3.1.3 Phasing Plan for Cargo Handling Equipment

(1) Container Handling Equipment

The required container cargo handling equipment is calculated by the following formula;

(Number of transfer crane-Rubber tired gantry type)=2×Gn+1×Bn

(Number of tractors)=5×Gn+(Number of tractors for CFS)
(Number of tractors for CFS)=2×Bn

(Number of chassis)=2×(Number of tractors)+(Number of chassis for CFS)
(Number of chassis for CFS)=2×(Number of bays in CFS)

(Number of reachstackers)=1×Bn

(Number of Forklifts for container maintenance: 5 tons)=1×Bn

(Number of forklifts for CFS: 2 tons)=1×(Number of bays in CFS)

where, Gn: Number of gantry cranes
Bn: Number of container berths

The results of the calculation are shown in Table 3.1.3-1. The results include sufficient spare units.

Table 3.1.3-1 Phasing Plan for Required Container Handling Equipment

(units)

Item	Cumulative Number of Required Container Handling Equipment		
	Phase 1	Phase 2	Phase 3
Number of Berths	1	2	3
Gantry Cranes	2	4	6
Transfer Cranes	5	10	15
Tractors	12	24	36
Chassis	36	72	108
Reachstackers	1	2	3
Forklifts(5t)	1	2	3
Forklifts(2t)	6	12	18

(2) Non-container Cargo Handling Equipment

It is necessary to ensure the cargo handling productivity mentioned in Table 3.1.2-4 Required number of berth for foreign trade in 2005, 2010, 2015 and 2020.

The best methods to increase the loading/unloading efficiency are as follows;

① To introduce the pallet handling system in the stevedoring
② To utilize the forklift at the quay side and in transit sheds

The required number of pallets, trucks and forklifts are calculated by the number of gangs and these are the same during 2005 to 2020. The results are shown in Table 3.1.3-2.

Table 3.1.3-2 Required Non-container Handling Equipment (2005-2020)

Equipment	Capacity	Type of Cargo	Quantity (unit)
Pallet		Bag	27
trucks	10 ton	Heavy Equipment Construction Material Break Bulk Others	9
Forklift	10 ton	Heavy Equipment Construction Material	3
	5 ton	Construction Material Others	5
	3 ton	Break Bulk	14

3.2 Short Term Development Plan

3.2.1 Policy for the Short Term Plan and Urgent Development Plan

(1) Policy for the Short Term Plan

According to the Phasing of the Long Term Plan, the new container terminal construction will be conducted in three phases in line with the container traffic demand up to 2020. Meanwhile, the capacity of existing port facilities (berths, transit sheds, warehouses) at NSD and Boton areas is adequate to handle the non-container cargo demand up to 2020.

Concerning the new container terminal, since the time period between the completion of Phase 1 and the commencement of Phase 2 is only two years, the short term plan should be one package consisting of Phase 1 and 2.

Policies for the Short Term Plan are defined as follows:

① The new container terminal construction (including reclamation) with berth length of 560 m will be completed by 2007 including Phase 1 and 2 development plan. And Phase 1 development will be completed in 2005.

② The Short Term Plan will include not only the new container terminal construction, but also installation of new navigational aids and the rehabilitation work of the NSD wharves and other port related facilities in order to reinforce the deteriorated structural members of framework.

③ The Short Term Plan will also include the procurement of non-container cargo handling equipment (pallet, trucks, forklift).

(2) Urgent Development Plan

It is recommended that the SBMA installs at least one second-hand gantry crane at the existing berth (Sattler Pier) through 2000 to 2005 in order to accommodate non-self sustaining container ships (full-container ships without ship's gear), to encourage shipping companies to expand the frequency of container ships calling at SBF, and to attract or generate new container customers (consignees and consignors) in SBF until the new container terminal will be operated. This countermeasure is defined as the urgent development plan. Under this plan, container handling capacity will increase to 110,000 TEUs as mentioned in "Chapter 3.1.2 Phasing Plan for Port Facilities" and full-container ships (non-gear ships) will be able to dock at Sattler Pier.

The urgent development plan includes the following items:

① Installation of at least one second-hand gantry crane at Sattler Pier

② Pavement work on the existing container yard (10 ha) at NSD area

3.2.2 Requirements and Port Layout Plan for Short Term Plan

(1) Requirements for Short Term Plan

The target year of the short term plan is 2005 (Phase 1) and 2007 (Phase 2). Requirements for the short term plan are as follows:

1) The number and length of berths for new container terminal

Two berths are required for the new container terminal according to the container traffic demand and capacity (mentioned in "Chapter 3.1.2 Phasing Plan for Port Facilities").

The ship size of 2,000 TEU container ships that are entered into service on the route between Japan, Indonesia and the Philippines by the Tokyo Senpaku Kaisha Ltd. (TSK Lines) are shown in Table 3.2.2-1.

Table 3.2.2-1 Container Ship Size of 2,000 TEU Carrier in TSK Lines

Name of Ship	Loading Capacity (TEU)	Length (m)	Breadth (m)	Draft (m)	Deadweight Tonnage (t)	Gross Tonnage (t)
ACX LAVENDER	1,902	209.5	32.2	11.5	30,124	35,084
HAKONE MARU	2,096	211.0	32.2	11.5	29,733	35,309

However, a standard 2,000 TEU container ship has a length of 245 m, breadth of 32.2 m and draft of 11.6 m. Therefore, the necessary berth length for the 2,000 TEU container ship is 280 m and the necessary berth depth is 13.0 m considering the standard size.

According to the operation system of the container terminal mentioned in "Chapter 4.6 Improvement Plan and Schedule for Short Term Plan", two terminal operators for two terminal sites should be adopted as the operation scheme.

Consequently, the berth length in the short term plan is 560 m (two berths of 280 m) and the berth depth is 13.0 m.

2) The rehabilitation plan for the existing wharves and facilities

The existing port facilities at NSD and Boton areas are planned to be utilized for non-container cargo handling up to 2020.

However, according to the diagnostic investigation conducted by the JICA Study Team in 1998, Marine Terminal requires some reinforcement for future use. Therefore, rehabilitation work to reinforce the structural members of Marine Terminal will be included in the short term plan.

Rehabilitation of existing roads which container trucks will pass through, rehabilitation of Rivera/Bravo Wharf and relocation of buildings/utilities behind Boton Wharf are included in this project.

3) Installation of new navigational aids

According to the results of interviews to the municipal fishermen inhabiting along the Subic Bay, the port should be provided with ample navigational lights/markers and a new lighthouse for safety (see Chapter 7.4.2 Impact on Fishery Resources and Activities).

The Short Term Plan includes the installation of these new navigational aids.

(2) Port Layout Plan for Short Term Plan

The necessary scale of new container terminal facilities is defined in accordance with the phasing plan for port facilities mentioned in Chapter 3.1.2.

The port layout plan is changeable based on the actual operation method in the container terminal, for example, whether one operator will utilize the total terminal area or two operators will utilize each terminal separately and independently. In this stage of the study, the latter operating method (two operators) is assumed, because greater competition results in benefits not only for customers but also for SBMA (see "Chapter 4. Port Development, Management and Operation").

When formulating the long term plan, it was thought that the car racing field located in the north side of the Subic International Airport could be used for a container storage yard in the short term. However, this field will not be able to be used for a container storage yard in the short term plan, because this field will be developed as a general aviation activity from 2001 according to the Airport Master Plan.

The port layout including the new container terminal of the short term plan is shown in Figure 3.2.2-1.

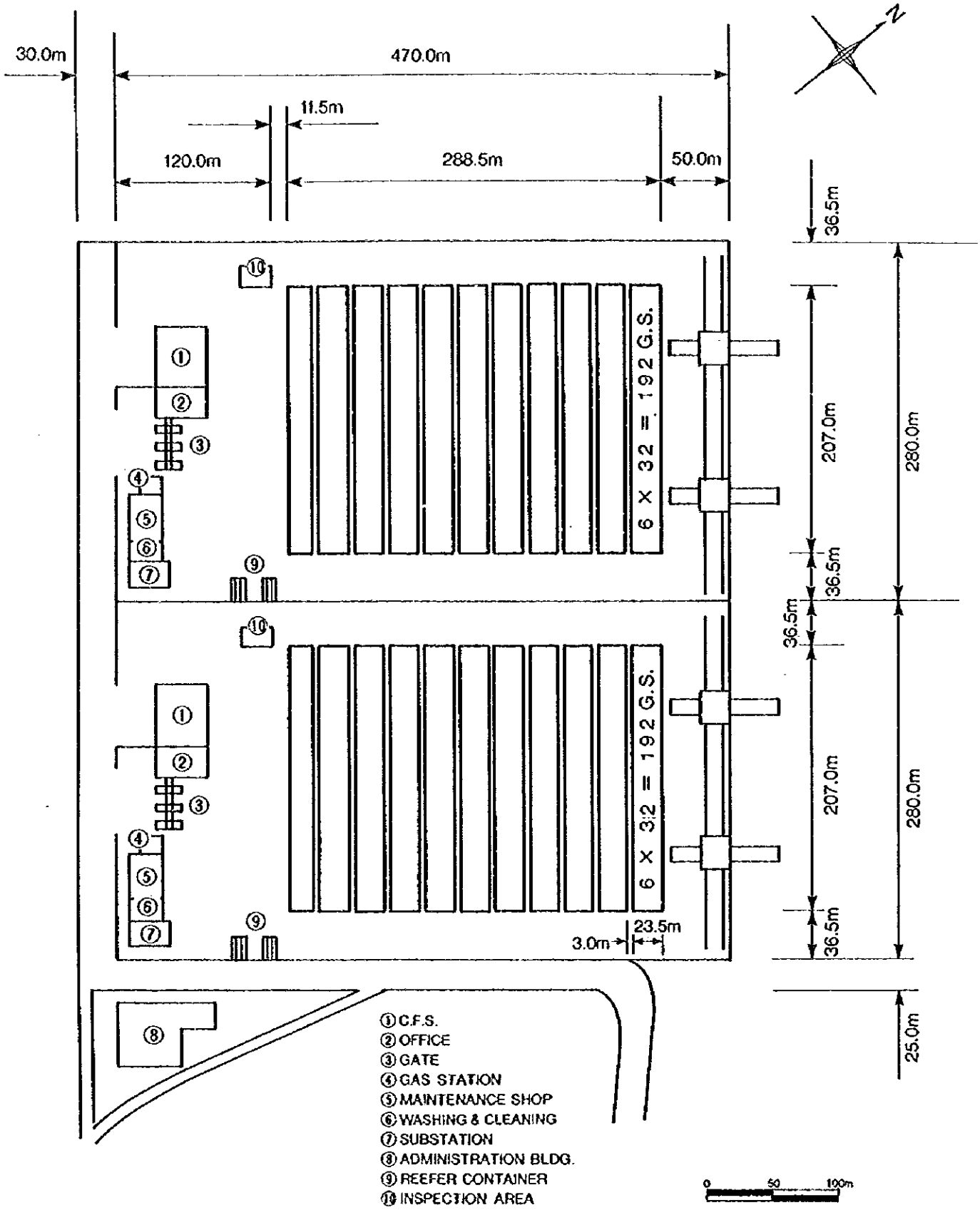


Figure 3.2.2-1 Port Layout for Short Term Plan (New Container Terminal)

3.2.3 Restriction of Airspace Caused by the Airport

(1) Height Limitation at Cubi Point

Restriction of airspace consists of the specifications of obstacle limitation surfaces around aerodromes defined in "International Standards and Recommended Practices, Aerodromes, Annex 14 (International Civil Aviation Organization)", and of the obstacle clearance surfaces caused by instrument approach procedures and instrument departure procedures.

Obstacle limitation surfaces around the Subic International Airport are shown in Figure 3.2.3-1 and obstacle clearance surfaces caused by approach and departure procedures are shown in Figures 3.2.3-2, 3, 4 and 5.

According to the obstacle clearance height, the height limitation at Cubi Point is shown in Figure 3.2.3-6 and the height limitation at each section of access road from Boton area to Cubi Point is shown in Figure 3.2.3-7.

(2) Height Limitation at Boton Wharf

The height limitation at Boton wharf is shown in Figure 3.2.3-8.

It is recommended to install a marker buoy that indicates the channel under the flight path. When a mast height is 25 m from sea water level, the marker buoy must be installed at a point having a distance of 665 m from the runway end (R/W 25). The required distance between the marker buoy and the runway is calculated as follows:

(Distance between buoy and R/W)=(Height limitation from HHW)÷2%+60m

(Height limitation from HHW)=(Mast height)+(HHW from LLW)- (R/W elevation from LLW)

Mast height: 25 m

HHW from LLW: 1.7 m

R/W elevation from LLW: 14.6 m

All ships berthing/deberthing Boton Wharf must contact the Port Operation Division of Sea Port Department in SBMA and Sea Port Department must coordinate the ships traffic with the airplanes traffic in order to avoid collisions.

The SBMA must control ships traffic at Boton Wharf according to the following rule:

① All ships must inform their mast height to the SBMA.

② Ships having a mast height less than 12.9 m {(R/W elevation from LLW)- (HWL from LLW)=14.6 m -- 1.7 m} can pass across the Flight Path of R/W 25.

③ Airplane Taking-off

a) Ships having a mast height more than 12.9 m and less than 25 m must pass the east side of the marker buoy.

b) Ships having a mast height more than 25 m must wait for an airplane to take off before crossing the Take-off Flight Path.

④ Airplane Landing

Ships having a mast height more than 12.9 m must wait for an airplane to land before crossing the Landing Flight Path.

The location of the marker buoy that indicates the height limitation of 25 m is shown in Figure 3.2.3-8.

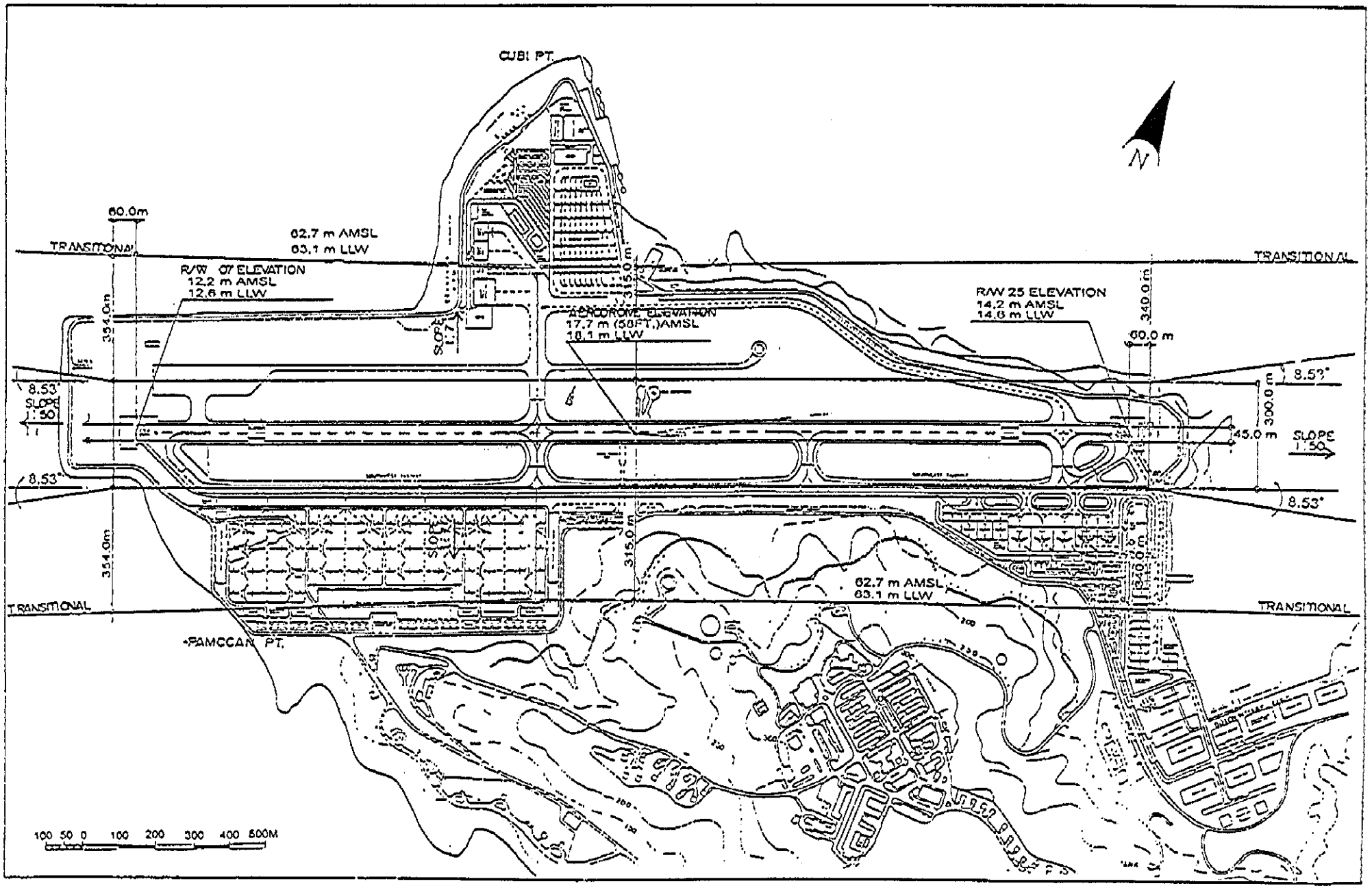


Figure 3.2.3-1 Obstacle Limitation Surfaces (The Subic International Airport)

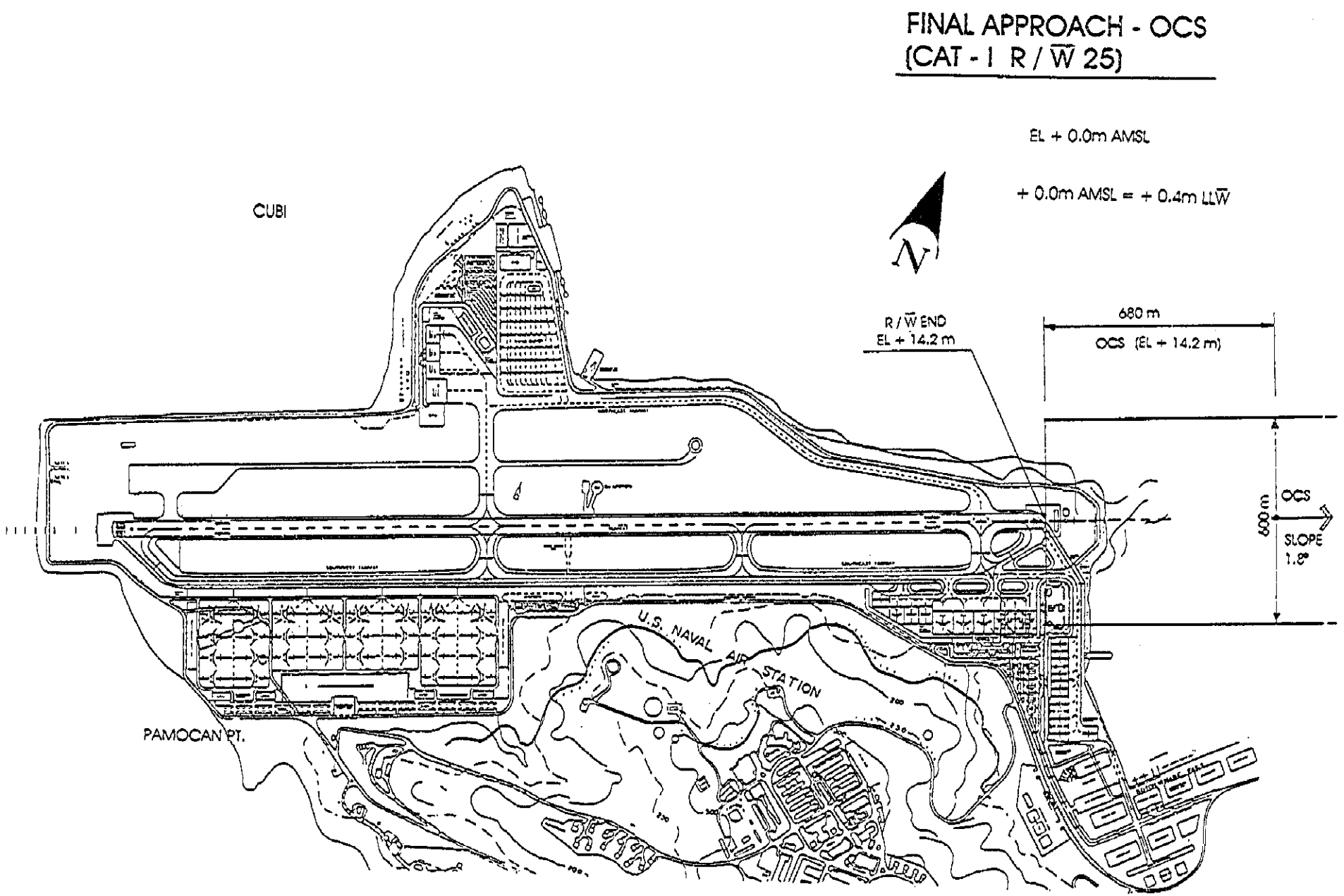


Figure 3.2.3-2 Final Approach OCS (CAT-1, R/W 25)

