

Chapter 6 Master Plan of the Port of Constantza

6.1 Development Scenario of the Port

(1) Viewpoints for the Preparation of the New Master Plan

Taking the development strategy into consideration, in drawing up the New Master Plan, the modernization of the Port of Constantza needs to be planned based on the following viewpoints.

- 1) Need to meet the advancement of containerization
- 2) Coping with increasing ship sizes
- 3) Realization of internationally competitive of the port
- 4) Improvement of linkage with inland transport system
- 5) Realization of port development integral with regional development plan

(2) Forecast of standard ship size by cargo type

The maximum vessel size in 2020 by cargo type was forecasted as follows;

Grains	:	30000 DWT to 50000 DWT
Container	:	40000 DWT (3000TEU) to 60000DWT(4000TEU)
Steel products:		50,000 DWT class handy max type
General cargo:		10,000 DWT to 15,000 DWT

6.2 Optimum Cargo Handling System by Commodities and Requirement for Port Development

By analyzing the balance between the existing cargos handling capacity vs. forecasted cargo demand by commodity, following observations can be made.

- As for container cargo and grains export, shortage of handling capacity for grains will be occurred and additional facilities will be necessary.
- As for crude oil, petroleum products and ores, the existing capacities are enough to handle these commodities.

As for present cargo handling productivity, the average cargo handling productivity were calculated. It is observed that productivities of “Steel products”, “Non-ferrous products” and “Timber” are particularly low compared to the performance at other ports. One reason for this low productivity is the scattered or dispersed use of berths for handling similar cargoes. In order to improve productivity, it is advisable to handle the same type of commodity collectively at a spatial and dedicated terminal.

6.3 Required Port Facilities

The Master Plan is consists of three categories as follows:

1) New Master Plan Projects

These are the set of projects that are recommended by the Study Team to be included in the Master Plan for the Port of Constantza.

2) Existing Projects

These are projects that are already ongoing or will be implemented mainly by the private sector, thus in the Master Plan they are treated as given projects.

3) Future Expansion Area

This is a study team proposal for the future expansion area beyond the year 2020.

Table 6.3.1 outlines development projects related to the Master Plan

(1) Outline of the Master Plan Project

Projects of the New Master Plan can be divided into three groups according to their purposes.

(i) Projects to meet future cargo demand

The objective of the first group projects is to meet the increasing traffic demand of the port in the future. One of the projects of this group is the development of new container terminal and the other is construction of grain terminal.

(ii) Projects to improve port operation

The second group projects are to improve the present port operation. Cargoes are currently handled by each operator in small scale on scattered terminals. Some cargoes are to be integrated in one or two places in a specialized and aggregated manner, thereby raising the cargo handling efficiency and adapting it to the future maritime transport trends such as increase in ship size.

General cargo will be gradually containerized, so that remaining break bulk cargoes and large lot cargoes will be steel products and timber. So the Study Team proposes Steel Product Terminal, Timber Terminal and reorganization of General Cargo Terminals in the Master Plan.

(iii) Projects to improve port transportation system

In this group, projects are to improve accessibility of the port terminal in the port to the inland transportation network.

One is to develop barge related facilities in the port for promoting the inland waterways transport using the Black Sea-Danube Canal. The second is to improve railways in the port and the third is to improve road alignment in the port.

(2) Requirement of each terminal

(i) Container Terminal

At present a container terminal at South Port S-2 is under processing to tender, which will provide terminal capacity of about 375,000 TEUs. In order to realize combined scale merit of container handling, it is advisable to develop a new container terminal at the same S-2 Pier as Phase II and III of on-going Phase I terminal development.

Additional Phase II and III development plan which include additional one berth (500m) with three Gantry Cranes and 23.5ha of yard space will be required.

(ii) Grain Terminal

Grain export demand in 2020 will be 6.5 million ton, which includes Romanian's export and transit from inland countries. Taking annual fluctuation of grains export into consideration, a New Grain Terminal of annual handling capacity of 2 million tons is required for the year 2010. The forecasted vessel size is from 30,000 to 50,000 DWT. In consideration of accommodating larger vessels and accessibility for barge transport of grains, it is recommended to construct an additional silo in South Port.

Major required facilities are 1 berth for grain vessels, 2 berths for barges, silo and handling equipment.

(iii) Steel Product Terminal

Currently many general cargo berths are handling steel products and non-ferrous metal product. According to the cargo volume forecast for 2020, steel demand will rise to 1.8 million tons. One of planning concepts of the steel products terminal is to integrate physically at one location for easy maintenance and economic operation. Required facilities are 6 berths and storage area.

(iv) Timber Terminal

Currently general cargo berths at the North Port area are handling timber products. Since it is comparatively easy handling work, all the general cargo berths at the North Port area are capable to handle timber.

