2,600	7,000	HWS: +2.20 m; Bearing Strata: -33 m; Crown Height of Berth: +4.00 m

* Prices in 1,000 Rupiah.

Description		Unit	Quantity	Unit Price	Price	Remarks
Mobilization and Demobilization		LS	1		992,334	5 % of Total of the Direct Construction Cost
Side Breasting	Steel Pipe Pile Works	m	675	1,161	783,608	D=800mm, t=12mm, L=25m ; 1 Berth x 3 Dolphin x 9 Piles
Dolphin	Reinforced Concrete	m3	510	1,665	819,303	
(3,000 GRT)	Corrosion Protection of Piles	no	27	7,800	210,600	
	Fender System	unit	6	49,400	296,400	C-800H, R1, 2 Units x 1 Berth x 3 Dolphin
	Bollard	no	3	9,100	27,300	35 ton Type
Mooring	Steel Pipe Pile Works	m	300	1,161	348,270	D=800mm, t=12mm, L=25m ; 1 Berth x 3 Dolphin x 4 Piles
Dolphin	Reinforced Concrete	m3	162	1,665	269,779	
(3,000 GRT)	Corrosion Protection of Piles	no	12	7,800	93,600	
	Bollard	no	3	9,100	27,300	35 ton Type
Cat Walk		m	180	845	152,100	
Loading Deck	Steel Pipe Pile Works	m	900	896	806,130	D=600mm, t=12mm, L=25m ; Pitch of Piles=5.0 m; 36 piles.
(3,000 GRT)	Corrosion Protection of Piles	no	36	5,850	210,600	
18m x 50m	RC Beams and Slabs	m3	360	1,665	599,508	A: 1900 m2 x H:0.4m
Movable Bridge (3,000 GRT)		Unit	1	1,976,000	1,976,000	W: 10.0 m x L: 8.0 m, Wheel Load: T-20; 1 Units.
Side Breasting	Steel Pipe Pile Works	m	675	1,161	783,608	D=800mm, t=12mm, L=25m ; 1 Berth x 3 Dolphin x 9 Piles
Dolphin	Reinforced Concrete	m3	195	1,665	324,734	
(1,000 GRT)	Corrosion Protection of Piles	no	27	7,800	210,600	
	Fender System	unit	9	39,000	351,000	C-630H, 3 Units x 1 Berth x 3 Dolphin
	Bollard	no	3	8,450	25,350	25 ton Type
Mooring	Steel Pipe Pile Works	m	300	896	268,710	D=600mm, t=9mm, L=25m ; 1 Berth x 3 Dolphin x 4 Piles
Dolphin	Reinforced Concrete	m3	113	1,665	188,179	
(1,000 GRT)	Corrosion Protection of Piles	no	12	5,850	70,200	
	Bollard	no	3	8,450	25,350	25 ton Type
Cat Walk		m	95	845	80,275	
Loading Deck	Steel Pipe Pile Works	m	650	896	582,205	D=600mm, t=12mm, L=25m ; Pitch of Piles=5.0 m; 26 piles.
(1,000 GRT)	Corrosion Protection of Piles	no	26	5,850	152,100	
16m x 40m	RC Beams and Slabs	m3	256	1,665	426,317	A: 1900 m2 x H:0.4m
Movable Bridge (1,000 GRT)		Unit	1	1,976,000	1,976,000	W: 9.0 m x L: 9.0 m, Wheel Load: T-20; 1 Units.
Causeway	Filling Works	m3	7,510	27	205,023	Sandy Gravel: 46.9 m3/m
(L=85m + 35m)	Rubble Stone (10 - 200kg/unit)	m3	3,520	94	329,472	22.0 m3/m
	Armour Rock (100-300kg/unit)	m3	3,510	94	328,536	21.9 m3/m
	Geotextile	m2	1,440	12	16,848	9.0 m2/m
	Pavement (Carriage Way)	m2	1,120	69	77,168	W: 3.5m x 2 Lanes.
	Pavement (Walk Way)	m2	480	51	24,336	W: 1.5m x Both Sides.
Site Clearance and Grading		m2	67,000	4	261,300	New Terminal Area
Terminal Building		m2	2,600	1,560	4,056,000	A1
Gate House		LS	1	10,400	10,400	
Pavement (Parking Area)		m2	7,000	69	482,300	A2
Pavement (Passage)		m2	7,000	69	482,300	A3; Width 10.0m
Drainage		m2	14,000	9	127,400	A0
Landscaping		m2	50,400	4	196,560	A0 - (A1+A2+A3)
Fence		m	900	910	819,000	
Water Supply		m2	2,600	29	74,360	
Electric Power Supply		LS	1	200,000	200,000	
Sewerage System		m2	2,600	16	40,560	
Total				(1)	20,839,021	1,000 Rupiah.

