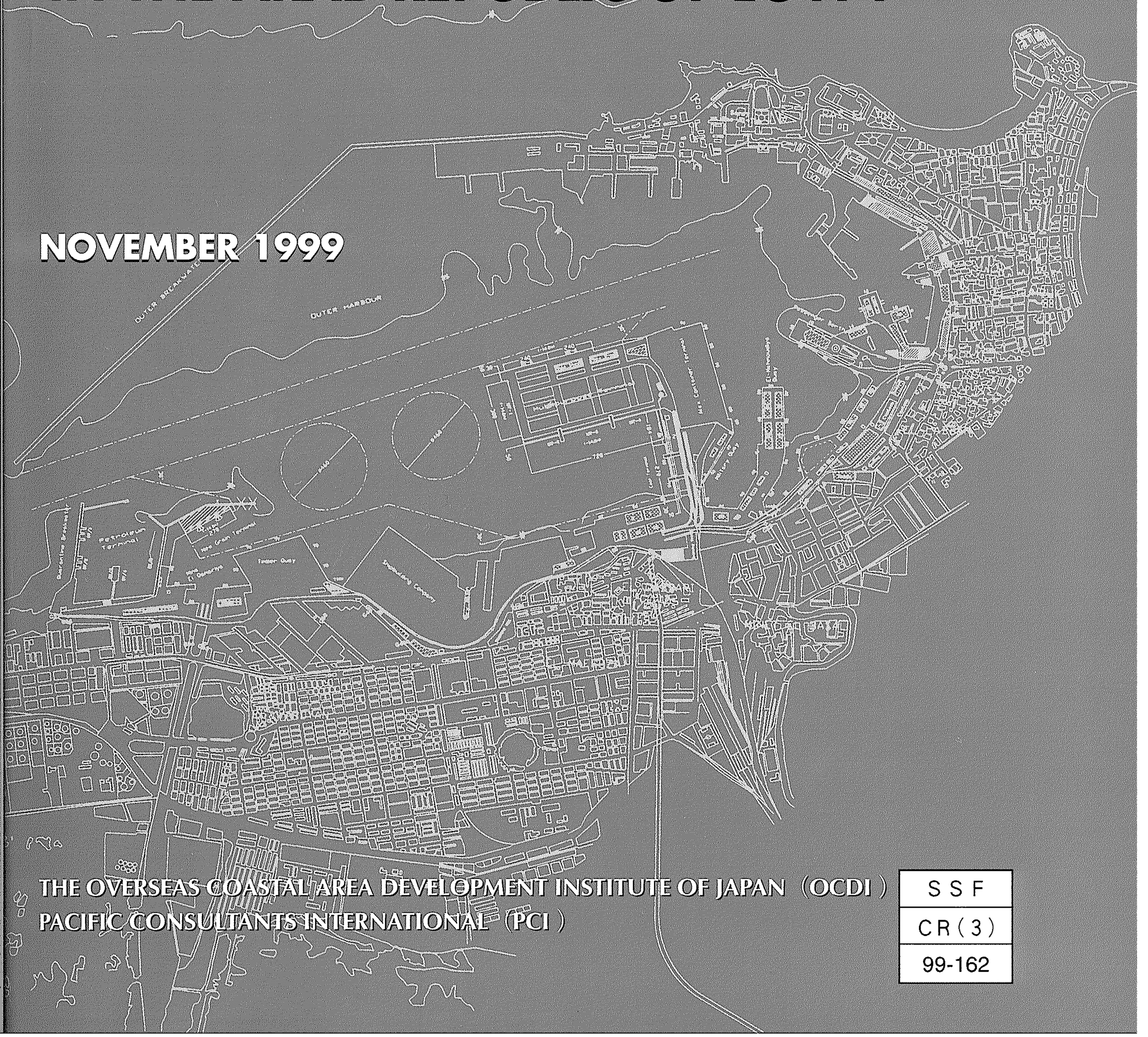
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
MINISTRY OF MARITIME TRANSPORT (MOMT)

No.

FINAL REPORT

THE STUDY ON MASTER PLAN AND REHABILITATION SCHEME OF THE GREATER ALEXANDRIA PORT IN THE ARAB REPUBLIC OF EGYPT



NOVEMBER 1999

THE OVERSEAS COASTAL AREA DEVELOPMENT INSTITUTE OF JAPAN (OCDI)
PACIFIC CONSULTANTS INTERNATIONAL (PCI)

S S F
C R (3)
99-162

The following foreign exchange rates are applied in this study:

US$ 1.00 = LE (Egyptian Pound) 3.40 = ¥ 136.00, as of May, 1998

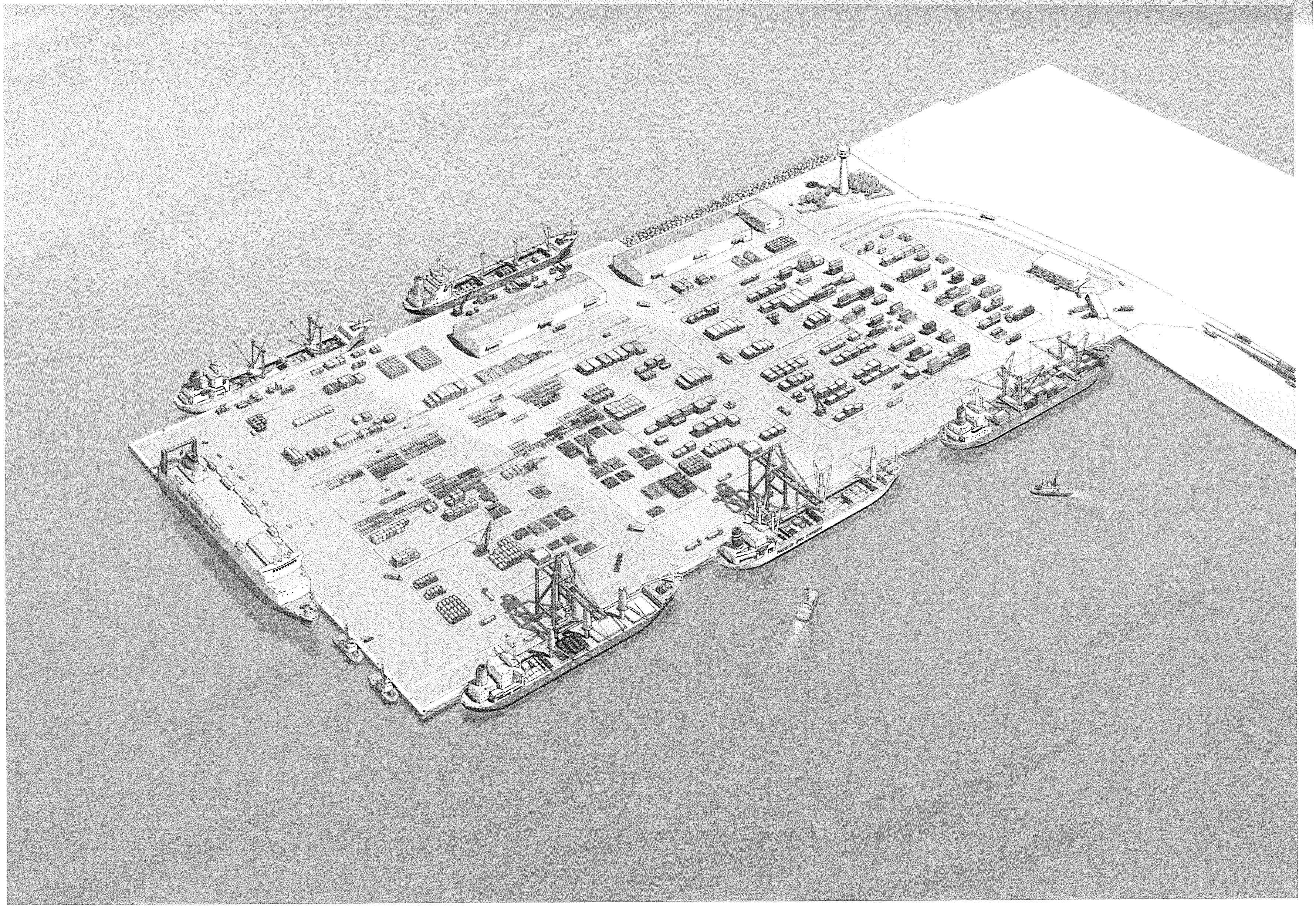
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
MINISTRY OF MARITIME TRANSPORT (MOMT)

FINAL REPORT

THE STUDY ON MASTER PLAN AND REHABILITATION SCHEME OF THE GREATER ALEXANDRIA PORT IN THE ARAB REPUBLIC OF EGYPT

NOVEMBER 1999

THE OVERSEAS COASTAL AREA DEVELOPMENT INSTITUTE OF JAPAN (OCDI)
PACIFIC CONSULTANTS INTERNATIONAL (PCI)



PREFACE

In response to a request from the Government of the Arab Republic of Egypt, the Government of Japan decided to conduct a study on the master plan and rehabilitation scheme of the Greater Alexandria Port in the Arab Republic of Egypt and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA selected and dispatched a study team, headed by Mr. Yugo Otsuki of the Overseas Coastal Area Development Institute of Japan (OCDI), consisting of OCDI and Pacific Consultants International (PCI) to Egypt, four times between March 1998 and September 1999.

The team held discussions with the officials concerned of the Government of Egypt and conducted field surveys at the study area. Upon returning to Japan, the team conducted further studies and prepared this final report.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between out two countries.

Finally, I wish to express my sincere appreciation to the officials concerned of the Government of Egypt for their close cooperation extended to the Team.

