Unit waiting area per person = 1.2 m2

Offices, resthouse, etc ; 30 % of above area

The passenger/driver number within the car is ;

Bus	; 3 car x 60 person/car	=	180	person
Private Car	; 8 car x 4 person/car	=	24	person
Truck	; 6 car x 1 person/car	=	6	person
Jeepney	; 49 car x 1 person/car	=	49	person
Total			259	person

Thus the required utility area is ;

259 person x 0.8 x 0.6 x 0.8 x 1.2 m^2/person x 1.3 = 150 m^2

Note: 0.8: Load factor

0.6: Concentrate ratio

0.8: Utilized ratio

4. Waiting Parking Area

Waiting parking area is required to provide the vehicle transport service for non Ro/Ro Passenger. The required area is calculated as follows;

Assumption ; 10 % of total passenger travels on foot.

212 persons are transported by loading bus & private car

(Bus; 3 car x 60 p)+(Private Car; 8 car x 4 p)=212p

Remaining portion of passenger (70%) is transported as follows;

by Bus ; 50 % by Jeepney ; 50 % (each 354 p)

Thus the required parking area is calculated as follows;

Bus	; 354 p / 60 p x 60 m^2 =	354 m^2
Jeepney	; 354 p / 14 p x 25 m^2 =	632 m^2
Total		986 m^2

Thus the necessary parking area is ;

$$986\ m^2 \times 0.8 = 788\ m^2 \doteqdot 800\ m^2$$

$$\begin{pmatrix} \text{Bus} & ; & 4\ \text{lot} \\ \text{Jeepney} & ; & 17\ \text{lot} \end{pmatrix}$$

5. Passenger terminal for waiting person

The required passenger terminal area is calculated with the same equation used for the loading utility area.

$$\text{Passenger Terminal} = (1{,}000\ p - 259\ p) \times 0.8 \times 0.6 \times 1.2\ m^2/p \times 1.3$$
$$= 554\ m^2 = 600\ m^2$$

6. Summary of the Required Area

The summary of the required area is as shown in Table N-2-7-1.1 and Table N-2-7-1.2.

Table N-2-7-1.1 Summary of the Required Terminal Area at Port of Iloilo

Item	Necessary Area
Apron	115 m x 12 m
Parking Area	2,300 m^2
Loading	1,500 m^2
Waiting	800 m^2
Passenger Terminal	600 m^2
Total	2,900 m^2

Source : Jica Study Team

Table N-2-7-1.2 Summary of the Required Terminal Area at Port of Bacolod

Item	Necessary Area
Apron	115 m x 12 m
Loading Parking Area	1,500 m^2 *
Passenger Terminal Waiting Parking Area	600 m^2
	800 m^2
Utilized Area at L.Parking	150 m^2 *
Total * on shore = 1,650 m^2 off shore = 1,400 m^2	

Source : JICA Study Team

Appendix N-2-9-1; Unit Price Analysis

A. Cost Analysis and Estimating Strategies

1. In consideration of the existing labor items in the country, Implementing rule 6727 as amended covering daily wage basis and the minimum wage and salary rates of employees and workers in the private sector is implemented in the cost analysis. Equipment rental rates and terms bases for the construction is based on the accepted rates by Associated Construction Equipment Lessors, Inc (ACEL).

2. Average operating days of equipment is 25 days per month and ordinary daily operation is 8 hours per day.

3. Daily rate for personnel are as follows;

Position	Pay scale(/day)
Laborer	118.00
Mason	124.00
Steelman	124.00
Carpenters	124.00
Gen. Foreman	179.00
Sr. Welder	144.00
Painter	132.00
Driver	132.00
Light Equipment Operator	128.00
Heavy Equipment Operator	139.00
Plumber	131.00
Sr. Plumber	134.00
Dockman Driver	131.00
Sr. Dockman Rigger	131.00
Floating Crane Master	163.00
Crane Operator	139.00
Survey Aide	144.00
Tinsmith	134.00
Electrical helper	124.00

Mechanic helper	124.00
Sr. Field Electrician	139.00
Mechanic II	134.00
Batching Plant Operator	134.00
Vibrator Operator	118.00

5. The proportion being adapted by the DOTC for the local and foreign cost of construction items may be used as follows:

Item	Local	Foreign
Labor	100%	0%
Sand/Stone	70%	30%
Cement	75%	25%
Reinforcing Steel Bars	30%	70%
Steel	20%	80%
Dredging/Reclamation	30%	70%
Navigation Aids	20%	80%
Electrical System	20%	80%
Pavement	65%	35%
Marine Works	30%	70%
Concrete	65%	35%
Rubber Fender	20%	80%
Equipment Utilization	30%	70%

B. Detail computation of major construction items

Detail Computation of major construction work is shown in below.