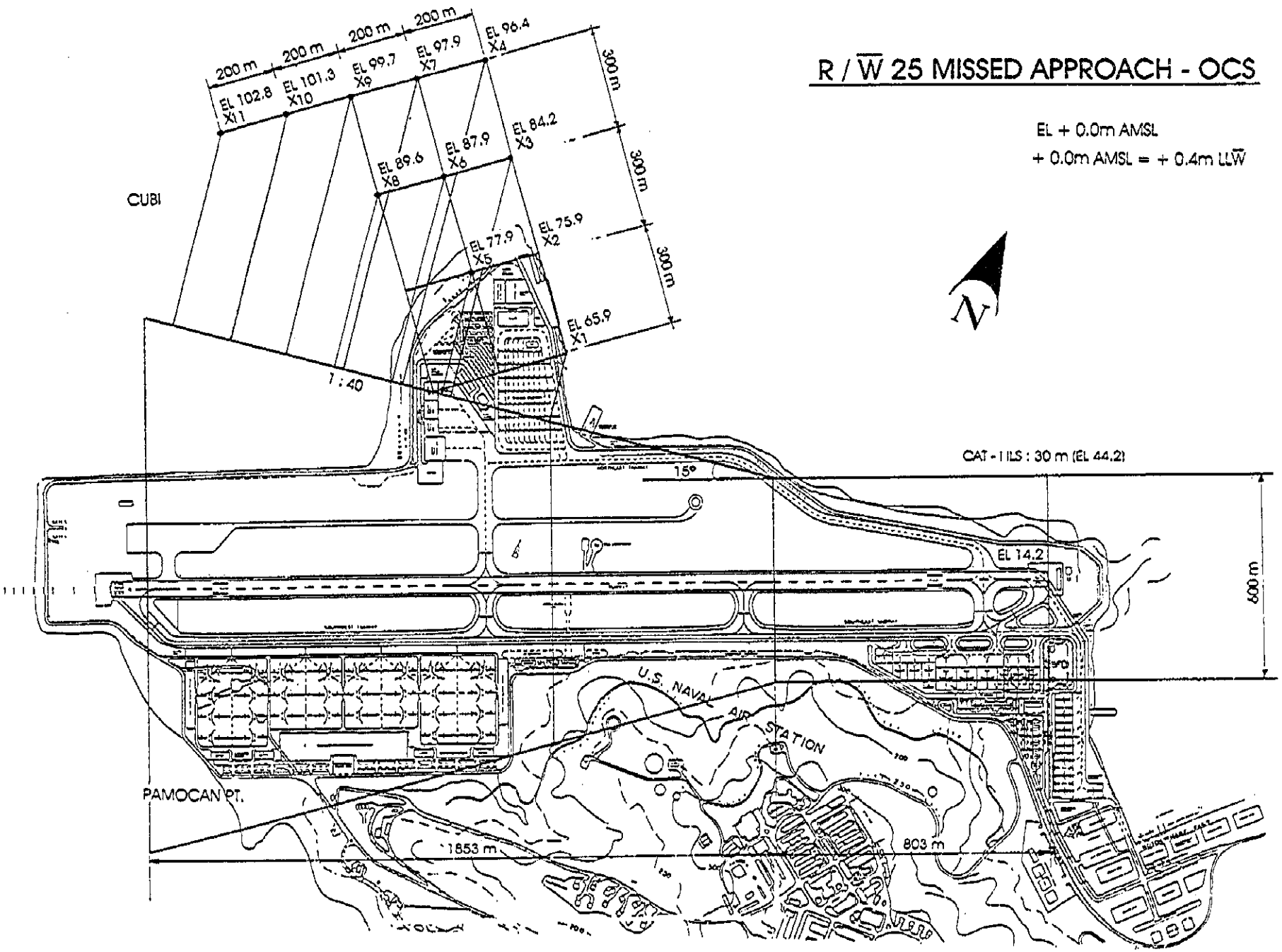
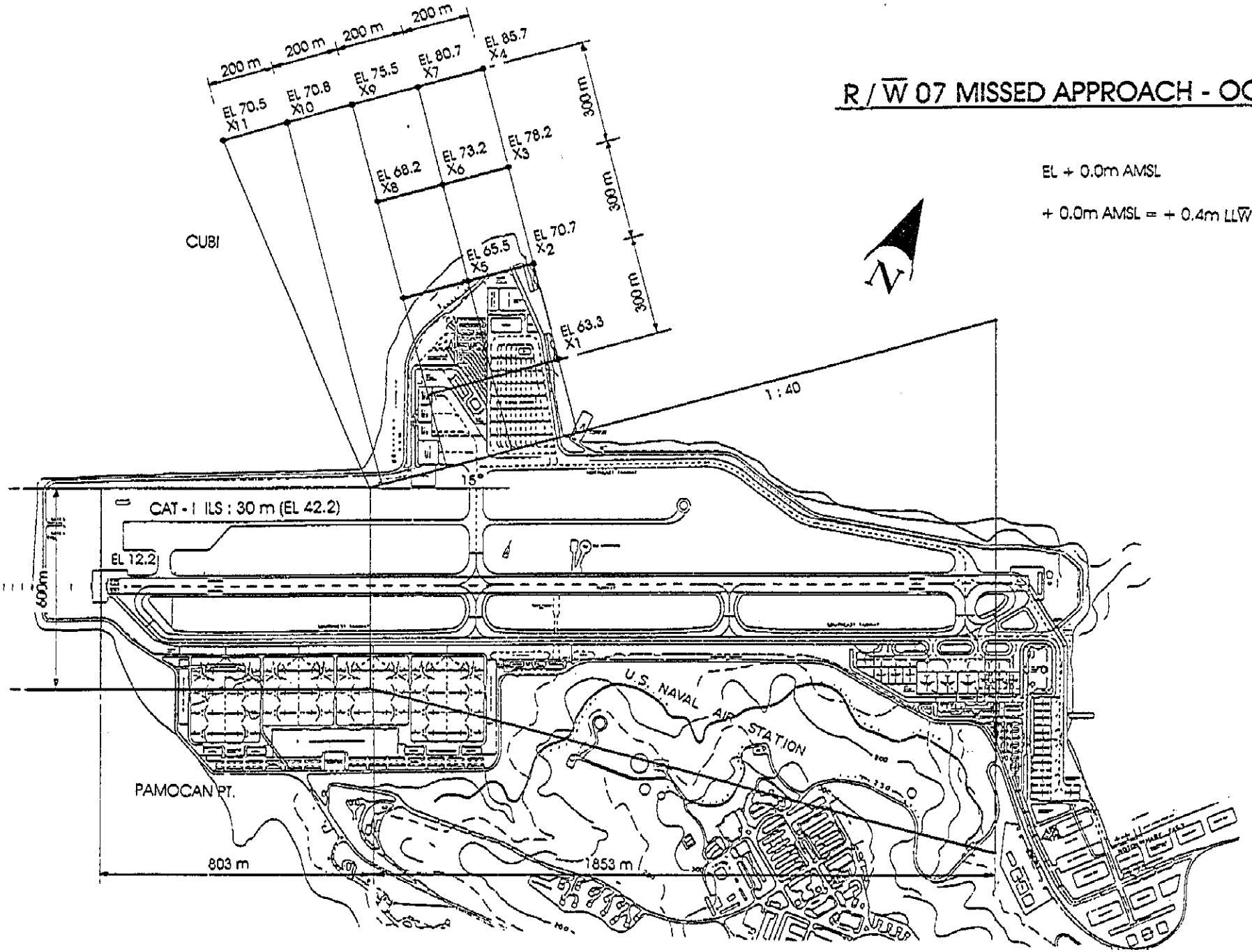


Figure 3.2.3-3 R/W 25 Missed Approach OCS

R / W 07 MISSED APPROACH - OCS



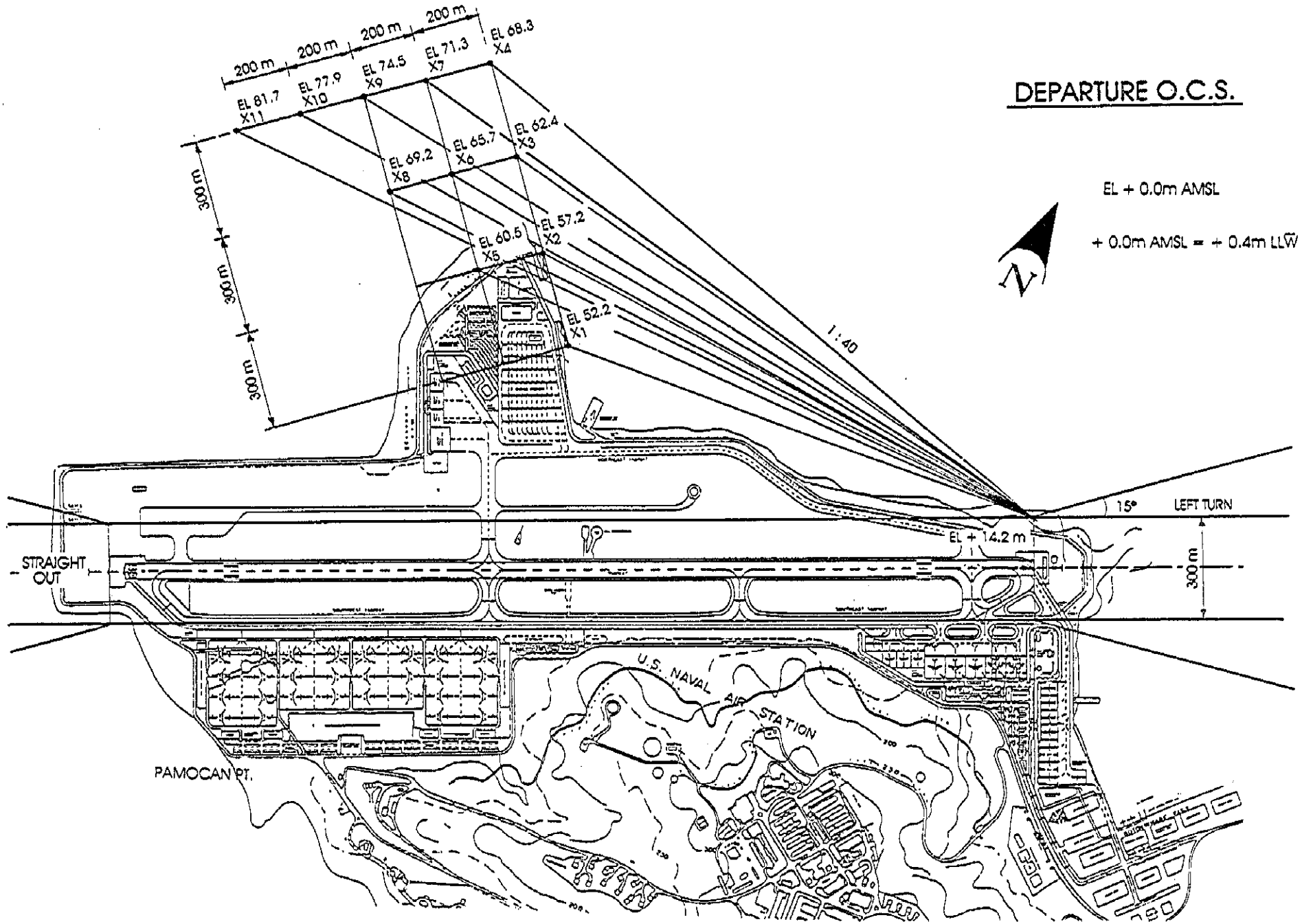
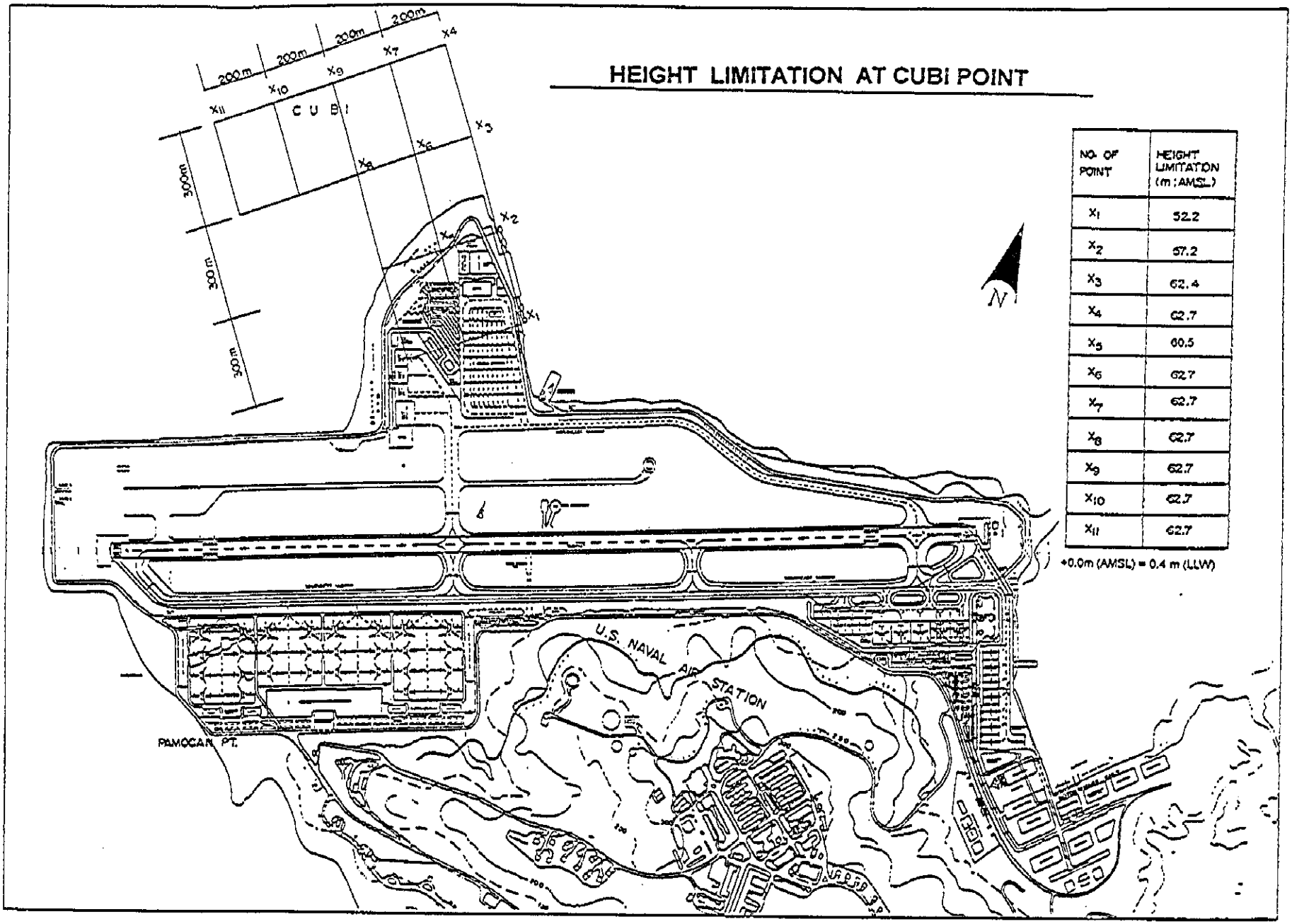


Figure 3.2.3-5 Departure OCS



NO. OF POINT	HEIGHT LIMITATION (m; AMSL)
X_1	52.2
X_2	57.2
X_3	62.4
X_4	62.7
X_5	60.5
X_6	62.7
X_7	62.7
X_8	62.7
X_9	62.7
X_{10}	62.7
X_{11}	62.7

Figure 3.2.3-6 Height Limitation at Cubi Point

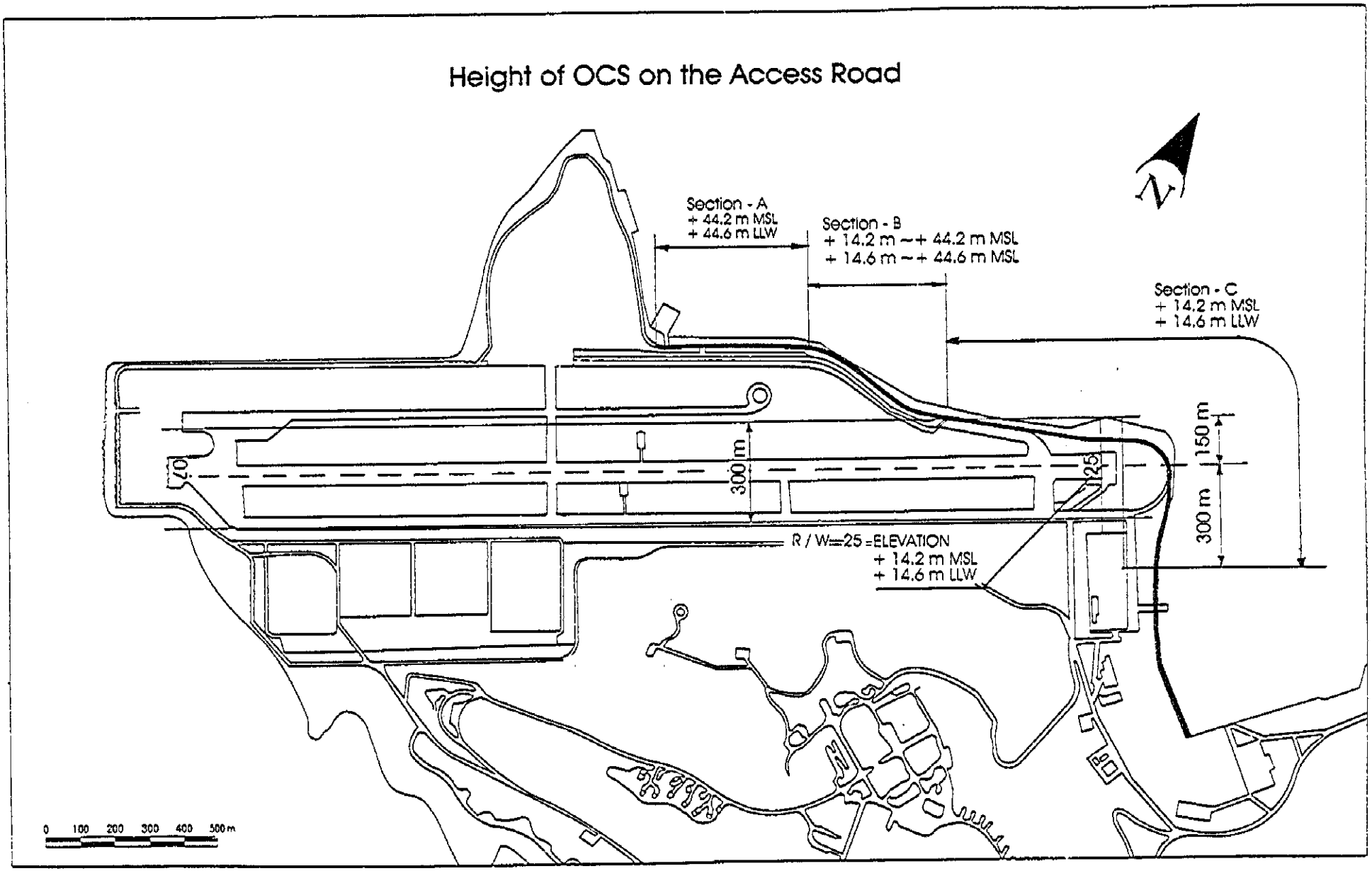
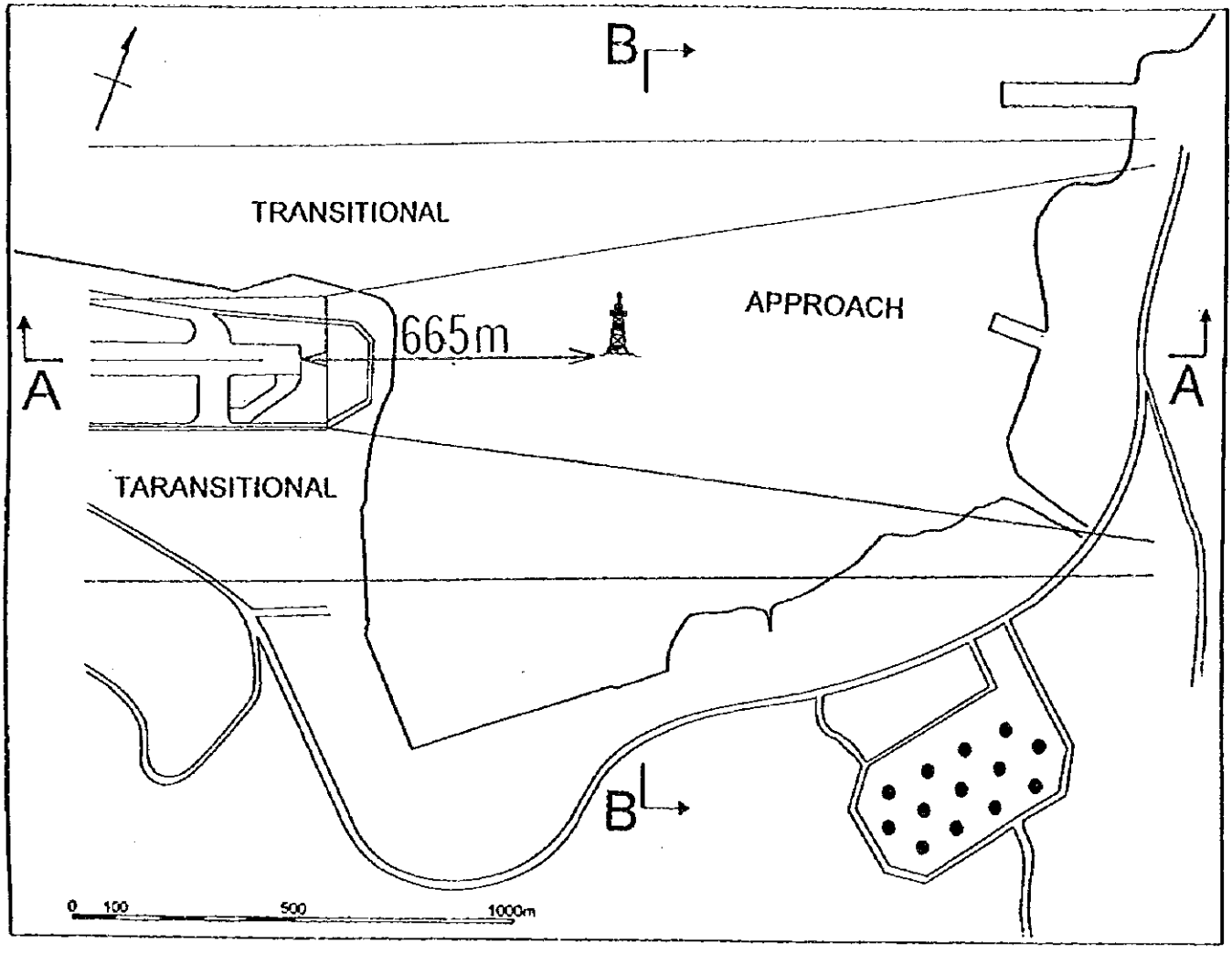
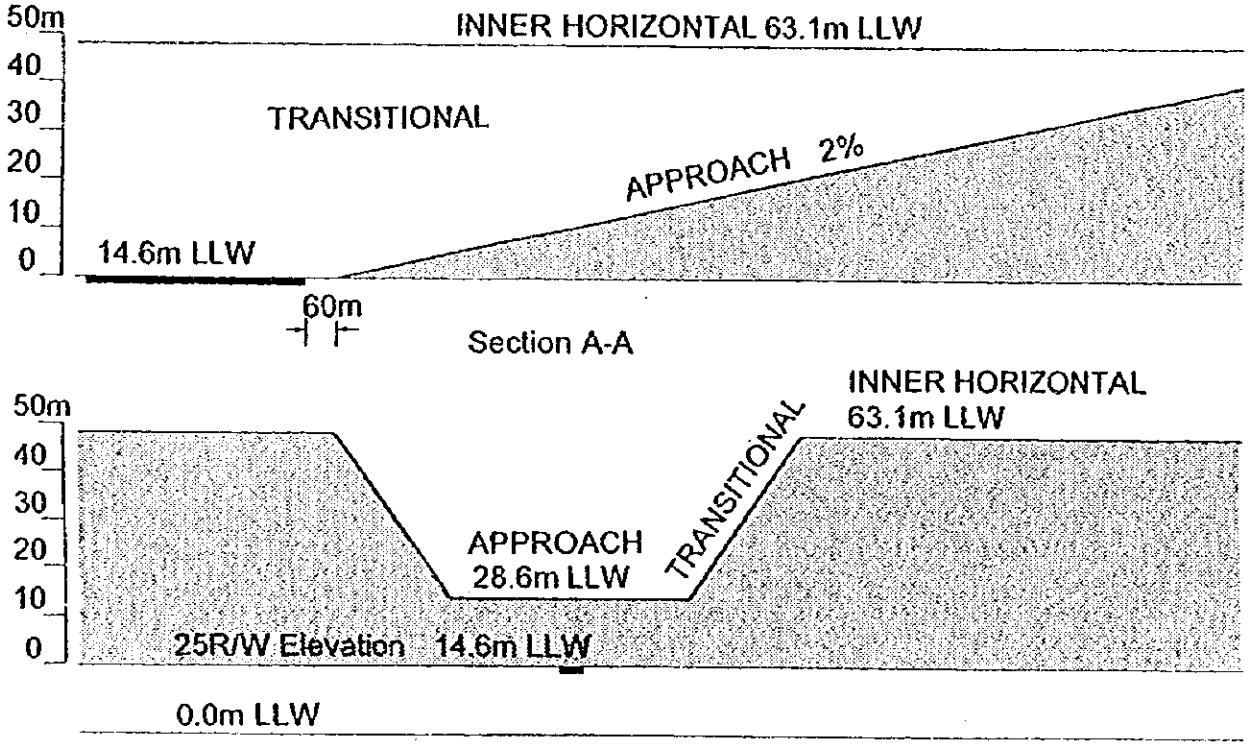


Figure 3.2.3-7 Height of OCS on the Access Road





Section B-B

Figure 3.2.3-8 Detailed Height Limitation in Boton Area

3.2.4 Requirement for Cargo Handling Equipment in Short Term Plan

(1) Required Scale of Container Handling Equipment

Required number of container handling equipment in Short Term Plan is shown in Table 3.2.4-1.