November, 1999

Kimio Fujita

President

Japan International Cooperation Agency

LETTER OF TRANSMITTAL

November, 1999

Mr. Kimio Fujita
President
Japan International Cooperation Agency

Dear Mr. Fujita:

It is my great pleasure to submit herewith the final report for the Study on the Master Plan and Rehabilitation Scheme of the Greater Alexandria Port in the Arab Republic of Egypt.

The study team which consists of the Overseas Coastal Area Development Institute of Japan (OCDI) and Pacific Consultants International (PCI), and headed by myself, conducted surveys in Egypt four times from March 1998 to September 1999 as per the contract with the Japan International Cooperation Agency.

The findings of these surveys were fully discussed with the officials of the Ministry of Maritime Transport (MOMT) and other authorities concerned to formulate the Master Plan and Rehabilitation Scheme for the period up to the year 2017 and to formulate and examine the feasibility of the Short-term Plan for the period up to the year 2007, and were then compiled into this report.

On behalf of the study team, I would like to express my deepest appreciation to the Government of Egypt, Alexandria Port Authority and other authorities concerned for their brilliant cooperation and assistance and for the heartfelt hospitality which they extended to the study team during our stay in Egypt.

I am also greatly indebted to the Japan International Cooperation Agency, the Ministry of Foreign Affairs, the Ministry of Transport and the Embassy of Japan in Egypt for giving us valuable suggestions and assistance during the preparation of this report.

Respectfully,

Yugo Otsuki
Leader of the Study Team for the Study on Master Plan and Rehabilitation Scheme of the Greater Alexandria Port in the Arab Republic of Egypt

ABBREVIATION LIST

A	AGOSD	Alexandria General Organization for Sanitary Drainage
	ANSDAK	Alexandria National Iron and Steel Co.
	APA	Alexandria Port Authority
	APC	Alexandria Petroleum Company
	AWSA	Alexandria Water Supply Authority
B	BOD	Biochemical Oxygen Demand
	BOR	Berth Occupancy Ratio
C	CD	Chart Datum
	CEE	Corporate Environmental Ethics
	CFS	Container Freight Station
	CIS	Commonwealth of Independent States
	COD	Chemical Oxygen Demand
	CY	Container Yard
D	DPA	Damietta Port Authority
	DWT	Dead Weight Tonnage
E	EDI	Electronic Data Interchange
	EEAA	Egyptian Environmental Affairs Agency
	EIA	Environmental Impact Assessment
	EIRR	Economic Internal Rate of Return
F	FIRR	Financial Internal Rate of Return
G	GDP	Gross Domestic Product
	GRDP	Gross Regional Domestic Product
	GRT	Gross Tonnage

I	IEE	Initial Environmental Examination
L	LOA	Length Overall
M	MOMT	Ministry of Maritime Transport
O	OECD	Organization for Economic Cooperation and Development
P	PSPA	Port Said Port Authority
Q	QGC	Quay-side Gantry Crane
R	RTG	Rubber-Tired Gantry
S	SCA	Suez Canal Authority
T	TEU	Twenty-foot Equivalent Unit
U	UNCTAD	United Nations Conference on Trade and Development
	USAID	United States Agency for International Development
V	VTMS	Vessel Traffic Management System

CONTENTS

PART III MASTER PLAN

PART IV SHORT-TERM PLAN

List of Tables

PART I

PART II

PART III

PART IV

APPENDIX

List of Figures

PART I

PART II

PART III

PART IV

APPENDIX

Executive Summary

1. Background of the Study

Mediterranean ports in Egypt, viz. the Greater Alexandria (including El Dekheila Port), Damietta and Port Said Ports, play a role in handling Egyptian sea-borne trades to a large extent. The Greater Alexandria Port handles approximately 20 million tons, which accounts for a little more than 60% of the Egyptian sea-borne trade cargo. However, the future cargo demand for the Greater Alexandria Port is expected to exceed its overall capacity, mainly due to geographical constraint, un-modernized cargo handling and transportation systems, and aged facilities of the port. Additionally, port related traffic such as cargo trucks coming in/out the port causes heavy traffic jam at the downtown area right behind Alexandria Port.

On the other hand, El Dekheila Port was developed as a modern port and started its operations in 1986, located only 6 km west of Alexandria Port. This port is expected to complement and ease congested Alexandria Port. Roles of Damietta Port and Port Said Port have been enhancing their importance as a container port taking the geographical advantages of proximity to Suez Canal. Functions of Alexandria Port and El Dekheila Port are requested to be integrated as the Greater Alexandria Port so as to promote national and regional development by maximizing its potential, taking account of increasing cargo demand and structural change of commodity flows through those ports.

2. Objectives of the Study

The objectives of the study are i) to formulate development guidelines of the Mediterranean ports in Egypt (target year: 2017), ii) to formulate the Master Plan for the Greater Alexandria Port (including El Dekheila Port) (target year: 2017), iii) to formulate the Short-term Plan (target year: 2007), and iv) to propose measures to improve port management and operations.

3. Outline of the Study

3.1 Development Guidelines of the Mediterranean Ports in Egypt

Development guidelines are formulated for three ports viz. the Greater Alexandria Port, Damietta Port and Port Said Port for the target year of 2017. The following matters are proposed.

(1) Handling Local Containers

It is proposed to allocate local containers first to the existing container terminals at the Greater Alexandria Port and Port Said Port up to their potential capacity of 2.2 million TEUs per annum (1.5 million TEUs in the Greater Alexandria and 700,000 TEUs in Port Said). Then, it is also proposed to allocate excess containers of 700,000 TEUs to the existing terminal at Damietta Port and the new terminal at Port Said East Port.

(2) Handling of Transshipped Containers

It is proposed to increase the capacity of container-handling in Damietta Port up to 1.7 million TEUs per annum. Thus, in the target year 2017, the Egyptian hub ports containing Port Said East Port and

Damietta Port are expected to take demand for handling transshipped containers of 5.2 million TEUs per annum which accounts for 44.1 % of the total demand of 11.7 million TEUs in the East Mediterranean and the Black Sea.

(3) Handling of Conventional General Cargo

It is proposed to allocate a great portion of the total conventional general cargo (12.8 million tons, 73.6% of the total in 2017, almost the same percentage as at present) to the Greater Alexandria Port. At Damietta Port, it is also proposed to implement the second phase development by the year 2017 so as to meet the increasing demand (3.2 million tons in 2017) for handling conventional general cargo and to compensate for the conversion of the existing conventional berths into container berths.

(4) Handling Dry Bulk Cargo

1) Grain

Although the incremental volume of grain up to the target year is moderate as a whole, there will be shortage of grain handling capacity at the Greater Alexandria Port compared with the regional demand. To meet the increasing demand economically, it is proposed to redevelop the existing obsolete grain-handling facilities at the West Zone of Alexandria Port.

2) Coal and Coke

Since the volume of coal/coke will be stable up to the target year, it is proposed to redevelop the existing obsolete facilities for handling coal/coke in the harbor area of Alexandria Port by additional investment rather than concentrating coal/coke handling in El Dekheila Port. This will save ocean coal transport costs.

(5) Handling of Liquid Bulk Cargo

To meet the increasing demand of liquid bulk cargo in the future, it is proposed to renovate the existing obsolete facilities for handling petroleum and edible oil at the Petroleum Basin in the Alexandria Port in addition to a new oil jetty to be constructed at El Dekheila Port by MEDOR.

(6) Common Port Facilities

Together with the development, redevelopment or renovation of marine terminals at each port as mentioned above, it is proposed to prepare required common port facilities such as breakwaters, port roads and vessel traffic management system (VTMS).

(7) Management, Operations and Institutional Matters

The following matters are proposed.

- To promote private participation and privatization of the state-owned companies so as to improve the level of services to port users,
- To promote the establishment of integrated private terminal operators with enough capital and

ability to perform comprehensive port terminal operations including stevedoring, warehousing and trucking, and

- To make MOMT set the maximum level of the port charges and allow each port authority to decide the charges freely below the maximum level.

3.2 Master Plan and Short-term Plan for the Greater Alexandria Port

3.2.1 Facility Plan

The Master Plan and the Short-term Plan for the Greater Alexandria Port are formulated in the framework of "the Development Guidelines of the Mediterranean Ports in Egypt" mentioned above. The followings are the major items of the plans.

Items of the Plans	1st Phase Project (Short-term Plan)		2nd Phase Project		Completion (Master Plan)	
1.Project Period	Up to 2007		2007-2017		Up to 2017	
2.Projected cargo volume of final year (thousand tons)	35,722		44,327		44,327	
3.Multi-purpose Terminal		million LE: 443		million LE: 51		million LE: 494
3.1 Infrastructure						
(1) Deep water berth (14 m below C.D.)	960 m		480 m		1,440 m	
(2) Open yard	13 ha		4 ha		17 ha	
(3) Dedicated access road (700 m long) with a fly-over bridge connected to the existing fly-over bridge	Development		—			
3.2 Superstructure						
(1) Warehouses	6,000 sq.m.		6,000 sq.m.		12,000 sq.m.	
(2) Gate house	Development		—			
(3) Truck scale	Development		—			
3.3 Two (2) units of multi-purpose quay-side gantry cranes	Development		—			
4. Redevelopment of the existing Grain Terminal at the West Zone		118		—		118
4.1 New berth with a length of 270 m (14m below C.D.)	Development		—			
4.2 Grain-handling equipment						
(1) Two (2) units of rail-mounted ship unloaders	Development		—			
(2) Belt conveyors connecting ship unloaders and the existing silos	Development		—			
5. New Coal Berth with a length of 270 m (14m below C.D.) at the existing Coal/Coke Terminal	Development	23	—	—		23

6. Redevelopment of El Mahmudiya Quay		—		—		—
(1) Demolishing warehouses no.44 and no.45	Development		—			
(2) Preparation of open yards behind berths no.39 and no.40	Development		—			
7. Deepening of the Inner Harbor Basins to water depth of 14 m below C.D. between the West and Central Zones of Alexandria Port (The cost is allocated to 3,4 & 5)	Development	—	—	—		—
8.A new port road bridge connecting the East and Central zones	Development	10	—	—		10
9.Commoon port facilities	Development	4	—	—		4
(1) Introduction of the latest vessel traffic management system (VTMS)						
(2) Installation of a waste oil receiving facility at El Dekheila Port	Development		—			
Grand Total		598		51		649

* CD : Chart Datum

3.2.2 Management, Operations and Institutional Matters

(1) It is recommended that APA set the targeted productivity/throughput and monitor the performance of operators.