Table N-2-9-1.1 Detailed Breakdown of Major Construction Work

(Unit in pesos)

Cost Item	Total	Foreign	Local
1.Direct cost	Reinforced Concrete (Class A)		
Material	5,100	2,550	2,550
Equipment	900	630	270
Labor	2,000	0	2,000
total	8,000	3,180	4,820
2.Indirect cost			
Overhead	480	191	289
Profit	800	318	482
total	1,280	509	771
Total of 1 & 2	9,280	3,689	5,591
V.A.T	928	369	559
Ground total	10,208	4,058	6,150
Cost Item	Total	Foreign	Local
1.Direct cost	RC Pile (including driving)		
Material	1,550	775	775
Equipment	900	630	270
Labor	1,050	0	1,050
total	3,500	1,405	2,095
2.Indirect cost			
Overhead	210	84	126
Profit	350	141	210
total	560	225	335
Total of 1 & 2	4,060	1,630	2,430
V.A.T	406	163	243
Ground total	4,466	1,793	2,673
Cost Item	Total	Foreign	Local
1.Direct cost	Rock Work (Armour Rock)		
Material	360	108	252
Equipment	160	112	48
Labor	130	0	130
total	650	220	430
2.Indirect cost			
Overhead	39	13	26
Profit	65	22	43
total	104	35	69
Total of 1 & 2	754	255	499
V.A.T	75	26	50
Ground total	829	281	549
Cost Item	Total	Foreign	Local
1.Direct cost	Reclamation/Dredging		
Material	45	14	32
Equipment	25	18	8
Labor	30	0	30
total	100	31	69
2.Indirect cost			
Overhead	6	2	4
Profit	10	3	7
total	16	5	11
Total of 1 & 2	116	36	80
V.A.T	12	4	8
Ground total	128	40	88
Cost Item	Total	Foreign	Local
1.Direct cost	Pavement		
Material	440	132	308
Equipment	150	105	45
Labor	110	0	110
total	700	237	463
2.Indirect cost			
Overhead	42	14	28
Profit	70	24	46
total	112	38	74
Total of 1 & 2	812	275	537
V.A.T	81	27	54
Ground total	893	302	591

Note 1 : Overhead is 6% of Direct Cost (D.O. No.30 in DPWH)
2 : Profit is 10% of Direct Cost (D.O. No.30 in DPWH)
Source: JICA Study Team

Note A-2-11-1 Estimate of Transport and Handling Cost

1. Ferry Operating Cost

Ferry Operating Cost excluding tax is estimated based on actual operational revenue/expense data of a representative liner vessel.

	1988	1989	1990
	(Unit : Thousand Pesos)		
OPERATING REVENUE			
1) Freight Revenue	2,855	3,727	4,187
2) Passenger Revenue	20,494	24,739	27,281
3) Revenue from Vessel Charter	10	-	-
4) Other Vessel Revenue	2,665	2,979	3,257
Total	26,024	31,445	34,725
VESSEL OPERATING EXPENSES			
1) Fuel	2,871	2,723	3,833
Diesel	931	608	611
Special Fuel Oil	1,940	2,115	3,222
2) Lubricants	638	647	670
3) Vessels Depreciation on Cost	1,093	1,335	652
4) Drydocking, Repairs & Maintenance	1,546	3,816	3,751
5) Salaries and Wages	2,223	3,092	3,536
6) Food and Subsistence	1,171	1,192	1,597
7) Insurance (Protection & Indemnity Premiums)	145	214	242
8) Supplies Used	970	1,086	248
9) Port Charges	251	270	285
10) Charter Hire Expense	-	-	-
11) Employees Benefits	614	772	936
12) Miscellanies	2,079	2,835	3,738
Total	14,368	17,974	19,292
Commissionable Days		346	348
No. of Trips		1,038	1,044
Total NM		24,544	24,686
		(Unit : Peso)	
Ferry Cost/Trip		17,316	18,479
Ferry Cost/NM		732	781

2. Ro/Ro Vessel Operating Cost

Ro/Ro Operating Cost excluding tax is estimated based on actual operational revenue/expense data of an existing vessel with size of 1900 grt.