Table 3.2.4-1 Required Number of Container Handling Equipment

(unit)

	Short Term Plan		
	Phase 1	Phase 2	Total
Gantry Cranes	2	2	4
Transfer Cranes	5	5	10
Tractors	12	12	24
Chassis	36	36	72
Reachstackers	1	1	2
Forklifts (5t)	1	1	2
Forklifts (2t)	6	6	12

(2) Specification of Gantry and Transfer Crane

The height limitation along the layout of quay wall is 57.2 m from average mean sea level (AMSL) based on the results of the investigation of the obstacle clearance height shown in Figure 3.2.3-6.

The allowable gantry crane height is calculated by the following formula.

(Height of gantry crane)=(Height limitation: AMSL)+(Difference between AMSL and LLW)-(Height of top at quay wall: LLW)-(Allowance)

Height limitation: 57.2 m (AMSL)
Difference between AMSL and LLW: 0.4 m
Height of top at quay wall: 3.0 m (LLW)
Allowance: 3.0 m

The height of gantry crane is decided as 51.6 m and an articulated crane type must be selected for accommodation of 2,000 TEU container ships under this height limitation.

Main specifications of gantry crane and transfer crane are as follows:

a) Gantry Crane

Type	Articulated Crane Type
Hoisting capacity	40.0 ton (under spreader)
Outreach	35.0 m
Span	30.0 m
Backreach	10.67 m

Total lifting height	37.0 m
Lifting height above rail	26.0 m
Lifting height below rail	11.0 m
Maximum boom height above rail	51.50 m
Power source	Supplied from outside
Approximate working speed	
Main hoist with full load	53 m/min
Main hoist with no load	128 m/min
Trolley travel	153 m/min
Gantry travel	45 m/min
Boom hoist	5 min/one way (excluding latch time)

Outline of gantry crane is shown in Figure 3.2.4-1

b) Transfer Crane

Type	Eight (8) Rubber Tired Diesel Electric Powered Gantry Type Traveling Crane, 2 wheel drive
Hoisting capacity 40.0 ton (under spreader)	
Span	23.47 m
Lifting height under spreader	15.24 m
Approximate working speed	
Hoist with full load	23.0 m/min
Hoist with no load	52.0 m/min
Trolley travel	70.0 m/min
Gantry travel135 m/min	

Outline of transfer crane is shown in Figure 3.2.4-2.

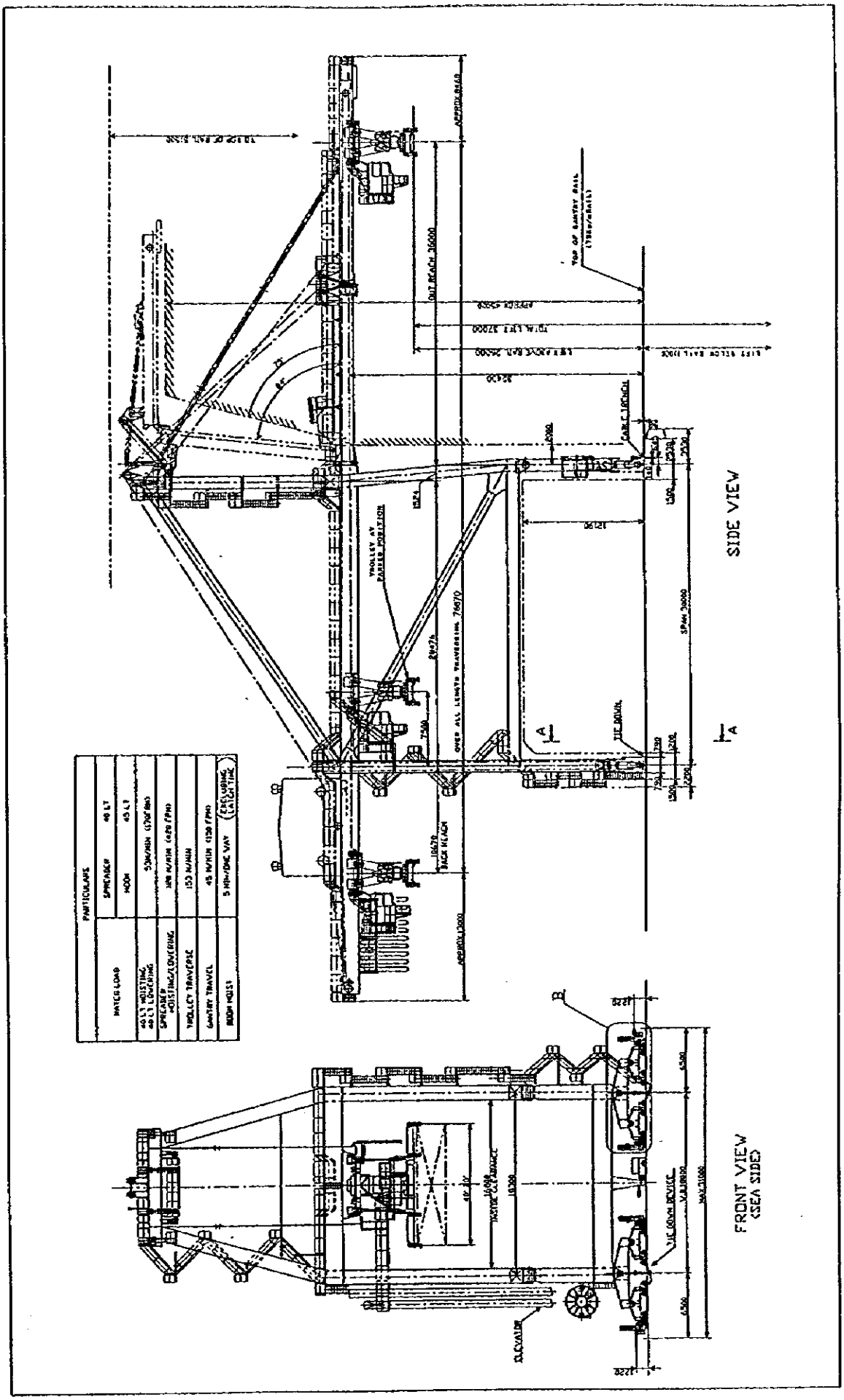
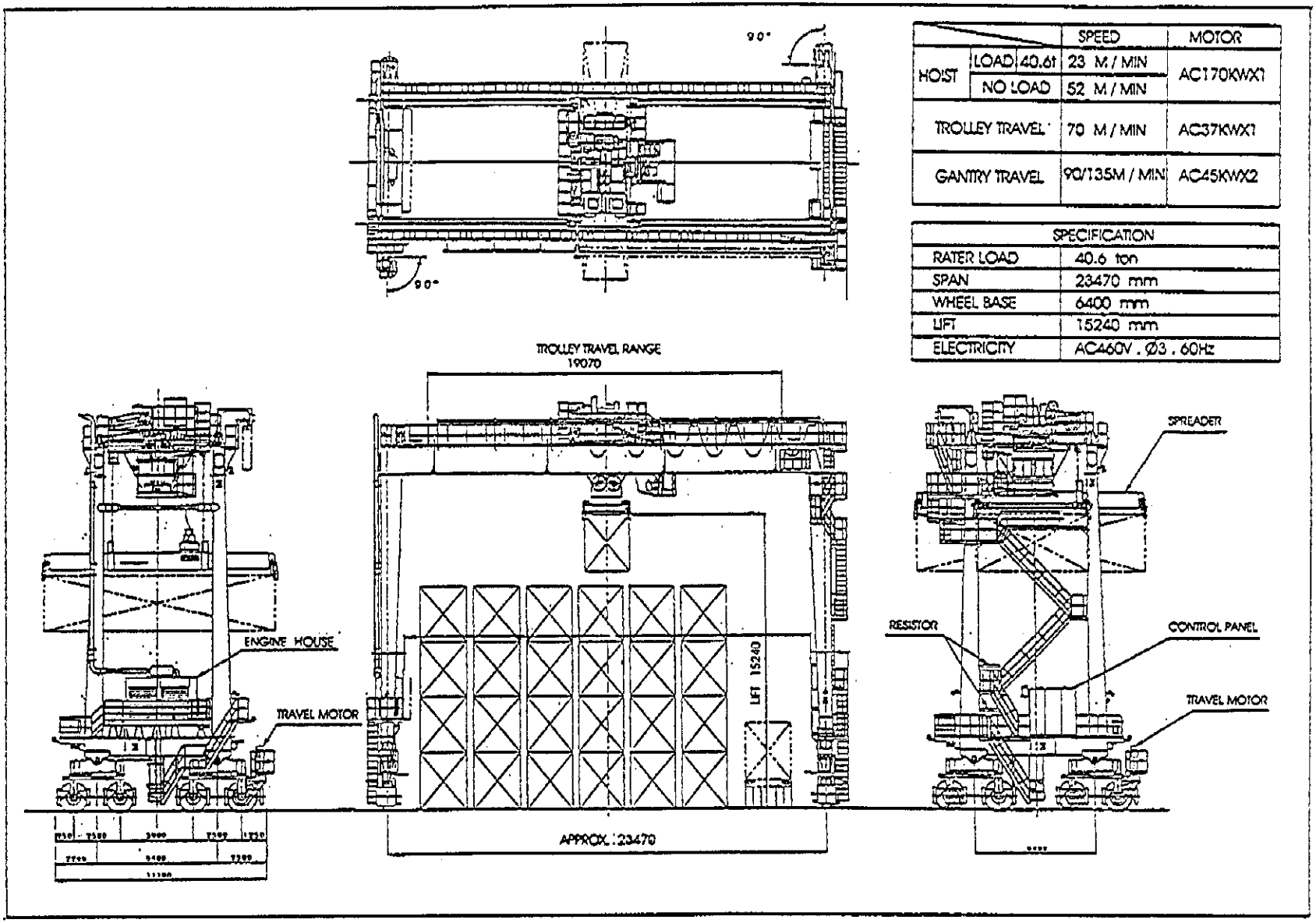


Figure 3.2.4-1 Outline of Gantry Crane



		SPEED	MOTOR
HOIST	LOAD 40.6t	23 M / MIN	AC170KWX1
	NO LOAD	52 M / MIN	
TROLLEY TRAVEL		70 M / MIN	AC37KWX1
GANTRY TRAVEL		90/135M / MIN	AC45KWX2

SPECIFICATION	
RATER LOAD	40.6 ton
SPAN	23470 mm
WHEEL BASE	6400 mm
LIFT	15240 mm
ELECTRICITY	AC460V . Ø3 . 60Hz

Figure 3.2.4-2 Outline of Transfer Crane

3.3 Preliminary Design of the Facilities for Short Term Plan

3.3.1 Design Criteria

In order to carry out structural design of the port facilities included in the Short Term Plan, i.e. Phases 1 and 2, design criteria to meet the requirements have been established. As defined in the port planning, the Short Term Development principally consists of construction of a new container terminal at Cubi Pt. and reinforcement/rehabilitation of the existing facilities. In addition, relevant essential facilities for the container terminal operation will be also included in the Project. They are a new access road to the terminal at Cubi Pt. and navigational aids for calling vessels of the new terminal for their safe manoeuvring.

Design criteria to be applied to the structural designs of each project component are summarised in Table 3.3.1-1. Special considerations on the criteria are described hereunder.

(1) New Construction of the Container Terminal

Design conditions for the new container terminal should fully meet requirements for a modern international container terminal in view of its operational conditions. Live loadings, such as surcharge and equipment loads on the apron, berthing and mooring forces of the target vessels, and appropriate seismic forces have been considered in the design criteria.

The soil investigation was carried out in 1998, where two offshore borings near Cubi Pt. were included. Considering these borings and laboratory test results, sub-soil conditions for the design of the quay structure at Cubi Pt. have been established as shown in Figure 3.3.1-1. As seen in the figure, the soil conditions at Cubi Pt. seem to consist of upper sandy soils, i.e. soil types classified as SP, SM, SW and their mixtures, and lower hard cohesive layers of MH on the bearing stratum of weathered Andesite.

(2) Reinforcement/Rehabilitation of the Existing Facilities

Reinforcement/rehabilitation of the existing facilities has been developed based on the results from the structural diagnosis and the expected usage in the short term perspective. Considering the Short Term Development Plan previously established, the reinforcement of Marine Terminal in NSD zone has been studied in order to facilitate their roles in the development strategy.

In the port planning of this Study, Marine Terminal will be used as a main international terminal for non-container operation of cargoes, such as heavy equipment, construction materials, and other bulk cargoes.

Table 3.3.1-1 General Design Criteria for Basic Design in the Master Plans

Particulars	New Container Terminal at Cubi Pt.	Reinforcement/Rehabilitation of the Existing Facilities		
		Marine Terminal		Boton Wharf
		(1)	(2)	
I Operational Conditions				
1 Target Vessels and Water Depth				
1.1 Target Vessels				
(1) Type	Container Vessel	Bulk Carrier	General Cargo, Ro-Ro, LCT, etc.	General Cargo, LCT
(2) Tonnage (ton)	30,000 DWT, 35,000 GRT	20,000 DWT	7,000 DWT	3,000 DWT
1.2 Water Depth (Draft) (m)	13 (11.5)	12.5		9.5
1.3 Mooring	100 tf/unit	100 tf/unit		
1.4 Berthing	0.10 m/s (Tug)	0.10 m/s (Tug)		
2 Surcharge and Live Loads at Apron				
2.1 Surcharge (tf/m2)				
(1) Normal	3.0	5.0	5.0	5.0
(2) Seismic	1.5	2.5	2.5	2.5
2.2 Live Loads				
(1) Gantry Crane	See Chapter 3.2.4	-	-	-
(2) Mobile Equipment	40ft Container Truck	Standard and Multi-tyred Trucks and Forklift		
II Natural Conditions				
1 Meteorology				
1.1 Temperature	max: 34.3, min: 21.2, mean: 27.9 ℃			
1.2 Rainfall	max: 200 mm/hr			
1.3 Wind	v: 150 kph (42 m/s), p (9~30m): 1920 Pa, p (0~9m): 1440 Pa			
2 Oceanography				
2.1 Tide	MLLW: ±0, EHW: 1.37, MHW: 0.87, MSL: 0.46, ELW: -0.46 m			
2.2 Current	max: 20 cm/s at Bay Entrance			
2.3 Wave	offshore max. in extreme condition: 5.34 m			
3 Geotechnical Conditions	see boring logs			
4 Seismic Condition	design seismic coefficient: 0.18 (local coefficient: 0.15, importance factor: 1.2, factor for sub-soil condition: 1.0)			
III Structural Conditions				
1 Materials				
1.1 Concrete				
(1) Grade and Strength (kPa)	A (for PC): 34.5, B (for marine RC): 27.5, C (for on-land RC): 24.0, D (for Plain Concrete): 18.0, E (for Lean Concrete): 10.0			
(2) Re-Bars (Grade, Yield & Allowable Stress MPa)	D-40: fy=275, fs=138, D-60: fy=414 , fs=166 (Deformed Bar)			
(3) PC Strands (Yield Stress Mpa)	PC-250: fy=1725, PC-270: fy=1860			
1.2 Structural Steels (SS400 Equivalent)	Yield Stress(fy): 245 Mpa, Young's Modulus(E): 2000000 Mpa, Allowable Stress(fsa): 137 Mpa, Poisson's Ratio(n): 0.3, Thermal Expansion: 11×10^{-6} /℃			
1.3 Steel Pipe Piles (Grade and Allowable Tensile Stress MPa)	SS400, SM400, SMA400, STK400: 137, SKK490, SHK490, SKY490: 186			
1.4 Steel Sheet Piles (Grade and Allowable Tensile Stress MPa)	SY295: 176, SY390: 235			
1.5 Corrosion Rate of Steel Members	for Sea Side above HWL: 0.3 m/yr, HWL~(LWL-1m): 0.25 mm/yr, (LWL-1m)~seabed: 0.2 mm/yr; for Land Side in marine atmosphere: 0.1 mm/yr, below GL above GWL: 0.03 mm/yr, below GWL:			
1.6 Unit Weight (kN/m3)	PC, RC and Plain Concrete: 23.5, Mortar: 19.6, Asphalt: 22.6, Structural Steel: 77.0			
1.7 Fill Materials				
(1) Unit Weight (kN/m3), underwater values in bracket	Sand: 17.7 (9.8), Rock/Stone: 17.7 (9.8), Gravel: 17.7 (9.8)			
(2) Strength Parameters (Shearing Resistant Angle)	Sand: 30 deg., Rock/Stone: 35 deg., Gravel: 35 deg.			
2 Other Considerations				
2.1 Increase in Allowable Stress	Dead Load + Live Load + Impact: No Increase, Dead Load + Live Load + Impact + Wind: 33 %, Dead Load + 1/2 Live Load + Seismic Load: 50 %, Other Possible Loads + Temporarily Load: 33 %			
2.2 Safety Factors (factors in bracket: seismic condition)				
(1) Slope	1.3 (1.0)			
(2) Gravity Type Structures	Sliding: 1.2 (1.0), Over-Turning: 1.2 (1.1), Bearing Capacity (Circular Arc Slip): 1.2 (1.0)			
(3) Sheet Piles	Stability of Moment Balance: 1.5 (1.2), Anchor Block Stability: 1.5 (1.2)			
(4) Shallow Foundation	Bearing Capacity: 2.5 (1.5)			
(5) Pile Foundation	Baring Capacity: 2.5 (1.5), Pullout: 3.0 (2.5)			
2.3 Service Period	50 yrs	20 yrs		