According to cargo volume forecast for 2010, timber demand will rise to 1.13 million tons and the estimated volume for 2020 will be 0.68 million tons. Timber terminal should be physically integrated at one location for easy maintenance and economic operation. Required facilities are 8 berths and storage area.

(v) Reorganization of General Cargo Terminal

Almost all general cargo will be containerized in the future and timber and steel products will be shifted to the aggregated terminal. Considering these conditions, the New Master Plan recommends the berths in the Old North Port should be tend not to be used in the

future for cargo handling, due to their insufficient depth and limited space of back up area.

(vi) Barge Basin

Barge Transport will predominant in the long haul transport of dry bulk, and major commodities to be carried by barges will be Iron ore and scrap, Chalk, cement and construction materials, Ferrous and non-ferrous metals, coal and coke.

The required facilities are mooring quays for temporary berthing before loading/unloading cargo and assembling new convoy to next trip. Since it is estimated that the cargoes to be carried by barges will increase to 20 million tons in 2020, a large wet basin should be reserved for this transport mode. Mooring facilities for pushers and tugs of convoys are also required.

(vii) Railway and Road Improvement

The Study Team has examined the present road and railway capacity in the port, reviewing existing facilities and conducting Traffic Survey.

As for railways, it is considered that the present capacity will be able to meet the future cargo demand in the Master Plan.

The railway station capacity for marshalling of wagons in the North Port can sufficiently meet the future cargo demand. However, it will become more important that railway cargoes are marshaled efficiently and smoothly between railway stations and each berth.

As for road, the Study Team suggests constructing bypass road of the Gate 5, which is located on the middle of the North Port, in order to avoid traffic jam of the Gate 5 due to steep and narrow road alignment. In addition, repair and maintenance works of roads in several points are also required.

(3) Existing Projects

Projects that are already on going or will be implemented mainly by private sectors are basically treated as given projects in the Master Plan. Following projects are considered as given projects:

- Breakwater Rehabilitation
- LPG terminal, Bitumen terminal, Soya Bean terminal
- Grain Terminal in the north port
- International Business Center
- Passenger maritime station
- Waste Management
- Dredging Project

In addition, the projects that are not yet fully justified or identified by traffic demand forecast are considered as the some possible projects related to the Master Plan.

6.4 Required Cargo Handling Equipment

6.4.1 Issues on Existing Cargo Handling Terminals and Improvement Scenarios

For the analysis of improvement scenarios, following reference data were prepared for review:

Commodity is classified into 14 groups for type of cargo taking the classification used in the traffic forecast. Each cargo is classified into four type of cargo namely, general cargo, containerized, dry bulk and liquid bulk. Study year are 1999, 2010 for the short-term plan and 2020 for the Master Plan. Both cargo traffics case-1 and case-2 are taken into account.

Table 6.4.1-1 Cargo Volume Arrangement by Commodity and Type of Cargo
(1999, 2010 and 2020)(Case 1 and Case 2)

Balance between future traffic and existing cargo handling capacity was evaluated for both traffic forecasts Case-1 and Case-2. Estimated berth capacities of 19 operators are shown by the eight-cargo type classification.

Table 6.4.1-2-1 Balance between Future Traffic and Existing Cargo Handling Capacity (Case 1)

Table 6.4.1-2-2 Balance between Future Traffic and Existing Cargo Handling Capacity (Case 2)

Forecast cargo volume is generally lower than the present total cargo handling capacity of the terminals, except for handling capacities of **containerized cargoes** and **dry bulk grain cargoes**.

Note: Grain forecast is for the bulk grain carrying by bulk carriers. Grain packed in bags is classified as general cargoes.

6.4.2 Future Improvement Plan of Cargo handling Equipment

Considering cargo demand increase tendency, following improvement scenario can be proposed:

- (1) New Container Terminal at Pier S2 of the South Port:
 - a. 1st Phase Construction (On-going Project to be in 2004 by JBIC finance)
 - b. 2nd and 3rd Phase Construction

- (2) New Grain Terminal at Pier S3 of the South Port:
 - (2)-1 In case of Case 1 Cargo Demand:
 - a. 1st Phase Construction (2.0 million tons/year)
 - b. 2nd Phase Construction (2.0 million tons/year)
 - (2)-2 In case of Case 2 Cargo Demand:

No additional terminal will be require before 2020.