	1988	1989
	(Unit : Peso)	
OPERATING REVENUE		
1) Freight Revenue	4,798,551	3,883,087
2) Passenger Revenue	9,999,296	7,242,686
3) Revenue from Vessel Charter	0	623,656
4) Other Vessel Revenue	0	0
Total	14,797,847	11,749,429
VESSEL OPERATING EXPENSES		
1) Fuel (Diesel)	4,714,634	3,095,383
2) Lubricants	180,081	252,555
3) Vessels Depreciation on Cost	361,014	384,569
4) Drydocking, Repairs & Maintenance	2,280,000	1,801,424
5) Salaries and Wages	489,636	590,895
6) Food and Subsistence	104,961	115,289
7) Insurance (Protection & Indemnity Premiums)	360,000	575,411
8) Supplies Used	26,429	43,590
9) Port Charges	340,085	329,164
10) Charter Hire Expense	3,723,335	1,923,720
11) Employees Benefits	32,400	53,008
12) Miscellanies	140,890	309,923
Total	12,753,465	9,474,931
Commissionable Days		340
No. of Trips		576
Total NM		18,432
Ro/Ro Cost/Trip		16,450
Ro/Ro Cost/NM		514

3. Land Transport Cost

Land transport cost is estimated by vehicle operating cost (VOC). VOC consists of the following two items, Running Cost which is dependent on distance and Fixed Cost which is dependent on time. Running Cost is defined as the part of vehicle operating costs which vary directly with the number of kilometers operated according to the Highway Planning Manual Volume 4, MPWH, Oct.1982. Fixed Cost is defined as the part of the vehicle operating costs which vary directly with operating time (running + waiting time).

i) Running Cost (₱/km)

a. Fuel Cost
b. Oil Cost
c. Tires
d. Maintenance
e. Distance Related Depreciation

ii) Fixed Cost (₱/min)

f. Time Related Depreciation Cost
g. Opportunity Cost
h. Crew Cost
i. Overhead/Licenses/Fees
j. Insurance Costs

The breakdown for the estimation of VOC is shown in Table N-2-11-1.2 and Table N-2-11-1.3 by vehicle type using prevailing prices in Region IV.

$$\text{(Land Transport Cost)} = \sum_i \{ (\text{km}) \times Vri + (\text{time}) \times Vfi \}$$

where,

Vri : Running Cost Unit of Vehicle type i
Vfi : Fixed Cost Unit of Vehicle type i

Table N-2-11-1.1 Summary of Vehicle Operating Cost in Region IV

Vehicle Type	Running Cost (₱/km)	Fixed Cost (₱/min)
Light Car	2.858	0.141
Jeepney	1.637	0.413
Large Bus	4.055	0.829
Truck (2-ax)	6.705	1.045
Truck (3-ax)	9.689	1.405

Source: JICA Study Team based on JICA Field Survey

Table N-2-11-1.2 Breakdown of Basic Vehicle Operating Costs: Economic Costs (Running Cost)

			Large	Trucks (2-ax)	Trucks (3-ax)
Fuel Cost	Light Car	Jeepney	Bus	tons:12	tons:24 up
Fuel Type	Premium Gasoline	Diesel	Diesel	Diesel	Diesel
Fuel Consumption (liters/km)	0.10	0.09	0.25	0.33	0.4
Fuel Price (excluding Tax)	6.10	6.00	6.00	6.00	6.00
+ Fuel Cost/km	0.61	0.55	1.50	2.00	2.40
Oil Cost					
Oil Type	Special	Regular	Regular	Regular	Regular
Oil Consumption (1000/km)	0.70	0.90	3.00	3.50	4.00
Oil Price (excluding Tax)	33.00	29.00	29.00	29.00	29.00
+ Oil Cost (1000/km)	23.10	26.10	87.12	101.50	116.00
or Oil Cost/km	0.02	0.03	0.09	0.10	0.12
Tires					
Tire Life (kms)	35,000	54,000	81,000	81,000	81,000
Tire Prices	6,018	4,610	24,274	36,411	70,143
Recapping Price	none	1,637	7,282	10,923	21,043
+ Tire Cost/km	0.17	0.12	0.39	0.58	1.13
Maintenance					
Cost of Vehicle	297,500	219,620	836,000	1,528,360	2,359,800
Annual Operating Distance (kms)	12,000	60,000	80,000	50,000	50,000
Spare Parts/yr.	0.025	0.10	0.08	0.07	0.07
Parts Price	7,438	21,962	66,880	106,985	165,186
+ Parts Cost (excluding tax)/km	0.62	0.3660	0.84	2.14	3.30
Labor Hours	60	200	300	300	300
Labor Price /hr.	43.83	43.83	43.83	43.83	43.83
+ Labor Cost/km	0.22	0.15	0.16	0.26	0.26
Distance Related Depreciation					
Life Time kilometer	120,000	420,000	640,000	600,000	600,000
Price	291,482	215,010	811,726	1,491,949	2,289,657
Km.-dependent share	0.50	0.85	0.85	0.65	0.65
+ Distance Related Depreciation Cost/km	1.21	0.44	1.08	1.62	2.48
Total Running Cost/km	2.858	1.637	4.055	6.705	9.689

