2.3 Oceanographic Conditions

2.3.1 Waves

The wave heights and frequencies can be calculated from wind velocity, wind duration and fetch.
SMB method is generally applied for predicting the wave height simply from available wind data.

(1) Latakia Port

The existing breakwater was designed on the assumption that the height of the waves from south-west and west are 7.0 m and 3.5 m respectively.
The predominant wave direction is south-west.
In 1968, 9.5 m height's wave attacked the port and destructed the breakwater.
The report "Expected Wave Attack" has been made by Waterloopkundig Laboratorium Delft in 1953. According to the report, the followings are described.

- The wave attack from west is not serious as Latakia is protected from the wave action by Cyprus Island.

- For the wave attack from the NW, the fetch of 175 km, maximum wave height is calculated 4.5 m provided that maximum wind velocity is 17.5 m/s and attain the velocity at least 12 hours continuously.

(2) Tartous Port

The existing breakwater was designed on the assumption that the height of the wave from south-southwest is 7.0 m.
Tartous Port is less protected against winds from north-west than it is the case of Latakia. The maximum wave height from north-west is 4.0 m.
Arward island located about 3 km offshore from Tartous port protects slightly from south-west wave.

(3) New Port

Wave height measurement was conducted at New Port in November and December 1995.
According to the results, the following can be said.

- Since the predominant wind direction is easterly, offshore wind, in winter season, the wave height near the shore is no so high.

2.3.2 Tide

The tidal level variations are characterized by seasonal, tidal and onset-offset fluctuations.
Seasonal fluctuations depend on the change of the volume of water in the sea and do not exceed 20-30 cm. The annual sea level variations are characterized by a low level of the monthly mean from December to May and by a high level from June to September.
Tidal fluctuation value is about 0.3 m and the onset-offset fluctuation is 0.5 m.
The onset level rising occurs at south-west wind. The offset is observed at strong wind coming from north-east.

2.3.3 Current

(1) Latakia Port

The current speed at moderate sea does not exceed 0.2 m/s and reaches 0.4-0.5 m/s in rough sea condition.
If the wave height exceeds 4.0 m, the current speed may reach 0.8-1.0 m/s.
The current directions are unsteady though they are directed mainly to the south and north.

(2) Tartous Port

The current characteristics at Tartous port are similar to Latakia port.
The direction is generally from south to north.

(3) New Port

Current measurement was conducted at the future channel area of New Port in November and December 1995.
The current speed is normally 0.1-0.2 m/s and reaches 0.5 m/s in rough sea condition.
South-east and south-west direction are predominant during winter season.

2.3.4 Water Depths

(1) Latakia Port

Concerning the maintenance dredging, it has been done at the area just in front of the quay at the frequency once per 5 years. The thickness of the sedimented material was 20-50 cm.
In front of the silo quay, sedimentation of 120 cm thickness has been found.
At the existing military zone, sedimentation of 150 cm thickness has been revealed.
This phenomena occurred mainly due to the sewage discharged into port from town.

No dredging has been conducted at the basin for old port area and approximately 300,000 cu.m. sedimentation has been found at this basin.
Sedimentation at the basin for old port is caused by sewage from the town and siltation influenced by north-west wave.
Sounding map of Latakia Port is shown in Fig. 2.3.4-1.

(2) Tartous Port

A small river named Hassen Al Baher situated approximately 2 km north of Tartous Port discharges into Mediterranean Sea. However, this river causes no sedimentations to Tartous Port.
Suppose a big wave from northwest attacks, occasionally siltation seems to occur but not so considerable degree.
As for maintenance dredging, in 1994, it was carried out at ambient phosphate pier. Maximum thickness of sedimented materials was 2.0 m.
Sounding map of Tartous Port is shown in Fig. 2.3.4-2.

(3) New Port

Sounding was carried out in order to grasp the present seabed undulation at New Port by using echo sounder in May 1995.
Fig. 2.3.4-3 shows the contour of water depth.

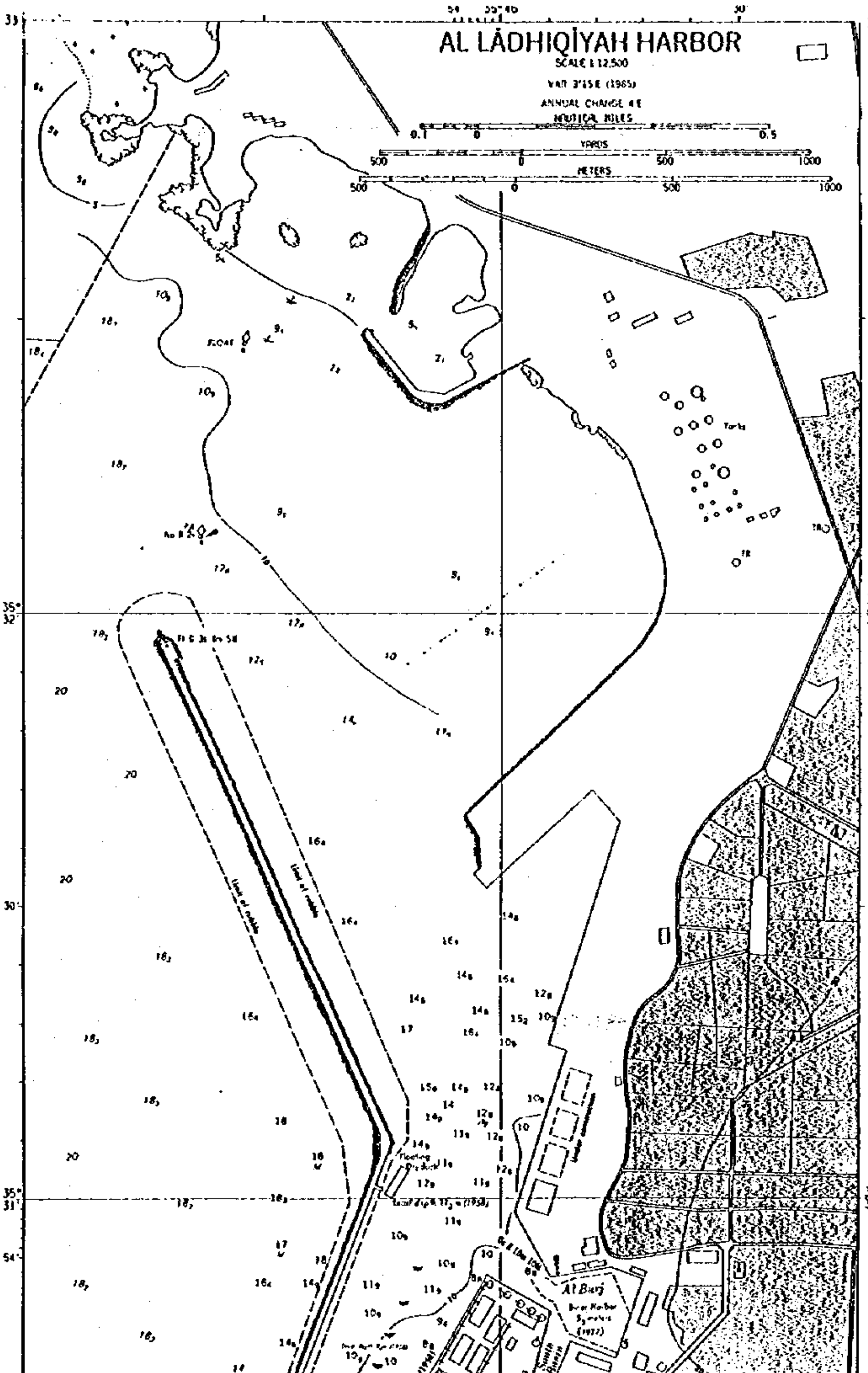


Figure 2.3.4-1 Sounding Map of Latakia Port

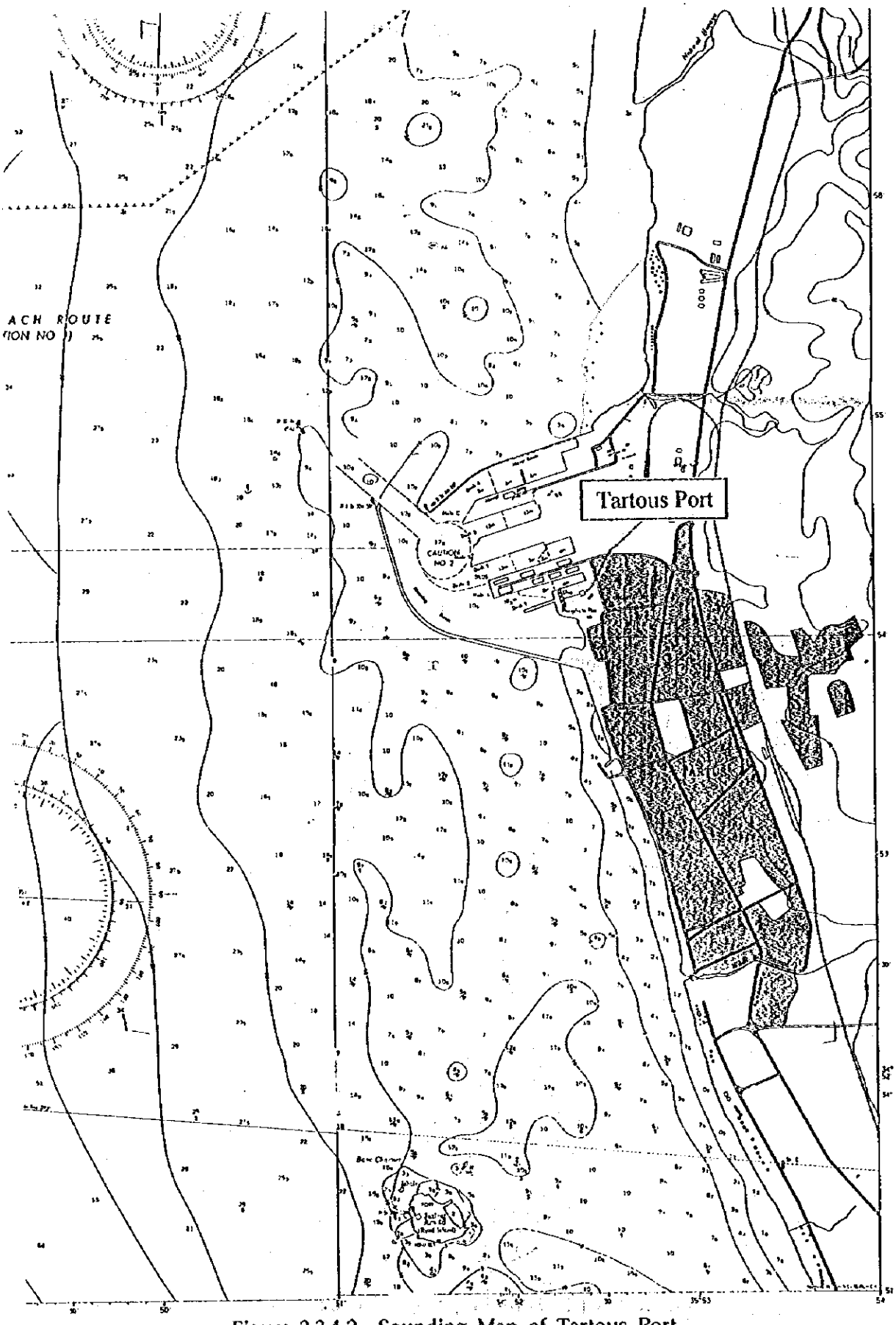


Figure 2.3.4-2 Sounding Map of Tartous Port

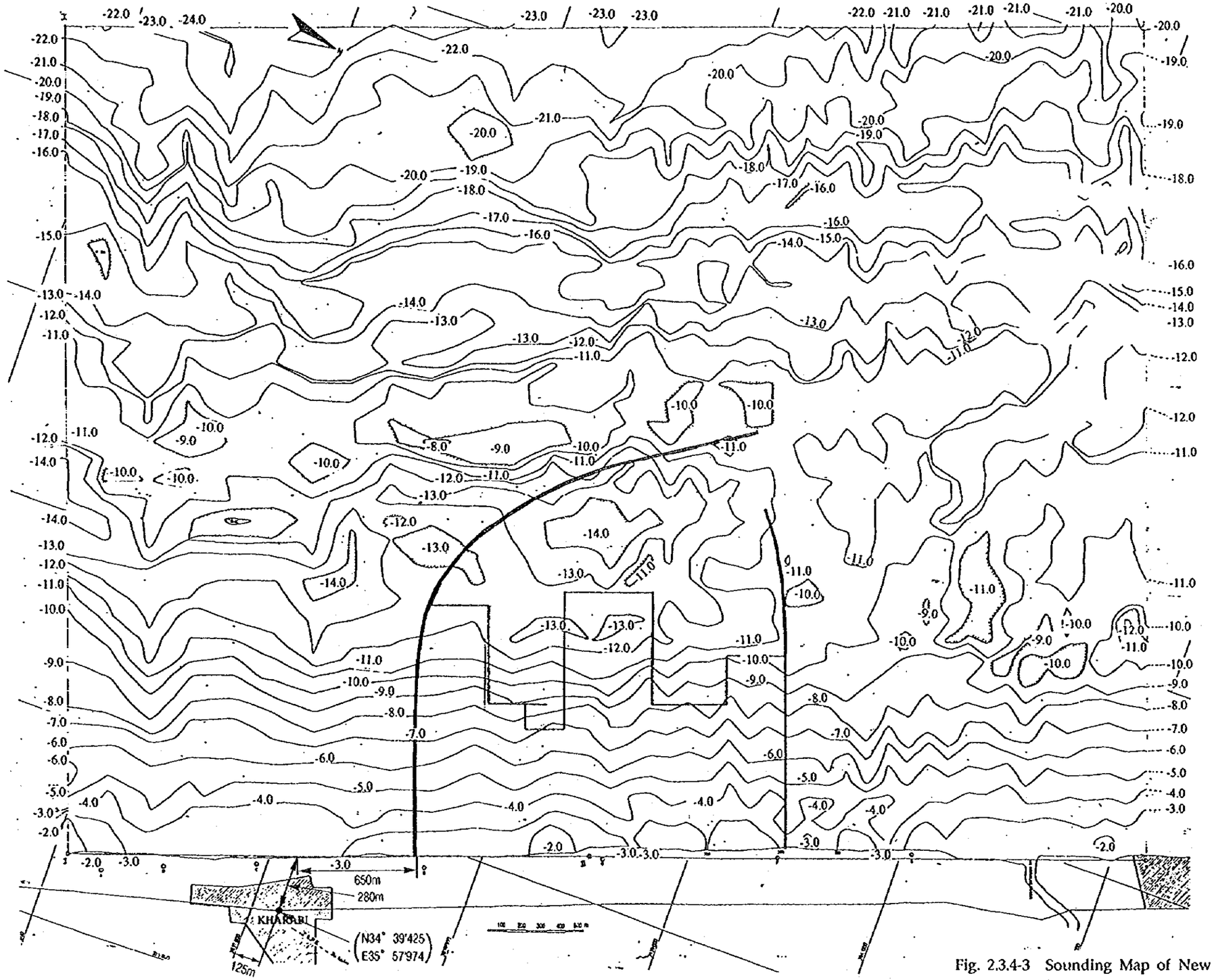


Fig. 2.3.4-3 Sounding Map of New Port Area

2.4 Geological Conditions

2.4.1 Geological Conditions of the Syrian Coast

Syrian coastline, approximately 183 km, is tightly squeezed by a mountain range. Syria is situated geologically at the west edge of Arabian plate. The Syrian mountain consists of limestone of Mesozoic Jurassic and Cretaceous era and basalt of Cenozoic era.

As for the coastal plain, limestone, basalt, sandstone and conglomerate are distributed.

In the coastal area, alluvial deposit mainly consisted of sand and conglomerate are thinly sedimented.

Fig. 2.4.1-1 shows the geological conditions and mineral resources of Syrian coast

2.4.2 Subsoil Conditions in and around the Existing Study Port

(1) Latakia Port

169 numbers of borings have been conducted at Latakia Port in 1979 and their locations are shown in Fig. 2.4.2-1. Boring logs of cross section 37 is given in Fig. 2.4.2-2.

The geological structure of expansion area is characterized by middle upper quaternary marine deposits represented by limestone.

The limestone comprised separate rock weathering and not widely distributed across the area. The limestone is characterized by a diversified composition from detrital sludgy to algal and clayey.

The bed rock have been exposed for a long time to weathering and their physical condition is accordingly dissimilar.

The bed rocks have been inundated and buried under the recent marine deposits series. This series thickness varies from 10-20 cm (near the coast) to 20-25 cm (in deep water area). The deposits are mainly composed of sandy and coarse clastic products, the grain of the clastic products decreasing seaward.

With the low sections of the top of bed rock a substantial important acquires the strata presenting close interstratification of dust-like and fine sands with loamy silts.

