CHAPTER 7 IMPACT OF PORT TRAFFIC ON URBAN ROAD SYSTEM

7.1 General

Three approaches were used in the impact survey of port traffic on the urban road system. The first was an O/D survey of port traffic at Metro Manila boundary, the second was port user's preference survey and the third was analysis of port traffic impact on urban road system.

Traffic volume related port cargo and port passenger will increase correspond to the development of port. The port development plan should be evaluated in terms of traffic impact on urban road system by the port related vehicles.

A development plan of general road of Metro Manila in the year 2010 was planned by DPWH. And JICA study team presented the elevated highway plan in the year 2010. In this port study, port related traffic is applied to both general road and highway system.

7.2 O/D Survey of Port Traffic

7.2.1 Survey Objective

The objective of the surveys conducted at Metro Manila boundary is to determine the level of cargo vehicle traffic and the characteristics of cargo movement.

7.2.2 Survey Method

(1) Vehicle Traffic Count Survey

A two-day traffic count was conducted at each survey station on a two-shift basis considering the truck-ban schedule from 4:00a.m. - 9:00 a.m. and from 5:00 p.m - 9:00 p.m.. Therefore, the first shift was from 9:00 a.m. - 5:00 p.m. and the second shift from 9:00 p.m. - 4:00 a.m.. The surveys were conducted from November 17-19, 22-24, 1993.

An hourly recording of vehicles passing the cordonline per direction was imposed. Sampling rate is 100%. The survey form used is shown in Appendix B-1. Number of cargo vehicles was counted by type at each station.

(2) Cargo/Vehicle Origin/Destination Interview Survey

With the assistance of traffic aides and highway policemen, cargo trucks, chosen at random, were signaled to pull over, allowing the interviewers to approach the driver and do the interview.

This survey was also conducted for two days with the same time schedule as that of the vehicle traffic count. The survey form used is shown in Appendix B-2. Interviewing items are volume and O/D.

(3) Survey Coverage

The areas covered by the surveys at the cordonline are shown in Figure 7-1. These are Susana Heights (EX03), Malinta-Meycauayan boundary (EX01), and MacArthur Highway (CH04)

7.2.3 Results of Survey

(1) Results of Traffic Count Survey

Appendices B-3, B-4 and B-5 give the volume of cargo vehicles counted at Susana Heights, McArthur Highways, and North Diversion Road, respectively. The results of the counts are presented per day/per direction for each survey station. To visualize the total volume of cargo vehicles, graphs are presented in Figures 7-2, 7-3 and 7-4 showing the hourly distribution per direction.

Graphs are also presented for the hourly fluctuation of trucks (2-and 3-axle), dump trucks, trailers (with and without container), and tank/lorry, per direction, as shown in Appendices B-6, B-7 and B-8.

(2) Results of Cargo/Vehicle Origin/Destination Survey

1) Sampling Rate

The O/D sampling rates are 10% at Susana Heights, 10% at Malinta-Myecauayan boundary and 21% at McArthur Highway, respectively. These are shown on Table 7-1.

2) Vehicle Volume O/D

Out of the 3,407 cargo vehicles counted at Susana Heights, major originating areas are Laguna (24.3%), Muntinlupa (11.3%), Manila (7.5%), and Batangas (7.2%). On the other hand, almost one-third of cargo vehicles' destination is Laguna (32.3%) (See Appendix B-9). Destinations of port traffic are towards the south (Laguna, Cavite, and Batangas).

The vehicle volume of 1,269 at the McArthur Highway point to Bulacan as the main origin (47.7%) and destination point (44.4%), followed by Valenzuela. Port traffic is also directed towards Bulacan (See Appendix B-10).

As is the case with McArthur Highway, of the 3,330 cargo vehicles counted, Bulacan is the major origin/destination point of cargo vehicles at 20.5% and 22.3%, respectively. Other generating/attracting areas are Pampanga, Quezon City, and Valenzuela. Traffic from North and South Harbors is destined for Bulacan (See Appendix B-11). Table 7-2 present port traffic by survey station.

3) Commodity Volume O/D

Total volume of commodities at Susana Heights is 18,990 tons. High commodity traffic is from Laguna (19.4%), Muntinlupa (9.0%), Manila (8.4%), and Batangas (7.3%) to Laguna (36.7%), Muntinlupa (11.1%), Batangas (8.0%), and Cavite (5.6%), as shown in Appendix B-12. Commodity traffic from/to the ports was significant.

Of the total 3,979 tons recorded at McArthur Highway, the volumes of commodities from Bulacan (54.3%) and Valenzuela (16.7) rank highest and the same is true for destination points, as shown in Appendix B-13. A relatively large volume of commodities was recorded coming form North harbor to Bulacan.

Appendix B-14 presents the commodity traffic recorded at North Diversion Road (18,126 tons), which is heaviest to/from Pampanga, Bulacan, Manila, Quezon City and Valenzuela.

4) Commodity Breakdown by Packing Type

Commodity breakdown by packing type is shown in Table 7-3.

7.2.4 Findings on Port Traffic Survey

(1) Characteristics of Hinterland

Table 7-4 shows cargo volumes related to the port. Regarding the port cargoes, both number of truck and volume of cargo from/to Susana Heights have larger ratios than those from/to northern boundary. On the other hand, factories located in northern Manila are estimated to generate goods consumed or processed in Metro Manila.

(2) Truck-Ban

Figures 7-2 to 7-4 show that traffic volume at North Diversion Road is evenly leveled distributed over the whole day compared to Susana Heights and McArthur Highway. Also these figures indicate that the volume of cargoes passing in the night could be increased. So, truck-ban is still an effective regulation for valuable use of the

urban traffic road.

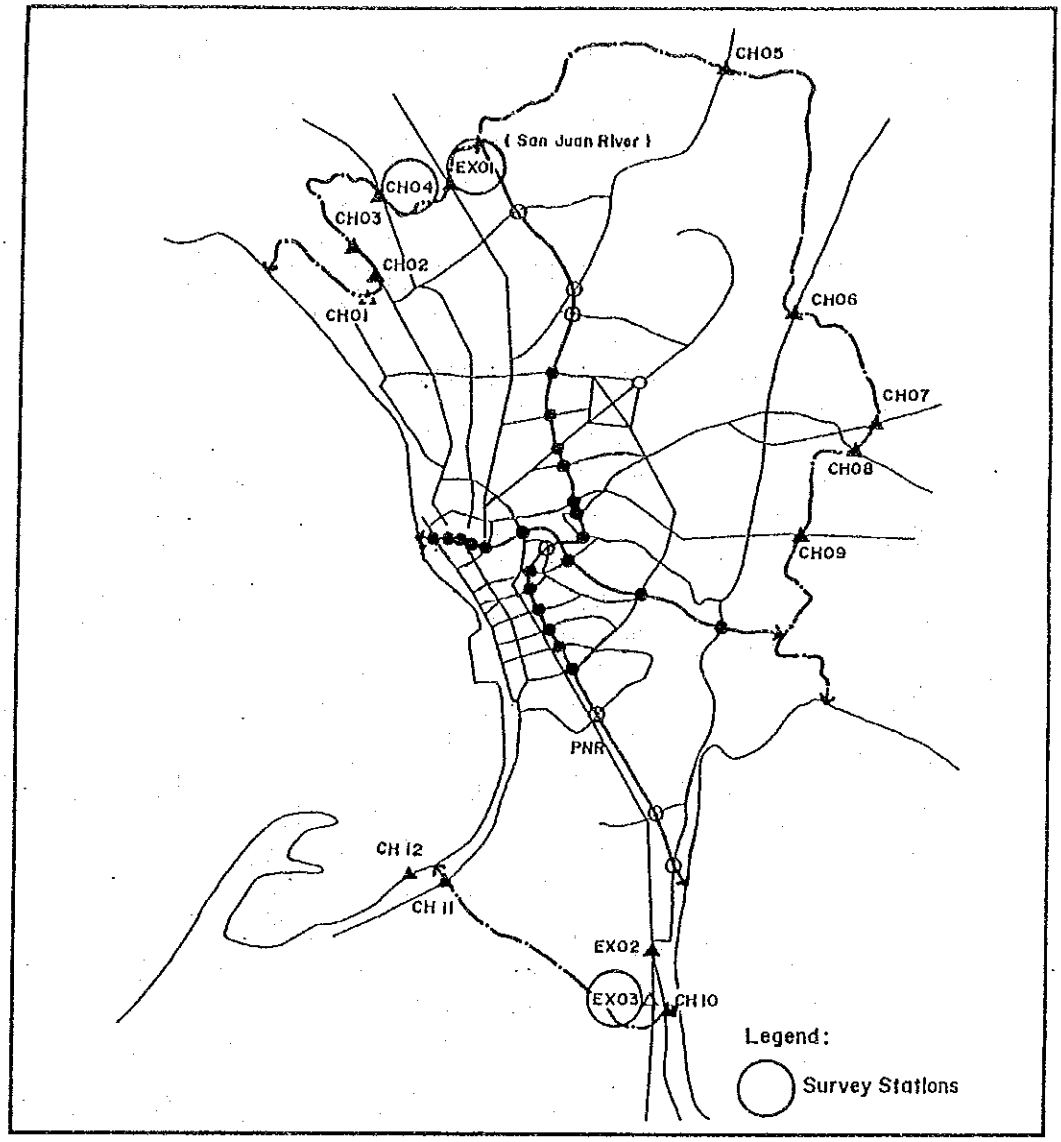


Figure 7-1 Survey Stations

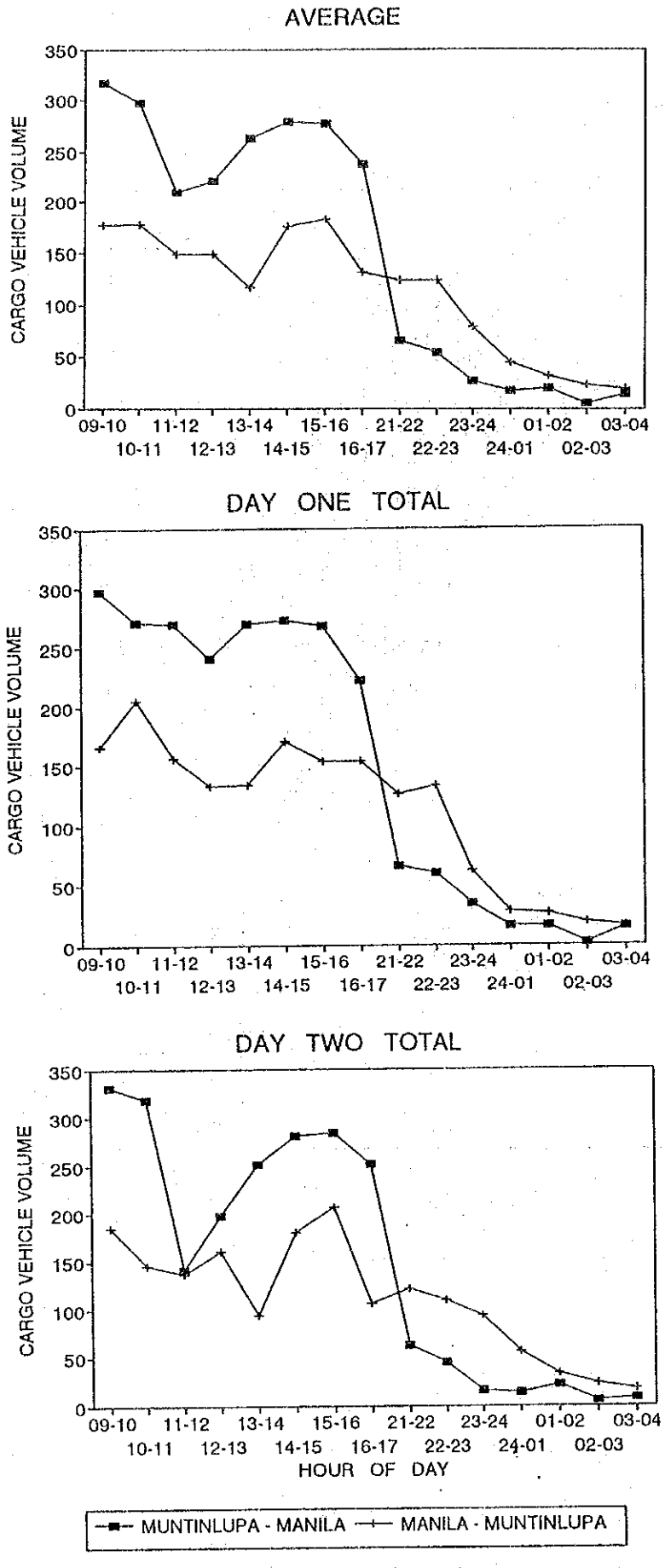


Figure 7-2(1) Hourly Distribution of Total Cargo Vehicle Volume by Direction, Susana Heights Station

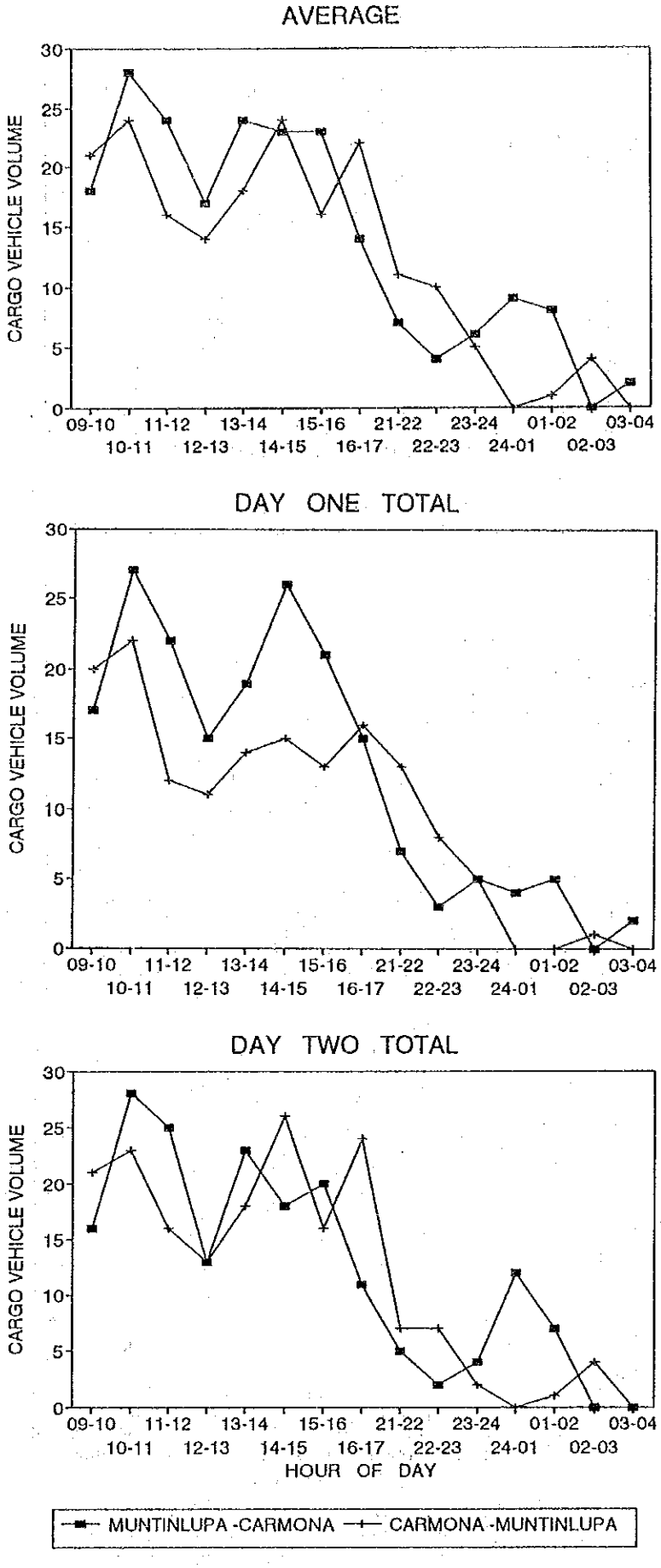

AVERAGE
CARGO VEHICLE VOLUME
30
25
20
15
10
5
0
09-10
10-11
11-12
12-13
13-14
14-15
15-16
16-17
21-22
22-23
23-24
24-01
01-02
02-03
03-04
DAY ONE TOTAL
CARGO VEHICLE VOLUME
DAY TWO TOTAL
CARGO VEHICLE VOLUME
HOUR OF DAY
MUNTINLUPA -CARMONA
CARMONA -MUNTINLUPA

Figure 7-2(2)

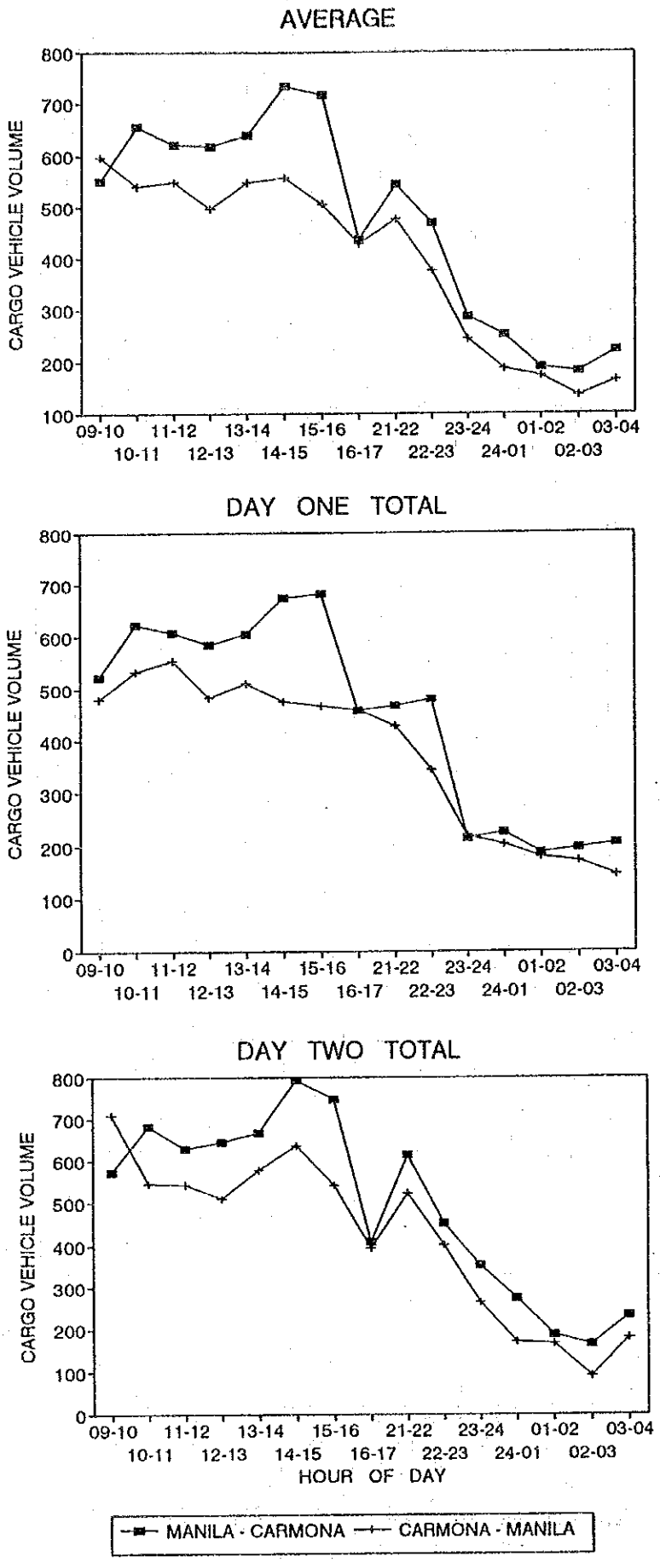

AVERAGE
CARGO VEHICLE VOLUME
800
700
600
500
400
300
200
100
09-10 11-12 13-14 15-16 21-22 23-24 01-02 03-04
10-11 12-13 14-15 16-17 22-23 24-01 02-03
DAY ONE TOTAL
CARGO VEHICLE VOLUME
800
700
600
500
400
300
200
100
0
09-10 11-12 13-14 15-16 21-22 23-24 01-02 03-04
10-11 12-13 14-15 16-17 22-23 24-01 02-03
DAY TWO TOTAL
CARGO VEHICLE VOLUME
800
700
600
500
400
300
200
100
0
09-10 11-12 13-14 15-16 21-22 23-24 01-02 03-04
10-11 12-13 14-15 16-17 22-23 24-01 02-03
HOUR OF DAY
MANILA - CARMONA
CARMONA - MANILA

Figure 7-2(3)

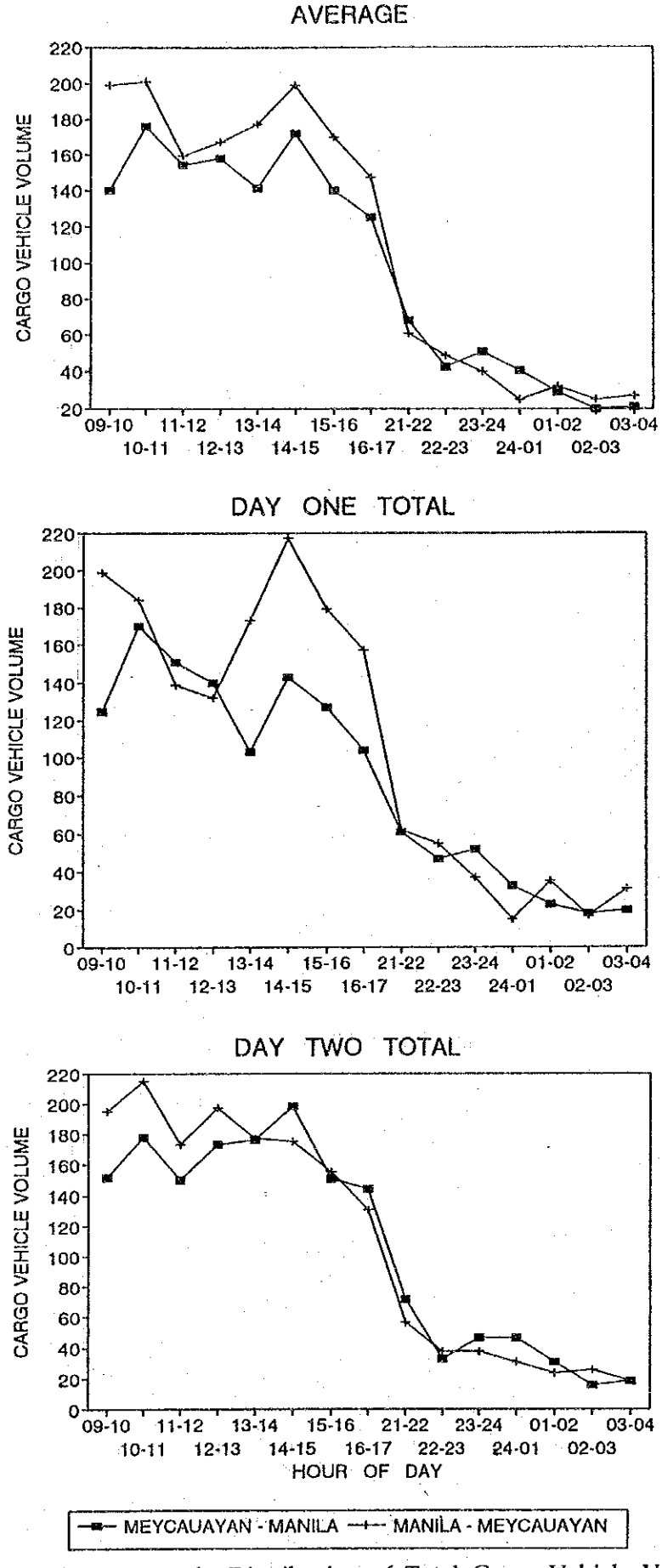


Figure 7-3 Hourly Distribution of Total Cargo Vehicle Volume by Direction, McArthur Highway Station

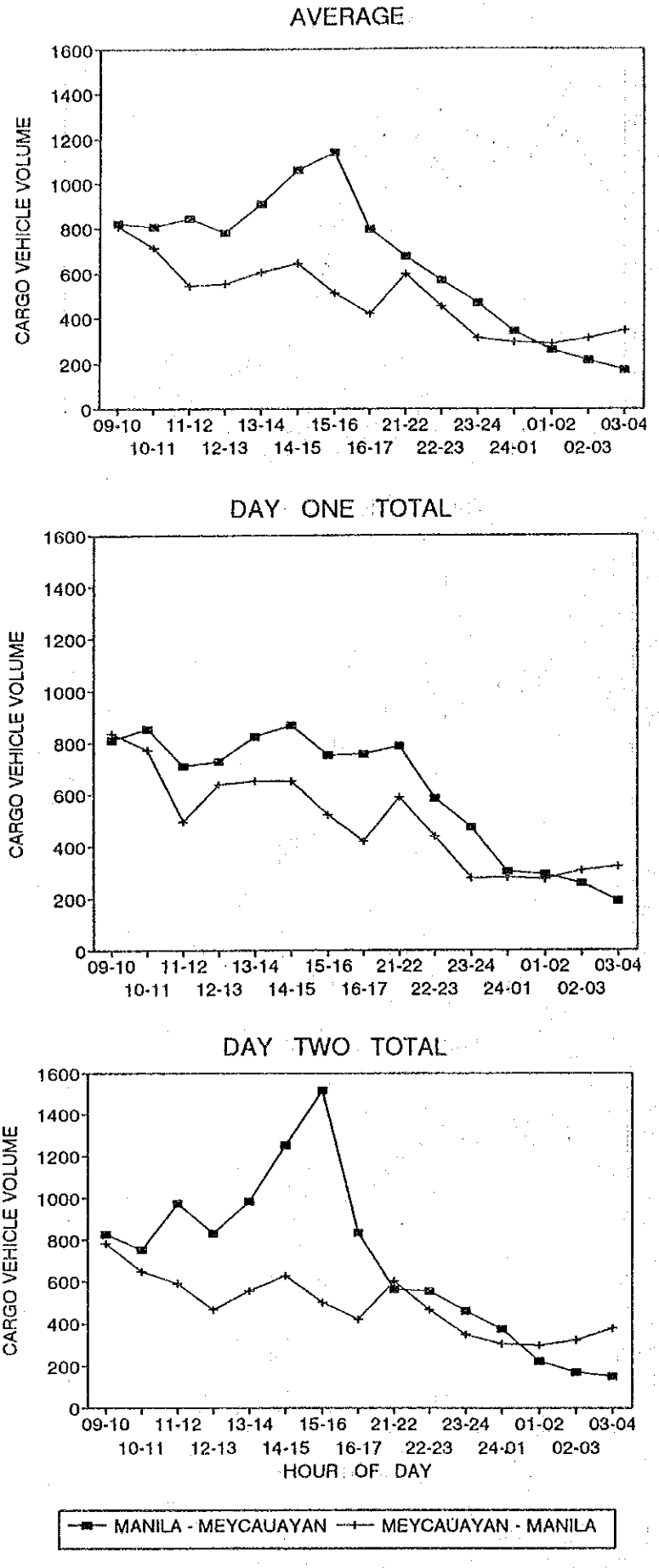


Figure 7-4 Hourly Distribution of Total Cargo Vehicle Volume by Direction, North Diversion Road Station

Table 7-1 O/D Sampling Rate

	O/D Interview	Traffic Count	Ratio of Interview
Total			
South Superhighway	3,407	34,662	10%
North Diversion	3,330	34,456	10%
McArthur Highway	1,269	6,187	21%
Trailer (With Container & Head only)			
South Superhighway	414	1,645	25%
North Diversion	191	1,611	12%
McArthur Highway	53	121	44%
Truck			
South Superhighway	1,378	6,653	21%
North Diversion	1,583	8,784	18%
McArthur Highway	449	1,249	36%

Table 7-2 Port Traffic by Station Number of Interviewed Vehicle

Port	South S/H/W	McArther H/W	North Div.	Total
North Harbor				
From	74	18	32	124
To	64	13	17	94
MICT				
From	20	2	5	27
To	17	2	2	21
South Harbor				
From	57	6	73	136
To	20	11	6	37
Total of Port Related Vehicle	252	52	135	439
Total of Interviewed Vehicle	3,407	1,269	3,330	8,006

Table 7-3 Cargo Traffic by Station Number of Vehicle by Packing Type

Packing Type	South S/H/W	McArther H/W	North Div.	Total
Container	185	9	32	226
Non-Container	3,222	1,260	3,298	7,780
Total	3,407	1,269	3,330	8,006

Table 7-4 Port Traffic by Station Cargo Volume

(unit:ton)

Port	South S/H/W	McArther H/W	North Div.	Total
North Harbor				
From	815	140	283	1,238
To	570	84	159	813
MICT				
From	293	0	65	358
To	141	0	28	169
South Harbor				
From	644	45	927	1,616
To	92	78	39	169
Total of Port Related Cargo	2,555	347	1,501	4,403
Total of Cargo by Interviewed Vehicle	18,900	3,979	18,126	41,095

7.3 Survey of Port User's Preference

7.3.1 Survey Objective

The company survey aims primarily to identify the conditions and requirements for the improvement of existing port facilities or the construction of a new port, and their accessibilities. This would be based on the views of respondents concerning problems presently encountered as well as the probable utilization of ports outside Metro Manila.

