

## Chapter 2 Present Conditions of the Port of Constantza

### 2.1 Site Conditions

The port of Constantza is located at the west coast of the Black Sea, at about 179 nautical miles from the Bosphorus and 85 nautical miles from the mouth of the Sulina branch of the Danube. Its geographical coordinates are:

Latitude:  $44^{\circ}10'N$ , Longitude:  $28^{\circ}39'E$

The port consists of the old port to the north and the new port to the south. The north port is fully operational and it covers 484 ha of land and 305 ha of water area. The south port is partly operational and it covers 610 ha of land and 2,227 ha of water area at present. In the south port area, there is the entrance to the Danube-Black Sea Canal, which is part of the Rhine-Maine-Danube waterway.

The south port has also dedicated river/maritime basin for transshipment of cargo into barges.

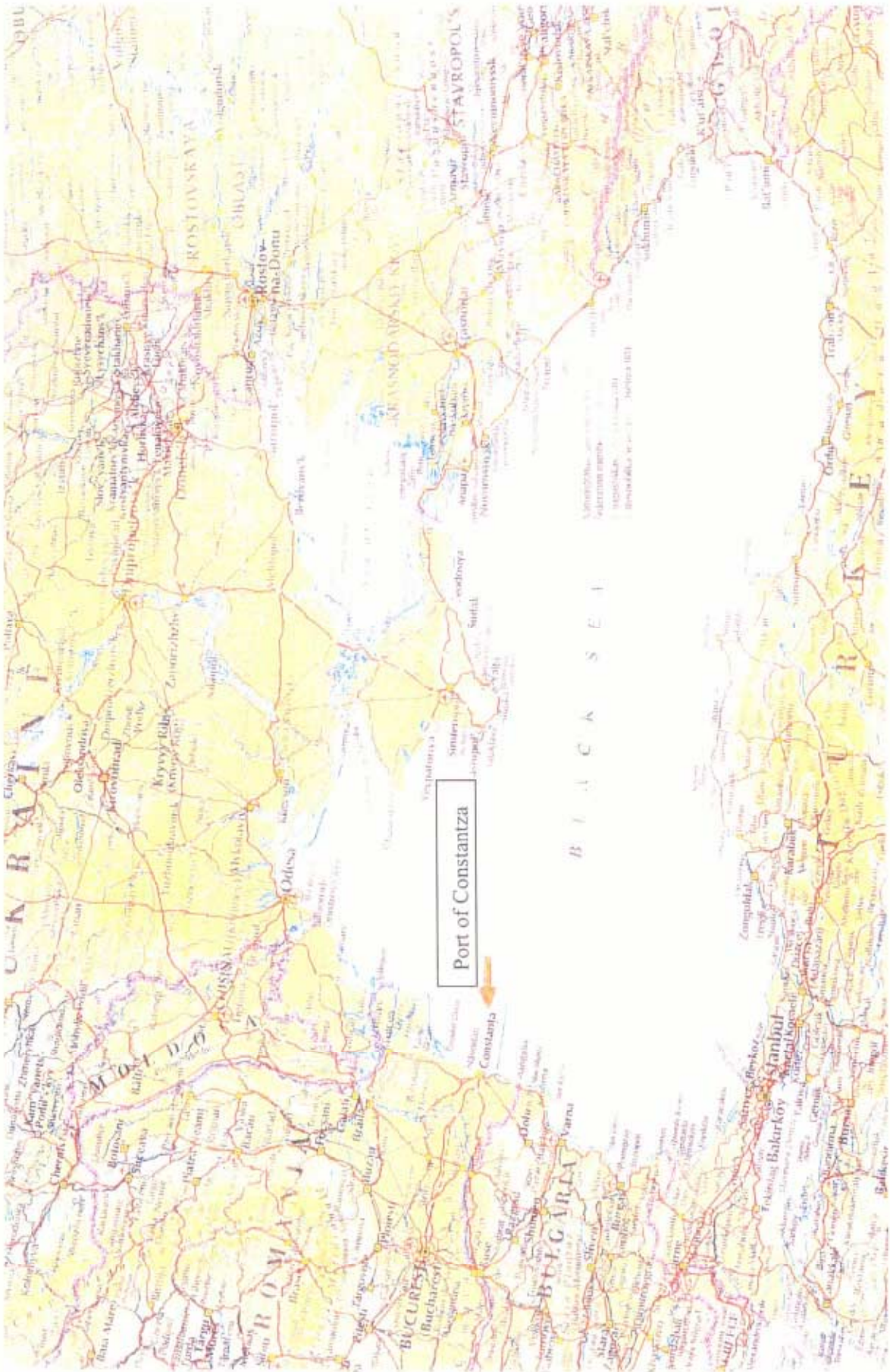
Fig. 2.1.1 shows the location of the port of Constantza and Fig. 2.1.2 shows the map of the port of Constantza.

Table 2.1.1 shows the outline of the port, however as for the final status, there is no planned year of completion nor concrete plan, hence further consideration would be needed.

Table 2.1.1 Outline of the port of Constantza

	Unit	North Port	South Port		Total	
		Existing	Existing	Final	Existing	Final
Total Area	ha	789	2,837	2,837	3,626	3,626
-Land	ha	484	610	1,300	1,094	1,784
-Water	ha	305	2,227	1,573	2,532	1,842
Breakwater	km	3.5	10.5	11.5	14.0	15.0
Quays Length	km	15	10	50	25	65
Number of Berth	No.	82	50	200	132	282
Depth in the basin	M	7.2-14.5	7.0-19.0	7.0-22.5	7.0-19.0	7.0-22.5
Traffic Capacity	mil. Ton/year	63.5	20.0	170.0	83.5	233.5
-dry goods	mil. Ton/year	43.5	10.0	160.0	53.5	203.5
-liquid goods	mil. Ton/year	20.0	10.0	10.0	30.0	30.0
Maximum ship capacity						
-dry goods	D.W.T	65,000	150,000	165,000	150,000	165,000
-liquid goods	D.W.T	80,000	150,000	250,000	150,000	250,000

Source : “Constantza city & port map”, “Romania Ports 2000, Ministry of Transport”



Port of Constantza

Fig. 2.1.1 Port of Constantza



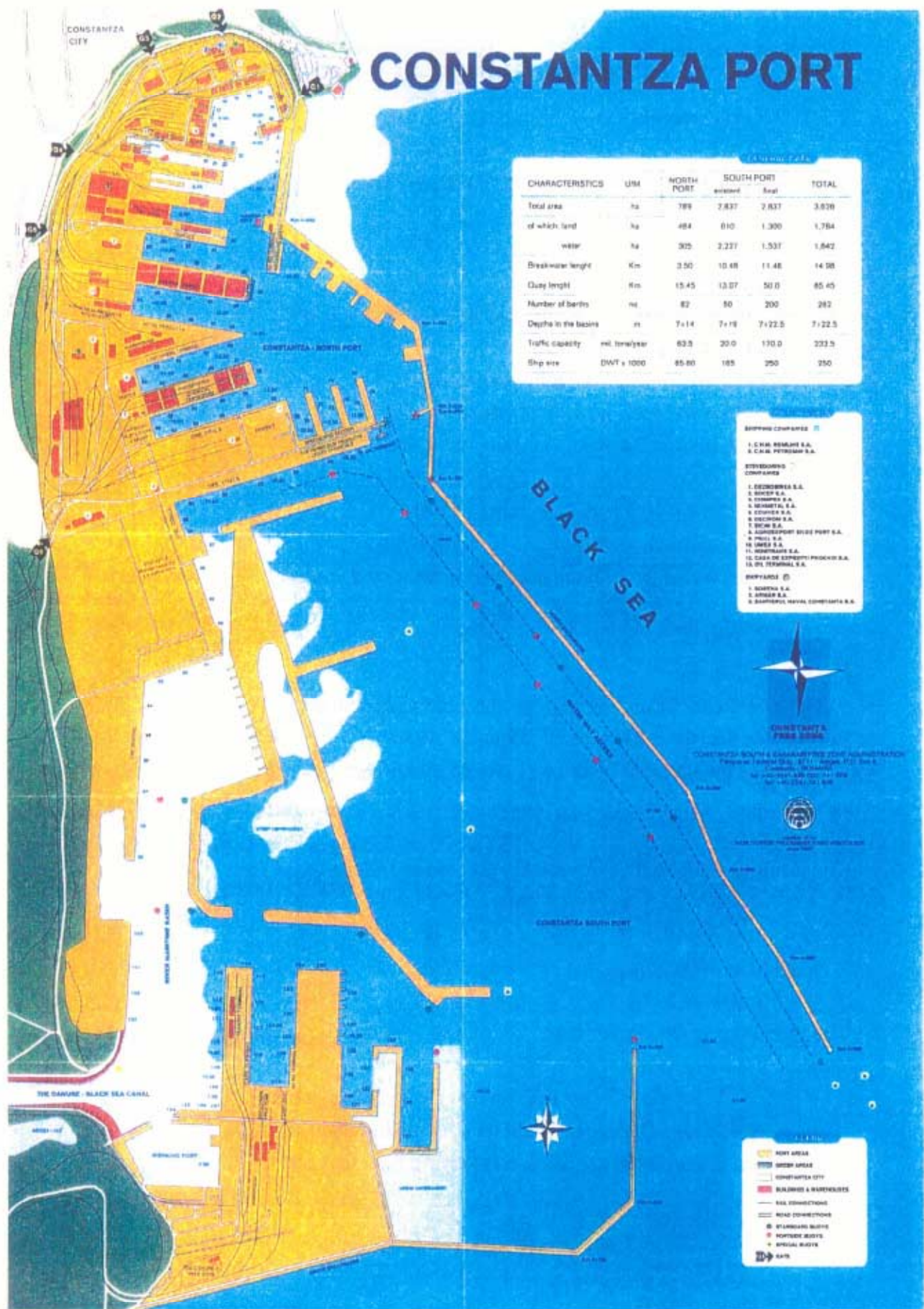


Fig. 2.1.2 Map of the port of Constantza

## 2.2 Port Facilities

### 2.2.1 Overall Layout

Overall layout of the port including approach channel and anchorage is shown in Fig. 2.2.1

#### (1) Approach channel

Traffic separation scheme is introduced in the port as follows:

##### 1) Separation zone

The separation zone has the following borders:

Lat $44^{\circ}4.42'N$ ,	Long $28^{\circ}43.22'E$
Lat $44^{\circ}4.78'N$ ,	Long $28^{\circ}43.76'E$
Lat $44^{\circ}0.19'N$ ,	Long $28^{\circ}49.96'E$
Lat $43^{\circ}50.81'N$ ,	Long $28^{\circ}49.44'E$

##### 2) Entrance channel

The entrance channel into the port has the general direction NW. True course is  $316^{\circ}$ .

Lat $44^{\circ}0.74'N$ ,	Long $28^{\circ}50.73'E$
Lat $44^{\circ}5.35'N$ ,	Long $28^{\circ}44.53'E$

##### 3) Exit Channel

The exit channel from the port has the general direction SE. True course is  $136^{\circ}$ .

Lat $44^{\circ}3.88'N$ ,	Long $28^{\circ}42.44'E$
Lat $44^{\circ}59.27'N$ ,	Long $28^{\circ}48.65'E$

#### (2) Anchorage

The limits of roadstead of Constantza port are as follows:

Lat $44^{\circ}10.5'N$ ,	Long $28^{\circ}44.0'E$
Lat $44^{\circ}10.5'N$ ,	Long $28^{\circ}49.5'E$
Lat $44^{\circ}6.5'N$ ,	Long $28^{\circ}49.5'E$
Lat $44^{\circ}6.5'N$ ,	Long $28^{\circ}44'E$

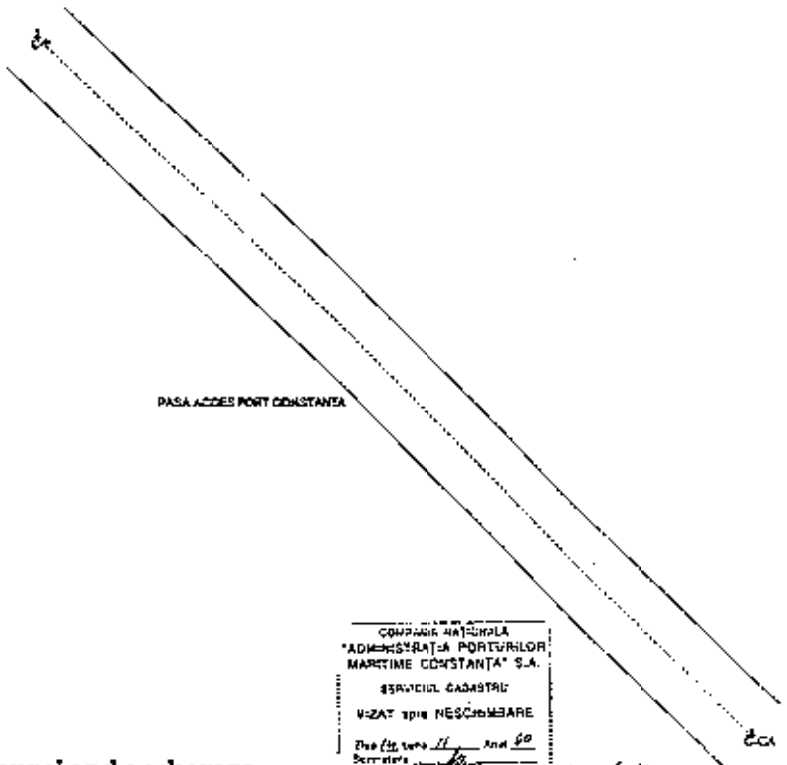
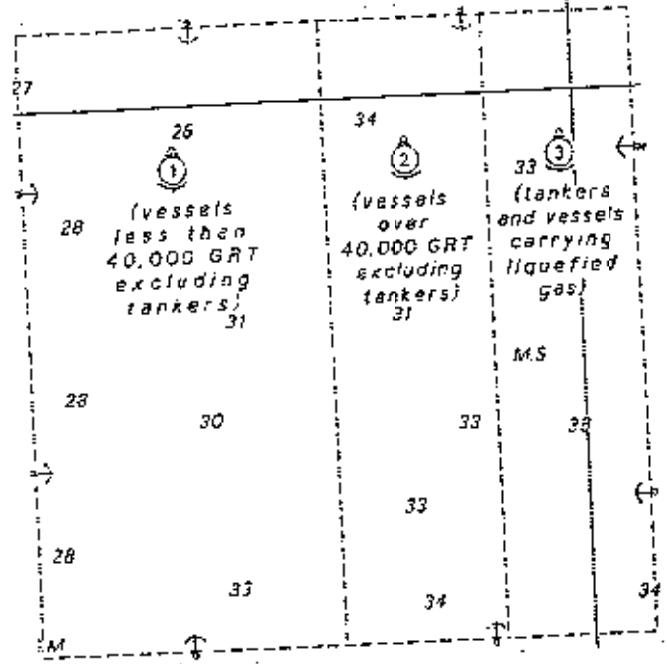
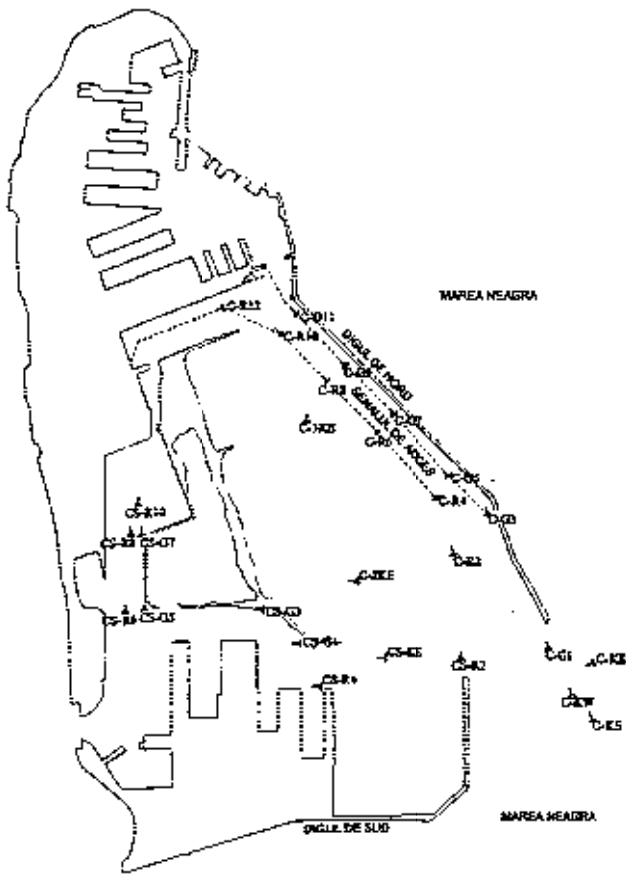
The meridians of  $28^{\circ}46.70'E$  and  $28^{\circ}48.20'E$  divide the anchorage zone into three areas numbered from west to east:

Zone 1: for vessels less than 40,000 GT excluding tankers

Zone 2: for vessels over 40,000 GT excluding tankers

Zone 3: for tankers and vessels carrying liquefied gas

SISTEMUL DE SEMNALIZARE AL PORTULUI CONSTANTA



COMPANIA NAVALA  
"ADMINISTRATIJA PORTURILOR  
MARITIME CONSTANTA" S.A.  
SERVICIUL CADASTRU  
VIZAT SI/NESCUMBARE  
Plan (1:1000) Nr. 50  
Data: 1988

Fig. 2.2.1 Map of approach channel and anchorage

### (3) Breakwaters

Two breakwaters, namely northern breakwater which is 5.90 km and southern breakwater which is 5.56 km are designed to ensure the necessary sheltering, totaling a length of 11.46 km. Both breakwaters are almost completely constructed however reparation and completion project are in progress. There still remain to be constructed the last 1 km of the Northern breakwater.