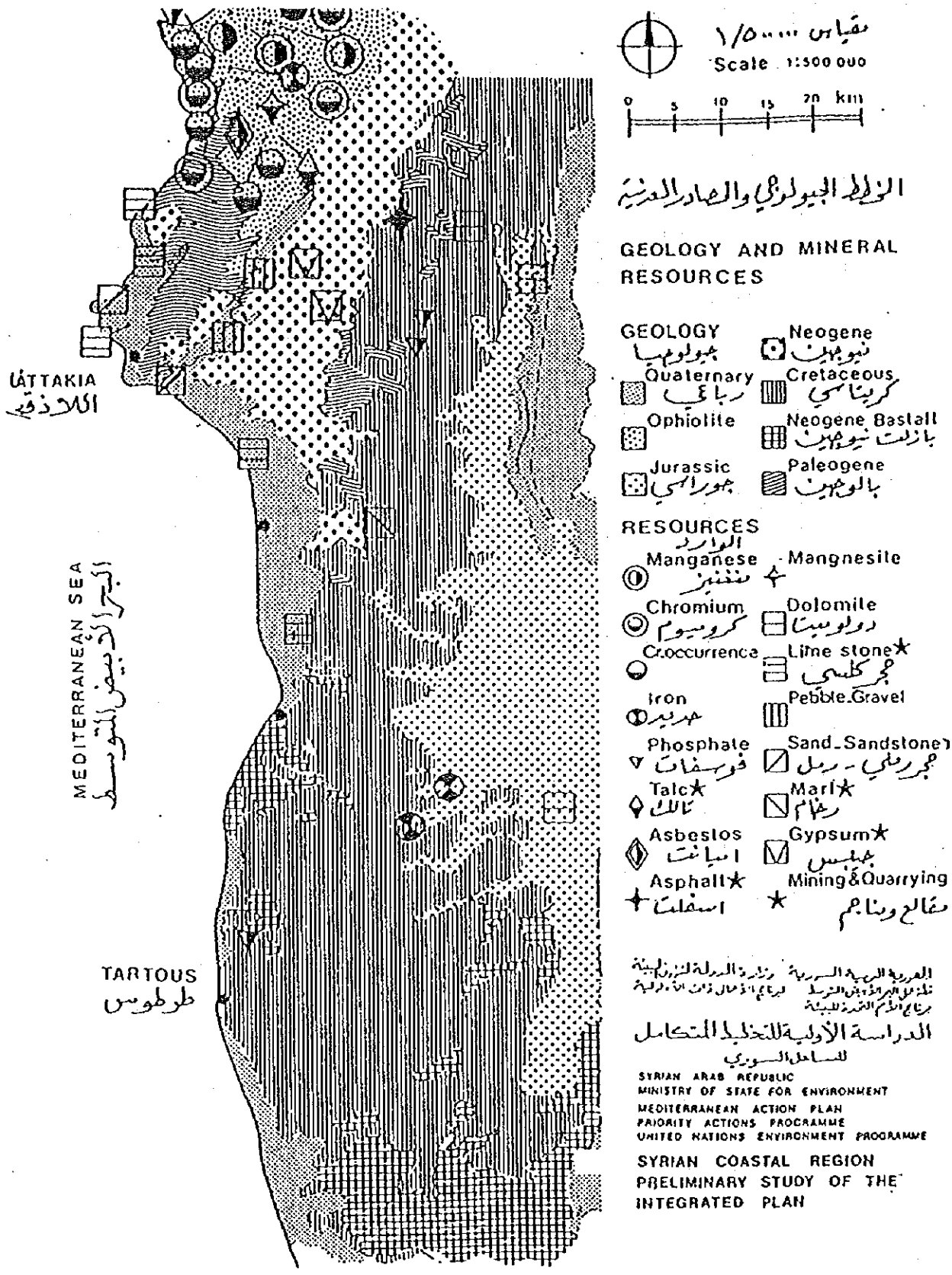


Figure 2.4.1-1 Geology and Mineral Resources along Syria Coast

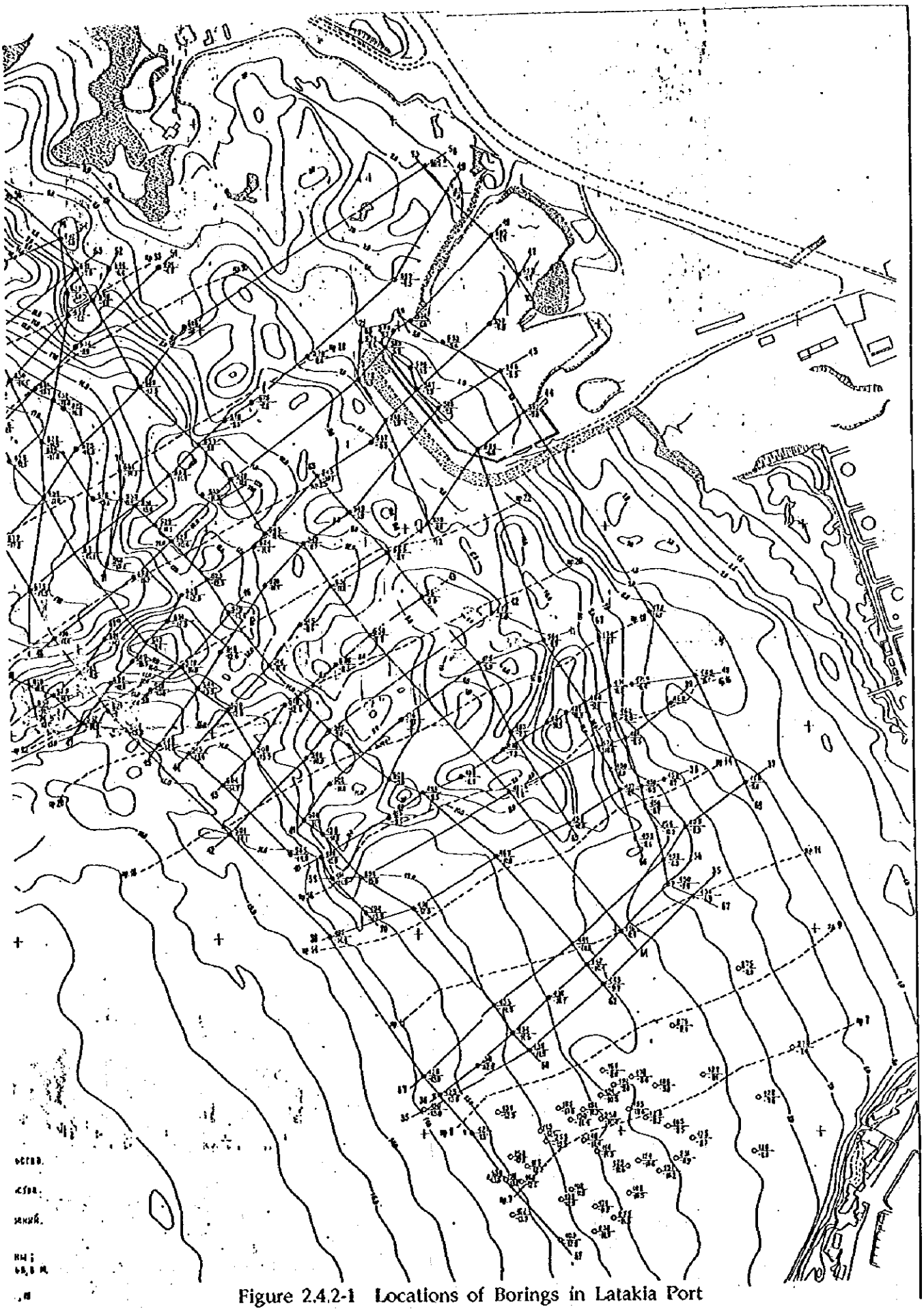
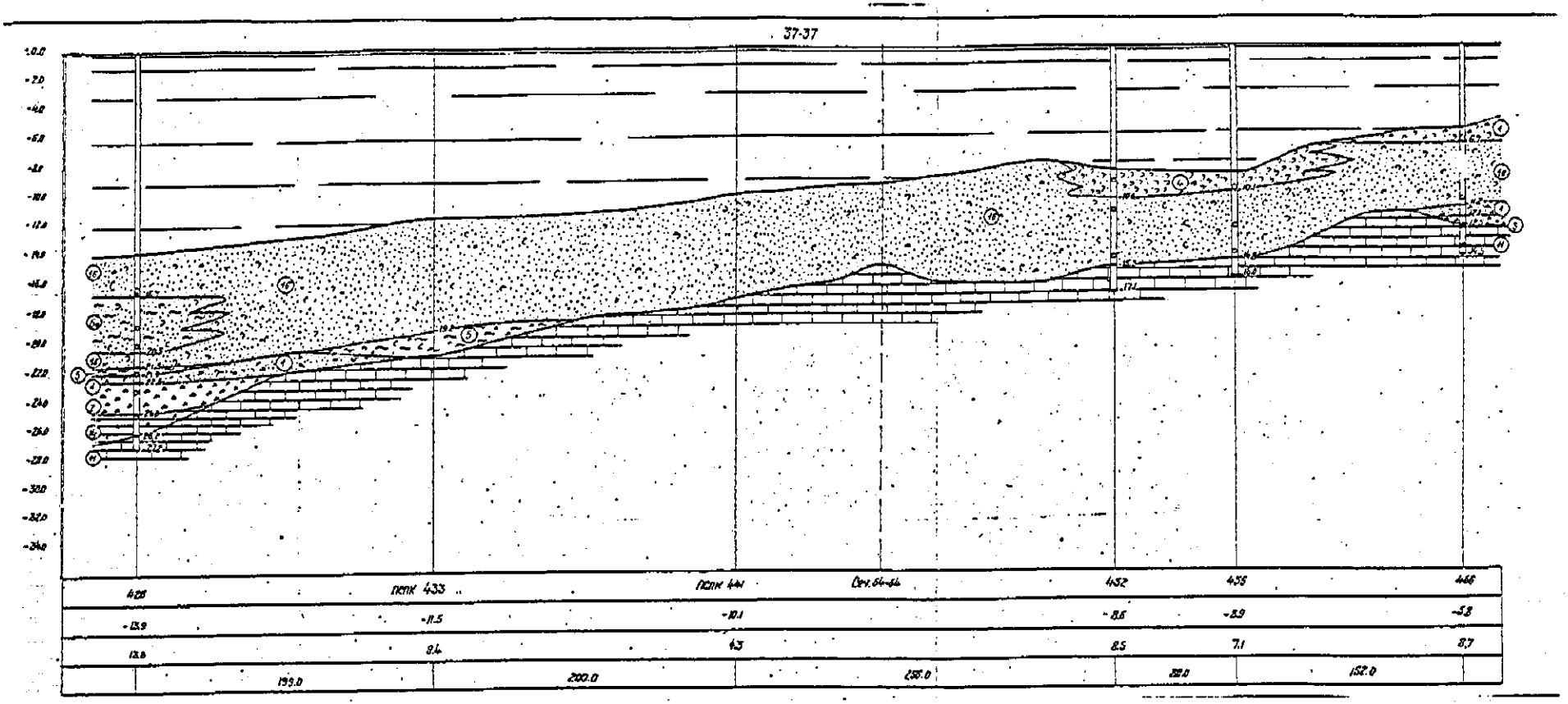


Figure 2.4.2-1 Locations of Borings in Latakia Port



Coarse sand gravely light gray and limestone grass, with well rounded pebble

Debris-ground with gravel, pebble and grass with sandy

Grass ground with gravel, pebble and rock debris

Fine shell rock with grass, pebble, rock debris and gravel

Dark gray loamy silt with small size broken shell

Dust like sand, fine, and dark gray broken shell with loam and mud

Yellowish gray and dark gray limestone

Dark broken clay with grass and rock debris

Figure 2.4.2-2 Cross Section 37

(2) Tartous Port

41 numbers of boring have been carried out in and around Tartous port in 1959. Fig. 2.4.2-3 and Fig. 2.4.2-4 show the location of the borings and boring logs respectively.
According to the boring No. 16, rock level seems to be below -9.3 m
Also, Fig. 2.4.2-3 represents the contour showing the weathered rock depth presumed from the boring results.
It appears that rock surface is sloping toward the sea. Layers of sand and clay are at many places of sufficient thickness to afford good anchor ground for ships.

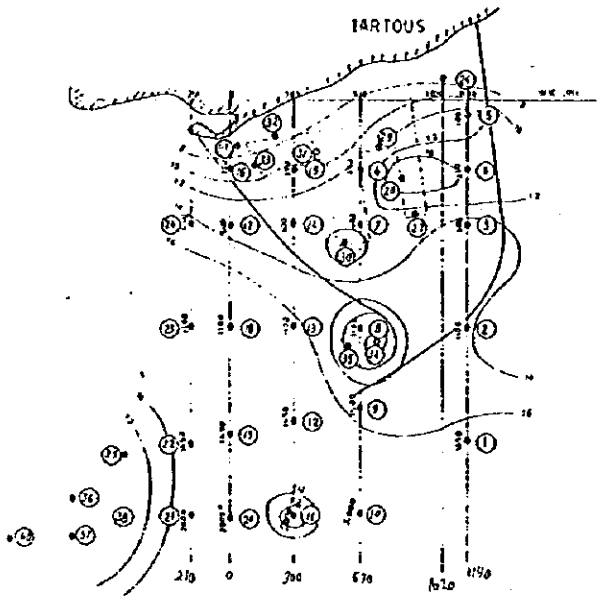


Fig. 2.4.2-3 Location of Borings and Presumed Depth of Rock

(3) New Port

3 offshore borings were carried out to grasp the subsoil condition at New Port in 1995. The location of the borings and their boring logs are shown in Fig. 2.4.2-4 and Fig. 2.4.2-5 respectively.
In addition to the borings, sonic prospecting survey was done in order to grasp the 2 dimensional rock depth. Fig. 2.4.2-6 shows the contour of the rock depth. According to the results of the survey, it is revealed that the rock is found bellow the sand whose thickness is around 1.0m.
The characteristics of the obtained materials are described in the Table 2.3.4-1.
At the coast in front of Hamidieh village, conglomerate and sandstone strata in Cenozoic Tertiary era are distributed. Limestone in Mesozoic era also can be found at the beach.

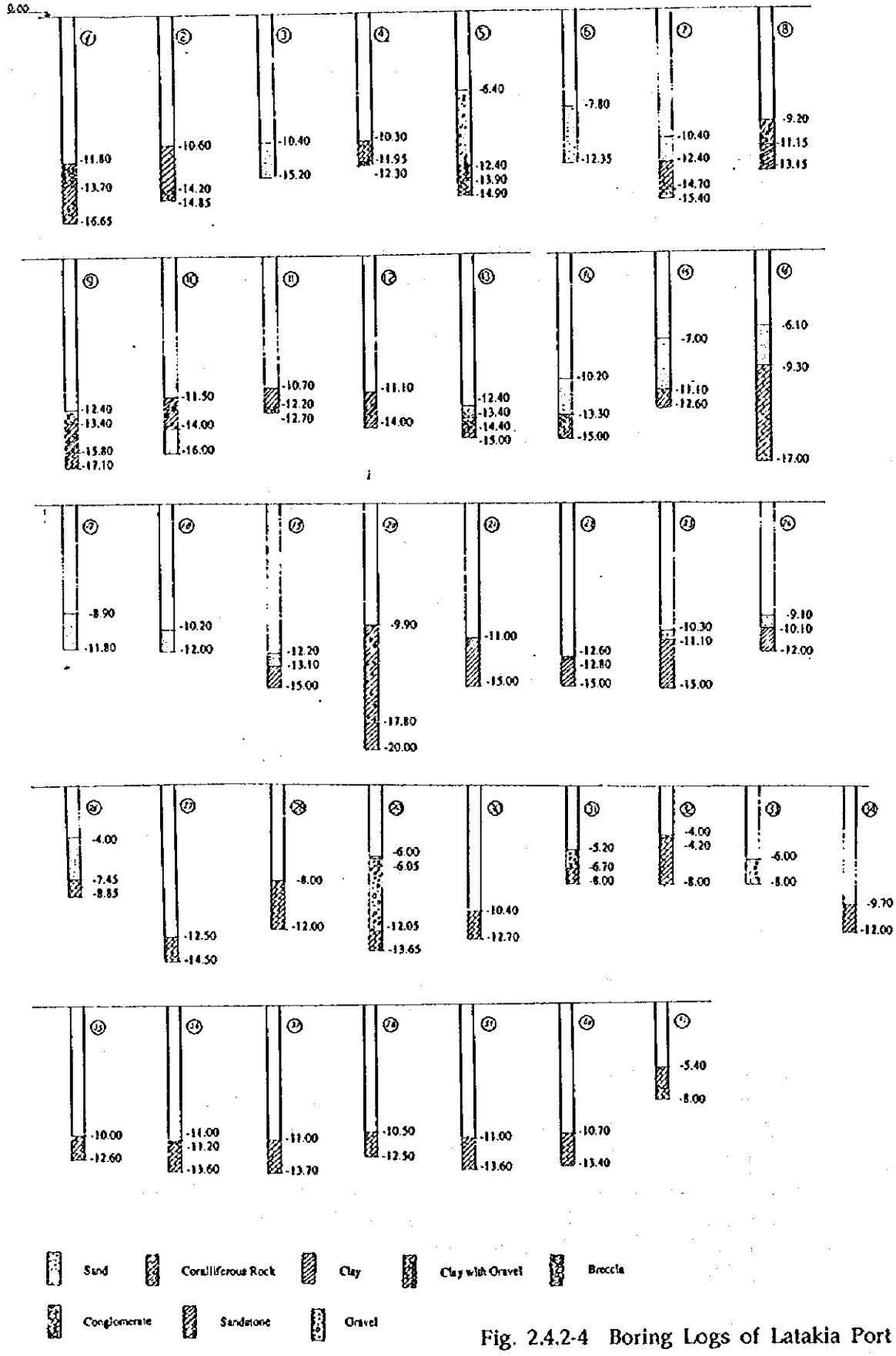


Fig. 2.4.2-4 Boring Logs of Latakia Port

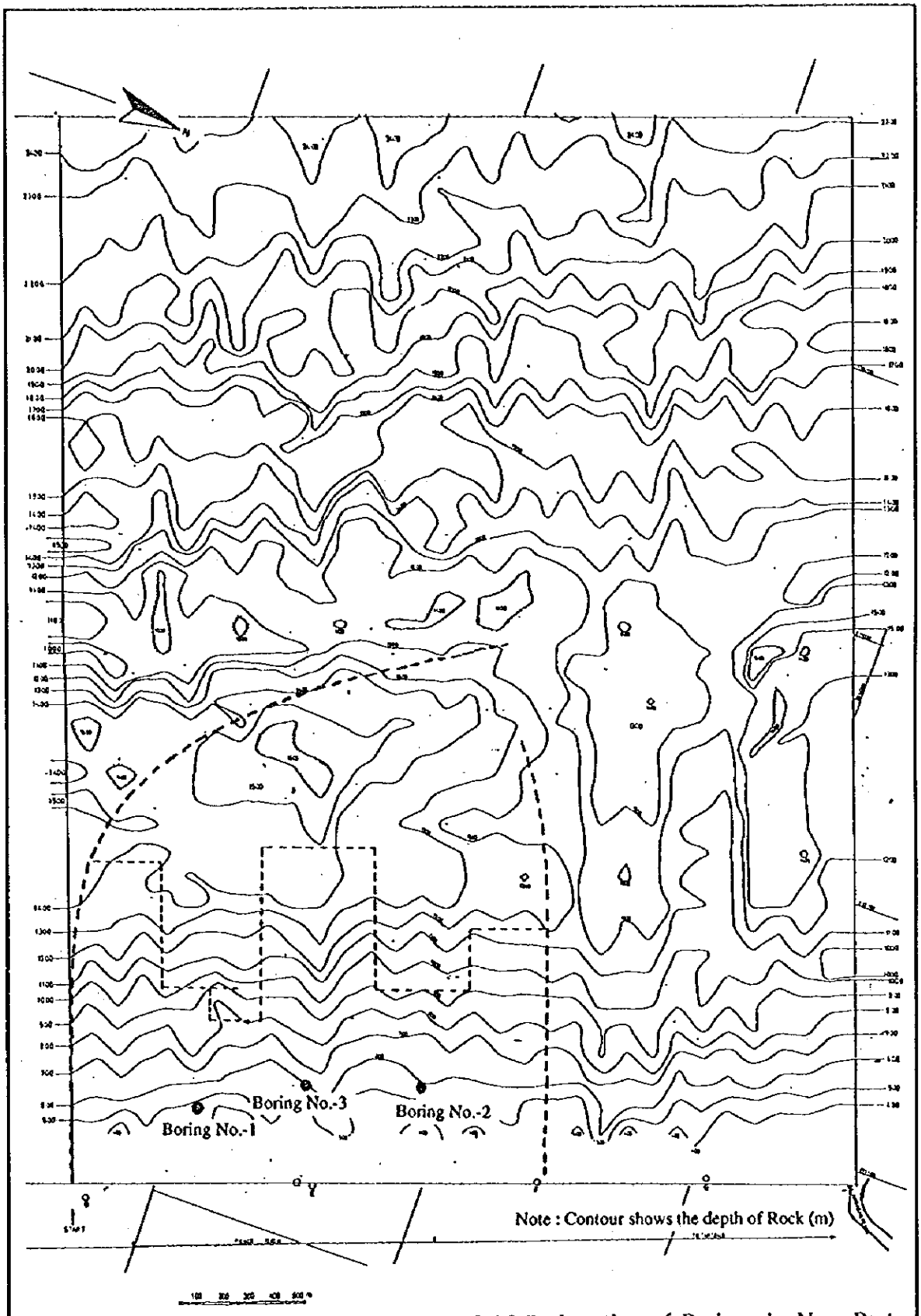
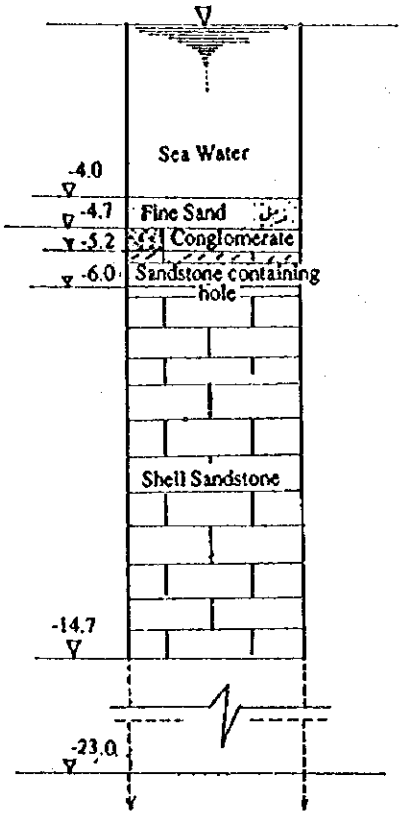
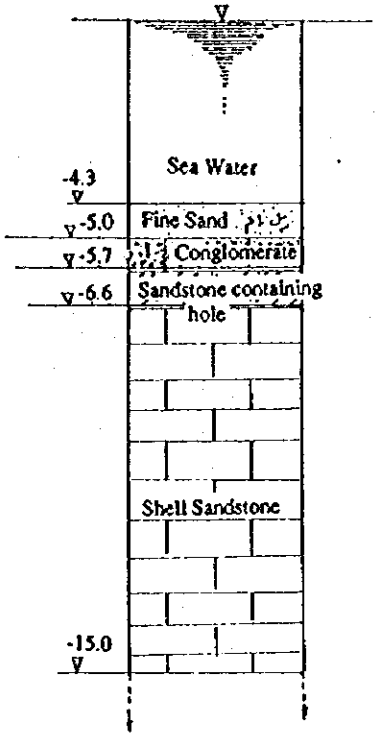


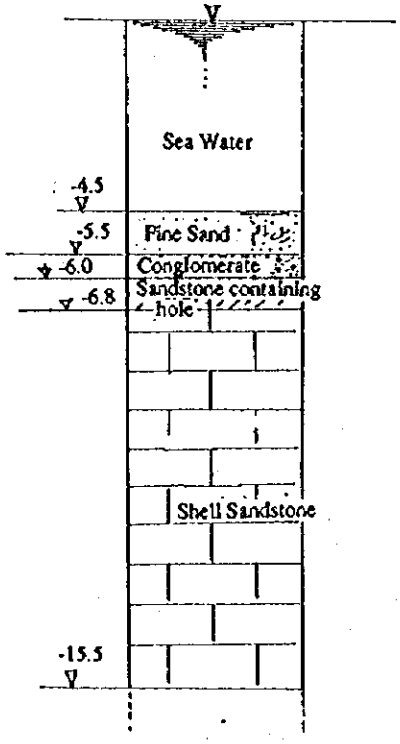
Fig. 2.4.2-5 Location of Borings in New Port



Boring No.-1



Boring No.-2



Boring No.-3

Fig. 2.4.2-6 Boring Logs of New Port

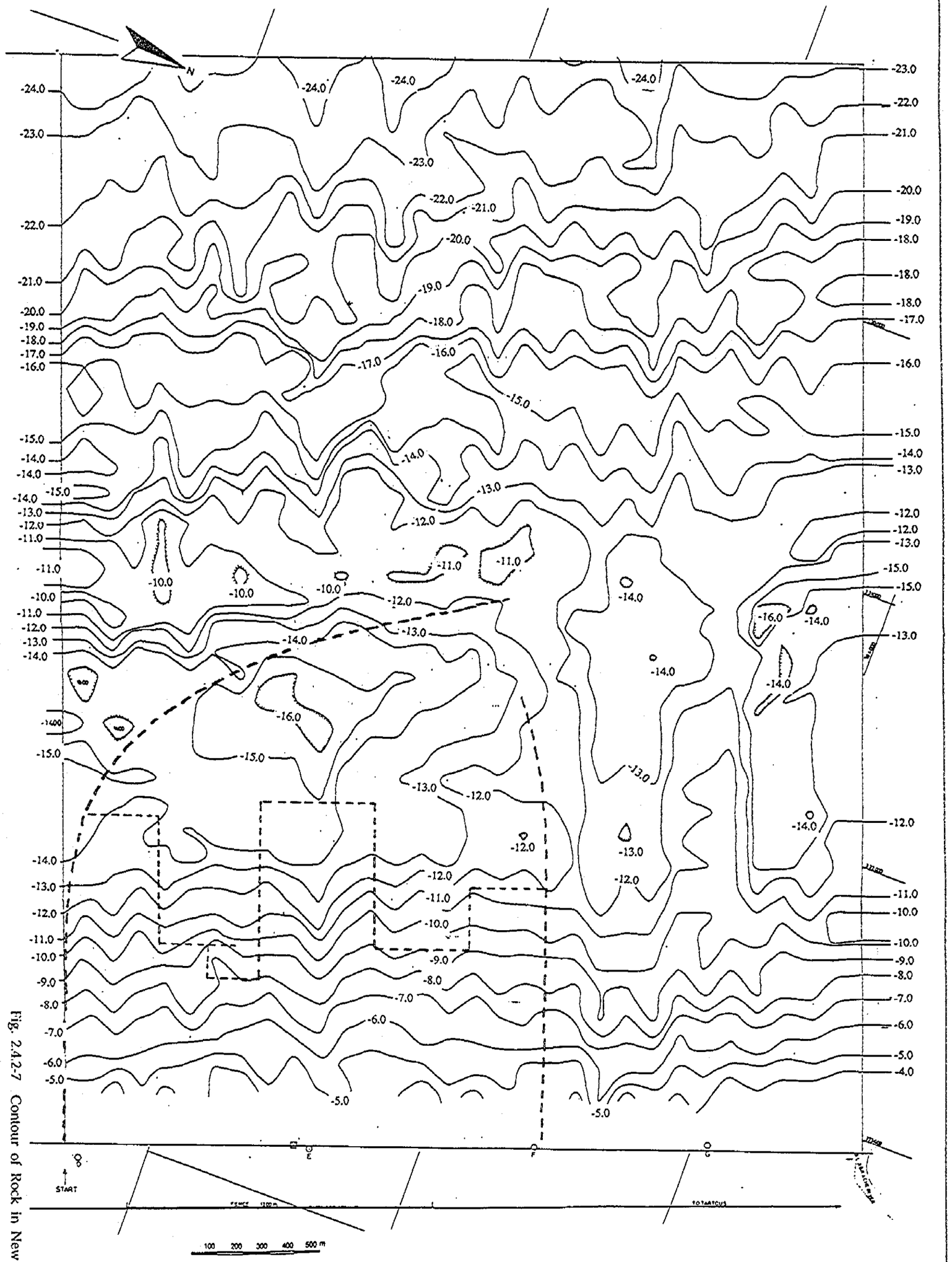


Fig. 2.4.2-7 Contour of Rock in New Port

Table 2.4.2-1 Characteristics of Samples

	Unconfined Compression Test	Tensile Resistance Test
Conglomerate	403.2 kg/cm2	47.9 kg/cm2
Sandstone containing hole	352.7 kg/cm2	38.2 kg/cm2
Shell Sandstone	549.1 kg/cm2	59.2 kg/cm2

Chapter 3 Transport Systems

3.1 Ports in Syria

3.1.1 Outline of the Ports in Syria

In Syria, the two principal ports, Latakia and Tartous are situated on the coast facing the Mediterranean Sea. They are commercial ports on for public use serving for ocean-going vessels from/onto which various kinds of foreign trade cargoes such as container cargo, break-bulk cargo and dry bulk cargo are discharged/loaded. The two ports are administrated and operated by the state-owned port companies, Latakia Port General Company and Tartous Port General Company, respectively, under the jurisdiction of the Ministry of Transport.

Additionally, the three petroleum marine terminals are situated in Banias, Tartous and Latakia, respectively, which are administrated and operated by Syrian Arab Distribution Company of Petroleum under the Ministry of Petroleum and Mineral Resources (SADCOP). Through the Banias terminal, crude petroleum is exported, and refined petroleum is exported/imported. The Tartous terminal placed approximately 5km north of Tartous Port is used for exporting crude petroleum. The Latakia terminal placed within the limits of Latakia Port is used for importing refined petroleum. Each terminal has buoys through which petroleum is discharged/loaded from/onto petroleum tankers.

Furthermore, there are two local ports mainly used for fishing boats or ferry boats: the ports of Jableh and Arwad which are administrated by the General Directorate of Ports under the Ministry of Transport. The directorate also directly administrates fishing port zone which lies within the limits of Latakia Port (see Fig 3.1.1-1).