(2) It is proposed that APA divide the new multi-purpose terminal into two or three portions and lease them or give concession to existing state-owned or private companies. To choose competent terminal operators, it is recommended to have a tender on concession or lease fee.

4. Appraisal of the Short-term Plan

4.1 Economic Appraisal

A comparison between the "Without" case and the "With" case was carried out to evaluate the economic feasibility of the project for construction of 1) Multipurpose Terminal including common port facilities such as VTMS and waste oil receiving facilities, 2) Grain Terminal Modernization, 3) Deep Water Coal Berth, and 4) New Port Road Bridge proposed in the Short-term Plan from the viewpoint of the national economy of Egypt.

The resulting economic internal rate of return (EIRR), benefit cost ratio (B/C), and net present value (NPV) for the above-mentioned projects proposed in the Short-term Plan are presented in Table 4.1, Table 4.2 and Table 4.3. Consequently, all the projects are considered to be economically feasible from the viewpoint of the national economy of Egypt.

Table 4.1 Resulting EIRR for each Project

(unit: %)

Project	Multi-purpose Terminal	Grain Terminal Modernization	Deep Water Coal Berth	New Port Road Bridge	Overall Projects
EIRR	23.0	18.2	39.1	19.8	22.7

Table 4.2 Resulting B/C for each Project

Project	Multi-purpose Terminal	Grain Terminal Modernization	Deep Water Coal Berth	New Port Road Bridge	Overall Projects
B/C	1.70	1.74	4.34	1.74	1.80

Table 4.3 Resulting NPV for each Project

(unit: 1,000LE)

Project	Multi-purpose Terminal	Grain Terminal Modernization	Deep Water Coal Berth	New Port Road Bridge	Overall Projects
NPV	265,295	82,331	56,772	4,539	408,937

4.2 Financial Appraisal

The financial revenues are generated from the port dues and charges based on the tariff proposed to cover capital investment and operational costs by referring to the current tariff level and those of the neighboring ports.

The resulting financial rates of return (FIRR) for the projects of 1) Multipurpose Terminal including common port facilities such as VTMS, waste oil receiving facilities and New Port Road Bridge, 2) Grain Terminal Modernization, 3) Deep Water Coal Berth, and 4) the overall projects are 10.2%, 16.6%, 36.4% and 12.6% respectively, exceeding the weighted average interest rate (5.3%) of assumed fund raising plans and hence each project is considered to be financially feasible.

Table 4.4 Resulting FIRR for each Project

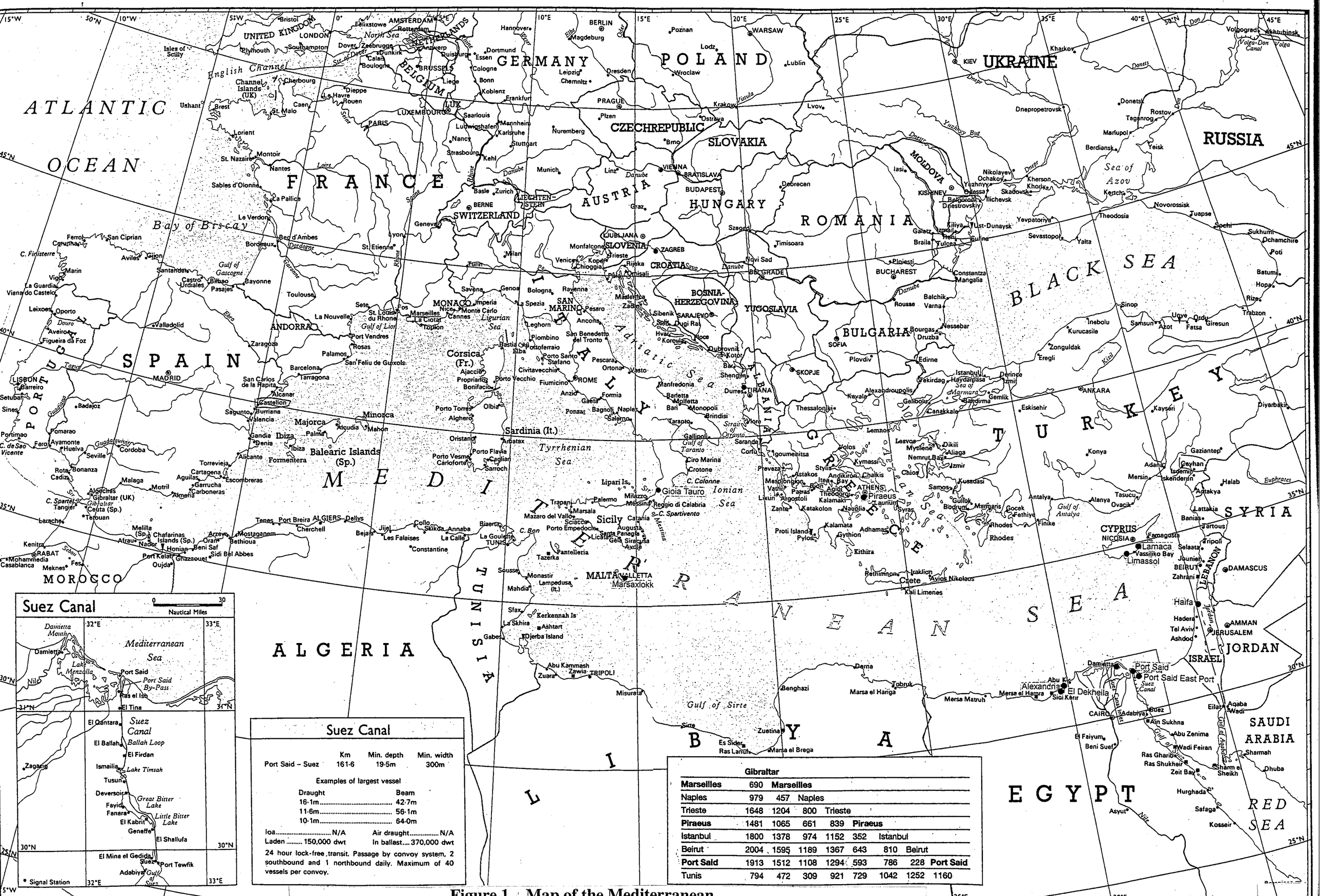
(unit: %)

Project	Multi-purpose Terminal	Grain Terminal Modernization	Deep Water Coal Berth	Overall Projects
FIRR	10.2	16.6	36.4	12.6

5. Proposed Measures together with Project Implementation

Prior to constructing a new multi-purpose terminal, sawn timber landing operations from barges at quays Nos. 57-61 need to be relocated to appropriate places in the harbor.

For achieving gradual conversion of barge operation into quayside operation smoothly, it is proposed that the Government take the initiative in conducting measures to give barge operators licenses to perform quayside operation. In addition, it is recommended to provide retraining programs to obtain necessary knowledge, techniques or skills for quayside operation.



Suez Canal

	Km	Min. depth	Min. width
Port Said – Suez	161·6	19·5m	300m

Examples of largest vessel

Draught	Beam
16·1m	42·7m
11·6m	56·1m
10·1m	64·0m

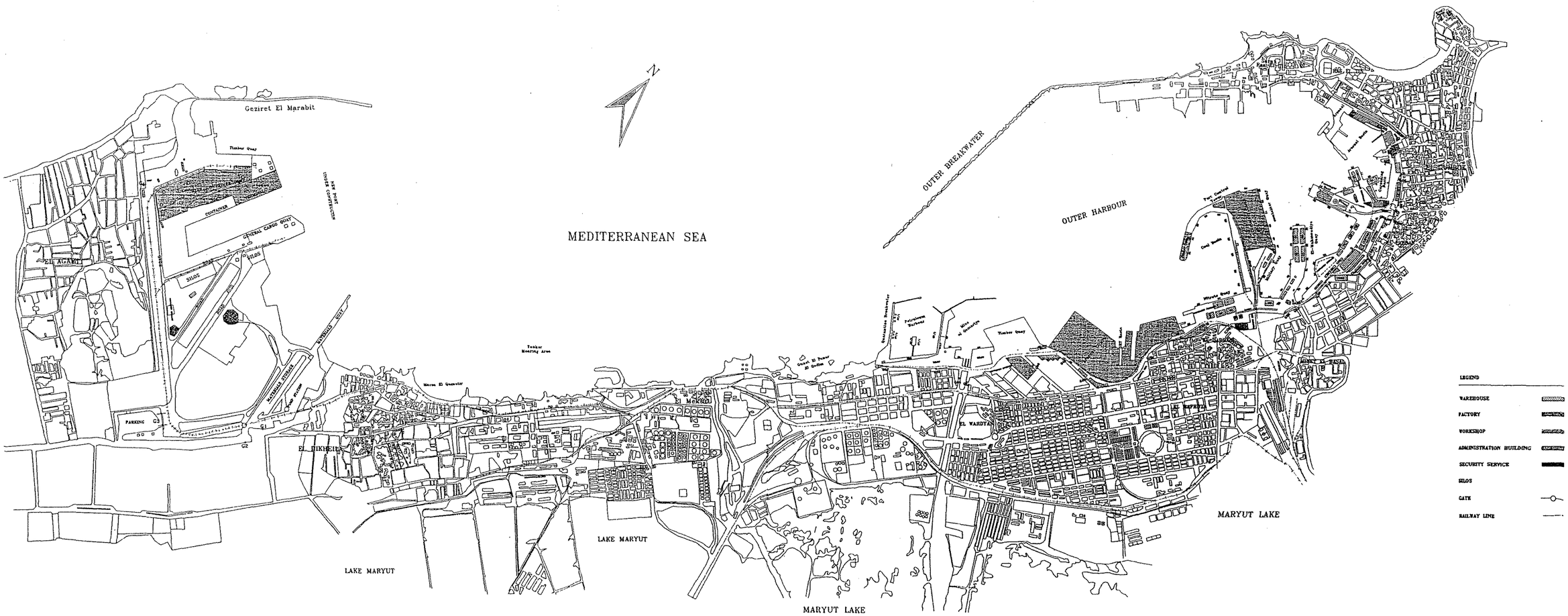
loa........................N/A Air draught..............N/A

Laden .... 150,000 dwt In ballast.... 370,000 dwt

24 hour lock-free ,transit. Passage by convoy system, 2 southbound and 1 northbound daily. Maximum of 40 vessels per convoy.