#### **2.2.2 Berths and their usage**

There are about 80 berths in the north port and about 50 berths in the south port. Each berth allocated for the specific cargo type and specific operator, however these days each operator tend to handle various kind of commodities at their berth. Fig. 2.2.2 shows the berths and its operators. Table 2.2.2 shows the name of the dock, name of the berth, length, design depth, present depth, typical usage and operator.

Table 2.2.2 Berths and main usage

Dock	Berth	Length (m)	Number of Berth	Design Depth (m)	Present Depth (m)	Typical Usage	Operator
1	Passenger	296	1		12.3		
	RoRo-5	99	1	13.5	6.8	Ro-Ro	
	RoRo-4	364	1	13.5	8.7	Ro-Ro	
	RoRo-3	91	1	13.5	10.9	Ro-Ro	
	RoRo-2	104	1	13.5	8.7	Ro-Ro	
	1-5	600	5	11.5	10.0	Scrap	Dezrobirea
	6-7	199	2	11.5	10.0	General Cargo	Dezrobirea
2	8	130	1	9.0	8.4	General Cargo	Phoenix
	9-10	168	2	9.0	6.6	(Technical Vessels)	
	11-12	138	2	8.3	8.3	Refrigerated products	Dezrobirea
	13-16	488	4	8.3	7.4	General Cargo	Dezrobirea
	17-18	224	2	8.3	8.3	Cereal	Agroexport
	19	128	1	8.3	7.6	Edible Oil & Molasses	Frial/Agroexpirt
	20	125	1	8.3	6.7	General Cargo	Dezrobirea
	21	125	1	8.3	6.7	Edible Oil & Molasses	Dezrobirea
	22	98	1	8.3	7.3	General Cargo	Phoenix
3	23	141	1	8.3	7.3	Cement	Decirom
	24	137	1	8.3	8.1	Cereal	Agroexport
3-5						<Shipyard>	SNC
6	30	131	1	11.5	8.7	<Shipyard>	SNC
	31-33	674	3	11.5	10.1	Cereal	Agroexport
	34	197	1	11.5	9.7	(Not for Cargo)	Petromar
	35-37	624	3	11.5	10.4	General Cargo	Socep
	38	206	1	11.5	10.4	Equipment	Umex
	39	200	1	13.5	11.9	Container	Umex
7	40	205	1	13.5	10.5	General Cargo, equipment	Umex
	41-43	625	3	13.5	10.5	General Cargo	Socep
	44	220	1	13.5	10.5	General Cargo	Umex
	45-46	448	2	13.5	10.5	Metal products, metal plates	Minmetal
	47-48	460	2	13.5	10.5	Cement, building material,	Decirom
8	49-50	464	2	13.5	8.9	Cement, building material,	Decirom
	51	235	1	13.5	8.5	Cement, building material,	Decirom
	52	241	1	13.5	8.7	Container	Socep
	53	220	1	13.5	8.7	Refrigerated goods	Frial
	54-57	936	4	13.5	10.2	Chemical Products	Chimpex
	58	181	1	13.5	9.4	Chemical Products	Chimpex
9	59-60	463	2	13.5	10.5	Chemical Products	Chimpex
	61-63	674	3	11.5	9.6	Chemical Products	Chimpex
	64-65	430	2	11.5	9.0	Ore, coal, coke	Minmetal
	66-67	430	2	13.5	9.0	Ore, coal, coke	Minmetal
	68	208	1	13.5	10.6	Cement	Sicim

Dock	Berth	Length (m)	Number of Berth	Design Depth (m)	Present Depth (m)	Typical Usage	Operator
10	69	327	1	13.5	11.6	Crude oil & oil product	Oil Terminal
	70	327	1	13.5	10.3	Crude oil & oil product	Oil Terminal
	71		1			(Not Operational)	Oil Terminal
11	72	327	1	13.5	12.2	Crude oil & oil product	Oil Terminal
	73	329	1	13.5	11.4	Crude oil & oil product	Oil Terminal
	74		1			(Not Operational)	Oil Terminal
12	75	326	1	14.0	12.1	Crude oil & oil product	Oil Terminal
	76	326	1	14.0	12.1	Crude oil & oil product	Oil Terminal
	77		1			(Not Operational)	Oil Terminal
	78	335	1	14.0	11.8	Bunkerage	Oil Terminal
1-South	79	405	1	19.0	17.8	Crude oil & oil product	Oil Terminal
	80-81	606	2	19.0	18.2	Ore, coal, coke	Comvex
	82	292	1	16.5	15.2	Ore, coal, coke	Comvex
	83-84	500	2	14.5	12.5	Ore, coal, coke	Comvex
	85	356	1	14.5	10.1	Ore, coal, coke	Minmetal
	86-87		2			(Under construction)	
	88-89	380	2	9.0	6	Barge Preparation	(Mast)
	90	191	1	7.0	6.0	For LPG Terminal	
River - Maritime Basin	91-93	600	3	7.0	4.1	For LPG Terminal	
	94-96	714	3	7.0	4.1	Ore, coal, coke	Comvex
	97-99	718	3	7.0	3.4	(Barge repair)	
	100-101	383	2	7.0	4.3	Cereal (Rail->Barge)	(Mast)
	102-103	389	2	7.0	6.3	Bitumen	Sargent
	104	180	1	7.0	4.5	Cereals	Soya Plus
	105-107	330	3	9.0	8.0	Cereals	Soya Plus
	108-109	295	2	9.0	6.6	General cargo	Romtrans
	110-112	586	3	14.5	9.9	General cargo	Romtrans
	113	220	1	14.5	9.9	Cereals	Silotrans
	114	201	1	14.5	12.1	Cereals	Silotrans
1S	115-118	904	4	14.5	13.8	General cargo	Romtrans
	119	307	1	14.5	10.7	General cargo	FTZ/Mast
	120	227	1	14.5	9.9	Ferry-Boat	SNTFM
	121	214	1	14.5	13.6	Ro-Ro	MPAC
	122	214	1	14.5	12.9	Building Materials, cement	Decirom
	123	212	1	14.5	14.3		
	124-125	441	2	16.5	14.0		Mast
2S,3S	126-130	1070	5	16.5	126,127=15.1		Mast(Berth129,130)
	131-137		7	16.5		Under construction	

Source: CPA, Constantza Port Handbook 2000-2001, etc



Type of cargo	Operator	Berth
General cargo	Rohrab	2, 3, 4
General cargo	Dzardzard	1, 7, 11, 15, 20
Cereals	Agrosport	17-18
General cargo	Frial	19, 21
General cargo	Dedrom	23
General cargo	Phoenix	8
Cereals	Agrosport	31-33
General cargo	Socap	35-37, 41-43
Industrial equipment	Umox	38-40, 44
Metal products	Minmetal	45-48
Cement & general cargo	Dedrom	47-51
Containers	Socap	52
Reefer	Frial	53
Fertilizers	Chympek	54-53
Oil & coal	Minmetal	64-67, 69
Cement	Socap	68
Oil & oil products	Q-Terminal	69-70, 72, 73, 75, 76, 79
Oil & coal	Comtek	80-84, 84-BE, 100-103
General cargo	Romtrans	103-113, 115-118
Cereals	S-ALSHB	114
General cargo	Free Trade Zone	119
Ferry-boat	SNTFM	120
Ro-Ro	MPAC	121
Cereals	Mast	floating installations

Characteristics	L/M	North port		South port	
		extent	total	extent	total
Total area	ha	785	2,837	2,837	3,626
of which: land	ha	484	610	1,300	1,784
water	ha	305	2,227	1,537	1,842
Breakwater length	Km	3.50	12.46	11.46	14.96
Quay length	Km	15.45	13.07	53.0	65.45
Number of berths	no.	52	59	230	282
Depths in the basins	m	7-14	7-19	7-22.5	7-22.5
Traffic capacity	ml.tons/year	85	20,0	170.0	255
Ship size	DWT x 1000	65-80	165	250	250

- Starboard Buoys
- Portside Buoys
- Special Buoys

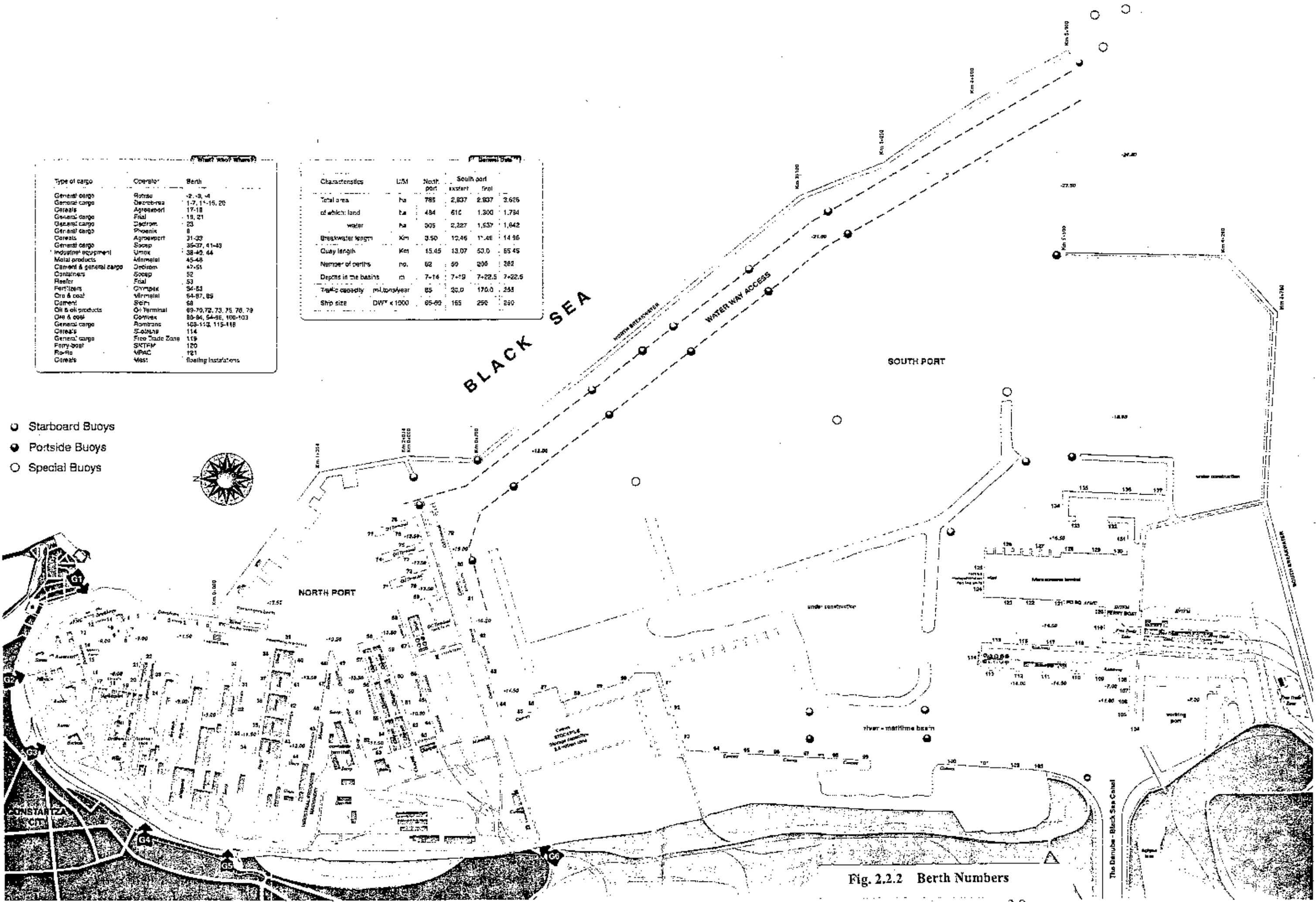


Fig. 2.2.2 Berth Numbers

### 2.2.3 Storage Facilities

Table 2.2.3 shows the major storage facilities. As for the Oil Terminal, their facilities locate not only in the port area but also several city areas.

Table 2.2.3 Major storage facilities

Operators	Open storage	Covered storage	Silos and tanks	Typical commodities
Dezrobirea	25,000 (m2)	40,000 (m2) 3,000 (m2)		General cargo Refrigerated cargo
Agroexport			90,000 t (3 silos)	Cereals
Silotrans			100,000 t (10silos)	Cereals
Frial	11,000 (m2)	8,000 (t)	24,600 t (7 tanks)	Edible oil Refrigerated cargo Reefer container (72x40ft, 50 plugs)
Decirom	48,000 (m2)	18,000 (m2)		Cement & General cargo
Sicim		8,000 (m2)	40,000 t (4 silos)	Cement Cement (bag)
Phoenix	4,000 (m2)	4,000 (m2)		General cargo
Socep	63,000 (m2) 130,000 (m2)	50,000 (m2) 2,000 (m2)		General cargo Container (1,130x20ft ground slots) Container (Vanning and devanning)
Umex	76,000 (m2)	7,000 (m2)		Steel products Container and timber
Convex	520,000 (m2)			Bulk (ore, coal, cokes)
Minmetal	185,000 (m2) 55,000 (m2)			Bulk (ore, coal, cokes) Steel products
Chimpex		72,000 (m2) 30,000 (m2)	30,000 t (silos)	General cargo Chemicals Phosphates
Oil Terminal			800,000 t 500,000 t 160,000 t 160,000 t 80,000 t	Crude Oil Fuel Oil Diesel Oil Gasoline Chemicals
Romtrans	110,800 (m2)	38,200 (m2)		General cargo, hard wood

Source: Draft Port Fact Book (1999, GIBB), hearing from each operators, etc

## **2.3 Cargo Handling Equipment**

### **2.3.1 Summary**

#### **(1) Evaluation and Conclusions**

- a. Cargo handling equipment at the North Port (Historical area) consists of old fashioned, low efficiency, aged equipment, requiring much maintenance, repair, modernization, or demolition.
- b. Cargo handling equipment at the South Port (newly constructing area) consists of relatively new equipment but its life can be prolonged by applying preventive maintenance and its efficiency can be improved by introducing new technology.

For the analysis of present conditions of cargo handling equipment, the following reference data was prepared for review:

Table 2.3.1-1 Present Conditions of Cargo Handling Equipment (Delivery Date, Capacity, etc.)

#### **(2) Cargo Handling Capacity**

Total capacity of cargo handling equipment at the Port is sufficient for present cargo volume, except for containerized cargoes.

In order to estimate the port capacity, each berth capacity was evaluated by means of combined capacity based on: 1) quay wall capacity, 2) storage capacity and 3) delivery capacity out of port.