3.1.2 Port Policy in Syria

As mentioned previously, the two principal commercial ports in Syria, namely Latakia and Tartous are administrated and operated by the respective port general companies as state-owned ports. In the management of the ports of Latakia and Tartous, the following policy common to the two ports is adopted:

a. To increase revenues of the port general companies obtained from port dues and charges,
b. To provide employment for citizens,
c. To obtain foreign currency through the promotion of transit cargo-handling at the ports,
d. To assist the promotion of the export of government cargo through the reduction of cargo-handling costs at the ports.

The two ports are managed in line with the respective port five-year plans and the annual plans which are made by the respective port general companies. In

addition to their own plans mentioned above, the national port five-plan and annual plan are worked out by the port general companies and are submitted to the State Planning Commission (SPC) through the Ministry of Transport. Then the draft plans are assessed by the SPC and finally are approved by the Prime Minister's Office. The national port five-plan and annual plan cover the following matters:

a. Construction of port infrastructures,
b. Procurement of port equipment,
c. Reclamation and land acquisition,
d. Personnel of the port general companies.

With respect to the strategy to realize the above-mentioned port policy, it is necessary to strengthen competitiveness of the two Syrian ports, Latakia and Tartous, with the ports in neighboring countries situated on the coast of the East Mediterranean Sea including Turkey, Lebanon, Israel and Egypt by close cooperation between Latakia and Tartous.

As to the promotion of transit cargo-handling at the Syrian ports, the neighboring arabic countries which once utilized the Syrian ports as the gateways to the west-bound shipping routes mainly towards the European continent, North Africa and the east coast of the American continent are expected to again use the Syrian ports in the future.

Along with the promotion of the existing ports of Latakia and Tartous, the Government of Syria intends to create a new port for handling dry bulk cargo including phosphate rock, cement clinker/cement, scrap iron, pellet of iron ore, sulfur fertilizer and petroleum coke. The prime purpose of the creation of the new port is to shift dusty bulk cargo such as phosphate rock which is currently handled at Tartous Port and is suspected to be generating air pollution against residents and farming lands around the port to the new port from Tartous Port. The new port is also aimed to back up the promotion of manufacturing or mining industries in its possible hinterland by receiving raw or intermediate materials to be imported or shipping their final products to be exported. As to phosphate export, the new port will not only resolve the present dust problem at Tartous Port, but increase the capacity to handle phosphate (capacity at Tartous Port is insufficient even for the current demand), resulting in the promotion of the phosphate mining industry. Additionally, a new steel-making factory at Al-Zara and cement-making factories inland are expected to coincide with the opening of the new port. The new port is also expected to receive transit bulk cargo from/to the Arabic countries neighboring Syria.

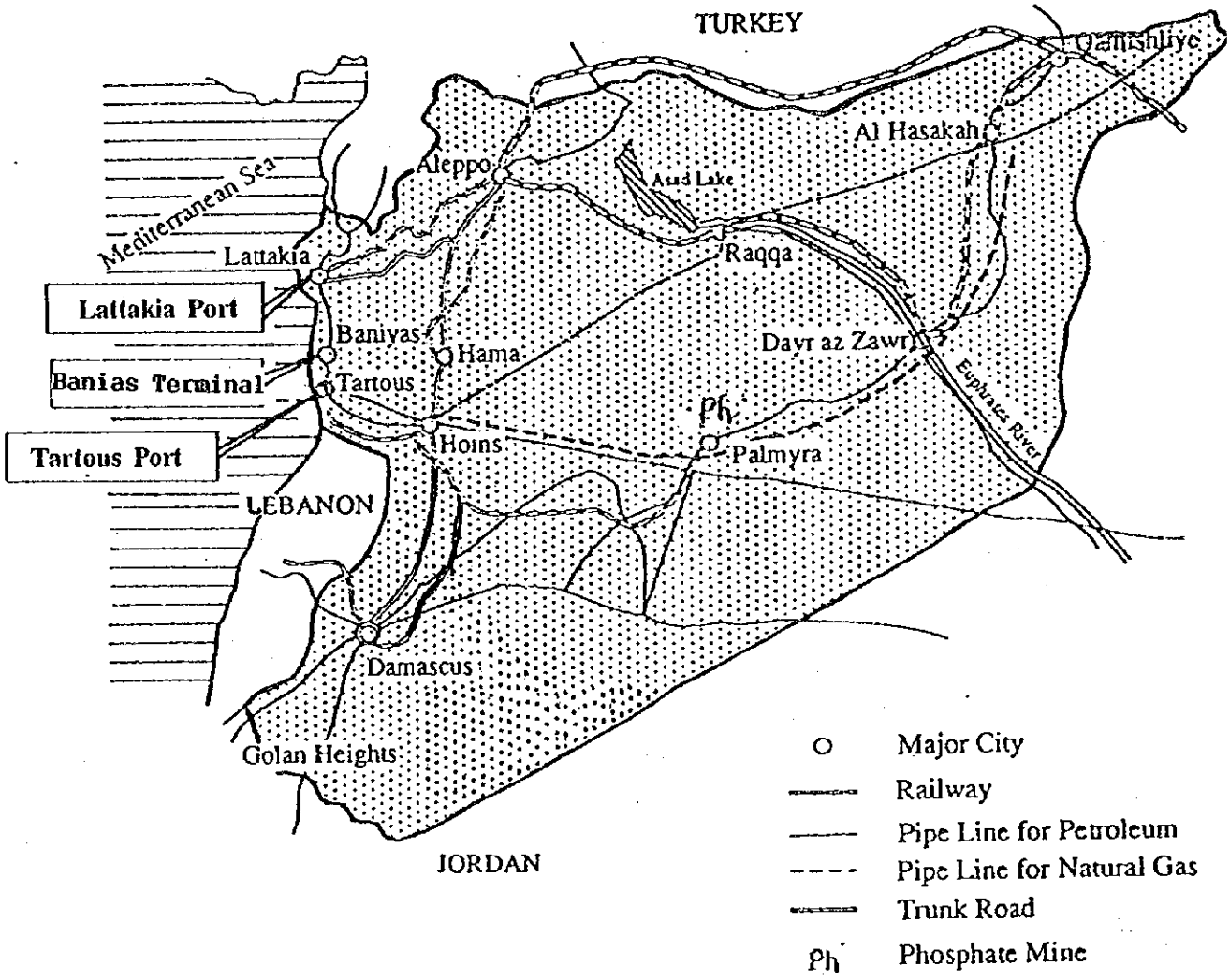


Figure 3.1.1-1 Location of the Syrian Ports

3.2 Roads

3.2.1 Existing Road Network

Table 3.2.1-1 shows the length of roads by type in Syria.
Total length of roads has been remarkably increasing, especially paved roads. Even since 1985, length of asphalted roads has been increased 600-800 km annually. As a result, paved roads account for 94% of the total in 1993.

Present main road network in Syria is shown in Figure 3.2.1-1.
In the western area where population and main industries are concentrated, the highway network connected between main cities is almost completed excluding the route between Latakia and Aleppo.
Most main roads except for highway are two-lane paved roads.

Table 3.2.1-1 Length of Roads in Syria

(Unit: km)

Year	1980	1985	1990	1993
Asphalted Roads	12,969	20,732	23,779	26,299
Paved, non-asphalted	4,172	5,467	7,305	7,910
non-paved	2,678	2,197	2,129	2,168
Total	19,819	28,396	33,213	36,377

Data: STATISTICAL ABSTRACT

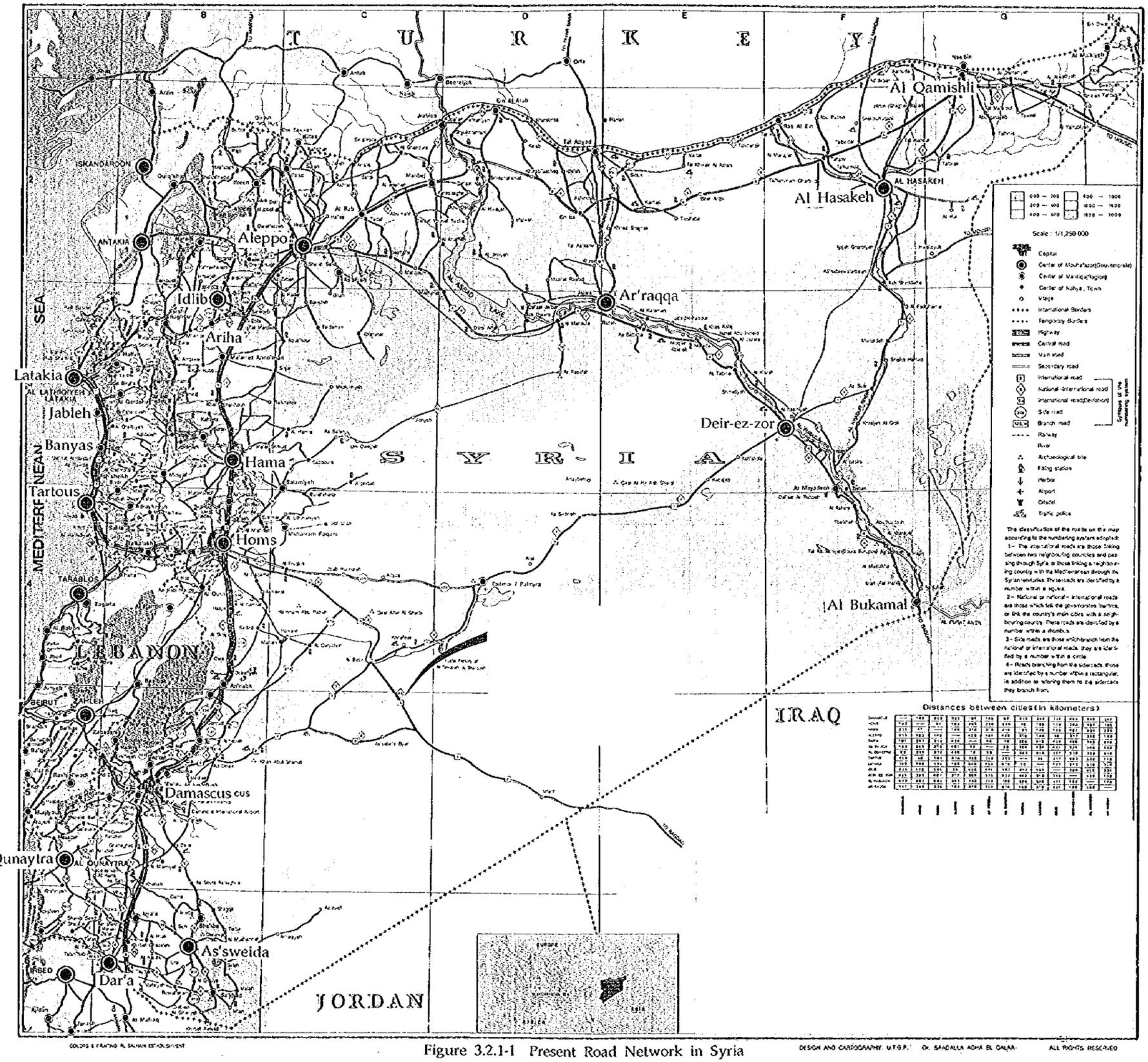


Figure 3.2.1-1 Present Road Network in Syria

3.2.2 Road Construction Projects

Four road construction projects, that is, two highway projects and two main road projects are proceeding.

Two high way projects are as follows :

1) Latakia - Artha Route through Shughour
   The study is already completed but the financing has not been settled.
2) Damascus Loop Route (total length is 102 km) and Others
   (Please refer to Figure 3.2.1-2)
   i) Sunubar - Adra
      The construction will be completed before 1996.
   ii) Sunubar - deria
      The construction is scheduled from 1996 to 1998.
   iii) Deria - Adra
      The study will be completed by June of 1995.
      The construction schedule is from 1998 to 2001.
   iv) Kiswa - Damascus(3 km) in the route of Damascus - Jordan border
      Construction to increase the number of lanes from four to six will be completed by the beginning of 1996.
   v) 20 km between Damascus and Adra in the route of Damascus - Homs
      Construction to increase the number of lanes from four to six will be completed by June of 1995.

Two projects involving main roads are as follows :

1) Aleppo - I'zaz - Salmiya(Turkey) Route (Secondary Road)
   Construction to widen the road will be completed by the end of 1996. The number of lanes is two at present and after that.
2) Latakia - Kasab Route (Main Road)
   Construction to widen the road will be completed by the end of 1998. The number of lanes is two at present and after that.

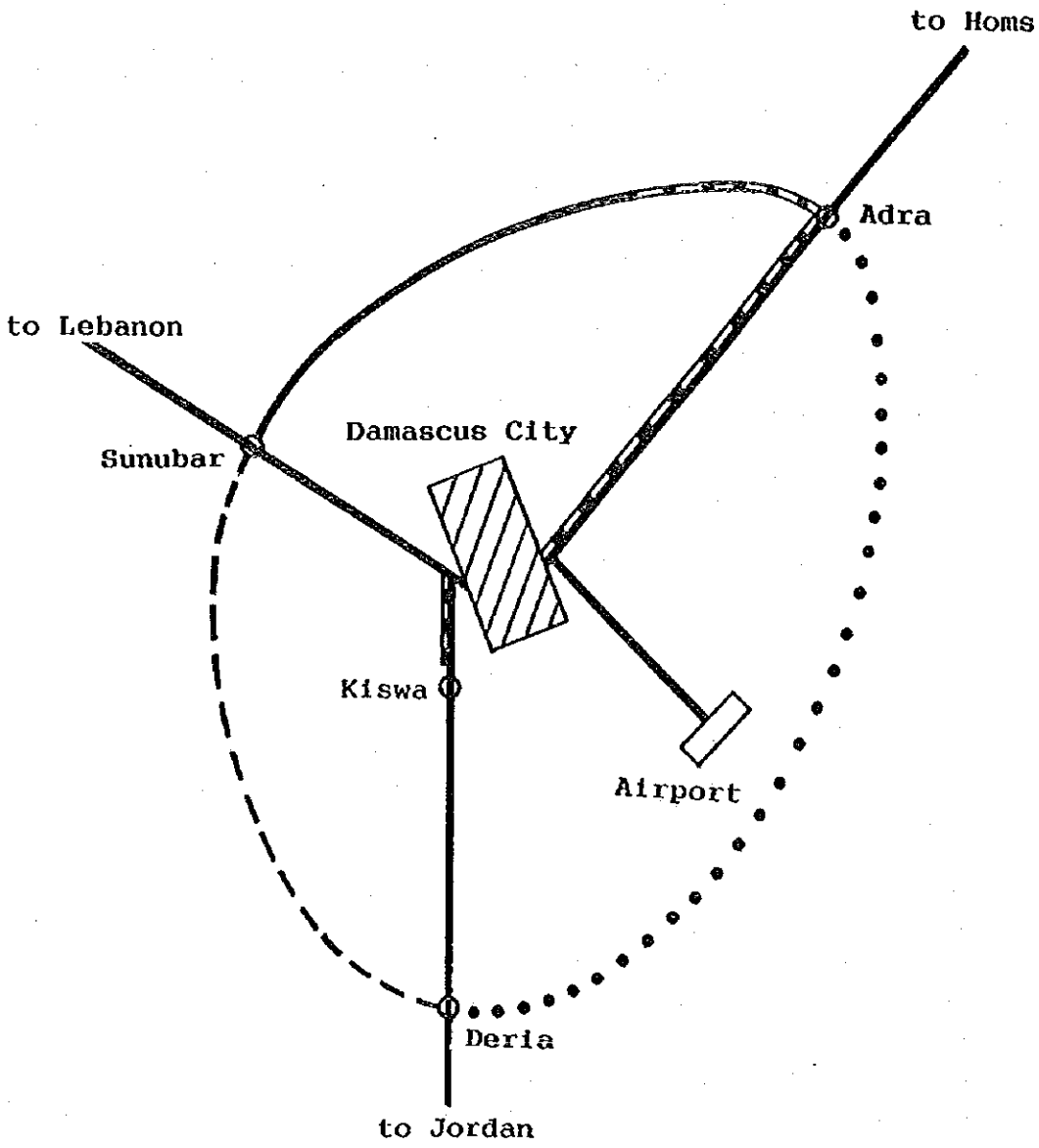


Figure 3.2.1-2 Construction Plan of Damascus Loop Route and Others

3.3 Railways

3.3.1 Existing Railway Systems

Railways in Syria are constructed by the General Company for Railway Construction and operated by the General Organization for Railway. Total Length of railway is 2342 km (1993) of which 327 km is narrow gauge. From 1985 to 1993, total extension of 330 km was realized for a 20% overall increase. Narrow gauge line is distributed in the south of Damascus. All lines are single-track.

Distance between major cities and industrial areas is shown in Table 3.3.1-1. Major oil fields are located in Hasaka, and phosphate mines are located around Sharkiya. The new steel-making factory is planned to be located between Homs and Hama, Al-Zara. Among the coastal ports, Tartous is the closest to the phosphate mines, the new steel-making factory and Homs industrial area.

The Syrian railway owns 5207 wagons and locomotives. Breakdown of wagons are as follows.

AUTOMOTIVE	13
LOCOMOTIVES	195
PASSENGER CARS	527
CARGO WAGONS	3918
FUEL WAGONS	408
OTHER WAGONS	146
TOTAL	5207

(Statistical Abstract 1994)

Table 3.3.1-1 Railway Distance Between Major Cities, Ports & Industries

	LATAKIA													
LATAKI	*	ALEPPO												
ALEPPO	197	*	RAQQA											
RAQQA	390	204	*	DEIRZZOR										
DEIRZZ	520	333	130	*	HASAKE									
HASAKE	656	469	466	136	*	QAMISHLI								
QAMISH	737	551	347	217	81	*	HAMA							
HAMA	230	140	333	462	599	680	*	HOMS						
HOMS	197	189	382	511	647	729	49	*	DAMAS					
DAMAS	379	389	582	712	848	929	249	216	*	SHARKYA				
SHARKY	359	370	563	692	828	910	230	197	241	*	TARTOUS			
TARTOU	73	274	467	596	732	813	147	114	296	276	*	T. PORT		
T. PORT	87	278	471	600	736	817	151	118	300	280	4	*	BANYAS	
BANYAS	45	236	429	558	694	776	185	152	334	314	38	42	*	JABLEH
JABLEH	23	214	407	536	672	754	207	173	355	336	60	64	22	*

(Ministry of Transport)

The total cargo volume carried by railway in 1993 is 3.9 million tons, and passenger number is 3 million. Volumes by commodities are shown in Table 3.3.1-2. The total volume has been decreasing in recent 5 years. The cargo volume in 1993 fell by 9%. The major commodities are fuels, phosphate, cement/sand and cereals. These commodities account for more than 80 % of all railway cargoes. Phosphate, sand and imported cargo decreased drastically, while cement, flour wood/iron have been increasing. The number of passengers has also fallen in recent years. The total number fell by 13% between 1991 and 1992, and by 26% in 1993.

Table 3.3.1-2 Commodity Volume & Passengers Carried by Railway
(Commodity:1000 ton, Passenger:1000)

	1989	1990	1991	1992	1993
Cereals	460	412	392	203	379
Flour	69	37	46	46	106
Foodstuff	30	17	16	16	15
Sugar	6	16	41	5	0
Wood/Iron	58	24	22	39	86
Cotton	4	2	0	0	0
Phosphate	1543	1318	1165	961	601
Fertilizer	58	50	57	51	50
Straw	8	5	6	4	4
Water	1	0	0	0	0
Fuels	1303	1812	1816	1706	1640
Cement	351	292	319	459	415
Sand	348	410	326	242	170
Other Coms.	530	325	292	280	243
Exported	39	30	39	73	92
Imported	533	486	629	200	100
Total	5341	5236	5166	4285	3901
Passengers	4260	4302	4646	4038	3004

(Statistical Abstract)

3.3.2 Railway Construction Projects

Present condition and future plans are described in Figure 3.3.2-1. Railway between Deirezzor and Albukamal, near Iraqi border, is under construction. Twelve percent of the railway has already been completed. Since Iraq has already constructed a railway from the border to Bagdad, the railway will connect Iraq with Syrian ports in the near future. The existing railway of narrow gauge has been reconstructed to the standard gauge between Damascus and Daraa. Fifteen percent of the rail has already been changed to the standard gauge. When the line is completed, Jordan will be connected with Syrian ports directly by railway. The line between Al-sharkya and Deirezzor, and between Daraa and Sweida are under feasibility studies. The lines between Aleppo and Midan Ikbis (Turkish border), Qamishly and Al-Yaroubiyeh, Homs and Tartous are being improved.

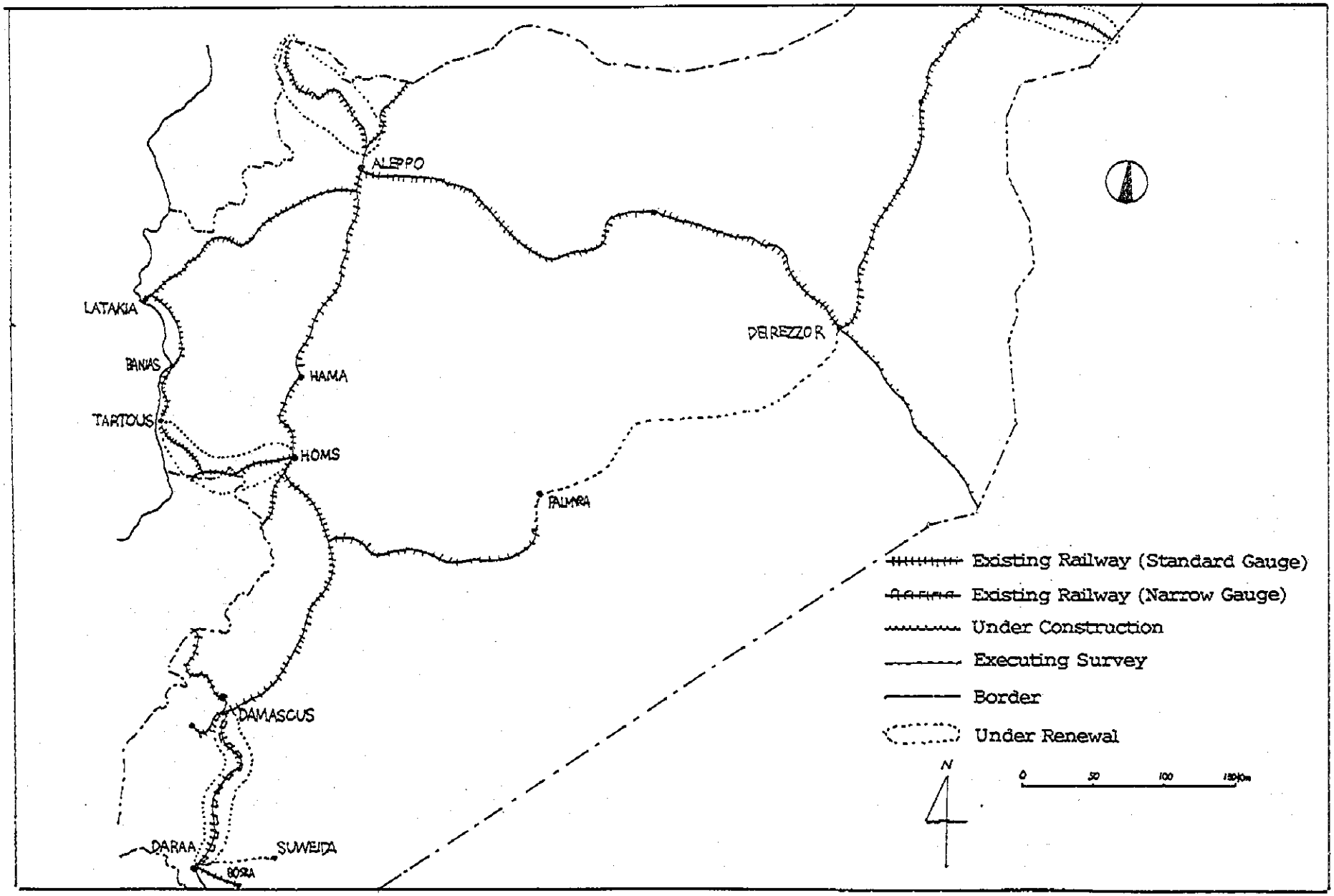


Figure 3.3.2-1 Present Conditions & Future Plan

3.4 Maritime Transport

3.4.1 International Maritime Transport Connected to the Syrian Ports

(1) Latakia Port

The container service by mother vessels is as follows.