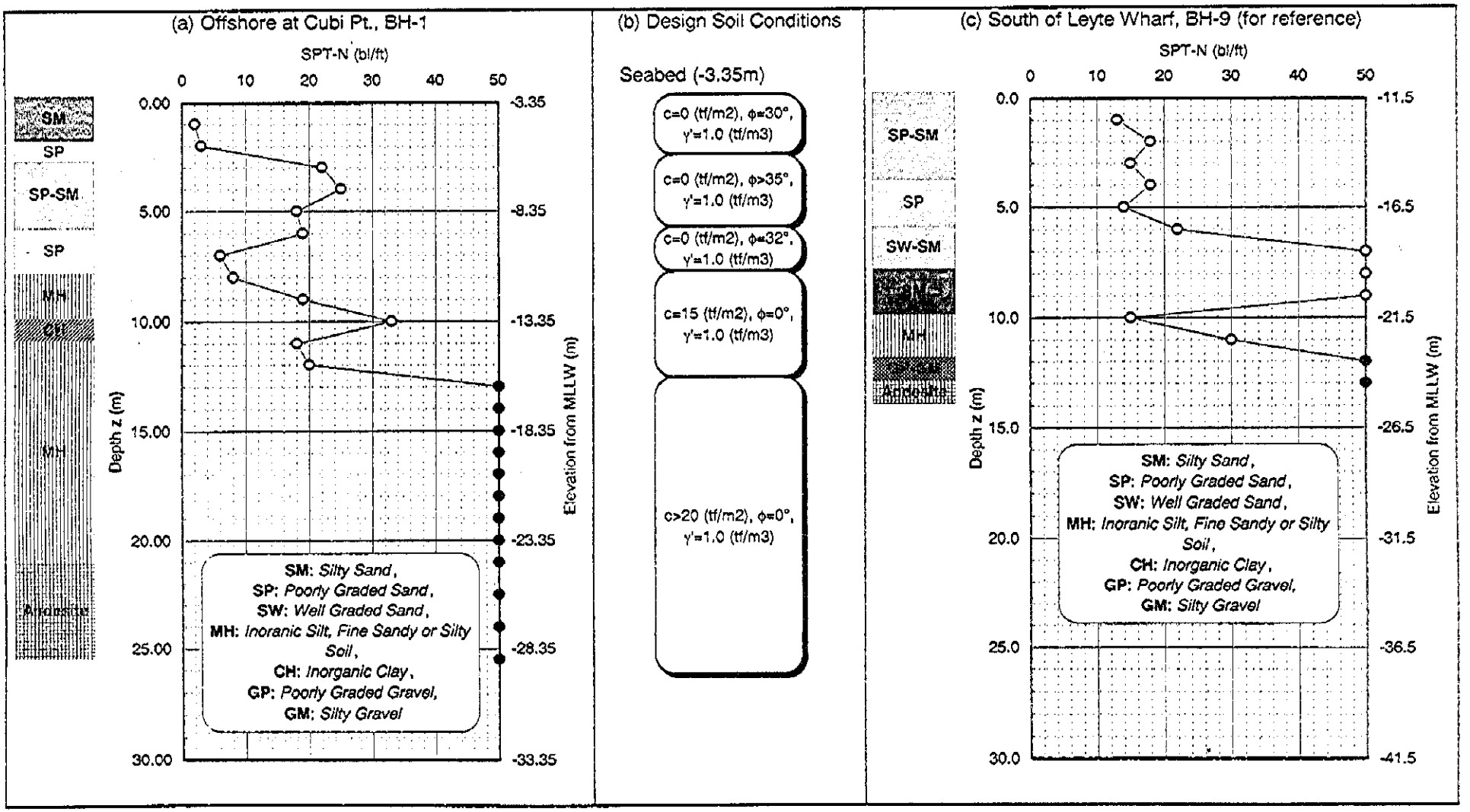


Figure 3.3.1-1 Soil Conditions at Cubi Pt. for Preliminary Design

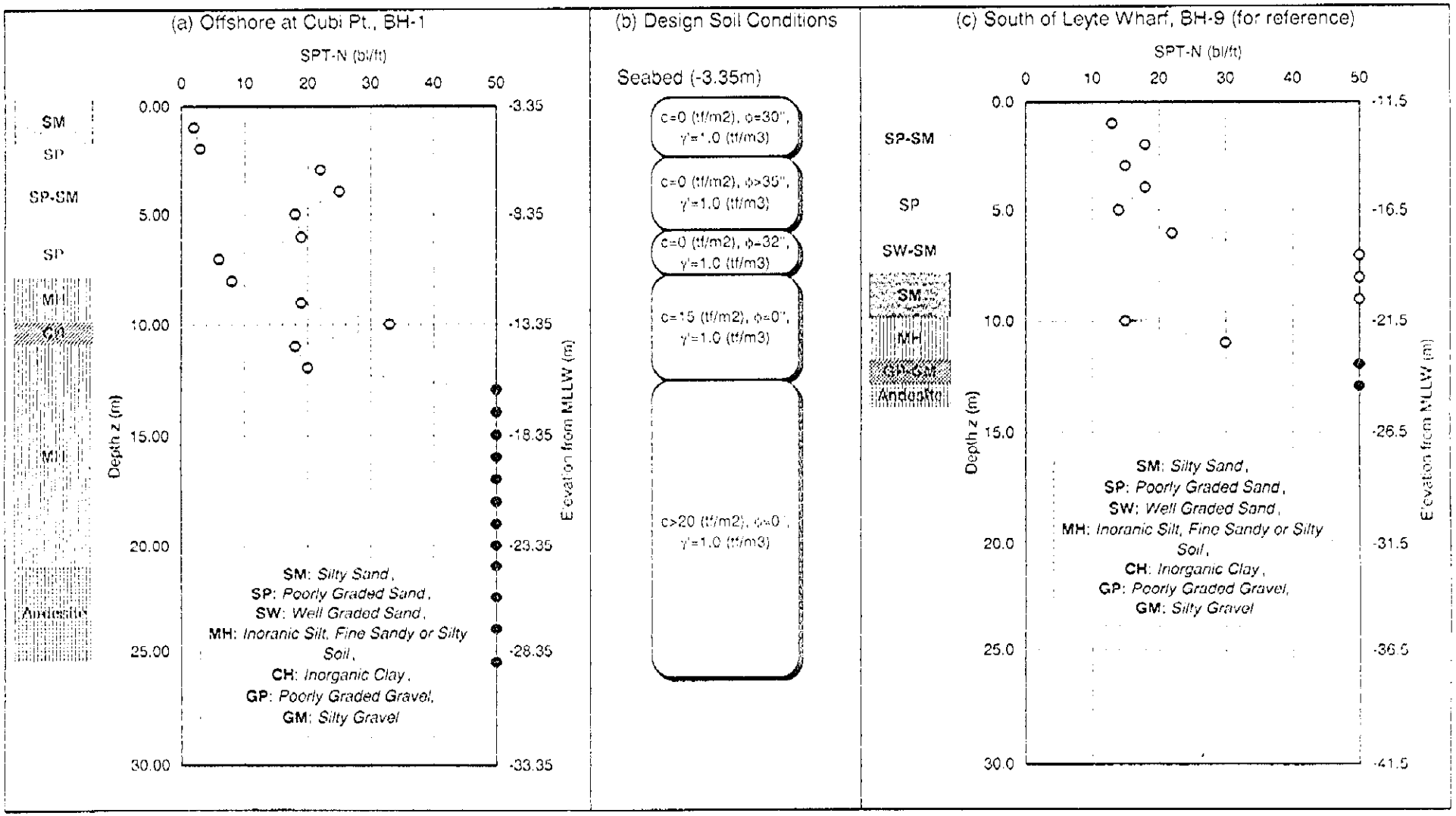


Figure 3.3.1-1 Soil Conditions at Cubi Pt. for Preliminary Design

For this to be realised, cargo handling equipment suitable to the operation, surcharge on the apron larger than that for the container facilities has been considered in the reinforcement/rehabilitation design, as well as sufficient capacity of sheds/warehouses. In view of the inevitable decay of the structural members so far developed, the reinforcement and rehabilitation consider a servicing period of future 20 years.

(3) Access Road to the New Container Terminal at Cubi Pt.

Based on the analysis of the existing road network in SBFZ, particularly around SBIA, an access road to the new container terminal at Cubi Pt. will be essentially required in order that the terminal is able to cater its expected cargo volume in the short term perspective.

Planning and design of the access road have been carried out under the expected criteria, such as traffic volume of trucks and service vehicles generated by the port activity, conditions to secure current operation of SBIA, especially the navigation of aircraft, etc. As usual in the design of roads and highways in the Philippines, relevant codes and standards established by DPWH should be specifically used.

3.3.2 Codes and Standards

For the water front facilities, such as wharves and revetment, the design manual of PPA is used for the design, which was prepared in cooperation with JICA in 1994. For other on-land facilities, available national codes and standards in the Philippines are used.

For major components in the Short Term Development, listed below are those adopted in the design.

- Design Manual of Port and Harbour Facilities in the Philippines, Philippine Ports Authority (PPA) in cooporation with JICA, 1994;
- Technical Standards for Port and Harbour Facilities in Japan, Overseas Coastal Area Development Institute of Japan (OCDI);
- National Structural Code of the Philippines (NSCP), Association of Structural Engineers of the Philippines (ASSEP);
- Design Guidelines, Criteria and Standards, Department of Public Works and Highways (DPWH), Philippines;
- Standard Specification, DPWH, Philippines.

In case no relevant local codes and standards have yet been developed, those established by ISO, ASTM, AASHTO, ACI, BS, ASME, JIS, etc., will be adopted, as internationally acceptable references.

3.3.3 Design of New Container Terminal at Cubi Pt.

(1) Quay Structure

Considering the sub-soil conditions at Cubi Pt., a suitable structure type for the quay has been studied as summarised in Table 3.3.3-1. A gravity caisson type quay structure will be the most suitable to the site conditions.

Typical section of the caisson type quay wall is shown in Figure 3.3.3-2 and the design calculation is summarised in Table 3.3.3-3.

Suitable quay fixtures to the objective vessels, i.e. rubber fenders and bollards, have been selected as shown in the above figure. The following capacities are expected:

- Rubber Fender: absorption energy of 65 tf-m at about 50 % deflection;
- Bollard: tractive force of 100 tf in every directions.

(2) Crane Foundation

At the sea side, the crane rail can be mounted on the coping of the quay, while on the land side, crane foundation shall be separately provided. Coupled battered steel piles will be adopted against horizontal loads from the gantry crane by seismic and wind forces.

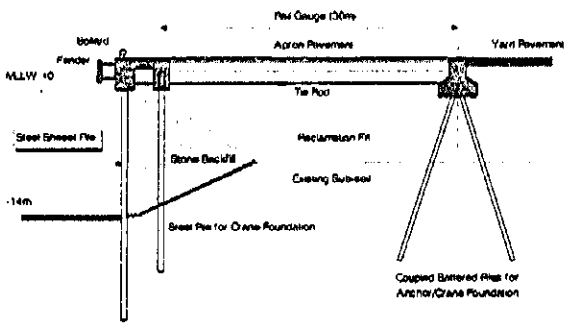
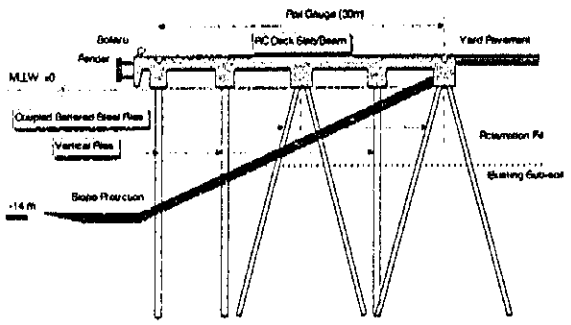
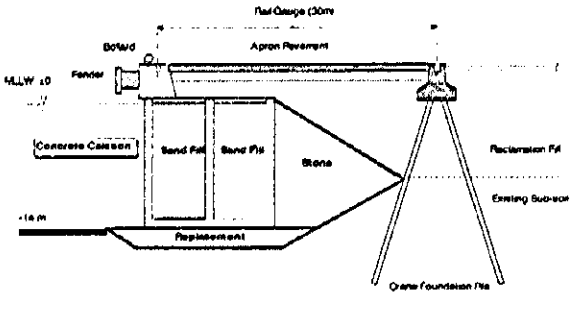
(3) Dredging and Reclamation

The site for the new terminal located at the tip of Cubi Pt. offers deeper water depth sufficient for the objective vessels. It is, however, expected that some shallower area in front of the quay has to be dredged.

Moreover, reclamation of the terminal area requires quite a bit of filling volumes to be obtained either by dredging the offshore seabed or from a quarry at Mt. Maritan located behind POL pier about 5km distant from the Cubi Pt. site.

Based on a preliminary estimation for the volumes presented in Table 3.3.3-4, the dredging and reclamation area is scheduled to be located as shown in Figure 3.3.3-3.

Table 3.3.3-1 Comparison of Quay Wall Structures

	STEEL SHEET PILE TYPE	RC DECK ON PILES TYPE	GRAVITY (CAISSON) TYPE
TYPICAL CROSS SECTION	 (not to scale)	 (not to scale)	 (not to scale)
MERITS	• Generally, construction period is shorter. • Sheet piling and dredging in front of the berth can be conducted almost simultaneously. • Concrete Works are minimum. • Rather durable structural type. • Maintenance will be easy, other than corrosion of the sheet piles. • Deepening of the water depth is possible in the future.	• Generally, construction period is shorter. • Volume of reclamation and replacement fill material may be minimum. • Deepening of the water depth is easier in the future.	• Generally, construction period is longer. • Caisson works normally require a wider fabrication yard, capable of towing the caisson boxes. In stead of the fabrication in the yard, large floating docks will be used in Subic Bay. • Fabrication of the caisson boxes can be commenced before dredging. • Suitable to the soil conditions. • Structure is rather durable and solid. Ideally no maintenance works are required.
DEMERITS	• Sheet pile driving will be difficult at Cubi Pt. site, considering the soil condition. • Steel sheet piles may not be used for crane foundation piles at sea front side, while anchor piles could be used for the crane foundation at land side. • Corrosion of steel pipe sheet piles should be considered. • Steel sheet piles and tie rods have to be imported.	• Sheet pile driving will be difficult at Cubi Pt. site, considering the soil condition. • Pile driving should be commenced after completion of the reclamation. • Maintenance will be essential, including corrosion of the steel piles and RC superstructures. • Volume of concrete works is larger for the superstructure. • Structurally flexible types, thus weaker against overloading.	• Construction needs experiences of the contractors. • Large floating equipment and special fabrication form are essential. • Crane foundation piles have to be separately provided. • Deepening of the water depth is difficult in the future.
Relative Cost	1.1	1.2	1.0
SUITABILITY TO THE PROJECT	Poor	Poor	Good

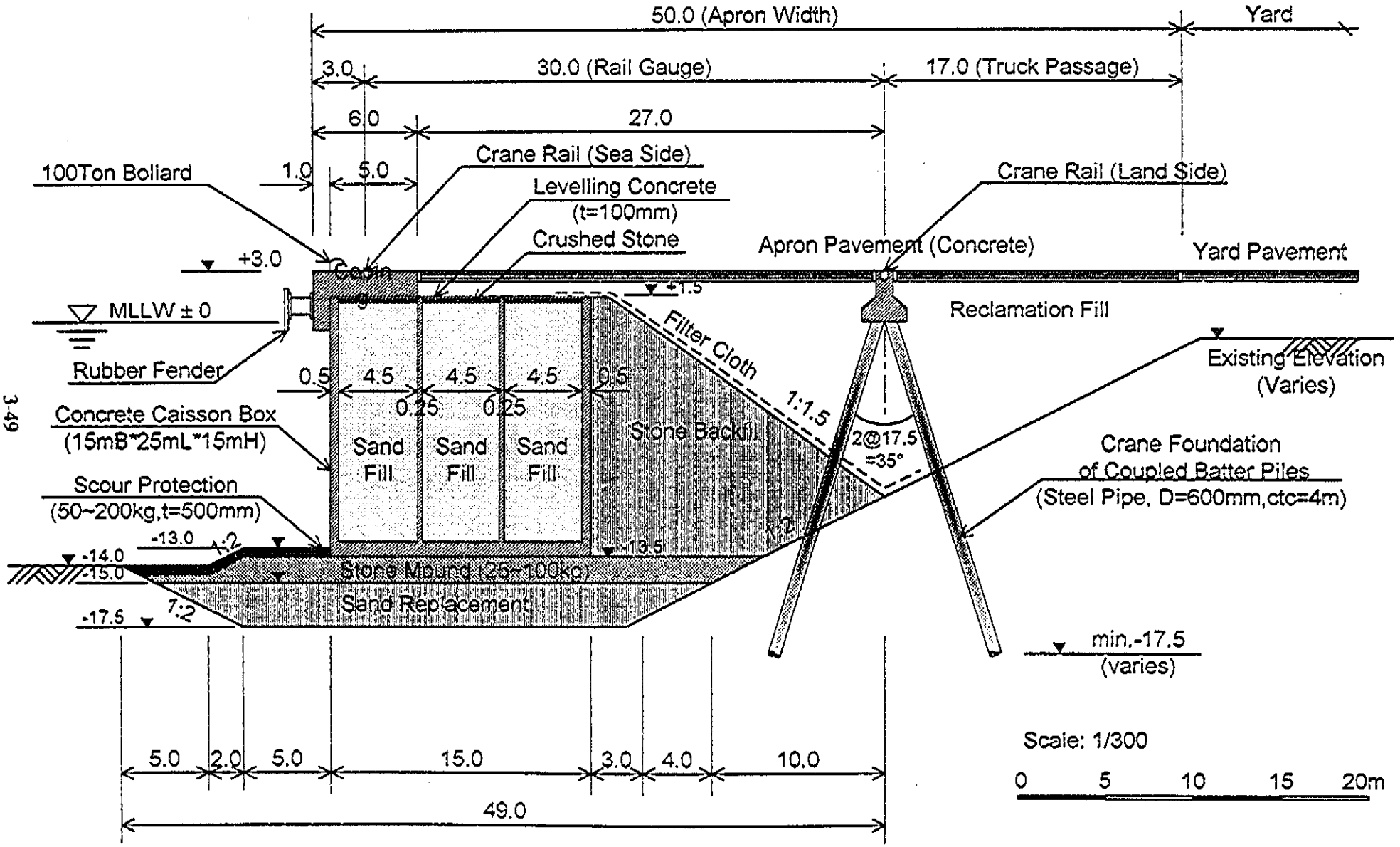


Figure 3.3.3-1 Typical Section of the Caisson Quay Wall for the New Container Terminal at Cubi Pt.

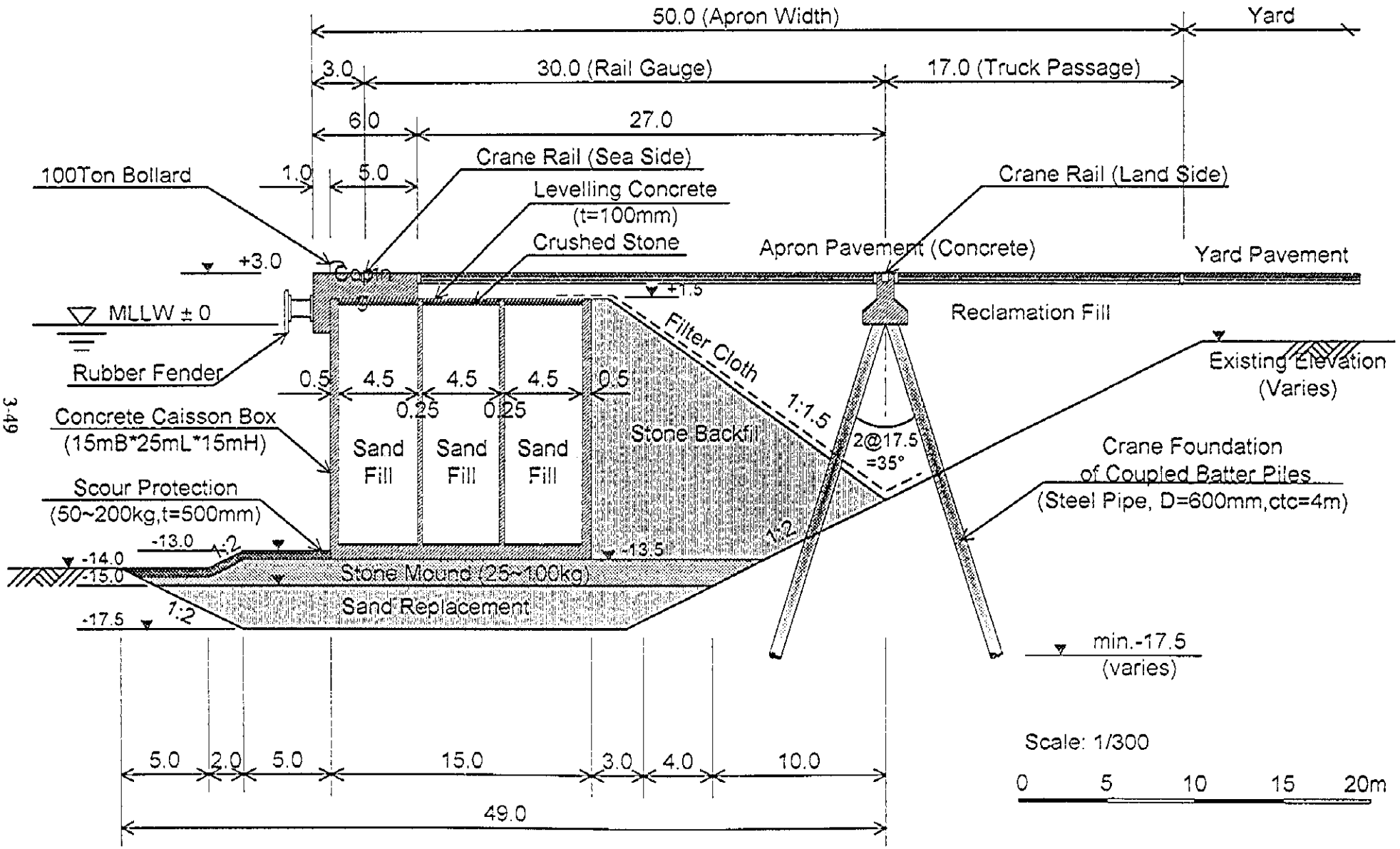


Figure 3.3.3-1 Typical Section of the Caisson Quay Wall for the New Container Terminal at Cubi Pt.

Table 3.3.3-2 Calculation Sheet for Stability of Caisson Type Quay Wall

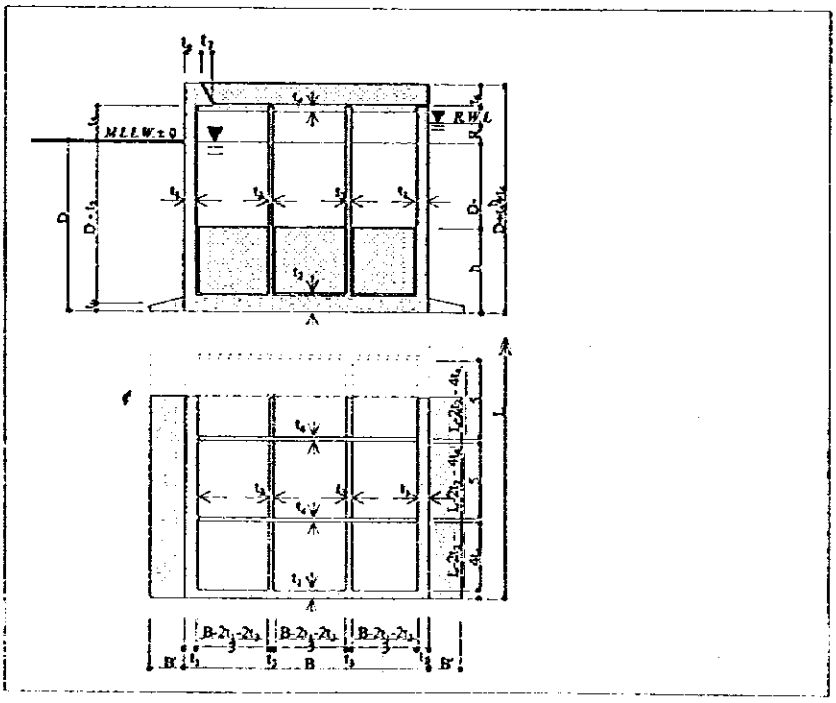
Particulars

Loading Condition				unit
Surcharge (Normal:Seismic)	w =	3.00 : 1.5		(tf/m²)
Mooring tension(tf/m):elev.(m)	T =	4.00 : 0.5		(tf) (m)
Design seismic intensity:under water	k =	0.18	0.36	
Friction coefficient at the bottom	f =	0.60		
Density of water	d_w =	1.025		(tf/m³)
Density of back fill sand(wet :dry :in wate	d_s =	2.00 : 1.8 : 1		(tf/m³)
Density of concrete	d_c =	2.40		(tf/m³)
Density of fill-in material:upper face	d_f =	2.00		(tf/m³)

Dimension		Crown Elevation: 3.0	(m)
	t_1 =	0.50	(m)
Total height of this structure (m) = 16.50	t_2 =	0.80	(m)
	t_3 =	0.25	(m)
Length of bottom : B (m) = 15.00	t_4 =	0.25	(m)
	t_5 =	1.50	(m)
No. of Bulkheads (longitudinal) : Nl = 2	t_6 =	1.50	(m)
	t_7 =	0.00	(m)
No. of Bulkheads (perpendicular) : Np = 4	t_8 =	5.00	(m)
	t_9 =	0.50	(m)
	B =	15.00	(m)
	B' =	0.00	(m)
	D =	13.50	(m)
	R =	0.61	(m)
	Mooring Elev. =	0.50	(m)
	h =	14.75	(m)
	L =	25.00	(m)

RESULTS OF SAFETY FACTORS

Normal	Sliding	: 3.15 > 1.2	O.K.
	Overturning	: 6.39 > 1.2	O.K.
Seismic	Sliding (without surcharge)	: 1.00 > 1.0	O.K.
	Sliding (with surcharge)	: 1.05 > 1.0	O.K.
	Overturning (without surcharge)	: 1.91 > 1.1	O.K.
	Overturning (with surcharge)	: 1.94 > 1.1	O.K.