Table 2.3.1-2 Existing Cargo Handling Capacity Estimated by IPTANA (Summary)

Appendix IB Existing Cargo Handling Capacity Estimated by IPTANA.

**Table 2.3.1-1 Present Conditions of Cargo Handling Equipment - 1/3**

Port of Constantza, Romania

Before 1970

From 1971 to 1980

From 1981 to 1990

After 1991

\*: Theoretical

No.	Name of Operator	Berth No.	Equipment						Handling Commodities	
			Type	No.	Manufacturer's Name	Delivery Date	Lifting Load(tons)	Productivity* (tons/hour)		
01	ROTRAC S.A.	(RR4)	(See below, No. 08, UME X)	-	-	-	-	-	Loading/unloading general cargoes (construction material, timber, etc.)	
02	S.C. DEZROBIREA S.	0 - 5	Jib Type Quay Crane	1	BOCSA	1994	16(in grab)/20(on hook)	-	Loading/unloading general cargoes (Steel scrap, etc.)	
				2	Eberswalde	1964	10(on hook)	-		
				3	Eberswalde	1964	10(on hook)	-		
				4	BOCSA	1994	16(in grab)/20(on hook)	-		
				5	BOCSA	1964	5(in grab)/6.3(on hook)	-		
				6	BOCSA	1964	5(in grab)/6.3(on hook)	-		
				7	BOCSA	1994	16(in grab)/20(on hook)	-		
				8	Eberswalde	1964	10(on hook)	-		
				9	Eberswalde	1964	10(on hook)	-		
				10	BOCSA	1994	16(in grab)/20(on hook)	-		
				11	BOCSA	1994	16(in grab)/20(on hook)	-		
		6, 7	Jib Type Quay Crane	1	BOCSA	1964	5(in grab)/6.3(on hook)	-	Loading/unloading general cargoes (construction material, timber, etc.)	
		2	BOCSA	1964	5(in grab)/6.3(on hook)	-				
		11, 12	Jib Type Quay Crane	1	Eberswalde	1955	3(on hook)	-	Loading/unloading general cargoes (construction material, timber, etc.)	
				2	GANZ	1964	3(on hook)	-		
				3	GANZ	1964	3(on hook)	-		
				4	GANZ	1964	3(on hook)	-		
		13 - 16	Jib Type Quay Crane	1	GANZ	1964	3(on hook)	-	Loading/unloading general cargoes (construction material, timber, etc.)	
				2	GANZ	1964	3(on hook)	-		
				3	GANZ	1964	3(on hook)	-		
4	GANZ			1964	3(on hook)	-				
5	GANZ			1964	3(on hook)	-				
6	GANZ			1964	3(on hook)	-				
20	Jib Type Quay Crane	1	Eberswalde	1964	5(on hook)	-	Loading/unloading general cargoes (construction material, timber, etc.)			
		2	Eberswalde	1964	5(on hook)	-				
03	S.C. AGROEXPORT S.	17, 18	Ship Loading Chute	1		1915	-	100	Loading grains	
				2		1915	-	100		
				3		1920	-	100		
				4		1920	-	100		
				5		1930	-	100		
		24	Ship Loading Chute	1		-	-	100	Loading grains	
				2		-	-	100		
		31 - 33	Jib Type Quay Crane	1	To be demolished			-	-	Unloading grains
				2	BOCSA	1978	16(in grab)/20(on hook)	-		
				3	BOCSA	1978	5(in grab)/6.3(on hook)	-		
				4	BOCSA	1978	16(in grab)/20(on hook)	-		
				5	BOCSA	1978	5(in grab)/6.3(on hook)	-		
				6	BOCSA	1978	16(in grab)/20(on hook)	-		
				1	East Germany	1992	-	150		
		2	East Germany	1992	-	150				
1	Buhler	1979	-	100						
04	S.C. FRIAL S.A.	19	Pipelines						Loading edible oil	
		21	Jib Type Quay Crane	1	GANZ	1963	5(on hook)	-	Loading/unloading general cargoes (construction material, timber, etc.)	
				2	Eberswalde	1970	3.2(on hook)	-		
		53	Jib Type Quay Crane	1	BOCSA	1973	5(in grab)/6.3(on hook)	-	Loading/unloading general cargoes (refrigerated food stuff, etc.)	
				2	BOCSA	1973	5(in grab)/6.3(on hook)	-		
3	BOCSA			1973	5(in grab)/6.3(on hook)	-				
05	DECIROM S.A.	23	Jib Type Quay Crane	1	BOCSA	1978	5(in grab)/6.3(on hook)	-	Loading/unloading general cargoes (construction material, timber, etc.)	
				2	East Germany	1979	5(on hook)	-		
				3	East Germany	1979	5(on hook)	-		
				4	East Germany	1979	5(on hook)	-		
		47, 48	Jib Type Quay Crane	1	BOCSA	1974	5(in grab)/6.3(on hook)	-	Loading/unloading general cargoes (construction material, timber, etc.)	
				2	BOCSA	1974	5(in grab)/6.3(on hook)	-		
				3	BOCSA	1978	5(in grab)/6.3(on hook)	-		
				4	BOCSA	1978	5(in grab)/6.3(on hook)	-		
		49,50	Jib Type Quay Crane	1	BOCSA	1974	5(in grab)/6.3(on hook)	-	Loading/unloading general cargoes (construction material, timber, etc.)	
				2	BOCSA	1974	5(in grab)/6.3(on hook)	-		
				3	BOCSA	1974	5(in grab)/6.3(on hook)	-		
				4	BOCSA	1974	5(in grab)/6.3(on hook)	-		
				5	BOCSA	1978	16(in grab)/20(on hook)	-		
				6	BOCSA	1978	5(in grab)/6.3(on hook)	-		
				7	BOCSA	1978	5(in grab)/6.3(on hook)	-		
				8	BOCSA	1978	5(in grab)/6.3(on hook)	-		
				9	BOCSA	1978	5(in grab)/6.3(on hook)	-		
10	BOCSA	1978	5(in grab)/6.3(on hook)	-						
11	BOCSA	1978	5(in grab)/6.3(on hook)	-						
06	S.C. PHOENIX S.A.	8	-	-	-	-	-	Loading/unloading general cargoes (construction material, timber, etc.)		

**Table 2.3.1-1 Present Conditions of Cargo Handling Equipment - 2/3**

Port of Constantza, Romania

Before 1970

From 1971 to 1980

From 1981 to 1990

After 1991

\*: Theoretical

No.	Name of Operator	Berth No.	Equipment						Handling Commodities		
			Type	No.	Manufacturer's Name	Delivery Date	Lifting Load(tons)	Productivity* (tons/hour)			
07	SOCEP S.A.	35 - 37	Jib Type Quay Crane	1	BOCSA	1978	5(in grab)/6.3(on hook)	-	Loading/unloading general cargoes (construction material, timber, etc.)		
				2	BOCSA	1978	5(in grab)/6.3(on hook)	-			
				3	BOCSA	1978	5(in grab)/6.3(on hook)	-			
				4	BOCSA	1978	5(in grab)/6.3(on hook)	-			
				5	BOCSA	1978	5(in grab)/6.3(on hook)	-			
				6	BOCSA	1978	5(in grab)/6.3(on hook)	-			
				7	BOCSA	1978	5(in grab)/6.3(on hook)	-			
				8	BOCSA	1978	5(in grab)/6.3(on hook)	-			
				9	BOCSA	1978	5(in grab)/6.3(on hook)	-			
				10	BOCSA	1978	5(in grab)/6.3(on hook)	-			
				11	BOCSA	1978	5(in grab)/6.3(on hook)	-			
				12	BOCSA	1978	5(in grab)/6.3(on hook)	-			
		41 - 43	Jib Type Quay Crane	1	BOCSA	1978	5(in grab)/6.3(on hook)	-	Loading/unloading general cargoes (construction material, timber, etc.)		
				2	BOCSA	1978	5(in grab)/6.3(on hook)	-			
				3	BOCSA	1978	5(in grab)/6.3(on hook)	-			
				4	BOCSA	1978	5(in grab)/6.3(on hook)	-			
				5	BOCSA	1978	5(in grab)/6.3(on hook)	-			
				6	BOCSA	1978	5(in grab)/6.3(on hook)	-			
				7	BOCSA	1978	5(in grab)/6.3(on hook)	-			
				8	BOCSA	1978	5(in grab)/6.3(on hook)	-			
				9	BOCSA	1981	16(in grab)/20(on hook)	-			
				10	BOCSA	1978	5(in grab)/6.3(on hook)	-			
				11	BOCSA	1978	5(in grab)/6.3(on hook)	-			
				12	BOCSA	1978	5(in grab)/6.3(on hook)	-			
51 - 52	Ship to Shore Gantry Crane	1	Takraf(East Germany)	1976	36(under spreader)	-	Loading/unloading containers				
		2	Takraf(East Germany)	1976	36(under spreader)	-					
	Storage Yard	Rail Mounted Gantry Crane	1	IPMPB(Pitesti)	1975	32(under spreader)		-	Stacking/unstacking containers		
			2	IPMPB(Pitesti)	1975	32(under spreader)		-			
08	UMEX S.A.	RR 4	Jib Type Quay Crane (owned by UMEX and rented to ROTRAC on an as required basis)	1	BOCSA	1979	5(in grab)/6.3(on hook)	-	Loading/unloading general cargoes (construction material, timber, etc.)		
				2	BOCSA	1979	5(in grab)/6.3(on hook)	-			
				3	BOCSA	1979	16(in grab)/20(on hook)	-			
				4	BOCSA	1979	5(in grab)/6.3(on hook)	-			
				5	BOCSA	1979	5(in grab)/6.3(on hook)	-			
		38	Jib Type Quay Crane	1	BOCSA	1979	5(in grab)/6.3(on hook)	-	Loading/unloading general cargoes (containers, construction material, timber, etc.)		
				2	BOCSA	1979	5(in grab)/6.3(on hook)	-			
				3	BOCSA	1979	16(in grab)/20(on hook)	-			
		39	Jib Type Quay Crane	1	BOCSA	1979	5(in grab)/6.3(on hook)	-	Loading/unloading general cargoes (containers, construction material, timber, etc.)		
				2	BOCSA	1979	16(in grab)/20(on hook)	-			
				3			50(on hook)	-			
		40	Jib Type Quay Crane	1	BOCSA	1979	5(in grab)/6.3(on hook)	-	Loading/unloading general cargoes (containers, construction material, timber, etc.)		
				2	BOCSA	1979	16(in grab)/20(on hook)	-			
				3	BOCSA	1979	5(in grab)/6.3(on hook)	-			
		44	Jib Type Quay Crane	1	BOCSA	1979	5(in grab)/6.3(on hook)	-	Loading/unloading general cargoes (containers, construction material, timber, etc.)		
				2	BOCSA	1979	5(in grab)/6.3(on hook)	-			
				3	BOCSA	1979	5(in grab)/6.3(on hook)	-			
		09	S.C. MINMETAL S.A.	45, 46	Jib Type Quay Crane	1	BOCSA	1979	5(in grab)/6.3(on hook)	-	Loading/unloading general cargoes (steel products, construction material, etc.)
						2	BOCSA	1979	5(in grab)/6.3(on hook)	-	
						3	BOCSA	1979	5(in grab)/6.3(on hook)	-	
						4	BOCSA	1979	16(in grab)/20(on hook)	-	
						5	BOCSA	1979	16(in grab)/20(on hook)	-	
				64 - 66	Gantry Type Ship Unloader	1	Ceretti Tanfani(Italy)	1970	20(in grab)	-	Unloading coals, cokes, ores
						2	Ceretti Tanfani(Italy)	1970	20(in grab)	-	
3	Ceretti Tanfani(Italy)					1978	20(in grab)	-			
4	Ceretti Tanfani(Italy)					1978	20(in grab)	-			
5	Ceretti Tanfani(Italy)					1983	20(in grab)	-			
6	Ceretti Tanfani(Italy)					1983	20(in grab)	-			
Storage Yard No. 1	Portal Type Stacker			1	MAN(Germany)	1971	-	2,000	Stacking/reclaiming coals, cokes, ores		
				1	MAN(Germany)	1971	-	1,000			
Storage Yard No. 2	Boom Type Stacker			1		1983	-	2,000	Stacking/reclaiming coals, cokes, ores		
				2		1983	-	2,000			
	Bucket Wheel Reclaimer			1		1983	-	1,000			
				2		1983	-	1,000			
				3		1983	-	1,000			
85	Barge Loader			1		1983	-	2,000	Loading coals, cokes, ores		
				2		1983	-	2,000			



**Table 2.3.1-1 Present Conditions of Cargo Handling Equipment - 3/3**

Port of Constantza, Romania

Before 1970

From 1971 to 1980

From 1981 to 1990

After 1991

\*: Theoretical

No.	Name of Operator	Berth No.	Equipment						Handling Commodities										
			Type	No.	Manufacturer's Name	Delivery Date	Lifting Load(tons)	Productivity* (tons/hour)											
10	S.C. CHIMPEX S.A.	54 - 57	Jib Type Quay Crane	1	BOCSA	1979	5(in grab)/6.3(on hook)	-	Loading/unloading general cargoes (construction material, timber, etc.)										
				2	BOCSA	1979	5(in grab)/6.3(on hook)	-											
				3	BOCSA	1979	5(in grab)/6.3(on hook)	-											
				4	BOCSA	1979	5(in grab)/6.3(on hook)	-											
				5	BOCSA	1979	5(in grab)/6.3(on hook)	-											
				6	BOCSA	1979	5(in grab)/6.3(on hook)	-											
				7	BOCSA	1979	5(in grab)/6.3(on hook)	-											
				8	BOCSA	1979	5(in grab)/6.3(on hook)	-											
				9	BOCSA	1979	5(in grab)/6.3(on hook)	-											
				10	BOCSA	1979	5(in grab)/6.3(on hook)	-											
				11	BOCSA	1987	16(in grab)/20(on hook)	-											
				12	BOCSA	1979	5(in grab)/6.3(on hook)	-											
				13	BOCSA	1979	5(in grab)/6.3(on hook)	-											
				14	BOCSA	1979	5(in grab)/6.3(on hook)	-											
11	S.C. SICIM S.A.	67 - 68	Jib Type Quay Crane	1	BOCSA	1979	5(in grab)/6.3(on hook)	-	Loading/unloading general cargoes (bagged cement, etc.)										
				2	BOCSA	1979	5(in grab)/6.3(on hook)	-											
				1		1985	-	400		Loading cement									
				2		1983	-	400											
				3		1984	-	?											
				12	S.C. OIL TERMINAL S.A.	69 - 79	Loading/Unloading Arm Set	1			1975	-	?	Loading/unloading liquid bulks(crude oil, chemical liquids, etc.)					
								2			1975	-	?						
								3			1975	-	?						
								4			1975	-	?						
								5			1975	-	?						
								6			1975	-	?						
								13		COMVEX S.A.	80 - 84	Gantry Type Ship Unloader	1		Kone(Finland)	1999	52(incl. grab)	?	Unloading coals, cokes, ores
													2		Voest Alpine(Austria)	1988	50(incl. grab)	?	
													3		Voest Alpine(Austria)	1988	50(incl. grab)	?	
Storage Yard	Stacker/Reclaimer	1	(Romanian)						1990				-		?	Stacking/reclaiming coals, cokes, ores			
		2	(Romanian)						1990				-		?				
		3	(Romanian)						1993				-		?				
		4	(Romanian)						1994				-		?				
		5	(Romanian)						1999				-		?				
94 - 96	Barge Loader	1	MKF(Romanian)	1988	-	?	Loading coals, cokes, ores												
		2	MKF(Romanian)	1990	-	?													
		3	MKF(Romanian)	1996	-	?													
		14	ROMTRANS S.A.	107 - 112	Jib Type Quay Crane	1			BOCSA				1992	5(in grab)/6.3(on hook)	-	Loading/unloading general cargoes (construction material, timber, etc.)			
2	BOCSA					1992	5(in grab)/6.3(on hook)		-										
3	BOCSA					1992	5(in grab)/6.3(on hook)		-										
4	BOCSA					1992	5(in grab)/6.3(on hook)	-											
5	BOCSA					1992	16(in grab)/20(on hook)	-											
6	BOCSA					1992	16(in grab)/20(on hook)	-											
115 - 118	Jib Type Quay Crane					1	BOCSA	1992	16(in grab)/20(on hook)	-	Loading/unloading general cargoes (construction material, timber, etc.)								
						2	BOCSA	1992	16(in grab)/20(on hook)	-									
						3	BOCSA	1992	5(in grab)/6.3(on hook)	-									
						4	BOCSA	1992	5(in grab)/6.3(on hook)	-									
						5	BOCSA	1992	5(in grab)/6.3(on hook)	-									
						6	BOCSA	1992	5(in grab)/6.3(on hook)	-									
						15	SILOTRANS S.R.L.	113	Pneumatic Barge Unloader	1		Christianson	1998	-	400		Unloading grains		
										2		Christianson	1998	-	400				
114	Ship Loader(Bulk)	1	Neuro	1998	-					800	Loading grains								
		2																	
16	FREE ZONE ADMINISTRATION	119	-	-	-	-	-	-	Loading/unloading general cargoes										
				-	-	-	-	-											
17	SNTFM - Ferry Boat Agency	119	-	-	-	-	-	-	Loading/unloading general cargoes										
				-	-	-	-	-											
18	CPA Ro-Ro	120	-	-	-	-	-	-	Loading/unloading general cargoes										
				-	-	-	-	-											
19	MAST Co. S.A.	-	-	-	-	-	-	-	Loading/unloading grains										
				-	-	-	-	-											