1) Croatia Line (NMC) - Monthly -

Route: Rijeka-Trieste-Adriatic Ports-Japan-Alexandria-Beirut-Limassol-Latakia-Mersin-Istanbul-Rijeka-Koper

Vessel: 16,600 - 23,700 DWT (566-752 TEU)

2) MOL/NYK - 1-2 Calls a Month

Route: Japan(Far East)-Port Suez-Limassol-Latakia/Beirut-Piraeus-Istanbul-Alexandria-Benghazi/Tripoli-Valletta-Derince-Algiers-Skikda-Misurata-La Goulrtte-Casablanca-Lisbon

Vessel: unfixed

Containers are carried to/from mother ports by feeder services. Mother ports and shipping companies that deliver feeder service to Latakia Port are as follows.

Ports: Limassol, Piraues, Damietta, Alexandria, Port Said, Barcelona, Marsaxlokk, Genoa, Ravenna, La Spezia, Valencia

Shipping Company: SOL, NORDANA, GRAND, NEDLLOYD, DSR, CMA, LLOYD TRS, ADRIATIC, METZ, ASCO, UDASCO, CONTSHIP, MOL, NYK, CROATIA, SARLIS, COSCO, USAC, VALFRACHT, FAST LINE, MISC

(2) Tartous Port

The liner container or Ro/Ro service conditions are as follows.

1) NIVER Line (Switzerland) - Monthly Service -

Route: South America - Middle East (Santos-Rio Grande-Buenos Aires-San Francisco-Piraeus-Tartous)

Vessel: KARPATHOS, KASSOS, MYKINAI (Capacity of the vessels are 3000 TEUs)

2) SERVIZI MARITIME (Italy) - Twice Monthly -

Route: Venice-Mersin(Turkey)-Tartous-Beirut

Vessel: Ro/Ro vessel with container

3) Consortium (Joint of 5 lines - DSR, DNOR(Germany), ELERMAN, CONTSHIP(UK), SARLIS(Greece)) - Twice Monthly -

Route: Europe - Middle East - Far East (Bremenhaven-Hamburg-Antwep-Rotterdam-Alexandria/Damietta-Beirut-Tartous)
This route connects with lines that go to the Far East, Australia and North America by feeder ships.

4) NORDANA (Denmark) - unfixed -

Route: Houston(USA) - Latakia/Tartous

Vessel: unfixed

Containers are mainly for oil refinery projects.

5) Other Ro/Ro Services

The following shipping companies are delivering Ro/Ro services.
(NYK, MITSUI, NISSAN, HUAL, K-Line, Neptune(Greece))

3.5 Airport

There are five airports in Syria for civil aviation use.
Table 3.5.1-1 shows the number of passengers and volume of cargoes passing through these airports.
Damascus Airport is an international airport, and large number of passengers and volume of cargoes pass through it.
Aleppo Airport which is located in the main city of the northern part of Syria is also used to a certain extent.
The other three airports are sparingly used.
(See Table 3.5.1-1)

Table 3.5.1-1 Trend of Number of Passengers and Handling Cargo Volume by Airports

(Unit: thousand person, ton)

	Number of Passengers				Handling Cargo Volume			
Airport Year	1982	1985	1990	1993	1982	1985	1990	1993
Damascus	1,224	1,505	1,589	1,366	7,197	5,038	7,081	1,745
Aleppo	38	61	156	194	-	-	-	1,033
Al-Kamishli	7	19	22	15	1	0.1	0.5	0.4
Latakia	2	4	10	7	-	1	3	29
Deir-ez-Zor	7	4	19	1	1	-	0.3	-

Data: STATISTICAL ABSTRACT

3.6 Transit Transport

As for the cargoes transshipped via Syria to other countries called transit cargo, the trend of its volume is shown in the Table 3.6.1-1.

The volume of the transit cargoes which passed through Syria from the 1970s to 1981 ranged between 10 million tons and 30 million tons.
However, it remarkably decreased from 1982 due to discord in Iraqi-Syrian relations originating from Iran-Iraq Conflict. This led to a great decrease in transit cargoes originating and destined from/for Iraq.

Table 3.6.1-2 shows the volume of transit cargoes in 1993 per origin and destination.
The transit cargoes through Syria are mainly destined for Jordan and Saudi Arabia. Transit cargoes destined for these two countries mainly originate from Turkey and Lebanon.
As for the countries which the transit cargoes destined for Jordan come from, excluding Turkey and Lebanon mentioned above, West European countries, the former USSR and Romania are listed.
In addition, the cargoes originating from Lebanon are also destined for Kuwait and the United Arab Emirates.
On the other hand, there are many cargoes originating from Jordan destined for Lebanon.
In short, transit cargoes through Syria can roughly be divided into the following categories :

* Originating from Turkey, Lebanon, West European countries, the former USSR and Romania destined for Jordan.
* Originating from Turkey and Lebanon destined for Saudi Arabia.
* Originating from Jordan destined for Lebanon.
* Originating from Lebanon destined for Kuwait and the United Arab Emirates.

Table 3.6.1-3 shows the transit transport before discord between Syria and Iraq arose.
Total volume of the transit cargoes in 1981 exceeded 14 million tons. As is clear from the table, three out of four of total volume originated from Iraq.
Iraqi oil transport through the Iraqi-Syrian pipelines got the vast majority of the volume. If this factor is excluded total volume of transit cargoes in 1981 was 3.5 million tons.
Upon the analysis of this volume, 3.5 million tons, from the same angle as in 1993, the biggest volume was destined for Iraq, followed by for Saudi Arabia and for Jordan.
On the other hand most of this volume, 3.5 million tons, originated from Lebanon, West European countries, Turkey and East European countries, and the cargoes originating from Lebanon were also destined for Kuwait and the United Arab Emirates.

The cargoes destined for Lebanon originated from West European countries, Jordan and Saudi Arabia.

Remarkable differences (excluding the transport through the pipeline) between these two years, 1981 and 1993, before and after occurrence of the discord between Syria and Iraq is explained as follows:

* In 1981 the biggest volume of about 1.4 million tons was destined for Iraq and then became zero (these cargoes originated from West European countries, Lebanon, Turkey and East European countries).
* In relation to the above, the position of West European countries and East European countries has remarkably dropped.

Table 3.6.1-1 Trend of Transit Cargo Volume through Syria

(Unit: thousand ton)

Year	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Transit Cargo Volume	31838	25971	30023	10607	3167	2435	11268	11155	14321	6501	1393

Year	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Transit Cargo Volume	1304	1183	1131	1213	789	588	546	796	8016	1849

Data: STATISTICAL ABSTRACT

Note: Transit Volume is by all transportation facilities.

Table 3.6.1-2 Transit Cargo Volume through Syria by Origin and Destination in 1993

(Unit: thousand ton)

Destination / Origin	Jordan	Turkey	Saudi	Bahrain	Kuwait	Lebanon	Qatar	UAE	Others	Total
Jordan		17				82				100
Turkey	124		330	4	24	21	4	27	2	537
Saudi	1	1				35				38
Bahrain										1
Kuwait		2				6				8
Lebanon	104	2	243	11	73		11	71	13	528
UAE		1				13				14
Weatern Europe	116	4	1		1	6	1	2		133
Russia	55					1				56
Romania	65		1			2				67
Eastern Europe	49		2		1	5		3		59
Others	257	18	3			26		1		309
Total	771	48	580	16	100	199	16	104	16	1,849

Data: STATISTICAL ABSTRACT

Note: 1)Western Europe includes Poland.

2)Eastern Europe includes Greece and Syprus without Romania.

Table 3.6.1-3 Transit Cargo Volume through Syria by Origin and Destination in 1981

(Unit: thousand ton)

Destination / Origin	Jordan	Turkey	Saudi	Iraq	Kuwait	Lebanon	Qatar	UAE	Others	Total
Jordan						87				87
Turkey	149		98	231	5	20	1	6	2	509
Saudi		12				85			3	101
Iraq						18			10,827	10,845
Kuwait						3				3
Lebanon	136	2	486	274	124	1	16	78	13	1,130
Weatern Europe	124	1	106	490	49	179	3	4	8	964
USSR	18		2			1				22
Romania	46		39	48		1			3	137
Eastern Europe	57		29	184	11	3	1	3	2	291
Others	18	1	28	156	5	17		1	4	231
Total	548	15	788	1,385	194	413	22	93	10,861	14,321

Data: STATISTICAL ABSTRACT

Note: 1)Western Europe includes Poland.

2)Eastern Europe includes Greece and Syprus without Romania.

Chapter 4 Present Condition of Latakia Port

4.1 Port Facilities

4.1.1 Port Limits

The land areas which are used for the port activities are owned by the Latakia Port Company. This are spans around 6 km from the north to south along the shore line.

In Syria, sea and shore line belong to the country in principle. But, the port facilities such as approach channel and water basin etc. are administrated and maintained by the Port Company. At Latakia Port, water areas designated as the port facilities consist of approach channel, turning basin and anchorage basin. Water areas designated as the port facilities are administrated and operated by the Port Company. Navigation to is controlled by the Harbor Master except in emergency cases.

In general, development of port facilities both on land and off shore is planned by the ministry of transportation, and these facilities are constructed and maintained by the Port Company.

Table 4.1.1-1 Port Administration

Area	Owner	Development Planning	Construction	Administration, Operation	Maintenance
Land Area	L.P.C.	The Ministry of Transportation	L.P.C	L.P.C.	L.P.C.
Water Area	Country	The Ministry of Transportation	L.P.C.	L.P.C.	L.P.C.

4.1.2 Infrastructures

(1) General

Latakia Port consists of Inner Port Area, Old Port Area (1950 - 70) and 1st Stage Area (1979 - 90). Originally, Inner Port Area had its facilities only within the small bay, thus its use was restricted to small ships. In 1952, after the establishment of the Latakia Port Company, development of Old Port Area was planned and the breakwater (1,400 m), water areas and deep-water quays (-9.5 m) were constructed. This is the origin of the modern Latakia Port.

Ist Stage Area was expanded from the Old Port Area, with further extension of breakwater (1,730 m), expansion of the port area by reclamation, deep-water quays (-13.3 m) and construction of the container terminal. Main facilities are summarized below:

Table 4.1.2-1 Summary of Main Facilities at Latakia Port

Facilities	Inner Port Area	Old Port Area	Ist Stage Area
Breakwater	-	1,400 m	1,730 m
Quay: General Cargo	270 m	630 m	1,566 m
Grain	-	185 m	-
Container	-	-	584 m
Passenger	-	240 m	-
Small Boats (less than -5.0m)	805 m	-	-
Warehouses, Transit Sheds*	22,304m²	74,156m²	34,440m²
Open Yard, Container Yard	41,000m²	96,500m²	240,000m²

Note: */ including warehouses for cold storage, spare parts and passenger terminal.

The total area for open yard and container yard at Inner Port Area and Old Port Area is 137,500² according to the above table. Twenty five percent of the area is paved by quarry waste.

(2) Breakwater

As Latakia Port is located on the open sea coast, the construction of a breakwater was planned to protect the water front structures from the wave attacks. For this reason, basically the preference was being given to berthing facilities of the pier type.

Breakwater was constructed with total length of 1,400 m in the Old Port Area, and afterwards was extended by 1,730 m at the Ist Stage. The maximum depth of the breakwater is around 18.0 m. It is planned to extend further 600 m according to the future expansion of Latakia Port in the IInd Stage, together with the construction of a new north breakwater of 1,247m.

(3) Water Areas

Approach channel having 250 m width and 14.5 m depth was constructed at the Ist Stage. For the port approaches and aids of navigation, control posts were installed at the container terminal and its hinterland.

The water areas which are enclosed by breakwater comprise three basins: the first is at the Inner Port area, the second is at the Ist Stage Area with 480 m diameter and 14.0 m depth, and the third basin is planned to be provided at the IInd Stage. All the basins are connected by an inner two-way fairway. At the existing turning basin, ships of more than 200 m long can move and maneuver with the assistance of tugs.

It is said that the total reclamation volume at Ist Stage was around 6 million cubic meters (reclamation area: 900,000 square meters) and the dredging volume for the construction of port facilities was around 1.4 million cubic meters.(0.8 million cubic meters for water areas, and 0.6 million cubic meters for port structures) The dredged materials were used for the reclamation by using cutter suction dredger with delivery pipe. The difference was provided by sand transported from the coastal area.

(4) Inner Port Area, Old Port Area

Inner Port Area and Old Port Area have a water area of 45 hectares and the land area of 60 hectares including a grain terminal and passenger terminal with a total quay length of 2,130 m.

The vertical silos in the grain terminal are made of 32 cells of 1,420 cubic meters each, permitting the storage of about 35,000-40,000 tons of grain. The silos can receive the grain from trucks or rail wagons. There are silo machinery tower, receiving station and silo administration building next to silos. The conveyor bridge is connected between the silo machinery tower and the quay. The bridge supports the overhead discharge conveyors. At the end of the bridge, a dolphin type quay having a total length of 185 m is provided for loading ships with a draft of up to 8.5 m. While the size of the average bulk carrier has increased over the years, the ships most commonly used at Latakia Port are estimated as less than 10,000 DWT.

Passenger terminal is a precast concrete blocks built two-storied building having a total area of 3,036 square meters. At present, the terminal is used for the passenger ships bound for the route Latakia-Beirut-Cyprus-Alexandria, only once a week regularly and the terminal building is used for passengers partly. These ships are available only for passengers. There is no boarding bridge connecting the terminal with the quay and the gang plank is used for the passengers.

In front of the passenger terminal, there are quays totalling 240 m with a draft of up to 9.5 m. These quays are available for the passenger ships of maximum 15,000 GRT.

However, these quays are also used for cargo handling. These quays are equipped by 4 traveling quay cranes with the capacity of 60 tons each. In the port, there are two floating cranes with the capacity of 100 tons and 35 tons. These floating cranes are available at all the quays and at basins for lighters. Slipways are available for ship repairing and can accommodate ships up to 900 GWT.

Inner Port Area and Old Port Area have many sheds and open yards behind the quays which become very congested during cargo handling. These areas have 22 warehouses including a cold storage warehouse with capacity of 1,500 tons and open yards of 137,500 square meters.

In general, although the port facilities and buildings at these areas are aging, they are well maintained and still in good condition.

(5) Ist Stage Area

In 1973, the expansion of Ist Stage Area was studied by a team from the former USSR with target years 1980 and 2000 based on the following background.

1. The considerable economic development of Syria and the increase of the international seaborne trade of the country.
2. The necessity to provide in Syrian ports facilities to accommodate large ships and specialized ships, as well as to steer clear of cargo handling operations at the open roadstead.
3. The possibility of future transit trade via Syrian ports due to the development of railway network.
4. Further increase of traffic capacity of the ports of Latakia and Tartous cannot be established within the limits of the present ports.

Two hinterlands of Latakia Port and Tartous Port each were defined by the geographical and economical situation in Syria in those days; the first includes the northern and north-eastern areas; the second includes middle and the southern areas. These hinterlands were distinctly delimited by the existing railway system, which practically outlined the hinterland areas of the Ports of Latakia and Tartous. In this study, demand forecast of the port cargo was 3 million tons at the year 1980, and 7 million tons at the year 2000. (2.8 million tons as of 1993)

The results of this study were as follows:

1. Expansion of Latakia Port was deemed feasible based on the increasing port cargo volume.
2. Optimum alternative among the four master plans was prepared.
3. Construction cost for the expansion project was estimated and evalauted.

The Ist Stage Area has a water area of 90 hectares and a land area of 80 hectares. The Ist Stage Area is divided into the general cargo terminal and the container terminal functionally. In the general cargo terminal, there are marginal quays of total length 1,610m, with water depth ranging from -6.8m to -13.3 m. This area is served by an access rail way line.
The container terminal is located next to the general cargo terminal having quays with maximum 13.3 m depth. These quays are equipped with crane tracks for use with gantry crane. The crane tracks will be supported on the quay wall on the seaside and on a reinforced concrete beam with concrete pile foundation on the land side. The marshaling yard was paved by cement concrete. CFS, with an area of 8,160 square meters, was constructed behind the marshaling yard.
The port facilities at this area are comparatively new, but it seems that these facilities do not function well because of the shortage of cargo handling equipment. In the water area neighboring the container terminal, underwater oil pipelines are laid connecting the mooring buoy with the oil tanks at hinterland. But, these

pipelines are planned to be removed to allow for future port development.

(6) Siding

The 757 km railway line, Latakia-Aleppo-Dayr Az Zor-Al Hasakah-Al Qamishly, is now available. An access railway line (track of 1,435 mm) of about 4.5 km is extended from the terminal station Latakia to the Ist Stage Area vie the station--siding "The Port", located in the Old Port Area. This access line is laid at the rear of the Inner Port basin.
The station-siding "The Port" comprises eight tracks of effective length 300-350 m and serves as a yard for wagons arriving to and departing from the port. But, at the station-siding shunting is not provided and all the yard operations with vans destined for the port, its selection and marshaling of trains for the quays and warehouses is to be carried out at the marshaling yard of Latakia railway station which is next to the port.

Although the volume of cargo for direct discharging to and loading from rail will be the governing factor, there is a strong case in general against quayside direct delivery to rail for break-bulk operations.
Quayside wagon-shunting operations are very difficult to organize in such a way that high productivity can be achieved at the hatch being worked without interference with gangs working other hatches or other ships. Where possible, the loading to rail for onward transport in the case of imports, and the sorting of consignments from up-country for export, should be carried out in a rail yard away from the quay, with transfer from and to the quay being carried out on port mobile equipment, normally trailers. This move away from direct delivery to and from rail transport is due to the declining volumes of packaged bulk shipments being carried on general cargo liners. Only where a continuing and large volume of cargo in the form of heavy machinery, iron or steel and large bundles is foreseen, would the provision of quayside rail track be justified.

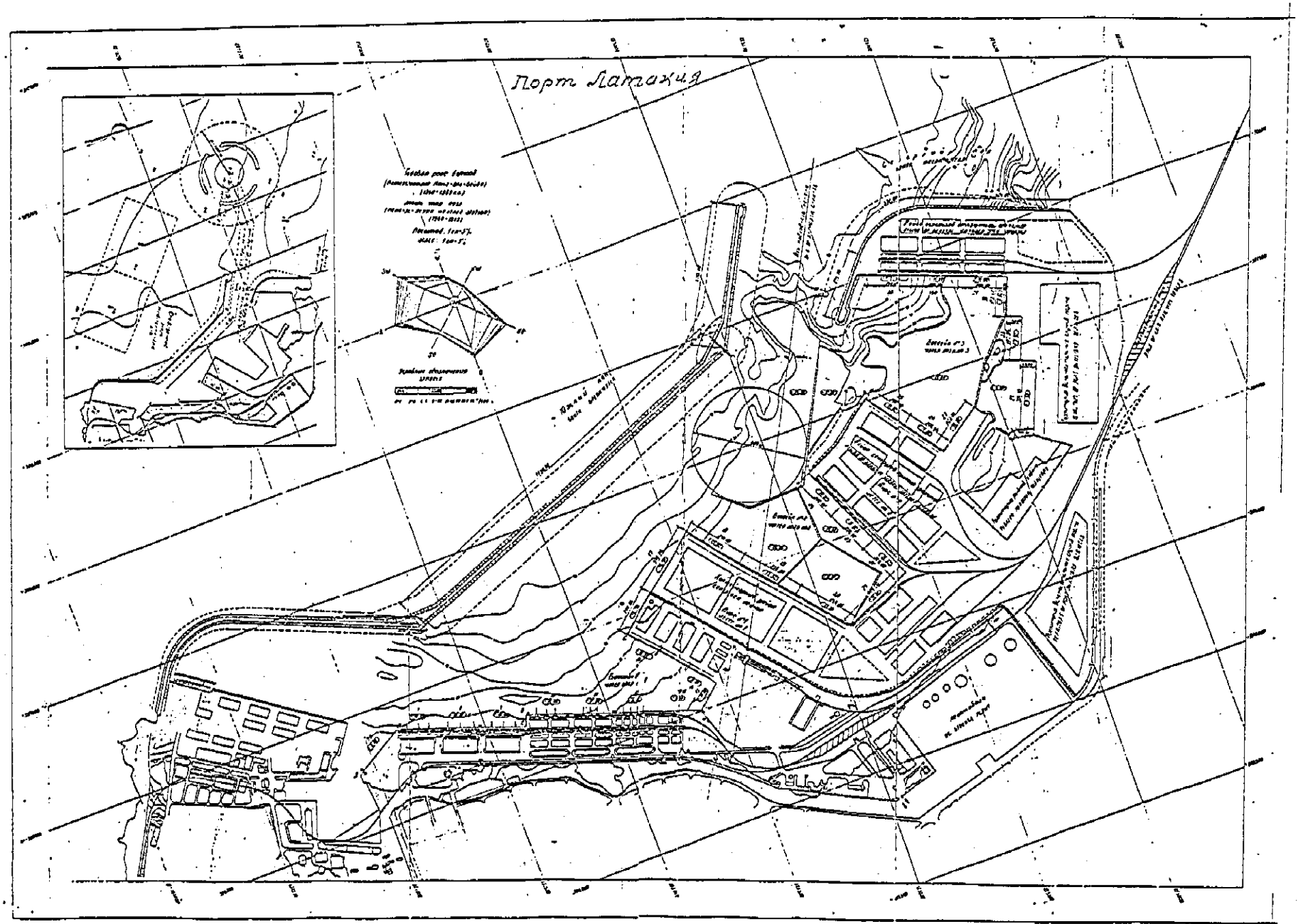


Figure 4.1.2-1 Location Map - Latakia Port

Table 4.1.2-2(1) Main Port Facilities
Latakia Port

Area	Facilities	Dimension	Structural Type	Design, Supervision	Const-ruction	Year of Const.
Inner Port	Eastern Quay	270m, -7.0m	Steel sheet pile "Larsen 5"	France	France	1954
	Southern Quay	160m, -2.5, -3.0m	Steel sheet pile "Larsen 5"	France	France	1932
	Northern Quay	275m, -4.0, -4.5m	Steel sheet pile "Larsen 5"	France	France	1932
	Fast of Slipway	130m, -2.0, -3.0m	Concrete block	France	France	1932
	East of Slipway	50m, -2.0m	Concrete block	France	France	1932
	West of Slipway	190m, -2.0, -4.0m	Concrete block	France	France	1932
	Slipway, 900tons loading capacity	30m, -3.0, -5.0m	Concrete block	France	France	1932
Old Port	Breakwater	1,400m, Max.-13m	Rubble mound	Denmark KAMPSAX	Yugosla-via	1956
	Silo Quay	180m, -8.5m	Concrete pillars with pre-packed concrete foundation	Denmark	Yugosla-via	1956
	Quay No.1	150m, -9.5m	Concrete block	Denmark	Yugosla-via	1956
	Quay No.2	150m, -9.5m	Concrete block	Denmark	Yugosla-via	1956
	Quay No.3	150m, -9.5m	Concrete block	Denmark	Yugosla-via	1956
	Quay No.4	180m, -9.5m	Concrete block	Denmark	Yugosla-via	1956
	Passenger Quay	240m -7.0, -9.5m	Concrete block	Denmark	Yugosla-via	1956
Ist Stage (General Cargo Terminal)	Breakwater	1,730m, Max.-18m	Rubble mound armored with tetrapod	USSR, State Design and Research Institute of Sea Transport	Syria	1979
	Turning Basin	D480m, -14.0m		USSR	Syria	1984
	Turning Basin	D480m, -12.5m		USSR	Syria	1984
	Quay No.7A	220m, -6.8m	Concrete block	USSR	Syria	1984
	Quay No.7	178m, -10.8m	Concrete block	USSR	Syria	1984
	Quay No.8	180m, -10.8m	Concrete block	USSR	Syria	1984
	Quay No.9	190m, -10.8m	Concrete block	USSR	Syria	1984
	Quay CD	55m, -10.8m	Concrete block	USSR	Syria	1984
	Quay No.10	180m, -11.8m	Concrete block	USSR	Syria	1984
	Quay No.11	180m, -11.8m	Concrete block	USSR	Syria	1984
	Quay No.12	180m, -13.3m	Concrete block	USSR	Syria	1984
	Quay No.12A	204m, -13.3m	Concrete block	USSR	Syria	1984
Ist Stage (Container Terminal)	Quay No.13	134m, -13.3m	Concrete block	USSR	Syria	1984
	Quay No.14	190m, -13.3m	Concrete block	USSR	Syria	1984
	Quay No.15	260m, -13.3m	Concrete block	USSR	Syria	1984