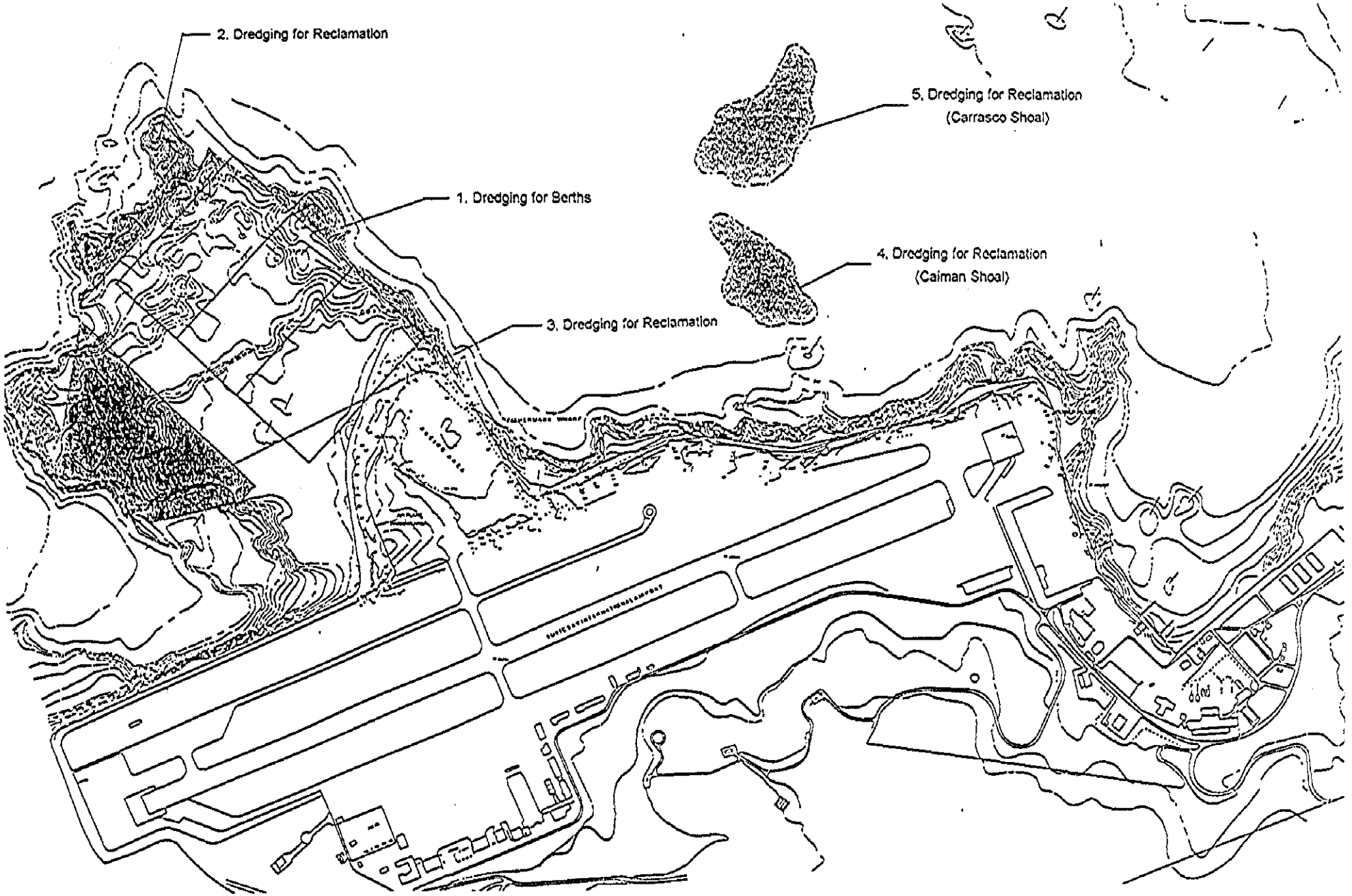


Figure 3.3.3-2 Dredging Area

Table 3.3.3-3 Volume of the Dredging and Reclamation for the Short Term Development

Dredging		(m3)	Reclmation		(m3)	Remarks
1	Quay Front to -14m	22,000	1	Phase 1 Area	996,000	
2	Northwest of the Reclamation to -15m	107,000	2	Phase 2 Area	1,255,000	
3	Southwest of the Reclamation to -15m	1,866,000				
4	Carrasco Shoal	234,000				
5	Caminan Shoal	250,000				
Total Dredging Volume		2,479,000	Total Reclamation Volume		2,251,000	
Dredged Materials usable for Reclamation (65% of the Total)		1,611,350	Ballance		-639,650	Ballance of the Volume should be obtained from Mt. Maritan

(3) Revetment

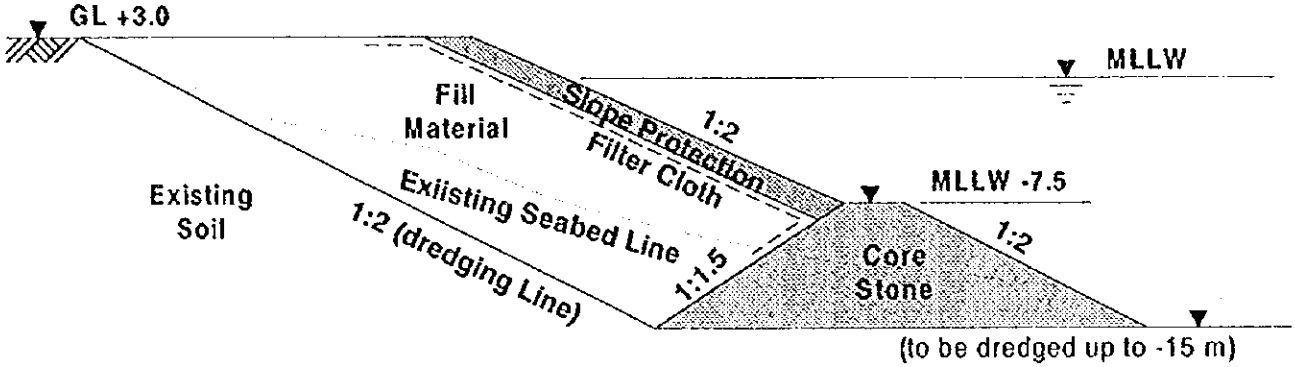
The reclamation for the terminal in each phase of the construction should be secured by appropriate revetment along its edges. However, the revetment for Phase 1 towards the extension to the successive Phase 2 area will not be necessary, since the construction of both Phases 1 and 2, will be continuously implemented. Typical section of the revetment is shown in Figure 3.3.3-3.

(4) Pavement

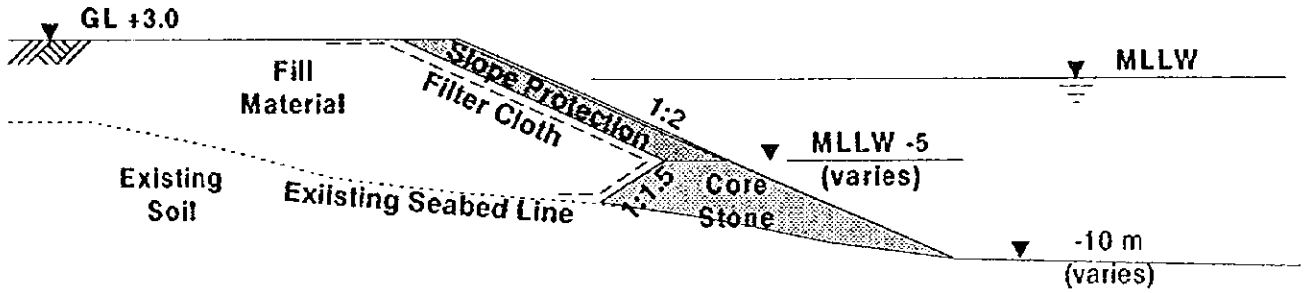
Pavement inside the terminal area has been studied in view of its specific use for the operation. Depending on the critical loading for each area, suitable types of the pavement are selected and determined as shown in Table 3.3.3-4.

For this selection, considered in the design are the following remarks:

- Apron of the berth and passageway inside the yard: ideally only loaded trailer trucks and unloaded handling equipment will pass on the pavement. Thus it does not need to be designed for heavy wheel loads of the equipment, such as forklifts/side loaders/ reach stackers for loaded containers;
- Container Stock Yard: considering the site conditions, the yard will be provided in the reclamation on firm coral stratum and no serious settlement will be expected. Accordingly, concrete pavement has been selected. Wheel loads of the loaded equipment and required container corner loads up to 4 tiers high should be considered;
- Passage of rubber tyred transfer cranes: rigid block pavement of pre-stressed concrete slab is adopted for the heavy wheel loads.
- The access road to the container terminal: Asphalt concrete pavement is designed for various types of vehicles.



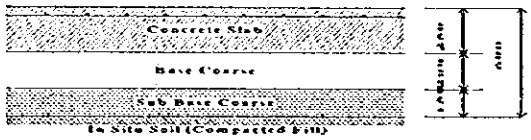
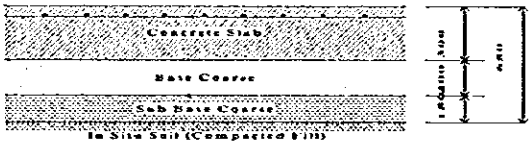
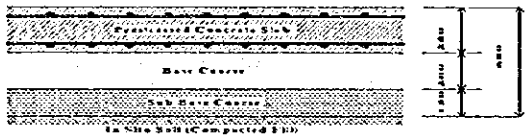
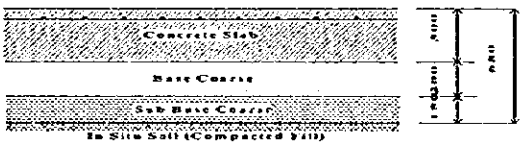
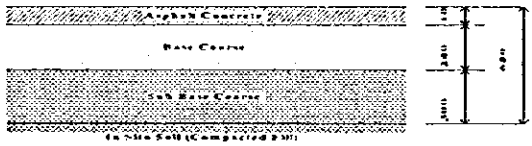
(a) Typical Section for the Revetment (South West)



(b) Typical Section for the Revetment (North West)

Figure 3.3.3-3 Typical Sections of Revetment
for the New Container Terminal

Table 3.3.3-4 Selection of Pavement Type and Preliminary Design of the Section

Area	Type	Design Loading	Section
Berth Apron & Terminal Service Road	Concrete	Container Trailer Truck	
Container Stack Yard	Concrete	Loaded Containers at 4 tiers high	
Transfer Crane Passageway	PC Slab	Transfer Crane	
Inspection Area for Reefer Containers	Concrete	Reachstacker for Loaded Containers	
Access Road to the Terminal	Asphalt Concrete	MS Truck	

* Note that MS truck loading (8 t/wheel at the rear axle) is the most critical condition for the design of standard roads and highways.

(5) Buildings

Buildings planned in the Short Term Development are summarised in Table 3.3.3-5. Considerations in the design are presented below:

- CFS will be framed by steel structures in order to offer wider space at a least number of the supporting columns;
- Both administration and operator's offices will be RC building equipped with required interior furnish for office use;
- Gate house: Steel framed roof will be provided over the checking booths;
- Maintenance shop: A single story building, but the roof will be 10 m high to accommodate with taller equipment;
- Substation: RC building will be adopted for power house, wherein emergency generator will be installed, while the substation itself may be enclosed by a fence in the open air.

Table 3.3.3-5 Outline of Buildings in the New Container Terminal

Building	No.	Capacity / Floor Area (m2)	Story	Structural Particulars		
				Frame	Wall	Roof
① CFS	1 per Terminal (2 for Phases 1&2)	1,920 m2	single	Steel	Concre Block	Gulvanised Iron Sheet
② Operator's Office	1 per Terminal (2 for Phases 1&2)	80 persons 1,200 m2	two	R/C	Concre Block	R/C
③ Gate House	1 per Terminal (2 for Phases 1&2)	6 lanes, 3 booths	single	R/C	Concre Block	Gulvanised Iron Sheet
⑤ Maintenance Shop	1 per Terminal (2 for Phases 1&2)	500 m2	single 10m high	Steel	Concre Block	Gulvanised Iron Sheet
⑥ Container Washing Area	1 per Terminal (2 for Phases 1&2)	400 m2	single	Steel	-	Gulvanised Iron Sheet
⑦ Substation (Powerhouse)	1 per Terminal (2 for Phases 1&2)	600 m2	single	R/C	Concre Block	R/C
⑧ Administration Building	1 (for all the Phases)	2,000 m2	single (partially two)	R/C	Concre Block	R/C

(6) Utilities

1) Drainage

Inside the container yard, storm water will be collected by an appropriate gradient of the pavement to the surface drainage, which will be of an open type, i.e. U-shaped ditch, V-shaped gutter, etc. The main drainage will be a buried concrete box culvert type, to which surface and domestic drains will be connected. Septic tanks for each building will be also installed, as well as spilled waste water collector for the container washing and maintenance shops.

2) Water Supply

Fire fighting, ship's supply and other domestic consumption in the terminal have been considered and the water will be tapped at mains of the Cubi Pt. area. Relevant facilities, such as reservoirs, elevated tanks and pumps will be included, together with their network pipes.

3) Power Supply

Substation and emergency generator for quay cranes will be provided, in addition to other demands of reefer receptacles, lighting and building supply.

3.3.4 Design of Access Road to the New Container Terminal at Cubi Pt.

(1) General Alignment

In order to separate traffic generation in the new container terminal from the existing road network around SBIA, an access road to the terminal has been studied in terms of its smooth connection to the existing main road, Argonaut Highway, and its required capacity.

The access from the Boton Wharf area along the north west shoreline of Cubi Pt. has been selected as the most feasible route to the new container terminal. General alignment on the plan is shown in Figure 3.3.4-1.

(2) Elevation

Considering possible effects to navigation of the landing/taking-off air crafts at SBIA, the elevation of the access road has been designed as lower as possible to fit to the existing terrain of the route, as well as to the existing circumferential road outside the airport boundary. The elevation profile of the access road has been determined as also shown in Figure 3.3.4-1.

(3) Sections

Two lanes in each direction and side walk at the side are considered. Width of the road is 28 m in total.

The road is provided on reclamation extended along the shoreline from Boton area to the existing racing course at the north east foot of Cubi Pt. Sloping revetment has been designed at the edge of the present shoreline, consisting of slope protection on the surface, core stone and reclamation fill. To keep the elevation lower than the runway of SBIA, cutting of the existing ground will be secured either by vertical revetment or slope to the higher elevation.

In addition, a portion of the road at the cross point of the existing runway, north east edge of SBIA, will be covered with a sheltering shed in order to minimise unfavourable effects to the navigation of the aircraft using the runway.

Typical sections of the access road are shown in Figure 3.3.4-2.

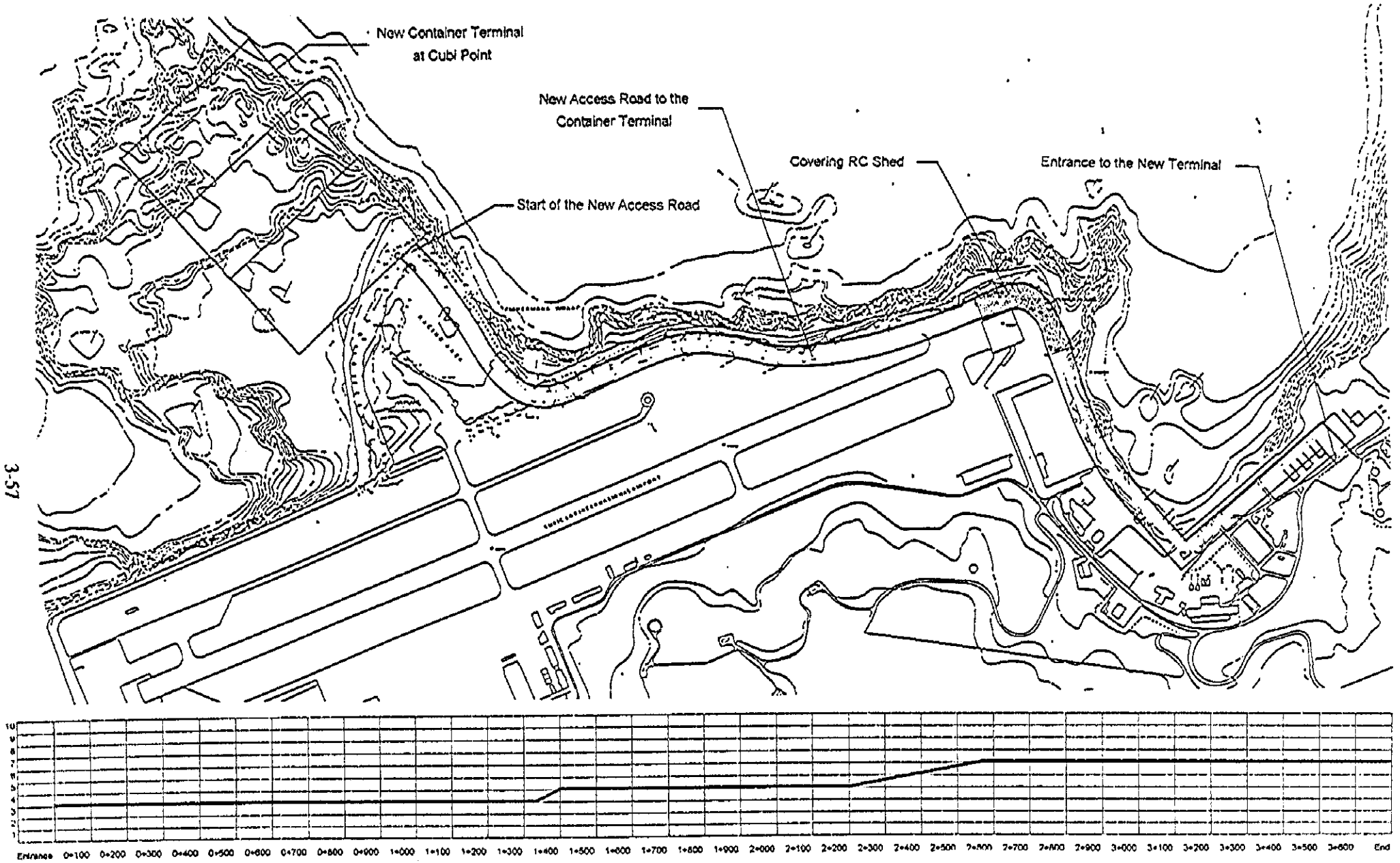
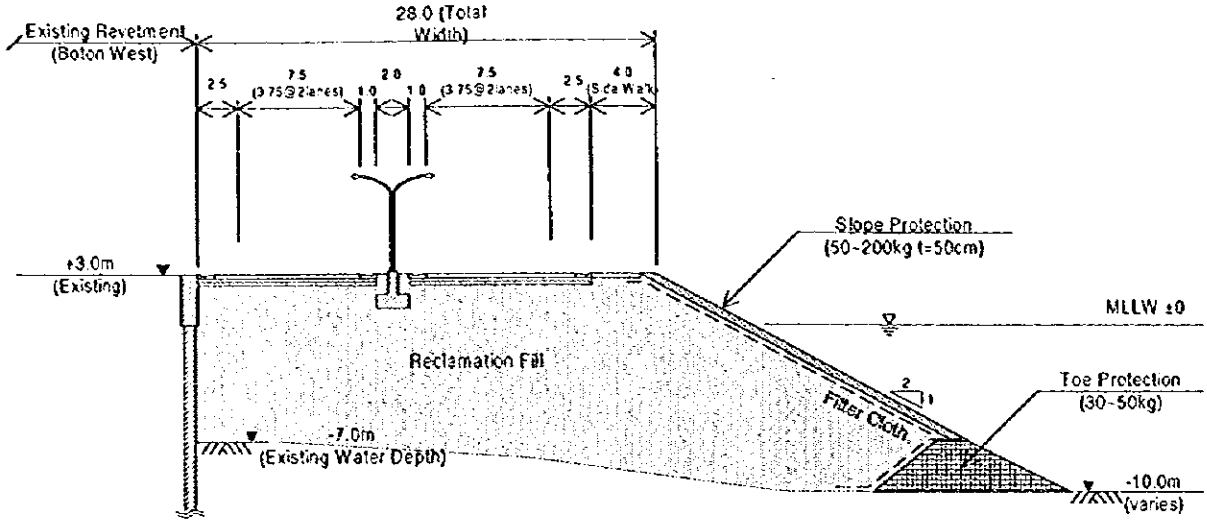
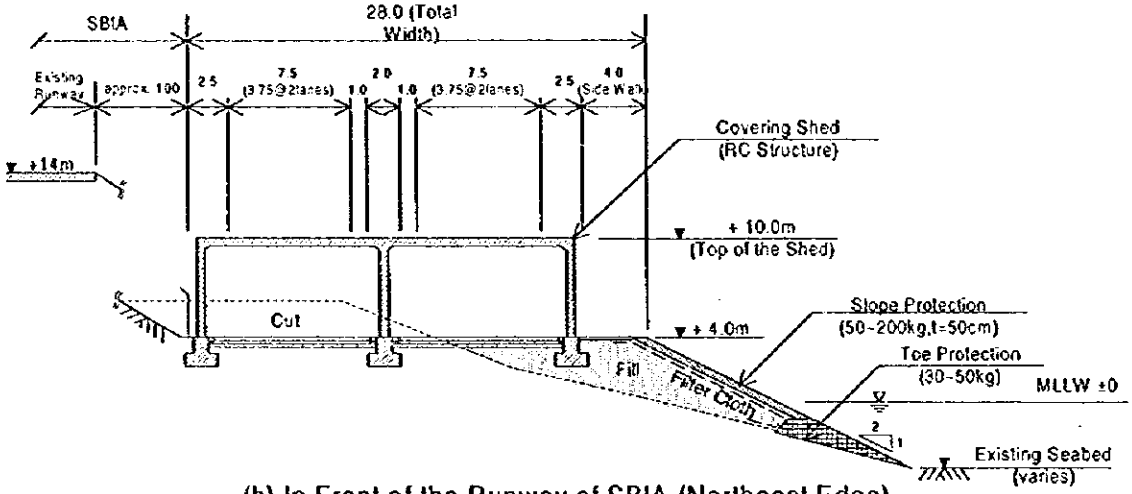


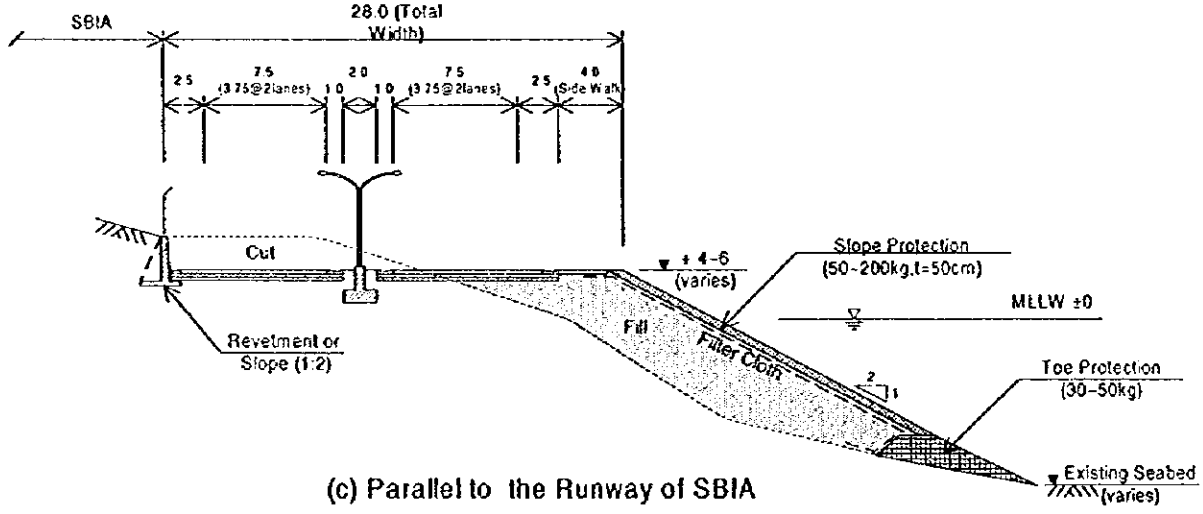
Figure 3.3.4-1 General alignment and Longitudinal Elevation Profile of New Access Road



(a) Along the Revetment of Boton West Area



(b) In Front of the Runway of SBIA (Northeast Edge)



(c) Parallel to the Runway of SBIA

Figure 3.3.4-2 Typical Sections of the Access Road (Scale:1/400)

3.3.5 Design of Rehabilitation/Reinforcement for the Existing Wharves

In the Master Plan, Marine Terminal is expected to cater non-containerised cargo for international shipment. As established in the design criteria, the pier will be used by bulk carriers of 20,000 DWT and/or general cargo, Ro-Ro, LCT and other types of vessels of 7,000 DWT.