**Table 2.3.1-2 Existing Cargo Handling Equipment Capacity (Estimated by IPTANA)**

Operator	Operating berth	Equipment	Calculation of equip't productivity											No. of equipment	TOTAL Productivity of equipment	Factor of berth occupancy	Quay Operating Capacity	Total Capacity of Berths				
			[tons/cycle]	[Cycles/hour]	[man/half month]	[Tons/hour]	[Hour/day]	[Equip't occup time]	[days/year]	[t/year]	[t/year]	[t/year]	[t/year]									
1 DEZROBIREA	0-5	Quay crane EBERSWALDE 101	5	4.23	x	0.7	14.81	x	22	x	0.85	x	365	x	101,336	x	2	202,672	x	0.5	101,336	633,559
		Quay crane EBERSWALDE 101	10	3.88	x	0.42	16.30	x	22	x	0.85	x	365	x	111,634	x	4	446,536	x	0.5	223,268	223,268
		Quay crane BOCSA 16T	16	3.76	x	0.3	18.05	x	22	x	0.85	x	365	x	123,582	x	5	617,910	x	0.5	308,955	308,955
		Quay crane BOCSA 5T	5	4.23	x	0.7	14.81	x	22	x	0.85	x	365	x	101,336	x	2	202,672	x	0.5	101,336	101,336
		Quay crane EBERSWALDE 3T	3	4.63	x	0.9	12.50	x	22	x	0.85	x	365	x	85,618	x	4	342,472	x	0.5	171,236	171,236
2 AGROEXPORT	17-18	Quay crane GANZ 3T	3	4.63	x	0.9	12.50	x	22	x	0.85	x	365	x	85,618	x	6	513,708	x	0.5	256,854	256,854
		Quay crane BOCSA 5T	5	4.23	x	0.7	14.81	x	22	x	0.85	x	365	x	101,336	x	2	202,672	x	0.5	101,336	101,336
		Ship loading Chute	17-18				41.00	x	22	x	0.85	x	365	x	280,000	x	5	1,400,000	x	0.5	700,000	700,000
3 FRIAL	21	Quay crane BOCSA 5T	5	20.81	x	0.81	42.14	x	22	x	0.85	x	365	x	288,406	x	2	576,812	x	0.5	288,406	288,406
		Quay crane BOCSA 16T	8	14.12	x	0.81	91.50	x	22	x	0.85	x	365	x	626,124	x	3	1,878,372	x	0.5	939,186	939,186
4 DECIROM	47-50	Pneumatic Unloader	5	4.23	x	0.7	14.81	x	22	x	0.85	x	365	x	101,336	x	3	304,008	x	0.5	152,004	152,004
		Quay crane BOCSA 5T	3	4.63	x	0.9	12.50	x	22	x	0.85	x	365	x	85,618	x	1	85,618	x	0.5	42,809	42,809
		Quay crane BOCSA 5T	5	4.23	x	0.7	14.81	x	22	x	0.85	x	365	x	101,336	x	1	101,336	x	0.5	50,668	50,668
5 SOCEP	35-37/41-43	Pipelines	5	4.23	x	0.7	14.81	x	22	x	0.85	x	365	x	101,000	x	4	404,000	x	0.5	202,000	202,000
		Quay crane BOCSA 5T	5	4.23	x	0.7	14.81	x	22	x	0.85	x	365	x	101,336	x	14	1,418,704	x	0.5	709,352	709,352
		Quay crane BOCSA 16T	16	3.76	x	0.3	18.05	x	22	x	0.85	x	365	x	123,582	x	1	123,582	x	0.5	61,791	61,791
		Quay crane BOCSA 5T	5	4.23	x	0.7	14.81	x	22	x	0.85	x	365	x	101,336	x	23	2,330,728	x	0.5	1,165,364	1,165,364
		Portainer 40T	16	3.76	x	0.3	18.05	x	22	x	0.85	x	365	x	123,582	x	1	123,582	x	0.5	61,791	61,791
6 UMEX	38-40	Container 40T	16	3.76	x	0.3	18.05	x	22	x	0.85	x	365	x	123,582	x	2	247,164	x	0.5	123,582	123,582
		Conveyor TEU/DEAR	16	3.76	x	0.3	18.05	x	22	x	0.85	x	365	x	123,582	x	2	247,164	x	0.5	123,582	123,582
		Quay crane BOCSA 5T	5	4.23	x	0.7	14.81	x	22	x	0.85	x	365	x	101,336	x	5	506,680	x	0.5	253,340	253,340
		Quay crane BOCSA 16T	16	3.76	x	0.3	18.05	x	22	x	0.85	x	365	x	123,582	x	3	370,746	x	0.5	185,373	185,373
		Quay crane BOCSA 50T	25	4	x	0.5	50.00	x	22	x	0.85	x	365	x	342,210	x	1	342,210	x	0.5	171,105	171,105
7 MINMETAL	45-46	Quay crane BOCSA 5T	5	4.23	x	0.7	14.81	x	22	x	0.85	x	365	x	101,336	x	3	304,008	x	0.5	152,004	152,004
		Quay crane BOCSA 16T	16	3.76	x	0.3	18.05	x	22	x	0.85	x	365	x	123,582	x	4	494,328	x	0.5	247,164	247,164
		Quay crane BOCSA 5T	5	5.68	x	0.95	26.98	x	22	x	0.85	x	365	x	184,600	x	3	553,800	x	0.5	276,900	276,900
8 CHIMPEX	64-67	Unloader 20T	10	3.76	x	0.6	44.54	x	22	x	0.85	x	365	x	400,000	x	6	2,400,000	x	0.5	1,200,000	1,200,000
		Quay crane BOCSA 5T	5	4.23	x	0.7	14.81	x	22	x	0.85	x	365	x	101,336	x	15	1,520,040	x	0.5	760,020	760,020
		Quay crane BOCSA 16T	16	3.76	x	0.3	18.05	x	22	x	0.85	x	365	x	123,582	x	4	494,328	x	0.5	247,164	247,164
9 SICIM	68	Ship Unloader (bulk) 25T*	16	8.82	x	0.81	106.39	x	22	x	0.85	x	365	x	6,000,000	x	2	12,000,000	x	0.5	6,000,000	6,000,000
		Ship Loader (bulk)	5	4.23	x	0.7	246.77	x	22	x	0.85	x	365	x	1,684,500	x	4	6,738,000	x	0.5	3,369,000	3,369,000
10 OIL TERMINAL	69-79	Ship Loader (bulk)	5	4.23	x	0.7	14.81	x	22	x	0.85	x	365	x	101,336	x	2	202,672	x	0.5	101,336	101,336
		Loading/Unloading Arm	69-79				20.868	x	22	x	0.85	x	365	x	2,400,000	x	2	4,800,000	x	0.5	2,400,000	2,400,000
11 COMVEX	80-84	Ship Unloader 50T*	16	3.76	x	0.3	18.05	x	22	x	0.85	x	365	x	123,582	x	28	3,460,316	x	0.5	1,730,158	1,730,158
		Ship Unloader (bulk) 25T*	16	8.82	x	0.81	106.39	x	22	x	0.85	x	365	x	6,000,000	x	3	18,000,000	x	0.5	9,000,000	9,000,000
12 ROMTRANS	107-112; 115-118	Ship Loader (bulk)	5	4.23	x	0.7	14.81	x	22	x	0.85	x	365	x	101,336	x	2	202,672	x	0.5	101,336	101,336
		Ship Loader (bulk)	5	4.23	x	0.7	14.81	x	22	x	0.85	x	365	x	101,336	x	2	202,672	x	0.5	101,336	101,336
13 SILOTRANS	113-114	Quay crane BOCSA 5T	5	4.23	x	0.7	14.81	x	22	x	0.85	x	365	x	101,336	x	8	810,688	x	0.5	405,344	405,344
		Quay crane BOCSA 16T	16	3.76	x	0.3	18.05	x	22	x	0.85	x	365	x	123,582	x	4	494,328	x	0.5	247,164	247,164
		Pneumatic Unloader												2,000,000	x	2	2,000,000	x	0.5	1,000,000	1,000,000	
		Ship loader												2,000,000	x	1	2,000,000	x	0.5	1,000,000	1,000,000	

**Note:** Unloader 20T, 25 T, 50T Tons/hour multiply with 0.82 (moving tractor shovels in ship holes)  
The calculation of Berths Capacity was realised on base of Quay Crane theory

## **2.3.2 Outline of Cargo Handling Equipment**

Based on study of the obtained information, including the Reports previously carried out, collected data and site investigation through the visits of the major terminal operators of the Ports, the following facts are observed:

### **(1) General Cargo Handling**

#### **a. Cargo Handling Operation**

##### **i. Unloading Operation:**

Unloading from railway wagons/road trucks to storage areas:

By Quay Cranes, portal type with revolving jib

Crane with hook for timber, steel products, etc. (for export)

Crane with grab for steel scrap, dry bulk cargoes (for export)

Unloading from river barges/small ships to storage areas:

By Quay Cranes, portal type with revolving jib

Crane with hook for timber, steel products, etc. (for export/transit)

Crane with grab for steel scrap, dry bulk cargoes (for export/transit)

##### **ii. Loading Operation:**

Loading to ships from storage areas or directly from railway wagons/road trucks:

By Quay Cranes, portal type with revolving jib

Crane with hook for timber, steel products, etc. (for export/transit)

Crane with grab for steel scrap, dry bulk cargoes (for export/transit)

#### **b. Performance of the Equipment**

Effective and sufficient for present general cargo handling conditions.

#### **c. Capacity of the Equipment**

Enough capacity to suit handling each commodity, ranging 3.0t to 50.0t rated load

#### **d. Conditions of the Equipment**

Most equipment is very old and requires repairs and/or parts changes.

Maintenance works have been carried out by operators own maintenance personnel and/or other particular firms specialized for maintenance works.

Some cranes have been refurbished.

On some cranes, mechanical and/or electrical parts have been changed to Romanian products for easier procurement of spare parts.

On some cranes, the electric systems have been changed to products of new technology for higher efficiency and easier maintenance.

Some cranes have been demolished and scrapped.

## **(2) Container Cargo Handling**

### **a. Cargo Handling Operation**

#### **i. Operation at Container Handling Quay:**

Unloading/ loading operations for ships:

By Quay Cranes, gantry type with rising boom, equipped with telescopic spreader for container handling.

“SOCEP” Terminal:

Present:

2 x Quay Cranes, 36t capacity, less than “PANAMAX” size.

Project: Procuring new equipment for larger vessel size and higher productivity.

1 x Quay Crane, 45t capacity, longer outreach, higher lifting height, “PANAMAX” size.

“UMEX” Terminal:

Present:

Mobile cranes and/or ships cargo gears.

Project: Procuring new equipment for larger vessel size and higher productivity.

1 x Mobile Container Crane, revolving jib type, 100t capacity, Gottwald’s product.

#### **ii. Operation at Container Handling Yard:**

Unloading/ loading operations for railway wagons and yard chassis/road trucks:

By Yard Cranes.

“SOCEP” Terminal:

Present:

2 x 36t capacity, Rail Mounted Gantry (RMG) type, equipped with telescopic spreader for container handling.

“UMEX” Terminal:

Present:

Mobile cranes.

**b. Performance of the Equipment**

Present container cargo handling equipment has less productivity and less dimensions for ships. Operators need new equipment to meet performance requirements.

**c. Capacity of the Equipment**

Insufficient capacity for handling present cargo handling volume.

**d. Conditions of the Equipment**

Most present equipment is very old and requires repairs and/or parts changes. Maintenance works have been carried out by operators own maintenance personnel and/or other particular firms specialized for maintenance works.

**(3) Dry Bulk Cargo Handling**

**(3)-1 Grains**

**a. Cargo Handling Operation**

**i. Unloading Operation:**

Unloading from railway wagons/road trucks, side opening lid type, to storage silos: (for export)

By Receiving Hoppers at ground level over belt conveyors in the underground tunnels (“AGROEXPORT” Terminal).

Unloading from road trucks, back opening lid type, to storage silos: (for export)

By Receiving Hoppers with tilting platform at ground level (“SILOTRANS” Terminal).

Unloading from river barges/small ships to storage silos: (for export/transit)

By Pneumatic Bulk Unloaders, rail mounted type (“SILOTRANS” Terminal), floating pneumatic type and quay cranes with individual hoppers (direct loading to railway wagons/road trucks (“AGROEXPORT” Terminal).

**ii. Loading Operation:**

Loading to ships from silos via quay belt conveyors: (for export/transit)

By Loading Pipe Chutes, traveling type (“AGROEXPORT” Terminal) or Bulk Loaders, rail mounted gantry type (“SILOTRANS” Terminal).



**b. Performance of the Equipment**

Effective and sufficient for present dry bulk cargo handling conditions.

**c. Capacity of the Equipment**

Enough capacity for present dry bulk cargo handling volume.

**d. Conditions of the Equipment**

“AGROEXPORT” Terminal:

Most equipment is very old and requires repairs and/or parts changes.

Maintenance works have been carried out by operators’ own maintenance personnel and/or other particular firms specialized for maintenance works.

Some equipment has been refurbished.

On some equipment, mechanical and/or electrical parts have been changed to Romanian products for easier procurement of spare parts.

Some equipment has been demolished and scrapped.

“SILOTRANS” Terminal:

All equipment is very new and well maintained.

Maintenance works have been carried out by operators’ own maintenance personnel and other particular firms specialized for maintenance works.

**(3)-2 Cement: (“SICIM” Terminal)**

**a. Cargo Handling Operation**

**i. Unloading Operation:**

Cement unloading from railway tank wagons/tank trucks to storage silos: (for export)

Cement in bulk: compressed air hose/pipeline system

**ii. Loading Operation:**

Loading to ship from silos via belt conveyors: (for export)

Cement in bulk: by Ship Loader, with pipe chute

Cement in bag: by Bag Loader, with spiral chute

Loading to ship from storage areas: (for export)

Cement in 1.5t cement bag: by Quay Crane, revolving jib type with hook

Clinker in bulk: by Quay crane, revolving jib type with grab bucket

**b. Performance of the Equipment**

Effective and sufficient for present cement cargo handling conditions.

**c. Capacity of the Equipment]**

Enough capacity for present cement cargo handling volume.

**d. Conditions of the Equipment**

Most equipment is very old and requires repairs and/or parts changes.

Maintenance works have been carried out by operators' own maintenance personnel and/or other particular firms specialized for maintenance works.