Table 4.1.2-2(2) Main Port Facilities
Latakia Port

Area	Facilities	Dimension	Structural Type	Design, Supervision	Con-struction	Year of Const.
IInd Stage (Planned)	Breakwater South	600m, Max.-20.0m	Rubble mound	USSR, State Design and Research Institute of Sea Transport		
	Breakwater North	601m, Max.-17.0m	Rubble mound	USSR		
	Breakwater North	372m, Max.-18.0m	Rubble mound	USSR		
	Breakwater North	274m, Max.-18.0m	Rubble mound	USSR		
	Approach Channel	W250m, -14.5m		USSR		
	Quay No.16	200m, -13.3m	Concrete block	USSR		
	Quay No.17	300m, -13.3m	Concrete block	USSR		
	Quay No.18	270m, -13.3m	Concrete block	USSR		
	Quay No.19	270m, -13.3m	Concrete block	USSR		
	Quay No.20	280m, -13.3m	Concrete block	USSR		
	Quay No.21	320m, -11.8m	Concrete block	USSR		
	Quay No.22	200m, -11.8m	Concrete block	USSR		
	Quay No.23	200m, -11.8m	Concrete block	USSR		
	Quay No.24	200m, -11.8m	Concrete block	USSR		
	Quay No.25	200m, -11.8m	Concrete block	USSR		
	Quay No.26	206m, -11.8m	Concrete block	USSR		
	Quay No.27	220m, -11.8m	Concrete block	USSR		
	Quay No.28	300m, -6.8m	Concrete block	USSR		
	Quay No.29	180m, -6.8m	Concrete block	USSR		
	Quay No.30	173m, -6.8m	Concrete block	USSR		
	Quay No.31	200m, -11.8m	Concrete block	USSR		
	Quay No.32	200m, -11.8m	Concrete block	USSR		
	Quay No.33	190m, -11.8m	Concrete block	USSR		

Table 4.1.2-3(1) Buildings, Yard
Latakia Port

Port Area	Facilities	Location	Dimension	Structural Type	Year of Const.
Inner Port	Warehouse No.13	Near the Quay East of Lake	2,570m²	Concrete block with prefabricated concrete roof	1932-1958
	Warehouse No.14	Next to Warehouse No.13	660m²	ditto	1932-1958
	Warehouse No.15	Next to Warehouse No.14	1,650m²	ditto	1932-1956
	Warehouse No.16 for cold storage	Behind Eastern Quay	2,600m², 1,500t	ditto	1932-1956
	Warehouse No.18	Behind Southern Quay	3,000m²	ditto	1932-1956
	Warehouse No.19	Behind Eastern Quay	3,024m²	ditto	1932-1956
	Warehouse No.21	Behind Northern Quay	600m²	ditto	1932-1956
	Warehouse No.22	Behind Northern Quay	2,250m²	ditto	1932-1956
	Warehouse No.23	Near the Gate No.3	4,000m²	ditto	1932-1956
	Warehouse for spare parts	Behind Warehouse No.10	1,950m², 2 stories	ditto	1932-1956
	Open Yard No.6	Behind Warehouse No.18	20,000m²	Asphalt concrete paved	1956
	Open Yard No.7	Near the Gate No.2	9,000m²	ditto	1956
	Open Yard No.8	Behind Warehouse No.19	12,000m²	ditto	1956
	Open Yard No.9	Next to Warehouse No.23	7,000m²	ditto	1956
	Open Yard No.10	Behind Northern Quay	3,000m²	ditto	1956

Note: Dimensions include the estimation by the study team.

Table 4.1.2-3(2) Buildings, Yard
Latakia Port

Port Area	Facilities	Location	Dimension	Structural Type	Year of Const.
Old Port	Silos for grain	Behind Dolphin	35,000-40,000t D6.34mxH45mx 32cells	Reinforced concrete	1960
	Warehouse No.1	Behind Quay No.1	3,600m²	Concrete block, prefabricated roof	1958-1970
	Warehouse No.2	Behind Quay No.2	10,800m², 3 stories	ditto	1958-
	Warehouse No.3	Behind Quay No.3	10,800m², 3 stories	ditto	1958-
	Warehouse No.4	Behind Quay No.4	3,600m²	ditto	1958-
	Warehouse No.5	Behind Warehouse No.2	10,800m²	ditto	1958-1970
	Warehouse No.6	Behind Warehouse No.3	10,800m²	ditto	1958-1970
	Warehouse No.7	Behind Warehouse No.4	2,600m²	ditto	1958-1970
	Warehouse No.8	Behind Silos	3,600m²	ditto	1958-
	Warehouse No.9	Behind Open Yard No.9	3,600m²	ditto	1958-1970
	Warehouse No.10	Behind Warehouse No.5	3,600m²	ditto	1958-1970
	Warehouse No.11 for dangerous goods	Near the Gate No.1	1,800m²	ditto	1958-1970
	Warehouse No.12	Next to Open Yard No.1	9,120m²	ditto	1958-1970
	Passenger Terminal	Behind Passenger Quay	3,036m², 2 stories	ditto	1963
	Open Shed	Behind Slipway	1,500m²		
	Open Yard No.1	Behind Breakwater	30,000m²	Asphalt concrete paved	1970
	Open Yard No.2	Behind Warehouse No.1	6,000m²	ditto	1970
	Open Yard No.3	Behind Warehouse No.6	6,000m²	ditto	1970
	Open Yard No.4	Behind Warehouse No.8, No.9	13,000m²	ditto	1970
	Open Yard No.5	Next to Warehouse No.12	40,000m²	ditto	1970
1st Stage (General Cargo Terminal)	Warehouse No.24	Behind Quay No.7	8,760m²	Concrete block, prefabricated roof	1990
	Warehouse No.25	Behind Quay No.8	8,760m²	ditto	1990
	Warehouse No.26	Behind Quay No.9	8,760m²	ditto	1990
	Open Yard No.11	Behind Quay No.10	12,800m²	Portland cement concrete paved	1990
	Open Yard No.12	Behind Quay No.11, No.12	12,800m²	ditto	1990
	Open Yard No.13	Behind Quay No.12A	12,800m²	ditto	1990
1st Stage (Container Terminal)	Container Yard	Container Terminal	201,600m²	Portland cement concrete paved, with crane trucks foundation	1990
	CFS	Container Terminal	8,160m²	A concrete block one-story building with prefabricated concrete roof	1990

Note: Dimensions include the estimation by the study team.

4.1.3 Cargo Handling Equipment

(1) Cargo Handling Equipment

1) Existing Cargo Handling Equipment

Details of the cargo handling equipment in Latakia port, the largest one in Syria, are as per Table 4.1.3-1.
Most of the general cargo handled in the port are not palletized. The handling from/to ship for general cargo is carried out by using portal jib cranes which are installed on the quay side or are part of the ship's gear and most of unloaded cargo are loaded to trailers directly. The handling of the general cargo at open yard is carried out by a combination of mobile cranes and trailers. The port is not equipped with a quay-side container crane. The containers which are transported by container ship with ship cranes are handled by her cranes, and the containers which are transported by conventional ship are handled by her ship gears or large mobile cranes. However the containers which are transported by large ship without ship gear or ship crane are handled by floating cranes. The main cargo handling equipment at the port is as follows;

A Quay-side Cranes (portal jib crane)

The handling system which was planned originally for the handling from/to ship at all the berths except grain berth and container berth is quay-side crane system. Then three (3) quay cranes were installed on berth 1st~4th and berth 7th~12th respectively and four (4) cranes were installed on berth 5th and 6th. Thirty-four(34) quay cranes were installed in total. Two(2) cranes, however, were disposed of and therefore thirty-two(32) quay cranes are installed at present. Some of them are very old (38 years of age) and in poor condition. The main dimensions of the portal cranes which are installed at the quay are as per Table 4.1.3-2.

B Grain Loaders

Two(2) grain loaders are installed on the grain berth in front of the grain silo

C Floating cranes

There are no quay side container cranes. Two(2) large floating cranes are available to cope with container handling for container ship without ship crane or ship gear.

Table 4.1.3-1 Cargo Handling Equipment at Latakia Port

Type & Name	Capa-city	Pro-cured	No. of Equip.			Location	Remarks
			Total	Avail-able	Non-Avail.		
Floting Crane	100t	1957	1	1			Self Propelled Double - link
"	32t	1976	1	1			"
Portal Jib No.2	3t	1957			1	KahalehNo.1	Disposed
Crane No.3	3t	"	1	1		No.1	OK
No.4	"	"	1			No.2	Workable (Bad Body)
No.5	"	"	1	1		No.2	One speed (gear box)
No.6	"	"		1		No.2	OK
No.7	"	"	1	1		No.3	One speed (gear box)
No.8	"	"	1	1		No.3	Normal
No.9	"	"	1		1	No.3	Without jib
No.10	"	"	1	1		No.4	
No.11	"	"	1	1		No.4	
No.12	"	"	1		1	No.4	Hydraulic pump T
No.13	6.3t	1980	1	1			
No.14	"	"	1	1			
No.15	"	"	1	1			
No.16	"	"	1	1			
No.17	"	1990	1	1		No.7	
No.18	"	"	1	1		"	
No.19	"	"	1	1		"	
No.20	"	"	1	1		No.8	
No.21	"	"	1	1		"	
No.22	"	"	1	1		"	
No.23	"	"	1	1		No.9	
No.24	"	"	1	1		"	
No.25	"	"	1	1		"	
No.26	"	"	1	1		No.10	
No.27	"	"	1	1		"	
No.28	"	"	1	1		"	
No.29	"	"	1	1		No.11	
No.32	"	"	1	1		No.12	
No.33	"	"	1	1		No.12	
No.34	"	"	1	1		No.12	
No.30	16t	1990	1	1		No.11	
No.31	"	"	1	1		No.11	
Mobile crane	65t	1975	5	4	1		P & H 1unit 3 year ago
"	22t	1977	2	1	1		Damage 1unit 1.5 year ago
"	18t	1977	30	29	1		P.P.M 1unit 3 years ago
"	10t	1976	20	4	16		
"	100t	1981	1	0	1		with spreader. from beginis
Pneumatic unloaders	100t/h	1990	6	6		Diesel	For Grain
Tire Mounted	125t/h	1970	1	1		Electric	

Type & Name	Capa-city	Pro-cured	No. of Equip.			Location	Remarks
			Total	Avail-able	Non-Avail.		
Straddle	35t	1991	3	3			
Carrier	30.5t	1980	4	4			
Top Lifter	42t	1991	1	1			
Top Lifter	42t	1993	1	1			
Fork-lift Truck	32t	1991	2	2			Valmet
"	"	1993	1	1			
"	30t	1980	1	1			
"	10t	1991	5	5			
"	10t	1993	10	10			For general cargo & empty
"	3t	1977	20	10	10		containers
"	3t	1980	30	10	20		
"	1.5t	1993	10	10			
Trailor	55t	1991	9	9			
Tractor	3t	1970	20	15	5		
Ship Loader	150t/h	1970	2	2		Grain berth	for Export Grain

Table 4.1.3-2 The Main Dimensions of Portable Jib Crane at Latakia Port

Name of crane	Capacity t x m	Rail Gauge (m)	Height of hook (m)	Lengthof the cap cable(m)	Distance from sea rail to quay front
No 7	3t x 25m	5.515m	40m	33m	1.81m
No 14	6.3t x 27.5m	5.5m	35m	33m	1.65m
No 21	6.3t x 27m	10.5m	25m	50m	2.0m
No 30	16t x 32m	10.5m	25m	50m	2.0m

D Tire-Mounted Equipment

a) Mobile Cranes

Most of the general cargo handling at the open yard and some general cargo handling from/to ship are carried out by mobile cranes. The port has fifty-eight(58) mobile cranes for general cargo handling at the open yard and apron. However all of them except one(100t capacity)are very old with the average age being 17.5 years. One third of them are not available at present.

Furthermore the above mentioned 100 t mobile crane has never worked since it was procured.

b) Straddle carriers

Straddle carrier handling system has been introduced at the container yard. There are seven(7) straddle carriers.

c) Top-lifters and large fork-lift trucks
Two(2) top lifters and five(5) large fork-lift trucks are possessed for conntainer handling at apron and other places. Fifteen(15) middle-sized fork-lift trucks are possessed for handling empty containers and general cargo.

d) Small fork-lift trucks
Sixty(60) small fork-lift trucks are possessed for handling palletized cargo and general cargo at apron, open yard and in transit sheds and warehouses. Most of them, however, are very old and in poor condition.

2) The records of actual working and brokendown hours(days) of the existing cargo handling equipment.

Records of actual working and brokendown for all quay side cranes were not available. The records of actual working and brokendown hours(days) for the quay side cranes selected by the team were obtain.
The record of actual working hours for all tire mounted equipment was not available and thus only certain equipment is included in Table 4.1.3-4. Furthermore the record of actual brokendown for the equipment was not available and only that of the equipment selected by the team is included in Table 4.1.3-5.

3) Procurement plan and Disposal plan

There are no procurement plan and disposal plan. Furthermore we could not obtain service life table. Assuming the depreciation of cargo handling equipment to be in the range of 10-12.5% based on" Table of Depreciation ", the service lives of the equipment are estimated in the range of eight(8) - ten(10) years.

(2) Maintenance/Repair Shops

1) Maintenance System

Periodical oiling, greasing and changing are carried out systematically. However there are no preventive maintenance systems at this port. So all equipment is used without any maintenance until it brokendown, at which time it is repaired. According to interviews, preventive maintenance is not performed because there is not sufficient spare equipment. However, preventive maintenance would result in shortening of the breakdown hours (days) for the each piece of equipment. The organization of maintenance of cargo handling equipment is divided into several departments, including Land equipment department (tire mounted cranes), High power department (rail mounted cranes) and Silo department (grain handling equipment).

Table 4.1.3-4 Working Hours of Tire Mounted Equipment at Latakia Port

Type	Name	Working Hours												
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Mobile Crane	65t No. 67	352	184	245	276	263	164	160	150	180	130	200	150	2451
	64	229	98	194	199	221	76	60	120	100	90	195	90	1672
	69							69						69
	74	137	123	112	220	113	113	120	130	150	200	145	170	1733
	18t No. 2	246	224	218	245	152	96	200	214	210	212	170	100	2287
	3	228	224	174	162	163	191	215	210	240	160	140	190	2297
	6	224	246	188	231	201	220	190	180	210	230	205	212	2537
	14	251	228	166	263	221	200	250	218	150	230	200	200	2577
	24	288	251	210	250	137	45	275	225	217	250	147	200	2495
	25	248	267	183	222	61		240	230	130	195	70	180	2026
	28	222	156	203	214	134	190	210	150	180	200	130	160	2149
Straddle Carriers	30.5 t No. 1	122		322	327	459	318	300	450	310	320	250	270	3448
	35t 2	297	339	338	349	333	457	430	400	390	330	335	290	4288
	3	363	233	288	341	330	324	300	310	350	308	240	360	3747
	4	157	227	379	348	363	320	250	300	370	345	360	320	3739
	5	318	220	334	343	302	328	310	215	340	350	300	320	3680
	6	213	144	186	254	183	221	240	170	195	250	200	240	2496
	7	400	338	376	328	365	338	380	320	370	300	300	310	4125
Fork - Lift Trucks	32t,42t No. 201	209	436											645
	202	149	102	414	350	241	284	290	313	130				2273
	203	300	310	444	366	295	220	310	380	365	412	295	240	3937
	204	305	191				285	340	290	200	170			1781
	205	394	394	443	495	334	366	180	150	150	178	80	95	3259
Fork - Lift Trucks	10t No. 87	263	211	162	219	208	215	200	212	170	218	194	218	2490
	89	221	110	124	153	136	69	190	185	212	160	210	79	1849
	90	140	171	133	224	177	190	210	220	165	230	220	210	2290
	91	231	222	243	210	226	282	230	200	245	198	175	235	2697
	93	329	348	453	401	442	317	300	380	400	418	410	380	4578
	98	419	408	386	376	370	357	410	395	450	430	380	200	4581
	99	298	260	349	334	301	299	280	165	200	80	130	160	2856
Tractors	No. 52	175	205	180	63	143	96	140	170	130	60	148	90	1600
	33	84	133	131	109	171	100	80	140	120	100	150	95	1413
	26	86	139	149	108	166	131	85	140	112	98	145	60	1419
	46	109	152					85	140	112	98	122	110	928
	48				50	106		40	120	80	95	48	70	609
	25	175	209	205	220	179	54	165	230	190	185	170	100	2082
Trailers for Containers	No. 4										70	120	110	300
	5	370	320	386	192	352	254	280	350	210	380	300	350	3744
	6			223	253	377	293	280	310	250	280	290	300	2856
	7	231	214	313	382	108	199	190	118	380	310	280	270	2995
	8	221	243	254	152	64	180	195	110	180	270	240	225	2334
	9	231	254	435	324	397	357	350	390	390	410	290	220	4048
	10	469	346	463	445	457	379	370	440	420	440	350	400	4979
	11	170	194	366	366	296	249	250	300	350	380	270	268	3459
	12	163	143	207	190	329	355	300	310	280	200	358	280	3115
Trailors for General Cargo	No. 50	223	222	214	226	81	110	180	160	190	130	100	115	1951
	51					162	104	140	180	122	148	160	118	1134
	52	134	241	349	166	88	274	100	112	144	160	85	60	1913
	53	127	69	67	162	124	224	95	110	200	190	170	155	1693

Table 4.1.3-5 Brokendown Days of Tire-Mounted Equipment at Latakia Port

Type	Name		Brokendown days	Remarks
Mobile crane	65t	No. 71	90	1993
	16t	No. 3	32	1993
Straddle carrier	35t	No. 2	87	1993
	35t	No. 4	236	1993
Fork lift truck	42t	No. 201	150	1993
	32t	No. 202	110	1993
	10t	No. 90	46	1993
	3t	No. 2	160	1990
	3t	No. 3	37	1990
	1.5t	No. 186	186	1993
	1.5t	No. 226	226	1993

2) Maintenance cost

Since the total maintenance cost for all or each item of cargo handling equipment is not available, the total cost is estimated by the study team from the cost of the spare parts and outside orders, and personnel payroll which is calculated by number of engineers and workers and the average of their salary. Total maintenance costs are shown in Table 4.1.3-6.

Table 4.1.3-6 Maintenance Cost for Last 5 Years at Latakia

Items	1990	1991	1992	1993	1994
1- Spare parts cost and out side ordered cost					
a- Cargo handling equipment and others	5.459.227	8.526.721	6.582.764	8.899.899	9.717.734
b- Tractors, trailers and others	2.448.464	2.222.954	4.642.150	3.061.674	2.804.164
c- Passenger cars	1.477.025	1.711.852	1.835.542	1.735.937	2.143.076
d- Sea Equipment	562.591	2.618.518	774,730	5.782.607	1.519.375
e- Elevators and others	221.613	197.307	487.195	421.341	215.946
Total	10.168.920	15.277.352	14.322.381	19.901.448	16.400.301
2- Personel cost					10.432.800
Grand Total Cost					26.833.101

Remarks: 1: Common cost (power, water,fuel, lubricatio oil etc.) is excluded.
2: Personal cost is estimated by total number of person and their average salary.
207 x 100 x 42 x 12 = 10,432,800

3) Repair Shops

Four major maintenance shops belong to the land equipment maintenance department. In addition small maintenance shops belong to each department.
Forty(40) engineers and one hundred and sixty(160) workers work in the four(4) major maintenance shops and the many minor maintenance shops. The detailed organization chart is shown in Fig-4.1.3-1.

The total area of all maintenance shops is about 5,000 sq m and main machines in each maintenance shop are as per Table 4.1.3-7.
The working hours in the maintenance shops are from 08~15.00 and over time is from 16.00~18.00.
Even if cargo handling operations are in progress at the port, after 18.00, there are engineers and workers for maintenance on duty at the port. If trouble happens after this time, the reserved equipment is used instead of broken-down equipment or the engineer(s) in charge and/or worker(s) in charge at home are convened.

Table 4.1.3-7 List of Main Machinery in the Maintenance Shops at Latakia Port

Lathes	9 units	Milling machine	1 unit
Radial Drilling Machines	2 units	Drilling Machines	7 units
Air Compressors	5 units	Electric Welders	5 units
Oxygen Welders	4 units	Portable Diesel Welders	2 units
Pipe Cutter	1 unit	Steel Sheet Cutters	2 units
Plate Bender	1 unit	Grinders	2 units
Battery Charger	3 units	Portable Generator	1 unit
Electric Saws	2 units	Others	1 Set

(3) Spare parts

1) Procedure for spare parts procurement

At first, a two year supply of required spare parts is procured with equipment and the kind and quantity to be kept are decided based on experience. Then the minimum number of spare parts is stored. According to interviews, about 39,000 items of spare parts are stored at present. A computer system for spare parts management has not been introduced yet,in stead, they are managed by a card system.

2) Procedure for spare parts procurement

In case there are no spare parts in their storage, it is considered whether or not make them at the maintenance shop at first and if it is imposible to make them it is finally ordered out side for procurement. The list of spare parts to be procured is made by the engineer at the maintenance shop and then is submitted to department of management of spare parts.

3) Spare parts storage

The spare parts are kept in two storages(50 m x20 m x 2F,22 m x 15m x 1F) being arranged by equipment type and by parts number.