Accordingly, the current pier structures will be required to be rehabilitated and reinforced to meet the requirements. Enumerated below are objectives of the rehabilitation/reinforcement:

- Reinforcement of the pile foundation to sustain berthing and seismic forces;
- Reinforcement of the superstructure, i.e. beams and slabs, of the apron to cope with larger surcharge and heavier equipment;
- Rehabilitation of the damaged structural members to restore their original capacity;
- Provision of required quay fixtures for objective vessels in the Master Plan.

Design of the rehabilitation/reinforcement schemes has been developed in line with the above objectives and formulated as follows:

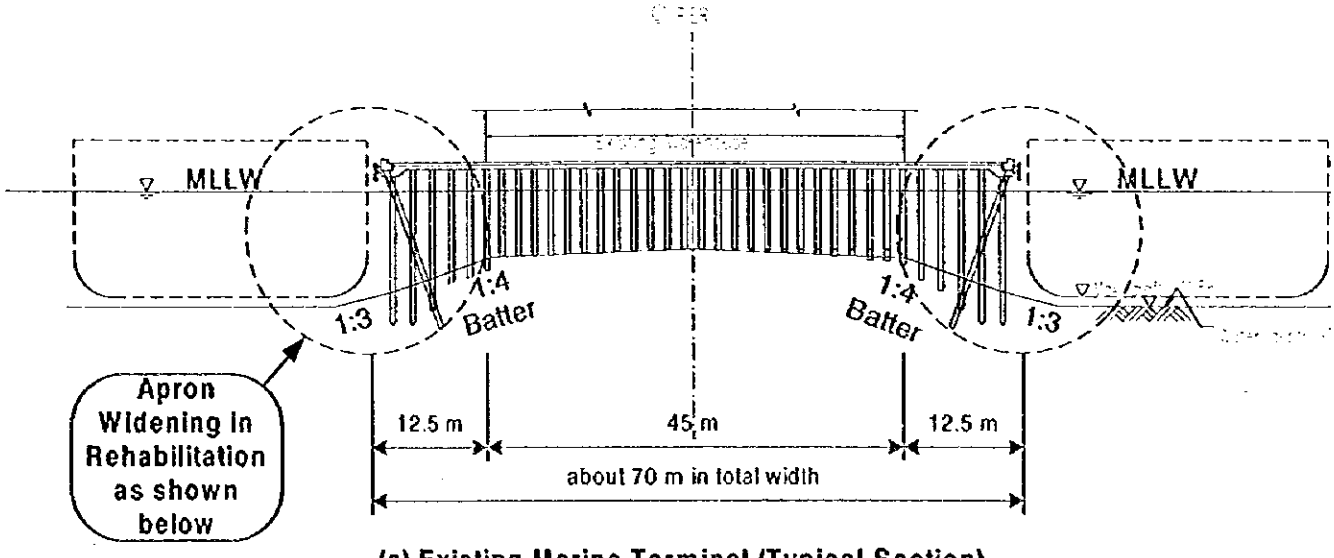
- Provision of steel pipe pile system along the faceline, consisting of two vertical piles and a couple of battered piles in a bay;
- Widening of the apron with new superstructure on the new pile foundation;
- Rehabilitation of the damaged structural members to restore their original capacity;
- Provision of required quay fixtures for the objective vessels in the Master Plan.

Rehabilitation/reinforcement of the pier is schematically shown in Figure 3.3.5-1.

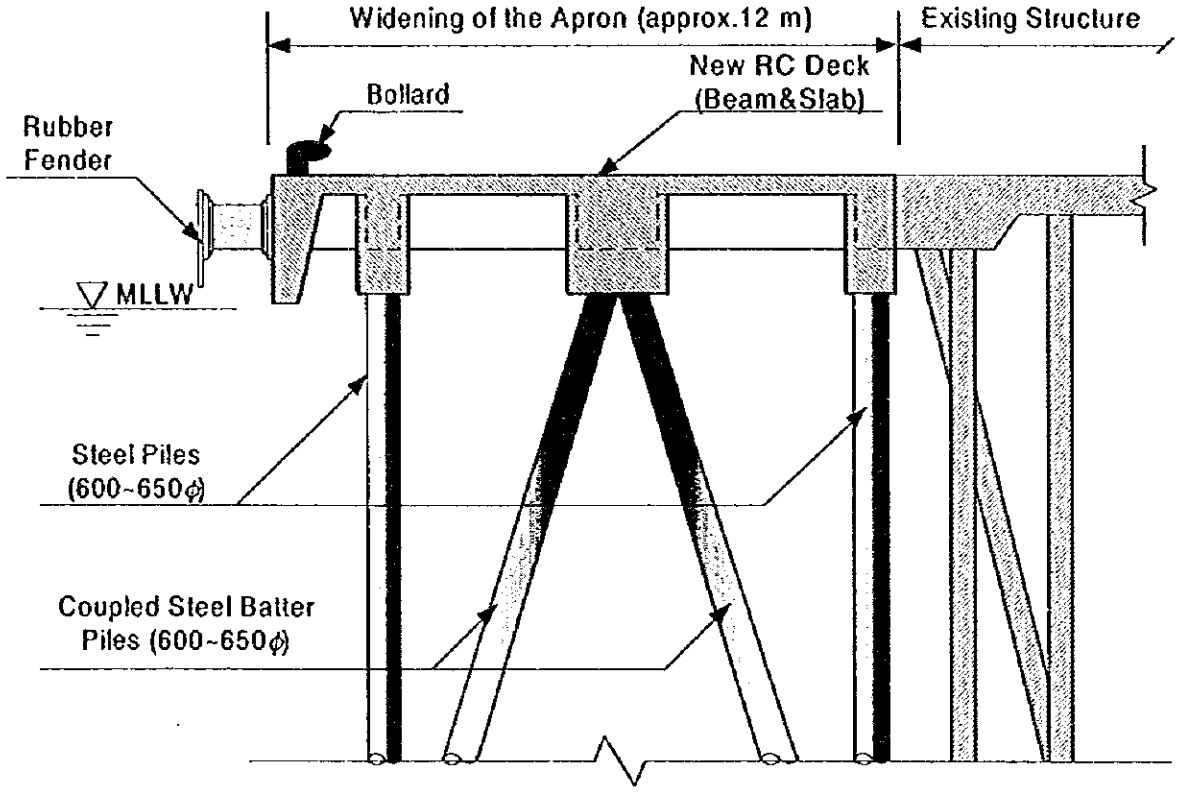
3.3.6 Upgrading Existing Navigational Aids in Subic Bay

The existing navigational aids in Subic Bay have been used for more than 14 years and some of them have been no longer functional requiring maintenance or immediate repairs. In order to secure safe approach of larger vessels, particularly to avoid any incidental collisions to smaller fishing boats in the bay, upgrade of the navigational aids has been studied.

In view of their current status, all the existing light buoys and beacons should better be replaced with new units. In addition, a new light house in Grande Island will also be provided as a replacement of the existing one.



(a) Existing Marine Terminal (Typical Section)



(b) Widening of the Apron

Figure 3.3.5-1 Rehabilitation and Reinforcement of Marine Terminal

Outline of the navigational aids is summarised in Table 3.3.6-1 and their arrangement is shown in Figure 3.3.6-1.

Table 3.3.6-1 Outline of the Navigational Aids Upgrade in Subic Bay

Light Buoys/Beacons	Replacement of the Existing or New INstallation	Body Coour	Lighting Characteristics	Top Mark	Power Source	Remarks
No.1	Replace	Red & Green	Gp.g.(2+1) 7 sec	CAN	Solar/Wave Generator	
No.5	Replace	Red	Fl. (2) 6 sec	CAN	Solar/Wave Generator	GPS Synchroniser
No.6	Replace	Red	Fl. (2) 6 sec	CONICAL	Solar/Wave Generator	GPS Synchroniser
No.7	Replace	Green	Fl. (2) 6 sec	CAN	Solar/Wave Generator	GPS Synchroniser
No.8	Replace	Red	Fl. (2) 6 sec	CONICAL	Solar/Wave Generator	GPS Synchroniser
No.9	Replace	Yelloe	Fl.y. 4 sec	"X"	Solar/Wave Generator	
No.10	Replace	Red	Fl. (2) 6 sec	CONICAL	Solar/Wave Generator	GPS Synchroniser
No.11	Replace	Red and White	Mo. (A) 8 sec	SPHERICAL	Solar/Wave Generator	
No.12	Replace	Yelloe	Fl. (2) 6 sec	CONICAL	Solar/Wave Generator	
Light House (Grande Island)	Replace	White	Occ. 5 sec		Solar Generator	GRP Body, 10 m high
A-1	New	Yellow	Fl.y. 4 sec	"X"	Solar/Wave Generator	
A-2	New	Yellow	Fl.y. 4 sec	"X"	Solar/Wave Generator	
A-3	New	Yellow	Fl.y. 4 sec	"X"	Solar/Wave Generator	
A-4	New	Green	Fl. (2) 6 sec	CAN	Solar/Wave Generator	GPS Synchroniser
A-5	New	Red	Fl. (2) 6 sec	CONICAL	Solar/Wave Generator	GPS Synchroniser
A-6	New	Green	Fl. (2) 6 sec	CAN	Solar/Wave Generator	GPS Synchroniser
A-7	New	Green	Fl. (2) 6 sec	CAN	Solar/Wave Generator	GPS Synchroniser
A-8	New	Red	Fl. (2) 6 sec	CONICAL	Solar/Wave Generator	GPS Synchroniser
A-9	New	Green	Fl. (2) 6 sec	CAN	Solar/Wave Generator	GPS Synchroniser
A-10	New	Green	Fl. (2) 6 sec	CAN	Solar/Wave Generator	GPS Synchroniser
A-11	New	Green	Fl. (2) 6 sec	CAN	Solar/Wave Generator	GPS Synchroniser
A-12	New	Yellow	Fl. 4 sec	"X"	Solar/Wave Generator	
A-13	New	Yellow	Fl. 4 sec	"X"	Solar/Wave Generator	
A-14	New	Yellow	Fl. 4 sec	"X"	Solar/Wave Generator	
A-15	New	Yellow	Fl. 4 sec	"X"	Solar/Wave Generator	

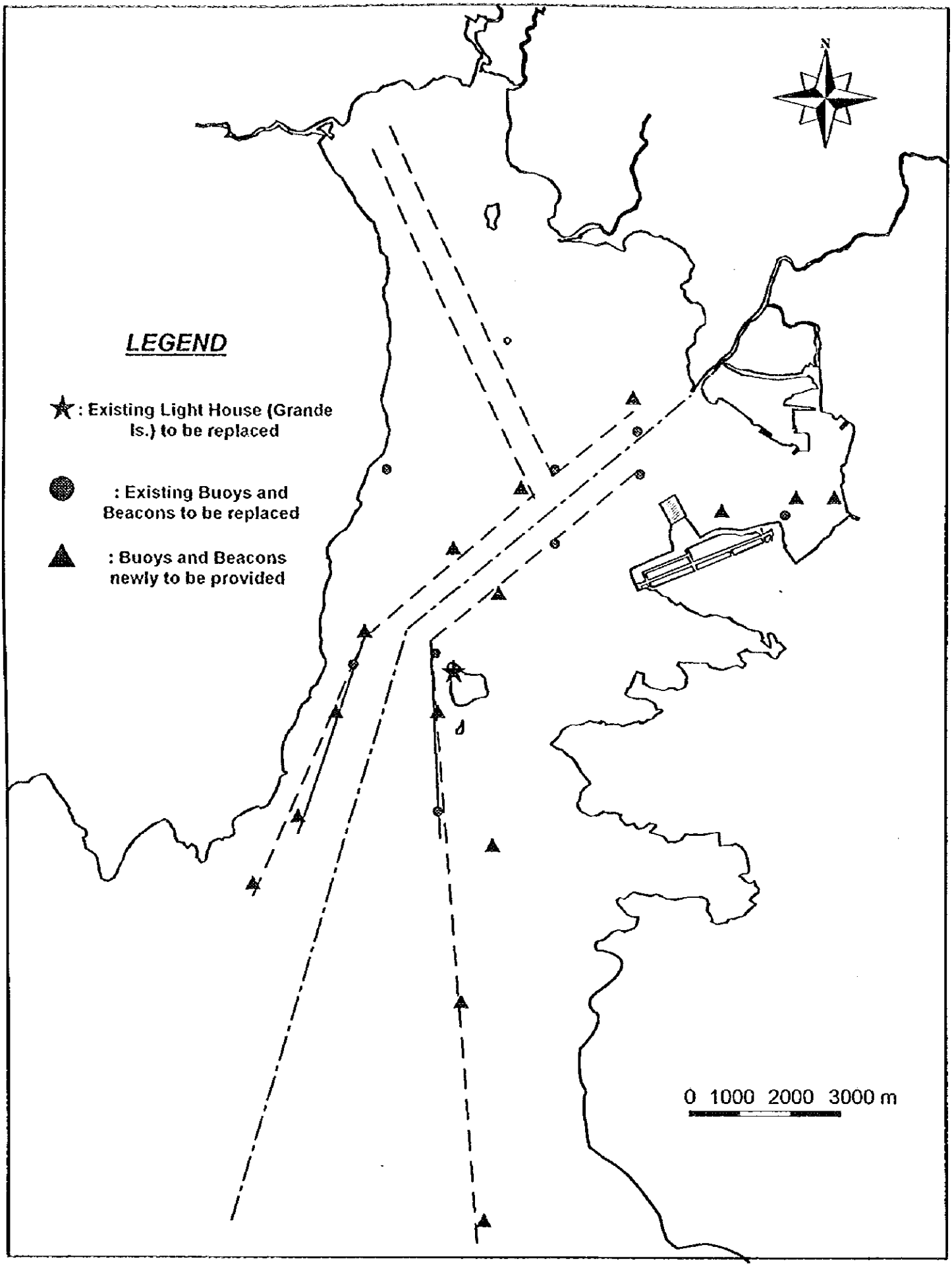


Figure 3.3.6-1 Navigation Aids (Light House, Buoys and Beacons) Planned

3.4 Cost Estimate for Short Term Plan

3.4.1 General Conditions for the Estimate

(1) Composition of the Cost

In general, project cost for port development consists of construction cost, equipment procurement, engineering services and physical contingency. In this Study the following composition of the Project cost has been considered:

i) Construction Cost;
ii) Equipment Procurement;
iii) Engineering Services (10 % of i) & ii))
iv) Price Escalation (annual 2% for 5 years for i), ii) & iii))
v) Physical Contingency (10 % of i), ii) and iii));
vi) Cost for Rehabilitation Program scheduled by SBMA
vii) Administration Cost of SBMA for the Project Implementation.

(2) Basis and Exchange Rate

The following exchange rate has been used for the cost estimate:

1 US$ = 127.7507 Yen = 40.4458 Pesos, (1 Pesos=3.158565 Yen)

The above rate is derived from the average in February 1998 based on Central Bank Reference Exchange Rate, Philippines.

(3) Unit Price for the Project Component

Each work item is broken down to the costs of materials, construction equipment depreciation and labour wages. Unlike construction industry in Japan, there are no such official rates in the country. A comprehensive survey was conducted by searching markets, product suppliers/distributors, contractors and local manufacturer, as well as relevant bidding documents of the government projects and consultants' own databases.

It should be noted that VAT (value added tax) exemption to the unit price has been considered in this estimate similar to the other projects already implemented in SBFZ. It was also confirmed through foreign contractors having completed their works inside SBFZ. Accordingly, the unit prices evaluated do not include VAT portion in this estimate.

3.4.2 Estimate of the Project Cost

Based on the conditions explained, the Project Cost has been estimated from quantity of the construction works in the preliminary design and the unit price of the corresponding works consisting of the foreign and local components.

(1) Overall Project Cost

Summary of the Project Cost for Phases 1 and 2 Development is shown in Table 3.4.2-1 below.

Table 3.4.2-1 Overall Project Cost for Short Term Development Plan (Phases 1 & 2)

(in Million US$)

COST ITEM (Executing Body)	Phase 1			Phase 2			Total (Short Term)		
	SBMA	Ope-rator	Total	SBMA	Ope-rator	Total	SBMA	Ope-rator	Total
1 Detailed Design / Tender Preparation	4.0		4.0	2.0		2.0	6.0		6.0
2 Construction	65.3	13.3	78.6	52.3	11.9	64.2	117.6	25.2	142.8
2.1 New Container Terminal									
(1) Construction	34.8	2.8	37.6	35.8	2.8	38.6	70.6	5.5	76.2
(2) Equipment Procurement (for container operation)	12.5	9.1	21.6	12.5	9.1	21.6	25.0	18.2	43.2
(3) Equipment Procurement (for non-container operation)		1.4	1.4			0.0	0.0	1.4	1.4
2.2 Rehabilitation of Marine Terminal	4.0		4.0	4.0		4.0	8.0		8.0
2.3 Access Road to the New Container Terminal	11.6		11.6	0.0		0.0	11.6		11.6
2.4 Navigation Aid	2.4		2.4	0.0		0.0	2.4		2.4
3 Consulting Supervisory Srvices	4.0		4.0	2.7		2.7	6.7	0.0	6.7
4 Price Escalation (5 years at 2% per annum for items 1, 2 &3)	7.6	1.4	9.0	5.9	1.2	7.2	13.6	2.6	16.2
5 Physical Contingency (10% for items 1, 2 & 3)	7.3	1.3	8.7	5.7	1.2	6.9	13.0	2.5	15.5
6 Sub-Total of items from 1 to 5	88.2	16.0	104.3	68.7	14.3	82.9	156.9	30.3	187.2
7 SBMA Rehabilitation Progrm *	12.6		12.6	9.6		9.6	22.2		22.2
8 Administration Cost	3.0		3.0	2.5		2.5	5.5		5.5
GRAND TOTAL	103.8	16.0	119.8	80.8	14.3	95.1	184.6	30.3	214.9

* Existing Roads, Rivera/Bravo Wharf and Relocation of Buildings/Utilities behind Boton Wharf

In this table, a portion of the construction cost for some project components is expected to be borne by the operators of the terminal, since those elements in the project will be designed and provided to meet the specific requirements of the operators.

The following facilities are expected to be provided by the operators of the terminal:

- Operator's office;
- CFS;
- Maintenance Shop;
- Container Washing Area;
- Cargo Handling Equipment other than Gantry Cranes.

(2) Breakdown of the Construction and Procurement Costs

Breakdown of the construction and procurement costs for each project component is shown in Table 3.4.2-2, which consists of foreign and local currency portion as derived from the unit price composition.

Details of the above breakdown into the cost item are shown in Tables 3.4.2-3 and 3.4.2-4 for Phases 1 and 2, respectively.