**(3)-3 Ores**

Iron, bauxite, etc.: "MINMETAL" Terminal, "COMVEX" Terminal

Phosphate, etc.: "CHIMPEX" Terminal

**a. Cargo Handling Operation**

**i. Unloading Operation:**

Unloading from ships to storage yards or silos ("CHIMPEX" Terminal) via belt conveyors/stackers: (for import)

By Grab Bucket Bulk Unloaders, rail mounted gantry type

**ii. Loading Operation:**

Loading to river barges/small ships from storage yards via reclaimers/belt conveyors: (for import)

By Bulk Loaders or Bag Loader, with spiral chute ("CHIMPEX" Terminal), rail mounted gantry type

Loading to railway wagons from storage yards via reclaimers/belt conveyors: (for import)

By Railway Wagon Loading Station, with weighing system

Loading to railway wagons directly from ships: (for import) ("MINMETAL" Terminal)

By Grab Bucket Bulk Unloaders, rail mounted gantry type, via chute with weighing system

**b. Performance of the Equipment**

Effective and sufficient for present ore cargo handling conditions.

**c. Capacity of the Equipment**

Enough capacity for present ore cargo handling volume.

**d. Conditions of the Equipment**

Most equipment is very old and requires repairs and/or parts changes.

Maintenance works have been carried out by operators' own maintenance personnel and/or other particular firms specialized for maintenance works.

**(3)-4 Coals and Cokes: "MINMETAL" Terminal, "COMVEX" Terminal**

**a. Cargo Handling Operation**

**i. Unloading Operation:**

Unloading from ships to storage yards via belt conveyors/stackers: (for import)

By Grab Bucket Bulk Unloaders, rail mounted gantry type

**ii. Loading Operation:**

Loading to river barges/small ships from storage yards via reclaimers/belt conveyors: (for import/transit)

By Bulk Loaders, rail mounted gantry type

Loading to railway wagons from storage yards via reclaimers/belt conveyors: (for import/transit)

By Railway Wagon Loading Station, with weighing system

Loading to railway wagons directly from ships: ("MINMETAL" Terminal)

By Grab Bucket Bulk Unloaders, rail mounted gantry type, via chute with weighing system

**b. Performance of the Equipment**

Effective and sufficient for present coal/coke cargo handling conditions.

**c. Capacity of the Equipment**

Enough capacity for present coal/coke cargo handling volume.

**d. Conditions of the Equipment**

Most equipment is very old and requires repairs and/or parts changes. Maintenance works have been carried out by operators' own maintenance personnel and/or other particular firms specialized for maintenance works.

**(4) Liquid Bulk Cargo Handling: "OIL TERMINAL" Terminal**

Oils: crude oil, fuel oil: for import/transit  
Liquid chemical products for export

**a. Cargo Handling Operation**

**i. Unloading Operation:**

Unloading from ships to storage tanks via pipelines by ship's pump:  
By Unloading(/Loading) Arms, rise and lower, fixed type

**ii. Loading Operation:**

Loading to barges/ small ships from storage tanks via pipelines by gravity and supplementary pumps of storage tanks:  
By Loading(/Unloading) Arms, rise and lower, fixed type

**b. Performance of the Equipment**

Effective and sufficient for present oil/liquid bulk cargo handling conditions.

**c. Capacity of the Equipment**

Enough capacity for present oil/liquid bulk cargo handling volume.

**d. Conditions of the Equipment**

Most equipment is very old and requires repairs and/or parts changes. Maintenance works have been carried out by operators' own maintenance personnel and/or other particular firms specialized for maintenance works.

## 2.4 Inland Transport facilities in the port

### 2.4.1 Introduction

There are four transport modes connected to and from the port, namely railways, roads, canals and pipelines. In this section, a brief description for each mode is provided.

### 2.4.2 Railways

The total length of the railway in the port reaches 144km, formed by marshalling yards and railways along the quay (transfer cargo directly from the vessel to wagons and vice versa) and behind the quay (transfer cargo from wagons to warehouses and platform and vice versa). Almost every berth has direct rail access.

There are four railways stations in the port area, namely (a) Constantza Port A (permitting the access and operation to the berths 1-24), (b) Constantza Port B (for berths 25-48), (c) Constantza Port Mol 5 (for berths 49-78) and (d) Constantza South Port Ferry Boat (79-135).

Table 2.4.1 shows the access points for railways to the port area.

Table 2.4.1 Railways access points to the port area

Gate	Number of lines	Serving berth
Gate 6-7	2	North port: berth 0-84
Gate 9	2	River maritime area: berth 90-103
Gate 10	2	South port: berth 106-130

Source: CMPA

Table 2.4.2 Yearly number of trains and its average number of wagons to and from Constantza Port

	Year							2000 (10 months)
	1994	1995	1996	1997	1998	1999		
No. of trains arrived at Constantza	5,989	5,850	6,250	6,779	4,970	4,570	4,250	
-Average no. of wagons	21	20	22	23	28	16	20	
No. of train departed from Constantza	6,189	6,110	6,540	7,032	5,289	5,019	4,627	
-Average no. of wagons	22	23	23	25	30	18	22	

Source: CFR-Marfa Constantza Branch



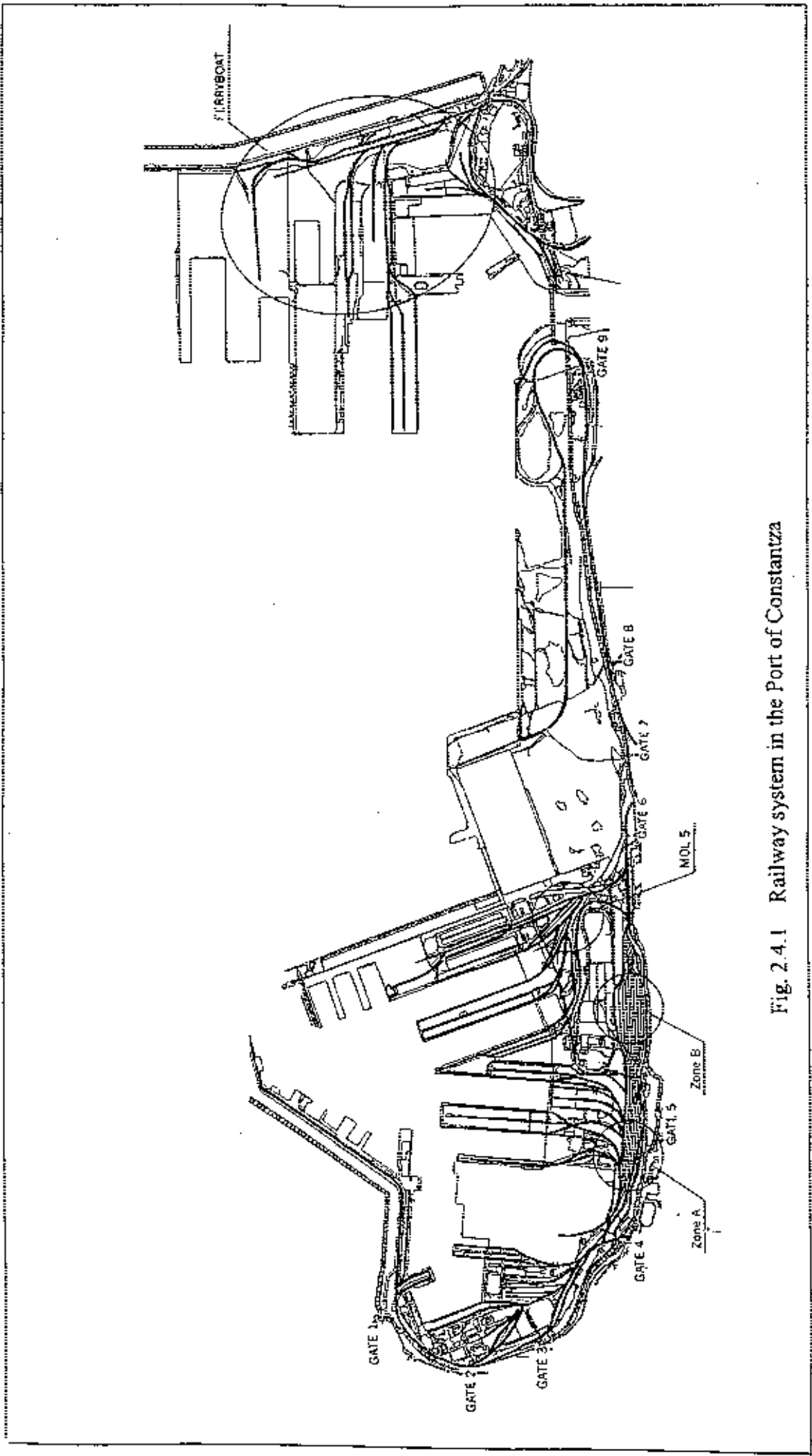


Fig. 2.4.1 Railway system in the Port of Constantza

### 2.4.3 Roads

The total length of the road in the port is about 100km. Table 2.4.3 shows road access points to the ports. Gates 5, 6, and South Port are major access points for cargo transport.

Table 2.4.3 Road access points to the port area

Gate	Usage
Gate 1	Small car, construction vehicle
Gate 2	Pedestrian
Gate 3	Small car
Gate 4	Pedestrian
Gate 5	Small car and truck
Gate 6	Small car and truck
Gate 7,8	Temporal use
Gate 9	Truck
South Port	Truck (south port)

Source: CMPA

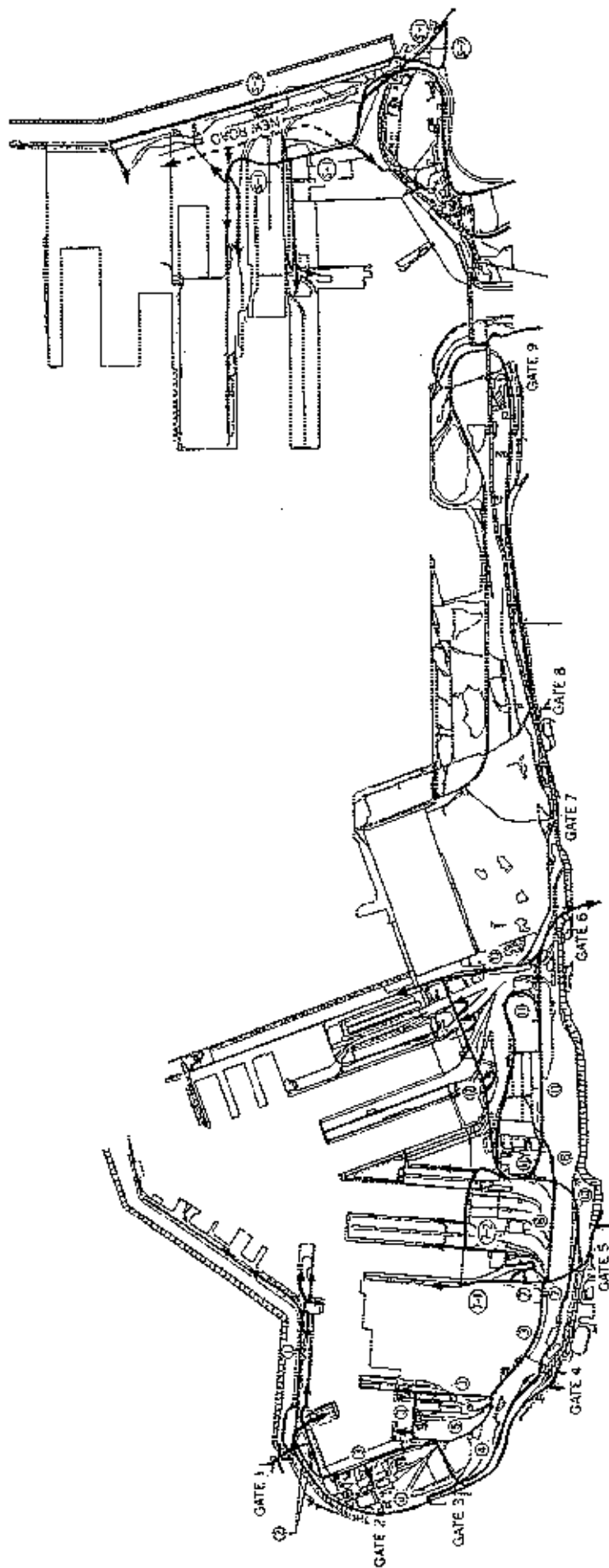


Fig. 2.4.2 Road network in the Port of Constanza

## 2.4.4 Canals

In the Constantza south port area, there is the entrance of the Danube-Black Sea canal. The canal connects the port of Constantza and the Danube at Cernavoda, 300km upstream from its mouth. The canal started its operation from 1984. Besides the main canal, there is branch canal that connects Poarta Alba, located in the middle of the main canal to the port of Midia. This branch canal started its operation from 1987. Table 2.4.4 shows main characteristics of the canal. Fig. 3.3 shows the canal system. Fig. 2.4.4 shows typical cross sections of the canal.

Table 2.4.4 Main Characteristics of the canals

Characteristics Elements	Unit	Danube-Black Sea Main Canal		Poarta Alba – Midia Navodari Canal
Total length	km	64.4		31.2
Width	km	90		50
Normal Draft	m	7.0		5.5
Air clearance below the bridge	m	17.0		13.0
Barge convoy & vessel characteristics		Barge Convoy	Self propelled vessel	Barge Convoy
- Capacity	t			3000
- Length	m	6 x 3000	5000	119.4
- Width	m	296	138.3	11.4
- Draft	m	22.8	16.8	3.8
		3.809	5.5	
Double locks with useful size of the locking sluice chamber		Cernavoda, Agigea		Ovidiu, Medgidia
- Length	m	310.0		145.0
- Width	m	25.0		12.5
- Depth on sill	m	7.5		6.0
Canal harbors		Cernavoda, Medgidia, Basarabi		Ovidiu, Luminita
Connected Maritime harbors		Constantza		Midia
Traffic capacity	mil. t / y	75-80		20-25