Engineering Fee	LS	1	(2)	2,083,902	1,000 Rupiah. 10 % of (1)
Physical Contingency	LS	1	(3)	2,292,292	1,000 Rupiah. 10 % of (1) + (2)
VAT	LS	1	(4)	2,521,522	1,000 Rupiah. 10 % of (1) + (2) + (3)
Grand Total				27,736,737	1,000 Rupiah

Table A8.3.8 Estimation of Construction Cost (Sorong)

Terminal	Size of Boat (GRT)	Berth	Building (m2)	Parking (m2)	Design Conditions (Datum Level: LWS)
Sorong	max: 1000, min: 500	1	2,200	5,300	HWS:+2.00 m; Bearing Strata: -20 m, Crown Height of Berth: +3.50 m

* Prices in 1,000 Rupiah.

Description		Unit	Quantity	Unit Price	Price	Remarks
Mobilization and Demobilization		LS	1		724,293	3 % of Total of the Direct Construction Cost.
Side Breasting Dolphin	Steel Pipe Pile Works	m	675	950	641,250	D=800mm, t=12mm, L=25m ; 1 Berth x 3 Dolphin x 9 Piles
	Reinforced Concrete	m3	195	1,398	272,610	
	Corrosion Protection of Piles	no	27	6,000	162,000	
	Fender System	unit	9	30,000	270,000	C-630H, 3 Units x 1 Berth x 3 Dolphin
	Bollard	no	3	6,500	19,500	25 ton Type
Mooring Dolphin	Steel Pipe Pile Works	m	300	730	219,000	D=600mm, t=9mm, L=25m ; 1 Berth x 3 Dolphin x 4 Piles
	Reinforced Concrete	m3	115	1,398	160,770	
	Corrosion Protection of Piles	no	12	4,500	54,000	
	Bollard	no	3	6,500	19,500	25 ton Type
Cat Walk		m	95	780	74,100	
Loading Deck W:16m x L:40m	Steel Pipe Pile Works	m	650	730	474,500	D=600mm, t=12mm, L=25m ; Pitch of Piles=5.0 m; 26 piles.
	Corrosion Protection of Piles	no	26	4,500	117,000	
	RC Beams and Slabs	m3	260	1,398	363,480	A: 1,275 m2 x H:0.4m
Movable Bridge		Unit	1	1,460,000	1,460,000	W: 9.0 m x L: 8.0 m, Wheel Load: T-20, 1 Units.
Causeway (L= 120 m)	Filling Works	m3	3,770	28	105,560	Sandy Gravel; 31.4 m3/m
	Rubble Stone (10 - 20kg/unit)	m3	1,700	57	96,900	14.1 m3/m
	Armour Rock (100-300 kg/unit	m3	2,330	72	167,760	19.4 m3/m
	Geotextile	m2	870	9	7,830	7.2 m2/m
	Pavement (Carriage Way)	m2	840	57	47,880	7.0 m2/m
	Pavement (Walk Way)	m2	360	41	14,760	3.0 m2/m
Terminal Building		m2	2,200	1,200	2,640,000	A1
Gate House		LS	1	8,000	8,000	
Pavement (Parking Area)		m2	5,300	57	302,100	A2
Pavement (Passage)		m2	6,500	57	370,500	A3; Width 10.0m
Drainage		m2	11,800	7	82,600	A0= 135 m x 80 m
Landscaping		m2	10,000	3	30,000	A0 - (A1+A2+A3)
Fence		m	710	700	497,000	
Widening of Accesss Road		m2	1,760	57	100,320	L:160m x w:11m
Water Supply		m2	2,200	22	48,400	
Electric Power Supply		LS	1	200,000	200,000	
Sewerage System		m2	2,200	12	26,400	
Total				(1)	9,778,018	1,000 Rupiah.

Description	Unit	Quantity	Unit Price	Price	Remarks
Engineering Fee	LS	1	(2)	977,802	1,000 Rupiah. 10 % of (1)
Physical Contingency	LS	1	(3)	1,075,582	1,000 Rupiah. 10 % of (1) + (2)
VAT	LS	1	(4)	1,183,140	1,000 Rupiah. 10 % of (1) + (2) + (3)
Grand Total				13,014,541	1,000 Rupiah

Table A8.3.9 Estimation of Construction Cost (Selayar)

Terminal	Size of Boat (GRT)	Berth	Building (m2)	Parking (m2)	Design Conditions (Datum Level: LWS)
Selayar	max: 1000, min: 500	1	1,700	4,400	HWS:+2.00 m; Bearing Strata: -20 m; Crown Height of Berth: +3.50 m

* Prices in 1,000 Rupiah.