Table 6.4.1-1-1 Cargo Volume Arrangement by Commodity and Type of Cargo (1999)

Category	No.	Type	Commodities	1999											
				Case 1					Case 2						
				Total	General	Container	Bulk	Liquid	Total	General	Container	Bulk	Liquid		
Export-Load	1	B	Cereals	1.01			1.01			1.01			1.01		
	4	C	Foods, Beverage, Tobacco	0.14		0.14			0.14			0.14			
	6	G	Timber, Charcoal	0.64	0.64				0.64	0.64					
	7	B/G	Fertilizers(B:50%+G:50%)	0.68	0.34		0.34		0.68	0.34			0.34		
	9	B/G	Iron Ore, Scrap	0.62	0.62		0.00		0.62	0.62			0.00		
	10	B	Non-Ferrous Ore	0.02			0.02		0.02				0.02		
	13	B	Solid Fuel(Coal, Coke, etc.)	0.10			0.10		0.10				0.10		
	14	L	Crude Oil	0.00				0.00	0.00					0.00	
	15	L	Oil & Gas Products	1.38				1.38	1.38					1.38	
	17	L/G	Chemical Products(L:50%+G:50%)	0.70	0.35			0.35	0.70	0.35				0.35	
	18	B/G	Cement, Construction Mat'ls(B:70%+G:30%)	1.81	0.54		1.27		1.81	0.54			1.27		
	20	G	Ferrous/NonFerrous Materials	1.33	1.33				1.33	1.33					
	23	C	Various Manufactured Products	0.36		0.36			0.36		0.36				
	24	C	Other Cargoes	0.62		0.62			0.62		0.62				
		Total	9.41	3.82	1.12	2.74	1.73	9.41	3.82	1.12	2.74	1.73	2.74	1.73	
Import-Unload	1	B/G	Cereals(B:90%+G:10%)	0.04	0.00		0.04		0.04	0.00			0.04		
	4	C	Foods, Beverage, Tobacco	0.47		0.47			0.47		0.47				
	6	G	Timber, Charcoal	0.00	0.00				0.00	0.00					
	7	B/L	Fertilizers(B:40%+L:60%)	0.37			0.15	0.22	0.37				0.15	0.22	
	9	B/G	Iron Ore, Scrap	4.17	0.00		4.17		4.17	0.00			4.17		
	10	B	Non-Ferrous Ore	1.07			1.07		1.07				1.07		
	13	B	Solid Fuel(Coal, Coke, etc.)	1.73			1.73		1.73				1.73		
	14	L	Crude Oil	3.14				3.14	3.14					3.14	
	15	L	Oil & Gas Products	0.83				0.83	0.83					0.83	
	17	L/G	Chemical Products(L:50%+G:50%)	0.03	0.02			0.02	0.03	0.02				0.02	
	18	B	Chalk, Cement, Construction Materials	0.01			0.01		0.01				0.01		
	20	G	Ferrous/NonFerrous Materials	0.05	0.05				0.05	0.05					
	23	C	Various Manufactured Products	0.35		0.35			0.35		0.35				
	24	C	Other Cargoes	0.09		0.09			0.09		0.09				
		Total	12.35	0.07	0.91	7.16	4.21	12.35	0.07	0.91	7.16	4.21	7.16	4.21	
Transit-Load	1	B	Cereals	0.68					0.68				0.68		
	4	C	Foods, Beverage, Tobacco	0.03		0.03			0.03		0.03				
	6	G	Timber, Charcoal	0.00	0.00				0.00	0.00					
	7	B	Fertilizers(Natural, Chemical)	0.01			0.01		0.01				0.01		
	9	B/G	Iron Ore, Scrap	0.08	0.08		0.00		0.08	0.08			0.00		
	10	B	Non-Ferrous Ore	0.01			0.01		0.01				0.01		
	13	B	Solid Fuel(Coal, Coke, etc.)	0.00			0.00		0.00				0.00		
	14	L	Crude Oil	0.00				0.00	0.00					0.00	
	15	L	Oil & Gas Products	0.00				0.00	0.00					0.00	