Source: The Administration of the Navigable Canals

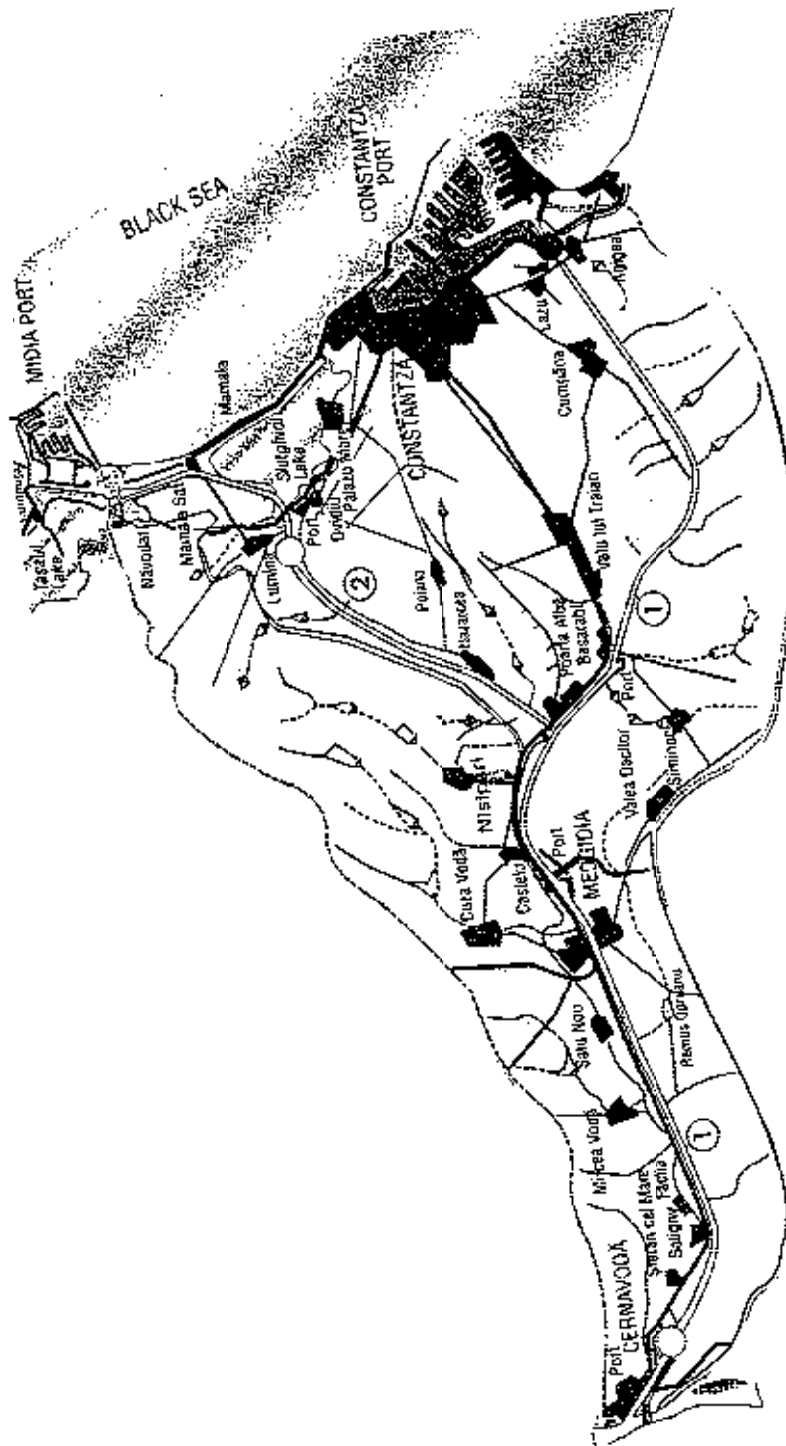
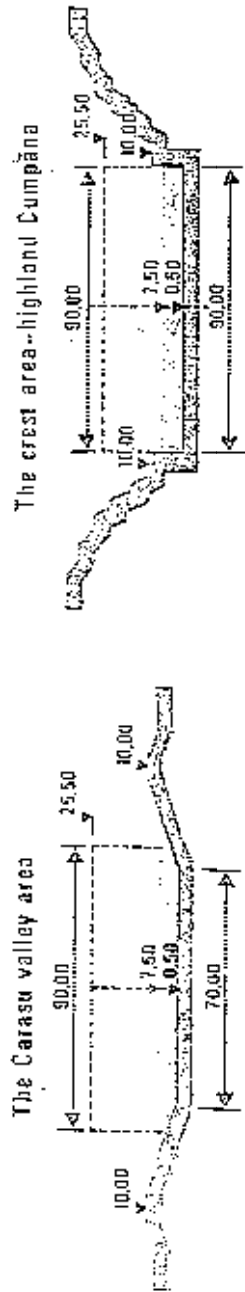
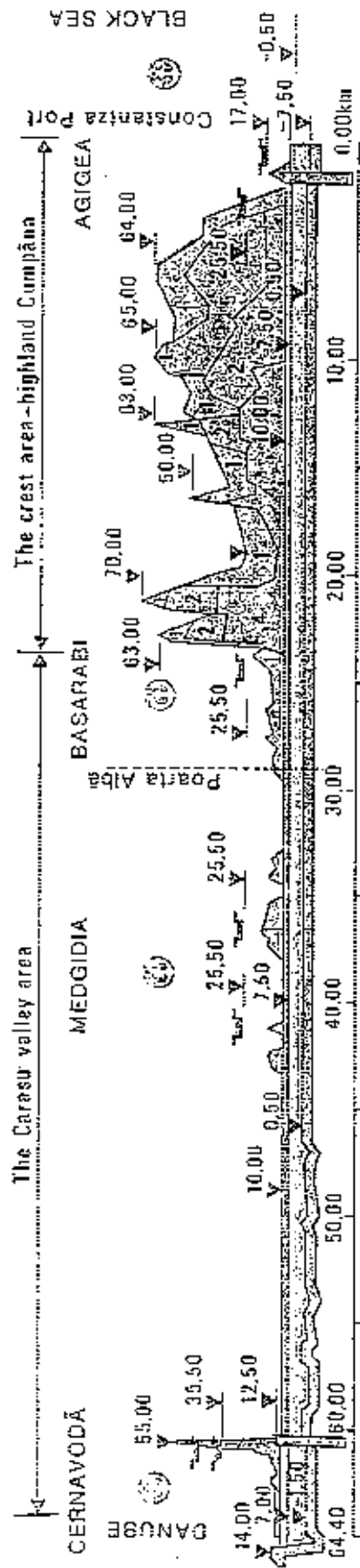


Fig. 2.4.3 The Danube-Black Sea Canal

### CROSS SECTIONS



### LONGITUDINAL PROFILE



### LEGEND





-  Loessoid clay silty
-  Limestone and sand of SARMATIAN
-  Chalk SENONIAM
-  Red clays

Fig. 2.4.4 Typical cross sections of the canals

## 2.4.5 Other Inter Modal Facilities

### (1) Ro-Ro Terminal

There are two Ro-Ro terminals in the port. One is berth “Ro-Ro 4” located in the north port area and the other is berth 121 located in the south port area. As for the “Ro-Ro 4”, it is not used for Ro-Ro vessel at present. As for the berth 121, CPA owns the facility and Romtrans Agency operates it.

Table 2.4.6 shows Ro-Ro traffic history of the port of Constantza. The traffic mainly come from and goes to Turkey to and from Romania or Europe.

Table 2.4.5 Ro-Ro traffic of the port of Constantza

Year	No. of Truck & Trailers	Tons
1992	13,006	390,027
1993	14,745	433,645
1994	12,245	352,216
1995	6,143	179,768
1996	5,344	149,916
1997	4,085	114,997

Source: Intermodal Transportation Feasibility Study in Romania (Wilbur Smith Associates et .al. 1999)

### (2) Ferry

There is ferry berth at berth 120 operated by SNTFM “CFR Marfa” SA.

This facility has following features;

- a group composed of 3 railway lines, each having the length of 750 m for wagon reception and dispatch.
- a group composed of 10 railway lines , each having 500 m for preparing of wagons for loading/unloading on/from the vessel.
- mobile bridge that achieves the connection of the railway lines on the vessel and the terrestrial railway lines device.
- Two ferry boats: M/V Eforie (12,000 DWT) and M/V Mangalia(12,000 DWT)  
Capacity : 108 railways wagons, or 125 trucks or several combinations of them.

There are several ferryboat routes such as:

- Constantza – Izmir/Mersin (Turkey)
- Constantza – Samsun (Turkey)
- Constantza – Poti/Batumi (Georgia)

- Constantza – Derince (Turkey)

Table 2.4.6 shows the transport history of Ferry Boat Eforie

Table 2.4.6 Transport history of Ferry Boat Eforie

Year	Line	No. of voyages	No. of Wagons Loaded (empty)	Total Tons
1995	Samsun	3		6,560
1996	Samsun	7		12,100
1997	Samsun	10		5,900
	Mersin	4	157 (129)	7,837
1998	Mersin	8	480 (508)	14,400

Source: Intermodal Transportation Feasibility Study in Romania (Wilbur Smith Associates et .al. 1999)

From January to October in 2000, there were 18 voyages to and from Turkey and 4 voyages to and from Poti, Gerogia. Major export cargoes from Romania are cereals and major import cargoes are building materials, food products, machines and fodder.



## **2.5 Port Activities**

### **2.5.1 Status of Inspectorate of Civil Navigation (ICN) and Harbor Master (HM)**

The ICN is established by GO no. 95/1998 as public institution sub-ordinated to the MPWTH but having its own legal personality. The Harbor Master offices from Constantza, Tulcea, Galatzi, Giurgiu and Drobeta-Turnu Severin became part of ICN.

The organization and functioning of ICN is regulated by GD no. 627/1998. ICN is self financed from the fees and charges collected for the services provided and other activities. Its duties cover not only the port marine activities, but also control of Romanian ships in international waters and outside ports in national navigable waterways. It keeps the ships registries and certification and is also in charge with seafarers certification.

ICN main attributions, on categories, are (art. 4 Chapter II of Annex no. 1 to the GD no. 627/1998):

#### Regulatory attributions

- elaborates the norms of navigation in national navigable waters and submits them for MPWTH's approval; it also applies these above mentioned norms;
- elaborates norms for certification for seafaring personnel and asks for their approval at Ministry of Transport; registers seafaring personnel, delivers Seaman Passport ; registers Romanian vessels,
- approves yearly signalling plan and the works made in national navigable waters; authorises, from the safety navigation point of view, the activities in national navigable waters;
- elaborates action plans in case of national calamity and together with other institutions participates to intervention actions;
- elaborates specific rules concerning safety of navigation in harbors and shipping lanes and submits them to the MPWTH for approval.
- elaborates proposals concerning: compulsory arrival and leaving harbor cards, traffic separations installation, the ways of signalling harbor and beaches areas;

#### Supervision and control attributions

supervises and leads the traffic and controls the vessel navigation in Romanian navigable waters, regardless of the flag;  
investigates the events and accidents of vessels in Romanian waters; investigates the events and the accidents of Romanian vessels in high sea;  
takes the necessary measures in case of dangerous situations;  
co-ordinates the assistance and salvage activities;  
establishes and sanctions according to the law in force the actions that are considered contravention to the safety norms of civil navigation and to the norms of national navigable waters pollution ;  
controls and supervises the activities of nautical activities, industrial fishing and sport fishing;  
controls the vessels, regardless of the flag, in national navigable waters, as well as the Romanian vessels in high sea or in foreign harbor in order to observe the conformity with technical navigable conditions established by domestic regulations or international Agreements and Conventions to which Romania is party;  
establishes mooring and roadstead zones;  
controls the observance of internal and international regulations for transport of dangerous goods;

#### Port marine activities

approves the vessels harbor entering and leaving, as well as the movement of ships in the harbor area;  
drafts the civil vessels arriving and leaving formalities;  
controls and supervises activities of pilots, towing and port mooring;  
controls and supervises, from the safety navigation point of view, the activities of loading / discharging, stowage and securing of cargo goods; the activities of embarking / disembarkation and the activities of bunkering;  
controls the function of signalling systems;

#### ICN ruling body

It is made by a Ruling Council composed of 9 persons who are nominated by order of the MPWTH.

The director general of INC – nominated as chief state inspector – is also the president of the Ruling Council.

### **2.5.2 Pilotage**

The ports of Constantza, Midia and Mangalia are adequately provided with pilotage services. Pilotage is compulsory for all vessels except naval, public service and salvage vessels and leisure craft. The ship's master must notify Constantza Port Control at least 12 hours prior to arrival at the roadstead.

Eleven companies, operating in the private sector, are currently licensed and between them have 117 pilots available, and 13 pilot vessels. The pilots have experience as ships' captains who are licensed by the Ministry on an annual renewal basis.

The roadstead of Constantza port is an open road, therefore, during bad weather, it is necessary that vessels should perform maneuvers, giving the necessary indications for the safety of navigation, without undertaking responsibilities.

### **2.5.3 Towage**

Tug assistance is compulsory within the port area for vessels over 1,000NRT(net register tonnage), for vessels under 1,000 NRT towage needs are established depending on the weather conditions and the mooring area. The tug is allocated depending on NRT, the vessels cargo, the transfer zone, and other conditions. The towage services in the roadstead and in the port are continuously performed, 24 hours a day.

The Port of Constantza including the Port of Midia has 38 tugs available. The mix of work within the port is considerable with large ships, medium sized ships and barges all needing assistance. Provided the allocation of work among the fleet is balanced with the respective power of each tug an adequate and safe operation should result.

The basis of charging for services is a standard one using time, ship dwt, size of tugs etc, but no single tariff applies. Companies make their own arrangements with clients.

### **2.5.4 Others**

(1) Fresh Water Fresh water may be taken on board via quay installations at every berth or by barge in the roadstead.

(2) Bunkers Bunkering is carried out by tanker barge both inside the port and in the roadstead, subject to the harbor master's approval. Heavy fuels and gasoline are readily available.

## 2.6 Cargo Operations

There are 18 major cargo handling operators in Constantza Port, namely Rotrac. S.A., Dezrobirea S.A., Phoenix S.A., Agroexport S.A., Frial S.A., Deciom S.A., Socep S.A., Umex S.A., Minmetal S.A., Chimpex S.A., Sicim S.A., Oil terminal S.A., Comvex S.A., Romtrans S.A., Silotrans S.R.L., Mast C.O., CFR Marfa Ferryboat Branch and Free Zone Administration.

These operators are handling cargoes under a license granted by the Ministry of Transport. They also operate under a lease contract with CPA for the use of CPA's properties such as platforms and warehouses. The term of these contracts is basically one year, but these operators have a continuous presence in the port and have largely invested in fixed assets such as buildings and key-cranes.

The length and depth of the berths of the major terminal operators are shown in Table 2.6.1 to 2.6.2.

Table 2.6.3 and 2.6.4 show the cargo handling volume by operator and by commodity.

According to Table 2.6.3, the biggest operator for cargo handling volume is Oil Terminal, with approximately 41% of the total cargo volume. Comvex, whose main handling commodity is coal & coke, ranks second while Minmetal, whose main handling commodities are coal & coke, mineral and ferrous-metal products ranks third. In total, these companies account for approximately 65% of the total cargo handling volume.

As for the volume by commodity, oil has the largest share, with 41% of the total cargo handling volume. The second is minerals and the third is coal & coke. In total, these commodities account for approximately 66% of the total cargo handling volume.

Table 2.6.1 Major Terminal Operators in the Port of Constantza

Operator	Berth		Major Cargo	Handling Volume in 2000 (thousand ton)	Remarks
	No. of Berth	Berth Length (m)			
Rotrack	North : Ro-Ro		Lumber, Construction materials	77	Ro-Ro handling
Dezrobirea	North : 14	1,691	Scrap, Copper (Roll)	486	
Phoenix	North : 2	230	Wood, Chemicals, Metal product, Foods	55	
Agroexport	North : 6	1,035	Cereal, Foods, General cargo	663	Silo 30,000 t x 3
Frial	North : 3	458	Cold foods, Chemical product	54	
Decirom	North : 6 South : 1	1,514	Lumber, Cement, Coal, Cokes	924	
Socep	North : 7	1,490	Container, Metal product, Cereal, Chemical product, General cargo	2085	
Umex	North : 4	831	Metal product, Lumber, Foods, General cargo, Container	481	
Minmetal	North : 6 South : 1	1,664	Iron ore, Bauxite, Coal, Cokes, Metal or nonmetal, Aluminum, Copper, Steel product, Cereal, Salt, Lumber	971	
Chimpex	North : 10	2,269	Cereal, Chemicals, Phosphoric acid	1211	
Sicim	North : 1	208	Cement	478	
Oil Terminal	North : 6 South : 1	2,369	Crude oil, Gasoline, Chemicals, Motor oil	3,966	
Comvex	North : 9	2,112	Coal, Iron ore, Bauxite	4,066	
Romtrans	South : 9	1,785	Steel product, Cereal, Lumber, General cargo	1,414	
Silotrans	South : 2	421	Cereal	257	
Mast	South : 6	1,168	Cereal	960	
Soia Plus	South : 4	510	Cereal	-	
T.T.S	South : 1	192	Cereal	-	
U.S.A	South : 1	177	-	-	
Sargent	South : 1	212	-	-	
A.Z.L	South : 1	338	-	-	