7.3.2 Survey Method

(1) Survey Preparation

For the Company Survey, a list of top corporations, either existing or potential port users and some shipping firms were drawn up. Letters were prepared addressed to the president or general manager of the firm.

(2) Company Interview Survey

Questionnaires, with accompanying explanations of the survey items, were handcarried to sampled companies, with the exception of four which were sent via courier service to shipping firms with provincial head offices. Only 50 (42%) out of the 120 companies answered the questionnaires.

(3) Survey Coverage

Majority of the companies surveyed is located within Metro Manila, some with main offices located outside Metro Manila. A list of the 120 companies which were sent questionnaires (See Appendix b-15) is shown in Appendix B-16.

7.3.3 Survey Results

(1) Goods Handled

The respondent companies are engaged in varying types of businesses. Table 7-5 gives an idea of the kinds and volume of goods being transported by these companies.

(2) Assessment of Goods Transportation

Table 7-6 presents the assessment of goods transportation. In general, respondents consider traffic congestion (66%) as the item which causes the most headaches, followed

by handling method (62%), and the truck ban (62%). Respondents consider customs clearance (46%) and handling charge (44%) as the least of their problems.

Appendices B-17 and B-18 present the reasons for the corporations' and shipping companies' assessments.

The survey results also show that the critical areas where immediate improvement is imperative are the problems of traffic congestion and the present condition of road facilities.

(3) Use of Batangas and Subic Ports

Top corporations and shipping companies were also asked about the possibility of their using Batangas and Subic if they were to have the same function as the MICT.

About 4% and 40% answered to "total" and "partial" usage, respectively, of the Batangas port, while 44% answered in the negative. Those who answered that they will use Batangas port, however, have domestic operation in mind, say, for distribution to the Calabarzon area, the presence of warehouses or plants in the area, for domestic shipping, etc.

For Subic Bay, about 4% and 32% answered to "total" and "partial" usage, respectively. Fifty -two percent (52%) answered that they will not use it. Reasons for using Subic Port, in general, also point to domestic operation.

Table 7-7 presents the responses of those surveyed on whether they would use Batangas and Subic Ports, while Tables 7-8 and 7-9 state the reasons why some would consider using Batangas and Subic Ports.

(4) Improvement of Existing Ports or Construction of a New Port

Majority of those who answered would rather have the existing ports of Manila improved (66%). About 14% and 6%, respectively, would like to have Batangas Port and Subic Port improved. Twenty four percent (24%) answered that they would like to have a new port built outside Metro Manila, say at Cavite (See Table 7-10).

(5) Ownership/Rental of a Storage Area along the Pasig River

About ten percent (10%) answered that they either own or rent a storage area along the Pasig River.

7.3.4 Findings on Port User's Preference Survey

Following recommendations for port development are preferred by port users.

(1) Improvement of port function in GCR is necessary in the near future.

(2) Traffic congestion shall be relieved by implementing the urban road development plan.

Table 7-5-1(1) Types and Volume of Goods Transported (Average Volume/Year)

COMPANY	INCOMING		OUTGOING	
	QUANTITY	UNIT	QUANTITY	UNIT
1.	-	-	-	-
2.	-	-	-	-
3.	156 184	20/40 CONTAINERS BAGS/CARTONS	416 10,000	20/40 CONTAINERS CARTONS
4.	50	TONS	-	-
5.	370,000	TONS	-	-
6.	22,170 248,310	UNITS SETS	112,320 1,018,080	UNITS PIECES
7.	1 3,650	KILO TONS CUBIC METERS	24	KILO TONS
8.	4,125,000	BAGS	-	-
9.	500	KILO TONS	-	-
10.	31,040 3 2	PIECES UNITS SETS	20,850 10	PIECES UNITS
11.	2,317,200	PIECES	2,37,200	PIECES
12.	46,900 2,050	METRIC TONS DMTs	53,150	METRIC TONS
13.	166,420,388 68,900 540,800 1,528 340 320 1,096	CASES METRIC TONS HEADS TEUs PALLETS DRUMS CARTONS	70,044 75	CASES TONS
14.	200	KILO TONS	279,500	SETS
15.	-	-	-	-
16.	155,120 18,000	METRIC TONS PIECES	18,000,000	BAGS
17.	2,373	TONS	-	-
18.	-	-	-	-
19.	7,886 41,000,000	METRIC TONS PIECES	1,668	METRIC TONS
20.	85,000	CASES	15,000	CASES
21.	23,877	UNITS	575	UNITS
22.	- - - -	- - - -	100 1,200 1,500 1,100	BUNDLES CARTONS REAMS ROLLS
23.	-	-	-	-
24.	-	-	-	-

Table 7-5-1(2) Types and Volume of Goods Transported (Average Volume/Year)

COMPANY	INCOMING		OUTGOING	
	QUANTITY	UNIT	QUANTITY	UNIT
25.	60 500,000	TONs METRIC TONS	90	TONs
26.	-	-	14,300	TONs
27.	36	TEUs	2,040	TEUs
28.	970 162,221	UNITS PIECES	10	UNITS
29.	312,008 362,200	METRIC TONS KILO TONS	7,650 -	CASES -
30.	164,150	METRIC TONS		
31.	-	-	-	-
32.	99,095	TONS		-
33.	525,000	METRIC TONS		
34.	-	-	-	-
35.	-	-	480	
36.	102,440	METRIC TONS	40,500	
37.	24,454 - -	CUBIC METERS - -	2,127 950 12,000	CUBIC METERS TONS CARTONS
38.	15,000,000	LITERS	-	-
39.	64,476 6	METRIC TONS PIECES	4,400	METRIC TONS
40.	1,200	METRIC TONS	-	-
41.	52,790	TEUs	11,992	TEUs
42.	1,200 6,180	VANS HERDS	121,904	METRIC TONS
43.	436,800 43,200	CUBIC METERS TONS	- -	- -
44.	3,408	TEUs	4,670	TEUs
45.	1,896	MILLION KILO	-	-
46.	286,159 68,050 5,581 11,605	BOARD FEET BAGS CRATES METRIC TONS	113,014 296,881 60 14,698 25	BOARD FEET BAGS CRATES METRIC TONS CUBIC METERS
47.	11,800 364,000	TONS CASES	- -	- -
48.	255,068	CUBIC METERS	280,574	CUBIC METERS
49.	1,050,703	METRIC TONS	1,050,703	METRIC TONS
50.	38,454	PIECES	9,063	PIECES

Table 7-6 Assessment of Goods Transportation

(%)

Particulars	Serious Problem	Poses a Problem	Not a Problem	No Answer	Total
1 Cargo Handling at Port					
1) Handling Time	10(20.0)	16(32.0)	19(38.0)	5(10.0)	50(100.0)
2) Handling Method	13(26.0)	18(36.0)	14(28.0)	5(10.0)	50(100.0)
3) Handling Charge	1(2.0)	18(36.0)	22(44.0)	9(18.0)	50(100.0)
4) Cargo Loading/Unloading To/From Land Transport	6(12.0)	22(44.0)	17(34.0)	5(10.0)	50(100.0)
5) Customs Clearance	4(8.0)	10(20.0)	23(46.0)	13(26.0)	50(100.0)
6) Storage at Port	10(40.0)	13(26.0)	13(26.0)	14(28.0)	50(100.0)
2 Transport in the Hinterland					
1) Traffic Congestion	20(40.0)	13(26.0)	4(8.0)	12(26.0)	50(100.0)
2) Road facilities	12(24.0)	16(32.0)	6(12.0)	16(32.0)	50(100.0)
3) Truck Ban	12(24.0)	19(38.0)	5(10.0)	14(28.0)	50(100.0)

Table 7-7 Responses to the Use of Batangas and Subic Port by Company

COMPANIES	WILL USE BATANGAS PORT			WILL USE SUBIC PORT		
	YES TOTALLY	YES PARTLY	NO	YES TOTALLY	YES PARTLY	NO
TOTAL	2	20	22	2	16	26

Table 7-8

Reasons Why Some Companies Would Consider Use of Batangas Port

COMPANIES	REASONS
1)	Our plant is near Batangas. We can use it for shipment to VIS/MIN.
2)	MICT is very congested. We need an alternative port as Manila port problem is far from being corrected.
3)	Proximity and less traffic problem with the use of the SSH route.
4)	For shipments to our Calaca coal-fired power plant.
5)	For delivery of bulk cargoes to Sta. Rosa, San Pablo, Calauan in order to lessen cost of delivery and time.
6)	We have a warehouse in Cabuyao, Laguna which is nearer from Batangas port.
7)	For plats located in CALABARZON.
8)	If "red tape" is minimized vis-a-vis MICT.
9)	Because we have customers in Batangas.
10)	Our San Pablo distributor may use it to transport goods to the Mindoro area.
11)	If it is open to domestic shipping.
12)	To decongest Manila ports.
13)	New and wide road network is being built in the CALABARZON area and if Batangas port would be built around modern port infrastructure with state of the art equipment, then our company would not hesitate to use it.
14)	Manila port is already congested and trafficked along the way.
15)	Proximity between the port and our plants.
16)	Because we have heavy operations at Batangas and other nearby provinces like Laguna and Quezon.
17)	It will also be very useful on the assumption that it will have the same function in terms of operation and time.
18)	As and alternative port to Manila North Harbor.

Table 7-9

Reasons Why Some Companies Would

Consider Use of Subic Port

COMPANIES	REASONS
1)	Some of our export shipment could be feedered to Subic. This would depend on the carrying lines if they call at Subic.
2)	Transhipment from Batangas to Subic, if freight truck handling (FTH) is reasonable.
3)	Excellent facilities.
4)	This can be another alternative Port outside M.M.
5)	For shipment to our power plant under construction.
6)	If conditions and facilities at Subic are much better.
7)	If "red tape" is minimized.
8)	For plants located in the northern corridor.
9)	It is an area for business expansion.
10)	If it is open to domestic shipping.
11)	To decongest Manila ports.
12)	Our company would surely look at Subic as a new additional area for operations encompassing northern Luzon, the central plain of Luzon, the northern part of Metro Manila and the free-port zone of Subic and Clark.
13)	All things being equal, this will be very useful except that additional costs will have to be incurred due to the transfer of equipment from Manila to Subic (if consignee is Manila).

Table 7-10

Preference of Companies as to

Improvement or Construction of Ports

COMPANIES	IMPROVE EXISTING MANILA PORT	IMPROVE BATANGAS PORT	IMPROVE SUBIC PORT	CONSTRUCT ANOTHER PORT OUTSIDE M.M.
TOTAL	33	7	3	12

7.4 Analysis of Port Traffic Impact on Urban Road System

7.4.1 Objective of Impact Analysis

The establishment of a traffic network, understanding the effect of cargo related to the port activity on traffic, and the formulation of a development strategy for the major ports in the CALABARZON requires an analysis of the possible influences of port-cargo on the traffic of Metro Manila, and also the quantification of suitable cargo volumes for the port of Manila and of the newly proposed port.

7.4.2 Current Traffic Condition

(1) Current Traffic Volume

Current traffic volume by time period is understood from Tables 7-11 to 7-13 which shows the results of the survey conducted in June 1993.

North Harbor : Hours in which more than 100 vehicles were observed are from 0800 to 1600 to port and from 0700 to 1700 from port. Peak hour is 1400 for both.

MICT : Hours in which more than 100 vehicles were observed are from 0800 to 1700 and 2200 to port and from 0800 to 1100, 1300 to 1900 and 2300 from port. Peak hour for traffic entering the port is 1400 at which there is a massive concentration of vehicles. On the other hand peak hours are distributed over a long period for vehicles exiting.

South Harbor : Hours in which more than 100 vehicles were observed are from 0700 to 1100 and 1300 to 1600 to port and from 0900 to 1100 and 1300 to 1700 from port. Peak hour is 0900 in the morning to port.

(2) Current OD Table

1993 OD table is currently being drafted in the following manner.

1) Choosing 1 day data from the 7-day survey conducted in June 1993.
2) Re-coding origin and destination which is coded by municipality.
3) Expanding the samples according to the counted number of vehicles.
4) Converting to PCU (Passenger Car Unit). PCU Cargo OD table is shown in Appendix B-19.

(3) Current Traffic Characteristics

1) Cargo

Table 7-14 shows cargo volume by vehicle type. The largest three types, that is, trailer, truck 3-axle and 2-axle account for 95 % of the cargo volume.

The distribution of loading weight of these three types is shown in Table 7-15.

Table 7-16 shows daily variance cargo volume which is calculated by the average loading weight above and using the following formula.

Cargo Volume = 5.67 * (Truck 2-ax) + 9.03 * (Truck 3-ax)
+ 15.12 * (Trailer w/Cont)

The average weekday ratio to weekly cargo volume is 17.3 %, which is equivalent to 1/300 by year.

Day ratio towards a year = 0.173 / 52 = 1/300

2) Passenger

Access mode from/to port North Harbor is shown in Table 7-17. Three main modes are implied, that is, public transportation (Bus and PUJ (Public Use Jeepney)), Taxi and Car/Jeep.

The average occupancy can't be known from the survey of June 1993, however, using the port survey data of "Metro Manila Urban Expressway System" the average occupancy is integrated by "Private/Personal" or "Social/Leisure" purpose trip (See Table 7-18).

Table 7-19 shows daily variance of passenger. Thursday, the day chosen for this study, is 14.4 % week ratio and it's equivalent to 1/365 by year.

Day ratio towards a year = 0.144 / 52 = 1/365

7.4.3 Traffic Demand Forecast

(1) PCU OD Table

1) Preparation of 1993 OD Table

Cargo OD table is generated simply by converting from vehicle to PCU, while on the other hand Passenger OD table needs one more process in which number of passengers is converted to vehicles using the occupancy rate. Public transportation is excluded from this study for the following reasons.

(a) No public route exists from/to North Harbor and the passengers use public mode outside the port facility.

(b) Public mode is estimated by "Metro Manila Urban Expressway System" in the terms of preloaded link volume.

2) Forecast of 2010 OD Table

Upon completion of the 1993 OD table and forecast of the demand by year, the forecast model is formulated as the following process.

(a) Mode Split

(b) Conversion to No. of Vehicles

(c) Distribution

Especially for cargo OD, three kinds of OD tables are estimated, Medium Demand Case 1, 2 and High Demand Case 1 because of the different distribution used. Case 1 takes into account the development strategy in CALABARZON and the land use scenario of Metro Manila Urban Expressway System, and Case 2 is the same as present condition. Details of Case 1 are as follows.

(Case 1)

o Inside EDSA : same as present

o Inside Metro Manila : 50% increase

o Outside Metro Manila : 100% increase

(2) Traffic Assignment

1) Network

The networks used for traffic assignment by "Metro Manila Urban Expressway System" are applied as follows.

for 1993 OD : 1990 Network

for 2010 OD : 2010 Network with expressways and planned roads

2) Method

Equilibrium assignment is applied to this study the same as "Metro Manila Urban Expressway System". It consists of an iterative series of all-or-nothing traffic assignments with an adjustment of travel times reflecting delays encountered in the associated iteration. The load from each assignment after the first iteration is combined with the previous load in such a way as to minimize the impedance of each trip and thus reducing the number of iterations to find the equilibrium load. Equilibrium assignment is multipath because the final loads are a linear combination of the all-or-nothing loads of each iteration. These loads may be assigned to different paths because of the time adjustments after each iteration.

3) Case

Traffic assignments have been made with the above networks as follows.

(a) Current : 1990 Network and 1993 OD

(b) 2010 Case 1 : 2010 Network and Medium Case 1 2010 OD

(c) 2010 Case 2 : 2010 Network and Medium Case 2 2010 OD

(d) 2010 Case 3 : 2010 Network and High Case 1 2010 OD

(3) Process Flow

Figures 7-5 and 7-6 show the flow of data process.

7.4.4 Results

(1) Port Traffic

Volume of port traffic reaches 40,657 PCU's by cargo and 8,783 PCUs by passenger respectively, under the medium case in 2010. Total urban traffic volume is estimated at 4,920,000 PCU's. So the numerical ratio of port traffic to urban traffic is only 1%. When transport distances are counted as a part of traffic volume, the volume ratio accounts for 2~3 % in the Medium Case (refer to Table 7-20).

(2) Traffic Impact

Tables 7-21 and 7-22 are selected as problem links because speed is decreased to 20 km/h on general roads and 30 km/h on expressways (See Figures 7-7 and 7-8). These same problem links are encountered in both cases (Medium case and High case).

Port traffic volumes extracted from traffic assignment are shown in Appendices B-20 to B-26. Each year 2010 case shows heavy traffic from/to port between the port and expressways, in particular, the northern part of C-3 expressway. Appendices B-27 to B-32 show how speed decreases because of port traffic. Appendices B-33 to B-35 show increasing link volume and decreasing link speed due to port traffic.

(3) Economic Impact

In the year 2010, average traffic speed of the top 60 links affected by port traffic in Metro Manila is estimated at 45.9 km/hour from Appendix B-33. This speed is further decelerated till 39.4 km/hour when port traffic is taken into account (truck-ban is not considered).

There are around 500 links in Metro Manila, so traffic speed on 12% of all links will decrease by more than 3 km/h. On the assumption that vehicle operation cost and

traffic time value are 2.3 and 60 pesos/hour/PCU respectively and average traffic distance along the affected road is 10km, total economic loss amounts to 0.40 billion pesos/year by 590,000 PCUs (12% of daily traffic). GDP is estimated at 1.86 trillion pesos and around 30% of GDP equal to GRDP Metro Manila (558 billion pesos).
So, economic loss by port traffic is computed as 0.1% of GRDP Metro Manila. The impact on the remaining links (88 %) is concluded to be small.
(Note:Cost data refer to "Metro Manila Urban Expressway System")
On the other hand, MICT and South Harbor generated an aggregate of 10.11 billion USD of trade cargoes in 1991. North Harbor is as a valuable port as the former two.

(4) Recommendation

Indeed, port traffic has a substantial impact on the urban road traffic. And so, in advance of the implementation of the port development plan, the port related road development plan shall be carried out from the following point of view. Namely, if an expressway between the port of Manila and the South Super Highway is linked from Ramp 1096 to Ramp 1021 on a south west part of the Urban Expressway Plan (See Figure 7-8), the former expressway plan makes a circular network and leads to a reduction in the traffic congestion by port related vehicles on the coastal road and the east part of expressway.

Table 7-11 No. of Vehicles Counted at North Harbor

Time		Van Pick	Light Cargo	Truck 2-ax	Dump	Truck 3-ax	Tralr Conta	Tralr Head	Tank	Total
(In)	1	5	-	1	-	3	8	6	- +	23
	2	6	2	3	-	3	6	4	- +	24
	3	5	2	3	-	3	11	3	- +	27
	4	5	5	1	-	3	5	5	- +	24
	5	41	7	4	-	1	2	2	- +	57
	6	7	8	-	-	3	2	1	- +	21
	7	17	1	2	-	2	1	3	- +	26
	8	52	10	12	1	20	7	5	- +	107
	9	61	23	12	-	23	8	5	- +	132
	10	57	25	14	5	25	12	3	1 +	142
	11	53	30	24	2	27	15	9	- +	160
	12	53	19	20	-	17	10	4	1 +	124
	13	50	24	20	2	21	16	10	- +	143
	14	62	36	19	3	36	26	16	- *	198
	15	33	28	11	-	30	14	18	1	135
	16	58	24	23	2	23	18	12	-	160
	17	23	8	5	-	4	11	2	-	53
	18	18	4	5	-	6	6	2	-	41
	19	19	8	12	-	3	11	-	-	53
	20	14	9	13	-	4	18	9	-	67
	21	8	11	9	-	5	28	4	-	65
	22	14	2	1	-	12	8	10	1	48
	23	5	1	7	-	2	18	17	-	50
	24	2	1	2	-	-	15	6	-	26
(Out)	1	6	5	5	-	7	12	6	- +	41
	2	1	1	-	-	3	5	1	- +	11
	3	6	2	1	-	1	13	1	- +	24
	4	7	6	1	-	1	4	2	- +	21
	5	19	5	5	-	1	2	5	- +	37
	6	12	-	4	-	9	2	3	- +	30
	7	60	9	17	-	4	5	6	1 +	102
	8	54	9	21	-	15	12	5	- +	116
	9	40	11	23	-	9	31	3	1 +	118
	10	45	17	25	2	13	25	2	1 +	130
	11	41	23	26	5	13	33	4	- +	145
	12	38	17	5	-	2	3	4	1 +	70
	13	49	26	9	3	31	11	15	3 +	147
	14	50	32	26	3	26	13	22	2 *	174
	15	43	30	29	2	11	18	24	3	160
	16	46	22	44	-	21	10	29	-	172
	17	24	11	39	-	5	8	25	-	112
	18	31	9	15	2	7	7	9	-	80
	19	28	9	13	-	-	5	8	-	63
	20	26	14	7	-	2	14	13	1	77
	21	15	9	19	-	5	25	12	1	86
	22	19	7	-	-	15	41	-	1	83
	23	8	4	6	-	7	34	-	-	59
	24	5	3	5	-	4	27	-	-	44

Table 7-12 No. of Vehicles Counted at MICT

Time		Van Pick	Light Cargo	Truck 2-ax	Dump	Truck 3-ax	Tralr Conta	Tralr Head	Tank	Total
(In)	1	1	-	-	1	2	17	2	- +	23
	2	2	-	-	4	-	14	1	1 +	22
	3	-	-	-	3	2	10	-	- +	15
	4	3	1	-	2	2	11	7	- +	26
	5	2	2	1	-	22	23	7	- +	57
	6	9	4	-	-	11	14	6	2 +	46
	7	41	4	6	1	20	18	7	1 +	98
	8	56	31	11	1	47	65	14	1 +	226
	9	67	24	17	3	64	138	23	2 +	338
	10	51	38	19	2	65	152	32	2 +	361
	11	42	27	13	1	29	148	22	2 +	284
	12	16	21	5	2	12	69	9	- +	134
	13	42	23	14	4	36	116	12	1 +	248
	14	58	15	17	1	41	270	22	- *	424
	15	47	21	7	-	33	174	34	1	317
	16	50	17	6	2	24	161	11	1	272
	17	35	4	3	1	8	87	21	-	159
	18	21	6	-	7	2	44	8	1	89
	19	13	3	-	2	1	41	5	-	65
	20	6	1	2	3	6	29	8	-	55
	21	5	1	2	4	4	36	6	-	58
	22	4	2	-	14	-	68	21	-	109
	23	-	2	-	1	3	47	6	-	59
	24	1	-	-	2	1	37	3	-	44
(Out)	1	-	-	-	-	6	19	4	- +	29
	2	4	-	-	1	4	9	3	- +	21
	3	-	1	-	-	1	11	-	- +	13
	4	1	-	-	-	1	15	-	- +	17
	5	1	1	-	1	-	14	1	- +	18
	6	8	2	-	-	2	7	6	- +	25
	7	30	3	1	1	7	6	12	- +	60
	8	45	11	1	3	15	26	7	3 +	111
	9	39	7	10	-	29	82	17	1 +	185
	10	54	14	11	1	24	86	13	- +	203
	11	62	26	7	-	22	103	19	4 +	243
	12	34	3	3	1	5	32	10	1 +	89
	13	52	14	4	2	1	92	28	- +	193
	14	43	15	17	4	38	129	13	1 +	260
	15	40	24	17	-	26	84	11	- +	202
	16	65	27	8	-	26	122	15	- *	263
	17	54	10	7	-	16	93	17	2	199
	18	25	8	-	2	5	68	8	-	116
	19	27	15	2	5	4	88	14	-	155
	20	10	1	-	3	3	53	4	1	75
	21	7	-	1	2	2	56	2	2	72
	22	3	2	-	3	-	60	5	-	73
	23	18	-	-	28	-	61	11	-	118
	24	6	-	-	5	-	38	10	-	59