	17	L/G	Chemical Products(L:50%+G:50%)	0.00	0.00			0.00	0.00	0.00				0.00	
	18	B	Chalk, Cement, Construction Materials	0.00			0.00		0.00				0.00		
	20	G	Ferrous/NonFerrous Materials	0.06	0.06				0.06	0.06					
	23	C	Various Manufactured Products	0.00		0.00			0.00		0.00				
	24	C	Other Cargoes	0.04		0.04			0.04		0.04				
		Total	0.91	0.14	0.07	0.70	0.00	0.91	0.14	0.07	0.70	0.00	0.70	0.00	
Transit-Unload	1	B/G	Cereals(B:90%+G:10%)	0.04	0.00		0.04		0.04	0.00			0.04		
	4	C	Foods, Beverage, Tobacco	0.00		0.00			0.00		0.00				
	6	G	Timber, Charcoal	0.00	0.00				0.00	0.00					
	7	B	Fertilizers(Natural, Chemical)	0.01			0.01		0.01				0.01		
	9	B/G	Iron Ore, Scrap	0.00	0.00		0.00		0.00	0.00			0.00		
	10	B	Non-Ferrous Ore	0.10			0.10		0.10				0.10		
	13	B	Solid Fuel(Coal, Coke, etc.)	0.00			0.00		0.00				0.00		
	14	L	Crude Oil	0.07				0.07	0.07					0.07	
	15	L	Oil & Gas Products	0.00				0.00	0.00					0.00	
	17	L/G	Chemical Products(L:50%+G:50%)	0.01	0.01			0.01	0.01	0.01				0.01	
	18	B	Chalk, Cement, Construction Materials	0.00			0.00		0.00				0.00		
	20	G	Ferrous/NonFerrous Materials	0.00	0.00				0.00	0.00					
	23	C	Various Manufactured Products	0.00		0.00			0.00		0.00				
	24	C	Other Cargoes	0.01		0.01			0.01		0.01				
		Total	0.24	0.01	0.01	0.15	0.08	0.24	0.01	0.01	0.15	0.08	0.15	0.08	
Total	1	B	Cereals	1.77	0.01	0.00	1.76	0.00	1.77	0.01	0.00	1.76	0.00	0.00	
	4	C	Foods, Beverage, Tobacco	0.64	0.00	0.64	0.00	0.00	0.64	0.00	0.64	0.00	0.00	0.00	
	6	G	Timber, Charcoal	0.64	0.64	0.00	0.00	0.00	0.64	0.64	0.00	0.00	0.00	0.00	
	7	B	Fertilizers(Natural, Chemical)	1.07	0.34	0.00	0.51	0.22	1.07	0.34	0.00	0.51	0.22	0.00	
	9	B/G	Iron Ore, Scrap	4.87	0.70	0.00	4.17	0.00	4.87	0.70	0.00	4.17	0.00	0.00	
	10	B	Non-Ferrous Ore	1.20	0.00	0.00	1.20	0.00	1.20	0.00	0.00	1.20	0.00	0.00	
	13	B	Solid Fuel(Coal, Coke, etc.)	1.83	0.00	0.00	1.83	0.00	1.83	0.00	0.00	1.83	0.00	0.00	
	14	L	Crude Oil	3.21	0.00	0.00	0.00	3.21	3.21	0.00	0.00	0.00	3.21	0.00	
	15	L	Oil & Gas Products	2.21	0.00	0.00	0.00	2.21	2.21	0.00	0.00	0.00	2.21	0.00	
	17	L/G	Chemical Products	0.74	0.37	0.00	0.00	0.37	0.74	0.37	0.00	0.00	0.37	0.00	
	18	B	Chalk, Cement, Construction Materials	1.82	0.54	0.00	1.28	0.00	1.82	0.54	0.00	1.28	0.00	0.00	
	20	G	Ferrous/NonFerrous Materials	1.44	1.44	0.00	0.00	0.00	1.44	1.44	0.00	0.00	0.00	0.00	
	23	C	Various Manufactured Products	0.71	0.00	0.71	0.00	0.00	0.71	0.00	0.71	0.00	0.00	0.00	
	24	C	Other Cargoes	0.76	0.00	0.76	0.00	0.00	0.76	0.00	0.76	0.00	0.00	0.00	
		Total	22.91	4.04	2.11	10.75	6.01	22.91	4.04	2.11	10.75	6.01	6.01		