Description		Unit	Quantity	Unit Price	Price	Remarks
Mobilization and Demobilization		LS	1		773,356	8 % of Total of the Direct Construction Cost.
Side Breasting Dolphin	Steel Pipe Pile Works	m	675	751	506,925	D=800mm, t=12mm, L=25m ; 1 Berth x 3 Dolphin x 9 Piles
	Reinforced Concrete	m3	195	1,227	239,265	
	Corrosion Protection of Piles	no	27	5,500	148,500	
	Fender System	unit	9	30,000	270,000	C-630H, 3 Units x 1 Berth x 3 Dolphin
	Bollard	no	3	6,500	19,500	25 ton Type
Mooring Dolphin	Steel Pipe Pile Works	m	300	585	175,500	D=600mm, t=9mm, L=25m ; 1 Berth x 3 Dolphin x 4 Piles
	Reinforced Concrete	m3	115	1,227	141,105	
	Corrosion Protection of Piles	no	12	4,200	50,400	
	Bollard	no	3	6,500	19,500	25 ton Type
Cat Walk		m	95	600	57,000	
Loading Deck W:16m x L:40m	Steel Pipe Pile Works	m	650	585	380,250	D=600mm, t=12mm, L=25m ; Pitch of Piles=5.0 m; 26 piles.
	Corrosion Protection of Piles	no	26	4,200	109,200	
	RC Beams and Slabs	m3	260	1,227	319,020	A: 640 m2 x H 0.4m
Movable Bridge		Unit	1	1,460,000	1,460,000	W: 9.0 m x L: 8.0 m, Wheel Load: T-20; 1 Units.
Trestle (L=80m, W=11m)	Steel Pipe Pile Works	m	900	585	526,500	D=600mm, t=12mm, L=25m ; Pitch of Piles=5.0 m; 36 piles.
	Corrosion Protection of Piles	no	36	4,200	151,200	
	RC Beams and Slabs	m3	360	1,227	441,720	L:1,400m x B:10.0m x H 0.4m
Causeway (L= 40 m)	Filling Works	m3	1,880	22	41,360	Sandy Gravel; 46.9 m3/m
	Rubble Stone (10 - 20kg/unit)	m3	880	71	62,480	22.0 m3/m
	Armour Rock (100-300 kg/unit)	m3	880	71	62,480	21.9 m3/m
	Geotextile	m2	360	9	3,240	9.0 m2/m
	Pavement (Carriage Way)	m2	280	42	11,760	7.0 m2/m
	Pavement (Walk Way)	m2	120	33	3,960	3.0 m2/m
Dredging and Reclamation		m3	10,000	24	240,000	to secure the Turning Basin of vessels (LOA=70m)
Land Filling		m3	27,500	22	605,000	V=0.5*A0*(3.5+0.5)=37,500 m3. Dredged Sand would be provided.
Slope Protection (L=270 m)	Filling Works	m3	4,200	22	92,400	Sandy Gravel
	Rubble Stone (10 - 20kg/unit)	m3	1,900	71	134,900	
	Armour Rock (100-300 kg/unit)	m3	2,600	71	184,600	
	Geotextile	m2	970	9	8,730	
Terminal Building		m2	1,700	1,200	2,040,000	A1
Gate House		LS	1	8,000	8,000	
Pavement (Parking Area)		m2	4,400	42	184,800	A2
Pavement (Passage)		m2	5,500	42	231,000	A3; Width 10.0m
Drainage		m2	9,900	6	59,400	A0= 150 m x 125 m
Landscaping		m2	18,750	3	56,250	A0 - (A1+A2+A3)
Fence		m	550	650	357,500	2 x (150 + 125) *meter.*
Water Supply		m2	1,700	20	34,000	
Electric Power Supply		LS	1	150,000	150,000	
Sewerage System		m2	1,700	10	17,000	
Navigation Aids		Unit	5	12,500	62,500	
Total				(1)	10,440,301	1,000 Rupiah.
Engineering Fee		LS	1	(2)	1,044,030	1,000 Rupiah. 10 % of (1)
Physical Contingency		LS	1	(3)	1,148,433	1,000 Rupiah. 10 % of (1) + (2)
VAT		LS	1	(4)	1,263,276	1,000 Rupiah. 10 % of (1) + (2) + (3)
Grand Total					13,896,040	1,000 Rupiah

Table A8.3.10 Estimation of Construction Cost (Labuhan Bajo)

Terminal	Size of Boat (GRT)	Berth	Building (m2)	Parking (m2)	Design Conditions (Datum Level: LWS)
Labuhan Bajo	max: 1000, min: 500	1	1,700	4,400	HWS:+1.80 m; Bearing Strata: -20 m; Crown Height of Berth: +3.50 m

* Prices In 1,000 Rupiah.