Note: All those with + signs are added together to arrive at the Total Running Cost/km

Source: JICA Study Team based on JICA Field Survey

Table N-2-11-1.3 Breakdown of Basic Vehicle Operating Costs: Economic Costs (Fixed Cost)

Time Related Depreciation Cost	Commercial Light Car	Jeepney	Bus	Truck (2)	Truck (3)
Price: Pesos	297,500	219,620	836,000	1,528,360	2,359,800
Time dependent share	0.50	0.15	0.15	0.35	0.35
Vehicle Life: Years	10	7	8	12	12
Annual Operating Time: Hours	2,000	3,000	3,000	3,000	3,000
+ Cost: Pesos/Hour	7.44	1.57	5.23	14.86	22.94
Opportunity Cost					
Price: Pesos	297,500	219,620	836,000	1,528,360	2,359,800
Annual Operating Time: Hours	2,000	3,000	3,000	3,000	3,000
Marginal % Opportunity Cost of Capital	0.15	0.15	0.15	0.15	0.15
+ Cost: Pesos/Hour	11.16	5.49	20.90	38.21	59.00
Crew Cost					
+ Wage w/ 13th month: Pesos/Hour	-	14.32	28.64	14.28	14.28
Overhead/ Licenses/Fees					
+ Overhead	-	5.70	15.20	15.20	15.20
+ Licenses/Fees	0.60	0.11	0.75	0.95	0.95
Insurance Costs					
+ Cost: Pesos/Hour	9.00	0.33	0.33	0.07	0.07
Sum of Fixed Costs:Pesos/min	0.470	0.459	1.184	1.393	1.874
Basic Fixed Cost Reduction					
x Comm'l use factor	0.30	1.00	1.00	1.00	1.00
x Fleet reduction factor	1.00	0.90	0.70	0.75	0.75
Total Fixed Cost :Pesos/Min.	0.141	0.413	0.829	1.045	1.405

Note: All those with + signs are added together and those with x are multiplied together to arrive at the Total Fixed Cost

Source: JICA Study Team based on JICA Field Survey

4. EIRR Calculation

Base Case EIRR = 18.4%

Table N-2-11-1.4 Cost-Benefit Analysis

(Unit:Million Pesos)

Year	(C) Cost	(B) Benefit	(B)-(C)	NPV at 15%	NPV at EIRR
1993	-	-	-	-	-
1994	17.88	-	-17.88	-13.52	-12.76
1995	179.27	-	-179.27	-117.87	-108.06
1996	46.45	-	-46.45	-26.56	-23.65
1997	2.51	37.17	34.66	17.23	14.91
1998	2.51	39.23	36.72	15.88	13.34
1999	2.51	44.43	41.92	15.76	12.87
2000	2.51	47.59	45.08	14.74	11.69
2001	2.51	50.01	47.50	13.50	10.40
2002	2.51	55.95	53.44	13.21	9.89
2003	2.51	58.65	56.14	12.07	8.77
2004	2.51	62.55	60.04	11.22	7.93
2005	2.51	65.66	63.15	10.26	7.04
2006	2.51	69.06	66.55	9.41	6.27
2007	2.51	72.42	69.91	8.59	5.56
2008	2.51	76.23	73.72	7.88	4.96
2009	2.51	77.92	75.41	7.01	4.28
2010	2.51	79.75	77.24	6.24	3.71
2011	2.51	81.72	79.21	5.57	3.21
2012	2.51	83.87	81.36	4.97	2.79
2013	2.51	87.25	84.74	4.50	2.45
2014	2.51	89.21	86.70	4.01	2.12
2015	2.51	91.89	89.38	3.59	1.84
2016	2.51	94.85	92.34	3.23	1.61
2017	2.51	98.86	96.35	2.93	1.42
2018	2.51	102.38	99.87	2.64	1.24
2019	2.51	106.27	103.76	2.38	1.09
2020	2.51	109.61	107.10	2.14	0.95
2021	2.51	114.86	112.35	1.95	0.84
2022	2.51	120.63	118.12	1.78	0.75
2023	2.51	129.56	127.05	1.67	0.68
2024	2.51	141.88	139.37	1.59	0.63
2025	2.51	141.88	139.37	1.38	0.53
2026	-113.36	141.88	255.24	2.20	0.82
Total	203.03	2573.22	2370.19	51.58	0.12

Note: NPV - Net Present Value

Source: JICA Study Team