Table 6.4.1-2 Cargo Volume Arrangement by Commodity and Type of Cargo (2010)

Category	No.	Type	Commodities	2010										
				Case 1					Case 2					
				Total	General	Container	Bulk	Liquid	Total	General	Container	Bulk	Liquid	
Export-Load	1	B	Cereals	1.80			1.80			1.50				
	4	C	Foods, Beverage, Tobacco	0.24		0.24			0.19		0.19			
	6	G	Timber, Charcoal	1.13	1.13				1.13	1.13				
	7	B/G	Fertilizers(B:50%+G:50%)	0.36	0.18		0.18		0.48	0.24			0.24	
	9	B/G	Iron Ore, Scrap	0.85	0.85		0.00		0.85	0.85			0.00	
	10	B	Non-Ferrous Ore	0.00			0.00		0.00				0.00	
	13	B	Solid Fuel(Coal, Coke, etc.)	0.00			0.00		0.00				0.00	
	14	L	Crude Oil	0.00				0.00	0.00					0.00
	15	L	Oil & Gas Products	2.39				2.39	2.82					2.82
	17	L/G	Chemical Products(L:50%+G:50%)	0.67	0.34			0.34	0.70	0.35				0.35
	18	B/G	Cement, Construction Mat'ls(B:70%+G:30%)	1.07	0.32		0.75		1.36	0.41			0.95	
	20	G	Ferrous/NonFerrous Materials	1.90	1.90				1.90	1.90				
	23	C	Various Manufactured Products	0.63		0.63			0.49		0.49			
	24	C	Other Cargoes	1.08		1.08			0.84		0.84			
		Total	12.12	4.72	1.95	2.73	2.73	12.26	4.88	1.52	2.69	3.17		
Import-Unload	1	B/G	Cereals(B:90%+G:10%)	0.20	0.02		0.18		0.38	0.04		0.34		
	4	C	Foods, Beverage, Tobacco	0.82		0.82			0.64		0.64			
	6	G	Timber, Charcoal	0.00	0.00				0.00	0.00				
	7	B/L	Fertilizers(B:40%+L:60%)	0.69			0.28	0.41	0.52			0.21	0.31	
	9	B/G	Iron Ore, Scrap	6.90	0.00		6.90		6.90	0.00		6.90		
	10	B	Non-Ferrous Ore	1.68			1.68		1.39			1.39		
	13	B	Solid Fuel(Coal, Coke, etc.)	2.11			2.11		2.10			2.10		
	14	L	Crude Oil	11.92				11.92	9.33				9.33	
	15	L	Oil & Gas Products	1.44				1.44	1.13				1.13	
	17	L/G	Chemical Products(L:50%+G:50%)	0.00	0.00			0.00	0.00	0.00			0.00	
	18	B	Chalk, Cement, Construction Materials	0.00			0.00		0.00			0.00		
	20	G	Ferrous/NonFerrous Materials	0.00	0.00				0.00	0.00				
	23	C	Various Manufactured Products	0.62		0.62			0.48		0.48			
	24	C	Other Cargoes	0.16		0.16			0.13		0.13			
		Total	26.54	0.02	1.60	11.15	13.77	23.00	0.04	1.25	10.94	10.77		
Transit-Load	1	B	Cereals	2.65			2.65		0.50			0.50		
	4	C	Foods, Beverage, Tobacco	0.03		0.03			0.03		0.03			
	6	G	Timber, Charcoal	0.00	0.00				0.00	0.00				
	7	B	Fertilizers(Natural, Chemical)	0.00			0.00		0.00			0.00		
	9	B/G	Iron Ore, Scrap	0.11	0.11		0.00		0.11	0.11			0.00	
	10	B	Non-Ferrous Ore	0.00			0.00		0.00			0.00		
	13	B	Solid Fuel(Coal, Coke, etc.)	0.00			0.00		0.00			0.00		
	14	L	Crude Oil	0.00				0.00	0.00				0.00	
	15	L	Oil & Gas Products	0.00				0.00	0.00				0.00	
	17	L/G	Chemical Products(L:50%+G:50%)	0.00	0.00			0.00	0.00	0.00			0.00	
	18	B	Chalk, Cement, Construction Materials	0.00			0.00		0.00			0.00		
	20	G	Ferrous/NonFerrous Materials	0.10	0.10				0.10	0.10				
	23	C	Various Manufactured Products	0.07		0.07			0.07		0.07			
	24	C	Other Cargoes	0.13		0.13			0.13		0.13			
		Total	3.09	0.21	0.23	2.65	0.00	0.94	0.21	0.23	0.50	0.00		
Transit-Unload	1	B/G	Cereals(B:90%+G:10%)	0.05	0.01		0.05		0.13	0.01		0.12		
	4	C	Foods, Beverage, Tobacco	0.09		0.09			0.09		0.09			
	6	G	Timber, Charcoal	0.00	0.00				0.00	0.00				
	7	B	Fertilizers(Natural, Chemical)	0.00			0.00		0.00			0.00		
	9	B/G	Iron Ore, Scrap	0.83	0.00		0.83		0.83	0.00		0.83		
	10	B	Non-Ferrous Ore	0.27			0.27		0.22			0.22		
	13	B	Solid Fuel(Coal, Coke, etc.)	0.00			0.00		0.00			0.00		
	14	L	Crude Oil	0.39				0.39	0.39				0.39	
	15	L	Oil & Gas Products	0.00				0.00	0.00				0.00	
	17	L/G	Chemical Products(L:50%+G:50%)	0.00	0.00			0.00	0.00	0.00			0.00	
	18	B	Chalk, Cement, Construction Materials	0.00			0.00		0.00			0.00		
	20	G	Ferrous/NonFerrous Materials	0.00	0.00				0.00	0.00				
	23	C	Various Manufactured Products	0.08		0.08			0.08		0.08			
	24	C	Other Cargoes	0.02		0.02			0.02		0.02			
		Total	1.73	0.01	0.19	1.15	0.39	1.76	0.01	0.19	1.17	0.39		
Total	1	B	Cereals	4.70	0.03	0.00	4.68	0.00	2.51	0.05	0.00	2.46	0.00	
	4	C	Foods, Beverage, Tobacco	1.18	0.00	1.18	0.00	0.00	0.95	0.00	0.95	0.00	0.00	
	6	G	Timber, Charcoal	1.13	1.13	0.00	0.00	0.00	1.13	1.13	0.00	0.00	0.00	
	7	B	Fertilizers(Natural, Chemical)	1.05	0.18	0.00	0.46	0.41	1.00	0.24	0.00	0.45	0.31	
	9	B/G	Iron Ore, Scrap	8.69	0.96	0.00	7.73	0.00	8.69	0.96	0.00	7.73	0.00	
	10	B	Non-Ferrous Ore	1.95	0.00	0.00	1.95	0.00	1.61	0.00	0.00	1.61	0.00	
	13	B	Solid Fuel(Coal, Coke, etc.)	2.11	0.00	0.00	2.11	0.00	2.10	0.00	0.00	2.10	0.00	
	14	L	Crude Oil	12.31	0.00	0.00	0.00	12.31	9.72	0.00	0.00	0.00	9.72	
	15	L	Oil & Gas Products	3.83	0.00	0.00	0.00	3.83	3.95	0.00	0.00	0.00	3.95	
	17	L/G	Chemical Products	0.67	0.34	0.00	0.00	0.34	0.70	0.35	0.00	0.00	0.35	
	18	B	Chalk, Cement, Construction Materials	1.07	0.32	0.00	0.75	0.00	1.36	0.41	0.00	0.95	0.00	
	20	G	Ferrous/NonFerrous Materials	2.00	2.00	0.00	0.00	0.00	2.00	2.00	0.00	0.00	0.00	
	23	C	Various Manufactured Products	1.40	0.00	1.40	0.00	0.00	1.12	0.00	1.12	0.00	0.00	
	24	C	Other Cargoes	1.39	0.00	1.39	0.00	0.00	1.12	0.00	1.12	0.00	0.00	
		Total	43.48	4.95	3.97	17.67	16.89	37.96	5.14	3.19	15.30	14.33		