Table 3.4.2-2 Project Cost for Short Term Development (Phases 1&2) in 1000 US$

	Phase I			Phase II			Total of Phases I and II		
	Local Component (1000$)	Foreign Component (1000$)	Total (1000$)	Local Component (1000$)	Foreign Component (1000$)	Total (1000$)	Local Component (1000$)	Foreign Component (1000$)	Total (1000$)
I New Container Terminal (Cubi)	**11,593.87**	**49,040.55**	**60,634.42**	**11,496.07**	**48,684.17**	**60,180.24**	**23,089.94**	**97,724.72**	**120,814.66**
1 Earth Work	1,000.01	3,830.71	4,830.72	1,646.14	6,383.76	8,029.90	2,646.15	10,214.47	12,860.62
2 Pavement	2,205.86	5,579.41	7,785.27	2,147.52	5,355.76	7,503.28	4,353.38	10,935.16	15,288.55
3 Building	1,462.09	3,778.78	5,240.88	1,077.91	2,843.43	3,921.34	2,540.01	6,622.21	9,162.22
4 Utility	1,145.49	4,092.26	5,237.75	1,041.09	3,848.79	4,889.88	2,186.58	7,941.06	10,127.63
5 Wharf	3,344.07	10,506.15	13,850.22	3,344.07	10,506.15	13,850.22	6,688.13	21,012.30	27,700.43
6 Channel and Basin Dredging	131.95	513.64	645.59	79.84	310.78	390.62	211.79	824.42	1,036.21
7 Equipment	2,304.40	20,739.60	23,044.00	2,159.50	19,435.50	21,595.00	4,463.90	40,175.10	44,639.00
II Access Road	**2,416.32**	**9,139.96**	**11,556.28**	**0.00**	**0.00**	**0.00**	**2,416.32**	**9,139.96**	**11,556.28**
1 Reclamation	393.68	2,176.50	2,570.18	0.00	0.00	0.00	393.68	2,176.50	2,570.18
2 Excavation	177.20	620.60	797.80	0.00	0.00	0.00	177.20	620.60	797.80
3 Pavement	844.07	3,504.04	4,348.11	0.00	0.00	0.00	844.07	3,504.04	4,348.11
4 Slope Protection	210.63	809.00	1,019.63	0.00	0.00	0.00	210.63	809.00	1,019.63
5 Core Stone	511.34	1,472.73	1,984.07	0.00	0.00	0.00	511.34	1,472.73	1,984.07
6 Shed	217.85	432.24	650.10	0.00	0.00	0.00	217.85	432.24	650.10
7 Others (Drain, Light, etc.)	61.55	124.84	186.39	0.00	0.00	0.00	61.55	124.84	186.39
III Rehabilitation/Reinforcement of the Existing Faciltiies	**562.03**	**3,447.59**	**4,009.62**	**562.03**	**3,447.59**	**4,009.62**	**1,124.06**	**6,895.18**	**8,019.24**
1 Steel Pile	229.97	2,414.99	2,644.96	229.97	2,414.99	2,644.96	459.94	4,829.98	5,289.92
2 Apron Widening	325.67	944.45	1,270.13	325.67	944.45	1,270.13	651.35	1,888.91	2,540.25
3 Repair Older Member	6.38	88.15	94.53	6.38	88.15	94.53	12.76	176.30	189.06
IV Naviation Aid	**239.76**	**2,157.84**	**2,397.60**	**0.00**	**0.00**	**0.00**	**239.76**	**2,157.84**	**2,397.60**
1 Light Buoy	190.35	1,713.15	1,903.50	0.00	0.00	0.00	190.35	1,713.15	1,903.50
2 Light Beacon	15.75	141.75	157.50	0.00	0.00	0.00	15.75	141.75	157.50
3 Miscellaneous	33.66	302.94	336.60	0.00	0.00	0.00	33.66	302.94	336.60
TOTAL FOR ALL PROJECT COMPONENTS	**14,811.98**	**63,785.94**	**78,597.93**	**12,058.09**	**52,131.76**	**64,189.86**	**26,870.07**	**115,917.71**	**142,787.78**
(Sub-Total of Construction Cost)	**12,507.58**	**43,046.34**	**55,553.93**	**9,898.59**	**32,696.26**	**42,594.86**	**22,406.17**	**75,742.61**	**98,148.78**
(Sub-Total of Equipment Procurement Cost)	**2,304.40**	**20,739.60**	**23,044.00**	**2,159.50**	**19,435.50**	**21,595.00**	**4,463.90**	**40,175.10**	**44,639.00**

Table 3.4.2-3 Cost Estimate for Phase 1 Development

Project Component	Quantity	(Unit)	Unit Price in US$			Total Price in US$		
			Local Component ($/unit)	Foreign Component ($/unit)	Total (VAT exclusive)	Local Component ($)	Foreign Component ($)	Total ($)
I New Container Terminal (Cubi)						11,593,871.42	49,040,550.21	60,634,421.63
1 Earth Work						1,000,009.85	3,830,711.65	4,830,721.50
1.1 Dredging/Reclamation	596,851	m3	1.25	4.85	6.092	743,154.96	2,892,892.29	3,636,047.25
1.2 Revetment	1,205	m	213.16	778.27	991.431	256,854.89	937,819.36	1,194,674.25
1.2.1 Fill	33,874	m3	1.08	5.97	7.051	36,585.62	202,274.28	238,859.90
1.2.2 Slope Protection	13,389	m3	7.86	30.20	38.061	105,268.45	404,324.81	509,593.26
1.2.3 Core Stone	20,083	m3	5.73	16.49	22.218	115,000.82	331,220.27	446,221.09
2 Pavement						2,205,861.03	5,579,405.69	7,785,266.72
2.1 Service Road & Others	38,451	m2	9.94	36.89	46.822	382,159.75	1,418,636.55	1,800,796.30
2.2 Stacking Yard	52,889	m2	19.44	28.94	48.388	1,028,408.54	1,530,784.70	2,559,193.24
2.3 Transfer Crane Slab	4,554	m	101.49	301.18	402.674	462,188.26	1,371,590.15	1,833,778.41
2.4 Inspection Area	14,000	m2	10.05	37.96	48.009	140,677.61	531,448.57	672,126.18
2.5 Access Road	19,150	m2	10.05	37.96	48.009	192,426.87	726,945.72	919,372.60
3 Building						1,462,094.04	3,778,782.21	5,240,876.25
3.1 CFS	1	LS	184,832.73	719,227.44	904,060.171	184,832.73	719,227.44	904,060.17
3.2 Operator's Office	1	LS	415,805.25	935,681.08	1,351,486.330	415,805.25	935,681.08	1,351,486.33
3.3 Gate	1	LS	189,195.82	441,123.26	630,319.082	189,195.82	441,123.26	630,319.08
3.4 Maintenance Shop	1	LS	81,656.39	239,887.68	321,544.073	81,656.39	239,887.68	321,544.07
3.5 Substation	1	LS	167,000.78	352,268.02	519,268.803	167,000.78	352,268.02	519,268.80
3.6 Administration Building	1	LS	384,182.45	935,353.77	1,319,536.223	384,182.45	935,353.77	1,319,536.22
3.7 Washing Area	1	LS	39,420.61	155,240.96	194,661.566	39,420.61	155,240.96	194,661.57
4 Utility						1,145,490.73	4,092,262.27	5,237,753.00
4.1 Water Supply and Fire Fighting	1	LS	155,033.27	312,782.08	467,815.357	155,033.27	312,782.08	467,815.35
4.2 Electrical Works (exterior)	1	LS	666,868.71	2,574,598.25	3,241,466.958	666,868.71	2,574,598.25	3,241,466.96
4.3 Storm Water Drainage	1	LS	274,694.51	643,768.87	918,463.374	274,694.51	643,768.87	918,463.37
4.4 Sewage System	1	LS	4,613.23	6,803.62	11,416.852	4,613.23	6,803.62	11,416.85
4.5 Others (Generator, etc.)	1	LS	44,281.02	554,309.44	598,590.460	44,281.02	554,309.44	598,590.46
5 Wharf						3,344,066.92	10,506,148.80	13,850,215.71
5.1 Earth Work	280	lm	2,092.05	6,285.70	8,377.749	585,774.78	1,759,995.01	2,345,769.79
5.2 Caisson Work	280	lm	3,526.87	10,464.03	13,990.901	987,524.96	2,929,927.27	3,917,452.23
5.3 Cast-in-Place Concrete	280	lm	4,955.82	14,112.71	19,068.524	1,387,628.50	3,951,558.36	5,339,186.86
5.4 Pavement	280	lm	597.94	1,657.62	2,255.559	167,422.37	464,134.06	631,556.42
5.5 Crane Foundation	280	lm	489.55	3,008.85	3,498.400	137,073.85	842,478.24	979,552.09
5.6 Miscellaneous	280	lm	280.87	1,993.06	2,273.923	78,642.45	558,055.87	636,698.33
6 Channel and Basin Dredging	52,986	m3	2.49	9.69	12.184	131,948.85	513,639.59	645,588.44
7 Equipment						2,304,400.00	20,739,600.00	23,044,000.00
7.1 Container Handling						2,159,500.00	19,435,500.00	21,595,000.00
7.1.1 Gantry Crane	2	Unit	625,000.00	5,625,000.00	6,250,000.000	1,250,000.00	11,250,000.00	12,500,000.00
7.1.2 Transfer Crane	5	Unit	137,500.00	1,237,500.00	1,375,000.000	687,500.00	6,187,500.00	6,875,000.00
7.1.3 Yard Tractor	12	Unit	7,500.00	67,500.00	75,000.000	90,000.00	810,000.00	900,000.00
7.1.4 Yard Chassis	36	Unit	1,500.00	13,500.00	15,000.000	54,000.00	486,000.00	540,000.00
7.1.5 Reachstacker	1	Unit	62,500.00	562,500.00	625,000.000	62,500.00	562,500.00	625,000.00
7.1.6 Forklift (5ton)	1	Unit	3,500.00	31,500.00	35,000.000	3,500.00	31,500.00	35,000.00
7.1.7 Forklift (2ton)	6	Unit	2,000.00	18,000.00	20,000.000	12,000.00	108,000.00	120,000.00
7.2 Non-Container Handling						144,900.00	1,304,100.00	1,449,000.00
7.2.1 Pallet	27	Unit	200.00	1,800.00	2,000.000	5,400.00	48,600.00	54,000.00
7.2.2 Trucks (10ton)	9	Unit	8,000.00	72,000.00	80,000.000	72,000.00	648,000.00	720,000.00
7.2.3 Forklift (10ton)	3	Unit	5,000.00	45,000.00	50,000.000	15,000.00	135,000.00	150,000.00
7.2.4 Forklift (5ton)	5	Unit	3,500.00	31,500.00	35,000.000	17,500.00	157,500.00	175,000.00
7.2.5 Forklift (3ton)	14	Unit	2,500.00	22,500.00	25,000.000	35,000.00	315,000.00	350,000.00
II Access Road						2,416,322.38	9,139,961.90	11,556,284.28
1 Reclamation	364,500	m3	1.08	5.97	7.051	393,679.58	2,176,497.20	2,570,176.78
2 Excavation	140,200	m3	1.26	4.43	5.690	177,200.70	620,603.76	797,804.46
3 Pavement	84,000	m2	10.05	41.71	51.763	844,065.65	3,504,044.39	4,348,110.03
4 Slope Protection	26,790	m3	7.86	30.20	38.061	210,629.06	809,003.61	1,019,632.67
5 Core Stone	89,298	m3	5.73	16.49	22.218	511,338.48	1,472,734.52	1,984,073.00
6 Shed	200	m	1,089.27	2,161.21	3,250.477	217,854.02	432,241.37	650,095.39
7 Others (Drain, Light, etc.)	3,000	m	20.52	41.61	62.131	61,554.89	124,837.06	186,391.95
III Rehabilitation/Reinforcement of the Existing Facilities (Marine Terminal)						562,027.61	3,447,591.06	4,009,619.67
1 Steel Pile	110	lm	2,090.65	21,954.46	24,045.111	229,971.74	2,414,990.44	2,644,962.18
2 Apron Widening	110	lm	2,960.67	8,585.94	11,546.609	325,673.38	944,453.56	1,270,126.95
3 Repair Older Member	110	lm	58.02	801.35	859.369	6,382.49	88,143.05	94,530.54
IV Navigation Aid						239,760.00	2,157,840.00	2,397,600.00
1 Light Buoy	27	Unit	7,050.00	63,450.00	70,500.000	190,350.00	1,713,150.00	1,903,500.00
2 Light Beacon	1	Unit	15,750.00	141,750.00	157,500.000	15,750.00	141,750.00	157,500.00
3 Miscellaneous	1	LS	33,660.00	302,940.00	336,600.000	33,660.00	302,940.00	336,600.00
TOTAL FOR ALL PROJECT COMPONENTS						14,811,981.41	63,785,944.17	78,597,925.58
(Sub-Total of Construction Cost)						12,507,581.41	43,046,344.17	55,553,925.58
(Sub-Total of Equipment Procurement Cost)						2,304,400.00	20,739,600.00	23,044,000.00

Table 3.4.2-4 Cost Estimate for Phase 2 Development

Project Component	Quantity	(Unit)	Unit Price in US$			Total Price in US$		
			Local Component ($/unit)	Foreign Component ($/unit)	Total (VAT exclusive)	Local Component ($)	Foreign Component ($)	Total ($)
I New Container Terminal (Cubi)						**11,496,065.69**	**48,684,171.59**	**60,180,237.28**
1 Earth Work						**1,646,140.28**	**6,383,759.19**	**8,029,899.46**
1.1 Reclamation	1,241,606	m3	1.25	4.85	6.092	1,545,956.21	6,017,970.72	7,563,926.94
1.2 Revetment	470	m	213.16	778.27	991.431	100,184.06	365,788.46	465,972.53
1.2.1 Fill	13,212	m3	1.08	5.97	7.051	14,269.91	78,895.36	93,165.27
1.2.2 Slope Protection	5,272	m3	7.86	30.20	38.061	41,059.06	157,703.45	198,762.51
1.2.3 Core Stone	7,833	m3	5.73	16.49	22.218	44,855.09	129,189.65	174,044.74
2 Pavement						**2,147,522.83**	**5,355,756.84**	**7,503,279.67**
2.1 Service Road & Others	43,461	m2	9.94	36.89	46.822	431,841.86	1,603,064.28	2,034,906.14
2.2 Stacking Yard	52,889	m2	19.44	28.94	48.388	1,028,408.54	1,530,784.70	2,559,193.24
2.3 Transfer Crane Slab	4,554	m	101.49	301.18	402.674	462,188.26	1,371,590.15	1,833,778.41
2.4 Inspection Area	14,000	m2	10.05	37.96	48.009	140,677.61	531,448.57	672,126.18
2.5 Access Road	8,400	m2	10.05	37.96	48.009	84,406.56	318,869.14	403,275.71
3 Building						**1,077,911.58**	**2,843,428.44**	**3,921,340.03**
~~3.1 CFS~~	~~1~~	~~LS~~	~~184,832.73~~	~~719,227.44~~	904,060.171	~~184,832.73~~	~~719,227.44~~	~~904,060.17~~
~~3.2 Operator's Office~~	~~1~~	~~LS~~	~~415,805.25~~	~~935,681.08~~	1,351,486.330	~~415,805.25~~	~~935,681.08~~	~~1,351,486.33~~
3.3 Gate	1	LS	189,195.82	441,123.26	630,319.082	189,195.82	441,123.26	630,319.08
~~3.4 Maintenance Shop~~	~~1~~	~~LS~~	~~81,656.39~~	~~239,887.68~~	321,544.073	~~81,656.39~~	~~239,887.68~~	~~321,544.07~~
3.5 Substation	1	LS	167,000.78	352,268.02	519,268.803	167,000.78	352,268.02	519,268.80
3.6 Administration Building	0	LS	0.00	0.00	0.000	0.00	0.00	0.00
~~3.7 Washing Area~~	~~1~~	~~LS~~	~~39,420.61~~	~~155,240.96~~	194,661.566	~~39,420.61~~	~~155,240.96~~	~~194,661.57~~
4 Utility						**1,041,086.57**	**3,848,793.47**	**4,889,880.04**
4.1 Water Supply and Fire Fighting	1	LS	155,033.27	312,782.08	467,815.357	155,033.27	312,782.08	467,815.36
4.2 Electrical Works (exterior)	1	LS	666,868.71	2,574,598.25	3,241,466.958	666,868.71	2,574,598.25	3,241,466.96
4.3 Storm Water Drainage	1	LS	171,684.07	402,355.54	574,039.609	171,684.07	402,355.54	574,039.61
4.4 Sewage System	1	LS	3,219.50	4,748.15	7,967.652	3,219.50	4,748.15	7,967.65
4.5 Others (Generator, etc.)	1	LS	44,281.02	554,309.44	598,590.460	44,281.02	554,309.44	598,590.46
5 Wharf						**3,344,066.92**	**10,506,148.80**	**13,850,215.71**
5.1 Earth Work	280	lm	2,092.05	6,285.70	8,377.749	585,774.78	1,759,995.01	2,345,769.79
5.2 Caisson Work	280	lm	3,526.87	10,464.03	13,990.901	987,524.96	2,929,927.27	3,917,452.23
5.3 Cast-in-Place Concrete	280	lm	4,955.82	14,112.71	19,068.524	1,387,628.50	3,951,558.36	5,339,186.86
5.4 Pavement	280	lm	597.94	1,657.62	2,255.559	167,422.37	464,134.06	631,556.42
5.5 Crane Foundation	280	lm	489.55	3,008.85	3,498.400	137,073.85	842,478.24	979,552.09
5.6 Miscellaneous	280	lm	280.87	1,993.06	2,273.923	78,642.46	558,055.87	636,698.33
6 Channel and Basin Dredging	32,060	m3	2.49	9.69	12.184	79,837.51	310,784.86	390,622.37
7 Equipment						**2,159,500.00**	**19,435,500.00**	**21,595,000.00**
7.1 Gantry Crane	2	Unit	625,000.00	5,625,000.00	6,250,000.000	1,250,000.00	11,250,000.00	12,500,000.00
~~7.2 Transfer Crane~~	~~5~~	~~Unit~~	~~137,500.00~~	~~1,237,500.00~~	1,375,000.000	~~687,500.00~~	~~6,187,500.00~~	~~6,875,000.00~~
~~7.3 Yard Tractor~~	~~12~~	~~Unit~~	~~7,500.00~~	~~67,500.00~~	75,000.000	~~90,000.00~~	~~810,000.00~~	~~900,000.00~~
~~7.4 Yard Chassis~~	~~36~~	~~Unit~~	~~1,500.00~~	~~13,500.00~~	15,000.000	~~54,000.00~~	~~486,000.00~~	~~540,000.00~~
~~7.5 Reachstacker~~	~~1~~	~~Unit~~	~~62,500.00~~	~~562,500.00~~	625,000.000	~~62,500.00~~	~~562,500.00~~	~~625,000.00~~
~~7.6 Forklift (Ston)~~	~~1~~	~~Unit~~	~~3,500.00~~	~~31,500.00~~	35,000.000	~~3,500.00~~	~~31,500.00~~	~~35,000.00~~
~~7.7 Forklift (2ton)~~	~~6~~	~~Unit~~	~~2,000.00~~	~~18,000.00~~	20,000.000	~~12,000.00~~	~~108,000.00~~	~~120,000.00~~
II Access Road						**0.00**	**0.00**	**0.00**
1 Reclamation	0	m3	1.08	5.97	7.051	0.00	0.00	0.00
2 Excavation	0	m3	1.26	4.43	5.690	0.00	0.00	0.00
3 Pavement	0	m2	10.05	41.71	51.763	0.00	0.00	0.00
4 Slope Protection	0	m3	7.86	30.20	38.061	0.00	0.00	0.00
5 Core Stone	0	m3	5.73	16.49	22.218	0.00	0.00	0.00
6 Shed	0	m	1,089.27	2,161.21	3,250.477	0.00	0.00	0.00
7 Others (Drain, Light, etc.)	0	m	20.52	41.61	62.131	0.00	0.00	0.00
III Rehabilitation/Reinforcement of the Existing Facilities (Marine Terminal)						**562,027.61**	**3,447,592.06**	**4,009,619.67**
1 Steel Pile	110	lm	2,090.65	21,954.46	24,045.111	229,971.74	2,414,990.44	2,644,962.18
2 Apron Widening	110	lm	2,960.67	8,585.94	11,546.609	325,673.38	944,453.56	1,270,126.95
3 Repair Older Member	110	lm	58.02	801.35	859.369	6,382.49	88,148.05	94,530.54
IV Navigation Aid						**0.00**	**0.00**	**0.00**
1 Light Buoy	0	Unit	7,050.00	63,450.00	70,500.000	0.00	0.00	0.00
2 Light Beacon	0	Unit	15,750.00	141,750.00	157,500.000	0.00	0.00	0.00
3 Miscellaneous	0	LS	33,660.00	302,940.00	336,600.000	0.00	0.00	0.00
TOTAL FOR ALL PROJECT COMPONENTS						**12,058,093.30**	**52,131,763.65**	**64,189,856.95**
(Sub-Total of Construction Cost)						**9,898,593.30**	**32,696,263.65**	**42,594,856.95**
(Sub-Total of Equipment Procurement Cost)						**2,159,500.00**	**19,435,500.00**	**21,595,000.00**

3.5 Construction and Implementation Program for Short Term Plan

3.5.1 Construction Program for Short Term Plan

The following considerations have been incorporated in the previous cost estimate and the overall construction schedule has been developed as shown in Table 3.5.1-1.

(1) New Terminal Construction at Cubi Pt.

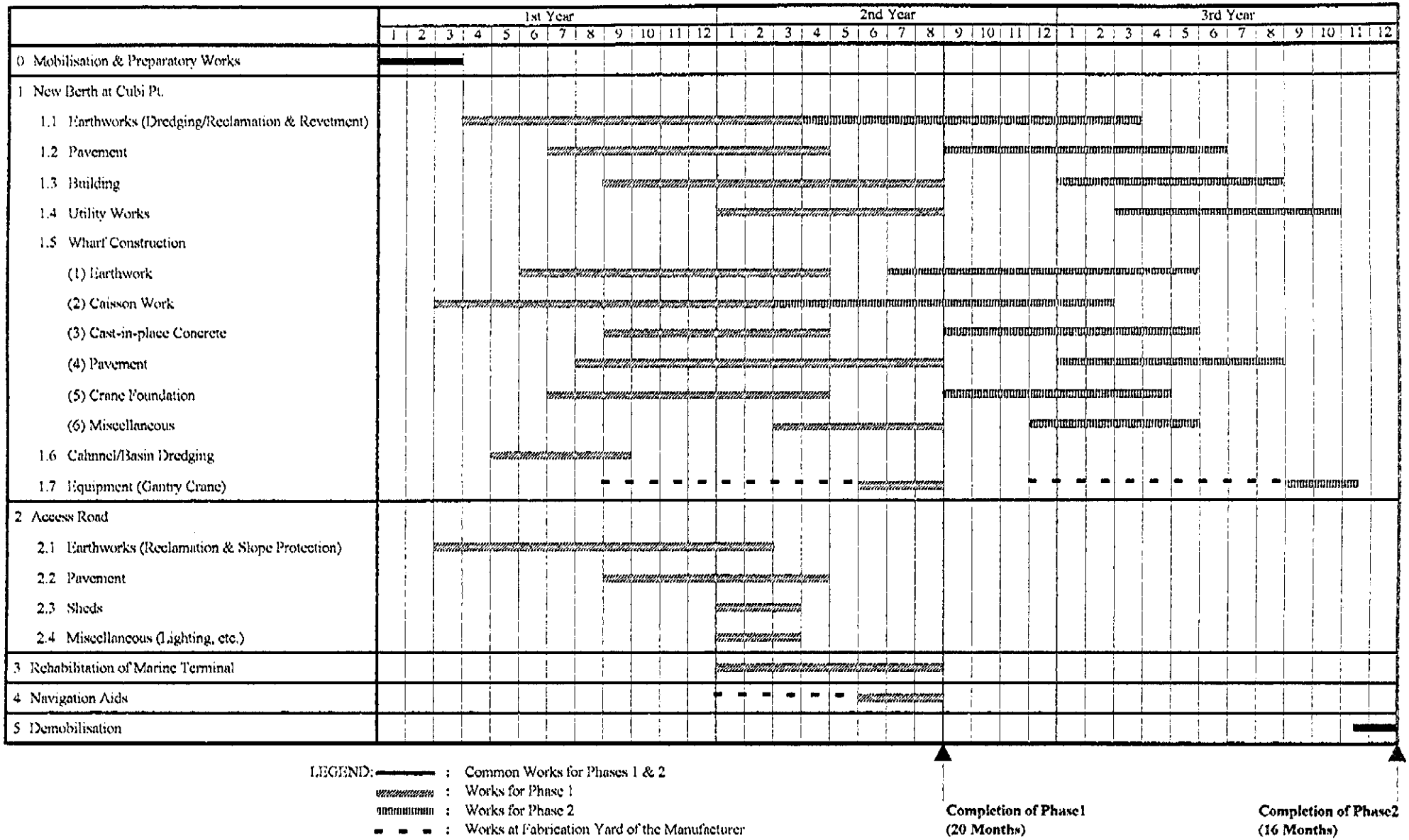
For the construction of the new container terminal at Cubi Pt., a large quantity of reclamation and dredging works for the filling materials will be required. As presented in the Preliminary Design, the reclamation fill will be obtainable from the offshore seabed, where hard sediments like coral or exposed weathered andesite are expected. Considering this for the dredging/reclamation work, a suitable type of dredger with sufficient capacity, i.e. most likely cutter suction type, will be mobilised.