Description		Unit	Quantity	Unit Price	Price	Remarks
Mobilization and Demobilization		LS	1		620,745	7 % of Total of the Direct Construction Cost.
Side Breasting Dolphin	Steel Pipe Pile Works	m	675	894	603,450	D=800mm, t=12mm, L=25m ; 1 Berth x 3 Dolphin x 9 Piles
	Reinforced Concrete	m3	195	1,336	260,520	
	Corrosion Protection of Piles	no	27	6,000	162,000	
	Fender System	unit	9	30,000	270,000	C-6301I, 3 Units x 1 Berth x 3 Dolphin
	Bollard	no	3	6,500	19,500	35 ton Type
Mooring Dolphin	Steel Pipe Pile Works	m	300	689	206,700	D=600mm, t=9mm, L=25m ; 1 Berth x 3 Dolphin x 4 Piles
	Reinforced Concrete	m3	115	1,336	153,640	
	Corrosion Protection of Piles	no	12	4,500	54,000	
	Bollard	no	3	6,500	19,500	25 ton Type
Cat Walk		m	95	660	62,700	
Loading Deck W:16m x L:40m	Steel Pipe Pile Works	m	650	689	447,850	D=600mm, t=12mm, L=25m ; Pitch of Piles=5.0 m; 26 piles.
	Corrosion Protection of Piles	no	26	4,500	117,000	
	RC Beams and Slabs	m3	260	1,336	347,360	A: 640 m2 x H0.4m
Movable Bridge		Unit	1	1,420,000	1,420,000	W: 9.0 m x L: 7.0 m, Wheel Load: T-20; 1 Units.
Causeway (L= 40 m)	Filling Works	m3	1,880	22	41,360	Sandy Gravel; 46.9 m3/m
	Rubble Stone (10 - 20kg/unit)	m3	880	64	56,320	22.0 m3/m
	Armour Rock (100-300 kg/unit)	m3	880	86	75,680	21.9 m3/m
	Geotextile	m2	360	9	3,240	9.0 m2/m
	Pavement (Carriage Way)	m2	280	57	15,960	7.0 m2/m
	Pavement (Walk Way)	m2	120	40	4,800	3.0 m2/m
Land Filling		m3	45,000	22	990,000	V=0.5*[4.0-(-3.0) + (4.0-2.0)]*(50m x 200m)=45,000 m3.
Slope Protection (L=300 m)	Filling Works	m3	3,300	22	72,600	Sandy Gravel
	Rubble Stone (10 - 20kg/unit)	m3	3,300	64	211,200	
	Armour Rock (100-300 kg/unit)	m3	1,400	86	120,400	
	Geotextile	m2	2,300	9	20,700	
Terminal Building		m2	1,700	1,200	2,040,000	A1
Gate House		LS	1	8,000	8,000	
Pavement (Parking Area)		m2	4,400	57	250,800	A2
Pavement (Passage)		m2	5,500	57	313,500	A3; Width 10.0m
Drainage		m2	9,900	6	59,400	A0= (Existing Terminal) +(50 m x 200 m)
Landscaping		m2	8,400	3	25,200	A0 - (A1+A2+A3)
Fence		m	300	700	210,000	2x50 + 200 meter.
Water Supply		m2	1,700	20	34,000	
Electric Power Supply		LS	1	150,000	150,000	
Sewerage System		m2	1,700	12	20,400	
Total				(1)	9,488,525	1,000 Rupiah.

Engineering Fee	LS	1	(2)	948,852	1,000 Rupiah. 10 % of (1)
Physical Contingency	LS	1	(3)	1,043,738	1,000 Rupiah. 10 % of (1) + (2)
VAT	LS	1	(4)	1,148,111	1,000 Rupiah. 10 % of (1) + (2) + (3)
Grand Total				12,629,226	1,000 Rupiah

Table A8.3.11 Estimation of Construction Cost (Manokwari)

Terminal	Size of Boat (GRT)	Berth	Building (m2)	Parking (m2)	Design Conditions (Datum Level: LWS)
Manokwari	max: 1000, min: 500	1	1,700	4,400	HWS: +1.20 m; Bearing Strata: -20 m, Crown Height of Berth: +4.00 m

* Prices in 1,000 Rupiah.