Table 2.6.2 Berth Dimensions by Operator

Operator	Berth No.	Length of Berth (m)	Depth in the Chart (m)	
Dezrobirea	1	120	10.3	
	2	120	10.6	
	3	120	10.6	
	4	120	9.0	
	5	120	9.5	
	6	101	9.3	
	7	98	10.1	
	11	138	6.0	
	12	141	7.2	
	13	122	7.4	
	14	122	7.3	
	15	138	7.3	
	16	106	6.0	
	20	125	6.0	
	Total length	1,691	-	
	Phoenix	8	130	8.1
		22	(100)	7.7
		Total length	230	-
	Agroexport	17	112	6.0
		18	112	6.7
24		137	8.1	
31		226	10.1	
32		230	9.9	
33		218	8.3	
Total length	1,035	-		
Frial	19	113	8.3	
	21	125	8.3	
	53	(220)	8.7	
Total length	458	-		
Decirom	23	141	7.3	
	47	224	10.7	
	48	237	10.7	
	49	228	8.9	
	50	235	7.8	
	51	235	10.5	
	122	214	12.7	
	Total length	1,514	-	
Socep	35	208	9.9	
	36	208	9.6	
	37	208	10.3	
	41	208	10.5	
	42	208	10.7	
	43	209	10.7	
	52	241	10.1	
	Total length	1,490	-	
Umex	38	206	9.8	
	39	200	10.6	
	40	205	10.3	
	44	220	10.7	
	Total length	831	-	
Silotrans	113	220	10.7	
	114	201	11.2	
	Total length	421	-	
Minmetal	45	224	10.6	
	46	224	10.0	
	64	215	10.6	
	65	215	10.1	
	66	215	12.8	
	67	215	12.3	
	85	356	12.7	
	Total length	1,664	-	
	Chimpex	54	240	9.5
		55	234	9.8
		56	234	9.7
57		229	9.4	
58		181	9.5	
59		229	10.5	
60		234	9.0	
61		234	9.9	
62		235	9.8	
63		219	9.6	
Total length	2,269	-		
Sicim	68	208	10.6	
Oil Terminal	69	327	11.6	
	70	327	10.3	
	72	329	13.3	
	73	329	12.1	
	75	326	13.0	
	76	326	12.2	
	79	405	12.2	
	Total length	2,369	-	
Comvex	80	306	17.7	
	81	307	17.7	
	82	292	14.7	
	83	250	12.5	
	84	250	12.3	
	93	-	4.3	
	94	239	3.3	
	95	229	5.4	
	96	239	3.8	
	Total length	2,112	-	
Mast	88	190	5.0	
	89	190	3.1	
	124	221	13.8	
	125	221	14.2	
	129	173	14.9	
	130	173	14.4	
	Total length	1,168	-	
Romtrans	108	147	6.5	
	109	147	6.5	
	110	148	8.0	
	111	218	9.6	
	112	220	10.4	
	115	219	12.5	
	116	228	12.6	
	117	240	12.0	
118	218	11.2		
Total length	1,785	-		

Table 2.6.3 Cargo Handling Volume by Operator

	Dezrobirez	Socep	Convex	Minmetal	Decirom	Sicim	Chimpex	Umex	Agloexport	Frial	Dil terming	Romtrans	Phoenix	Rotrac
1990	1,241	2,178	3,613	4,611	1,175	1,090	3,480	555	1,696	295	22,734			
1991	710	1,939	2,718	3,200	1,209	1,119	2,804	730	1,611	196	12,672			
1992	897	1,953	2,911	2,243	1,090	1,383	2,760	343	1,559	159	11,539	390		
1993	728	2,305	3,546	1,893	1,024	1,420	2,472	401	2,135	237	10,768	1,154		
1994	405	2,329	4,952	2,127	874	1,565	2,224	320	635	143	14,072	1,119	37	
1995	506	2,652	6,808	2,337	840	1,570	2,379	425	1,153	176	14,919	1,692	75	
1996	353	2,774	6,633	2,579	870	1,381	2,295	414	1,280	171	14,335	2,123	60	
1997	463	2,250	7,060	2,487	1,028	1,410	1,585	494	554	257	12,446	2,210	79	35
1998	388	2,384	7,091	2,009	928	1,153	1,075	540	707	126	10,880	1,822	59	96
1999	525	2,398	5,808	1,344	1,236	836	1,252	458	677	108	5,782	2,208	55	88
Average	622	2,316	5,114	2,483	1,027	1,293	2,233	468	1,201	187	13,015	1,590	61	73

Table 2.6.4 Cargo Handling Volume by Commodity

Year	(thousand tons)													
	Oil	Carbune & Cocs	Mineral	Ferro-metal	Wood	Sand & gravel	Cement	Cereal	Chemical products	Phosphate	Foodstuffs	General cargo	Container	Total
1990	22,734	4,804	4,608	732	110	4	2,117	2,030	2,054	1,786	504	969	216	42,668
1991	12,672	3,133	3,201	787	124	0	2,118	1,771	2,252	944	230	1,254	422	28,908
1992	11,539	2,973	1,644	1,364	167	22	2,304	1,584	2,557	906	440	1,382	345	27,227
1993	10,768	1,907	3,024	2,002	207		2,160	2,656	1,948	1,056	506	1,532	317	28,083
1994	14,072	2,554	4,386	2,080	258		2,225	447	2,322	711	428	927	392	30,802
1995	14,919	3,211	5,894	2,046	299	117	2,335	1,204	2,596	632	608	991	680	35,532
1996	14,335	3,324	6,246	1,547	367	13	1,887	1,671	2,467	867	784	1,105	655	35,268
1997	12,446	4,033	6,290	2,290	511	14	2,028	724	1,623	499	426	1,026	673	32,583
1998	10,880	2,720	6,649	1,689	550		1,745	1,330	803	366	706	1,303	714	29,455
1999	5,782	1,836	6,074	1,453	638	18	1,822	1,764	1,081	374	643	1,471	767	23,723
Average	13,015	3,050	4,802	1,599	323	19	2,074	1,518	1,970	814	528	1,196	518	31,425

General information on these operators is as follows:

a) Rotrac S.A.

Rotrac S.A. is a private company which operates berths 2, 3 and 4. It employs approximately 100 people. Average annual cargo handling volume in recent years is less than 0.2 million tons. Major commodities of their activity are timber and construction materials. Major cargo-handling equipment is represented by five quay cranes which are rent from Umex S.A, three mobile cranes, seven tractors and 10 trailers.

b) Dezrobirea S.A

Dezrobirea S.A is a 100% private company, which operates 14 berths, from 1 to 7, 11 to 16, and 20. The company's total number of permanent employees is approximately 400. Average annual cargo handling volume from 1995 to 1999 is about 443 thousand tons. Major cargo commodities are ferrous metals such as iron scraps, copper electrodes and rolls and wood products for export or transit from Hungary, fresh fruits and vegetable for import, for which the major transportation mode in Romania is by railway. Main destinations of the scrap, which come from inside the country by railway, are in Turkey and in the far-east countries.

The major cargo handling equipment used is: 22 quay cranes, three mobile loaders and 15 forklifts. Dezrobirea also owns two locomotives, weighting and radioactivity control equipment. This company operates a two-level special reefer storehouse of 6,000 square meters capacity. Dezrobirea is currently running a modernization program of cargo handling equipment including quay cranes and weight scales for trucks and wagons.

c) Phoenix S.A

Phoenix S.A is a private company which operates two berths, 8 and 22. The average annual cargo handling volume from 1995 to 1999 is around 65 thousand tons. The share of direct delivery/go-down cargoes, for which the major transportation modes in Romania are railways (for export) and trucks (for import), is approximately 70% of the total handling volume. Major transportation modes in Romania for storage cargoes, whose share is about 30%, are sea transportation for export and trucks for import.

The main commodities are wood products, chemicals and metals products for export, and foods for import. The main destinations/origins of the export/import cargoes are the Mediterranean countries such as Syria for woods, Turkey for chemicals and metal products, and Egypt for foods.



Major cargo handling equipment is as follows: one mobile crane (capacity: 50 tons), six forklifts (capacities between 3-5 tons), five tractors and one pallet carrier.

d) Agroexport S.A.

Agroexport S.A. is a 100% private company whose share capital is some 1.8 billion lei. The main shareholders are Britania Group (40%), Agrex shipping (19%) and SIF (14%). This company operates six berths, namely 17, 18, 24 and from 31 to 33. It employs 240 people in Constantza port. Total administrated area of this company in the port spreads over five hectares with silo facilities included.

The major facilities and equipment of their area are three silos with a total storage capacity of 90,000 tons, six pipe loaders for cereal cargoes at berth 17-18, two pipe loaders for cereals at berth 24, two quay cranes at berth 31-32 and two grain elevators in berth 33.

Average annual cargo handling volume, of which the major commodities are cereals, food products and general cargoes, is approximately 870,000 tons. As for the transportation modes, the railways conveyed 70% of the total cargo handling volume. The next predominant mode is barge with 20% followed by trucks. Ninety-percent of transshipment cargo were transported by barge in 1999.

This company has future expansion plans. The outline of their plans is as follows:

- First step: Construction of silos with 30,000 tons capacity behind berth 31.
- Second step: Construction of silos with 25,000 tons capacity behind berth 32
- Third step: Construction of warehouses behind berth 33.

e) Frial S.A.

Frial S.A. is a private company, which operates berths 19, 21 and 53, a refrigerated warehouse and 7 tanks for edible oil and molasses. The number of employees is around 240.

Average annual cargo handling volume from 1995 to 1999 is approximately 170,000 tons of which the main commodities are frozen foods and chemical products.

The capacities of the storage facilities is 17,000 tons representing 50,000 cubic meters for refrigerated warehouse and 25,000 tons for edible and molasses tanks.

Major cargo handling equipment of this company are three quay cranes at berth 53, two quay cranes at berth 21, pumping unit for liquid products at berth 19 and six forklifts. They have also 132 reefer plugs at berth 53 round the reefer warehouse.

f) Decirom S.A

Decirom S.A is a private company with stocks almost completely owned by its employees. They operate seven berths, namely berth 23, from 47 to 51 and berth 122 with approximately 850 employees.

Average annual cargo handling volume from 1995 to 1999 is approximately 980,000 tons with main commodities cement, wood products and coal & coke.

Major cargo handling equipment of this company is represented by 24 quay cranes, three mobile cranes and two floating loaders.

g) Socep S.A.

Socep is a stevedoring company since 1991. It became a private joint stock company in 1996. They operate seven berths, namely from berth 35 to 37, from 41 to 43 and berth 52, with 600 employees.

Its profile includes handling ferrous metals, grains, chemical products, general cargo and containers, except for liquid bulk. The company's annual throughput is of some 2.2-2.7 million tons including approximately 80,000 TEUs of containers.

Currently the dwelling time of storage containers for import is 15 days while that for export is 7-8 days.

The main cargo handling equipment is represented by two container gantry cranes, two rail mount gantries for containers, 20 trailers, 23 quay cranes, five mobile cranes, 28 forklifts, 25 tractors and wagons.

As for the new container terminal in South Constanta, Socep sees that project as very hard to justify economically. The company plans to build a new portainer and buy some additional forklifts. Modernization of the existent equipment is a permanent concern for Socep.

h) Umex S.A.

The main shareholder of Umex S.A is Romenergo, the state owning some 3% of the share capital, while the rest is in private hands. They operate berths 38, 39, 40 and 44 with approximately 440 employees.

Umex operates ferrous metals, woods, foodstuff, general cargo and containers. Sometimes it also operates bulk cargo. Average annual cargo handling volume from

1995 to 1999 is approximately 460,000 tons. The containers are handled at berths 39 and 44 with a productivity of some 10-14 moves per hour.

According to the data released by Umex, its main cargo handling equipment is as follows: 17 shore cranes, 30 mobile cranes and 19 forklifts. The capacity of the biggest mobile crane is approximately 250 tons.

The company plans to buy a brand new mobile crane to be used for normal feeders. It also plans to expand the container business to reefer containers using plugging stations and to enlarge the existing container terminal yard to some 30,000 square meters.

i) Minmetal S.A

Minmetal S.A is a joint-stock company with 70% of the stake owned by the state. The number of employees is approximately 530 people.

It operates seven berths, namely berth 45, 46, from 64 to 67 and 85, the major commodities being ore, coal, coke, ferrous and non-ferrous materials such as steel plates, aluminum ingots, copper, concrete, steel.

Minmetal's annual capacity is 7 million tons. After 1989, the occupancy rate is some 2.5 million tons for raw materials and 400,000 tons for steel products. Out of the total throughput, 40 percent is ore, 40 percent is coal and coke while the rest is bauxite and other products. The export is represented by 80 percent steel products and 20 percent non-ferrous products such as aluminum, copper, etc. They have also adapted their facilities to other products such as grains, salt, big bags, timber and others.

According to the data released by Minmetal, the major cargo handling equipment is as follows: six bridge cranes, six shore cranes, 11 mobile cranes, five tower cranes and 11 forklifts.

The company will follow two important development directions:

- Modernization efforts for acquiring new cranes and IT equipment. In five years time, Metanef will invest some \$15 million in Minmetal.
- The labor force qualification in the port qualification school.

j) Chimpex S.A.

Chimpex S.A. is a joint stock company with 70 percent of stake owned by the state. It operates 10 berths, namely berths 54 to 63 with approximately 800 employees. Some 95 percent of its total employees work for maintenance and cargo-handling including stevedores and cranes drivers.

Main commodities of this company are dry bulk, cargoes such as grains, chemical products and phosphate. The company's annual average cargo-handling volume from 1995 to 1999 is around 1.7 million tons.

Main cargo handling equipment comprises 18 quay cranes, two bulk unloaders, two bulk loaders and four mobile cranes.

k) Sicim S.A.

Sicim S.A. is a joint stock company with 60% of the stocks held by the state. The company operates berth 68 with approximately 280 employees.

Its only commodity is cement whose average annual volume from 1995 to 1999 is of approximately 1.3 million tons, bound for export. Its destinations are Turkey, Nigeria, Algeria, France and Spain. The transportation mode from factories to the port is by railway. The main market of this company is Egypt.

The cargo-handling equipment of this company comprises two cement loaders of 500 tons/h capacity and one bag loader. The company has five cement silos whose total capacity is of approximately 40,000 tons, and one bagging station.

l) Oil terminal S.A

Oil terminal S.A. is a joint stock company with almost all stocks held by the state. This company is operating 11 berths, namely berths 69 to 79, with around 300 employees.

This company handles only bulk liquid cargoes, namely crude oil, gasoline, fuel oil, chemical products and lubricants. As for the transportation modes from shipper to storage tanks in the port area for export, 90% of the total volume of Gasoline and Diesel oil is by rail. The remainder of these cargoes goes by pipelines. Transportation mode of the remaining commodities for export is 100% on railway. As for the import, 75% of fuel oil, 60% of jet fuel and others are transported by railway. All crude oil, 20% of Fuel oil goes by pipelines.

Oil Terminal's 200 tanks cover different areas of the city and port, some 1 million cubic meters storage facilities being located in the South area of the port, another 500,000 cubic meters in the Bratianu area of the city, while 200,000 cubic meters can be stored in the facilities located in the north port precincts.

As for the future prospects, Oil Terminal is in a wait-and-see mode for the moment and has no investment plans for the time being. Their belief is that other companies are supposed to build the pipelines, as long as they can pump 20 million tons per year. For

the moment, Oil Terminal's plans are those related to environmental protection.

As for the opinion or idea to the Master Plan, the director envisages a tool-machine assembly factory in the port whose products would allegedly go directly for export. No refinery is recommended to be located in the port because of the lack of cooling water.

m) Comvex S.A.

Comvex S.A. is a private company with 2.3% of the share capital owned by the State Ownership Fund. The company is operating nine berths, namely berths 80 to 84 and berths 93 to 96 with 477 employees including 50 office staff.

The company operates coal, iron ore and bauxite for import. Average annual cargo handling volume from 1995 to 1999 is around 6.7 million tons, including transshipment cargoes. The origins and destinations of these cargoes are as follows:

[Origin]

Coal: Australia, Canada, USA

Iron ore: South Africa, Australia, Brazil, India, Australia, Venezuela

Bauxite: Australia, Guyana, Guinea

[Destinations]

Coal: Romania

Iron ore: Yugoslavia, Hungary, Romania

Bauxite: Romania, Georgia, Ukraine

Length of stocking times of the cargo in the port is 30-50 days for import and 30-90 days for transit. As for the share of transportation delivery mode to the final user, 90% of cargo handling volume is represented by barge transportation. The remaining cargo leaves by railway and sea going vessels.

n) Romtrans S.A

Romtrans S.A. is a private company which operates nine berths, that are berths 108 to 112 and berths 115 to 118. The number of employees at this branch is approximately 640.

Average annual cargo handling volume from 1995 to 1999 is about two million tons. Major commodities of the cargo are ferrous metals, cereal, mineral, wood, general cargo. Their major transportation modes in Romania are railway & trucks with 40%, ships and barges with 30%, respectively.

The major cargo handling equipment is represented by 12 quay cranes, four floating cranes, one tugboat and three locomotives.

o) Silotrans S.R.L

Silotrans S.R.L is a private company which operates two berths, that are berths 113 and 114. The company employs some 90 people of which 38 are administrative staff, the rest being field workers and others.

The company's major commodities are maize, soybean and wheat, the cargo handling volume being approximately 583,000 tons in 1999. As for the transportation modes, the biggest transportation mode for these cargoes is vessels & barges with 94% of the total cargo handling volume.

The major facilities and equipment are 10 silos with a total storage capacity of 100,000 tons, one loader for cereals on berth 114, two un-loaders for cereals on berth 113.

p) Mast C.O.