	Gibraltar	Marseilles	Naples	Trieste	Piraeus	Istanbul	Beirut	Port Said
Marseilles	690	**Marseilles**						
Naples	979	457	Naples					
Trieste	1648	1204	800	Trieste				
Piraeus	1481	1065	661	839	**Piraeus**			
Istanbul	1800	1378	974	1152	352	Istanbul		
Beirut	2004	1595	1189	1367	643	810	Beirut	
Port Said	1913	1512	1108	1294	593	786	228	**Port Said**
Tunis	794	472	309	921	729	1042	1252	1160

Figure 1 Map of the Mediterranean



ALEXANDRIA PORT AUTHORITY	JICA JAPAN INTERNATIONAL COOPERATION AGENCY	MASTER PLANE AND REHABILITATION SCHEME FOR THE GREATER ALEXANDRIA PORT	TOPOGRAPHIC SURVEY (ALEXANDRIA PORT AREA)	PACIFIC CONSULTANTS INTERNATIONAL 7-3,SEKIDO 1-CHOME TAMASHI, TOKYO-206 JAPAN	TALAAT-IMAM CONSULTING ENGINEERS

Figure 2 Land Use Map of the Greater Alexandria Port

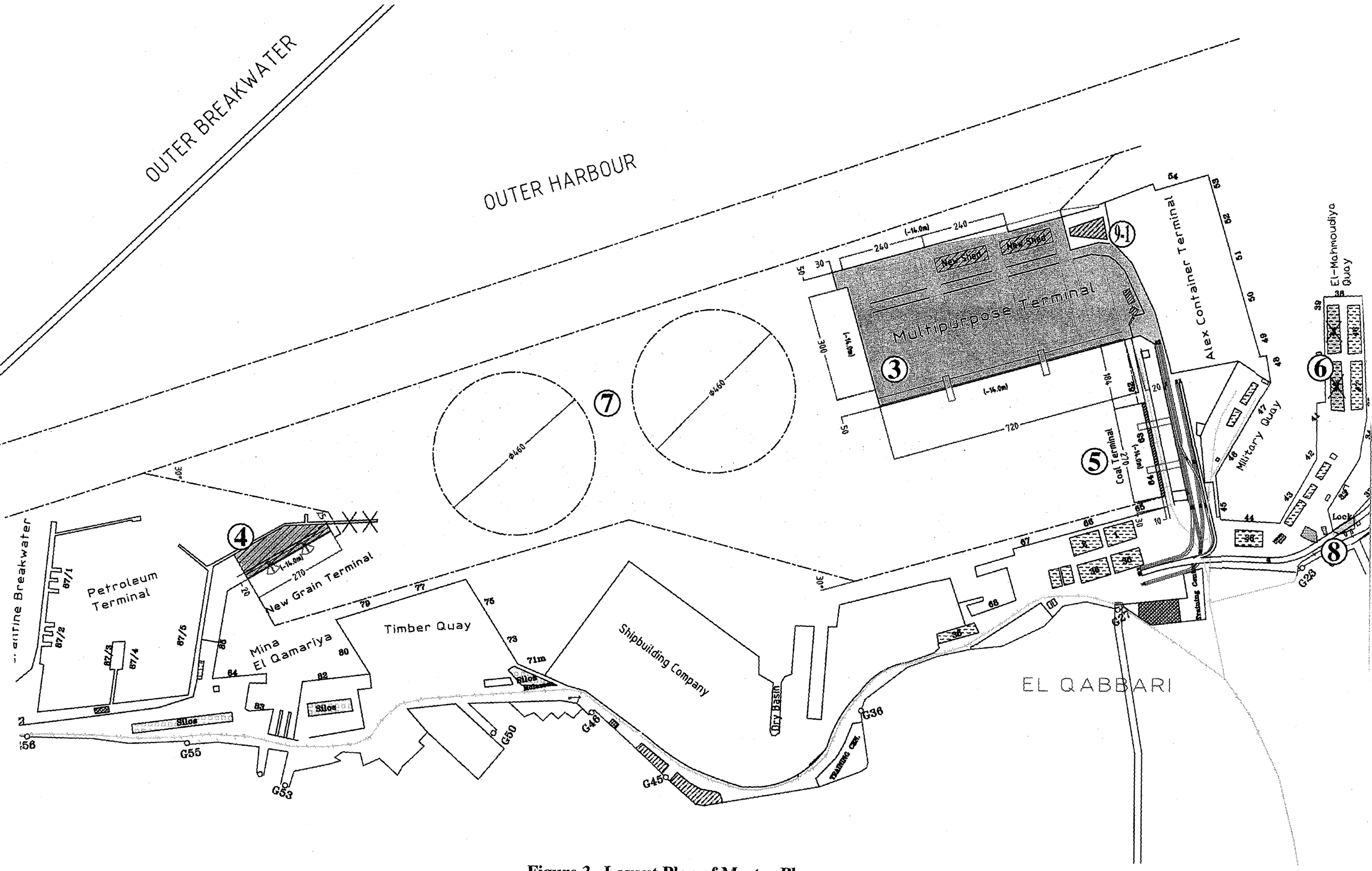


Figure 3 Layout Plan of Master Plan

ORGANIZATION OF THE STUDY TEAM

The study team is comprised of the following specialists. This name and responsibilities are listed below;

Name	Responsibilities
Yugo Otsuki	Team Leader, Overall management (OCDI)
Toshihiko Kamemura	Demand Forecast (1)
Tadahiko Kawada	Demand Forecast (2)
Masahiko Furuichi	Sub-Leader, Port Planning (1)
Shinichi Tezuka	Port Planning (2)
Shinobu Yamamoto	Port Management and Operation
Toshihiro Okura	Port Management and Operation
Toru Yano	Economic and Financial Analyses
Nobuo Ide	Port Facility Design
Masahiro Yokogawa	Construction and Cost Estimation
Abdelaziz Rabie	Natural Conditions
Jayamohan Somasundaram	Environmental Conditions
Tsuyoshi Oki	Coordinator
Toru Yano	Coordinator

CONCLUSIONS

1. Necessity of Coordinated Development of the Mediterranean Ports in Egypt

1. Egypt has enjoyed stable economic growth, with Gross Domestic Product from 1991/92 to 1996/97 growing at an annual average rate of 4.2%. On the Mediterranean coast, the three major ports, viz. the Greater Alexandria Port (containing Alexandria and El Dekheila), Damietta Port and Port Said Port, are handling the great majority of overseas trade cargo passing through the Egyptian ports (hereinafter referred to as "the local cargo"). The volume of the local cargo which passed through the three major ports recorded average annual increase rates of 12.2% in imports and 6.9% in exports, with 30 million tons in imports and 6 million tons in exports in 1996/97. In the same year, the Greater Alexandria Port ranked first in terms of local cargo volume, accounting for 67.1% of the total of the three ports, followed by Damietta (21.3%) and Port Said (11.6%).

2. The volume of the local cargo through the three ports is expected to continuously increase in the future; projected volumes in the years of 2017 are 16.6 million tons in conventional cargo (1.7 times as much as the volume in 1997) and 2.9 million TEUs in local containers (5.2 times as much as the volume in 1997) including the volume to be allocated to the new port, viz. Port Said East Port, respectively.

3. There is a shortage of the required infrastructures or cargo-handling machines and no leader giving proper instructions, resulting in inefficient, costly and time-consuming cargo-handling operations and consequent long berth-waiting time at the three major ports.

4. On the other hand, along with the economic growth in the countries facing the East Mediterranean Sea (the average annual growth rate of GDP from 1990 to 1995 is 3.7%), the progress of globalization in overseas trade involving those countries and the ever-increasing size of main-line container vessels, container transshipment at the East Mediterranean hub ports has been emerging in the last decade as a promising business. The volume of containers which were transshipped at the East Mediterranean hub ports and transported to/from feeder ports facing the East Mediterranean Sea or the Black Sea in 1997 is estimated as 2.6 million TEUs with an average annual increase rate in the last five years of 25.7%.The volume of containers transshipped at the Egyptian ports in 1997 accounted for 33.0% (38.2% in 1996) of the total in the East Mediterranean hub ports. In the same year, Gioia Tauro Port ranked first in terms of the volume of containers with the same catchment areas, with an estimated value of one million TEUs, followed by Damietta (542,000 TEUs), Marsaxlokk (417,000 TEUs), and Port Said (311,000 TEUs).