Description		Unit	Quantity	Unit Price	Price	Remarks
Mobilization and Demobilization		LS	1		658,932	7 % of Total of the Direct Construction Cost.
Site Clearance and Grading		m2	28,600	3	86,400	
Side Breasting Dolphin	Steel Pipe Pile Works	m	675	980	661,500	D=800mm, t=12mm, L=25m ; 1 Berth x 3 Dolphin x 9 Piles
	Reinforced Concrete	m3	195	1,531	298,545	
	Corrosion Protection of Piles	no	27	6,200	167,400	
	Fender System	unit	9	32,000	288,000	C-630H, 3 Units x 1 Berth x 3 Dolphin
	Bollard	no	3	6,700	20,100	25 ton Type
Mooring Dolphin	Steel Pipe Pile Works	m	300	753	225,900	D=600mm, t=9mm, L=25m ; 1 Berth x 3 Dolphin x 4 Piles
	Reinforced Concrete	m3	115	1,531	176,065	
	Corrosion Protection of Piles	no	12	4,600	55,200	
	Bollard	no	3	6,700	20,100	25 ton Type
Cat Walk		m	95	840	79,800	
Loading Deck W:16m x L:40m	Steel Pipe Pile Works	m	650	753	489,450	D=600mm, t=12mm, L=25m ; Pitch of Piles=5.0 m; 26 piles.
	Corrosion Protection of Piles	no	26	4,600	119,600	
	RC Beams and Slabs	m3	260	1,531	398,060	A: 640 m2 x H 0.4m
Movable Bridge		Unit	1	1,520,000	1,520,000	W: 9.0 m x L: 9.0 m, Wheel Load: T-20; 1 Units.
Trestle (L=40m, W=11m)	Steel Pipe Pile Works	m	450	753	338,850	D=600mm, t=12mm, L=25m ; Pitch of Piles=5.0 m; 18 piles.
	Corrosion Protection of Piles	no	18	4,600	82,800	
	RC Beams and Slabs	m3	180	1,531	275,580	L:1,400m x B:10.0m x H:0.4m
Causeway (L= 40 m)	Filling Works	m3	1,880	28	52,640	Sandy Gravel; 46.9 m3/m
	Rubble Stone (10 - 20kg/unit)	m3	880	79	69,520	22.0 m3/m
	Armour Rock (100-300 kg/unit	m3	880	86	75,680	21.9 m3/m
	Geotextile	m2	360	9	3,240	9.0 m2/m
	Pavement (Carriage Way)	m2	280	69	19,320	7.0 m2/m
	Pavement (Walk Way)	m2	120	48	5,760	3.0 m2/m
Terminal Building		m2	1,700	1,300	2,210,000	A1
Gate House		LS	1	9,000	9,000	
Pavement (Parking Area)		m2	4,400	69	303,600	A2
Pavement (Passage)		m2	7,000	69	483,000	A3; Width 10.0m
Drainage		m2	11,400	8	91,200	A0= 180 m x 160 m
Landscaping		m2	15,700	3	47,100	A0 - (A1+A2+A3)
Fence		m	680	750	510,000	2 x (180 + 1260) meter.
Water Supply		m2	1,700	24	40,800	
Electric Power Supply		LS	1	250,000	250,000	
Sewerage System		m2	1,700	15	25,500	
Total				(1)	10,158,642	1,000 Rupiah.

Engineering Fee	LS	1	(2)	1,015,864	1,000 Rupiah. 10 % of (1)
Physical Contingency	LS	1	(3)	1,117,451	1,000 Rupiah. 10 % of (1) + (2)
VAT	LS	1	(4)	1,229,196	1,000 Rupiah. 10 % of (1) + (2) + (3)
Grand Total				13,521,152	1,000 Rupiah

Table A8.3.12 Estimation of Construction Cost (Biak)

Terminal	Size of Boat (GRT)	Berth	Building (m2)	Parking (m2)	Design Conditions (Datum Level: LWS)
Biak	max: 1000, min: 500	1	1,700	4,400	HWS:+1.60 m; Bearing Strata: -20 m, Crown Height of Berth: +3.00 m

* Prices in 1,000 Rupiah.

Description		Unit	Quantity	Unit Price	Price	Remarks
Mobilization and Demobilization		LS	1		741,540	8 % of Total of the Direct Construction Cost.
Side Breasting Dolphin	Steel Pipe Pile Works	m	675	952	642,600	D=800mm, t=12mm, L=25m ; 1 Berth x 3 Dolphin x 9 Piles
	Reinforced Concrete	m3	195	1,468	286,260	
	Corrosion Protection of Piles	no	27	6,000	162,000	
	Fender System	unit	9	30,000	270,000	C-630H, 3 Units x 1 Berth x 3 Dolphin
	Bollard	no	3	6,500	19,500	25 ton Type
Mooring Dolphin	Steel Pipe Pile Works	m	300	732	219,600	D=600mm, t=9mm, L=25m ; 1 Berth x 3 Dolphin x 4 Piles
	Reinforced Concrete	m3	115	1,468	168,820	
	Corrosion Protection of Piles	no	12	4,500	54,000	
	Bollard	no	3	6,500	19,500	25 ton Type
Cat Walk		m	95	650	61,750	
Loading Deck W:16m x L:80m	Steel Pipe Pile Works	m	1,300	732	951,600	D=600mm, t=12mm, L=25m ; Pitch of Piles=5.0 m; 52 piles.
	Corrosion Protection of Piles	no	52	4,500	234,000	
	RC Beams and Slabs	m3	520	1,468	763,360	A: 1,280 m2 x H 0.4m
Movable Bridge		Unit	1	1,020,000	1,020,000	W: 9.0 m x L: 6.0 m, Wheel Load. T-20; 1 Units.
Causeway (L= 50 m)	Filling Works	m3	1,600	28	44,800	Sandy Gravel; 31.4 m3/m
	Rubble Stone (10 - 20kg/unit)	m3	710	58	41,180	14.1 m3/m
	Armour Rock (100-300 kg/unit	m3	970	58	56,260	19.4 m3/m
	Geotextile	m2	360	9	3,240	7.2 m2/m
	Pavement (Carriage Way)	m2	350	77	26,950	7.0 m2/m
	Pavement (Walk Way)	m2	150	50	7,500	3.0 m2/m
	Land Filling	m3	24,000	28	672,000	V=0.5*(2.5+1.5)*A0=23,400 m3.
Slope Protection (L=240 m)	Filling Works	m3	3,770	28	105,560	Sandy Gravel
	Rubble Stone (10 - 20kg/unit)	m3	1,700	58	98,600	
	Armour Rock (100-300 kg/unit)	m3	2,330	58	135,140	
	Geotextile	m2	870	9	7,830	
Terminal Building		m2	1,700	1,200	2,040,000	A1
Gate House		LS	1	8,000	8,000	
Pavement (Parking Area)		m2	4,400	77	338,800	A2
Pavement (Passage)		m2	4,000	77	308,000	A3; Width 10.0m
Drainage		m2	8,400	7	58,800	A0= 180 m x 65 m
Landscaping		m2	1,600	3	4,800	A0 - (A1+A2+A3)
Fence		m	330	700	231,000	
Water Supply		m2	1,700	22	37,400	
Electric Power Supply		LS	1	150,000	150,000	
Sewerage System		m2	1,700	12	20,400	
Total				(1)	10,010,790	1,000 Rupiah.