Table 7-13 No. of Vehicles Counted at South Harbor

Time		Van Pick	Light Cargo	Truck 2-ax	Dump	Truck 3-ax	Tralr Conta	Tralr Head	Tank	Total
(In)	1	2	2	-	-	-	19	1	- +	24
	2	1	1	-	-	5	17	-	- +	24
	3	-	1	-	-	4	5	-	1 +	11
	4	-	1	-	-	1	2	-	- +	4
	5	-	11	-	1	3	3	-	1 +	19
	6	16	-	-	2	4	1	-	- +	23
	7	73	3	2	-	18	5	4	- +	105
	8	64	10	5	2	38	72	8	- +	199
	9	94	11	4	3	34	59	8	- +	213
	10	57	7	6	2	9	66	7	3 *	157
	11	64	5	2	-	7	85	7	-	170
	12	41	3	2	-	10	12	8	-	76
	13	50	6	6	1	12	67	9	-	151
	14	41	13	11	1	12	59	5	-	142
	15	40	-	4	-	4	86	3	4	141
	16	41	2	-	-	9	62	2	-	116
	17	24	-	1	-	3	10	2	-	40
	18	28	1	-	-	-	6	2	-	37
	19	19	-	1	-	1	15	1	-	37
	20	44	-	2	-	6	29	6	-	87
	21	7	-	-	-	8	17	-	-	32
	22	11	1	-	-	6	52	2	-	72
	23	1	-	-	-	3	14	1	-	19
	24	-	4	-	-	4	9	1	-	18
(Out)	1	1	3	-	-	3	17	3	- +	27
	2	2	1	-	-	3	20	-	- +	26
	3	1	-	-	-	3	7	-	- +	11
	4	-	2	1	-	3	3	-	1 +	10
	5	1	13	-	1	3	3	-	- +	21
	6	6	1	-	-	1	2	2	- +	12
	7	35	1	-	2	4	3	1	- +	46
	8	34	1	3	4	4	21	3	- +	70
	9	49	8	4	1	28	37	5	2 +	134
	10	63	7	7	2	40	25	1	- +	145
	11	57	9	4	-	23	56	3	- +	154
	12	27	-	2	-	11	44	6	2 +	90
	13	34	2	2	-	24	40	1	- +	103
	14	37	20	8	3	26	40	1	- +	136
	15	50	10	15	-	37	61	2	1 +	175
	16	44	10	14	1	29	81	1	- +	182
	17	72	3	9	4	9	61	2	2 *	160
	18	36	2	-	1	7	26	2	-	75
	19	32	-	-	-	1	12	2	1	47
	20	22	2	-	-	1	23	7	-	55
	21	13	-	-	-	-	16	5	1	34
	22	9	8	1	-	7	36	14	-	75
	23	4	1	-	-	3	21	3	-	32
	24	1	3	-	-	1	8	3	-	16

Table 7-14 Cargo Volume

Vehicle Type	Total Nos	Excluding Vacant	Cargo Volume ton	(%)
1 Van/Pick-up	2672	2180	2646.70	2.5
2 Light Cargo	1183	1115	2518.90	2.4
3 Truck 2-ax	678	611	3842.46	3.7
4 Dump	31	-	-	-
5 Truck 3-ax	1631	1337	14721.88	14.1
6 Trailer Cont	5284	4160	79906.01	76.8
7 Trailer head	942	-	-	-
8 Tank/lorry	37	28	470.00	0.5
Total	12458	9431	104105.94	100.0

Table 7-15 Loading Weight Distribution

Loading Weight	Truck 2-ax	Truck 3-ax	Trailer w/Cont	Trailer Head	Total
0 - 0.9	77	294	1124	942	2437
1 - 1.9	31	38	15	-	84
2 - 2.9	30	29	47	-	106
3 - 3.9	23	16	45	-	84
4 - 4.9	26	6	4	-	36
5 - 5.9	174	68	31	-	273
6 - 9.9	256	157	81	-	494
10 - 14.9	59	868	161	-	1088
15 - 19.9	-	107	485	-	592
20 ton mor	2	48	3291	-	3341
Total	678	1631	5284	942	8535
Average 1	5.667	9.026	15.122	-	
Average 2	6.289	11.011	19.208	-	

Remark) Average 1 : including vacant
Average 2 : excluding vacant

Table 7-16 Daily Variance of Cargo Volume

Day	Truck 2-ax	Truck 3-ax	Trailer w/Cont	Trailer Head	Total	Cargo Volume	Dairy Vari.
(Mon)	600	1749	4047	747	7143	80386	15.4
(Tue)	820	1797	4302	1067	7986	85922	16.4
(Wed)	867	1659	4389	1277	8192	86259	16.5
(Thu)	890	1631	5212	1014	8747	98579	18.8
(Fri)	976	1713	5380	1035	9104	102348	19.5
(Sat)	571	1081	2612	664	4928	52492	10.0
(Sun)	193	492	803	296	1784	17678	3.4
Total	4917	10122	26745	6100	47884	523665	100.0

Table 7-17 Access Mode from/to North Harbor

No	Access	Passengers	(%)
1	Walk	113	0.5
2	Bus	1604	7.0
3	PUJ	5828	25.5
4	Taxi	7382	32.3
5	Car/Jeep	6622	29.0
6	Tricycle	236	1.0
7	Truck	66	0.3
8	Bicycle	6	0.0
9	Motorcycle	20	0.1
10	Pedicab	65	0.3
11	Others	883	3.9
Total		22825	100.0

Table 7-18 Average Occupancy

Mode	Car/Jeep	Taxi
No. of Vehicles ①	753	105
No. of Passengers ②	1991	427
Average Occupancy ③	1.64	3.07

③ = ② / ① - Driver (= 1)

Table 7-19 Daily Variance of Passenger

Day	Passengers	Daily Vari.
(Mon)	14115	8.9
(Tue)	29104	18.3
(Wed)	26154	16.5
(Thu)	22825	14.4
(Fri)	32956	20.8
(Sat)	12567	7.9
(Sun)	21007	13.2
Total	158728	100.0

Table 7-20 Traffic Impact on Urban Road by Port Related Vehicle

CASE	AREA	TRAFFIC VOLUME (PCU·KM)	PORT RELATED VEHICLE	
			(PCU·KM)	SHARE(%)
BASIC	INSIDE E D S A	10,746,000	–	–
	OUTSIDE E D S A	20,600,000	–	–
	PLANNED ELEV. H/W	4,701,000	–	–
	TOTAL	36,047,000	–	–
MEDIUM CASE INCREAS SHARE OUTSIDE E D S A	INSIDE E D S A	10,869,000	123,000	1.1
	OUTSIDE E D S A	20,764,000	164,000	0.8
	PLANNED ELEV. H/W	5,392,000	691,000	14.7
	TOTAL	37,025,000	979,000	2.7
MEDIUM CASE PRESENT SHARE	INSIDE E D S A	10,863,000	117,000	1.1
	OUTSIDE E D S A	20,714,000	114,000	0.6
	PLANNED ELEV. H/W	5,269,000	568,000	12.1
	TOTAL	36,845,000	799,000	2.2
HIGH CASE INCREAS SHARE OUTSIDE E D S A	INSIDE E D S A	10,914,000	168,000	1.6
	OUTSIDE E D S A	20,889,000	290,000	1.4
	PLANNED ELEV. H/W	5,855,000	1,154,000	24.5
	TOTAL	37,658,000	1,612,000	4.5

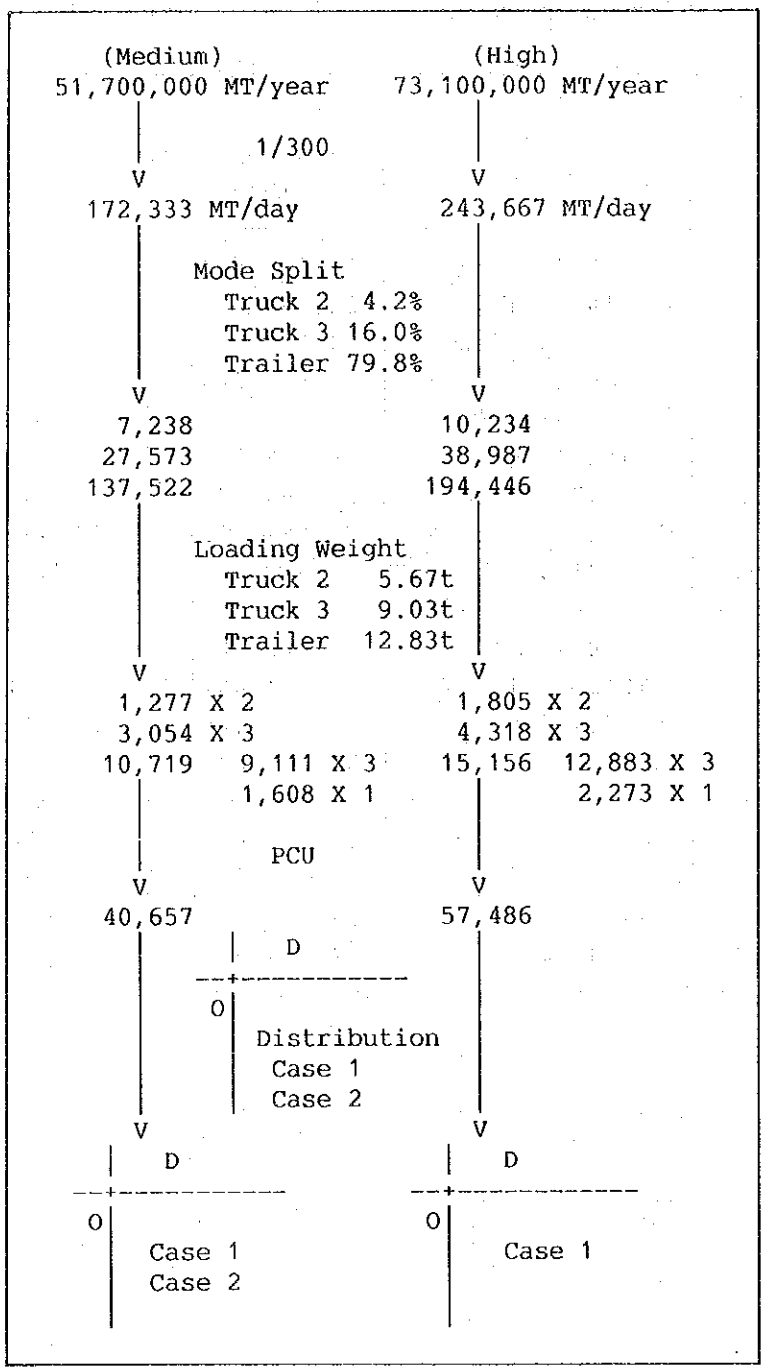


Figure 7-5 Cargo OD Table

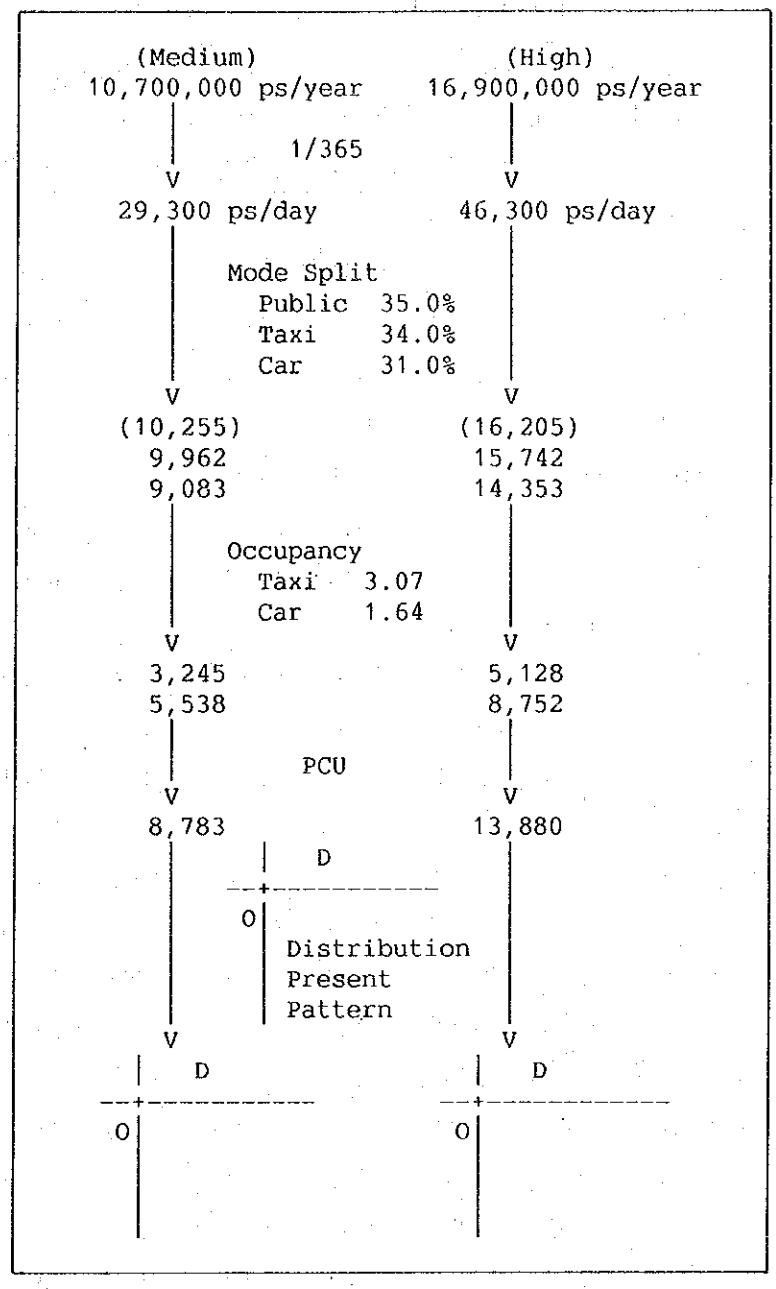


Figure 7-6 Passenger OD Table

Table 7-21 Problem Links Year 2010 Medium Case 1

Node (A)	Node (B)	(A)->(B) Speed (km/h) Orgnl.	Down	Volume Final	Up	(B)->(A) Speed (km/h) Orgnl.	Down	Volume Final	Up
(General Road) * less than 20.0 km/h									
104	421	26.83	15.60	11.23*	6333	18.48	13.16	5.32*	6801
105	421	26.83	19.60	7.23*	8573	18.48	5.42	13.06*	2262
105	106	29.08	12.28	16.80*	5052	25.03	12.64	12.39*	5876
372	373	13.59	6.83	6.76*	2090	19.79	11.48	8.31*	3444
371	372	7.05	2.03	5.02*	621	18.99	11.70	7.29*	3521
370	371	7.08	2.03	5.05*	621	16.46	11.46	5.00*	3521
103	126	23.10	5.40	17.70*	918	24.03	5.40	18.63*	918
107	108	11.78	6.20	5.58*	4224	13.02	3.15	9.87*	2148
108	109	13.95	3.83	10.12*	2588	17.18	3.98	13.20*	2111
106	107	8.94	4.01	4.93*	4224	9.34	3.15	6.19*	2148
188	344	22.01	3.38	18.63*	675	22.56	3.53	19.03*	707
338	344	22.82	3.54	19.28*	707	22.26	3.37	18.89*	675
112	113	21.04	3.20	17.84*	1325	43.84	3.52	40.32	1461
113	114	21.42	3.19	18.23*	1305	34.89	2.93	31.96	1198
111	337	14.85	2.53	12.32*	1707	25.32	3.46	21.86	1418
110	111	16.77	3.28	13.49*	1724	27.73	1.89	25.84	779
(Expressways) * less than 30.0 km/h									
1007	1008	41.31	11.41	29.90*	2764	39.03	12.28	26.75*	2979
1065	1066	32.59	9.65	22.94*	2341	48.31	12.77	35.54	3176
1064	1065	32.51	9.63	22.88*	2341	48.19	12.74	35.45	3176
1006	1007	24.80	10.32	14.48*	2764	23.92	9.97	13.95*	2979
1004	1005	16.04	3.15	12.89*	1940	18.82	5.47	13.35*	2245

Table 7-22 Problem Links Year 2010 High Case 1

Node (A)	Node (B)	(A)->(B) Speed (km/h) Orgnl.	(A)->(B) Speed (km/h) Down	(A)->(B) Volume Final	(A)->(B) Volume Up	(B)->(A) Speed (km/h) Orgnl.	(B)->(A) Speed (km/h) Down	(B)->(A) Volume Final	(B)->(A) Volume Up
(General Road) * less than 20.0 km/h									
104	421	26.83	18.78	8.05*	8156	18.48	13.48	5.00*	7709
105	106	29.08	14.59	14.49*	6118	25.03	13.98	11.05*	6785
105	421	26.83	20.50	6.33*	9095	18.48	7.89	10.59*	3697
372	373	13.59	7.01	6.58*	2146	19.79	12.37	7.42*	3715
371	372	7.05	2.05	5.00*	1609	18.99	12.59	6.40*	3793
370	371	7.08	2.08	5.00*	1609	16.46	11.46	5.00*	3793
188	344	22.01	5.40	16.61*	1078	22.56	6.37	16.19*	1275
338	344	22.82	6.38	16.44*	1275	22.26	5.39	16.87*	1078
105	129	20.66	9.53	11.13*	1259	11.18	1.89	9.29*	145
108	109	13.95	6.26	7.69*	4226	17.18	4.94	12.24*	2759
103	126	23.10	5.42	17.68*	922	24.03	5.42	18.61*	922
107	108	11.78	6.31	5.47*	4305	13.02	4.09	8.93*	2789
106	107	8.94	4.01	4.93*	4305	9.34	4.08	5.26*	2789
112	113	21.04	3.70	17.34*	1536	43.84	4.39	39.45	1822
111	337	14.85	2.98	17.81*	2012	25.32	4.85	20.47	1990
113	114	21.42	3.61	17.81*	1478	34.89	3.96	30.93	1617
156	161	23.05	1.55	21.50	534	21.11	5.62	15.49*	1927
110	111	16.77	3.42	13.35*	1822	27.73	2.99	24.74	1233
128	129	30.45	3.15	27.30	1415	11.44	2.98	8.46*	1810
133	372	20.39	3.11	17.28*	747	16.18	.75	15.43*	181
154	352	5.29	. 0	5.29*	0	13.67	3.18	10.49*	286
(Expressways) * less than 30.0 km/h									
1007	1008	41.31	15.00	26.31*	3636	39.03	15.42	23.61*	3740
1064	1065	32.51	12.14	20.37*	2951	48.19	17.91	30.28	4432
1065	1066	32.59	12.17	20.42*	2951	48.31	17.67	30.64	4363
1066	1067	41.33	11.97	29.36*	2901	51.19	14.34	36.85	4295
1006	1007	24.80	11.40	13.40*	3636	23.92	10.92	13.00*	3740
1024	1025	54.32	4.93	49.39	2464	39.37	13.02	26.35*	3156
1004	1005	16.04	3.53	12.51*	2241	18.82	4.91	13.91*	1794
1024	1064	32.59	3.10	29.49*	802	13.65	1.58	12.07*	1343

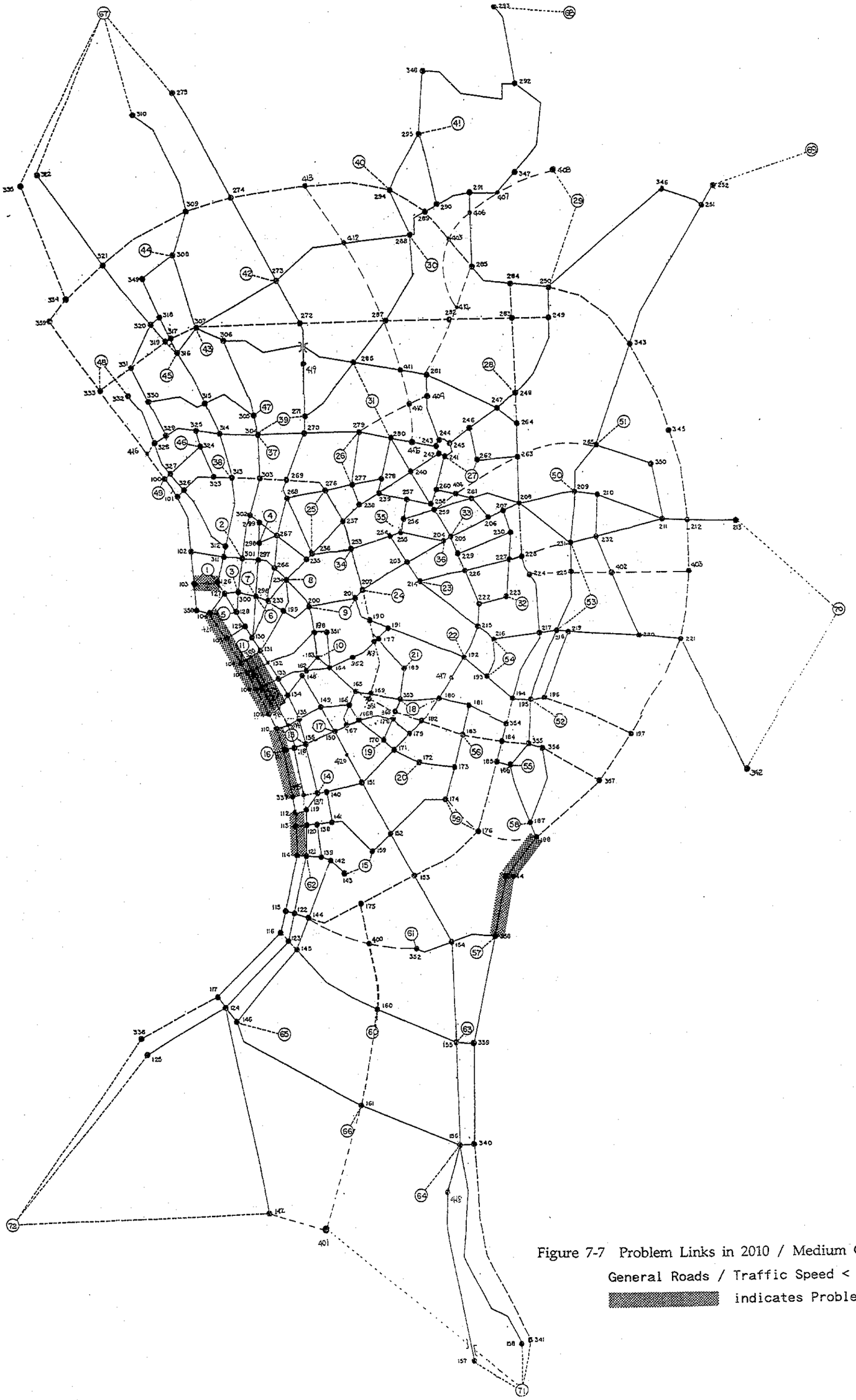


Figure 7-7 Problem Links in 2010 / Medium Case 1

General Roads / Traffic Speed < 20 km/h

indicates Problem Link

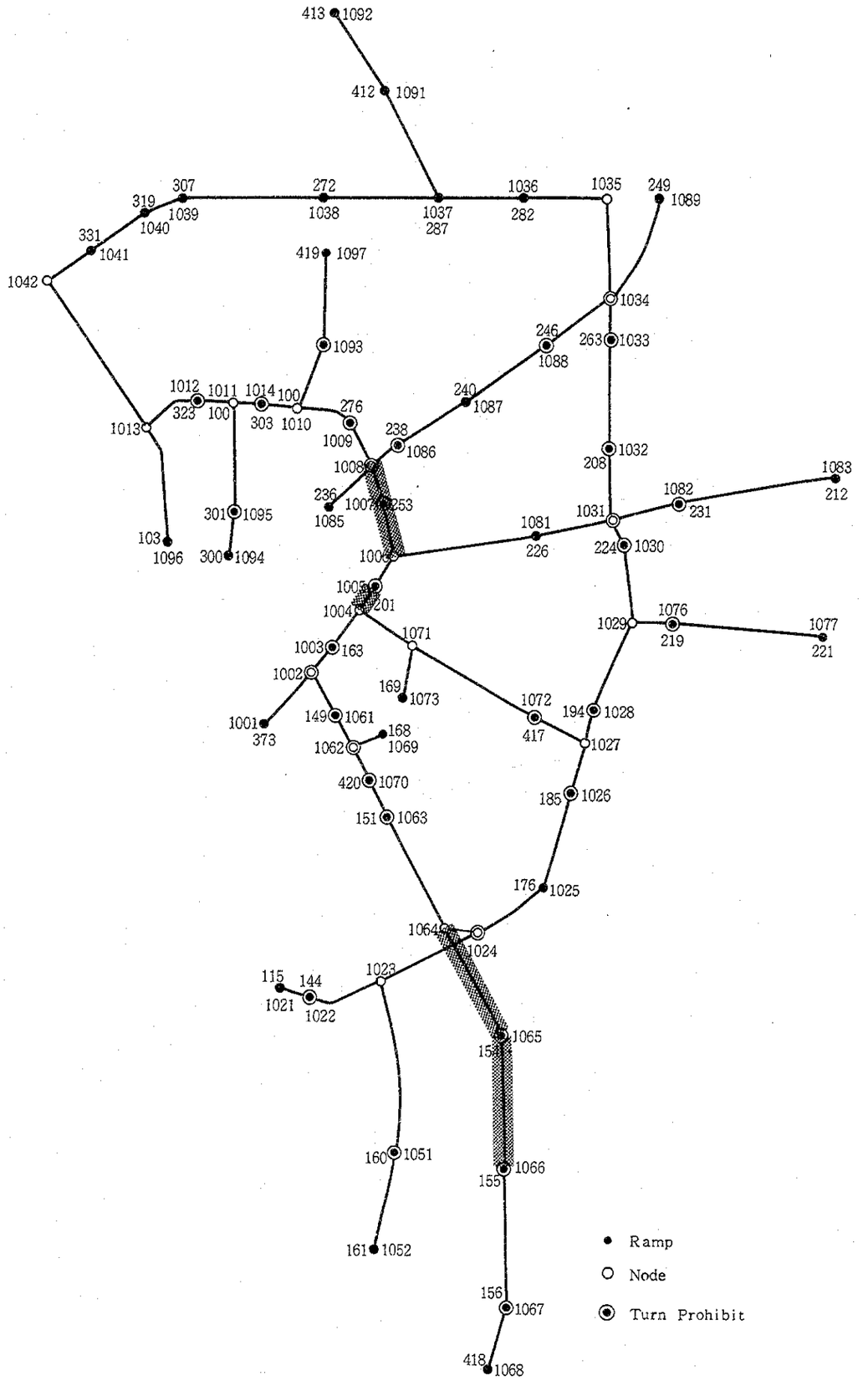


Figure 7-8 Problem Links in 2010 / Medium Case 1
Expressways / Traffic Speed < 30 km/h
indicates Problem Link

7.5 Countermeasure for Decreasing Port Traffic Impact

To decrease port traffic impact countermeasures shall be studied from several points of views. Determining the origin of port traffic, increasing the road capacity, increasing traffic efficiency and identifying bottlenecks of port related traffic are the main items that shall be studied.

(1) Optimal Allocation of Port Function in GCR

Present port function in GCR is centralized in the Port of Manila. With the progress of deurbanization of industry, ports of Batangas, Subic or new port will have an effect on international and domestic sea transportation.

(2) Implementation of Urban Road Development Plan

Road congestion results in a huge economic loss in terms of GDP. The influence of port traffic on urban road traffic is not small in the port area and slightly less in other areas. But in the case of Manila, present road traffic condition is very tight and an increase in port cargo traffic creates a lot of congestion along the urban network. Additional improvement road plan shall be taken into account on several congested points found in this study.

(3) Regulations of Port Traffic on Urban Road

From the economical point of view, high level use of road at night has a positive effect on traffic economy in GCR. To prohibit large vehicles such as those carrying port cargo from using the urban network during rush hours is a cheap and effective way to combat traffic congestion.

(4) Coastal Expressway on Manila Bay

To make access among Metro Manila, Region III and Region IV easy, planned urban expressway shall form a circle. Proposed coastal expressway on Manila Bay shall have a potential for port traffic to go-and-come without the truckban regulation.