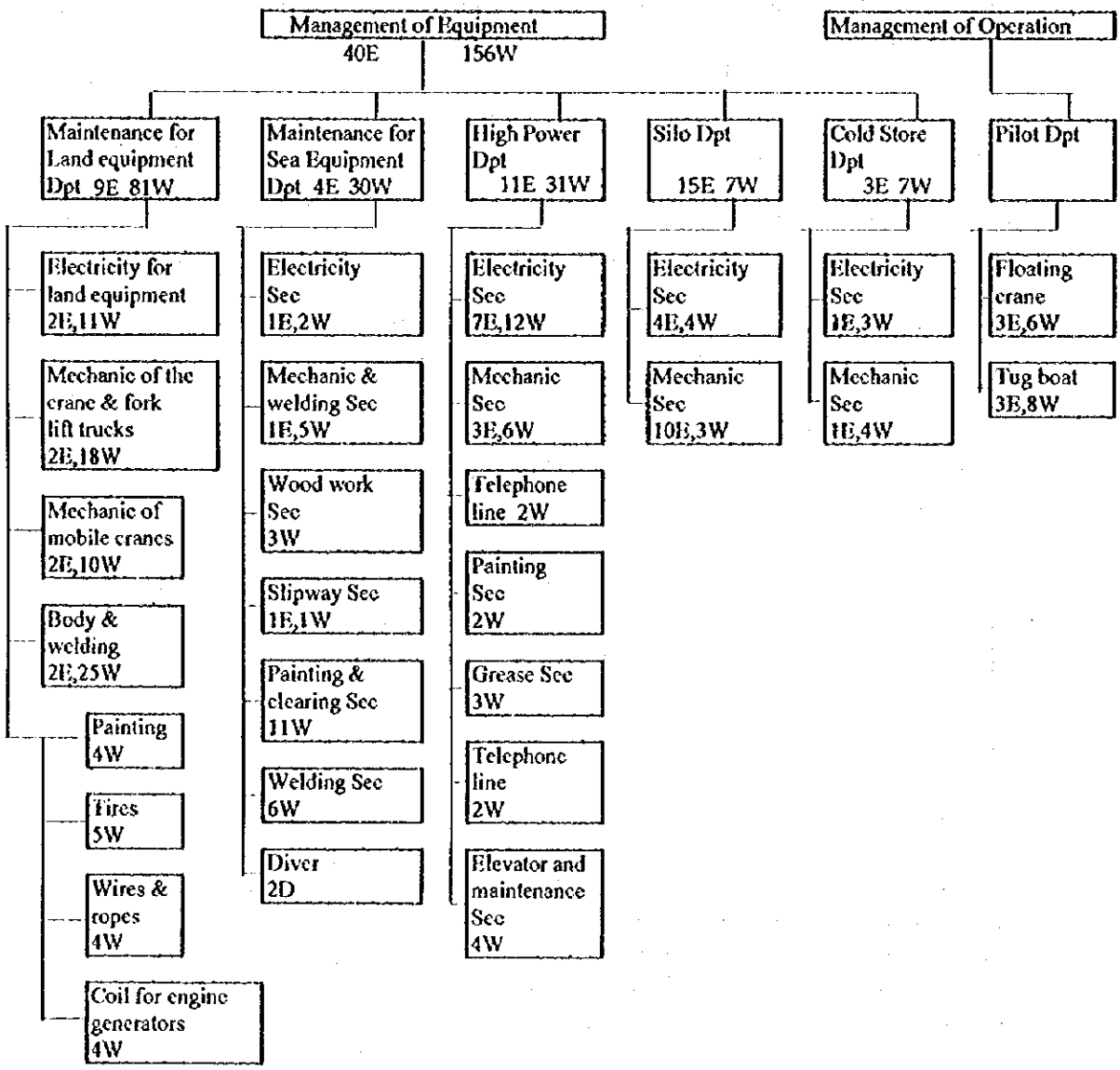


Figure 4.1.3-1 Organization Chart of Maintenance for Port Equipment at Latakia Port

4.2 Port Activities

4.2.1 Cargo/Passenger Traffic

(1) Cargo Traffic

1) Outline of Cargo Traffic

Trends of Export, Import and Transit Cargo Volume are shown in Table 4.2.1-1, Figure 4.2.1-1.

The volume of cargo handled in Latakia Port has fluctuated according to the prosperity or stagnation of the Syrian economy. In the first half of the 1980s, handling cargo volume decreased sharply due to the stagnation of the Syrian economy but since then has increased steadily along with the recovery of the Syrian economy.
Total handling cargo volume in 1994 was about three million tons, recovering the peak level of 1981.

Trends of Export/Import Cargo by main commodities are shown in Table 4.2.1-2, Table 4.2.1-3.

Major cargoes among export commodities are grain and cotton. Handling volume of grain has not been stable. Cotton had the highest share in export cargoes and its handling volume has increased steadily since 1988. Most of other export cargoes are agricultural products, foodstuffs and textiles.

Major cargoes among import commodities are fertilizer & chemicals, iron & steel, machine & equipment, grain and foodstuffs. Roughly speaking, handling volume of these major cargoes have increased since the end of the 1980s excluding grain. Most of these cargoes are either commodities which are not produced or commodities of which the production volume is too little for the consumption in Syria.

Table 4.2.1-1 Trend of Cargo Handling Volume in Latakia Port

(Unit : thousand ton)

Year	Export	Import	Total
1974	157	1,619	1,776
1975	121	1,523	1,644
1976	262	1,920	2,182
1977	336	1,797	2,133
1978	279	1,504	1,783
1979	317	2,002	2,319
1980	388	2,600	2,988
1981	456	2,590	3,046
1982	696	1,667	2,363
1983	368	1,372	1,740
1984	361	1,256	1,617
1985	223	1,583	1,806
1986	211	1,156	1,367
1987	146	1,222	1,368
1988	136	1,240	1,376
1989	309	1,166	1,475
1990	243	1,603	1,846
1991	268	2,015	2,283
1992	286	2,008	2,294
1993	404	2,459	2,863
1994	519	2,464	2,983

Data: General Company of Latakia Port
Note: Import includes Transit Cargo

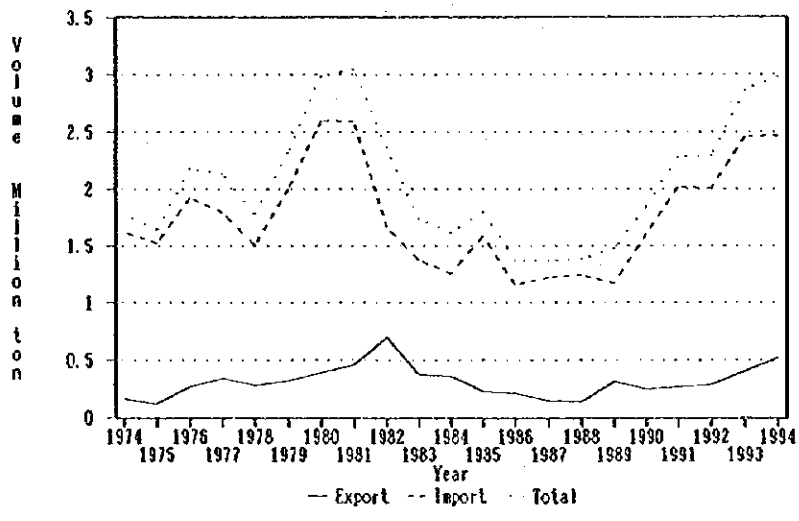


Figure 4.2.1-1 Trends of Cargo Handling Volume in Latakia Port

Table 4.2.1-2 Trend of Export Cargoes by Main Commodity Categories

(Unit: thousand ton)

Commodity \ Year	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Wheat	0	0	0	0	0	5	0	0	3	0	0
Corn/Grain	70	2	15	1	24	123	25	20	19	52	113
Pips	0	0	0	0	1	5	1	3	0	4	6
Peanuts	1	0	0	1	2	0	0	0	0	0	0
Onion	0	0	0	1	1	0	1	0	2	1	0
Cotton	197	115	113	72	46	66	97	102	119	156	205
Tabaco	3	0	0	0	0	0	6	7	4	2	2
Wool	3	2	1	1	2	5	4	2	25	3	3
Leather	2	0	1	2	1	1	2	2	2	1	1
Empty Containers	45	83	66	46	43	47	50	68	74	87	95
Trailers	0	0	1	0	0	2	0	0	2	0	0
Beverage	0	0	0	1	0	3	1	2	1	1	1
Others	42	19	15	22	15	51	57	62	35	97	92
Export Total	362	223	211	146	136	309	243	268	286	404	519

Data: General Company of Latakia Port

Table 4.2.1-3 Trend of Import Cargoes by Main Commodity Categories

(Unit: thousand ton)

Commodity \ Year	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Grain	109	159	89	300	281	197	135	265	304	271	288
Iron & Steel	203	143	130	63	73	75	121	215	231	374	328
Cement	9	2	5	2	5	0	4	2	6	3	4
Rice	0	13	4	4	2	25	30	67	97	113	89
Sugar	76	121	134	98	81	116	148	261	164	178	129
Foodstuff	333	174	119	65	46	56	462	305	141	152	236
Wood & Wooden Products	104	91	68	14	12	53	42	40	88	115	138
Fiber & Textiles	42	52	40	36	36	54	46	71	70	117	111
Meat & Cooking Oil	29	79	56	63	45	53	61	25	35	56	53
Sack	5	13	19	30	9	10	14	26	52	34	42
Fertilizer & Chemicals	2	213	134	216	346	244	169	235	333	464	445
Machine & Equipment	123	171	144	107	108	121	147	144	176	266	306
Others	221	333	199	197	171	229	210	297	271	287	264
Import Total	1255	1565	1140	1194	1215	1233	1587	1953	1969	2428	2434

Data: General Company of Latakia Port

2) Container Cargo

Historical Trends of container cargo volume and percentage of containerization are shown in Table 4.2.1-4.

Container cargo volumes in both export and import stagnated with the respective volumes of about 130,000 tons and about 400,000 tons in the latter half of the 1980s. After that, both volumes have increased steadily.
The shares of containerized cargoes in the volume of containerizable cargoes have shown the same trends as that of the volume.

Trends of number of container by size and estimated number of empty/laden container are shown in Table 4.2.1-5, Table 4.2.1-6 respectively.

The share of 40 foot containers has risen rapidly in the 1990s, reaching 33% of the total box number in 1994. The share of empty containers is estimated to be about 72% in exports but negligible for imports as of 1994.

Table 4.2.1-4 Trends of Container Cargo Volume and Share of Container in Latakia Port

(Unit : thousand ton, %)

	Container Cargo Volume			Volume of Containerizable Cargoes			Share of Container		
	Export	Import	Total	Export	Import	Total	Export	Import	Total
1984	135	389	524	291	943	1234	46.4	41.3	42.5
1985	144	608	752	221	1263	1484	65.2	48.1	50.7
1986	139	438	577	196	921	1117	70.9	47.6	51.7
1987	112	375	487	146	831	977	76.7	45.1	49.8
1988	84	316	400	112	860	972	75.0	36.7	41.2
1989	123	400	523	181	961	1142	68.0	41.6	45.8
1990	156	525	681	219	1331	1550	71.2	39.4	43.9
1991	195	628	823	248	1473	1721	78.6	42.6	47.8
1992	203	678	881	265	1434	1699	76.6	47.3	51.9
1993	272	876	1148	352	1784	2136	77.3	49.1	53.7
1994	337	913	1250	406	1818	2224	83.0	50.2	56.2

Data: General Company of Latakia Port(Container Cargo Volume)
Notes: Containerizable Cargoes are all cargo without Grain and Iron & Steel.

Table 4.2.1-5 Trends of Number of Container Handled in Lattakia Port

	Export			Import			Total		
	20foot (box)	40foot (box)	Total (TEU)	20foot (box)	40foot (box)	Total (TEU)	20foot (box)	40foot (box)	Total (TEU)
1984	18,458	4,936	28,330	18,657	4,842	28,341	37,115	9,778	56,671
1985	28,425	6,948	42,321	29,058	6,394	41,846	57,483	13,342	84,167
1986	22,320	4,880	32,080	21,622	5,098	31,818	43,942	9,978	63,898
1987	18,407	4,609	27,625	18,189	4,459	27,107	36,596	9,068	54,732
1988	15,133	4,267	23,667	14,626	4,271	23,168	29,759	8,538	46,835
1989	17,271	4,610	26,491	18,033	4,919	27,871	35,304	9,529	54,362
1990	23,504	5,022	33,548	24,857	5,170	35,197	48,361	10,192	68,745
1991	27,779	6,868	41,515	31,648	8,377	48,402	59,427	15,245	89,917
1992	29,721	8,531	46,783	28,677	8,547	45,771	58,398	17,078	92,554
1993	32,357	12,793	57,943	32,473	13,537	59,547	64,830	26,330	117,490
1994	33,631	16,517	66,665	33,632	16,783	67,198	67,263	33,300	133,863

Data: General Company of Latakia Port
Notes: Number of Container includes an empty Container.

Table 4.2.1-6 Trends of Estimated Number of Empty and Laden Container in Export

Year	Total Container (TEU)	Empty Container			Laden Container		
		Volume (ton)	Number		Number	Volume (ton)	Volume per TEU (ton/TEU)
			(TEU)	Share (%)	(TEU)		
1990	33,548	50,200	25,100	74.8	8,448	156,088	18.5
1991	41,515	68,100	34,050	82.0	7,465	195,153	26.1
1992	46,783	73,970	36,985	79.1	9,798	202,950	20.7
1993	57,943	87,125	43,563	75.2	14,380	271,742	18.9
1994	66,665	95,271	47,636	71.5	19,029	336,837	17.7

Data: General Company of Latakia Port(Total Container, Volume)
Notes: Unit Volume of empty container is 2 ton/TEU.

3) Transit Cargo

Historical trends of transit cargo volume by main countries and by main commodities are shown in Table 4.2.1-7, Table 4.2.1-8 respectively.

The transit cargo volume which had reached to about 580,000 tons in 1981 decreased rapidly after that and has varied within 10,000 tons since the latter half of the 1980s.
As for the countries, the transit cargo destined for Iraq had a remarkable share in 1981 but in the last decade this traffic has virtually disappeared. Most of transit cargoes have been destined for Jordan in the last decade.
As for the commodities, foods had a remarkable share in the 1980s but decreased after that. In the 1990s, tools & equipment and other cargoes have remarkable shares.

Table 4.2.1-7 Trend of Transit Cargo Volume by Main Countries

(Unit: ton)

Country \ Year	1981	1982	1985	1986	1987	1988
Iraq	195,843	83,596				
Lebanon	3,574	4,194	19		11	
Kuwait	2,257	1,009	23			10
Other Persian Gulf	5,931	1,124		42		265
Jordan	3,015	2,015	5,744	4,276	8,808	2,707
Iran	2,322	2,890				
Saudi Arabia	1,203	1,998	92	100		110
Others	363,129	93,193				
Total	577,274	190,019	5,878	4,418	8,819	3,092

Country \ Year	1989	1990	1991	1992	1993	1994
Iraq						
Lebanon		4	57	24	635	269
Kuwait			119	29		
Other Persian Gulf	119		1,603	35	38	90
Jordan	3,469	5,872	24,073	12,117	5,606	5,966
Iran						
Saudi Arabia	82	20	489	1,801	887	197
Others	13			57	85	8
Total	3,683	5,896	26,341	14,063	7,251	6,530

Data: General Company of Latakia Port

Table 4.2.1-8 Trend of Transit Cargo Volume by Main Commodities

(Unit: ton)

Commodity	1981	1982	1985	1986	1987	1988
Tools & Equipment	85,870	31,174	89		152	1
Chemical Materials	25,072	6,981		82	86	37
Grain	0	0				
Sugar	20	0			2,100	
Foods	75,424	16,165	5,607	3,416	2,066	881
Iron	36,438	17,499				20
Wood	6,144	1,068		278		
Cement	33,564	38,927				
Pavement & Marble	7,273	2,421				
Others	307,547	56,731	182	642	4,433	2,153
Total	577,352	190,019	5,878	4,418	8,837	3,092

Commodity	1989	1990	1991	1992	1993	1994
Tools & Equipment		21	827	2,931	4,141	1,666
Chemical Materials	199	3	1,206	596		125
Grain						
Sugar		2,100				
Foods	177	1,353	4,695	1,398	568	214
Iron	31		23	59	120	657
Wood	615			641	231	175
Cement						
Pavement & Marble						
Others	2,661	2,419	19,590	8,438	2,191	3,693
Total	3,683	5,896	26,341	14,063	7,251	6,530

Data: General Company of Latakia Port

(2) Passenger Traffic

Historical trend of number of passengers is shown in Table 4.2.1-9.
Number of passengers has varied within the range of 25,000 persons to 30,000 persons except for in 1990 and 1992. Most passengers are engaged in sightseeing tours aboard cruiser.

Table 4.2.1-9 Trend of Number of Travel Passengers

(Unit: person)

Year	1987	1988	1989	1990	1991	1992	1993
Number	24,895	31,379	24980	12,750	25,122	9,485	29,287

Data: General Company of Latakia Port

4.2.2 Hinterland

(1) Cargo Volume by Countries

Historical trends of cargo volume by countries in export and import are shown in Table 4.2.2-1, table 4.2.2-2 respectively.

As for exports, South Europe, especially Italy has had a large share for a long time, while shares of North Africa and Asia have increased recently. Especially cargo volume destined for Egypt has increased rapidly since 1990. This trend is assumed to show that container cargoes transshipped at the port of Egypt have increased rapidly.

As for imports, West and East Europe have had a large share for a long time; import volume from USSR and Romania was especially remarkable in 1993 and 1994. As with exports, there has been a rapid increase in the volume of imports from Egypt.

(2) Hinterland

Export and import cargo volume by address of exporter/ importer are shown in Table 4.2.2-3, Table 4.2.2-4.

As for exports, the share of Aleppo is very high because the share of cotton in the export volume is large and cotton & textile industries are concentrated in Aleppo.

As for imports, the share of Aleppo is not so high, while the share of Damascus is higher than export because major exporters for agricultural products and light manufacturing products like textiles and foodstuffs are not concentrated and major importers for consumer goods are concentrated in Damascus.

Table 4.2.2-1 Trend of Import Cargo Volume by Countries

(Unit: thousand ton)

Year	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Turkey	19	26	25	25	96	49	13	75	56	49	60
Cyprus	72	93	75	77	72	103	111	133	103	103	132
Lebanon	0	4	4	16	4	3	3	16	23	23	11
Others	0	1	0		74	78	2	10			
Middle East Total	91	124	104	118	246	233	129	234	182	175	203
Bulgaria	10	52	4	24	45	0	23	63	55	65	14
Romania	23	35	6	39	55	22	10	37	93	166	149
USSR	108	98	51	22	6	33	41	68	85	253	305
Yugoslavia	79	76	46	27	47	76	27	30	38	27	48
Poland	3	7	33	20	5	22	21	49	40	15	18
Hungary	12		11								
East Europe Total	235	268	151	132	158	153	122	247	311	526	534
Greece	36	26	21	14	11	19	18	40	48	74	98
Italy	114	216	134	94	74	107	143	170	153	258	177
France	56	170	211	323	229	107	346	189	148	113	155
Spain	89	67	64	17	18	19	26	36	1	7	13
Others	2	0	5	1	5	1	1	1	15	3	33
South Europe Total	297	479	435	449	337	253	534	436	365	455	476
United Kingdom	30	32	21	18	16	18	28	15	12	8	7
Belgium	88	91	63	130	155	215	248	282	287	306	275
Netherlands	83	100	68	73	40	82	73	74	44	34	46
Germany	76	107	51	45	58	69	66	60	42	71	46
Sweden	21	37	18	15	18	26	22	47	25	26	35
Others	24	43	27	22	19	110	26	56	37	24	15
Middle & North Europe Total	322	410	248	303	306	520	463	534	447	469	424
Egypt	0	0	0	5	10	10	109	237	266	491	524
Tunisia	2	1	1		29	36	26	20	23	7	1
Others	0	0	1	0	10	0	0	1	1	5	2
North Africa Total	2	1	2	5	49	46	135	258	290	503	527
Japan	26	44	22	16	12	14	21	18	17	9	20
China	0	25	22	8	8	9	2	2	24	15	33
Hongkong	21	26	33	19	14	5	3	8	13	3	
Thailand		14	2		0		49	48	13	52	13
Singapore	6	33	19	13	10	20	20	9	25	16	7
Bangladesh	14	26	21	30	9	9	13	14	45	19	37
Sri Lanka	19	18	17	11	12	14	4		5	0	1
Others	13	18	21	15	14	17	13	38	26	22	14
Asia Total without Middle East	99	204	157	112	79	88	125	137	168	136	125
USA	75	7	4	10	6	4	16	30	57	50	23
Canada	28	6	4	5	11	6	6	13	12	14	14
Cuba	64	33	11	26	13	0	24	52	0	1	0
Argentine	8	5	8	2			28		1	16	42
Brazil	10	6	4	0	0	11	4	4	4	7	30
Others											10
North & South America Total	185	57	31	43	30	21	78	99	74	88	119
Other Countries	22	20	8	0	15	3	2	15	26	77	26
Total	1253	1563	1136	1162	1220	1317	1588	1960	1863	2429	2434

Data: General Company of Latakia Port

Table 4.2.2-2 Trend of Export Cargo Volume by Countries

(Unit: thousand ton)

Year	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Turkey	0	0		1	6	35	10	3	3	3	9
Cyprus	10	17	15	18	13	13	13	15	14	13	16
Lebanon	1	1		1		0		0	0	3	16
Others	0	0	0	0	0	0	0	1	0	0	2
Middle East Total	11	18	15	20	19	48	23	19	17	19	43
Bulgaria	3	3				1				3	6
Romania					2	11		2	5	1	1
USSR	32	30	20	20	9	30	27	17	6	6	10
Yugoslavia	11	5	6	4	5	5	2	3	2	1	2
Poland		0			1	1	0	3	2	1	2
Others	1	0	3	1	0	0	0	0	0	0	0
East Europe Total	47	38	29	25	17	48	29	25	15	12	21
Greece	19	5	4	3	3	6	2	13	14	6	6
Italy	66	29	38	24	20	29	57	59	58	52	67
France	8	11	22	12	8	7	10	9	3	5	4
Spain	15	11	15	8	3	3	4	8	4	8	11
Others	5	0			0	0				6	6
South Europe Total	113	56	79	47	34	45	73	89	79	77	94
United Kingdom	16	12	9	5	6	6	3	2	4	6	1
Belgium	11	4	3	3	3	6	8	5	2	4	4
Netherlands	1	0	3	1	1	5	7	9	2	4	3
Germany	25	18	21	3	6	17	23	24	24	26	16
Sweden	0	2	0	0	1	1	3	1	2	2	0
Others	0	5	0	0	0	0	0	0	0	0	2
Middle & North Europe Total	53	41	36	12	17	35	44	41	34	42	26
Algeria	33	12	6	9	16	15	6	3	1	9	21
Libya	3	0	0	1	1	4	2	1	3	3	1
Egypt	0			1	0	0	24	22	93	116	175
Morocco	1	1	1	1			1	5	1	0	
Tunisia	5	4	2	1	3	10	4	4	2	1	5
North Africa Total	42	17	9	13	20	29	37	35	100	129	202
Japan	9	6	5	6	3	4	7	6	4	11	6
China	3	0				2	1		0	4	
India	14				3	11	1			25	64
Hongkong	0			0						11	5
Sri Lanka	19		5			28	3	16			5
Singapore							0	1	0	2	1
Others	14	4	3	0	6	29	0	0	0	6	10
Asia Total without Middle East	59	10	13	6	12	74	12	23	4	59	91
North & South America Total	0	0	0	1	0	5	5	4	3	3	6
Other Countries	36	34	29	23	17	25	14	24	32	63	37
Total	361	214	210	147	136	309	237	260	284	404	520

Data: General Company of Latakia Port

Table 4.2.2-3 Export Cargo Volume by Address of Exporter by Main Commodity Categories

(Unit: ton)

Area / Commodity	Damascus	Homs	Hama	Aleppo	Latakia	Idleb	Unknown	Total
Grain	1,201				53			1,254
Seeds	158	100		52			104	414
Beans	1,585				32			1,617
Wool			128	229				357
Leather & Skin				69				69
Cotton & textile	200	1	44	7,555	9		26	7,835
Foodstuff	829	46		37	259	120	45	1,336
Metal Products	283			3			110	396
Vehicles					14		3	17
Machine & Equipment	44					27	3	74
Chemicals	32	10		30				72
Others	15						2	17
Export Total	4,347	157	172	7,975	367	147	293	13,458
Share (%)	32.3	1.2	1.3	59.3	2.7	1.1	2.2	100.0

Data: Manifest(the first half of December, 1994)
Note: Empty container and empty trailer are excluded from the Table.