Engineering Fee	LS	1	(2)	1,001,079	1,000 Rupiah. 10 % of (1)
Physical Contingency	LS	1	(3)	1,101,187	1,000 Rupiah. 10 % of (1) + (2)
VAT	LS	1	(4)	1,211,306	1,000 Rupiah. 10 % of (1) + (2) + (3)
Grand Total				13,324,361	1,000 Rupiah

Table A8.3.13 Estimation of Construction Cost (Wahai)

Terminal	Size of Boat (GKT)	Berth	Building (m2)	Parking (m2)	Design Conditions (Datum Level: LWS)
Wahai	max: 1000, min: 500	1	1,400	3,400	HWS:+2.20 m; Bearing Strata: -20 m; Crown Height of Berth: +4.00 m

* Prices in 1,000 Rupiah.

Description		Unit	Quantity	Unit Price	Price	Remarks
Mobilization and Demobilization		LS	1		731,872	7 % of Total of the Direct Construction Cost.
Side Breasting Dolphin	Steel Pipe Pile Works	m	675	894	603,450	D=800mm, t=12mm, L=25m ; 1 Berth x 3 Dolphin x 9 Piles
	Reinforced Concrete	m3	195	1,336	260,520	
	Corrosion Protection of Piles	no	27	6,000	162,000	
	Fender System	unit	9	30,000	270,000	C-630H, 3 Units x 1 Berth x 3 Dolphin
	Bollard	no	3	6,500	19,500	25 ton Type
Mooring Dolphin	Steel Pipe Pile Works	m	300	689	206,700	D=600mm, t=9mm, L=25m ; 1 Berth x 3 Dolphin x 4 Piles
	Reinforced Concrete	m3	115	1,336	153,640	
	Corrosion Protection of Piles	no	12	4,500	54,000	
	Bollard	no	3	6,500	19,500	25 ton Type
Cat Walk		m	95	660	62,700	
Loading Deck W:16m x L:80m	Steel Pipe Pile Works	m	1,300	689	895,700	D=600mm, t=12mm, L=25m ; Pitch of Piles=5.0 m; 52 piles.
	Corrosion Protection of Piles	no	52	4,500	234,000	
	RC Beams and Slabs	m3	520	1,336	694,720	A: 1,280 m2 x H:0.4m
Movable Bridge		Unit	1	1,520,000	1,520,000	W: 9.0 m x L: 9.0 m, Wheel Load: T-20, 1 Units.
Causeway (L= 50 m)	Filling Works	m3	2,350	22	51,700	Sandy Gravel; 46.9 m3/m
	Rubble Stone (10 - 20kg/unit)	m3	1,100	64	70,400	22.0 m3/m
	Armour Rock (100-300 kg/unit	m3	1,100	86	94,600	21.9 m3/m
	Geotextile	m2	450	9	4,050	9.0 m2/m
	Pavement (Carriage Way)	m2	350	57	19,950	7.0 m2/m
	Pavement (Walk Way)	m2	150	40	6,000	3.0 m2/m
Land Filling		m3	66,000	22	1,452,000	Average Depth of Reclamation: 2.5 m; V=2.5*A0=66,000 m3.
Slope Protection (L=220 m)	Filling Works	m3	5,200	22	114,400	Sandy Gravel
	Rubble Stone (10 - 20kg/unit)	m3	2,500	64	160,000	
	Armour Rock (100-300 kg/unit)	m3	2,500	86	215,000	
	Geotextile	m2	990	9	8,910	
Terminal Building		m2	1,400	1,200	1,680,000	A1
Gate House		LS	1	8,000	8,000	
Pavement (Parking Area)		m2	3,400	57	193,800	A2
Pavement (Passage)		m2	6,000	57	342,000	A3; Width 10.0m
Drainage		m2	9,400	6	56,400	A0= 220 m x 120 m
Landscaping		m2	15,600	3	46,800	A0 - (A1+A2+A3)
Fence		m	750	700	525,000	
Access Road		m2	440	57	25,080	L:40m x W:11m
Water Supply		m2	1,400	20	28,000	
Electric Power Supply		LS	1	180,000	180,000	
Sewerage System		m2	1,400	12	16,800	
Total				(1)	11,187,192	1,000 Rupiah.