7.6 Summary of Port Traffic Impact on Urban Road System

To distinguish present traffic condition of Metro Manila and direction of port development, two surveys were conducted in November. And to estimate future impact by port traffic on the urban road network, delayed time of urban traffic stream due to port traffic was computed by traffic simulation program.

(1) O/D Survey of Port Traffic at Metro Manila Boundary

Traffic count survey and cargo/vehicle O/D survey were conducted at three points at Metro Manila boundary (Susana Heights, McArthur Highway and North Diversion Road). Characteristics of hinterland and necessity of truck-ban were observed.

(2) Port User's Preference Survey

Questionnaires were delivered to 120 selected companies and 50 answers were collected. According to their replies, traffic congestion, handling method and truck-ban are the main three items which should be improved. About 44% and 36% answered that they would use Batangas port and Subic port respectively, though they stipulated it would be for domestic operation. Twelve percent answered that they would like to have a new port built outside Metro Manila.

(3) Analysis of Port Traffic Impact on Urban Road System

In 2010, average traffic speed decelerates from 45.9 km/h to 39.4 km/h on 12% of links in Metro Manila due to port traffic. But most congested area (traffic speed is less than 20 km/h on general roads or 30 km/h on expressways) owing to port traffic is limited to port area and several points. Furthermore development of coastal expressway and circu-lar urban highway will bring preferable road conditions.

CHAPTER 8 PRELIMINARY DESIGN OF MAJOR PORT FACILITIES

8.1 General

Six ports will be considered for preliminary design of long-term development target year 2010, namely Manila South Harbor, Manila North Harbor, MICT, Port of Batangas, Naic/Cavite New Port and Sangley Point.

For the preliminary design of major port facilities, natural condition survey has been conducted for Naic/Cavite New Port Area, South Harbor and North Harbor of Port of Manila. These data will be applied for the preliminary design of above mentioned ports.

Regarding the port of Batangas, the engineering data from ongoing Batangas Port Development Phase-I will be applied for the preliminary design of Phase-II.

Regarding Port of Sangley Point, the engineering data of existing facilities could not available by this time, however, we could collect the soil investigation data of Rosalio coast which is 10 km south-west from Sangley Point. For the purpose of preliminary design of new container berth, soil data from Rosalio will be applied as the nearest site data.

The Master Plan year 2010 include following project.

(1) South Harbor of manila Port
-13m Full Container Terminal and Container Stock Yard

(2) North Harbor of Manila Port
-10m Container Terminal and -9m RO/RO Berth

(3) MICT
-13m Full Container Terminal

(4) Port of Batangas
-10m Container Berth and -5.5m RO/RO Berth

(5) Naic/Cavite

-13m Full Container Terminal and New Breakwater

(6) Sangley Point

-13m Full Container Terminal

8.2 Design Standards

The following design standards will be used as reference and guidance in the preliminary design.

a) National Structural Code of Philippines (NSCP)
b) ASEP Earthquake Resistant Design of Structures
c) Design Manual for Port and Harbour Facilities in the Philippine Ports Authority, JICA 1994
d) National Fire Protection Association (NFPA)
e) National Electric Code (NEC)
f) Technical Standards for Port and Harbour Facilities, Japan
g) British Standard Code of Practice for Marine Structure
h) American Association of State Highway (AASHTO)
i) DPWH Design Guideline and Standards of Philippines
j) American National Standard Institute (ANSI)
k) Japanese Industrial Standards (JIS)

The preliminary design of major port facilities shall be basically in accordance with the Technical Standards for Port and Harbor Facilities, Japan and the Design Manual for Port and Harbour Facilities in the Philippine Ports Authority, JICA 1994.

8.3 Design Criteria

The purpose of design criteria is to provide a firm technical basis for required engineering design of the major port facilities. The criteria will show the scale and size of facilities, loading conditions, design parameters based on the expected functions of each port facilities and relating natural conditions which is described in Chapter 2 of PART I. The method of design approach shall be based on internationally accepted codes, criteria and conformity with Philippine standards and practice.

8.3.1 New Container Terminal

(1) -13 m Full Container Terminal

Four locations will be proposed for construction of -13 m Full Container Terminal, namely Manila South Harbor, MICT, Naic/Cavite and Sangley Point.

The design conditions are as follows.

1) Tide Level

H.H.W.L	+1.77 m
H.W.L.	+1.26 m
M.T.L	+0.49 m
M.L.L.W	±0.00 m
D.L.T	-0.35 m
L.L.W.L	-0.67 m

2) Seismic Factor

Horizontal ... Kh = 0.15

3) Maximum Berthing Ship Size for Structural Design

Type of Ship	Dead Weight Tonnage(tf)	Length Overall(m)	Molded Breadth(m)	Full Draft(m)
Container Vessel	30,000	237	30.7	11.60

4) Berthing Velocity

v = 0.10 m/sec

5) Water Depth of the Berth

D = -13 m (M.L.L.W -13 m)

6) Crown Height of the Quay Wall

H = M.L.L.W + 4.0 (approximately)

7) Surcharge Load on the Wharves

Distributed load

Ordinary 2.5 tf/m2

Extraordinary 1.25 tf/m2

Wheel load

Trailer for a 40 ft container

8) Container Crane

Capacity (Panamax) ..... 40 ton (under spreader)

(2) -10 m Container Terminal

Two locations will be proposed for construction of -10 m Container Terminal, namely Batangas Port and Manila North Harbor.

The design conditions are as follows.

1) Tide Level

	Manila	Batangas
H.H.W.L.	+1.77 m	
H.W.L	+1.26 m	+1.41 m
M.T.L	+0.49 m	+0.52 m
M.L.L.W	±0.00 m	±0.00 m
D.L.T	-0.35 m	-0.40 m
L.L.W.L	-0.67 m	

2) Seismic Factor

Horizontal ..... Kh = 0.15

3) Maximum Berthing Ship Size for Structural Design

Type of Ship	Dead Weight Tonnage(tf)	Length Overall(m)	Molded Breadth(m)	Full Draft(m)
Container Vessel	12,500	145	21.6	8.30

4) Berthing Velocity

v = 0.10 m/sec

5) Water Depth of the Berth

D = -10 m (M.L.L.W -10 m)

6) Crown Height of the Quay Wall

H = M.L.L.W (approximately)
+3.20

7) Surcharge Load on the Wharves

Distributed load

Ordinary 2.5 tf/m2

Extraordinary 1.25 tf/m2

Wheel load

Trailer for a 40 ft container

8) Container Crane

Capacity ..... 30 ton (under spreader)

8.3.2 New Ro/Ro Berth

One location will be proposed for construction of -9 m RO/RO Berth, namely Manila North Harbor.

The design conditions are as follows.

1) Tide Level

H.H.W.L.	+1.77 m
H.W.L	+1.26 m
M.T.L	+0.49 m
M.L.L.W	±0.00 m
D.L.T	-0.35 m
L.L.W.L	-0.67 m

2) Seismic Factor

Horizontal ..... Kh = 0.15

3) Maximum Berthing Ship Size for Structural Design

Type of Ship	Gross Tonnage(tf)	Length Overall(m)	Molded Breadth(m)	Full Draft(m)
RO/RO Vessel	13,000	188	27.1	6.70

4) Berthing Velocity

v = 0.10 m/sec

5) Water Depth of the Berth

D = -9 m (M.L.L.W -9 m)

6) Crown Height of the Quay Wall

H = M.L.L.W +2.80 (approximately)

7) Surcharge Load on the Wharves

Distributed load

Ordinary 2.5 tf/m2

Extraordinary 1.25 tf/m2

Wheel load

Trailer for a 40 ft container

8.3.3 Other Port Facilities

Breakwater

The crown height of breakwater shall be basically in accordance with Japanese Technical Standard which presents guidelines for vertical and rubble mound type breakwaters.

Minimum Crown Height = H.W.L. + 0.6 x H 1/3

Width of Crown > 0.6 x H 1/3

Slope Gradient : Ocean Side 1:2
Port Side 1:1.5

Design wave in offshore are as follows,

Return Period 30 Years, Wave Height H 1/3 = 2.43 m
Return Period 50 Years, Wave Height H 1/3 = 2.69 m

Thus, Min. Crown Height = 1.26 + 0.6 x 2.69
= 2.87 m

Considering wave calmness at the basin of container terminal, the crown height shall be higher than +2.87 m, say +3.0 m.

8.4 Preliminary Design of Port Facilities

8.4.1 Introduction

(1) Natural Conditions

During second site survey period from November 1993 to January 1994, natural condition survey have been conducted for selected three sites, namely Naic/Cavite New Port area, Manila South Harbor and Manila North Harbor.

The data for other two ports will be collected based on the ongoing project information (Batangas) and the information from nearest site (Sangley Point).

The detailed information for natural conditions will be explained in Chapter 2, PART I and Appendix-A of this report.

(2) Objective Vessel

Size of Vessel	DWT	O.L	M.W	F.D
Container	30,000	237	30.7	11.6
Container	12,500	145	21.6	8.3
RO-RO	13,000	188	27.1	6.7
RO-RO	2,000	96	17.1	4.4

(3) Design Water Depth

Foreign Container Berth:	-13.0 m below MLLW
Domestic Container Berth:	-10.0 m "
Domestic RO-RO Berth:	- 9.0 m "
Domestic RO-RO Berth:	- 5.5 m "

(4) Crown Height of Quaywall

Foreign Container Berth:	+4.00 m above MLLW
Domestic Container Berth:	+3.20 m "
Domestic RO-RO Berth (Manila):	+2.80 m "
Domestic RO-RO Berth (Batangas):	+3.20 m "

(5) Load Conditions

Dead Loads: The dead loads are determined considering appropriate unit weights of materials.

Surcharge on the apron: 2.5 tf/m2

(6) External Forces Produced by Ships Berthing Velocity

Tractive Force:	Foreign Container Berth	100 ton
	Domestic Container Berth	70 ton
	Domestic RO-RO Berth	70, 25 ton

Berthing Velocity: V = 0.10 m/sec

Angle of Approach: 10 degree to the faceline

(7) Berth Length

Allowing 45 degree inclination in plan for bow and stern ropes from the centerline of the vessel and structural length beyond the extreme bollard at each end, the berth length will be determined as follows.

Ship length + beam (for bow and stern ropes) + 2 x 2 m + structural clearance, namely

a) -13 m Container Berth : 237 + 30.7 + 4 + 28.3 = 300 m
b) -10 m Container Berth : 145 + 21.6 + 4 + 9.4 = 180 m
c) - 9 m RO-RO Berth : 188 + 27.1 + 4 + 0.9 = 220 m
d) -5.5m RO-RO Berth : 96 + 17.1 + 4 + 2.9 = 120 m

8.4.2 Port of Manila

(1) South Harbor

The soil condition of proposed site for -13 m container terminal will be sandy silty clay soft layer up to around -25 m.

The estimated amount of settlement of reclaimed land for 50 years based on the Boring Data No. MS-1 will be about two (2) meters. (Refer to Table 8-2)

Without proper countermeasure of soil improvement method, the circular slip will break out in case of surcharge 2.0 tf/m. (Refer to Fig. 8-2)

The waves and tidal current conditions are not severe inside the breakwater.

Based on these conditions, following type of quay structures will be considered for comparison purpose.

a. Open-Type structure with Reinforced Concrete Piles.
b. Closed type steel sheet pile structure.
c. Gravity type concrete caisson structure.

Conclusively, the gravity (Caisson) type structure was selected as the structural type taking into consideration of the construction cost, condition of execution, durability of structure and the construction period. Typical cross section of -13 m Container Berth is shown in Figure 8-1.

(2) North Harbor, MICT

The soil condition of proposed site for -13 m container terminal will be sandy silty clay soft layer up to around -15 m.

The estimated amount of settlement of reclaimed land for 50 years based on the Boring Data No.MN-2 will be about 1.2 m. (Refer to Table 8-2)

The soil improvement method will be requested for the some part of soft layer against settlement.

Based on these conditions, three types of quay structures will be considered for berth structures as same in South Harbor.

Judging from the natural conditions, construction cost and construction period, the Open-Type steel pipe pile structure was selected as the structural type of -13 m container terminal at MICT. Typical cross section is shown in Figure 8-3.

The rest of berth structures for domestic cargo will be selected same type of structure of ongoing development project at North Harbor.

Typical cross section of -10 m Container Berth is shown in Figure 8-4 and typical cross section of Breakwater is shown in Figure 8-5 and typical cross section of -9m RO-RO Berth is shown in Figure 8-6.

8.4.3 Port of Batangas

The development of Batangas Port Phase -1 is now ongoing and the proposed Phase -2 site of Batangas Port is adjacent to Phase -1 area.

Most of the data for natural conditions of Phase 1 can be used for this study.

The soil condition of proposed site will be assumed to sandy layer based on the nearest boring data of JICA F/S 1987 and ongoing project.

The design structure of proposed container and RO-RO berths are selected Steel Sheet Pile type with steel pipe piles anchors, taking into consideration of the lowest cost, the shorter construction period and suitable to existing soil condition.

The typical cross section of -10 m Container Berth is shown in Figure 8-7 and typical cross section of -5.5 m RO-RO Berth is shown in Figure 8-8.

8.4.4 Naic/Cavite New Port

Naic is located near the entrance of Manila Bay facing to Corregidoor Island.

From the data of natural conditions survey, the soil condition of proposed site will be firm sandy layer which is very different from the soil condition of Port of Manila.

However, to keep calmness of sea condition at basin, the two breakwaters are requested around -8 m to -10 m offshore and channel dredging will be necessary for ship entrance.

Three types of quay structures will be considered for -13 m container terminal, namely

a) Gravity type concrete caisson structure
b) Closed type steel sheet pile structure.
c) Open type steel pipe pile structure

The concrete caisson type structure was selected based on the cost and speed of construction, and durability of structure.

The rubble mound type breakwater was selected due to easy transportation of stone materials from the Mariveles Quarry just opposite side of Manila Bay.

The typical cross section of -13 m Container Berth is shown in Figure 8-10 and typical cross section of Breakwater is shown in Figure 8-11.

8.4.5 Sangley Point

Sangley Point is now military base and whole area of peninsula are restricted area including surrounding offshore area. During our survey period, we could not receive any technical information of existing facilities from agencies and offices concerned.

As a result, we have to design proposed new container terminal based on the offshore soil condition of Rosario which is 10 km south-west from Sangley Point. The assumed soil condition shall be shown in Figure 2-15 PART I of this report.

The proposed location of container terminal will be inside of existing port area which is well sheltered from ocean wave by the peninsula of Sangley Point, therefore new breakwater is not considered.

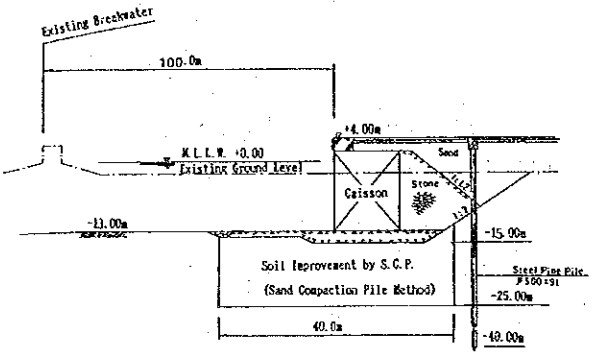
The typical cross section of -13 m Container Berth is shown in Figure 8-12 and typical cross section of Port Road is shown in Figure 8-13 and typical cross section of Causeway is shown in Figure 8-14. The selected type of quay structures are shown in Table 8-1 and the calculation for settlement of reclaimed land is shown in Table 8-2.

Table 8-1 Selected Type of Quay Structure

Manila South	Manila North	Batangas	MICT	Naic/ Cavite	Sangley Point
Gravity Type Concrete Caisson with Soil Improvement	Open Type Prestressed Concrete Pile	Closed Type Steel Sheet Pile	Open Type Steel Pipe Pile with Soil Improvement	Gravity Type Concrete Caisson	Open Type Steel Pipe Pile

TYPICAL CROSS SECTION at MANILA SOUTH HARBOR

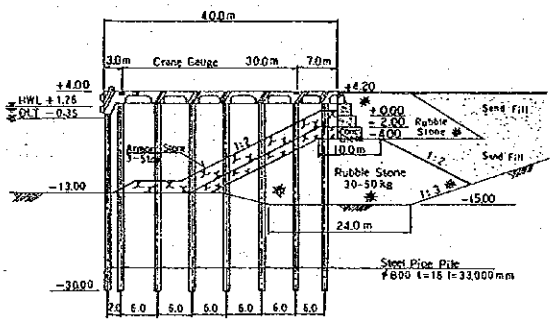
S=1/400



MANILA MICT

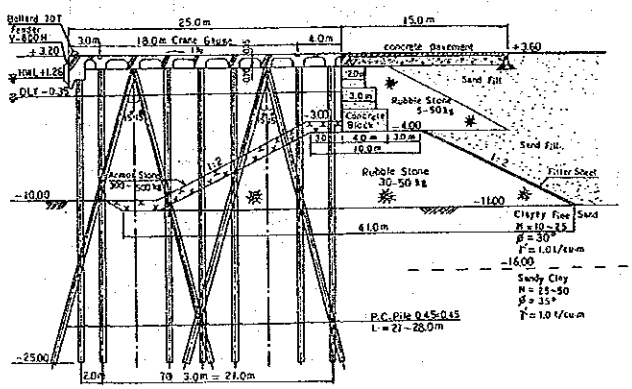
－13M CONTAINER BERTH

S = 1/400



MANILA NORTH HARBOR

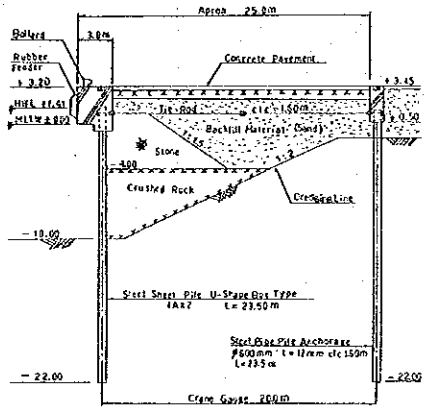
－10M CONTAINER BERTH S = 1/200



PORT OF BATANGAS

－10m Container Berth

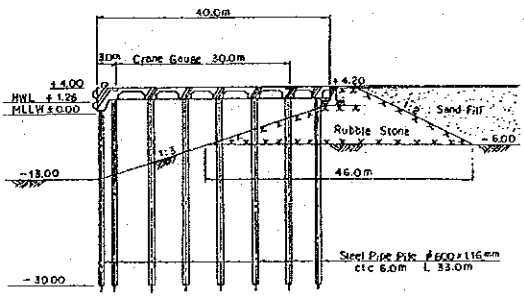
S=1/200



SANGLEY POINT

－13M CONTAINER BERTH

S = 1/400



CONTAINER BERTH AT NAIC

TYPICAL CROSS SECTION -(2) S=1/200

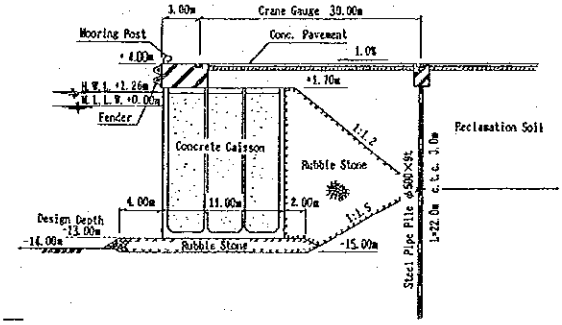


Table 8-2 Calculation for Settlement of Reclaimed Land

1. Manila South Harbor (Refer Borehole Log No. MS-1)

Depth -2.0	ΔH	Po kg/cm²	ΔP	Po+ΔP	Void Ratio			Settlemetnt $\Delta S=\frac{\Delta e}{1+eo}x\Delta H$
					eo	e_1	Δe	
-7.0	5.0m	0.125	1.12	1.245	2.58	1.97	0.61	0.85m
-15.0	8.0m	0.450	1.12	1.570	2.52	2.13	0.39	0.89m
-25.0	10.0m	0.900	1.12	2.020	0.866	0.845	0.021	0.11m
								$\sum \Delta S$=1.85 m

$\Delta P = \underbrace{2.0m \times 1.0t/m^3 + 4.0m \times 1.8t/m_3}_{\text{Reclaimed Soil up to + 4.0m}} + \underbrace{2.0t/m^2}_{\text{Surcharge}} = 11.2t/m^2 = 1.12kg/cm^2$

2. Manila North Harbor (Refer Borehole Log No. MN-2)

Depth -3.0	ΔH	Po kg/cm²	ΔP	Po+ΔP	Void Ratio			Settlemetnt $\Delta S=\frac{\Delta e}{1+eo}x\Delta H$
					eo	e_1	Δe	
-8.0	5.0m	0.125	1.22	1.345	3.14	2.92	0.22	0.27m
-15.0	7.0m	0.425	1.22	1.645	1.64	1.32	0.32	0.85m
								$\sum \Delta S$=1.12m

$\Delta P = \underbrace{3.0m \times 1.0t/m^3 + 4.0m \times 1.8t/m_3}_{\text{Reclaimed Soil up to + 4.0m}} + \underbrace{2.0t/m^2}_{\text{Surcharge}} = 12.2t/m^2 = 1.22kg/cm^2$