Mast C.O. is a private company, which operates six berths, that are berths 98 to 99, 124 to 125 and 129 to 130. The company has been in operation since 1998. Its cargo handling system is mainly the direct transfer of cereals between wagons and barges.

Its cargo handling volume in 1999 is 948,000 tons. The major cargo handling equipment of this company is represented by six floating cranes and four loaders.

Free Zone Administration and CFR Marfa Ferry Boat Branch are mentioned in 1.1.10 and 2.4 in Part I respectively.

## 2.7 Evaluation of the Existing Development Plans

### 2.7.1 Introduction

Existing terminal development plans are outlined in this chapter based on the information provided by CPA and several reports. A summary of these plans is provided in Table 2.7.1.

Table 2.7.1 Existing Development Plans

	Development Plans	Location	Promoter	Status	Funds
1	South Port New Container Terminal	South Port Pier 2	CPA	Ongoing	JBIC, state budget
2	Breakwater Rehabilitation	South Port	CPA	Ongoing	EBI, PHARE, state budget
3	LPG terminal	Berth 91-93 Central Island	Black Sea LPG Romania	Ongoing	Private
4	Bitumen terminal	Berth 102-103	Sargent	Ongoing	Private
5	Soya Bean terminal	Berth 104-107	Soyaplus	Ongoing	Private
6	Grain Terminal in the north port	Berth 31-33	Agroexport	Seeking finance	Private
7	Grain Terminal in the south port	South Port Pier 3		Postponed	World Bank, etc
8	International Business center	North Port near Gate1	CPA	Plan	
9	Passenger maritime station	North Port Passenger berth	CPA	Plan	
10	Waste Management		CPA	Seeking finance	ISPA, EBI, state budget,
11	Dredging Project	Port Area	CPA	Plan	CPA

## 2.7.2 Outline of the Existing Development Plans

### (1) South Port New Container Terminal

1) Name of the project: Constantza South Port. Container Terminal on the Pier II South

2) Outline of the project (Phase I)

This project is to increase container handling capacity to meet rising demand for container handling by constructing container terminal berths, and purchasing cranes and facilities at the South Port.

- Location: Berth 121-123
- Berth length: 625 m
- Water Depth: -14.5 m
- Width of apron 25 m
- Quay Crane: 3 units
- Terminal Yard: 90,000 m<sup>2</sup>
- Railway Terminal, Road and Road Connection
- Project Period: 2002-2008
- Capacity: 34,000 TEU/y

3) Financing sources:

Japan Bank for International Cooperation (JBIC) will fund 75% of the project on a loan basis, while remaining 25 percent will be funded using CPA's own resources and additional funds from the Romanian government through MOT.

4) Estimated cost of the project (Phase I)

US\$152.38 million

5) Present status:

The tender for the construction of terminals and procurement of equipment took place in Summer 2001.

6) Future prospects:

GIBB (1999) pointed out several issues regarding the project.

- High grow rate projected
- Possibility of hub port considering competitiveness against existing Mediterranean ports
- Economic viability (comparing to the existing terminals)

Furthermore following issues would be considered:

- Space for expansion
- Efficient use for continuous berth
- Utilization of existing facilities such as rail of ferry terminal



## **(2) Breakwater Rehabilitation**

### **1) Background**

With a view to ensuring the calmness of waterways and basins in south port, two breakwaters have been designed, totaling a length of 11,460 meters.

- Southern breakwater: 5,560 m
- Northern breakwater: 5,900 m

The construction of breakwaters started in 1975 and continued until 1990 when works were terminated due to a shortage of funds. Between 1991 and 1996, some funds were allocated from the state budget for works in critical areas and maintenance in the completed areas.

The construction works of the southern breakwater have been completed, however, as for the northern breakwater, the construction works were discontinued at Km 5+400. The section between Km 4+900 and Km 5+400 of the northern breakwater features only the core of quarry stone, up to the level -7.0m.

In January 1995, two vessels went astray and rammed the northern breakwater causing two breaches at Km 2+200 and Km 3+500. In 1995 the European Bank for Investments granted Romania a loan for financing the completion and reparation work. The European Community also contributed to the financing works through the PHARE Program.

### **2) Cost**

Estimated cost of the project: 70 million euros.

European Bank for Investments: 35 million euros.

PHARE Program: 17.5 million euros.

State budget: 17.5 million euros.

### **3) Present Status**

Following the international tender organized in July 1998, the works were attributed to the joint-venture Impregilo-Contransimex-Strabag International.

- Contracted value: 42,318,604 euros (VAT not included)
- The contract was signed on October 21, 1998.
- Estimated time for completion: February 2002.

Over 55 percent of the works have been completed.

### **4) Future Prospect**

Since the projects of the South Port such as Grain Terminal Project have not been realized yet, further consideration of required calmness in the harbor would be necessary.

### **(3) LPG Terminal**

#### 1) Background

The LPG terminal project is being carried out by *S.C. Black Sea LPG Romania S.A.* This company was established in 1997 as a joint venture company by Romanian companies Romgaz R.A., Renel R.A. and Rompetrol S.A., and United States companies Energy Transportation Group, Inc. of NY, UGI Enterprises Inc. of Valley Forge, Pennsylvania and North American World Trade, Ltd of Avon, Connecticut.

#### 2) Purpose of the project

The project consists of the following components:

- One sea berth for max. 35,000t loading capacity vessel, located on a side of a pier that shall be built in the central area of the port
- LPG unloading installations and precincts for cryogenic storage with the due installations, located on “the island”
- LPG loading platforms directly into railway and vehicle cisterns, connected to the existing railway and vehicle networks
- One barge loading berth, for the LPG forwarding on the Black Sea-Danube Canal
- LPG transport pipelines from the storage precincts to the loading platforms or directly to the regional end-users for the junction between “the island” and the shore, a vehicle bridge has to be built over the river-maritime canal for the barge circulation

#### 3) Present status

To expedite the start of LPG imports, *Black Sea LPG Romania S.A.* proposes that some infrastructure and super structure works be carried out at Constantza Port. This will make it possible for vessels of 5,000 t loading capacity to be discharged.

The selected location is between berths 91-93 representing the northern side of the river-maritime basin.

The following works have been planned:

- Setting up the mooring front
- The LPG pressure tank
- Loading ramps for railway cisterns
- Railway and road access system
- Facilities networks
- Fire fighting systems

#### 4) Cost and implementation schedule

Surface of the terminal 35,000 m<sup>2</sup>

Cost: \$5 million (1<sup>st</sup> stage), \$89 million (final stage)

Execution time: 12 months (1<sup>st</sup> stage), 30 months (final stage)

This project was approved by Technical and Economic Board of Ministry of Transport on March 8th 2000.

#### **(4) Bitumen Terminal**

The bitumen terminal, operated by United States company Sargeant, started its service on berths 102 and 103 in summer 1999 using floating equipment.

That company is expanding the infrastructure of this terminal with two storage tanks of 5,000 tonnes each and one warm bitumen delivery tank of 400 tonnes.

- Promoter: Sargeant
- Location: Berth 102-103
- Purpose: Handling bitumen
- Storage Capacity: 10,000 tonnes
- Cost: \$500 million

#### **(5) Soya Bean Terminal**

Soyaplus a joint venture company plans to invest US\$55million in a soya processing plant. Annual production is estimated at is 400,000 t. According to the order issued by the Ministry of Transport, C.P.A. rented to Soyaplus for 30 years from now on the surface needed for the arrangement.

- Promoter: Soyaplus SRL
- Location: Berth 104-107
- Purpose: Processing for lecithin and primary oil (1<sup>st</sup> stage, 2001)  
Oil refinery (2<sup>nd</sup> stage, 2005)
- Cost: \$55 million

#### **(6) Grain Terminal in the north port**

Agroexport Siloz is a major cereal operator in the port that operates three monumental silos of total capacity 90,000t. Agroexport Siloz is now planning to develop new silos behind berths 31 to 33. Outline of the plan is as follows:

<Phase 1>

- Location: Berth 31
- Silos: 30,000 t (6 x 5,000 t)
- Vessel Size: 40,000DWT

<Phase 2>

- Location: Berth 32
- Silos: 25,000 t (5 x 5,000 t)

<Phase 3>

- Location: Berth 33
- Warehouse: Horizontal warehouse with moving roof
- Purpose: Fodder

## **(7) Grain Terminal in the south port**

### 1) Outline of the project

In 1997, the World Bank funded a study\*\* regarding on grain terminal development, which recommended the following development plan.

- Development of a dedicated marine grain terminal on the Pier III of the south port, within an area falling under the authority of the Constantza South Free Trade Zone.
- Two silo concessions would occupy the full area of the pier.
- Part of the infrastructure of this pier is already partially built. Upon completion, a total area of some 200,000 m<sup>2</sup>, with a total quay length of 1,550 m will be available.
- The pier area should thus be divided into two equal parts:  
A first silo could be commissioned between 2000 and 2005 with an initial storage capacity of between 80,000 and 120,000 tonnes.

A second silo could be commissioned between 2005 and 2010, with approximately the same capacity and facilities.

- The two silos would be operated by two different operators.
- Sufficient space will be available within each silo concession to allow for the extension of the storage capacities of both silos to 150,000 tonnes at a later stage, and to allow for the installation of subsidiary activities around the silo such as horizontal storage facilities (for foodstuffs traffic) or grain-related transformation activities.
- Storage capacity: between 80,000 to 150,000 tonnes, with concrete or metal cells.  
Cells of the order of 3,000 – 4,000 t
- One maritime berth 250-300 m long, able to give access at minimum level (i.e. about –13.5 to –14m) to Panamax vessels.
- Sufficient barge berths to accommodate at least one barge at the same time, and possibly two

### 2) Cost of the Project

- \$ 65 million

### 3) Present status

Due to the economic situations, this project has been postponed. It would be necessary to reassess this project, while the new Silotrans Terminal started its operation from August 1998.

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\*\*Romania Grain Market and Export Project – Preparation Study for Maritime and River Infrastructure Component. (World Bank, 1998)

## **(8) International Business Center**

Diversifying its range of services is an important part of a ports development. These logistic services can be concentrated into a business center accessible to all interested people.

The activities and services proposed to be provided in the business center are:

- information office to provide statistics, vessel traffic info, etc.
- logistic services consultancy
- human resources consultancy
- financial and banking consultancy
- conference room, restaurants, medical assistance, shops

Due to its position between the city and the port, the international business center can also cover the city's necessities, as Constantza does not have such a center at present. The above mentioned activities can be run by specialized companies on a license base or by some departments of the CPA.

Taking into account the area's architectural structure, the available spaces and the access relations of the port with the city, it is recommended that the center be located at the north platform, north from gate 1 and east from the Maritime Stations. The platform has an area 6,900 square meters.

Technical data of the investment:

- location: near Gate 1, near the Maritime Station
- area: 6900 square meters
- height level: P plus 28
- the resistance structure will be metallic with indirect foundation
- built area 4390 sqm
- overall housing area 40,830 sqm
- access: through gate 1, actual restrictions preserved or new access from the Sailors Boulevard.

Estimated investment cost: \$32 million

## **(9) Passenger Maritime Station**

### 1) Outline of the project

Vertical quay with two mooring fronts:

293.4 m on the side pointing to the northern breakwater

363.5 m on the side pointing to the port area

Quay depth 10-11 m to accommodate vessels of 18,600tdw-500 persons

Platform width: 98 m

Passenger traffic mole platform surface: 5 ha

Platform surface: concrete

Operating period: 6 months/year

Type of vessels: exterior side passenger vessels and Ro-Ro on the side facing the port precincts

The passenger terminal will also include embarking/debarking spaces, customs control, waiting halls, offices, luggage facilities, halls for various usage, restaurants and shops.

2) Location of the project:

Port Constantza north, on the passenger mole, between the port museum and the Ro-Ro terminal at north and the old lighthouse at south. The access from the city will be ensured by gate 1, berth 0-5 platforms.

Estimated cost of the project: \$7.1 million

3) Justification for this project:

The European area enjoys some largely used routes: the English channel, the Canary Islands and the North Sea between the Scandinavian countries, as well as some cruising segments in the Mediterranean Sea, Atlantic Ocean, etc. In the east this activity is developed along the Aegean Sea and Marmara Sea coasts and to a lesser extent in the Black sea area.

Some possible routes can be identified:

Constantza – Istanbul

Constantza – Odessa

Constantza – Istanbul – Athens – Tartous – Beirut – Ashod – Alexandria

Constantza – Istanbul – Palermo – Genova – Marseille – Barcelona

4) Cost

Estimated annual incomes from port taxes: \$426,000

## **(10) Waste Management Project**

The Strategic Plan regarding the Waste Management in Constantza Port was elaborated in 1998, as part of the project on improving the scrap management financed by the Dutch ministry of economic affairs, with an aim at complying with the requisitions of the MARPOL 73/78 convention.

The plan focused on:

- oil residues
- chemical residues
- special solid scraps
- other solid scraps

The scraps produced on shore are collected, transported and stored by SALPORT

company without any sorting and without recouping the recyclable materials. Irrespective of their type, scraps are stored in the actual residues ramp which spreads over a 12 ha area, covered with a layer of ground scrap. There is no isolation against the infested waters, and there is no system of avoiding the toxic leakage in the atmosphere.

According with the Environment Protection Agency in Constantza, the actual ramp is not complying with the legislation in the field of hygiene and environment protection.

Liquid residues are separated by gravitation in the Oil Terminal.

The project will ensure that scrap are collected and stored taking into account all the environmental and public health considerations.

The feasibility study puts forward the following scenario:

- A. Vessel residues, sanitary residues and the solid scrap in the port basin will be incinerated. Estimated cost: 5.350 million euros
- B. Residues from the port platforms, solid scraps from the companies operating in the port and the street scraps will be stored in an ecological ramp provided with a special sector for the dangerous scraps. Estimated cost: 5.200 million euros.
- C. Dirty water, liquid scraps at the surface and waters resulting from the cleaning of the oil tankers will be treated in a water treatment station. Estimated cost: 4.600 million euros.
- D. Collection of the residual waters is to be performed by a collecting vessel. Estimated cost: 1.412 million euros.

Total estimated value of the project: 16.562 million euros, VAT and other taxes not included.

The incinerator will be located at Gate 6, far enough from the city's populated areas. The treatment station will be located in the Oil Terminal.

The project has been submitted for financing to the European Investment Bank and for an ISPA non-reimbursable loan.

Funds are to be disbursed as follows:

- 50 percent ISPA
- 50 percent EIB, state budget, CPA's own resources, in percentages to be established at a later date.

## **(11) Dredging Project**

The dredging operations are carried out according to the operators' request and also to the massive sediments on the sea bottom. CPA allocates US\$ 1 million of its own

resources for annual dredging operations. The measurement operations are carried out once every 2-3 months. The amount that could cover the cost of the necessary dredging operations, should be about \$2.5 million. Before starting dredging, some samples are collected and sent for analysis, in order to decide (according to the nature of the dredging material) whether it is suitable to use this material in the southern side of Constantza port for the two new pier construction, or whether to carry it to the middle of the “island” under the survey/control of both C.P.A. and Romanian Waters National Company.

The cost of the dredging operation varies, according to the material structure, between \$2 and \$7/m<sup>3</sup>.

### **2.7.3 Evaluation of the Existing Development Plans**

As given preconditions for this Master Plan Study, the JICA Study Team assumes that projects which have already received financing and which are now in progress, such as South Port New Container Terminal, Breakwater Rehabilitation, LPG terminal, Bitumen terminal, Soya Bean terminal and Waste Management Facilities, will be materialized during this decade.

Grain Terminal in the north port and Grain Terminal in the south port are in the planning stage and have not received financing. These two projects are reorganized in this Master Plan Study.

Two projects which are under joint study by CPA and related Private sectors, such as the International Business center and Passenger maritime station, are independent projects and do not have a large influence on the Master Plan of the Port. The JICA study team allocates these projects in the Master Plan Layout in their present form, but does not consider them as Candidate Projects for the Economic Analysis.

If the Dredging Projects are confirmed to be necessary during the berth allocation process of the Master Plan Study, these projects would be evaluated in the economic Analysis of the Study.