Table 6.4.1-1-3 Cargo Volume Arrangement by Commodity and Type of Cargo (2020)

Category	No.	Type	Commodities	2020										
				Case 1					Case 2					
				Total	General	Container	Bulk	Liquid	Total	General	Container	Bulk	Liquid	
Export-Load	1	B	Cereals	2.64			2.64			1.50			1.50	
	4	C	Foods, Beverage, Tobacco	0.42		0.42				0.29		0.29		
	6	G	Timber, Charcoal	0.68	0.68				0.68	0.68				
	7	B/G	Fertilizers(B:50%+G:50%)	0.19	0.10		0.10		0.30	0.15			0.15	
	9	B/G	Iron Ore, Scrap	0.30	0.30		0.00		0.30	0.30			0.00	
	10	B	Non-Ferrous Ore	0.00			0.00		0.00				0.00	
	13	B	Solid Fuel(Coal, Coke, etc.)	0.00			0.00		0.00				0.00	
	14	L	Crude Oil	0.00				0.00	0.00					0.00
	15	L	Oil & Gas Products	1.57				1.57	2.02					2.02
	17	L/G	Chemical Products(L:50%+G:50%)	0.36	0.18			0.18	0.51	0.26				0.26
	18	B/G	Cement, Construction Mat'ls(B:70%+G:30%)	0.64	0.19		0.45		0.94	0.28			0.66	
	20	G	Ferrous/NonFerrous Materials	1.90	1.90				1.90	1.90				
23	C	Various Manufactured Products	1.07		1.07			0.73		0.73				
24	C	Other Cargoes	1.85		1.85			1.26		1.26				
		Total	11.62	3.35	3.34	3.18	1.75	10.43	3.57	2.28	2.31	2.28		
Import-Unload	1	B/G	Cereals(B:90%+G:10%)	0.20	0.02		0.18		0.38	0.04		0.34		
	4	C	Foods, Beverage, Tobacco	1.41		1.41			0.96		0.96			
	6	G	Timber, Charcoal	0.00	0.00				0.00	0.00				
	7	B/L	Fertilizers(B:40%+L:60%)	1.24			0.50	0.74	0.81			0.32	0.49	
	9	B/G	Iron Ore, Scrap	8.30	0.00		8.30		6.90	0.00		6.90		
	10	B	Non-Ferrous Ore	1.01			1.01		0.84			0.84		
	13	B	Solid Fuel(Coal, Coke, etc.)	2.55			2.55		2.10			2.10		
	14	L	Crude Oil	16.40				16.40	10.64				10.64	
	15	L	Oil & Gas Products	2.47				2.47	1.68				1.68	
	17	L/G	Chemical Products(L:50%+G:50%)	0.00	0.00			0.00	0.00	0.00			0.00	
	18	B	Chalk, Cement, Construction Materials	0.00			0.00		0.00			0.00		
	20	G	Ferrous/NonFerrous Materials	0.00	0.00				0.00	0.00				
23	C	Various Manufactured Products	1.05		1.05			0.72		0.72				
24	C	Other Cargoes	0.28		0.28			0.19		0.19				
		Total	34.91	0.02	2.74	12.54	19.61	25.22	0.04	1.87	10.51	12.81		
Transit-Load	1	B	Cereals	3.84			3.84		0.50			0.50		
	4	C	Foods, Beverage, Tobacco	0.08		0.08			0.08		0.08			
	6	G	Timber, Charcoal	0.00	0.00				0.00	0.00				
	7	B	Fertilizers(Natural, Chemical)	0.00			0.00		0.00			0.00		
	9	B/G	Iron Ore, Scrap	0.04	0.04		0.00		0.04	0.04		0.00		
	10	B	Non-Ferrous Ore	0.00			0.00		0.00			0.00		
	13	B	Solid Fuel(Coal, Coke, etc.)	0.00			0.00		0.00			0.00		
	14	L	Crude Oil	0.00				0.00	0.00				0.00	
	15	L	Oil & Gas Products	0.00				0.00	0.00				0.00	