TYPICAL CROSS SECTION at MANILA SOUTH HARBOR

S = 1/400

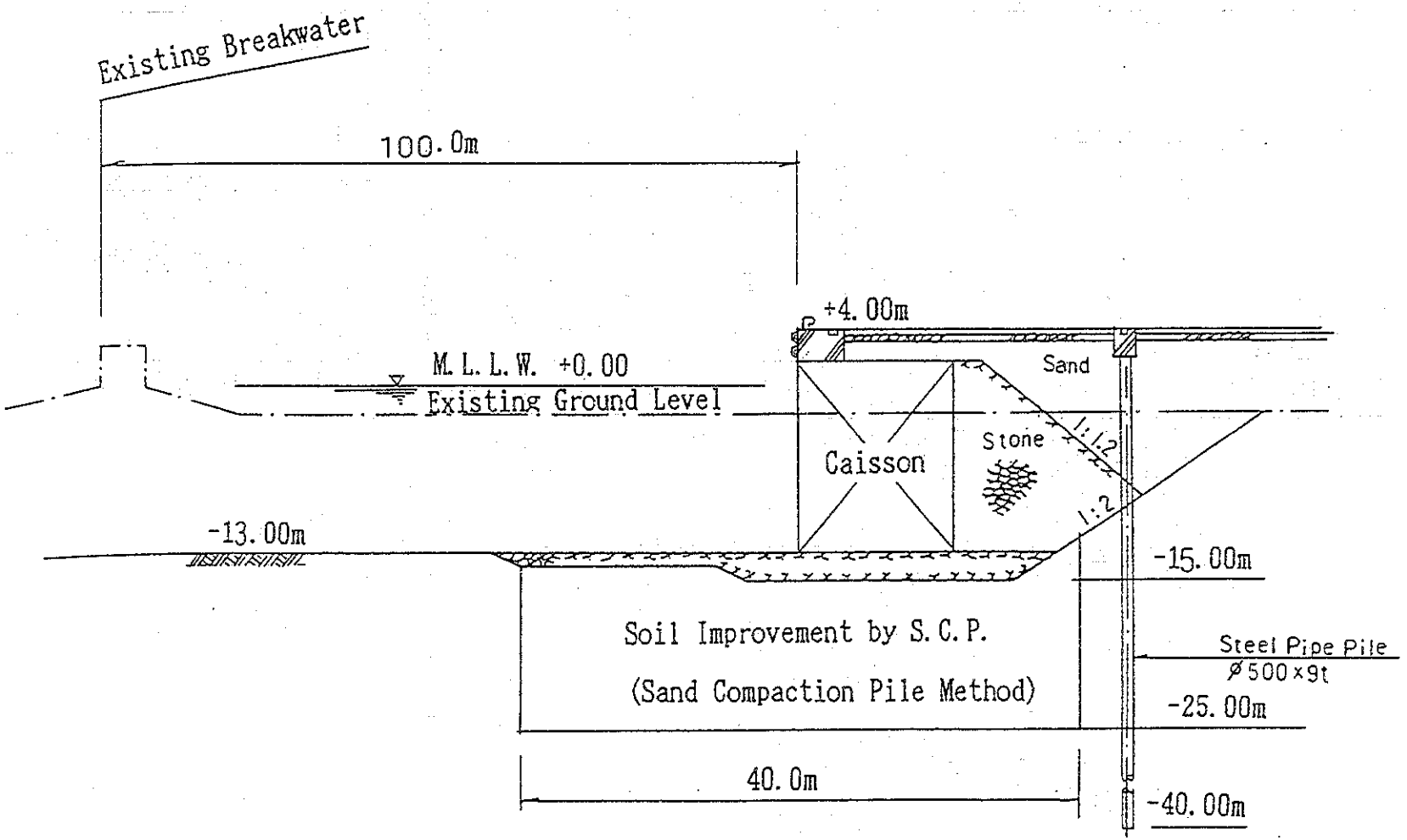


Figure 8-1 Typical Cross Section of -13m Container Berth

The Safety Factor against Circular Slip at Manila South Harbor

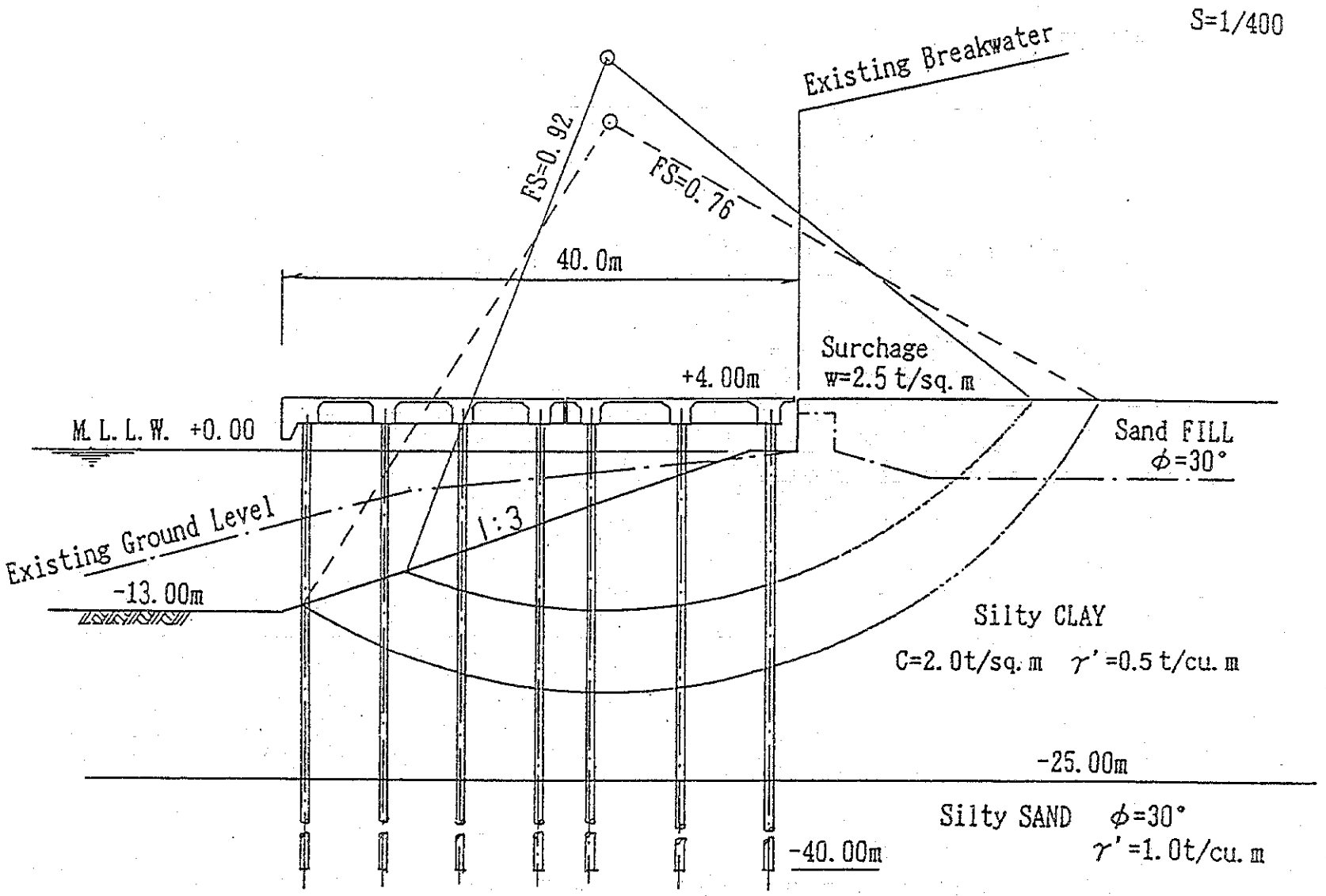


Figure 8-2 The Safety Factor of Circular Slip

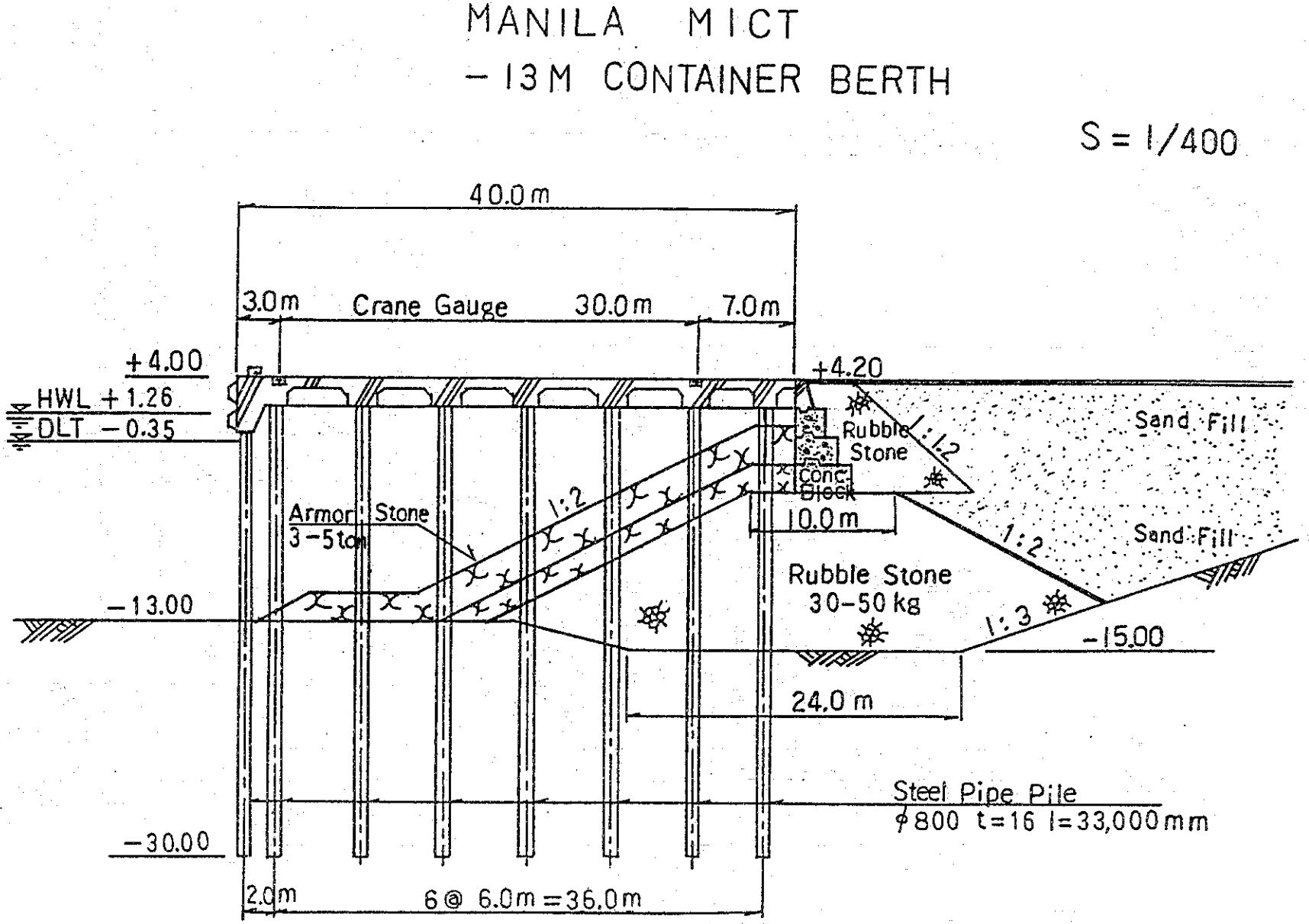


Figure 8-3 Typical Cross Section of -13m Container Berth

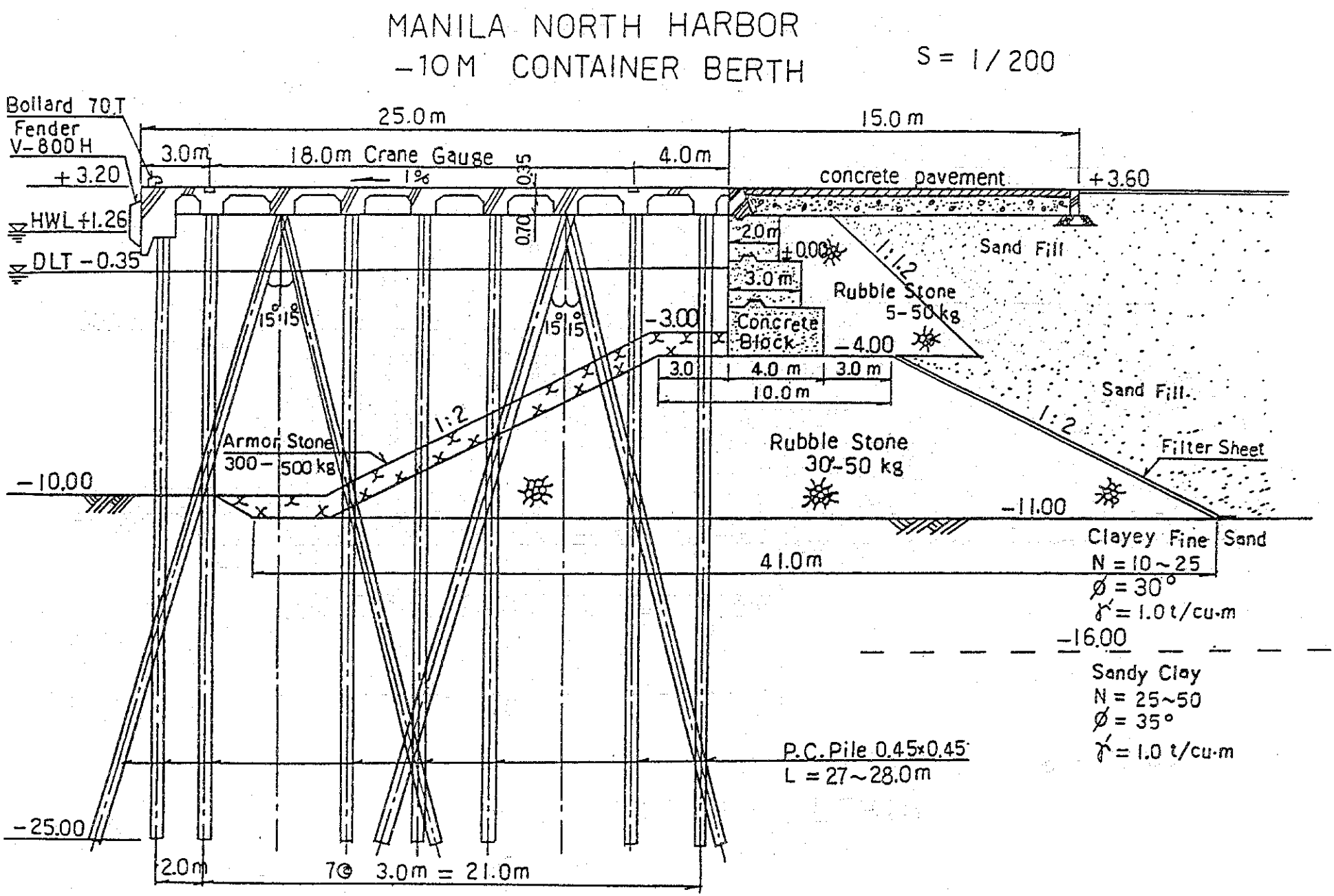


Figure 8-4 Typical Cross Section of -10m Container Berth

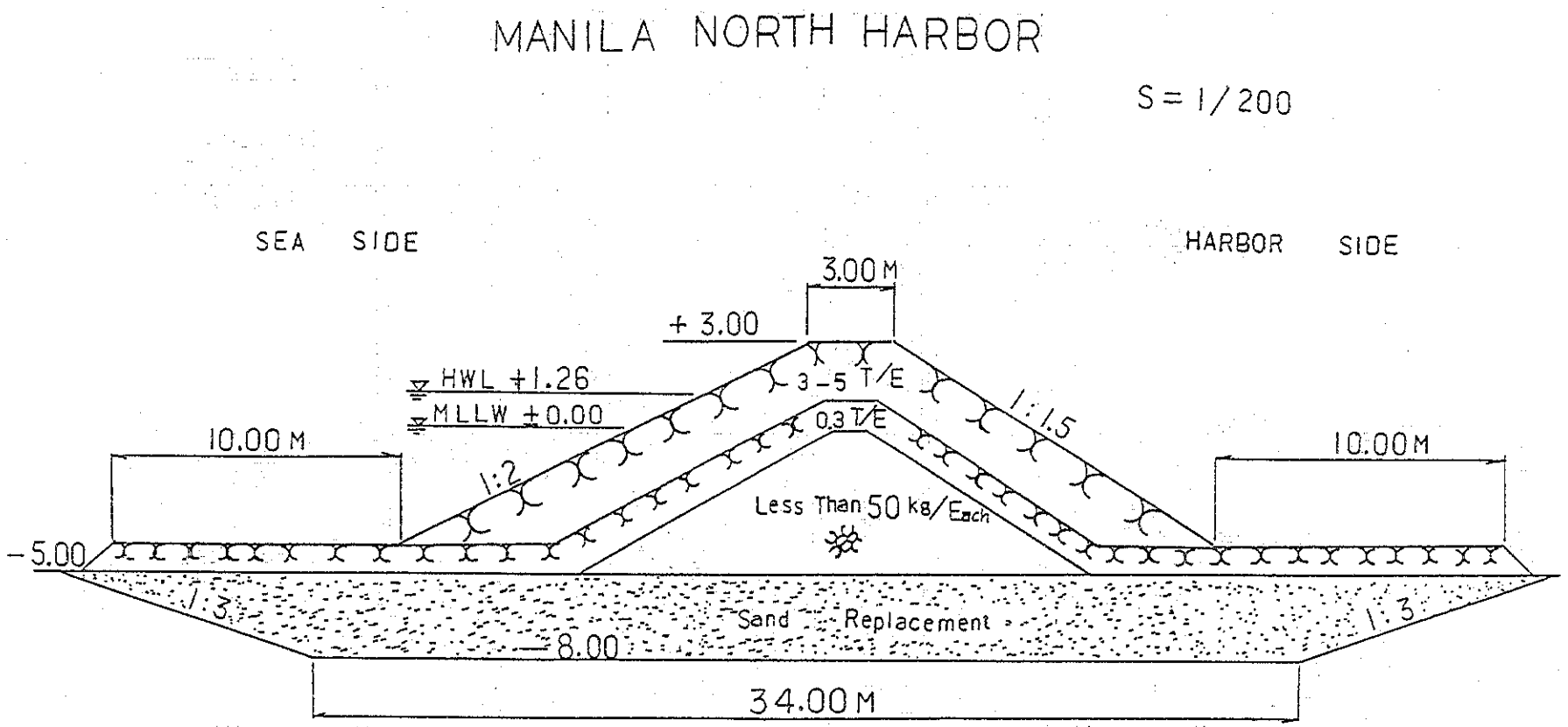


Figure 8-5 Typical Cross Section of Breakwater

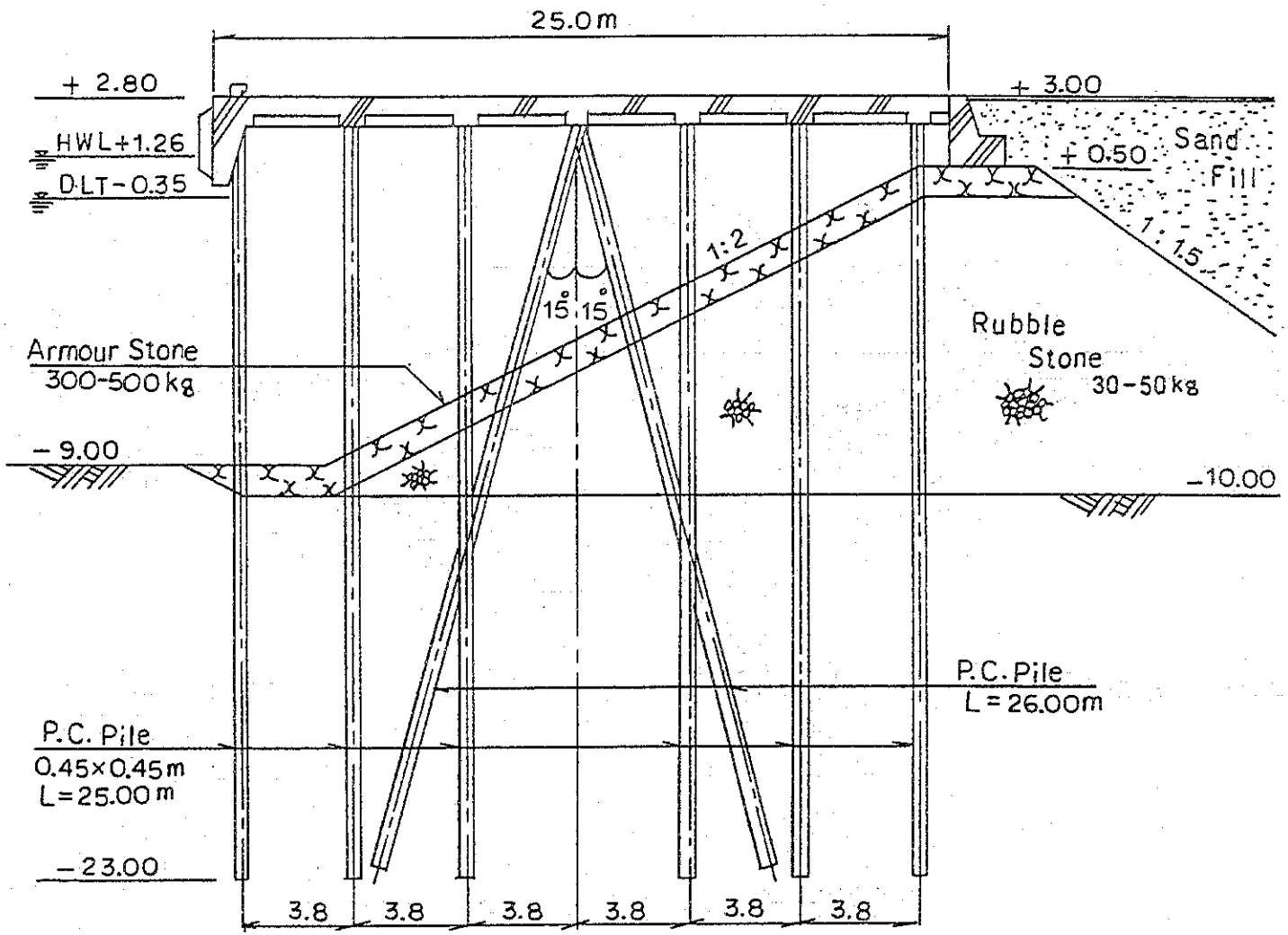


Figure 8-6 Typical Cross Section of -9m RO-RO Berth

PORT OF BATANGAS

– 10m Container Berth

S = 1 / 200

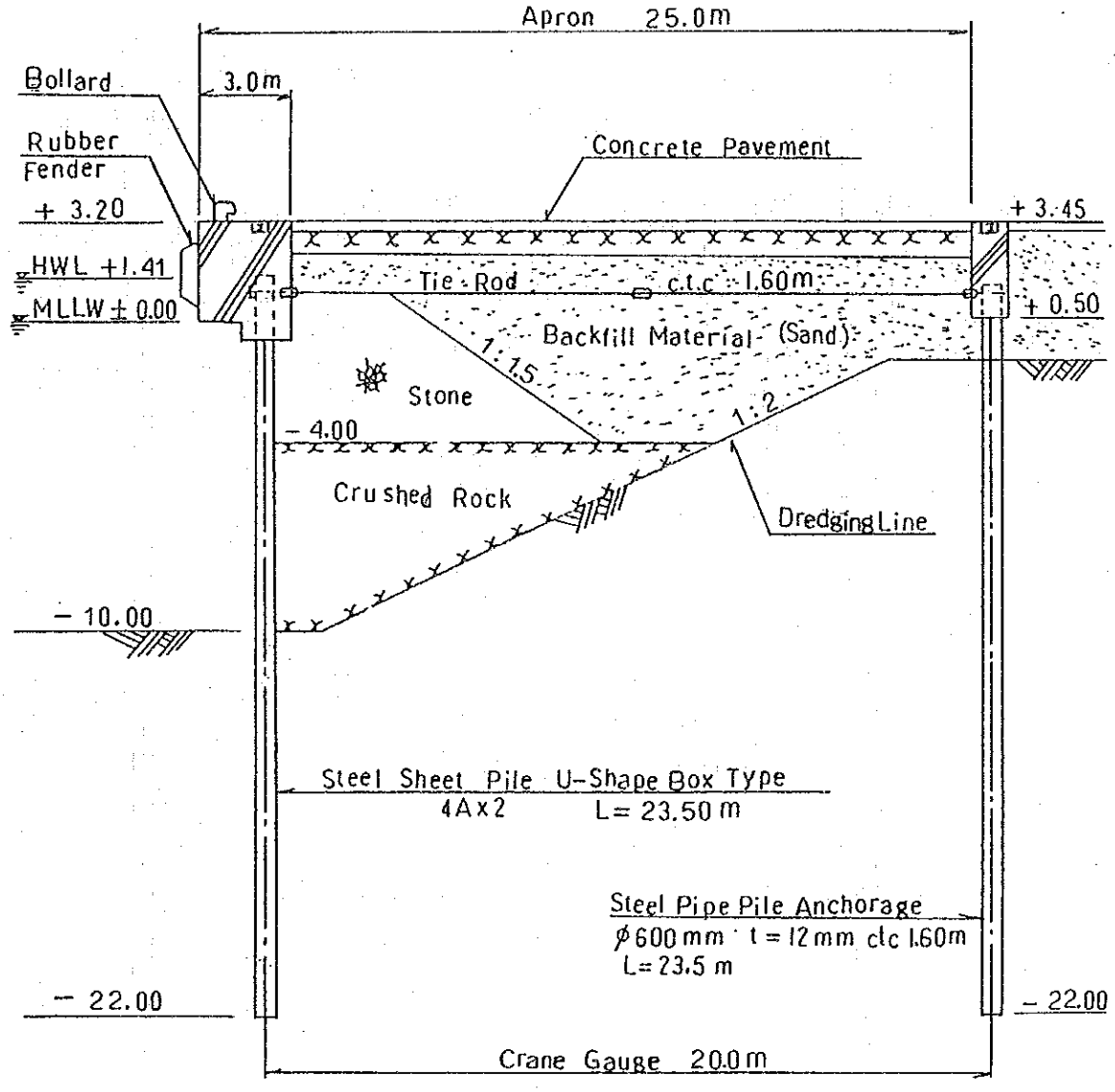


Figure 8-7 Typical Cross Section of -10m Container Berth

PORT OF BATANGAS

-5.5 m RO-RO BERTH

S = 1/200

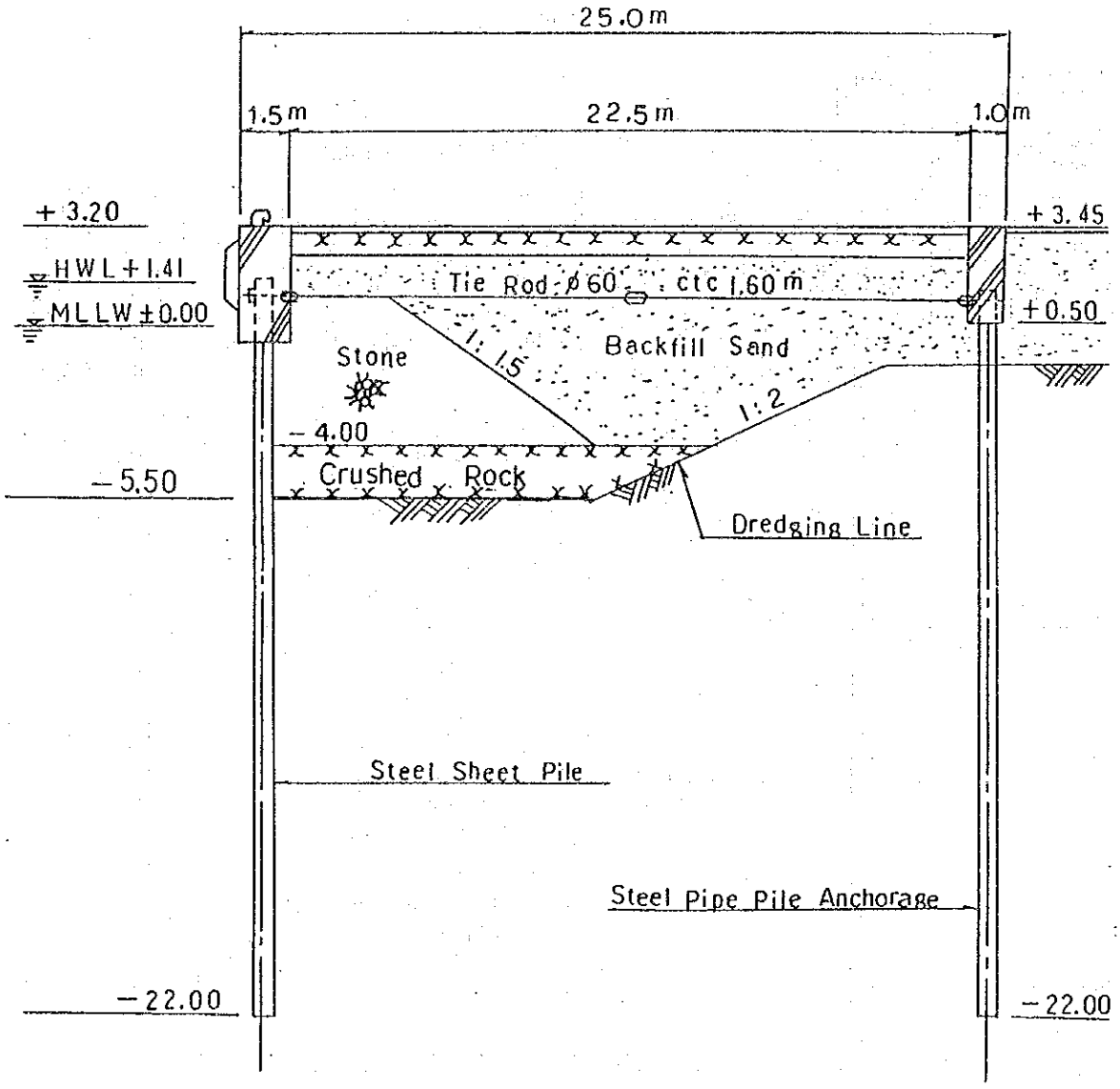


Figure 8-8 Typical Cross Section of -5.5m RO-RO Berth

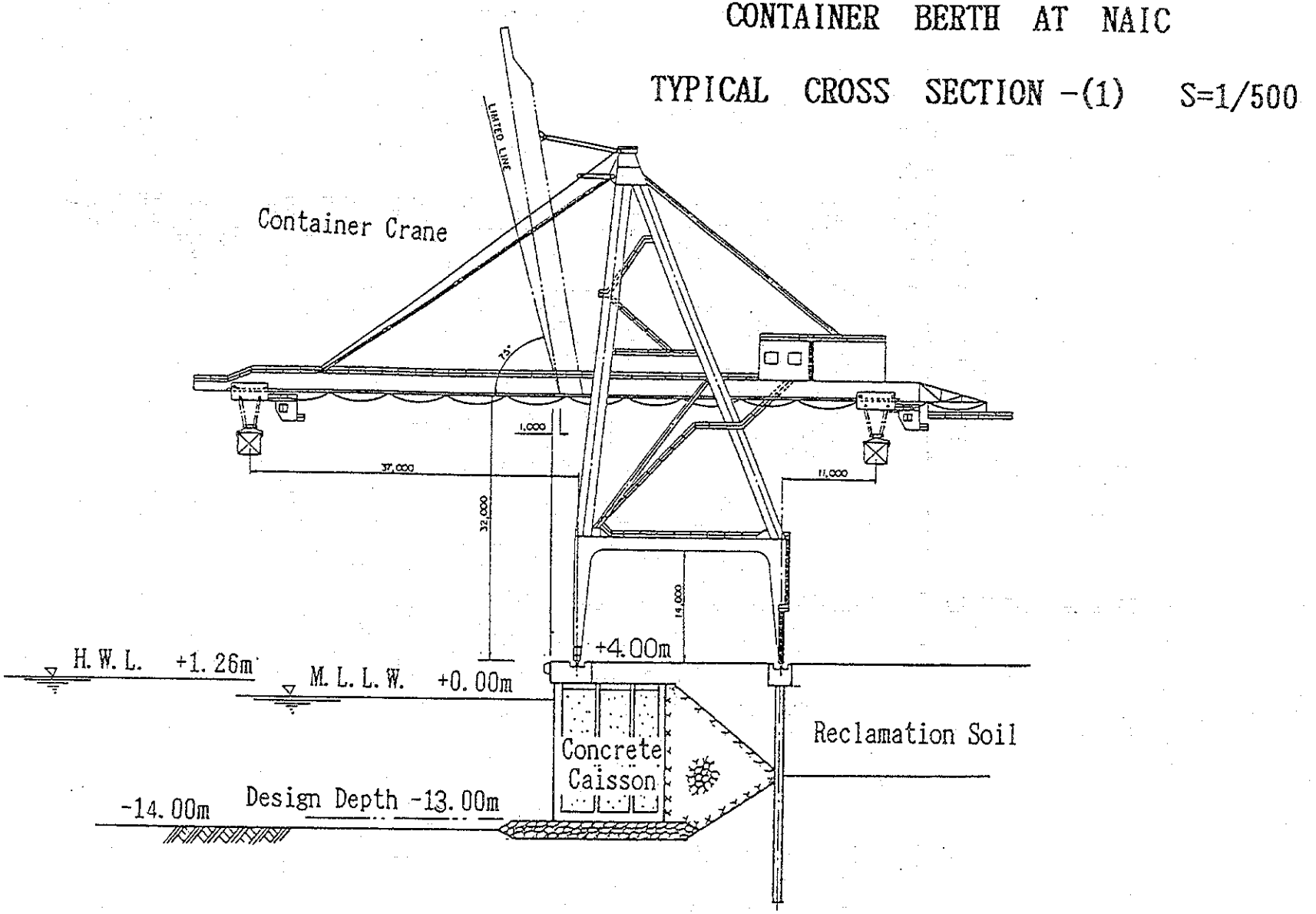


Figure 8-9 Typical Cross Section of -13m Container Berth

CONTAINER BERTH AT NAIC

TYPICAL CROSS SECTION -(2) S=1/200

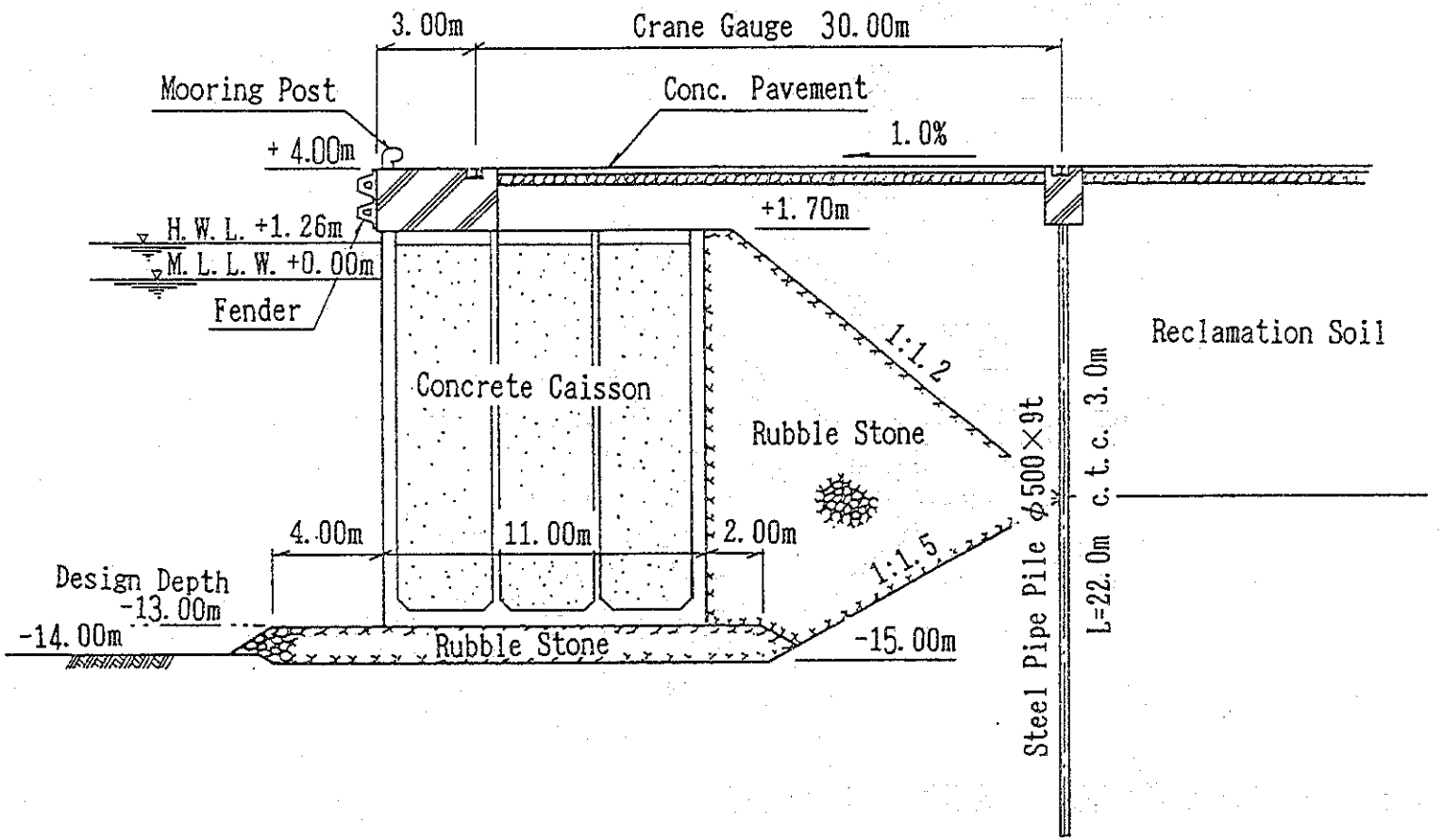


Figure 8-10 Typical Cross Section

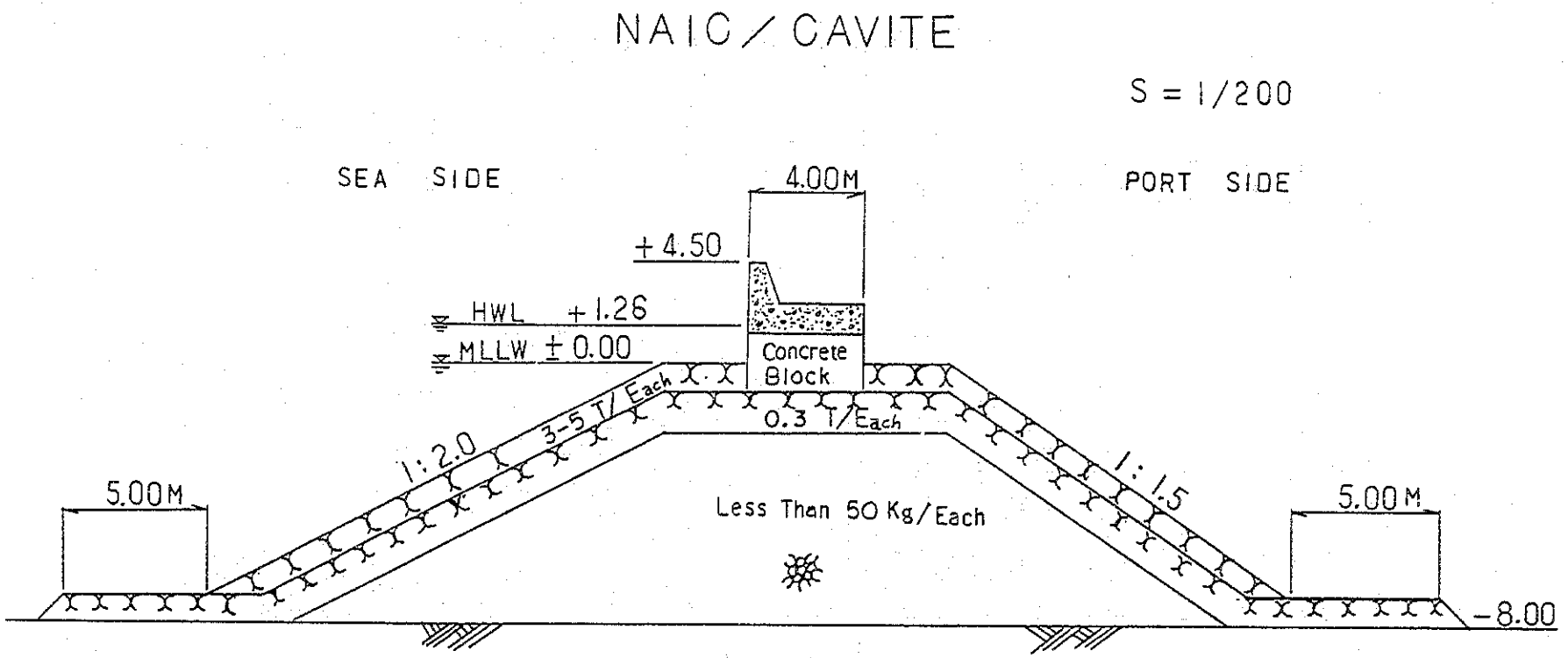


Figure 8-11 Typical Cross Section of Breakwater

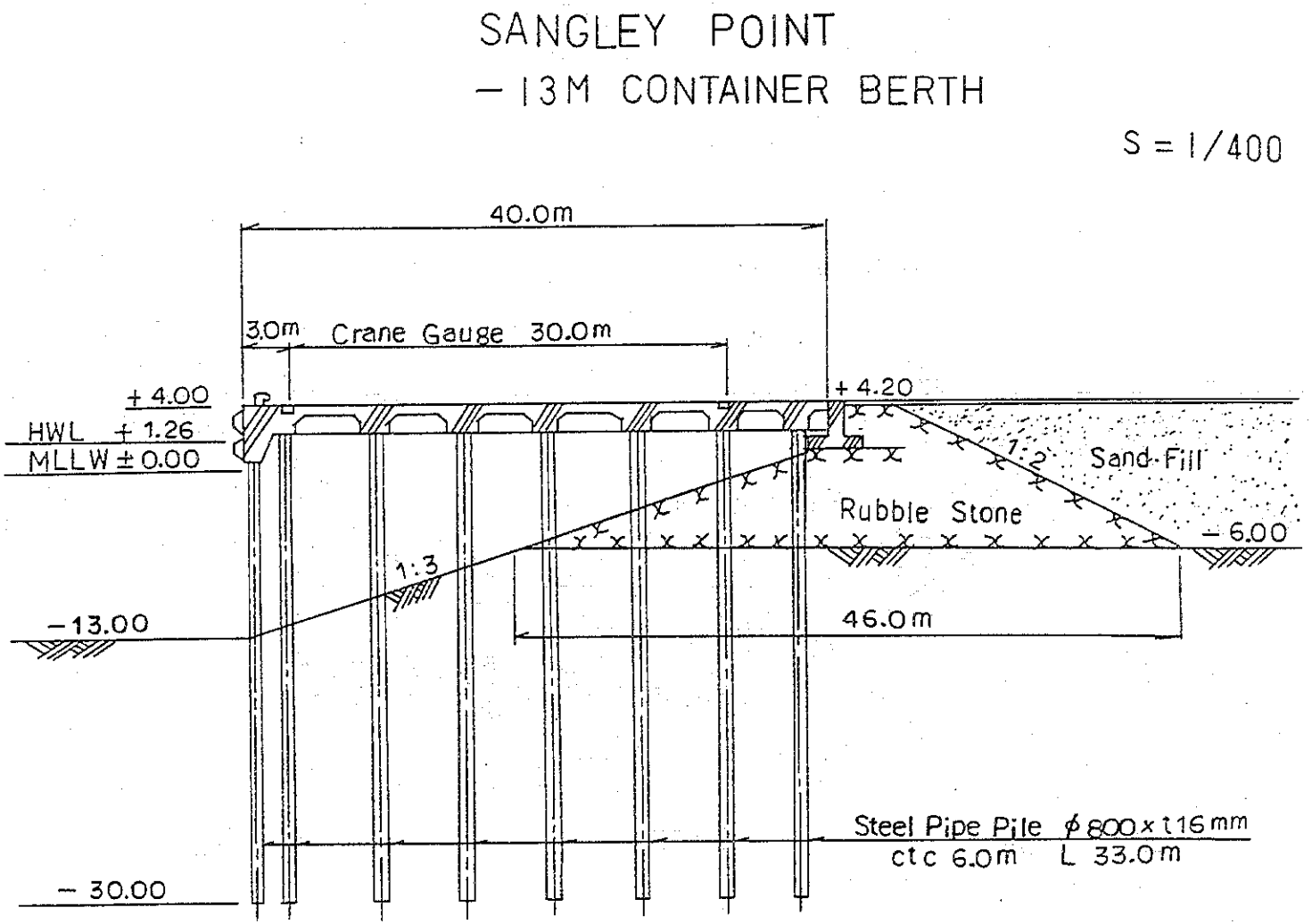


Figure 8-12 Typical Cross Section of -13m Container Berth

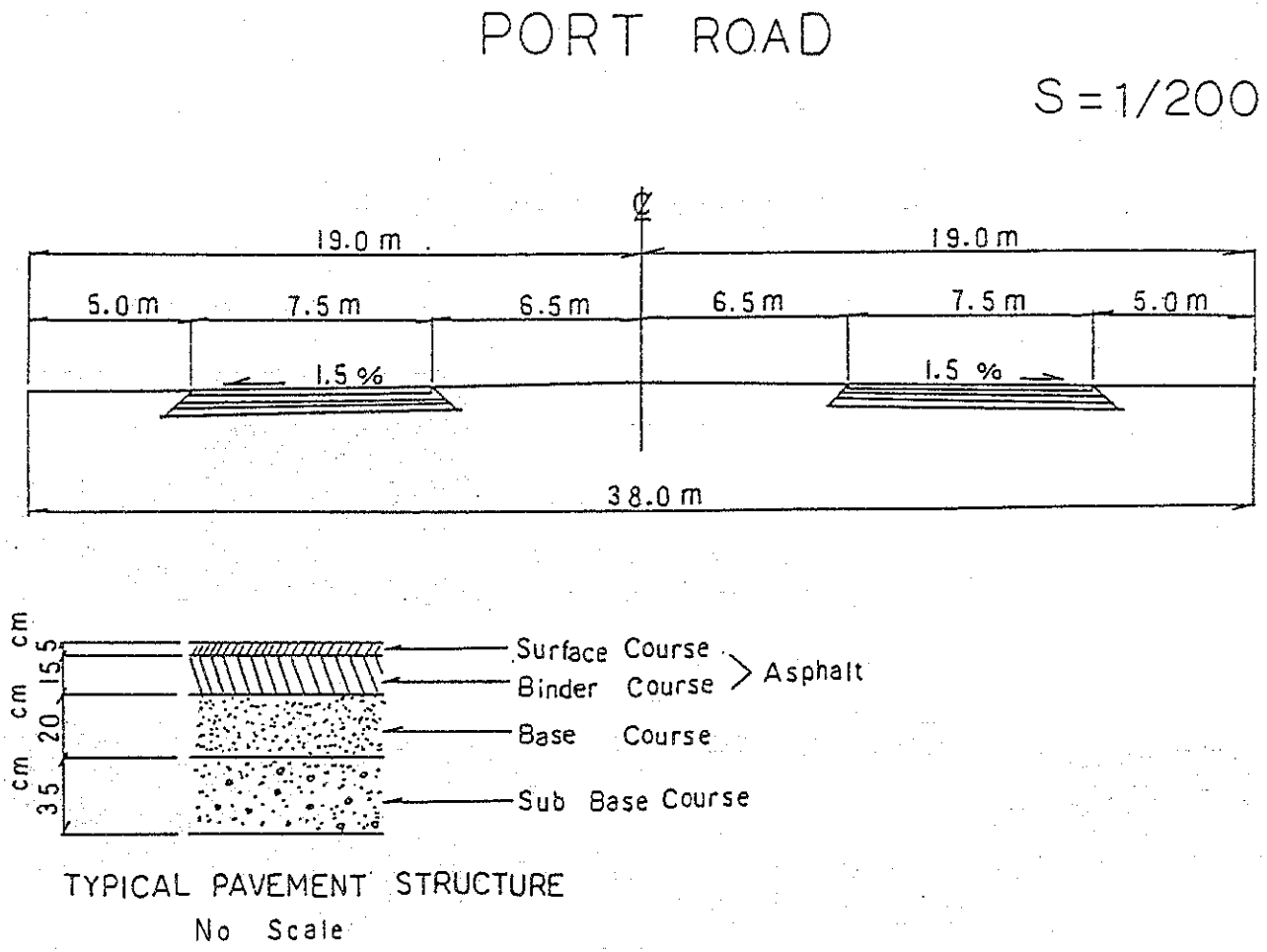
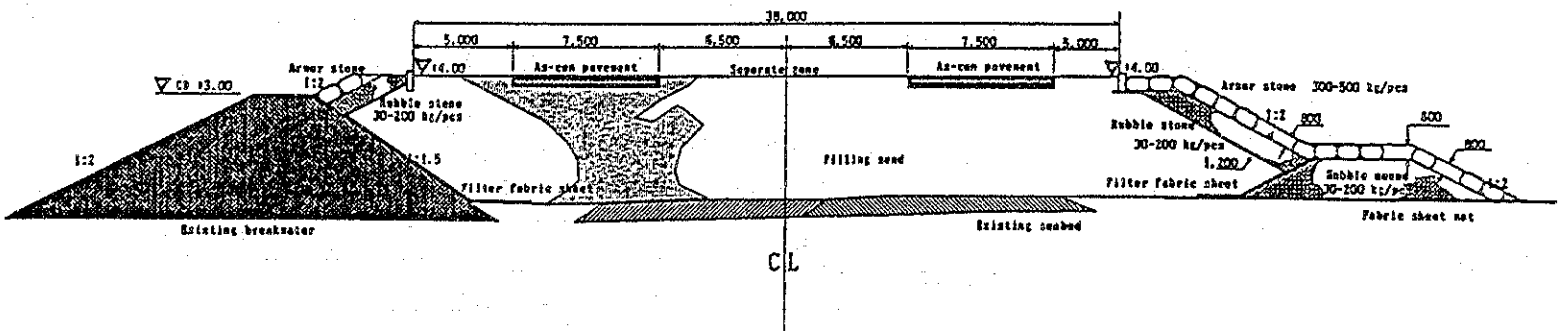
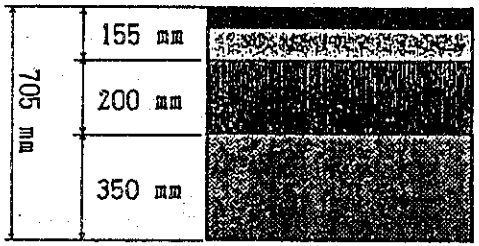


Figure 8-13 Typical Cross Section of Port Road

PORT ROAD & CAUSEWAY





Dense Asphalt Concrete
Corse Asphalt Concrete
Base Course
Sub-Base Course

TYPICALPAVEMENT STRUCTURE

Figure 8-14 Typical Cross Section of Causeway

CHAPTER 9 PRELIMINARY CONSTRUCTION PLAN, COST ESTIMATION AND LONG-TERM CONSTRUCTION SCHEDULE

9.1 General

During the second site survey period from 1st November to 15th December, 1993 the site visit and reconnaissance to proposed ports have been performed, namely port of Manila, Batangas, Subic, Mariveles, Sangley Point and Naic-Ternate coast of Cavite.

Data collection have been conducted simultaneously to the agencies and private companies concerned. The data for major construction equipment rental rates are collected mainly from ongoing project offices in GCR and the data for major construction materials are collected mainly at factories, quarries and production sites. Workers cost information is collected from engineering consulting companies and private contractors in Manila area. The information of land acquisition cost is obtained from provincial office of Cavite.

For the purpose of construction plan, maximum use of local products is encouraged in order to minimize importing material and plant and to stimulate local industries, if local products are applicable.

Regarding construction workers, skilled and unskilled workers are available in GCR but the crew and operator for heavy duty floating equipment will not be available.

Analyzing the result of data and information obtained from the first and second survey, viable construction plan of each proposed port for the long-term development plan of GCR port was made. Based on the construction plan, preliminary cost to construct the ports was estimated together with the long-term construction schedule.

9.2 Construction Plan

There are six ports proposed for the development of target year 2010, namely South Harbor, North Harbor and MICT in Port of Manila, Port of Batangas, Cavite/Naic and Cavite/Sangley Point.

9.2.1 South Harbor

For the construction planning of South Harbor, the data from natural conditions survey becomes very important due to soft soil condition of proposed -13 m container terminal area.

Two boring were carried out along existing east breakwater for exploration of soil conditions. According to the result of laboratory test, very soft layer exist up to -25 m.

The construction plan of Container Berth will be considered as follows;

(1) Trench excavation up to -13m
(2) Soil improvement works by sand compaction for indicated area of container terminal.
    Swelled existing cohesive soil brought about due to a compulsion replacement method shall be dredged and disposed at the designated offshore area.
(3) Installation of staging by rubble stone for Concrete Caisson mound.
(4) Installation of Concrete Caisson.
(5) Piling of steel pipe pile for the support of Container Crane.
(6) Backfill and pavement of apron.
(7) Remove existing east breakwater and reconstruction for joint portion of breakwater.
(8) Dredging up to -13 m for basin and channel.

9.2.2 North Harbor

Four boring were carried out along the both sides of existing breakwater, two points in MICT side and the other two points in the existing north harbor side. According to the result of laboratory test, very soft to loose layer exists up to -15 m.

The proposed construction area for -13 m container terminal is in the MICT side. The construction plan for MICT side will be explained in clause 9.2.3.

For the construction of -10 m container berth, following construction method shall be taken. The proposed site is at North Harbor side along the breakwater in North Harbor.

(1) Trench excavation up to -15m for the replacement of rubble stone
(2) Piling of P.C. piles for support deck structures.
(3) Replace by rubble stones and construct ruble mound.
(4) Concrete works for deck structures.
(5) Revetment by concrete blocks.
(6) Filter fabric sheet works and backfilling by sand.
(7) Apron works and fitting accessaries.

9.2.3 MICT