Engineering Fee	LS	1	(2)	1,118,719	1,000 Rupiah. 10 % of (1)
Physical Contingency	LS	1	(3)	1,230,591	1,000 Rupiah. 10 % of (1) + (2)
VAT	LS	1	(4)	1,353,650	1,000 Rupiah. 10 % of (1) + (2) + (3)
Grand Total				14,890,153	1,000 Rupiah

Table A8.3.14 Estimation of Construction Cost (Babang)

Terminal	Size of Boat (GRT)	Berth	Building (m2)	Parking (m2)	Design Conditions (Datum Level: LWS)
Babang	max: 1000, min: 500	1	1,400	3,400	HWS:+1.20 m; Bearing Strata: -20 m; Crown Height of Berth: +3.00 m

* Prices in 1,000 Rupiah.

Description		Unit	Quantity	Unit Price	Price	Remarks
Mobilization and Demobilization		LS	1		577,529	8 % of Total of the Direct Construction Cost.
Side Breasting Dolphin	Steel Pipe Pile Works	m	675	950	641,250	D=800mm, t=12mm, L=25m ; 1 Berth x 3 Dolphin x 9 Piles
	Reinforced Concrete	m3	195	1,397	272,415	
	Corrosion Protection of Piles	no	27	6,000	162,000	
	Fender System	unit	9	30,000	270,000	C-630H, 3 Units x 1 Berth x 3 Dolphin
	Bollard	no	3	6,500	19,500	25 ton Type
Mooring Dolphin	Steel Pipe Pile Works	m	300	731	219,300	D=600mm, t=9mm, L=25m ; 1 Berth x 3 Dolphin x 4 Piles
	Reinforced Concrete	m3	115	1,397	160,655	
	Corrosion Protection of Piles	no	12	4,500	54,000	
	Bollard	no	3	6,500	19,500	25 ton Type
Cat Walk		m	95	780	74,100	
Loading Deck W:16m x L:50m	Steel Pipe Pile Works	m	800	731	584,800	D=600mm, t=12mm, L=25m ; Pitch of Piles=5.0 m; 32 piles.
	Corrosion Protection of Piles	no	32	4,500	144,000	
	RC Beams and Slabs	m3	320	1,397	447,040	A: 1,280 m2 x H:0.4m
Movable Bridge		Unit	1	1,060,000	1,060,000	W: 9.0 m x L: 5.0 m, Wheel Load: T-20, 1 Units.
Slope Protection (L=160 m)	Filling Works	m3	2,500	28	70,000	Sandy Gravel; 15.7 m3/m
	Rubble Stone (10 - 20kg/unit)	m3	1,200	72	86,400	7.1 m3/m
	Armour Rock (100-300 kg/unit)	m3	1,600	72	115,200	9.7 m3/m
	Geotextile	m2	600	9	5,400	3.6 m3/m
Terminal Building		m2	1,400	1,200	1,680,000	A1
Gate House		LS	1	8,000	8,000	
Pavement (Parking Area)		m2	3,400	53	180,200	A2
Pavement (Passage)		m2	6,000	53	318,000	A3; Width 10.0m
Drainage		m2	9,400	6	56,400	A0=(140 x 140) + 0.5x40x(70 + 140) = 23,800 m2
Landscaping		m2	13,000	3	39,000	A0 - (A1+A2+A3)
Fence		m	440	700	308,000	
Access Road		m2	550	53	29,150	L: 55m x W: 10m
Water Supply		m2	1,400	20	28,000	
Electric Power Supply		LS	1	150,000	150,000	
Sewerage System		m2	1,400	12	16,800	
Total				(1)	7,796,639	1,000 Rupiah.