	17	L/G	Chemical Products(L:50%+G:50%)	0.00	0.00				0.00	0.00			0.00	
	18	B	Chalk, Cement, Construction Materials	0.00			0.00		0.00			0.00		
	20	G	Ferrous/NonFerrous Materials	0.10	0.10				0.10	0.10				
23	C	Various Manufactured Products	0.21		0.21			0.21		0.21				
24	C	Other Cargoes	0.36		0.36			0.36		0.36				
		Total	4.63	0.14	0.65	3.84	0.00	1.29	0.14	0.65	0.50	0.00		
Transit-Unload	1	B/G	Cereals(B:90%+G:10%)	0.05	0.01		0.05		0.13	0.01		0.12		
	4	C	Foods, Beverage, Tobacco	0.26		0.26			0.26		0.26			
	6	G	Timber, Charcoal	0.00	0.00				0.00	0.00				
	7	B	Fertilizers(Natural, Chemical)	0.00			0.00		0.00			0.00		
	9	B/G	Iron Ore, Scrap	1.00	0.00		1.00		0.95	0.00		0.95		
	10	B	Non-Ferrous Ore	0.16			0.16		0.13			0.13		
	13	B	Solid Fuel(Coal, Coke, etc.)	0.00			0.00		0.00			0.00		
	14	L	Crude Oil	0.46				0.46	0.46				0.46	
	15	L	Oil & Gas Products	0.00				0.00	0.00				0.00	
	17	L/G	Chemical Products(L:50%+G:50%)	0.00	0.00				0.00	0.00			0.00	
	18	B	Chalk, Cement, Construction Materials	0.00			0.00		0.00			0.00		
	20	G	Ferrous/NonFerrous Materials	0.00	0.00				0.00	0.00				
23	C	Various Manufactured Products	0.21		0.21			0.21		0.21				
24	C	Other Cargoes	0.05		0.05			0.05		0.05				
		Total	2.19	0.01	0.52	1.21	0.46	2.19	0.01	0.52	1.20	0.46		
Total	1	B	Cereals	6.73	0.03	0.00	6.71	0.00	2.51	0.05	0.00	2.46	0.00	
	4	C	Foods, Beverage, Tobacco	2.17	0.00	2.17	0.00	0.00	1.59	0.00	1.59	0.00	0.00	
	6	G	Timber, Charcoal	0.68	0.68	0.00	0.00	0.00	0.68	0.68	0.00	0.00	0.00	
	7	B	Fertilizers(Natural, Chemical)	1.43	0.10	0.00	0.59	0.74	1.11	0.15	0.00	0.47	0.49	
	9	B/G	Iron Ore, Scrap	9.64	0.34	0.00	9.30	0.00	8.19	0.34	0.00	7.85	0.00	
	10	B	Non-Ferrous Ore	1.17	0.00	0.00	1.17	0.00	0.97	0.00	0.00	0.97	0.00	
	13	B	Solid Fuel(Coal, Coke, etc.)	2.55	0.00	0.00	2.55	0.00	2.10	0.00	0.00	2.10	0.00	
	14	L	Crude Oil	16.86	0.00	0.00	0.00	16.86	11.10	0.00	0.00	0.00	11.10	
	15	L	Oil & Gas Products	4.04	0.00	0.00	0.00	4.04	3.70	0.00	0.00	0.00	3.70	
	17	L/G	Chemical Products	0.36	0.18	0.00	0.00	0.18	0.51	0.26	0.00	0.00	0.26	
	18	B	Chalk, Cement, Construction Materials	0.64	0.19	0.00	0.45	0.00	0.94	0.28	0.00	0.66	0.00	
	20	G	Ferrous/NonFerrous Materials	2.00	2.00	0.00	0.00	0.00	2.00	2.00	0.00	0.00	0.00	
23	C	Various Manufactured Products	2.54	0.00	2.54	0.00	0.00	1.87	0.00	1.87	0.00	0.00		
24	C	Other Cargoes	2.54	0.00	2.54	0.00	0.00	1.86	0.00	1.86	0.00	0.00		
		Total	53.35	3.51	7.25	20.76	21.82	39.13	3.76	5.32	14.51	15.54		

Table 6.4.1-2-1 Balance between Future Traffic and Existing Cargo Handling Capacity (Case 1)