-13 m container berth will be proposed at MICT side, just behind of the proposed -10m container berth of North Harbor, along the breakwater in North Harbor. Based on the boring data of North Harbor, steel pipe pile open structure with stone replacement method is selected.

To prevent wave influences from NE direction, 400 m extension of existing breakwater is requested for No.4 berth construction necessary for economic high growth case. The construction of No.4 container berth and breakwater will be proceeded simultaneously.

The construction plan for container berth will be considered as follows;

(1) Dredging for basin and slope under apron area.
(2) Soil replacement works up to -15 m of indicated area by rubble stone.
(3) Piling of steel pipe pile for deck structure.
(4) Concrete works for super structure.
(5) Revetment works by rubble stone and back filling by sand.
(6) Pavement works and miscellaneous works.

The construction plan for Rubble Mound Type Breakwater will be considered as follows.

(1) Grab dredging for sand replacement of sand mat.
(2) Dumping sand and leveling for foundation
(3) Dumping stone and grading by diver
(4) Placement armor stone and grading, leveling by crane barge.

9.2.4 Port of Batangas

-10 m container berth and -5.5 m RO-RO berth will be proposed at western side of existing port facilities.

Based on the data of ongoing Phase-1 development project and JICA F/S report in 1985, same type of berth structure is selected for Phase -2, namely steel sheet pile type with steel pipe piles anchors.

For the construction of Phase -2 development project, dredging works is one of the important factors for construction schedule.

The construction plan for -10 m container berth will be considered as follows;

(1) -10 m dredging for proposed basin.
(2) Piling of steel sheet pile for quay structure.
(3) Piling of steel pipe pile for anchorage.
(4) Tie rod works for anchoring.
(5) Install crushed rock for foot protection of SSP.
(6) Back fill by rubble stone and backfill by sand.
(7) Concrete works of coping anchor and apron.
(8) Install crane rail, bollard and rubber fender.

9.2.5 Cavite/Naic

Three (3) berths of -13 m container terminal will be proposed at offshore area of Maragondon Point, Naic, Cavite.

According to soil condition at site, proposed area is medium to stiff sandy layer. The gravity type of concrete caisson is selected for quay structure.

To prevent wave influences from offshore, two breakwaters will be constructed, namely 820 m west breakwater and 1,200 m North breakwater.
Both breakwaters are rubble mound type. Channel dredging is requested up to -13 m.

The construction plan for container berth will be considered as follows;

(1) Predredging up to -16 m for caisson foundation.
(2) Placing and leveling of rubble stone for caisson mat.
(3) Install caisson to right position for fixing. Filling sand into the caisson and cover concrete.
(4) Piling of steel pipe pile for crane anchorage.
(5) Place rubble backing and filter fabric sheet.
(6) Backfill by reclamation soil.
(7) Concrete works of coping, anchor, apron and crane beam.
(8) Backfill by reclamation soil.
(9) Install crane rail, bollard and rubber fender.

Since dredging material at channel and basin consists of mainly sandy soil, the material can be used for the reclamation fill for the container terminal area (900m X 350m).

Prior to the reclamation works, concrete caissons and rubble mound for revetment shall be installed to fill dredged material.

A cutter suction dredger of 2000 to 4000 cutter horse power equipped marine and land pipeline will be recommendable for dredging and reclamation activities. Dredged material will be transported by pipelines and damped behind of installed caissons and rubble mound to construct a temporary dike before filling works up to formation level of reclamation area.

9.2.6 Sangley Point

-13 m container berth will be proposed at existing port area of Sangley Point.

Steel pipe pile open type structure is selected due to assumed soil condition.

Breakwater is not considered due to the proposed location in existing port.

Dredging for channel and basin are requested up to -13 m. Big volume of dredging are estimated.

The construction plan for container berth will be considered as follows;

(1) Remove existing old port facilities.
(2) Dredging up to -13 m for basin.
(3) Piling of steel pipe pile for super structure.
(4) Rubble stone mound works for revetment.
(5) Concrete works for coping and apron, etc.
(6) Backfill by sand.
(7) Install crane rail, bollard and rubber fender.

9.3 Cost Estimation

9.3.1 Preconditions of cost estimation

Project cost based on facility layout plan and the preliminary design of the objective ports in the master plan is estimated under the following precondition of cost estimation.

1) Exchange rate of currency
   US$ 1 = Peso 28 = ¥ 112 (Peso 1 = ¥ 4) as of December 1993
2) Physical contingency is estimated at 10 %
3) Engineering service is estimated at 5 %
4) Value added tax is estimated at 10 %
5) Inflation factor is excluded from the cost estimation
6) Land acquisition cost: The price of 6,000 Peso/sq.m is applied at Manila Ports Area. The estimated cost at Cavite and Sangley Point is based on the latest price list obtained from Cavite State Government.
7) Procurement such as cargo handling equipment and tug boat is assumed to be procured in Japan.
8) Import tax of the procurement above is exempted
9) Import and reexport taxes of construction plant & equipment procured from

abroad used for the construction works of the project are exempted under the condition of reexport.

9.3.2 Project Cost in economic medium growth case

The project cost in medium case for long-term construction plan (in case -13 m foreign container cargo terminal is constructed at MICT) is approximate 20.9 billion Peso as shown in Table 9-1.