Description	Unit	Quantity	Unit Price	Price	Remarks
Engineering Fee	LS	1	(2)	779,664	1,000 Rupiah. 10 % of (1)
Physical Contingency	LS	1	(3)	857,630	1,000 Rupiah. 10 % of (1) + (2)
VAT	LS	1	(4)	943,393	1,000 Rupiah. 10 % of (1) + (2) + (3)
Grand Total				10,377,326	1,000 Rupiah

Table A8.3.15 Estimation of Construction Cost (Patani)

Terminal	Size of Boat (GRT)	Berth	Building (m2)	Parking (m2)	Design Conditions (Datum Level: LWS)
Patani	max: 1000, min: 500	1	1,400	3,400	HWS: +1.60 m; Bearing Strata: -20 m; Crown Height of Berth: +3.00 m

* Prices in 1,000 Rupiah.

Description		Unit	Quantity	Unit Price	Price	Remarks
Mobilization and Demobilization		LS	1		728,513	7 % of Total of the Direct Construction Cost.
Site Clearance and Grading		m2	28,800	3	86,400	
Side Breasting Dolphin	Steel Pipe Pile Works	m	675	949	640,575	D=800mm, t=12mm, L=25m ; 1 Berth x 3 Dolphin x 9 Piles
	Reinforced Concrete	m3	195	1,396	272,220	
	Corrosion Protection of Piles	no	27	6,000	162,000	
	Fender System	unit	9	30,000	270,000	C-630H, 3 Units x 1 Berth x 3 Dolphin
	Bollard	no	3	6,500	19,500	25 ton Type
Mooring Dolphin	Steel Pipe Pile Works	m	300	729	218,700	D=600mm, t=9mm, L=25m ; 1 Berth x 3 Dolphin x 4 Piles
	Reinforced Concrete	m3	115	1,396	160,540	
	Corrosion Protection of Piles	no	12	4,500	54,000	
	Bollard	no	3	6,500	19,500	25 ton Type
Cat Walk		m	95	780	74,100	
Loading Deck W:16m x L:50m	Steel Pipe Pile Works	m	800	729	583,200	D=600mm, t=12mm, L=25m ; Pitch of Piles=5.0 m; 32 piles.
	Corrosion Protection of Piles	no	32	4,500	144,000	
	RC Beams and Slabs	m3	320	1,396	446,720	A: 640 m2 x H:0.4m
Movable Bridge		Unit	1	1,130,000	1,130,000	W: 9.0 m x L: 6.0 m, Wheel Load: T-20; 1 Units.
Trestle (L=80m, W=11m)	Steel Pipe Pile Works	m	900	729	656,100	D=600mm, t=12mm, L=25m ; Pitch of Piles=5.0 m; 36 piles.
	Corrosion Protection of Piles	no	36	4,500	162,000	
	RC Beams and Slabs	m3	360	1,396	502,560	L:1,400m x B:10.0m x H:0.4m
Causeway (L= 30 m)	Filling Works	m3	950	28	26,600	Sandy Gravel; 31.4 m3/m
	Rubble Stone (10 - 20kg/unit)	m3	430	65	27,950	14.1 m3/m
	Armour Rock (100-300 kg/unit)	m3	590	65	38,350	19.4 m3/m
	Geotextile	m2	220	9	1,980	7.2 m2/m
	Pavement (Carriage Way)	m2	210	57	11,970	7.0 m2/m
	Pavement (Walk Way)	m2	90	40	3,600	3.0 m2/m
Dredging & Reclamation		m3	15,000	22	330,000	
Land Filling		m3	29,000	28	812,000	Average Depth of Reclamation: 1.5 m; Area 180m x 160m.
Slope Protection (L=260 m)	Filling Works	m3	4,100	28	114,800	
	Rubble Stone (10 - 20kg/unit)	m3	1,900	65	123,500	
	Armour Rock (100-300 kg/unit)	m3	2,600	65	169,000	
	Geotextile	m2	940	9	8,460	
Terminal Building		m2	1,400	1,200	1,680,000	A1
Gate House		LS	1	8,000	8,000	
Pavement (Parking Area)		m2	3,400	57	193,800	A2
Pavement (Passage)		m2	6,500	57	370,500	A3; Width 10.0m
Drainage		m2	9,900	6	59,400	A0= 180 m x 160 m
Landscaping		m2	17,500	3	52,500	A0 - (A1+A2+A3)
Fence		m	680	700	476,000	2 x (180 + 160) meter.
Water Supply		m2	1,400	20	28,000	
Electric Power Supply		LS	1	200,000	200,000	
Sewerage System		m2	1,400	12	16,800	
Navigation Aids		unit	4	13,000	52,000	
Total				(1)	11,135,838	1,000 Rupiah.

Engineering Fee	LS	1	(2)	1,113,584	1,000 Rupiah. 10 % of (1)
Physical Contingency	LS	1	(3)	1,224,942	1,000 Rupiah. 10 % of (1) + (2)
VAT	LS	1	(4)	1,347,436	1,000 Rupiah. 10 % of (1) + (2) + (3)
Grand Total				14,821,800	1,000 Rupiah