5. The potential demand for transshipment containers which will originate from or be destined to the above catchment areas and will be transshipped at the East Mediterranean hub ports in 2017 is estimated as 11.7 million TEUs in total with an average annual increase rate of 7.3% towards the year 2017. On the other hand, the existing capacity available for handling the above-mentioned transshipped containers at the hub ports is estimated as approximately 4.7 million TEUs per annum,

indicating that container-handling capacity of approximately 7 million TEUs in total is additionally required for transshipment services at hub ports towards the year 2017. In other words, incremental demand for handling 7-million-TEU containers is expected to be generated in the transshipment business at container hub ports in the future.

6. The ports of Port Said and Damietta, thanks to their geographical advantage of zero or little deviation from the international trunk route via the Suez Canal, have almost one third of the transshipment market share in the East Mediterranean and the Black Sea. And a promising new hub port, viz. Port Said East Port, which is on the verge of being constructed, could take a considerable market share in the future together with Damietta Port, if required port facilities are prepared and efficient operations are provided with competitive tariff. They would make a positive contribution to the Egyptian economy through earning foreign currency.

7. Thus to resolve the present problems and meet increasing demand for handling conventional cargo and local and transshipped containers in the future, it is necessary to develop, re-develop or rehabilitate the Egyptian Mediterranean ports, the Greater Alexandria Port, Damietta Port and Port Said Port, in a comprehensive manner to effective use of the limited resources. Main issues are outlined by type of cargo-handling as follows:

(1) Handling of Local Containers

8. Local containers imported or exported through the three Mediterranean ports in Egypt increased at a high growth rate of 13.8% per annum in the past five years, recording 571,000 TEUs in total in 1996/97. In the same year, 68.2% of the total local containers were received by the Greater Alexandria Port.

9. It is essential to meet future demand for handling local containers at those ports so as to support the national and regional economic growth. In this view, the Greater Alexandria Port whose hinterland extends over the Nile Delta including the second largest city, viz. Alexandria as its own back area and Cairo Metropolis, is expected to continue playing a major role in handling local containers.

10. The Greater Alexandria Port has a natural harbor with deep waters which is maintained without heavy maintenance dredging. The water depths of the existing container terminals are 14 m in the Alexandria harbor and 14m and 12 m (under construction) in El Dekheila, and their water depths seem to be sufficient to serve local container handling. In addition, the El Dekheila terminal has spacious land areas for future expansion. Thus, the Greater Alexandria Port has a large potential capacity for handling local containers (estimated as 1.5 million TEUs in total). The container-handling capacity, however, is insufficient to meet the large potential demand of 2.5 million TEUs in 2017.

11. Hence, to meet the potential demand, it is necessary to increase container handling capacity of Alexandria Port as much as possible by investing additionally for super-structures and container-handling machines and make the most of the already existing infrastructures including berths. Excess

containers would then be allocated to other Mediterranean ports including Port Said East Port.

12. Port Said Port is also required to serve local containers as well as Alexandria Port, because the port has its own hinterland, Port Said City, which accounted for 48.1% of its local container market in 1996/97. Also, the available navigational time to the port is limited due to interference with a convoy passing through the Suez Canal which presumably makes it difficult for the port to function as an international hub port for container transshipment in the next century.

13. In this regard, it is advisable that Port Said Port be used principally for local containers, and thereby the port will have room to receive a considerable amount of excess local containers from Alexandria Port in addition to the containers from/to its present hinterland in the future. Its capacity, however, is insufficient to receive all of the excess local containers.

14. While Damietta Port as well as Port Said East Port is expected to function as an international hub port for serving container transshipment in future, some amount of local containers is necessary for the sake of stable port management, since customer royalty at a hub port is prone to shift in the fiercely competitive transshipment business. Thus, a portion of the excess local containers from Alexandria will be required to be allocated to both Damietta Port and Port Said East Port in the future as well as Port Said Port.

(2) Handling of Transshipped Containers

15. The Egyptian hub ports are expected to take a considerable portion of the incremental demand for container-handling in the transshipment business which is anticipated to be 7 million TEUs towards the year 2017 in the East Mediterranean and the Black Sea. This will be an important source of foreign currency.

16. Damietta Port could increase the container handling up to 1.7 million TEUs in total by converting the existing conventional berths to additional container berths and preparing additional required super-structures and container-handling machines. This is much more economical than constructing a new terminal on virgin land. Thereby, in addition to local containers, Damietta Port could take a some portion of incremental demand for handling transshipped containers towards the year 2017 in the East Mediterranean and the Black Sea. Needless to say, much more demand is expected to be taken by Port Said East Port.

17. Although Damietta Port has several problems in container-handling, viz. insufficient specifications of container gantry cranes to accommodate the gigantic main-line container vessels, lack of efficient terminal operation system using computers, the resulting low container-handling productivity, etc., they could be overcome by moderate investment.

18. The present tips of the existing breakwaters are placed in the wave-breaking zones, and consequently the Damietta Port Authority is struggling to maintain its guaranteed water depths in the access channel

by continuous maintenance dredging throughout the year. To support the above expansion project, it is required to receive container vessels at the port on time by taking adequate countermeasures against siltation in the access channel. An effective countermeasures would be to extend the existing breakwaters. The port authority is studying the optimum extension lengths of the existing breakwaters.

(3) Handling of Conventional General Cargo

19. A great portion of the total conventional general cargo is being handled at Alexandria Port. Due to the lack of wharves specialized for handling long, bulky and/or heavy cargo such as iron billets, steel bars, scraps and plant components which are equipped with deeper berths with spacious aprons and open storage yards just behind them, these cargoes are handled at the existing berths in the harbor mostly with narrow aprons and aged sheds behind them together with other conventional cargoes which need to be stored in sheds. Thus, on-dock cargo-handling operations are conducted in chaotic conditions at these berths which are already close to being saturated, resulting in intricate cargo-hauling within the port. In addition, barge operations at anchorage within the harbor basins are done for handling goods such as sawn timbers and dust cargoes including sulfur and clay for the same reason mentioned above. Such cargo-handling results in a lot of wastage and inefficient, costly and time-consuming operations.

20. In the future, the volume of the above-mentioned long, bulky and/or heavy conventional general cargoes required to be handled at Alexandria Port is expected to increase to a considerable extent, (in the year 2017, 2.4 times as much as at present in Alexandria) whereas the remaining conventional cargoes are expected to remain at a moderate level (1.2 times as much as at present) reflecting the inverse effect of the anticipated further progress of containerization.

21. Hence, to meet the increasing demand for handling long, bulky and/or heavy cargoes, it is necessary to construct a new multi-purpose terminal with deep berths and spacious open yards aiming at handling principally long, bulky and/or heavy cargoes in Alexandria Port. Such a terminal could be constructed by re-developing the existing aged wharf. The preparation of the new terminal will reduce the congestion in handling the remaining conventional cargoes in the existing berths, thereby reducing berth waiting costs of vessels in off-shore anchorage

(4) Handling of Dry Bulk Cargo

1) Grain

22. In the Greater Alexandria Port, due to the shallow berth at the harbor grain terminal, a great portion of grains is discharged at El Dekheila Port. At El Dekheila Port, however, there are only two units of rail-mounted grain unloaders, and considerable grains are discharged onto truck wagons alongside directly by using portable pneumatic unloaders temporally placed on upper decks. This results in low grain-handling productivity of less than 300 tons per hour per vessel and consequently, all general cargo berths at El Dekheila are occupied by grain carriers.

23. Hence, to resolve present problems and meet the increasing demand for handling grains at the Greater Alexandria Port, it is necessary to construct a new deep water berth that will be connected with the existing silos through conveyors to receive Panamax type grain carriers in the Alexandria harbor.

2) Coal and Coke

24. At the coal/coke terminal in the Alexandria harbor, the berths are obsolete and shallow (10 m in design water depth). Nevertheless, a Panamax-type coal carrier of around 69,000 DWT with a full draft of 13.3 m and a length of 215 m once called the terminal in partly-loaded draft condition. To receive larger coal carriers in fully-loaded conditions, coal/cokes handling could be concentrated on the mineral jetty at El Dekheila by shifting the current handling at Alexandria to El Dekheila through investment for procuring coal/cokes handling machines on the jetty and yards and constructing storage yards and inland barge basins. The required resources for the investment, however, are gigantic and far outweigh the benefits to be obtained by such a concentration plan. Taking into account that demand for handling coal/cokes is predicted to increase slightly for the future, it is more economical to prepare deeper berths in front of the existing berth line with moderate investment so as to receive larger coal carriers at the existing coal/coke terminal in the Alexandria harbor.

(5) Handling of Liquid Bulk Cargo

25. The five marine oil berths of the Alexandria Petroleum Company in the Petroleum Basin within the Alexandria harbor have sufficient capacity for the refinery of the above company located behind the basin and another refinery of a company located within the free zone at Al Amriya south of Alexandria for the time of being, if the existing broken-down loading/unloading arms are replaced together with the installation of new connecting pipelines.

26. The Mediterranean Oil Refinery (MEDOR) is planning to construct a new refinery at Al Amriya. The company is also planning to construct a marine oil jetty to the west of the mineral jetty at El Dekheila Port.

(6) Common Port Facilities

27. To support cargo handling operations in the marine terminals, it is necessary to prepare required common port facilities such as breakwaters, port roads and vessel traffic management system (VTMS).

(7) Management, Operations and Institutional Matters

28. In Egypt, port authorities function as the Government's landlords over water, land and infrastructure of the ports. Port authorities are in charge of planning, constructing and maintaining port facilities, securing navigation safety and marine service in the ports. Port authorities lease land and facilities in the ports to both state-owned and private companies and collect fees from them.