In order to sellect a most suitable site for the construction of -13 m foreign container terminal, the construction cost at Manila South Harbor and MICT is estimated and compared. As the result, construction cost of port facilities is almost same as 9.72 billion. But connection road of 800 m to the existing high way is required at Manila South Harbor, and the construction cost including land acquisition and relocation of existing buildings will be approximately 400 million Peso. Therefore MICT is selected to construct -13 m foreign container terminal.

Table 9-1 Project Cost in medium case

Unit : Million Peso

Port / Cost Item	Manila South	MICT	Manila North	Batangas	TOTAL
Port Facilities	**353**	**4,783**	**4,687**	**461**	**10,284**
Dredging/ Filling	176	942	1,056	52	2,226
Wharf construction	0	2,403	1,329	91	3,823
Road / Pavement of	120	722	861	58	1,761
yard	0	300	651	10	961
Building works	47	186	245	43	521
Utilities / Electricity	10	230	545	207	992
Other works	**768**	**2,890**	**2,130**	**355**	**6,143**
Equipment	303	2,070	**1,844**	**221**	**5,410**
Indirect Cost					
TOTAL COST	**1,424**	**9,743**	**8,661**	**1,037**	**20,865**

9.3.3 Project Cost in economic high growth case

In order to decide most suitable site to construct additional 3 berths foreign container terminal, the project cost at Manila South Harbor, Naic/Cavite and Sangley Point is estimated. As the result, Manila South Harbor is selected to construct. The comparison of cost is shown in Table 9-2.

Project cost in economic high growth case based on facility layout plan and the preliminary design of the objective ports in the master plan is approximate 43.3 billion Peso as shown in Table 9-3.

Table 9-2 Comparison List for Project Cost of -13m, 900m long Container Terminal at Manila South, Naic/ Cavite, Sangley Point

Unit: Million Peso

Cost Item \ Ports	Manila South	Naic/ Cavite	Sangley Point	Reference MICT
1.Port Facilities	4,767	4,747	4,753	4,761
1) General Expenses	139	138	138	136
2) Dredging ('000cu.m)	(5,300)	(5,650)	(8,500)	(3,480)
	705	621	935	463
3) Filling ('000cu.m)	(1,600)	(3,700)	(500)	(2,509)
	304	152	21	477
4) Container Berth	1,944	817	2,268	2,403
5) Breakwater (l.m)	(1,100)	(2,020)	(0)	(0)
	48	548	0	0
6) Other Marine Works	441	521	67	79
7) Civil Works	1,186	1,950	1,324	1,203
2.Equipment	2,890	3,040	3,040	2,890
3.Indirect Cost	2,071	2,102	2,105	2,070
SUB TOTAL	9,728	9,889	9,898	9,721
4.Conection road	73	1,400	1,700	0
5.Land acquisition	240	2	27	0
6.Relocation cost	80	6	4,200	0
TOTAL PROJECT COST	10,121	11,351	15,825	9,721

Table 9-3 Preliminary Project Cost

(Million PEso)

Cost Item \ Ports	Manila South	MICT	Manila North	Batangas	TOTAL
Facility/Quantity					
Dredging ('000 cu.m)	5,300	5,020	8,630	790	19,740
Filling ('000 cu.m)	2,524	3,160	2,620	310	7,690
Container Berth (l.m)	3B,900	4B,1200	10B1,800	2B,330	4,230
Ro/Ro, Conven. Berth (m)	0	0	3B,660	2B,290	950
Revetment (l.m)	1,000	670	380	560	-
Breakwater (l.m)	1,100	400	0	0	2,310
Cause way (l.m)	1,850	0	5,970	500	8,320
Pavement (sq.m)	279,000	395,250	577,800	54,760	1,306,810
Building (sq.m)	27,000	36,000	99,000	1,600	163,600
Project Cost					
Port Facilities	5,120	6,458	7,429	954	19,961
Dredging/Filling	1,185	1,271	1,664	138	4,258
Container Berth	1,944	3,204	1,800	201	7,149
Ro/Ro, Conven. Berth	0	0	397	156	553
Other Marine Works	489	176	200	188	1,053
Road, Pavement	805	950	1,224	108	3,087
Building	300	400	1,084	20	1,804
Utilities, Other civil	397	457	1,060	143	2,057
Equipment	3,658	3,720	3,850	885	12,113
Conection road	73	0	0	0	73
Land acquisition	240	0	2,170	0	2,410
Relocation Cost	80	0	0	0	80
Indirect Cost	2,374	2,753	3,051	49	8,675
TOTAL Project Cost	11,545	12,931	16,500	2,336	43,312

9.4 Long-term Construction Schedule

Figure 9-1 shows Long-term Construction Schedule in economic medium growth case, where -13 m container terminal of 3 berths will be constructed at MICT.

The start operation in the Figure is set up according to the berth requirement of facility plan.

It is assumed the Detailed Design and the Tender Documentation for engineering services will take two years for the project of each port which is a standard term.

Port / Item	Quantity	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	TOTAL	Remarks
DETAILED DESIGN AND TENDER DOCUMENT		North		South		MICT		Batangas											▲ Start of D/D
I MANILA SOUTH HARBOR																			● Start of operation
Filling works	924,000cu.m					88	88											176	
Pavement/Utilities	80,000sq.m					67	100											167	
General Expenses						5	5											10	
Cargo Handling Equipment	Straddle 15unit					384	384											768	
COST Direct Cost						544	577											1,121	
COST Indirect Cost				15	15	132	141											303	
COST TOTAL COST				15	15	676	718											1,424	
II MANILA NORTH HARBOR																			
-10 m Container Berth	6 berths			270	270		90	90		90	90		90	90				1,080	
-9 m Ro/Ro Berths	2 berths							51	51			74	74					250	
Dredging	4,200,000cu.m			173	173	40	40	40	40	26	27							559	
Filling	2,620,000cu.m			100	100	75	72	25	25	25	25	25	25					497	
Other Marine Works				115	114													229	
Pavement / Road	389,000sq.m			140	140	60	60	40	40	75	40		74	40				709	
Buildings	59,400sq.m			163	163		54	54		54	55		54	54				651	
Other Civil Works				54	54	165	165	18	18	33	18		33	18				576	
General Expenses				30	30	10	13	10	7	9	7	3	10	7				136	
COST CARGO HANDLING EQUIPMENT				534	533		178	177		178	177		176	177				2,130	
PORT FACILITIES				1045	1044	350	494	328	181	312	262	102	360	209				4,687	
INDIRECT COST		103	103	350	350	92	160	125	57	122	111	40	132	99				1,844	
TOTAL PROJECT COST		103	103	1929	1927	442	832	630	238	612	550	142	668	485				8,661	
III MICT																			
-13 m Container Berth	3 berths							267	267	267	267	267	534	267	267			2,403	
Dredging/Navigation Aids	3,480,000cu.m							78	78	78	46	46	48	46	46			466	
Filling	2,509,000cu.m							60	60	60	60	60	60	58	58			476	
Pavement/Road	350,745sq.m							80	80	80	80	80	160	80	82			722	
Buildings	27,000sq.m								50	50		50	50	50	50			300	
Other Civil/Marine Works								72	45	45	45	45	74	45	45			416	
COST Equipment									370	520	370	370	520	370	370			2,890	
Facilities								557	580	580	498	548	926	546	548			4,783	
Indirect Cost						117	117	146	228	260	211	222	333	220	221			2,075	
TOTAL						117	117	803	1178	1360	1079	1140	1779	1136	1139			9,748	
IV BATANGAS																			
Port Facilities										168	293							461	
Equipment										142	213							355	
Indirect Cost									16	82	123							221	
TOTAL									16	393	628							1,037	

Figure 9-4-1 Long-Term Construction Schedule

CHAPTER 10 INITIAL ENVIRONMENTAL EXAMINATION (IEE)

10.1 Review of Present Environmental Condition

The result of the test of water quality concerned with Dissolved Oxygen (DO) and PH conducted by the Study Team at Port of Manila and the offshore of Maragondon Point satisfies the Water Quality Criteria (DO: Minimum 5.0 mg/l, PH: 6.0 ~ 8.5). In addition, according to the Annual Report (Air Quality Monitoring Section, DENR Region Office IV), air quality in Metro Manila also satisfies the standards (Under 0.14 ppm per 24 hrs.).

Therefore, water and air quality of above items seems to be fairly good. On the other hand, sea water turbidity (especially SS: Suspended Solids) seems to be bad, specially near the mouth of Passig River because the river flows into the Port of Manila with the sewage from houses, offices and factories which contributes to water pollution. Further-more, there is a offensive odor around the Smokey Mountain nearby North Harbor which is a disposal site for Metro Manila's waste. Behind the port area of the North Harbor where the Marcos Road runs along the wharf, many settlers live on one side of the road. This area is always very crowded with cars, cargo trucks, container trucks, jeepneys and people including passenger near the entrance of the wharf gate.

Many settlers also live in the port area such as existing breakwater at North Harbor and South Harbor.

Considering the above present environmental condition, the degree of impacts on environment such as water and air quality around the port area may depend on not only port development but also on the delay of adjusting social infrastructure.

10.2 Initial Environmental Examination

Initial Environmental Examination (IEE) is to grasp possible environmental impacts associated with development projects based on existing materials and the results of field survey, and to determine if Detailed Environmental Impact Assessment (EIA) would be needed. When Detailed EIA is necessary, IEE will also clarify for which environmental items a detailed investigation is needed. This procedure is known as scoping.

Therefore, in the area of required new port facilities in the ports of the master plan, the Study Team conducted the examination of the factors and the degree of impacts to environment using the Check List.

10.2.1 Initial Environmental Examination

The Check List for the IEE is shown in Table 10-1. This Table also shows the result of the impact size of the IEE including evaluation of five(6) ports (South Harbor, North Harbor, MICT, Sangley Point, Naic/Ternate New Port and Port of Batangas). According to Table 10-1, main items to be dealt with in the stage of EIA are as follows:

(1) Water Pollution

It is necessary to deepen/widen the present/new approach channel and turning basin for the forecasted large vessel size. Therefore, the dredging area shall be expanded and the volume of dredged soil shall be large. In this case, countermeasures to reduce impact on water quality should be taken at all ports.

(2) Air Pollution

Air pollution, impacts from construction works and the stage of operations related to port activities such as vehicle traffic, cargo handling equipment etc. in accordance with the increasing cargo volume, will be also important matters for environmental consideration at all ports.

(3) Generation of Noise and Vibration

The environmental impact of noise and vibration will be important matters as well as air pollution at all ports.

(4) Impact on Coastal Current

Emergence of new reclamation in front of shoreline at Naic/Ternate might produce effect on coastal current. Further-more, the changes in coastal currents might lead to coastal erosion and accretion.

In this case, countermeasure to minimize the impacts on coastal erosion and accretion must be carefully taken into consideration.

(5) Socio-economic Impact

a. Relocation of settlers

Relocation of settlers is a very important matters for the master plan at Port of Manila. Therefore, it is necessary to take the sufficient countermeasures for the relocation of settlers at an early stage.

b. Increase in employment opportunities

At Naic/Ternate, impact on employment will be large due to the new port.

c. Evaluation of tourism resources

At Naic/Ternate, it is necessary to take into consideration for the tourism resources because there is good beach far from proposed New Port.

(6) Other Problems

a. Congestion related to port activities

In accordance with increasing cargo volume, generated traffic volume related to the port activity will be large. Therefore, it is necessary to make a sufficient examination of the layout plan of road function such as access road.

b. Keeping the disposal place for dredged soil

To minimize the surplus dredged soil, it is necessary to balance the dredged soil volume and the required volume for reclamation at the stage of the master plan. In case of generation of further surplus dredged soil, it is better to keep the disposal area for dredged soil at the stage of the master plan.

On the other hand, environmental impacts on the items below from the new port facilities in the master plan in GCR are judged to be small or non-existent at all ports.

1) Impacts on aquatic or coastal ecosystem of fauna and flora will be small.

2) Impacts on historical and cultural heritage will be negligible.

3) Impacts on fishery resources will be small at Sangley Point and Naic/Ternate New Port because an area within Sangley Point is now used for oyster farming but the entire area of Sangley Point is used for port and air facilities of the Philippine's Naval Base. Further more, the proposed water area of Naic/Ternate New Port is now used by only a small number of fishermen with small boats. And these inland area is used for the fish pond. But the proposed access road is planned at the edge of the fish pond.

4) Impacts on Landscape

Impacts on landscape will be small because of the usually structure build up on the reclaim such as warehouse, gantry crane, office structures. Therefore, it is almost not considered that the new port facilities interrupt or break the present scenery at these area.

5) Others

There are no impacts from handling of hazardous material, waste treatment and disposal, industrial production activities and operation of recreational facilities because planned facilities are exclusively for containers and general cargo.

10.2.2 Major Result of IEE

In the proposed project site, there is no special environment which must be preserved because these port sites have already been developed over a long period of times except Naic/Ternate New Port.

Major results of IEE at each stage are as follows:

(1) Planning Stage

a) Relocation Ploblem

A new foreign/domestic container and RO/RO terminal are planned along the existing breakwater and at the Smokey Mountain Development and Reclamation Project Area respectively. Many settlers live on the port area such as existing breakwater at North Harbor and South Harbor. Therefore, in an early stage of this project, it is necessary that the suitable countermeasure for the relocation of settlers should be taken under the careful cosiderations.

b) Change in coastal current

New reclamation in front of the shoreline at Naic/Ternate New Port (selected port as an alternative of High Case) might affect the coastal current. Further-more, the changes in coastal currents might lead to coastal erosion and accretion. Thus, when the detailed design is examined, the degree of erosion and accretion must be ascertained by

means of a current simulation program and so on.

(2) Construction Stage

a) Water quality

As the volume of dredged soil is expected to be large at each port (Port of Manila, Alternative Ports, and Port of Batangas), it is necessary that countermeasures to reduce impact on water quality (especially SS) are taken using silt protector and so on.

b) Air quality

To minimize the air pollution from construction machines, it is important to select and combine suitable construction machines.

c) Noise and Vibration

To minimize the generation of noise and vibration from construction machines, it is important to select and combine suitable construction machines such as lower noise and vibration machines.

(3) Operation Stage

Environmental impacts from port activity is judged to be small. But, in order to keep the port and the area around the port in good condition, monitoring, suitable countermeasures and regulation on environment must be continuously conducted.

Before the selected project is implemented, it is necessary that the detail Environmental Impact Assessment (EIA) Should be examined at the early stage of the project

Table 10-1 Initial Environmental Examination (IEE)

Environmental impact factors	Environmental impact	Size of impact (check appropriate boxes)			
		No	Small	Moderate	Major
1. Impact from construction works					
1.1 Operation of working boats, construction machines	1.1.1 Air pollution		X		
	1.1.2 Generation of noise/vibration		X		
	1.1.3 Changes in terrestrial ecosystem	X			
1.2 Dredging, stirring of bottom soil, soil dumping into water	1.2.1 Pollution of water and bottom sediments (SS, hazardous materials)				X
	1.2.2 Offensive odor	X			
	1.2.3 Reduction of aquatic lives		X		
	1.2.4 Pollution of marine products		X		
	1.2.5 Devaluation of tourism resources (water color, coral reef)	X			
1.3 Soil removal	1.3.1 Changes in topography, underground water system	X			
	1.3.2 Extinction of terrestrial ecosystem	X			
1.4 Generation of surplus soil, wastes, dumping of dredged soil on ground	1.4.1 Pollution of water/bottom sediments			X	
	1.4.2 Impact on terrestrial ecosystem		X		
1.5 Employment of laborers	1.5.1 Inflow of alien cultures	X			
	1.5.2 Change in economic activities			X	

Environmental impact factors	Environmental impact	Size of impact (check appropriate boxes)			
		No	Small	Moderate	Major
1.6 Congestion of work vehicles and boats	1.6.1 Economic loss (traffic jam)		X		
	1.6.2 Devaluation of fishing ground		X		
2. Impact from port facilities and site					
2.1 Emergence of site (including landfill)	2.1.1 Pollution of water and bottom sediments		X		
	2.1.2 Beach erosion and accretion		X		
	2.1.3 Changes in coastal currents		X		
	2.1.4 Decrease of habitats for aquatic lives		X		
	2.1.5 Decrease of habitats for terrestrial lives	X			
	2.1.6 Change in scenic beauty	X			
	2.1.7 Resettlement of local residents and culture		X		
	2.1.8 Extinction of fishing grounds		X		
2.2 Emergence of external facilities	2.2.1 Pollution of water and bottom sediments	X			
	2.2.2 Beach erosion and accretion		X		
	2.2.3 Change in coastal current		X		
	2.2.4 Decrease of habitats for aquatic lives		X		

Environmental impact factors	Environmental impact	Size of impact (check appropriate boxes)			
		No	Small	Moderate	Major
	2.2.5 Change of scenic beauty	X			
2.3 Emergence of sea route	2.3.1 Change in coastal currents		X		
	2.3.2 Decrease of habitats for aquatic lives		X		
2.4 Emergence of anchorage	2.4.1 Change in coastal current	X			
	2.4.2 Decrease of habitats for aquatic lives	X			
3. Impact from utilization of facilities in water area and anchorage					
3.1 Impact from boats	3.1.1 Air pollution		X		
	3.1.2 Water pollution (bilge)		X		
	3.1.3 Beach erosion caused by furrow wave	X			
	3.1.4 Generation of wastes (dredged material included)		X		
	3.1.5 Obstruction to fisheries activities	X			
4. Impact from cargo loading and utilization of storage facilities					
4.1 Cargo loading activities and utilization of storage facilities	4.1.1 Air pollution (dust)	X			
	4.1.2 Pollution of water and bottom sediments	X			
	4.1.3 Generation of noise	X			
	4.1.4 Generation of offensive odor	X			

Environmental impact factors	Environmental impact	Size of impact (check appropriate boxes)			
		No	Small	Moderate	Major
	4.1.5 Change in coastal ecosystem	X			
	4.1.6 Generation of wastes	X			
	4.1.7 Employment effect		X		
5. Impact from operation of facilities handling hazardous materials					
5.1 Operation of oil distribution base and facilities handling hazardous materials	5.1.1 Air pollution	X			
	5.1.2 Pollution of water and bottom sediments (oil)	X			
	5.1.3 Generation of offensive odor	X			
	5.1.4 Change in coastal ecosystem	X			
	5.1.5 Change in terrestrial ecosystem	X			
	5.1.6 Decrease in amount of agricultural products, fisheries products and price	X			
6. Impact from waste treatment and disposal					
6.1 Operation of waste treatment/facility	6.1.1 Air pollution	X			
	6.1.2 Pollution of water and bottom sediments	X			
	6.1.3 Generation of offensive odor	X			
	6.1.4 Change in coastal ecosystem	X			
	6.1.5 Change in terrestrial ecosystem	X			

Environmental impact factors	Environmental impact	Size of impact (check appropriate boxes)			
		No	Small	Moderate	Major
6.2 Impact from waste disposal facility	6.2.1 Air pollution (dust)	X			
	6.2.2 Pollution of water and bottom sediments	X			
	6.2.3 Generation of offensive odor	X			
	6.2.4 Change in coastal ecosystem	X			
	6.2.5 Change in terrestrial ecosystem	X			
	6.2.6 Formation of slums	X			
7. Impact from traffic function					
7.1 Road traffic	7.1.1 Air pollution			X	
	7.1.2 Generation of noise/vibration			X	
	7.1.3 Change in terrestrial ecosystem	X			
	7.1.4 Change in local population distribution		X		
	7.1.5 Traffic jam/accidents		X		

Environmental impact factors	Environmental impact	Size of impact (check appropriate boxes)			
		No	Small	Moderate	Major
8. Impact from industrial production activities					
8.1 Operation of factories and plants	8.1.1 Air pollution	X			
	8.1.2 Pollution of water/bottom sediments	X			
	8.1.3 Generation of noise/vibration	X			
	8.1.4 Generation of offensive odor	X			
	8.1.5 Ground subsidence	X			
	8.1.6 Change in coastal ecosystem	X			
	8.1.7 Change in terrestrial ecosystem	X			
	8.1.8 Generation of wastes	X			
	8.1.9 Change in local population distribution	X			
	8.1.10 Employment effect	X			
9. Impact from distribution and storage functions					
9.1 Storage functions (including outdoor storage)	9.1.1 Air pollution (dust)	X			
	9.1.2 Pollution of water and bottom sediments	X			
	9.1.3 Generation of offensive odor	X			
9.2 Cargo handling	9.2.1 Generation of noise	X			

Environmental impact factors	Environmental impact	Size of impact (check appropriate boxes)			
		No	Small	Moderate	Major
	9.2.2 Employment effect		X		
10. Impact from operation of recreational facilities					
10.1 Utilization of hotels, marinas, artificial beaches	10.1.1 Pollution of water and bottom sediments	X			
	10.1.2 Change in coastal ecosystem	X			
	10.1.3 Generation of wastes	X			
	10.1.4 Inflow of alien cultures	X			
	10.1.5 Employment effect	X			
	10.1.6 Obstruction to fishing activities	X			

CHAPTER 11 MANAGEMENT AND OPERATION

11.1 Basic Policy of Management and Operation

11.1.1 Current Port Projects for Modernization in GCR

Second Manila Port Project financed by the Asian Development Bank is now under way to improve port efficiency because ports facilities (wharves, sheds and so on) in the Port of Manila have become too old for use and North and South Harbors was in need of immediate rehabilitation.

The development project financed by OECF is also under way in the Port of Batangas, though it is now suspended due to the relocation problem.

Feasibility Study of Manila Grain Terminal by USAID has already been completed and the completion of this terminal is now being considered by the way of BOT (Build-Operate-and-Transfer) Scheme.

11.1.2 Modernization for Port Management and Operation

It is important for the Ports in GCR to modernize and rehabilitate their facilities. And most important of all is the modernization of port management and operation for further development of the Ports in GCR.

The substantial benefits which arise from the renovated ports will be lost if there are problems in the managing and operating systems of the Ports.

11.1.3 Rapid Development of Containerization

'Containerization' dictates port management and operation to be modernized rapidly.

This world-wide development of containerization not only brings about mechanization and rationalization of loading and unloading by way of unitizing cargoes in each port, but door-to-door forwarding by the extended intermodality of shipping.

At present, international container cargo is mainly handled at the Port of Manila, but in the future, container cargo will be very common at almost all ports in GCR.

And competitiveness among ports around the world has been intensified by this development of containerization.

Through this wave of containerization, major shippers, consignees and agents urge

port authorities to modernize their port facilities.

Unless PPA tries to modernize its ports, they will fall behind in this movement toward which is most remarkably observed in South-East Asia, the Philippine economy will be damaged severely.

11.1.4 Management and Operation of a Container Terminal

Management and Operation demanded by containerization includes the following points;

(1) Effective forwarding system
(2) Improvement of storage system including the adoption of computer system
(3) Improvement of port management system covering whole port including safety control

11.1.5 Focus of ports in GCR

What focus of ports in GCR based on the above mentioned points?

Generally speaking, 1) Unified Administrative Body , 2) Improvement of Port Efficiency, 3) Provision of Services at Reasonable Charges, 4) Safe and Accurate Flow of Cargo, 5) Soundness of Port Finance and so forth are the key words of port modernization on management and operation.

Any default of these key words leads to bottlenecks, which prevents port users benefitting from other improvements.
In addition, that default will lower the other standards and cause port users financial losses.

The following are important elements of port administrative body for attaining these whole key words.

(1) A suitable form and structure for port management
    1) Autonomy
    2) Authority over whole port area and main port functions
    3) financial independence
    4) commercial-minded
(2) Efficient port management and accurate port statistics
(3) Sound financial organization
(4) Regional cooperation with neighboring ports

The target of ports in GCR is to attain the above mentioned elements collectively and concretely. PPA, which is the administrative body of public ports in GCR, has not yet attained all elements, but some of them have been attained.

In addition to urgent need for implementation of these elements, the relocation problem in port areas in GCR has to be solved urgently from the view point of socio-economy.

11.2 Modernization of Port Management and Operation

11.2.1 Current Problems of Management and Operation

Various reports, recommendations and consultations have already pointed out management and operation problems of the Ports in GCR administered by PPA. Although some of them have been solved, many problems requiring urgent countermeasures still remain.

(1) Major problems (except MICT)

1) Inadequate linkage between loading/unloading areas and the sheds, and decreasing efficiency by decrepit facilities and poor maintenance
   a. Cargo forwarding is not smooth because of inadequate linkage from apron to sheds.
   b. Although the rehabilitation of North Harbor has provided additional operating areas, the port is still experiencing limited storage/stacking area.
   c. Inadequate and inefficient cargo handling equipment prevents cargoes from being loaded/unloaded immediately to/from vessels/trucks.
   d. Most cargo handling equipment in use suffers from old age.
   e. Reduced efficiency such that their lifting capacity is impaired.
   f. They are no longer fuel-efficient and suffer from maintenance problems because of frequent breakdowns.
   g. Insufficient number of cargo handling equipment deployed.
   h. Inadequate or obsolete cargo handling equipment is used.

2) Lack of uniformed rates of loading/unloading fee and storage fee
   a. Shipping companies and agents complain about them.

3) Traffic congestion in the Ports' zone and the major thoroughfare to the Ports
   a. Clogged entry and exit points. Heavy traffic at R-10 Road causes delay in the exit of cargoes from the port zone while those coming in are stalled at the major thoroughfares leading to North Harbor
   b. Absence of adequate motorpools
   c. No demarcation between trucks or other vehicles and passengers

4) Inadequate loading/unloading of dangerous cargoes and lack of safety for portworkers
   a. Lack of safety measures for portworkers. (No hard hats, gloves etc.)
   b. Need of temporary dangerous cargo area inside the port.
   c. Lack of firefighting equipment

5) Lack of operational skill-training among majority of portworkers
6) Inadequate indication of fairway and lack of navigational aids
7) lack of adequate dredging of fairway
   a. lack of efficiency and capacity of dredgers owned by both PPA and the private sector
8) Port Safety Rules and Regulations not being strictly complied with
9) Weak monitoring and control system as to the implementation of Port Safety Rules and Regulations
10) Decline in port efficiency owing to sunk-ships and abandoned-ships not being removed
11) Need for environmental protection of ports

(2) Approval of 'Recommendations' Proposed by PPATC during the 16th Port Executive Conference held at the Subic Bay Port Complex on November 10-12, 1993.

During the conference, three recommendations presented by the PPA Training Center (PPATC) were approved. In order to improve safety and environmental problems in the Ports, these recommendations should be put in practice swiftly.

Principal advocate of the Central Safety Committee on Ports and Harbors (CSCPH),

which will plan, integrate, coordinate and monitor all safety, security and environmental management projects, programs and activities of all ports and harbors in the Philippines.

The 'Recommendations' state the following.

"Revival and institutionalization of the Central Safety Committee of Ports and Harbors with Local Chapters in the PDO and PMO levels encompassing the greater concerns of Safety namely operational safety, Port and cargo security and the environmental management of ports."

The second is the national and local adaptation, revision and implementation of global laws, guidelines and procedures on operational safety.

The 'Recommendations' state the following.

"National and local adaptation revision and implementation of global laws, guidelines and procedures on Operational Safety Security and Marine Pollution Control."

The third is the upgrading of key qualifications and competence of safety officers in the port.