In addition, the caisson quay structures preliminary designed normally require their fabrication yard capable of casting and towing huge RC boxes. It is, however, expected that floating docks will be used for the box fabrication, since such open yard is not available in Subic Bay. Accordingly, the construction of the new container terminal at Cubi Pt. essentially requires mobilisation of the large floating equipment, including high capacity cutter suction dredger and floating docks capable of loading at least tow boxes of the caisson unit.

Construction works enumerated below are expected in the present program:

1) Mobilisation of floating equipment, such as dredger and floating docks, etc.;
2) Preparatory works;
3) Caisson box fabrication on the floating docks;
4) Dredging and earthworks;
5) Foundation preparation for caissons
6) Placement of caissons;
7) In situ concrete;
8) Crane foundation piling;
9) Crane foundation beam casting;
10) Back-up yard filling work and other earthworks
11) Pavement;
12) Building construction;
13) Utility works;
14) Demobilisation

Table 3.5.1-1 Construction Schedule for Short Term Development (Phases 1 and 2)



1) Mobilisation and Preparatory Works

More than 3 months will be required for the preparatory works, including mobilisation of construction plants and major equipment.

2) Caisson Box Fabrication

A floating dock (FD) of 5,000 DWT at the minimum capacity will be used for the fabrication of caisson boxes, which enables two (2) units of the box to be fabricated at the same time. If additional FD(s) are available, the period can be substantially shortened.

Standard cycle time for the fabrication of one box is assumed to be 45 days considering 6 steps of casting on the FD. Resulting productivity of the caisson boxes with one FD is 4 units per 3 months.

As described in the next work item of dredging, the caisson type quay wall should be completed before the main reclamation work. Accordingly, the fabrication of the caisson boxes shall be commenced immediately after the preparatory works.

3) Dredging and Reclamation

The dredging of shallower seabed at the quay front will be carried out by grab dredger of 8 m3 capacity, which monthly dredging output is expected at about 40,000 m3/month. The dredged materials will be transported by hopper barges to the reclamation area. It is, however, necessary to construct the south revetment of the terminal to be used as a barrier against propagation of the turbid sea water from the dredging points towards south west shore of Cubi Pt. At the tip of this revetment, an wall of silt protector sheet will be extended northwards to prevent turbidity of the sea water from further dispersion offshore of the bay.

The main dredging/reclamation will be carried out by a cutter suction dredger of about 8,000 HP. Considering net working hours of 420 hr/month and hourly volume of 700 m3/hr, the dredging accomplishment is assumed to be about 300,000 m3/month. Prior to the dredging/reclamation works, the terminal area should be enclosed by the revetment and caisson quay walls, so that the reclamation area will also function as a sedimentation basin. An opening for spill way will be provided at the centre of the north west revetment. The spill way is also sheltered by the silt protector sheet in order to minimise the turvidity of the water through the spill way.

Details of the above considerations during the dredging works are described in other chapter on Environmental Studies.

4) Others

Stone works in marine construction will produce 200 m3/day of their completion, while concrete casting will be carried out about 300 m3/day at its maximum production.

(2) Access Road Construction

In principle, no special works are required for the access road construction. Reclamation and earthworks will be mainly conducted on-land.

(3) Rehabilitation/reinforcement of the Existing Wharf (Marine Terminal)

Minor rehabilitation of superstructures, such as patching of minor cracks of RC members, will be conducted without difficulties, while demolition and disposal works are needed for replacement of the damaged members.

In the reinforcement of Marine Terminal, widening of the apron will be carried out after the completion of piling work for crane foundation of Phase 1 construction of the new terminal. The same equipment for the piling work, i.e. floating cranes, pile driving equipment and barges will be used for this reinforcement, while piling of Phase 2 construction has not started.

(4) Navigation Aids

Mechanical and electrical works for the light buoys/beacons will be completed in the manufacturer's shop in a five month period. Three months for the assembly and installation at the site have been considered in the construction schedule to catch up the completion of Phase 1 development.

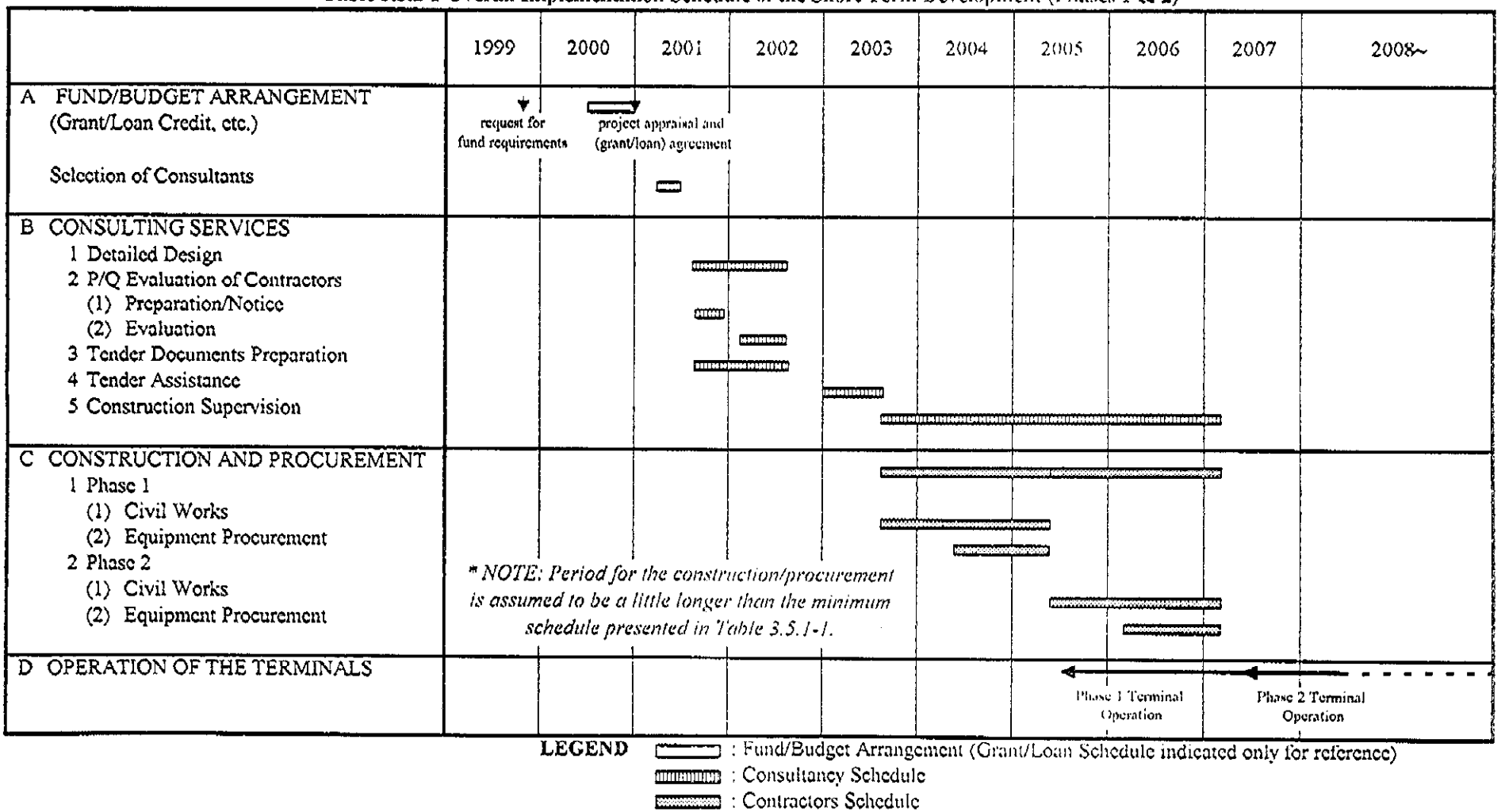
3.5.2 Implementation Program

Based on the above construction schedule, the overall implementation schedule of the Project, i.e. Short Term Development covering both Phases 1 and 2, has been developed as shown in Table 3.5.2-1.

In this schedule, arrangement of fund/budget for the implementation of the Project, is also presented only for reference, in case the Project is implemented under any grants/loans.

As can be seen in the schedule, the consultancy for the Project is assumed to cover both Phases 1 and 2 of the Short Term Development Plan.

Table 3.5.2-1 Overall Implementation Schedule of the Short Term Development (Phases 1 & 2)



4. Port Development, Management and Operation

4.1 Introduction of Private Sector and Responsibility of SBMA

4.1.1 Institutional Background of Privatization of the Philippines

(1) Philippine Constitution

In regard to the institutional right of the president of the Philippines concerning the participation of the private sector into any field of the government control, there is no particular stipulation in the Constitution. However, Article VII of the Philippine Constitution (1987) provides that:

" Sec.17.The President shall have control of all executive departments, bureau, bureaus and offices. He shall ensure that the laws be faithfully executed."

Since the SBMA Chairman is appointed by the President, the SBMA could be construed as an " executive department, bureau or office " under the authority of the President and in case the President decides the direction of privatization of any field of governmental activities, the above mentioned Sec.17 will be a fundamental institutional background of the President in doing so.

(2) Republic Act No.7227

The President shall have direct control and supervision over the BCDA:

" Sec.17. Supervision. – The Conversion Authority (BCDA) shall be under the direct control and supervision of the Office of the President for purposes of policy direction and coordination."

The President shall prescribe general guidelines for the BCDA regarding privatization:

" Sec.10. -.Function of the Board. – XXX (e) Carry out the purposes of the Conversion Authority with the following terms and references: XXX (2) Starting the fourth year of the Conversion Authority's full operation, a privatization or divestment program of its projects and subsidiaries shall begin under the general guidelines prescribed by the President of the Philippines." (Emphasis added)

The BCDA exercises oversight function over the SBMA:

" Sec.5. Powers of the Conversion Authority. – To carry out its objectives under this Act, the Conversion Authority is vested with the following powers: XXX (1) To exercise oversight functions over the Special Economic Zones declared under this Act and by subsequent presidential proclamations within the framework of the declared policies of this Act; "

" Sec.14 – Relationship with the Conversion Authority and the Local Government Units.-
(a) The provisions of existing laws, rules and regulations to the contrary notwithstanding, the Subic Authority shall exercise administrative powers, rules-making and disbursement of funds over the Subic Special Economic Zone in conformity with the oversight function of the Conversion Authority."

Under Republic Act No.7227, the SBMA is an implementing arm of the BCDA:

" Sec.13. The Subic Bay Metropolitan Authority. – (a) The Subic Bay Metropolitan Authority is hereby created as an operating and implementing arm of the Conversion Authority." (Emphasis added)

Based on the foregoing, it appears that the line of authority from the President extends to the SBMA through the BCDA. Therefore, the President has the power to oversee SBMA privatization activities

(3) Proclamation No. 50 (by President F.V.Ramos)

The proclamation was signed by ex President Ramos on September 18, 1992 under the caption " PROCLAIMING THE ADOPTION AND IMPLEMENTATION OF THE SUBIC CONVERSION PROGRAM AS A PRIORITY NATIONAL PROGRAM FOR ECONOMIC DEVELOPMENT AND DIRECTING ALL HEADS OF DEPARTMENT, BUREAUS, OFFICES, AGENCIES AND INSTRUMENTALITIES OF GOVERNMENT TO SUPPORT THE PROGRAM "

Section 1 and 5 are explaining concretely about the privatization policy of SBMA as follows:

" Sec.1, 1.1. The zone (including the adjoining communities) shall be developed with strong private sectors participation into a self-sustaining industrial, financial, commercial and tourism center; "

" Sec. 5. *Privatization Policy.* – The following policies on privatization shall guide the SBMA and the government departments, bureaus, offices, agencies and instrumentalities, in support of the conversion program;

5.1 SBMA shall encourage the participation of the private sector by privatizing the development and operations of the various facilities and projects necessary to fully implement the conversion program;

5.2 SBMA, unless otherwise authorized by the Office of the President, shall limit itself to lease of land within the base-lands;

5.3 SBMA may privatize through;

a) lease of land and improvements or sale of improvements;
b) management contract;
c) joint venture to operate and manage utilities and certain vital facilities;
d) build-operate-transfer scheme or its variants for capital intensive infrastructure development; and
e) other schemes allowed pursuant to Republic Act No. 7227.

(4) Executive Order No.12 (by The President)

On August 14, 1998 Executive Order No. 12 entitled " Revitalizing the privatization Program of the Government " was issued by the President.
Basically, the EO reaffirms the policy on privatization which is to promote an orderly, coordinated and efficient program for the privatization of government entities, assets or activities which are better managed, undertaken or owned by the private sector.

It also directs all government agencies and corporations to identify and list assets which may be disposed/sold to the private sector, and government entities which may be more efficiently and effectively undertaken by the private sector and submit said initial list of assets/activities to the Committee on Privatization (COP, an short explanation will follow) within 30 days from the issuance of the EO. The COP, as an executive office under the Office of the President, oversees the Government's privatization program. The COP is composed of the Secretary of Finance as Chairman and the Secretaries of Budget and Management, Justice, Trade and Industry and Director General of NEDA(National Economic and Development Authority) as members.

The directive covers not only the remaining GOCCs (Government Owned & Controlled Company) previously approved for privatization but also retained GOCCs whose assets/shares/activities may also be considered for privatization. Aside from the assets/GOCCs

identified for privatization, the EO now covers disposition transactions of government authorities such as but not limited to BCDA(Base Conversion Development Authority), PEA(Public Estate Authority), PTA(Philippine Tourism Authority), PEZA(Philippine Economic Zone Authority) and SBMA.

The basic principle for the issuance of the EO is to rationalize the privatization activities of the Government.

(5) SBMA's response to the EO No.12

In compliance with the EO No.12, the SBMA provided the COP with an official list of the assets and activities which may be sold to or undertaken by the private sector. Contents of that list are as follows:

1. Seaport
2. AIRPORT
3. JEST (Jungle Environment Survival Training)
4. SBMA Hotel (Bldg.281 and 282)
5. Bldg.8574 (Upper Mau) suitable for hotel or dormitory
6. All Beaches
7. George Dewey (Buildings along the Avenue)
8. Other housing units, especially those that are deteriorated
9. Grande Island
10. Road Maintenance
11. Security Services (FSC)
12. Other Services

It is worth noticing that the Seaport is at the top of the list, especially when the concession matter is still in the hands of court. It is difficult to tell when the courts will make decision so it is sincerely hoped that SBMA will be able to handle the privatization program without provoking any further law-suits.

(6) Historical Memo on COP and Privatization of the Philippines

Proclamation No.30 of 1986, as amended, launched a program for the disposition and privatization of the government corporations and or the assets hereof and created the Committee on Privatization (COP) and the Asset Privatization Trust (APT).

Then Executive Order No.37 of 1992 restated the privatization policy of the Government by encouraging government agencies and government corporations to identify assets which may be more efficiently, effectively and economically undertaken by the private

sector, and that disposition of such assets/activities may be undertaken through sale of physical assets, leasing of assets, management and maintenance contracts or build-operate-transfer (BOT) schemes.

As of June 30. 1998, out of the 562 Government Owned and Controlled Corporations (GOOCs) Assets approved by the President for privatization, 453 were privatized/disposed, generating gross sales proceeds of P 184 billion.

So far the privatization program has helped substantially in improving the investment climate, attracting foreign investments, broadening the ownership base, developing the local capital market and generating substantial revenues for priority government expenditures. However, there is still room for much greater private sector participation in developing the Philippine national economy.

4.1.2 Responsibility of SBMA

(1) Fostering the Entrepreneur Spirit

The fundamental definition of " Privatization " is " to transfer a business etc. from State to private ownership. "
However, this definition is just an outline of privatization as a phenomenon.
It is just like an old saying that a strong man tends to drink much, but drinking much does not necessarily make a man strong. In the same way, simply transferring assets from the public sector to private does not guarantee any success.

To understand the difficulties inherent in running an enterprise, one need only look at the case of PAL (Philippine Air Lines). According to the company's explanation on Jan. 25, 1999 PAL is proposing to sell its shares to the public as an alternative solution to its financial problems.

The proposal, which is included in the rehabilitation plan submitted by PAL to the Securities and Exchange Commission (SEC), is on top of getting strategic investors that will infuse much-needed fresh capital into the crippled airline.
According to the SEC, PAL will have to go through the usual strict regulations of registering its stocks for an initial public offering.

In order to qualify, PAL has to show a three-year profitability record and it is not clear whether the Philippine Stock Exchange (PSE) has a policy against listing companies that are under receivership, even if it shows profits during rehabilitation.

PAL may also have to change its plan of reducing its par value from P5 per share to P0.01 per share since the minimum par value allowed by the PSE is P1 per share. When

privately owned, PAL was publicly listed and was traded at the Old Manila Stock Exchange from Jan.27,1951 to Sept.9, 1982. When the airline was nationalized, the SEC ordered its de-listing from the exchange since government- owned and controlled corporations were not allowed to list. PAL had remained non-public even after the company was taken over by the private sector.

Also, according to the SEC, PAL needs to put its records in order and undergo an independent audit of its accounts, first to justify its proposed reduction in par value and second to prove its profitability should it push through with its plan to go public.

The task force assigned by the government to evaluate PAL's rehabilitation plan noted that PAL's financial statements for three years ending March31, 1996, 1997 and 1998 were not audited, when these were the periods used as bases for computations made in the proposed plan. One of the task force members is reported to have said " From hereon, there should be a regular audit by an independent auditor in PAL's financial accounts,".

PAL will also be required to create a sinking fund to be administered by a trustee bank that will allocate payments to creditors during its rehabilitation.
This bank or institution would have the power to allocate and distribute the fund among the creditors in accordance with rehabilitation plan.

Closely examining the history of PAL, it is clear all the transactions conducted by the concerned people have not been in line with basic business ethics. For example, PAL has shifted from a private company to a government owned and controlled corporation and back to private company. On each occasion PAL had a chance to renew the organization, especially in 1995 when the company changed to the private sector for the second time.
We do not have any inside-story regarding their market strategy or administration policy, however, the fact that the three years ending March 31,1996,1997 and 1998 were not audited suggests that the business ethics of the management of PAL deviated from the normal practices.

It is of great importance , therefore, for any organization which is going to privatize any part of its functions or fields to realize that the mere transfer of ownership from the public sector to the private is meaningless. The real importance lies in the spirit of the management who run companies, and that is the entrepreneurial spirit.

It will be the responsibility of SBMA to screen the candidate companies and selecting the company that undertakes a commercial venture in the right way. SBMA should be careful about the capital it accepts. It is said that the capital that took over PAL was run by a tobacco and beer magnate. In a free and democratic economy, there is no way to restrict the take-over of any crippled company, however, the participation of the private sector into the public sector is a different story. The transition must be done in the name of the people, for the benefit of the

people.

(2) Securing the Necessary Profit

While promoting privatization, SBMA must exercise its power to promote the port development, administration and operation as a Port Management Body. All the facilities, infrastructure and equipment of the Port need continuous maintenance and improvement entailing an enormous amount of money.
The cost sharing scheme between the national government, SBMA and the private sector must be discussed and a mutual agreement regarding how to share the cost must be reached. In this regard, SBMA must secure the necessary profit to pay for its share and this is the necessary condition for the Port to be operated satisfactorily.

A Port Management Body must financially be healthy before and after the privatization. The privatization should not be regarded merely as a means to diminish red figures. The privatization is not a witch's broom but a dual bladed sword which may benefit the holder or may hurt him if he misuses it.

In this regard, again PAL case has taught us a precious lesson. If the management of PAL had paid due attention to securing the necessary profit to continue running the company, the current situation would look different. The worst situation might have been avoided, if the management of PAL had moved in the right direction.

(3) Transparency

The transparency of any economic body is a fundamental condition in modern economic society. SBMA is not an exception and if requested, it must open the necessary information to the public. If necessary, SBMA must be ready to defend its decision making in the process of privatization. The following questions might arise why one specific candidate is selected as a new facility operator? Or what is the merit of the decision for SBMA in the short term and long term? If these questions are answered clearly, there would be no time consuming arguments. In the world of today where time is money, a "quick decision with quick action " could be the strongest strategy but it must be followed by accountability at the same time, otherwise " quick decision " will surely meet an obstacle resulting in an abrupt braking.

Corruption is the shadow of transparency and where there is corruption, transparency will become vague just like a x-ray photograph. Therefore, transparency should be considered as an established method to judge whether an organization is operated rightly or not.

(4) Fairness

Privatization of the Nation's and People's assets, activities and rights must be carried out impartially. It is a simple fact that any privatization needs a huge amount of money, and the central question is where that money come from. In many countries, privatization is merely a game among limited members in a closed room. Bureaucrats and tycoons of the business world sit down around the table and play games. If one tycoon fails in a field of business, say an air line business, another one takes over the right from him by making necessary fund selling his stock share in some other field, for example the brewery business. In this process, the last bridge-head is a governmental organization like COP that leads and watches the action of the players.

SBMA, in collaboration with COP, should try to be a watch tower in the process of privatization. The first step is to open the door of the playing room and next is to increase the numbers of players. For example, in a case of concession, just a nominal and ceremonial public notice is not enough. It is desirable that SBMA try to explain the strong points as well as the weak points of the assets and rights that are going to be privatized through the concession.

It is to be born in mind that the privatization could be an untamed child, and if he is left alone and society allows him to do as he likes, he can become a real monster damaging all people around him. What he needs is social training, how to behave in the business world, how to contribute to the society through his business.

In this regard, it is hoped that SBMA will make unfailing efforts to educate its staff and not only those who are directly involved in the privatization program but also any personnel in general on the importance of the above.