29. State-owned companies have been allowed to perform cargo handling operations, warehouse operations and act as shipping agents. They are under the control of the Holding Companies supervised by the Ministry of Public Enterprise. Inefficient cargo handling and high costs, which are major problems in Egyptian Ports, are mainly derived from the monopolistic situation of the state-owned companies. To solve these problems, Egyptian Government has begun to implement new policies: privatization of state-owned companies and private participation in the port sector.

2. The Development Guidelines of the Mediterranean Ports in Egypt

(1) Handling of Local Containers

30. The Development Guidelines is formulated with a target year of 2017. In that year, the number of local containers to be handled at the Mediterranean Ports in Egypt is estimated as 2.9 million TEUs. To receive the forecast traffic, it is proposed to allocate local containers first to the existing container terminals at Greater Alexandria Port and Port Said Port up to their potential capacity of 2.2 million TEUs per annum (1.5 million TEUs in the Greater Alexandria and 700,000 TEUs in Port Said). This entails investing in super-structures and container-handling machines to make the most of the already existing infrastructures.

31. It is also proposed to allocate excess containers of 700,000 TEUs to the existing terminal at Damietta Port and the new terminal at Port Said East Port which is expected to contribute to stabilizing terminal management.

(2) Handling of Transshipped Containers

32. To take a portion of demand for handling transshipped containers, the volume of which is anticipated to reach 11.7 million TEUs per annum towards the year 2017 in the East Mediterranean and the Black Sea, it is proposed to increase the capacity of container-handling in Damietta Port up to 1.7 million TEUs per annum. This could be accomplished at the least cost by using the existing infrastructures including the conversion of the existing conventional berths to container berths.

33. Thus, in the target year, the Egyptian hub ports containing Port Said East Port and Damietta Port are expected to take demand for handling transshipped containers of 5.2 million TEUs per annum of 44.1 % of the total demand of 11.7 million TEUs in the East Mediterranean and the Black Sea.

(3) Handling of Conventional General Cargo

34. In the year 2017, the volume of conventional general cargo to be handled at the Mediterranean Ports in Egypt is estimated as 17.4 million tons. To receive the forecast traffic, it is proposed to allocate a great portion of the total conventional general cargo (12.8 million tons, 73.6% of the total in 2017, almost the same percentage as at present) to the Greater Alexandria Port whose cargo-handling

capacity could be economically increased by re-developing some existing obsolete wharves through constructing a new terminal with deeper berths and spacious open yards just behind them or demolishing some existing warehouses to widen apron areas and prepare required open yards within the harbor area. This will reduce the congestion at the remaining existing wharves.

35. At Damietta Port, it is proposed to implement the second phase development by the year 2017 so as to meet the increasing demand (3.2 million tons in 2017) for handling conventional cargo and to compensate for the conversion of the existing conventional berths into container berths.

(4) Handling of Dry Bulk Cargo

1) Grain

36. In the year 2017, the volume of grains to be handled at the Mediterranean Ports in Egypt is estimated as 13.4 million tons or 1.4 times as much as the volume in 1997. Although the incremental volume up to the target year is moderate as a whole, there will be shortage of grain handling capacity at the Great Alexandria Port compared with the regional demand. To meet the increasing demand economically, it is proposed to redevelop the existing obsolete grain-handling facilities in the harbor area of Alexandria Port.

2) Coal and Coke

37. In the year 2017, the volume of coal and coke to be handled at the Greater Alexandria Port is estimated as 2 million tons almost the same as in 1997. Since the volume will be stable up to the target year, it is proposed to redevelop the existing obsolete facilities for handling coal and coke in the harbor area of Alexandria Port by additional investment rather than concentrating coal/coke handling in El Dekheila Port. This will save ocean coal transport costs.

(5) Handling of Liquid Bulk Cargo

38. In the year 2017, the volume of liquid bulk cargo containing petroleum and edible oil to be handled at the Greater Alexandria Port is estimated as 6.5 million tons including the assumed volume from/to the new refinery plant to be installed at Al Amriya or 1.5 times as much as the volume in 1997. To meet the increasing demand in the future, it is proposed to renovate the existing obsolete facilities for handling petroleum and edible oil at the Petroleum Basin in the Alexandria harbor in addition to a new oil jetty to be constructed at El Dekheila Port by MEDOR.

(6) Common Port Facilities

39. Together with the development, redevelopment or renovation of marine terminals at each port as mentioned above, it is proposed to prepare required common facilities such as breakwaters, port roads and vessel traffic management system (VTMS).

(7) Management, Operations and Institutional Matters

1) General

40. The current key issue facing the Egyptian ports is how to effectively implement the new policies, private participation and privatization of the state-owned companies, to improve the service level to port users. Since these are closely related, it is advisable to introduce the following coordinated plans.

41. It is advisable to promote the establishment of integrated private terminal operators with enough capital and ability to perform comprehensive port terminal operations including stevedoring, warehousing and trucking. The port authorities should divide port areas into several zones and designate some zones as port terminals, each of which must have the appropriate size for such operations and include berths for preferential use and warehouses and open storage yards for exclusive use. Port authorities should give port terminal operators the concessions to use the terminals on an auction basis and allow both existing state-owned and private companies to apply for this tender.

42. To assure competition in the port sector, private companies should be entitled to decide the charges freely based on the negotiations with their customers. Concerning fees charged by a port authority, MOMT should set the upper level of the charges and allow a port authority to decide the charge freely below the maximum level considering those of the ports in the neighboring countries.

2) Alexandria Port

43. Unloading of sawn timber and dust cargo such as phosphate and clay, is currently conducted by barge. To improve the operational efficiency and to prevent cargo damage and environmental pollution, it is proposed that the unloading operation be conducted at the quay. To avoid social unrest that could result from an abrupt loss of jobs, the conversion of barge operators must be done gradually and prudently by increasing the job opportunities in the port.

44. To eliminate exchange of documents and speed up the clearance, a terminal computer linked to the computer system of container terminal should be installed at a gate office. Through this computer system, information on containers to pass through the port gate will be exchanged in real time between the port gate office and the gate at the container terminal.

3) Damietta Port

45. The port authority is suffering from a deficit due to large depreciation costs and repayment of loans. This situation prevents the port authority from investing in new facilities with internal funds. It is necessary to lighten the financial burden of the port authority without relying on the subsidy from the Central Government by increasing revenues from cargoes.

46. It is necessary to grasp the basic information on transshipment containers using loading/unloading container lists from shipping lines. To survive the severe competition among transshipment ports in the Mediterranean Sea, it is advisable to make the future strategy of the port based on this information and the future prospect of container traffic in neighboring countries.

4) Port Said Port

47. Port Said Port Authority does not have its own pilots or tugboats. Suez Canal Authority carries out pilotage and tug assistance in the Port Said Port. While the convoy is passing the Suez Canal, Suez Canal Authority's pilots and tugboats are engaged in service for vessels navigating through the canal. If vessels joining the convoy increase, no pilots or tugboats are available for berthing/unberthing vessels after the convoy passes through the port. Port Authority should have its own pilots and tugboats.

48. Although the Suez Canal gives Port Said Port certain advantages, the navigable time for vessels entering or departing the port is limited due to the interference with the convoy passing through the north entrance of the canal. The convoy has the priority to navigate the canal. During the convoy's passage from midnight to 8:00 AM, vessels to call at the port must stay at the outer anchorage area and vessels at berth can not leave the port. This prevents quick dispatch of vessels and discourages shipping lines to call at the port and consequently limits the number of calling vessels. Port Said Port Authority should have meetings with Suez Canal Authority to extend the time available for entering and departing the port as much as possible.

3. Master Plan for the Greater Alexandria Port (Target Year: 2017)

(1) Handling of Local Containers

49. The Master Plan for the Greater Alexandria Port is formulated with a target year of 2017 in the framework of "the Development Guidelines of the Mediterranean Ports in Egypt" mentioned previously. In that year, the number of local containers to be allocated at the Greater Alexandria Port is 1.5 million TEUs per annum (500,000 TEUs in Alexandria Port and one (1) million TEUs in El Dekheila Port). To receive the allocated volume of containers, it is proposed to invest in additional super-structures and container-handling machines at the existing container terminals of Alexandria and El Dekheila.

(2) Handling of Conventional General Cargo

50. In the year 2017, the volume of conventional general cargoes that will need to be received at the Greater Alexandria Port is estimated as 13.0 million tons. Among those cargoes, the volume of long, bulky and/or heavy cargoes is forecast to be 8.6 million tons, 2.1 times as much as at present in Alexandria. To meet the increasing demand for handling long, bulky and/or heavy cargoes, it is proposed to construct a new multipurpose terminal which will principally handle those cargoes in the