The 'Recommendations' state the following.

"To upgrade the key qualifications and competence of Safety Officers in the Port by requiring them to undergo the 5-day TRAINMAR course entitled 'Operational Safety and Environmental Protection in the Ports.' "

11.2.2 Recommendation on Management and Operation for Containerization

In this section, management and operation for containerization will be considered. Containerization will develop rapidly in GCR in the near future.

(1) Key points for containerization in the Ports of GCR

In order to cope with containerization, key points for terminal operation are the following;

1) Establishment of adequate set-up and operational procedures for container terminal
2) Build-up of container information system
3) Improvement of container handling fee and mechanical repair and maintenance skill

(2) Establishment of adequate set-up and operational procedures for container terminal

Generally speaking, it is preferable for a container terminal to be managed and operated by a shipping company preferentially or exclusively from the view point of its efficiency. However, there are so few container berths in the Philippines at this time that they should be used openly. But in proportion to the expansion of container berths, preferential use or exclusive use should be considered in near future.

1) Adequate set-up for container terminal

a. Restriction of exclusive usage

From the view point of initial investment, it is clearly preferable for the port authority that container terminal is constructed and operated by the private sector just like ICTSI. Both construction cost of modern terminal and purchase cost of expensive facilities will be supplied by the private sector. The port authority does not need to issue bonds or get a loan.

In this scheme, the important thing is that the port authority should prepare for the effective preventive measures against the monopolistic usage by the particular private entity.

Container berths of the Ports administered by PPA in GCR should be used rationally at the same time by all ships regardless of which shipping companies then belong to.

MICT is now managed and operated by International Container Terminal Service, INC. (ICTSI). But PPA has the right to supervise. This scheme has lightened the PPA's financial burden, and this terminal is now operated rationally and effectively.

b. "WINDOW BERTHING SYSTEM, MICT" adopted by ICTSI

Rational berthing allotment is required for container terminal operation in order to keep on schedule. The following "WINDOW BERTHING SYSTEM" is highly appreciated from the view point of rational and effective operation without being occupied by a particular shipping company.

(WINDOW BERTHING SYSTEM)

a) The berthing window will be initially for lines with fixed weekly or monthly schedules and the berthing window will also be fixed on actual days and number of hours.

b) The shipping line must confirm 48 hours prior to arrival the exact time of arrival of the vessel.

c) A vessel must arrive within six hours of the start of a designated window. In the event that the vessel has not arrived after six hours, vessels will be serviced on a first come first served basis.

d) In the event that a vessel with a window berth arrives on time and the berth is occupied, the occupant of the berth will be given 4 hours into the window of the vessel with the designated window to complete operations.

e) The number of hours committed in a berth window will be adjusted according to the volume carried by the vessel, and the improvements in productivity in MICT.

f) For vessels that do not have a fixed schedule, temporary or per vessel window may also be arranged provided 7 days advance notice of exact time of arrival is given, provided further that the berth assignment does not overlap with the scheduled berth window.

g) For self-sustaining vessels that do not require the use of a shore crane, 3 days advance notice will be required to confirm a berth.

i) The terminal operator reserves the option to use the shore crane on self sustaining vessels, based on the terminal management's judgement of the requirement of operations.

2) Adequate operational procedures for container terminal

a. Simplification of all forms

Streamlined procedures are needed. The complex documentation procedures have to be eliminated. Excessively strict observance of regulations leads to the low productivity.

For instance, cargo storage procedures of a port administrative body including billing and cargo delivery in a port area have to be simplified as much as possible because the necessity of simplified cargo-delivery procedure is indispensable to containerization.

When it comes to the containerization in GCR, the terminal operating bodies of the Ports in GCR will need to implement streamlining of documentation and processing procedures in conjunction with the Bureau of Customs and the PPA.

b. Approval of Adopted IMO Forms by the Philippine Maritime Community

During the four-day seminar on the Facilitation of International Maritime Traffic (FAL) sponsored by the UN/ESCAP held at PPATC on November 1993, the adoption of six International Maritime Organization (IMO) FAL Forms which are the minimum documentary requirement on foreign ships were approved.

In addition, the dispensation with requiring foreign ships to present stowage plan and statistical supplement papers were also approved by the participants and they agreed to create a National Facilitation Committee (NFC) proposed by IMO, which will undertake a project on the use of electronic data interchange (EDI) for vessel clearance purposes.

From the above mentioned point of view, these series of improvements are highly appreciated.

(Six FAL Forms)

General Declaration / Cargo Declaration / Ship's Store Declaration / Crew's Effect Declaration / Crew List / Passenger List

NO	DOCUMENTARY REQUIREMENTS	PHIL	IMO
1	Maritime Declaration of Health	x	x
2	General Declaration	x	x
3	Inward Foreign Manifest Cargo Declaration	x -	- x
4	Ship's Store List	x	x
5	Crew's Effects Declaration	x	x
6	Crew List	x	x
7	Passenger List	x	x
8	Clearance from Last Port of Call	x	-
9	Oath of Master of Entering Vessel	x	-
10	NIL List	x	-
11	Stowage Plan	x	-
12	Copy of Bills of Landing	x	-
13	Statistical Supplement	x	-

(Source: SEMINAR REPORT, 15-18 November 1993)

(3) The Introduction of Computers into the Container Terminal Operations

1) The current situation on the computer system in the Port of Manila and PPA Office

a. North Harbor

The North Harbor, which aims at more active and expanded participation by the private sector in ports operations and services, is now under public bidding for privatization. The North Harbor will be integrated into three main terminals to be operated by one contractor each.

Under the terms of reference on this bidding, the major responsibilities of the winning Bidder shall be the following:

"The committed Information Technology based on the minimum requirements prescribed by PPA should be in place and implemented within 2 years from the start of the winning bidder's operation.

The systems expected to be included in the computerization program for North Harbor terminals are 'Cargo Information and Control', 'Vessel Information', and 'Billing and Collection."

(Source: PPA)

b. South Harbor

The P500 million rehabilitation of South Harbor by the PPA through ADB loan will be completed in this year. In accordance with this rehabilitation, Asian Terminals Incorporated (ATI), which is the exclusive cargo handling contractor, is embarking on a massive computerization program at its own cost. This program is designed and implemented for accounting, billing and terminal control operations.

Preceding this, agreement on the streamlining of cargo documentation procedures had been reached in the following area among ATI, the Bureau of Customs (BOC) and the PPA:

- there will be no further direct involvement by BOC wharfingers in endorsing or signing any document at the various piers/terminal offices
- PPA shall collect wharfage payment first before ATI will entertain any transaction for arrastre/storage billing
- there will be no further direct involvement by PPA terminal personnel in endorsing or signing any cargo release document at the various piers

(Source: ATI)

c. MICT

MICT is managed and operated by ICTSI, which has the Electronic Data Processing (EDP) System consisting of the following:

- Yard and Vessel Operations System

  "the Container Location and Information System (CLIF)"

  This on-line inquiry system gives required information as to general container information, location, shifting. Through program subsystems, the CLIF also provides equipment and operator productivity, yard space utilization, container aging, the Import Module, the Export Module, and the vessel planning module

- Inventory System

  This system is designed to monitor the movements of 7000 line items of spare parts. Using the moving average for costing and the perpetual inventory method for monitoring stock positions and re-order points.

- Container Freight Station System

  Similar to the CLIF system for the yard, the CFS system keeps track of loose containerized cargo within the LCL warehouse.

- Vehicle and Equipment Maintenance

  The system keeps track of acquisition. It produces a report on the spare part source and the mechanics that worked on the vehicle. It also is able to produce a record of downtime and idle hours. A fuel monitoring system is also attached to the module.

(Source: ICTSI)

d. PPA Office

Operational and financial information of South Harbor will be given by ATI in the form of ASCII file transfers on a regaular basis.

A PPA's management information systems (MIS) component has been included in the Second Manila Port Project.

However MIS has not yet been computerized and suspended because of the Commission on Audit (COA) in regard to the following:

a) Certain cost components provided for by the Project but which the COA feels are not acceptable

b) Possible duplication of the Project's Billing and Collection System with the DBM-COA project on a standardized Accounting System for Government-owned and Controlled Corporations (GOCCs).

2) Developing steps of computerization and automatization

Generally speaking, the manual limitation of planning, management and documentation on a container terminal is about 60,000 TEU a year.

It is indispensable for a terminal which handles over 60,000 TEU a berth a year to introduce the computer system in order to improve the efficiency even though container handling by a straddle carrier or a tyre-mounted transfer crane is manual.

STEP	NUMBER OF CONTAINER HANDLING	PLANNING/MANAGEMENT DOCUMENTATION	LOAKING/ UNLOADING
1	- about 60,000	manual	manual
2	about 60,000 -	computerized	manual
3	about 150,000 -	computerized	manual automatic
4		computerized	automatic

(Source:'Container Terminal Planning & Automatization System' by Yokohama Port Development Public Corporation)

Judging from the uncertainty of safety and reliably of fullautomatic loading/unloading system in a yard, many actual container terminals in the world are in step 2 or 3 excluding several experimental terminals which are in step 4.

Considered the forecast of rapid container increase in GCR, the Ports in GCR and their administrative body PPA need to promote and elaborate their current systems steadily.

The computerized system generally brings a container terminal the following effects:

a. easy countermeasures for increasing container handling

b. prevention of staff increase and effective lay-out of personnel

c. ensuring accurate and timely flow of information

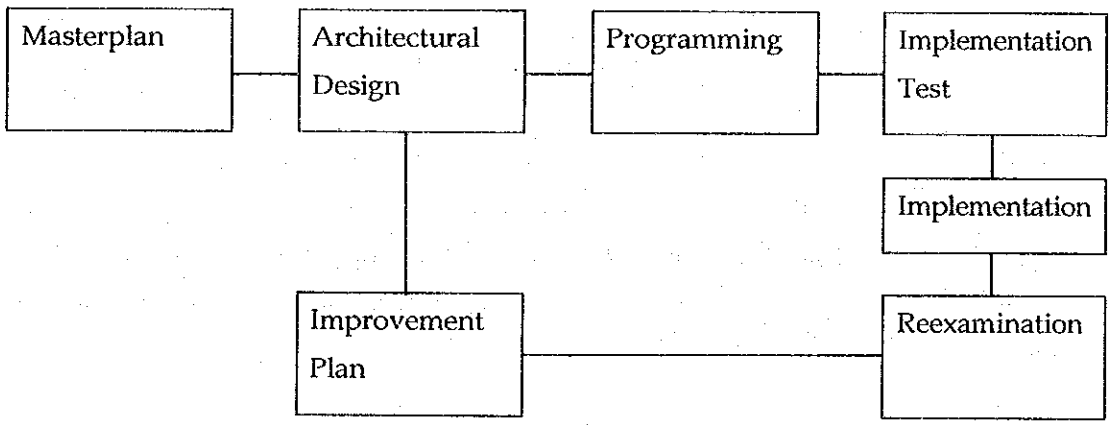
d. improvement of services for shipping companies or consignees by offering the information

e. effective utilization of a marshaling yard

f. easy access to various analytic and administered statistical materials

3) Key points for utilization of computer system

a. Once the system is installed, it will be operated permanently.
That system will be inflexible, unable to keep up with social and technological changes.
Out-of-dating of the system starts from the beginning and improvements must be done continuously as considering the future network system just like EDIFACT (Electronic Data Interchange For Administration, Commerce, and Transport).



b. Perfectly trained staff members, accumulation of accurate statistical information and reliable cost accounting are the preconditions for the introduction of computer system.

11.3 Privatization of Ports in GCR

11.3.1 Commercial Manner of Management

It is mentioned in the first section of this chapter that commercial point of view is needed in the management of the Ports. The modernization of future port management needed in the current market-oriented economy demands a commercial manner of management that entails the following points

(1) Elimination of delay by excessive forms and procedures of bureaucratic organization
(2) Management should not have to comply with stiffening administrative rules. Rather, a flexible and utilitarian type of management in which decision-making is done case by case based on the profits should be adopted.
(3) Necessity of port sales promotion

Based on the above mentioned points, privatization of the Ports in GCR should be promoted. In addition, port services should be improved through competition among the privatized ports.

11.3.2 Trend of Privatization in the Philippines

Privatization of Government-owned and Controlled Corporations (GOCCs), deregulation and preparation of transport infrastructure by utilizing the private sector are now being promoted aggressively in the Medium-term Philippine Development Plan.

The following points were made in recommendations of the sectional meeting of Inter-islands' Shipping on April 1991.

(1) The one-port-one-operator policy is inefficient and stunting economic development.
(Recommendation) Opening up cargo handling services in public ports to more than one operator
(2) Privatization is effective for improvement of port services.
(Recommendation) Promoting privatization in public ports

The importance of these concepts has been recognized by government sectors and PPA has several schemes of port privatization.

One of the schemes is Build-Operate-Transfer (BOT), and the current BOT Law (REPUBLIC ACT 6957) has been amended to attract more investors because the former

BOT Law did not provide enough incentives for private sector participation. The amendments include the following:

1) Financial incentives
2) Measures to minimize government regulations and procedures
3) The streamlining and simplification of the approval process for the BOT or Build Transfer (BT) projects

11.3.3 Current Situation of Privatization in GCR Public Ports

(1) MICT

The management and operation of MICT was transferred to the International Container Services, Inc. (ICTSI) as the pilot project of privatization on 19 May 1988. Since MICT was privatized, volume of container handling has moved ahead by leaps and bounds. The revenue from ICTSI contributes the financial statement of the PPA. The nexst largest source of revenue of PPA is fee from ICTSI. It grows rapidly year by year as the container handling volume of MICT continues to increase.

① Outline of the Contract Between the PPA and ICTSI

Term of contract and renewal

The term of the contract is 25 years and it can be renewed or extended with approval by the Board of Directors of the PPA and the President of the Philippines.

② Responsibility for future development and maintenance of the Terminal

- ICTSI has to expand and develop the MICT, both on the land side and the harbor basin, on the basis of its submitted port development program at its own expense and account. The PPA controls and supervises the development.
- ICTSI has to undertake all maintenance dredging works necessary for the harbor basin. Capital dredging activities have to be undertaken with prior approval of the PPA.
- ICTSI has to maintain the MICT at its own expense and account.

③ Fee

ICTSI has to pay a fixed fee and variable fee. Variable fee is based on the contract.

(2) South Harbor

The PPA approved the renewal of ATI's contract for cargo handling services for a term of fifteen years on March 13,1992. At the same time, PPA required the integration of operations of the three companies (ATI, OTSI, 7-R) under the umbrella company, ATI. ATI has a contract with the PPA for all cargo and container handling services at the South Harbor. ATI competes with ICTSI for container services.

In addition to the South Harbor, on July 10, 1992, ATI was granted the right to develop, construct, operate and manage a private commercial land based bulk grain terminal at Mariveles, Bataan, Port of Manila. This terminal is expected to be operational by August 1994.
(Source: ATI CORPORATE PROFILE)

(3) North Harbor

The North Harbor is now under public bidding for privatization which is expected to result in more active and expanded participation by the private sector in port operations and services.

The North Harbor will be integrated into three main terminals, to be operated by one contractor each.

- Terminal A Piers 2, 4, 6 to Slip 7 (151,452 sq.m.)
- Terminal B Piers 8, 10, 12 to Slip 13 (134,486 sq.m.)
- Terminal C Piers 14, 16 to Slip 17 (168,615 sq.m.)

These terminals will be used for Passenger/Cargo Vessels and Container Operations.

Use of the terminal shall be governed by the PPA "common user" policy while berth assignment shall be on a "first come first served basis".

This contract term is 20 years and the winning bidder (a private company, a joint venture or a consortium) will be vested by PPA with the management, operation and improvement of North Harbor Terminals except on matters pertaining to tariff setting, collection of port charges and regulatory functions exercised by PPA. The PPA prescribed minimum fixed fee for the first year and minimum yearly escalation rate are as follows:

Minimum Fixed

- Terminal A P 40 Million
- Terminal B P 37 Million
- Terminal C P 48 Million
- Minimum Yearly Escalation Rate = 10%

(Source: PPA T.O.R. ON THE PUBLIC BIDDING FOR THE MANAGEMENT, OPERATION AND IMPROVEMENT OF NORTH HARBOR TERMINALS)

(4) Port of Batangas

There is one cargo handling contractor. The contract was renewed in 1992 and extends to 2002.

- Basic payment P 200,000
- Minimum Yearly Escalation Rate = 10%

11.3.4 Recommendations for future privatization of public ports in GCR

It is true that the role of privatization is important for a port to become modernized. But privatization has to be carefully coordinated with the public interest and the economic policy of the government. This is because the private sector sometimes pursues individual interests too strongly.

(1) Security for public interests

It is needles to say that the public sector should retain tariff setting, collection of port charges and regulatory functions. In addition to these matters, there still exist many areas where the government should obtain control. These are mainly safety matters, i.e. buoys, lights, vessel traffic control dredging of access channels, and environmental matters.

(2) Adjustment among neighboring ports

In order to avoid useless duplicated investment, the functions among neighboring ports in GCR have to be adjusted. However, this does not mean that competition is unnecessary.

(3) Elimination of exclusive usage

The PPA "common user" policy is appropriate for the usage of public

ports, and conventional berth assignment should be on a "first come first served basis".

When it comes to constructing and operating a container terminal by MICT scheme, public interests must be kept by a contract or an act which restricts monopolistic usage by the developer.

But these kinds of restrictions should not dampen private sector's enthusiasm for participation in the project.

(4) Privatization of a small port

In the management and operation of a small port, the terminal is too small to be operated on market-oriented basis by several private companies. In such a case, excess of monopoly must be avoided by an agreement or a contract between the contractor and the administrative body.

(5) Fee system

As mentioned previously, the PPA has just invited bids of North Harbor for the operation, management and development/improvement of ports. This public bidding has been conducted in two phases. Phase I is Prequalification of Interested Bidders and Phase II is conducted in two stages. First Stage is Technical Bids and Second Stage is Financial Bid. In this Second Stage, the PPA prescribes the fee system as 'Fixed Fee' and 'Yearly Escalation Rate'.

In this system, both a bidder and a bidding party concerned can estimate their cost and benefit so easily that a lender can give a borrower the incentive, that is, 'minimizing cost and maximizing benefit'.

But when it comes to inflation or sharp fluctuation of cargo volume, it might give a borrower severe damage or a lender might be forced to give a borrower some subsidies.

Therefore the establishment of the fee system for the forthcoming privatization of the Ports in GCR has to be considered carefully compared with other systems. There is no best system. It depends on the peculiarities of each port.

What is important is that the contract must contain a renegotiation clause for its own fee system.

11.4 Port Finance

11.4.1 Port dues and charges

Port dues and charges are collected for use of port facilities. The level of port dues and charges must be rationally set in proportion to the value and usefulness of each port.

The administrative body of a port should get sufficient funds from the port dues and charges to maintain port facilities and allow for depreciation.

In princile, port dues and charges should be earmarked for reinvestment in port and port facilities; any other use of the revenue is to be avoided.

If port dues and charges are too low, the administrative body of a port can not get sufficient funds to improve the port and port facilities. Consequently, the quality of services received by port users will not correspond to their payment for port dues and charges.

Therefore the expense of port maintenance has to be rationally shared with the users which benefit from the port such as shipping companies.

It is better for a port authority to have the right to revise its tariff.

The PPA has this right although it has to get permission of the office of the President through the DOTC in order to do so. In order to generate sufficient revenue, this permission has to be given without delay.

11.4.2 Finance of the PPA

The PPA charges for use of ports and port facilities.

Port tariff increases of the PPA were previously approved by the President of the Philippines on June 27, 1983. This amendment accompanied approval of port tariff increases totaling 135% in 6 steps from August 1983 to October, 1985.

- in the year 1983 : 15%, 20%
- in the year 1985 : 30%, 30%
- in the year 1986 : 20%, 20% (Total 135%)

As mentioned in the previous Progress Report, current financial situation of the PPA is sound.

Both operating revenues and operating expenses of the PPA will definitely increase in conjunction with the forthcoming extension of container terminals in GCR.

Therefore, based on the port charges up to this time, the following points will need to be considered.

(1) Personnel plan and expense of personnel services
(2) Financial Forecasts of operating revenues and operating expenses
(3) Head office cost

11.5 Organization of Port Administrative Body

11.5.1 Importance of appropriate organization

What kind of organization would be suitable as to the port administrative body in GCR? It would be a crucial matter according to the development of privatized ports in GCR.

If the role of the PPA is as a specialist in port regulation, navigational safety, port planning and coordination between sea transport and other modality, it would be faced with the problem of excess personnel and it would be necessary to gradually shift personnel.

11.5.2 Current Organization of the PPA

The PPA is currently a sound organization. Present number of personnel is fundamentally based on the Restructuring Plan of 1988. The fixed number of personnel is 4123, but the actual current number is about 2300.

As to the number of ports, the PPA is now considering a reduction in the number of ports under its jurisdiction from the viewpoint of enhancing competitiveness with neighboring foreign ports, and its financial autonomy.

It is now being considered to cut the current number of 106 ports (including 19 hub-ports) to 74 ports (including 6 or to 8 hub-ports).

11.5.3 Executive Department Organization

Generally speaking, inner organization of executive department (Head Office) should be simplified and streamlined.

The following points need to be considered in order to activate the organization.

(1) Training middle-ranked staff for positions of authority
(Adjustment of gap between the few high ranked staffs and the majority of workers)

(2) Establishment of objective and clear criteria for promotion of regular staff
(Personnel changes not influenced by higher-ranked staff's change)

(3) Sharing information for strengthening organization

(4) Necessity of incentives for workers
(Preventive measures for well-trained personnel flowing out from the organization)

(5) Establishment of task force for improving organization consisting of efficiency specialists
(Objective proposals to improve the organization)

11.5.4 Current Situation of MICT

MICT, managed and operated by ICTSI, was the pilot project of port privatization and this project obtained satisfactory results. The manner of managing and operating MICT will be one of the models for other newly constructed container terminals in near future.

(1) Total Number of MICT workers

The employees of ICTSI are divided into three categories: regulars, on-call and stevedores. Regular employees are composed of headquarters and staff plus operators of cargo-handling equipment. On-call employees are those who are called to report only when the need arises. Stevedores are called on a gang basis and are contracted for specific shifts/vessels on rotation.

Regular Employees	863	Managers/Office Staff	433
On-Call	209	Cargo Handlers	1,149
Stevedores	510		
Total	1,582	Total	1,582

(2) Productivity Standard

ICTSI has an average productivity standard of 35 moves per hour and truck turn-around time of 45 minutes.

(3) Incentive and Motivation Schemes

a. The incentive schemes are prepared for maintaining and/or surpassing above mentioned productivity standard. This scheme consists of financial rewards and covers monthly and yearly periods.

b. Incentive training programs are in place.
(Multi-Skilled Training Program, Management Training and Apprenticeship Program)

c. Through the Employee Stock Option Plan, regular employees, regardless of rank, can purchase company shares of stock at a discounted price.

(Source: Materials provided by ICTSI)

11.6 Port Management and Operation for Newly Constructed Ports in the Target Year

11.6.1 Construction and Expansion of Port and Port Management

A port administrative body's finance must be sound in order to maintain and upgrade port facilities.

As mentioned in the beginning of this chapter, one of the key words for a suitable form and structure for port management is autonomy. This means the finance of main ports has to be separated from that of the nation. Main port's finance has to balance cost and revenue and this balance has to be retained while renewing port facilities, and paying back loans with interest. To attain this, adequate administrative scheme must be carefully considered to get sufficient funds for managing, operating and maintenance. It is desirable that the revenue exceeds the normal cost by a little bit.

Previously mentioned privatizing schemes could also be applied for the new container terminal in GCR.

In order to adopt this kind of privatizing scheme, what is urgently and concretely needed is to decide how to divide up the role between the public side and the private side, and the extent to which private funds will be introduced.

11.6.2 Management and Operation of Ports in GCR in the target year

(1) Port of Manila

- Promotion of Privatization and Land Acquisition Aided by the Government

Before a private port is planned and constructed, it must be approved by PPA. A private port can only handle designated cargoes for its own sake. This is a prerequisite of approval. It can not load or unload third parties' cargoes in its private port.

When it comes to the extending berths demanded by increasing cargoes in Port of Manila, they will not be specified as private use but public use. Therefore PPA has to handle this matter.

Presently there exists two sites in Port of Manila for extension of public berths. One is the reclamation along the existing North Breakwater and the other is the site of 'Smokey Mountain Development and Reclamation Project'.

The former can be reclaimed by PPA and the PPA can promote new berths in this site.

The latter will be reclaimed by executive order and this reclamation cost and relocation cost will be covered by the sale of this land. This project is carried out by NHA which contracted its reclamation with the private company. Therefore PPA is faced both with the matter of portoriented use and that of land acquisition when it promotes the extention of new berths at this site.

The PPA has to supervise, control, regulate, construct, maintain, operate, and provide such facilities of services as are necessary in the ports vested in, or belonging to the Authority by the Executive Order No.159 Article IV Section 6 Dated 13 April 1987. And the PPA must be financially independent of the Government.

But when it comes to the newly constructed ports or berths, the Government could offer support, for instance, in land acquisition, in order to lighten the initial cost of PPA. And the management and operation should be privatized like MICT or North Harbor through public bidding.

(2) Port of Batangas

- Early Solution to the Problem of relocation and Introduction of Privatizing Scheme

Detailed Design of the Port of Batangas as an engineering services loan by the OECF was completed in 1990 and the OECF loan was approved successively for the first stage of the project (Phase I) in March on 1991.

Phase I is now suspended by the relocation problem, which must be solved as early as possible by the authorities concerned.

After renovating the Port, privatization via public bidding should be introduced just like in the Port of Manila.

(3) Newly planned commercial port of Naic / Cavite and Sangley Point

- Necessity of PPA's Participation as a administrative body

A local public port is basically planned and constructed by the Project Management Office of DOTC. And after completed, the port will be transferred to the local government and it will be administered by the local government.

However, in the case of Naic and Sangley Point, it seems to be impossible for local governments to administer the ports from the view points of managing and operating know-how, and so on.

If the PPA administers these ports, the prerequisite is financial viability. Therefore it is impossible for the PPA to administer these ports without the total aid and collaboration of the national government, for example, a construction cost or cost of converting into commercial port would be borne by the government.

(4) Port of Subic

- Approval of Special Economic & Free Port Zone Administered by SBMA

Back site of Port of Subic is being planned as Subic Special Economic & Free Port Zone (SSEFPZ), where domestic and foreign trading industries, commercial and sightseeing industries are now being invited. The Port will be developed for SSEFPZ-oriented use. It is different from the above mentioned ports in GCR.

SBMA (Subic Bay Metropolitan Authority) will be an administrative body of the Port because all the facilities of Subic belongs to SBMA.

Therefore, minimizing the government's participation, the management and operation will be privatized by SBMA, which is now placing an order with an outside consultant-The Boston Consulting Group.

Therefore the Port of Subic will be developed independently as a free port and will not fall under the umbrella of the PPA Ports System.

But the Port of Subic must be deployed in conformity with the national port policies, harmonizing with the government departments or offices concerned like DOTC or PPA.