Table 4.2.2-4 Import Cargo Volume by Address of Importer by Main Commodity Categories

(Unit: ton)

Area / Commodity	Damascus	Homs	Hama	Aleppo	Latakia	Tartous	Others	Total
Maize	25,578			161				25,739
Rice	180				958			1,138
Fruits				1,946	3,897	385		6,228
Wool	22		66		28			116
Leather & Skin	310			17	73			400
Feed for Animal	578	43		13,742				14,363
Wood & Its Products	1,927			138	2,845			4,910
Sugar	4,592	1,204		2,223	2,118		502	10,639
Flour					9,917			9,917
Foodstuff	1,747	108	55	524	1,893		185	4,512
Paper	2,244		19	407	420	6		3,096
Cotton & textile	689	1	3	1,627	871		287	3,478
Tiles & Marbles	168			17	176	204		565
Metal Products	12,631	264		2,675	3,671	91	64	19,396
Vehicles	202	87	79	431	980	1	101	1,881
Machine & Equipment	4,902	218	101	1,570	950	69	53	7,863
Chemicals	10,395	8,585	64	2,199	1,291	683	183	23,400
Rubber & Tyre	206	22	600	361	712	9	22	1,932
Others	692	100	11	185	296		29	1,313
Import Total	67,063	10,632	998	28,223	31,096	1,448	1,426	140,886
Share (%)	47.6	7.5	0.7	20.0	22.1	1.0	1.0	100.0

Data: Manifest(the fiest half of December, 1994)

4.2.3 Vessels Calling to Latakia Port

Number of calling vessels in 1994 is 1,259, an increase of 1.5% over the previous year. Number of calling vessels has bee increasing since 1990 (see Figure 4.2.3-1). During 1994, the greatest number of vessels called in springr (see Figure 4.2.3-2). Shipsize distribution is shown in Figure 4.2.3-3. More than 30% of the vessels are under 1,000 DWT.

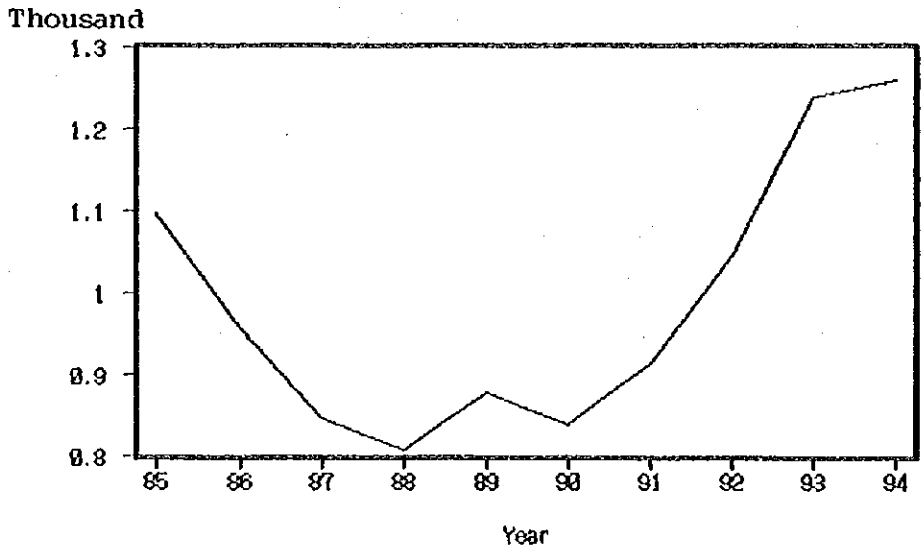


Figure 4.2.3-1 Number of Calling Vessels

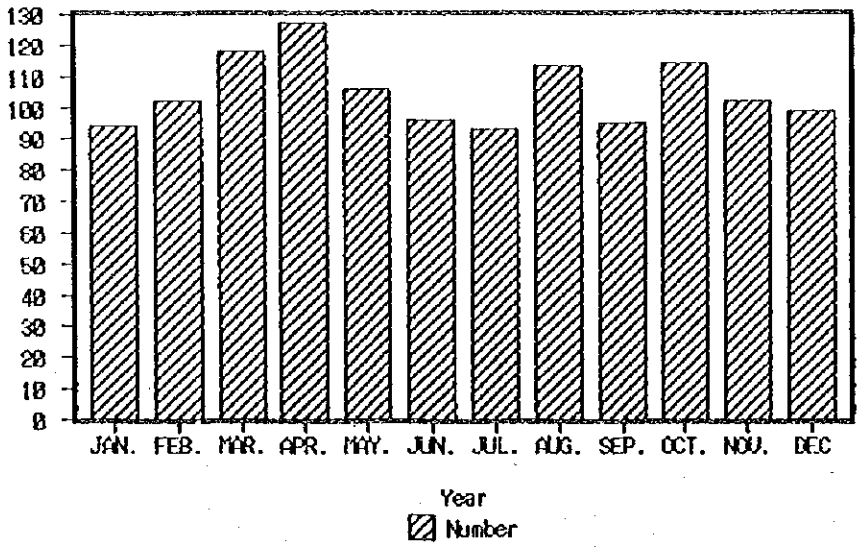


Figure 4.2.3-2 Monthly Distribution (1994)

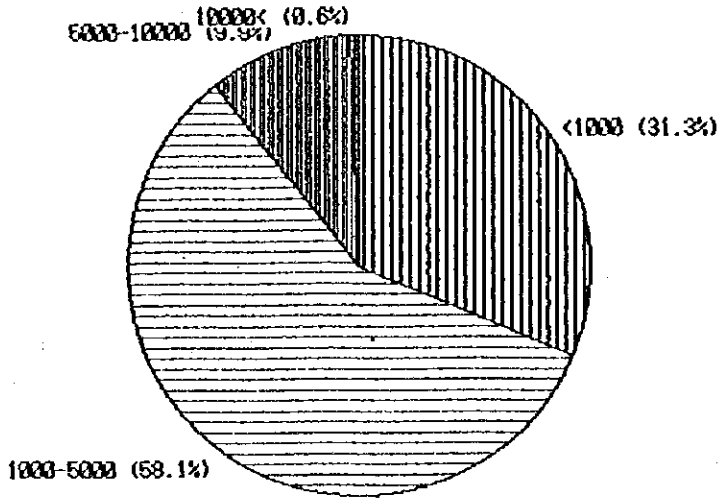


Figure 4.2.3-3 Shipsize Distribution (1994)

Figure 4.2.3-4 describes mooring places of the vessels. Nearly half of the vessels moored in the new port, including the container terminal. Breakwater is utilized as mooring place.

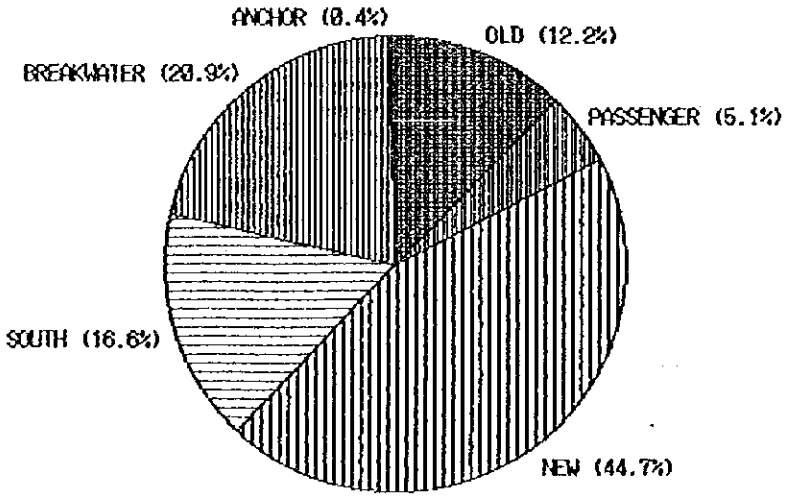


Figure 4.2.3-4 Mooring Place of the Vessels (1994)

4.2.4 Berth Occupancy Rates

(1) Commodities Handled in the Berths

As described above, Latakia Port consists of 3 areas. Old Port, New Port (1st stage), and Inner Port. According to the vessel records, the berths are classified into the following categories.

Old Port (O): 4 quays and a dolphin belong to this category. The majority of cargo handled in the old port are fruits, rice, sugar, textile, cement and other general cargoes.

New Port (N): Since the new port includes all berths constructed in the 1st stage, various cargoes are handled. The major commodities are container, general cargo, steel(pipe, wire), wood and exported commodities - lentil, cotton -.

Passenger Terminal (P): Containers, cotton, general cargoes are also handled in the passenger terminal.

Others : Oil and some steel and general cargoes are unloaded from the anchoring vessels. Breakwater is rarely used as berth.

(2) Berth Occupancy Conditions

Vessel records of the year 1994 are used for the survey. The records of Latakia include the following information.

Vessel Name, Flag, Arrival Time (X), Mooring Time(Y), Departure Time(Z), Origin Port, Destination Port

Waiting period and mooring period are calculated using above information.

Waiting Period(WP) = Y - X

Mooring Period(MP) = Z - Y

The vessels, the mooring period of which exceed 14 days, are eliminated, because these vessels moor not only for cargo handling.
Berth occupancy ratio is calculated as follows.

BOR = TMP / (TWP*NB)

TMP: Total of Mooring Period of vessels
TWP: Total Observation Period
NB : Number of berths of the area

(3) Berth Occupancy Conditions (See Table 4.2.4-1, Fig.4.2.4-1, Fig.4.2.4-2)

Both waiting period and mooring period are longer in the new port area. Among the vessels berthing in new port, container vessels record short mooring period. Berth occupancy rate is high in passenger terminal and low in silo and container terminal.

Table 4.2.4-1 Berth Occupancy Condition

AREA	No. of Vessels	Average Waiting	Average Mooring	No. of Berth	Berth Occupancy Rate
Old Port (Silo)	257 (39)	1.70day (3.15)	2.30day (3.02)	4	40.5 %
New Port	543	1.84	3.05	11	41.3
Passenger	262	3.15	1.67	2	59.8
Container	290	0.69	1.09	3	28.7
Average	1100	1.6	2.52	17	43.3

Note: "Silo" means vessels from which grain is carried into the silo.
"Container" means container or partcontainer vessels that moor in the New Port.

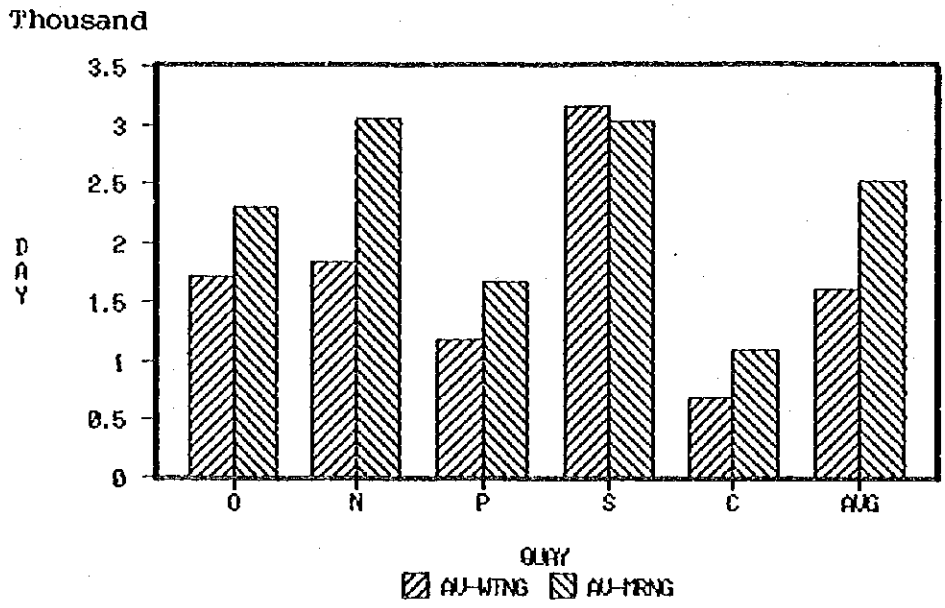


Figure 4.2.4-1 Mooring Condition (1994)

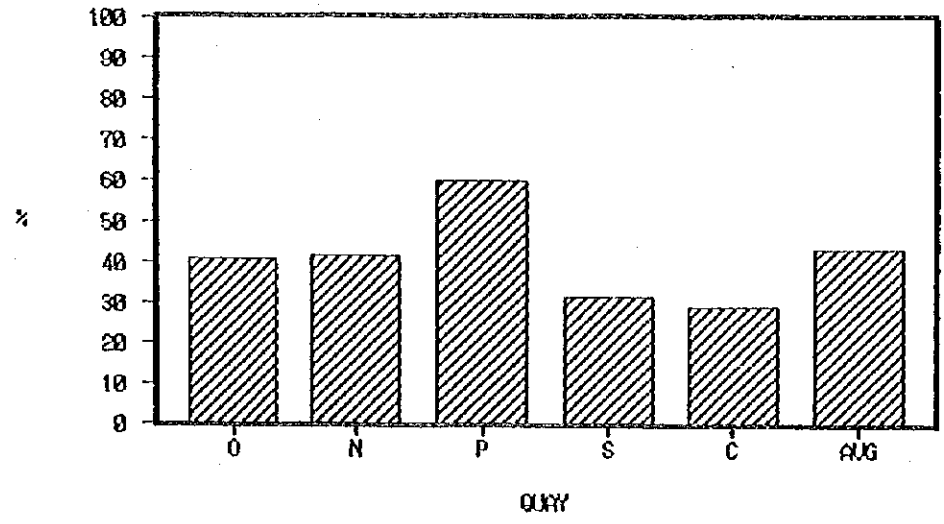


Figure 4.2.4-2 Berth Occupancy Ratio

4.2.5 Cargo Handling Productivities

Commodity-wise cargo handling productivities per vessel are calculated by using the records of vessels berthing and cargo handling operations as follows:

CHPi = VCi / MPi
CHPi: Cargo Handling Productivity by Commodity(i) per vessel laden with the commodity(i)
VCi : Cargo Volume of Commodity(i) discharged/loaded from/onto a vessel laden with the commodity(i)
MPi: Mooring Period of a vessel laden with Commodity(i)

The resulting average cargo handling productivities by commodity are described in Table 4.2.5-1, Fig.4.2.5-1.

Table 4.2.5-1 Cargo Handling Productivities of Major Cargo

COMMODITY	TOTAL VOLUME (ton)	TOTAL MOORING PERIOD(day)	AVERAGE CARGO HANDLING PRODUCTIVITY
General	618,196	759.63	33.91ton/hour
Maize	160,407	107.25	62.32
Steel	155,827	309.13	21.00
Flour	140,145	70.88	82.38
Wood	72,025	282.08	10.64
Container	101,427*	316.10	10.05*
Rice	48,927	112.00	18.20
Sugar	45,000	59.42	31.56
Banana	34,888	57.62	25.23
Cotton	21,558	48.33	18.59
Lentil	17,109	77.37	9.21
Chemical	14,369	28.67	20.88
Cement	6,455	21.08	12.76
Machines	3,912	9.71	17.04
Equipment	3,684	13.33	11.52
Car	3,097	31.04	4.16

Note: Commodities included in the table is only that are carried solely by vessels.
Volume and Productivity of container are TEU and boxes respectively.

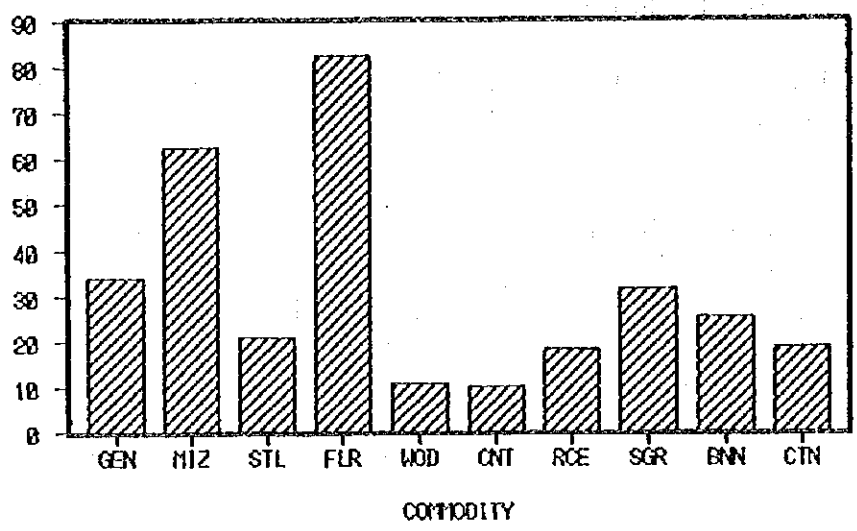


Figure 4.2.5-1 Cargo Handling Productivities

Note: GEN:General, MIZ:Maize, STL:Steel, FLR:Flour, WOD:Wood, CNT:Container
RCE:Rice, SGR:Sugar, BNN:Banana, CTN:Cotton

(2) Formulas to Estimate Cargo Handling Productivity

The cargo handling productivity for each cargo handling system on each cargo for short time (taking no account of berthing time, preparation and arrangement time for handling, long term interruption due to some troubles or others reasons and required wind-up time) are shown in the following formula. The values which are given by the Latakia port general company are shown in single parenthesis [ ] and the cycle times which are measured by the study team at site are shown in double parenthesis[[ ]]

1) Dry bulk(grain) Cargo

A. Loading by loader at the exclusive berth

$$Qbl = Qp \times Ko \times N \times Kw$$

Qbl: Actual loading capacity per hour (t/h/s)
Qp: Nominal capacity [150 t/h]
Ko: Operation efficiency [....]
N: Number of loaders to be used [2]
Kw: Working time efficiency [....]

B. Unloading by portable pneumatic unloaders at the general cargo berth

Qbu = Qp x Ko x N x Kw

Qbu: Actual unloading capacity per hour (t/h/s)
Qp: [100 t/h], Ko [60%],
N: Number of unloader to be used [depend on ship size. usually .....]
Kw: [.....]

2) Break-bulk Cargo

A. Bagged cargo unloading by the combination of quay side cranes and ship gears using rope sling.

Q = Wb x Nbq x Tbq x H x Kwq x Gq + Wb x Nbs x Tbs x H x Kws x Gs
= Wb x H (Nbq x Tbq x Kwq x Gq + Nbs x Tbs x Kws x Gs)

Wb: Weight of the bag [Rice: 25~50kg, Sugar: 50kg, Grain: 50kg]
Nbq: Number of bag per one lifting by quay side crane [60bags by 6t, 30bags by 3t]
Tbq: Number of handling times per hour by quay side crane [15times]
H: Working hours per day [07.00~15.00, 15.00~23.00 16 hours]
Kwq: Working efficiency by quay side crane handling [60%~70%]
Gq: Number of gang of the quay side crane [1~2. Max 4. in case of 2 ship gears, 2 quay cranes total 4 gangs]
Nbs: Number of bag per one lifting by ship gear [60~70 bags]
Tbs: Number of handling times per hour by ship gear [8~10times]
Kws: Working efficiency by ship gear handling [60~70%]
Gs: Number of gang of ship gear [2~4]
Remarks: The number of quay side cranes to be used is decided by the captain and that information is informed by the captain in advance of her entrance.

B. Syrian cotton loading

a. ship with ship gears

Q = Wq x Nq x Tq x H x Kq x Gq + Wq x Nq x Ts x H x Ks x Gs

Wq: Weight of the cotton [some time 300~350kg/bag, usually 400~450kg/bag]
Nq: Number of bag per one lifting by quay side crane [4~6bags]
Tq: Number of handling times per hour by quay side crane [12times] [[15times]]
Gq: Number of gang of the quay side crane [2] [[2~3]]
Ts: Number of handling times per hour by ship gear [8] [[12]]
Gs: Number of gang of the ship gear [2~4] [[1~2]]
H: [16], Kq: [0.65], Ks: [0.65]

b. ship without ship gear

Gp: [Depend on ship size and number of hatch. Large ship: 4]

C. Paper role unloading by quay side cranes

Q = Wp x Np x Tp x H x Kp x Gp

Wp: Weight of paper role [200kg and 400kg]
Np: Number of role per lifting [200kg - 4 roles, 400kg - 2 roles]
Tp: Number of handling per hour [25 times]
Gp: Number of gang [Normal 3, Max 4]
H: [16], Kp: [0.65]

D. Timber bundled unloading by the combination of quay side cranes and ship gears

By 6 t quay side crane
Q = Wt x Tt x H x Kp x Gp + Wt x Ts x H x Kp x Gs

Wt: Average weight of per lifting by 6 t quay side crane [4t]
Tt: Number of handling per hour by quay side crane [10 times]
Gp: Number of gang [2]
Wt: Average weight of per lifting by ship gear [5t~6t]
Ts: Number of handling per hour by ship gear [6]
Gs: Number of gang [2~3]
H: [16], Kp: [0.65]

E. Coiled Steel unloaded by 16 t quay side cranes

Q = Wc x N x T x H x K x G

Wc: Weight of coiled steel per one coil [3~4t]
N: Number of coil per one lifting [2]
T: Number of handling per hour[8~10]
G: Number of gang [2]

F. Long Steel Material unloading

a. Less than 6 t unloading by 6 t quay side cranes

Ws: [4t], T: [6]
Gs: [In case of with ship gear:2~3,In case of without ship gear:3~4]
Remarks: Most calling ship to be called are ships without ship gear.

b. Over than 6 t unloading by 16 t Quay side cranes

Ws: [12~13t], T: [6], G:[2]

3) Container Handling

A. Container Handling by ship cranes

Cycle Time: [About five(5) minutes]
Number of gang: [2~4 Gangs] {[1~2]}

B. Ro/Ro system [About 20 Movies]

4.2.6 Dwelling Times of Cargo in the Storage

(1) Container Cargo

1) Imports

All of the discharged containers are stored at the container yard in the port. The average dwelling time of these containers is between one to two weeks. About 60% of loaded containers are un-stuffed at the container yard and these cargoes are carried out by trucks. Twenty percent of the containers are un-stuffed in the Container Freight Station (CFS) and then stored in CFS for about one week. The remaining 20% of the containers are carried out of the port in boxes. Half of the container cargoes get customs clearance within the port, other half get customs clearance at the regional customs offices outside the port.

2) Exports

Almost all of the container cargoes are stuffed into container boxes at the container yard. Major exported cargo is cotton. Other cargoes are tobacco and other foodstuffs. Average dwelling time of loaded container is around 10 days.

(2) Other Cargo

Average dwelling times of other cargoes by type are as follows.

Grain : 15 - 20 days (Grain Silo - Capacity of 35,000 ton)

Sugar : 15 - 20 days

Wood : 2 - 3 weeks

General Cargo : 1 - 2 weeks

Feed : 1 - 2 Months

Cars, Machines : 2 weeks

4.3 Cargo-Handling System

4.3.1 Container-Handling

In Latakia Port, import containers are unloaded from ship to aprons or directly to trailers by using ship's cranes, mobile cranes or floating crane. In the former case, containers are loaded onto trailers or shifted to the place for switching container to straddle carriers by using forklift trucks. Then, those containers are handled by trailers or straddle carriers and then are stacked on the right position within the marshaling yards for storage. In the latter case, containers are moved to the back side marshaling yard by trailers and then lifted off by forklifts or straddle carriers.