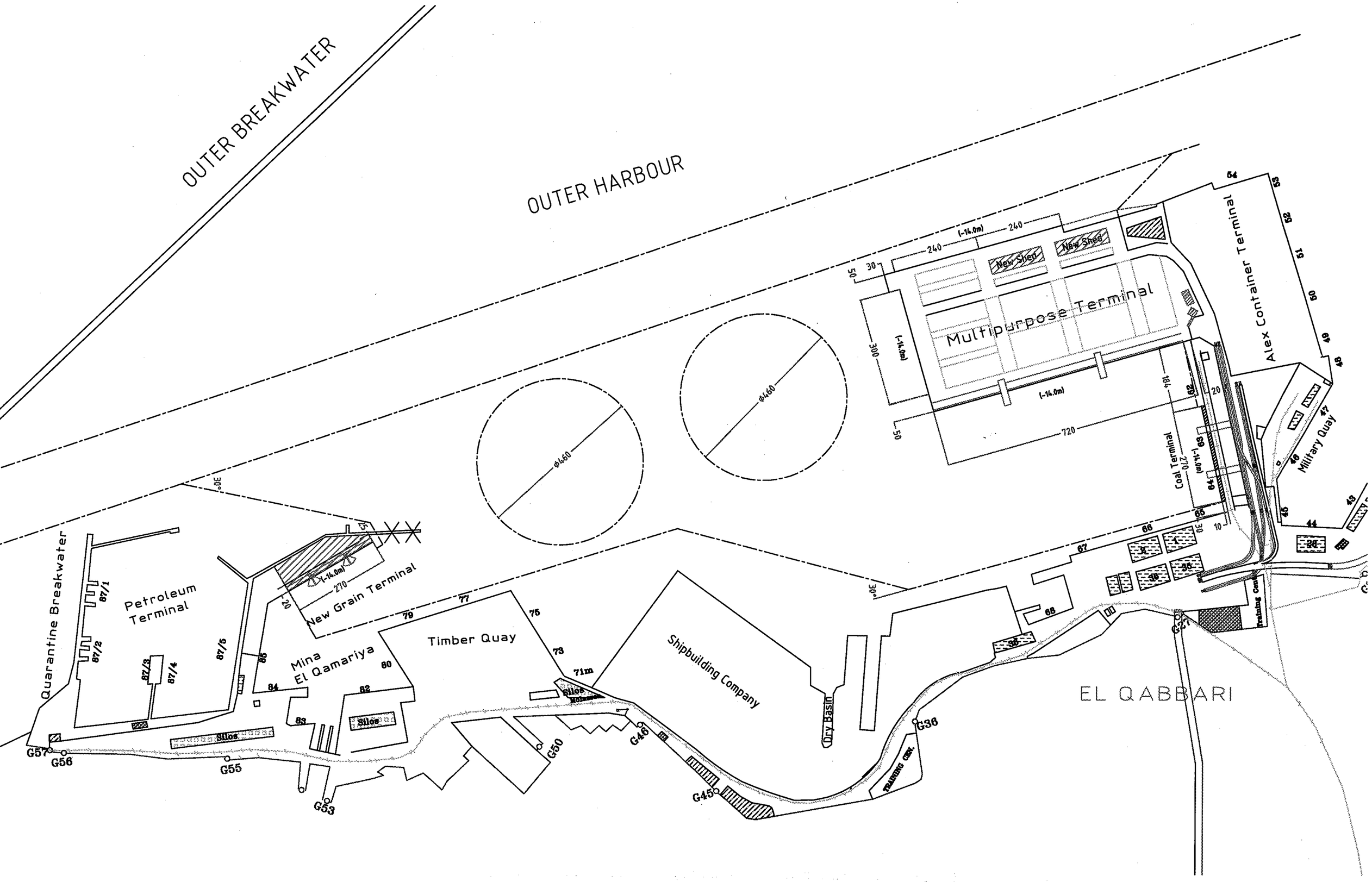


Figure 1 Layout Plan of Multi-purpose Terminal Master Plan

Alexandria harbor.

51. To reduce the current congestion at the existing wharves, it is proposed to redevelop the existing obsolete wharf through demolishing some existing warehouses.

(3) Handling of Dry Bulk Cargo

1) Grain

52. In the year 2017, the volume of grains that need to be received at the Greater Alexandria Port is estimated as 6.1 million tons or 1.4 times as much as the volume in 1997. To meet the increasing demand and save grain-handling costs at the port, it is proposed to construct a new deep water berth equipped with rail-mounted unloaders connected with the existing silos at the grain terminal in the Alexandria harbor

2) Coal and Coke

53. In the year 2017, the volume of coal and coke to be handled at the Greater Alexandria Port is estimated as 2 million tons. To save ocean transport costs for coal, it is proposed to construct a deep water berth in front of the existing coal/coke terminal in Alexandria harbor.

(3) Handling of Liquid Bulk Cargo

54. In the year 2017, the volume of liquid bulk cargo containing petroleum and edible oil to be handled at the Greater Alexandria Port is estimated as 6.5 million tons. To meet the increasing demand in the future, it is proposed to replace the existing obsolete loading/unloading arms and pipelines for handling petroleum and edible oil at the Petroleum Basin in the Alexandria harbor in addition to a new oil jetty to be constructed at El Dekheila Port by MEDOR.

(4) Common Port Facilities

55. Together with the development, redevelopment or renovation of marine terminals, it is proposed to prepare required common facilities including a new bridge connecting the east and central zones, a garbage collecting ship based on the International Convention for the Prevention of Marine Pollution from Ships and a waste oil receiving facility. It is also proposed to introduce the latest vessel traffic management system (VTMS).

(5) Project Cost

56. The total project cost of the Master Plan is roughly estimated as L.E.649 million.

(6) Initial Environmental Examination

57. It is concluded that the proposed master plan targeting principally the enhancement of operational efficiency and safety of the Greater Alexandria Port will lead to overall long-term environmental improvement of the port as well in tandem, in comparison to the baseline (present) environmental condition of the port.

(7) Management, Operations and Institutional Matters

58. It is recommended that APA set the targeted productivity/throughput and monitor the performance of operators. APA should recommend that productivity be improved if the performance is poor and reject the renewal of lease contract if improvement is not expected.

59. To upgrade the port services, it is proposed to enhance the privatization of state-owned companies. If some private investors in Egypt were to hold enough stakes to participate in management of the company, they would seek to increase the dividend by improving management and operation. Consequently, the service level to customers would be upgraded. Such participation in management of the company is a key element for the success of the privatization.

4. Short-term Plan for the Greater Alexandria Port (Target Year: 2007)

(1) Handling of Local Containers

60. The Short-term Plan is prepared as a first-phase plan for the development, redevelopment or rehabilitation of the Greater Alexandria Port with a target year of 2007 in the framework of "the Master Plan" mentioned previously. In that year, the number of local containers that will need to be handled at the Greater Alexandria Port is estimated as 1.2 million TEUs per annum. To meet the demand in the stage of the Short-term Plan, it is proposed to invest in required super-structures and container-handling machines for the existing container terminals of Alexandria and El Dekheila.

(2) Handling of Conventional General Cargo

61. In the year 2007, the volume of conventional general cargoes that will need to be received at the Greater Alexandria Port is estimated as 11.1 million tons. Among those cargoes, the volume of long, bulky and/or heavy cargoes is forecast to be 6.9 million tons, 1.7 times as much as at present in Alexandria. To meet the demand for handling long, bulky and/or heavy cargoes in the stage of the Short-term Plan, it is proposed to implement a first-phase project for the construction of a new multipurpose terminal in Alexandria harbor.

62. To reduce the current congestion at the existing wharves, it is proposed to demolish some existing warehouses.

(3) Handling of Dry Bulk Cargo

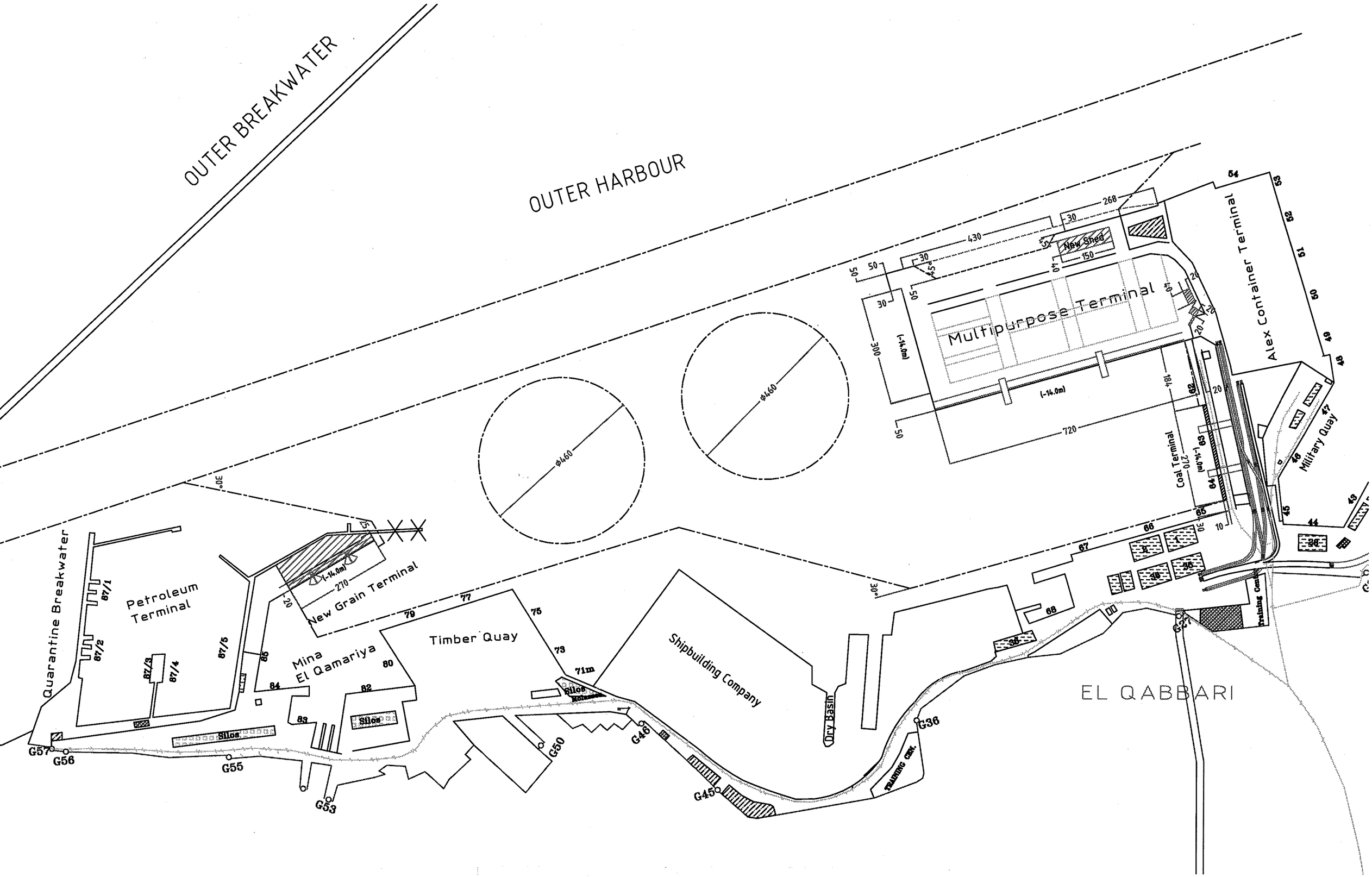


Figure 2 Layout Plan of Multi-purpose Terminal Short-term Plan

1) Grain

63. In the year 2007, the volume of grains that will need to be received at the Greater Alexandria Port is estimated as 5.4 million tons or 1.2 times as much as the volume in 1997. To meet the increasing demand and save grain-handling costs at the port, it is proposed to construct a new deep water berth equipped with rail-mounted unloaders connected with the existing silos at the grain terminal in Alexandria harbor.

2) Coal and Coke

64. In the year 2007, the volume of coal and coke to be handled at the Greater Alexandria Port is estimated as 1.7 million tons. To save ocean transport costs, it is proposed to construct a deep water berth in front of the existing coal/coke terminal in the Alexandria harbor.

(3) Handling of Liquid Bulk Cargo

65. In the year 2007, the volume of liquid bulk cargo containing petroleum and edible oil to be handled at the Great Alexandria Port is estimated as 4.8 million tons. To save costs for handling petroleum/edible oil, it is proposed to replace the existing obsolete loading/unloading arms and pipelines at the Petroleum Basin in the Alexandria harbor in addition to a new oil jetty to be constructed at El Dekheila Port by MEDOR.

(4) Common Port Facilities

66. It is proposed to prepare required common facilities including a new bridge connecting the east and central zones, a garbage collecting ship based on the International Convention for the Prevention of Marine Pollution from Ships and a waste oil receiving facility. It is also proposed to introduce the latest vessel traffic management system (VTMS).

(5) Project Cost

67. The total cost of the Short-term Plan is estimated as L.E. 598 million.

(6) Economic Analysis

68. A comparison between the "Without" case and the "With" case was carried out to evaluate the economic feasibility of the project for construction of 1) Multipurpose Terminal including common port facilities such as VTMS and waste oil receiving facilities, 2) Grain Terminal Modernization, 3) Deep Water Coal Berth, and 4) New Port Road Bridge proposed in the Short-term Plan from the view point of the national economy of Egypt.

69. The main economic benefits of Multipurpose Terminal project are saving in ship staying and off-shore waiting costs and construction costs of new berths for handling the excess cargoes in another port. The resulting economic rate of return (EIRR) of the projects is estimated as 23.0%, exceeding the general criterion to assess the economic justifiability.

70. The main economic benefits of Grain Terminal Modernization project are saving in ship staying and off-shore waiting costs. The resulting economic rate of return (EIRR) of the projects is estimated as 18.2%, exceeding the general criterion to assess the economic justifiability.

71. The main economic benefits of Deep Water Coal Berth project are saving in sea transportation costs. The resulting economic rate of return (EIRR) of the projects is estimated as 39.1%, exceeding the general criterion to assess the economic justifiability.

72. The main economic benefits of New Port Road Bridge project are saving in land transportation costs. The resulting economic rate of return (EIRR) of the projects is estimated as 19.8%, exceeding the general criterion to assess the economic justifiability.

73. The resulting economic rate of return (EIRR) of the overall projects proposed in the Short-term Plan is estimated as 22.7%.

(7) Financial Analysis

74. The financial revenues are generated from the port dues and charges based on the tariff proposed to cover capital investment and operational costs by referring to the current tariff level and those of the neighboring ports. The resulting financial rates of return (FIRR) for the projects of 1) the Multipurpose Terminal project including common port facilities such as VTMS, waste oil receiving facilities and New Port Road Bridge, 2) the Grain Terminal project, 3) Deep Water Coal Terminal project, and 4) the overall projects are 10.2%, 16.6%, 36.4% and 12.6% respectively, exceeding the weighted average interest rate (5.3%) of assumed fund raising plans and hence each project is considered to be financially feasible.

(8) Environmental Consideration

75. Implementation of the proposed short-term development plan is strongly recommended to enhance the port water quality improvement by diminishing barge operations and the air quality improvement by diminishing port-related detour traffic on Alexandria city area, and hence the long-term improvement of the environmental condition of the port. As a long-term environmental monitoring program of the Greater Alexandria Port, establishment of an ambient air quality monitoring station and a set of port water quality monitoring stations is recommended. In order to ensure not only the long-term sustainability of the offshore projects facilities of the short term development plan but also the improvement of port water environment, the elimination of untreated waste water from sewage out-falls into the port waters is strongly recommended.

(9) Management, Operations and Institutional Matters

1) Improvement of Conventional Cargo Handling

76. It is proposed that APA divide the new multi-purpose terminal, Timber Quay and Mamoudiya Quay into some portions and lease them or give concession to existing state-owned or private companies. As a terminal operator, each company will manage the allocated areas efficiently for comprehensive cargo handling from quayside operation, storage to trucking. To choose competent terminal operators, it is recommended to have a tender on concession or lease fee and to encourage private companies to join the tenders.

2) Measures to mitigate the Impact on Barge Operators

77. Prior to constructing a new multi-purpose terminal, sawn timber landing operations from barges at quays Nos. 57-61 need to be relocated elsewhere in the harbor.

78. For achieving gradual conversion of barge operation into quayside operation smoothly, it is proposed that the Government take the initiative in conducting measures to give barge operators licenses to perform quayside operation. In addition, it is recommended to provide retraining programs to obtain necessary knowledge, techniques or skills for quayside operation.

3) Improvement of Container Handling Operation

79. It is proposed to introduce the most advanced equipment or technologies and operational know-how of a private company with sufficient experience.

80. The following measures are proposed to enhance container handling productivity.

    1) To achieve the targeted container handling productivity (24 boxes/hour per crane) by improving crane operators' skill/technique.

    2) To introduce computer system such as container inventory system, delivering/receiving control system and loading/unloading control system.

    3) To exchange information and communicate effectively between crane operators and the supervisor at the control center in the container terminal by introducing advanced technology.

    4) To conduct regular maintenance of container handling equipment for minimizing the breakdown time to avoid lowering service level at sudden breakdowns.

4) Others

81. It is proposed to introduce a computer system concerning documentation inside the port authority at first. As a next step, it is necessary to upgrade functions and expand the area covered by the computer system.

RECOMMENDATIONS

In accordance with the results of the study, it is recommended that the Government of Egypt implement the development project of the Greater Alexandria Port to contribute to the Egyptian economy. The project is divided into two phases: the first phase project is that proposed in the Short-term Plan with the target year 2007 and the second phase project is that to be completed by the target year 2017 of the Master Plan.

1. The First Phase Project

The main components of the first phase project are summarized as follows:

1.1 Establishment of a new Multi-purpose Terminal (740 m x 400 m) at the Central Zone of Alexandria Port

(1) Construction of infra-structures
   1) Berths with a total length of 960 m and water depth of 14m below C.D.
   2) Open storage yard with area of 13 ha
   3) Dedicated access road with a fly-over bridge connected to the existing fly-over bridge: length of 700 m

(2) Construction of supper-structures
   1) One (1) warehouse with a total floor space of 6,000 sq. m
   2) Gate house
   3) Truck scale

(3) Procurement of two (2) units of multi-purpose quay-side gantry cranes

1.2 Redevelopment of the existing Grain Terminal at the West Zone of Alexandria Port

(1) Construction of a new berth with length of 270 m and water depth of 14m below C.D.
(2) Procurement of Grain-handling equipment
   1) Two (2) units of rail-mounted ship unloaders
   2) Belt conveyors connecting ship unloaders and the existing silos

1.3 Construction of a New Coal Berth with length of 270 m and water depth of 14m below C.D. at the existing Coal/Coke Terminal in Alexandria Port

1.4 Redevelopment of El Mahmudiya Quay of Alexandria Port

(1) Demolishing warehouses no.44 and no.45
(2) Preparation of open yards behind berths no.39 and no.40

1.5 Deepening of the Inner Harbor Basins by water depth of 14 m below C.D. at the West and Central Zones of Alexandria Port

1.6 Preparation of common facilities

(1) Construction of a new bridge connecting the East and Central Zones of Alexandria Port
(2) Introduction of the latest vessel traffic management system (VTMS)
(3) Installation of a waste oil receiving facility at El Dekheila Port

1.7 Management, operations and institutional matters

(1) Setting the target productivity/throughput and monitoring the performance of terminal operators
(2) Dividing the new multi-purpose terminal into some portions and allocating them to terminal operators performing conventional cargo handling comprehensively on an auction basis
(3) Implementing the measures to mitigate the impact on barge operators
    1) Preparing substitutive quays for barge operations prior to constructing a multi-purpose terminal
    2) Giving barge operators licenses to perform quayside operation and providing retraining program to obtain necessary knowledge
(4) Encouraging private investors to obtain enough stakes to exert their influence on the management of the privatized state-owned companies
(5) Introducing computer system concerning documentation inside APA

2. The Second Phase Project

The main components of the second phase project are summarized as follows:

2.1 Construction of a new Multi-purpose Terminal at the Central Zone of Alexandria Port

(1) Construction of infra-structures
    1) Berths with a total length of 480 m and water depth of 14m below C.D.
    2) Open storage yard with area of four (4) ha

(2) Construction of supper-structures
    1) One (1) warehouse with a total floor space of 6,000 sq. m