On the other hand, containers are also unloaded/ loaded from/to Ro-Ro vessels. In this case, import containers are brought out from Ro-Ro decks by trailer/maffy with trailers or directly by forklifts. In use of trailers, forklifts are in operation in Ro-Ro's holds.

As for exports, container movements within the container yard are reversed.

Almost all containers are stored at container yard after unloading from ships. According to an interview with an officer of the exploitation office, the storage period of container boxes at container yard from unloading to loading is as follows:

About 30% of unloading containers: approximately 30 days
About 70% of unloading containers: approximately 45 days

Seventy-five percent of unloaded container cargoes are un-stuffed at the yard and then the container cargoes are transported outside the port by consignee. The un-stuffing work is done anywhere within the container yard because the un-stuffing area is not fixed. In view of operational safety and damage, it is advisable to separate stuffing /unstuffing yard from stacking yards.

Fifteen percent of unloaded container cargoes is stored in sheds. The dwelling period of the container cargoes at the sheds is about one week in general. Then, these cargoes go outside the port after customs clearance.

Half of the remainder(5% of the unloaded container cargoes) is transported to consignee by container trailer after the customs clearance.

The remainder(5% of the unloaded container cargoes) is transported in bonded by container trailer to customs areas at the seat of prefectural offices. Then, the contents of these containers are delivered to consignees after being stripped from the containers and cleared from the customs areas.

Almost all empty containers are stored at the container yards within the port. Seventy two percent of the export containers are returned to the ships without

contents. The remainder(28% of the export containers) is loaded to ships after being stuffed at the container yard. About 80 percent of full containers for export(22% of export containers) are transported by the same shipping lines which import these container boxes. The remainder of the full containers(6% of export containers) for import and export is transported by different shipping companies. Figures 4.3.1 and 4.3.2 show the container flow for import and export, respectively.

The export container cargoes are stored approximately one week at the container yard after being stuffed into containers. Then, the containers are loaded onto ships.

There are eight container yards at Latakia Port namely 4B, 6, 5A, 5B, 9, 14A, 14B and 14C which are controlled by operation office at each yard. Operation in the yard is controlled manualing using the operation board. For the container storage, the container number and the bay number of slots at the container yards are registered on the operation board. Viz., there is no registration for the row number of slots. Therefore, the exact location of storage containers is not shown on the paper tags in the board. The container yards are allotted to each shipping company, namely C.M.A., Nedlloyd, N.Y.K., Kordano, Salis, Sinny, Fast, Pollish Ocean, Azof Danub, D.S.R., Yugoslav, Italian shipping line, English shipping line and Others(for irregular ships). Viz., Containers are stored separately at the area for each shipping line.

At Latakia Port, container ships berth mainly at Passenger berth at the old port area and new container berths at the new port area.

The area of new container terminal at Latakia Port is 240,000 square meters including quay and a Ro/Ro ramp. The depth and length of the quay are approximately 13.3 meters and 450 meters respectively. There is a four storied building and a container freight station in this yard. But, plugs for refrigerated containers and quay-side container gantry cranes are not yet installed. The yard has two gates for vehicles which are located at the north and north-east sides of the yard. At present, only the latter gate is usable as the former gate is not yet completed. This yard has railway facilities in the west side of the yard. The gate for railway wagons is located next to the former gate.

Official cargo handling time of container cargo is from 07:00 hrs. to 15:00 hrs. for the first shift, from 15:00 hrs. to 23:00 hrs. for the second shift and from 23:00 hrs. to 07:00 hrs. for the third shift.

Based on observation of container handling, there seems to be a lack of quay-side container gantry cranes. As to forklifts for container, the number of forklift seems to be inadequate. The cycle time of ship crane is about 4 minutes(net cycle time) and number of workers per ship crane is 7 persons (ship's crane operator :1, watchman:1, on board worker:2, worker at apron:1, fork lift driver:1, straddle carrier driver:1).

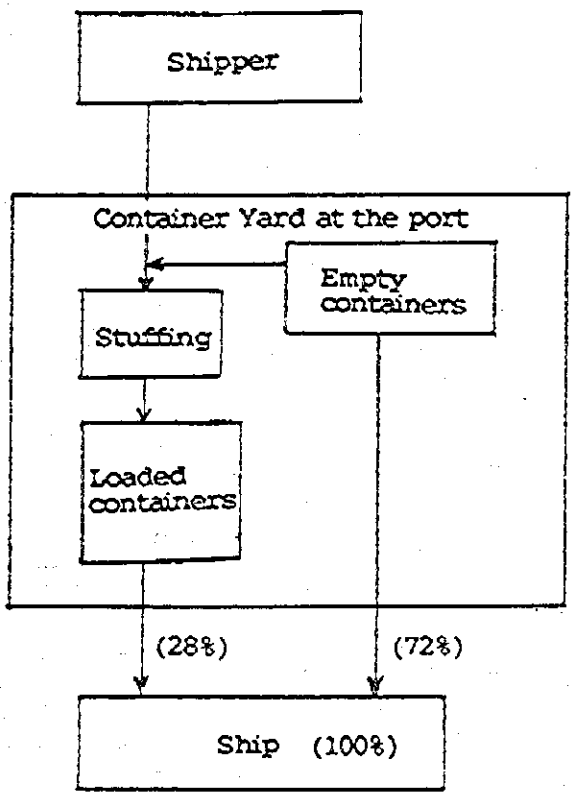


Figure 4.3.2 Export Container Flow

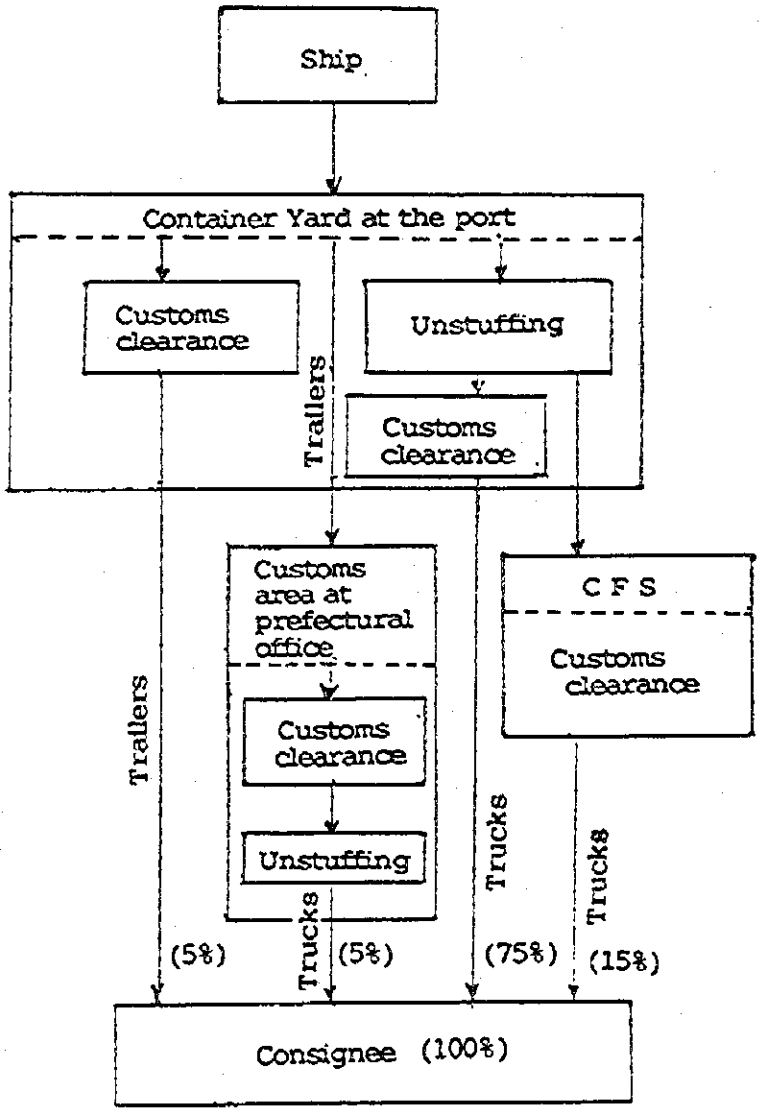


Figure 4.3.1 Import Container Flow

4.3.2 Handling of Conventional Cargo

Cargo handling of conventional cargoes (except import bulk cargo) between a vessel and a quay is done by quay cranes or ship's cranes in general. Then, these cargoes are moved to storage facilities near the area behind the berth of the calling ship in the port or warehouses of consignees out-side the port. There are four receiving methods for conventional cargoes unloaded at the quay as follows:

1) Cargoes are unloaded from a ship on to apron.
2) Cargoes are unloaded directly from a ship on to 2nd or 3rd floor of warehouses by quay cranes.
3) Cargoes are unloaded from a ship on to trucks at an apron.
4) Cargoes are unloaded from a ship to wagons at an apron.

Some portion of bagged cargo, heavy and long cargo(for example iron bars, pipes and coils, logs, lumber and timber) are directly loaded on to trucks or railway wagons(in the cases of 3) and 4)) from a ship.

After being unloaded from a ship to a quay, cargoes are stored in the port or directly brought out from the port to consignees. General sectors can directly deliver without storage in the port. The private consignees can't directly receive their cargoes along side a vessel in general. But, if permitted by customs, direct delivery to the private consignee is possible. As to the storage of conventional cargoes, valuable cargoes(for example electric goods and machinery), bags, cases, wood products, veils, part of barrels and paper are stored at warehouses in general. Long and heavy cargo such as iron bars, coils, pipes, lumber, timber and logs are stored at open yards in general. In the storage area, the cargoes are kept per gathering of each B/L.

Official cargo handling time of conventional cargo at Latakia port is from 7 o'clock in the morning to 3 o'clock in the afternoon for the first shift and from 3 o'clock to 11 o'clock in the evening for the second shift. But, according to the observation, actual cargo handling time of these cargoes at Latakia port is from 8 or 8.15 to 2.15 or 2.30 and from 3 or 3.15 to 6 or 7 in general. The main reasons for the difference are a result of preparation time and lack of lighting facility.

(1) Break Bulk Cargo

Cargo handling of break bulk cargoes at Latakia port is not specialized to the berth. Therefore, break bulk cargoes can be handled at any berth except silo pier, east and north quay at internal dock and 7A berth at the old port area and from berth 13 to 15 at the new port area.

The percentages of direct delivery and indirect delivery for imported Sugar and fertilizer are about 25 percent and 75 percent, respectively. These cargoes are stored at warehouses. The percentage of direct delivery for exported cotton is 70 percent.

According to the observation, the number of workers per crane and cycle time of crane for cargo handling of cases, bags and drums are shown in Table 4.3.1.

For loading on to truck, much loading time is spent for the protective arrangement of bags to prevent them from falling during transportation. Generally, the number of bags loaded exceeds the truck's capacity.

Because storage yards in the area behind berths 12 to 14 at the new port area are divided by the rail way, the cargo handling between the apron and the storage yard can not be conducted smoothly.

Because there seems to be a shortage of suitable attachments to the fork-lift for cargo handling of paper rolls, much cargo handling time is spent loading paper rolls on to trucks. In addition, paper rolls are often damaged.

Table 4.3.1 Number of Cargo Handling Workers and Cycle Time of Crane for Break Bulk Cargo

Packing style	Number of workeres			Cycle time of crane	Note
	Crane operater (persons)	Worker (on board) (persons)	Worker (at apron) (persons)	(minutes)	
Cases	1	3	2	2.4	Pallet
Bags	1	3	2	3.9	
Drums	1	3	2	2.0	Pallet

Cycle time of crane: Net cycle time.

(2) Heavy Cargo/Long Goods

The heavy cargoes and long goods are handled mainly from berth 10 to 12A berth at the new port area. For the old port, the heavy cargoes are handled at the passenger berth.

Based on observation, the number of workers per crane and cycle time of the crane for cargo handling of iron bars and pipes are shown in Table 4.3.2.

Also based on observation, there seems to be an insufficient number of large capacity fork-lifts and the attachments to the fork-lift for iron bars, iron rolls and long bundled cargoes.

Table 4.3.2 Number of Cargo Handling Workers and Cycle Time of Crane for Heavy Cargo/Long Goods

Packing style	Number of workeres			Cycle time of crane
	Crane operater (persons)	Worker (on board) (persons)	Worker (at apron) (persons)	(minutes)
Iron Bar	1	3	1	5.2
Pipes	1	3	2	5.2

Cycle time of crane: Net cycle time.

4.3.3 Ro-Ro Operations

The Ro-Ro ships are berthed mainly at the main wharf of the old port area, from number 7 berth to 9 berth and number 14 berth at the new port area. The container cargo handling of Ro-Ro vessel is handled by the fork-lifts and the special trailers which have a low chassis.

According to observation, there are approximately 15 people engaged in cargo handling, including drivers of cargo handling equipment. The cargo handling equipment and a part of the workers belong to the shipping company.

Some of the calling Ro-Ro ships do not berth at the Ro-Ro ramp of the new container yard. Therefore, the trailer can't smoothly cross the bridge between the ship and quay.

4.3.4 Grain Handling

The silo facility at Latakia Port was constructed for export grain in 1985. The total storage capacity of the silo is about 35,000 tons. There are three receiving lines on land side whose capacity is 100 tons per hour per line. The loading facilities from silo to ship have two lines whose capacity is 150 tons per hour per line.

The major commodity for import is maize, of which approximately 150,000 tons was imported and stored in silo in 1994. Maize is distributed by some 5,000 lorries as of 1994. For export, the major commodities are wheat and barley. The ratio of the cargo volume between the import and export is about 88.5 percent and 11.5 percent respectively. Number of calling silo-related ships is 31 in 1994.

There are six portable pneumatic diesel unloaders whose nominal capacity is 100 tons per hour per unit.

The import silo-cargo does not directly enter the silo. The import cargo is unloaded to lorries by the portable unloader. The cargo is ther transported to the dumper at the silo facilities.

The formation of cargo handling workers for unloading from ship to silo is as follows:

8 workers/unloader----------on board and operator of unloader
(Number of above workers varies according to number of unloaders.)
2 workers----------at the dumper
4 workers----------watcher on the quay
3 or 4 workers----------operator of silo

According to the observation of cargo handling with portable pneumatic diesel unloaders for import maize, the productivity of cargo handling is approximately 14 minutes/(truck)/(2 unloaders). The loading volume per truck is about 35 tons on average according to the interview with an officer at the dumper. Viz., the cargo handling productivity for the unloader is approximately 75 tons an hour per unit.

Workers engaged in handling of import bulk cargo with the portable pneumatic unloader face very foul conditions because the maize powder is dispersed through out the area of the handling berth.

After cargo handling between the ship and trucks for import grain handling, the bulk cargo is transported to the dumper at silo by trucks. Thus, the cargo handling cost at port is more costly than the direct cargo handling operation between the ship and silo.

Table 4.3.3 Standard Cargo Handling Productivity at Latakia Port

Cargo	Crane	Direct withdrawal		Entry cargo to shed			
				Back shed		Front shed	
		Number of workers	Quantity producted	Number of workers	Quantity producted	Number of workers	Quantity producted
Bonds	Quay crane	6	80	8	50	7	60
	Ship's crane	7	80	10	50	9	60
Container	Quay crane	6	60 boxes	7	40 boxes	-	-
	Ship's crane	7	60 boxes	9	40 boxes	-	-
Pallet or rolled	Quay crane	6	60	8	50	8	25
(less than one ton)	Ship's crane	7	60	10	50	10	25
Weights and equipment	Quay crane	6	130	8	100	-	-
more than 20Kg	Ship's crane	7	130	10	100	-	-
General cargo	Quay crane	12	50	21	40	19	45
	Ship's crane	13	50	23	40	21	45
Pallets	Quay crane	6	75	8	60	9	65
(more than one ton)	Ship's crane	7	75	10	60	11	65
Flour,sugar and rice	Quay crane	12	100	21	50	19	70
weight 100-50Kg	Ship's crane	13	100	23	50	19	70
Pre bound ?	Quay crane	6	140	9	100	5	20
	Ship's crane	7	140	11	100	7	20
Chemical,cement and	Quay crane	12	70	21	35	19	50
others(bag)	Ship's crane	13	70	23	35	19	50
Bulk less than 20Kg	Quay crane	12	70	21	40	19	55
	Ship's crane	13	70	23	40	19	55
Bale more than 100Kg	Quay crane	13	70	15	60	-	-
	Ship's crane	14	70	17	60	-	-
Jute	Quay crane	6	60	7	50	-	-
	Ship's crane	7	60	9	50	-	-
Barrels	Quay crane	12	80	12	50	11	60
(100 kg and more)	Ship's crane	13	80	14	50	15	60
Barrels	Quay crane	12	60	19	40	19	50
(50 kg-100Kg)	Ship's crane	13	60	21	40	19	50
Barrels	Quay crane	12	50	21	30	2	40
(less than 20Kg)	Ship's crane	13	50	23	30	2	40
Iron 6 m or more	Quay crane	6	150	8	110	-	-
less(weight 3tons)	Ship's crane	7	150	10	110	-	-
Iron more than 6m	Quay crane	6	130	8	100	-	-
(Weight 1-3tons)	Ship's crane	7	130	10	100	-	-
Iron less than 1ton	Quay crane	7	120	9	80	-	-
per bondle(6m or less)	Ship's crane	7	120	10	80	-	-
Iron 1ton per boundle	Quay crane	7	100	9	60	-	-
(length 6m or more)	Ship's crane	7	100	10	60	-	-

Souce:Latakia General Port Company

Figure 4.3.3 Location of Berth and Container Yard at Old Port Area in Latakia Port

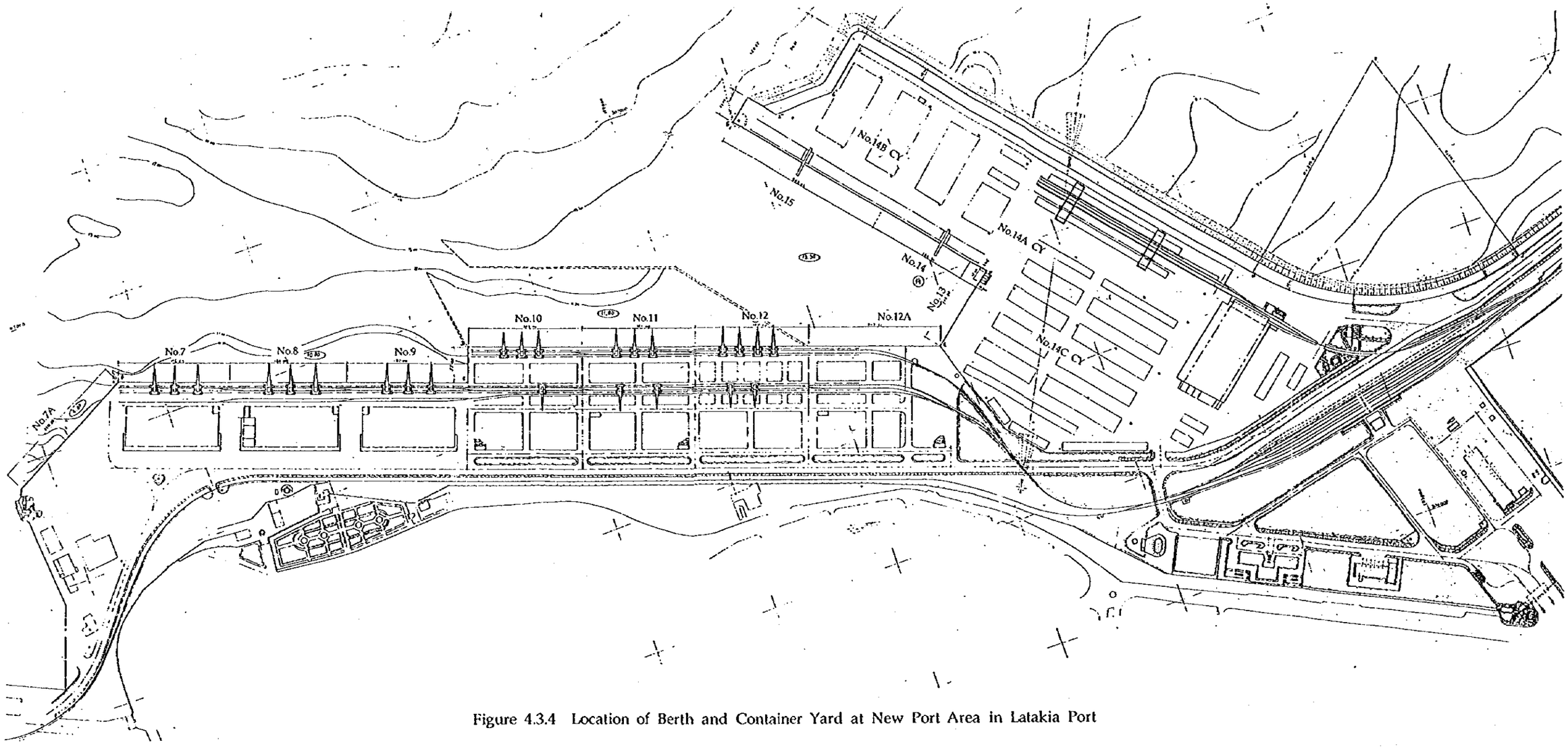


Figure 4.3.4 Location of Berth and Container Yard at New Port Area in Latakia Port

4.4 Port Services

4.4.1 Pilotage /Tug services

(1) Existing Tug boats and Pilot boats

Port service boats (included floating cranes) in Latakia port are listed in Table-4.4.-1-1.
The port is equipped with 2 floating cranes, 4 tug boats and 12 pilot/general service boats.
Most of them are very old, about 24 years of age on average; the oldest is 39 years of age.

Table 4.4.1-1 List of Service Boat at Latakia Port

Type	Name	Built Year	Main Dimensions			Main Engine	Material	Remarks
			L	B	D			
Floating Crane	Noraldiem	1958	40.36	19.36	1.3	ps	Steel	100t sel propell
	Hafez	1976	36.52	18.72	1.6	810	Steel	32t self propell
Tug Boat	Aljolan	1978	29.2	7.25	3.25	1100	Steel	Bollard 11t
	Brada	1956	28.22	6.5	2.6	800	Steel	Bollard 8t
	Zat al Swarl	1957	28.22	6.5	2.6	800	Steel	Bollard 8t
	Tahrir	1976	18.5	5.8	2.35	750	Steel	Bollard 7.5t
Port services	Noaman	1976	15.9	4.8	2.25	325	Steel	Boalld 3.5t
	Ogarit	1976	15.9	4.8	2.25	325	Steel	Bollard 3.5t
	Fateh	1968	16	4.5	2.2	290	Steel	Bollard 3t
	Al gazeir	1961	155	4.25	1.8	265	Steel	Bollard 3t
	Shaden	1973	16	4.8	25	300	Steel	Bollard 3t
	Alfrat	1961	15	3.2	0.95	106	Steel	
	Zohier	1992	8.1	2.91	0.5	136	Wooden	
	Abdallah	1968	13	3.8	1.1	165	Steel	
	Ayham	1975	15	3.6	1.3	148	Steel	
	Bashar	1975	14	3.8	1.1	190	Steel	
	Alianan	1968	13.5	3.75	1.5	185	Steel	
	Lobna	1975	8.2	2.7	0.7	25	Wooden	