No.	Operator	Berth No.	Handling Commodities	Handling Operation	Cargo Handling Capacity (x 1,000 tons)							Total	
					Break Bulk General Cargo	Containerized cargo Containers	Dry Bulk			Liquid Bulk			
							Grain	Coal/Ore	Phosphate/ Fertilizer	Cement	Crude Oil /Oil Products		Edible Oil
01	ROTRAC	Berth RR4	General Cargoes (timber, etc.)	Loading, Unloading									0
02	DEZROBIREA	Berth 0 - 5	General Cargoes (steel scrap, timber, etc.)	Loading, Unloading	634								634
		Berth 6,7	General Cargoes (fruits, etc.)	Loading, Unloading	101								101
		Berth 11,12	General Cargoes (timber, etc.)	Loading, Unloading	171								171
		Berth 13-16	General Cargoes (Kaolin, soda, timber, etc.)	Loading, Unloading	257								257
03	AGROEXPORT	Berth 20	General Cargoes (timber, etc.)	Loading, Unloading	101								101
		Berth 17, 18 & 24	Bulk Cargoes (grains)	Loading		1,000							1,000
		Berth 31-33	Grain (New Project)	Loading									550
04	FRIAL	Berth 19	Edible Oil	Loading, Unloading									93
		Berth 21	General Cargoes (rice, etc.)	Loading, Unloading	93								93
		Berth 53	General Cargoes & Refrigerated Food	Loading, Unloading	152								152
05	DECROM	Berth 23	General Cargoes (timber, rice, etc.)	Loading, Unloading	203								203
		Berth 47-50	General Cargoes (timber, Steel scrap, cement, etc.)	Loading, Unloading	771								771
06	PHOENIX	Berth 8	General Cargoes (timber)	Loading, Unloading									0
		Berth 22	General Cargoes (timber, rice, etc.)	Loading, Unloading									0
07	SOCEP	Berth 35-37 & 41-43	General Cargoes (bulk soda, steel scrap, timber, etc.)	Loading, Unloading	1,227								1,227
		Berth 51,52	Containerized Cargoes	Loading, Unloading	810								810
08	UMEX	Berth RR4	General Cargoes (timber etc.)	Loading, Unloading	264								264
		Berth 38-40	General Cargoes (timber, Steel scrap, cement, etc.)	Loading, Unloading	610								610
09	MINMETAL	Berth 44	General & Containerized Cargoes	Loading, Unloading	152								152
		Berth 45,46	General Cargoes (steel products, timber,)	Loading, Unloading	582								582
10	CHIMPEX	Berth 64-66	Bulk Cargoes (Coals, ores)	Unloading			12,000						12,000
		Berth 85	General Cargoes (timber, etc.)	Loading	1,750								1,750
11	SICIM	Berth 54-59	General Cargoes (timber, etc.)	Loading, Unloading									450
		Berth 69	Grain (New Project)	Loading									450
12	OIL TERMINAL	Berth 61	Bulk Cargoes	Loading									0
		Berth 62	Bulk Cargoes (phosphate ores)	Unloading									743
13	COMVEX	Berth 63	Bulk Cargoes (fertilizers)	Loading						743			743
		Berth 67	General Cargoes	Loading, Unloading									0
14	ROMTRANS	Berth 68	Bulk Cargoes (Cement)	Loading							2,501		2,501
		Berth 69-79	Liquid Bulk (crude oil, ethanol, chemical liquids, etc.)	Loading, Unloading						36,000			36,000
15	SILOTRANS	Berth 80-84	Bulk Cargoes (Coals, ores)	Loading, Unloading									12,000
		Berth 107-112 & 115-118	General Cargoes (timber, ferrous/non-ferrous metal, etc.)	Loading, Unloading	652			12,000					12,000
16	FREE TRADE ADMINISTRATION	Berth 113 & 114	Bulk Cargoes (grains)	Loading, Unloading							2,000		2,000
		Berth 119A-119B	General Cargoes (meat, etc.)	Loading, Unloading									0
17	CPA RO-RO TERMINAL	Berth 120	General Cargoes	Loading, Unloading									0
		Berth 120	General Cargoes	Loading, Unloading									0
18	MAST (Floating Operator)	Berth 124-125	Bulk Cargoes (cement, ores, etc.)	Loading, Unloading									0
		Berth 55	Grain (New Project)	Loading									250
19	Total Cargo Handling Capacity				7,720								7,720
					3,540								3,540
20	Cargo Demand Forecast (Case 1) - (2020)				810								810
					7,050								7,050
A	Balance(A-B)				-6,240								-6,240
					3,130								3,130
B	New Container Terminal (S2) - Phase 1												4,200
													2,000
C	New Grain Terminal (S3) - Phase 1												2,000
													2,000
Proposal	Edible Oil Terminal Relocation												2,500
													2,500

6.5 Basic Layout Plans

(1) Zoning for Port Activities

Major concepts of this zoning are as follows;

- 1) Bulk cargoes that require special handling equipment such as ore, fertilizer, cement, liquid bulk, are allocated to present location, if there is no problem for future use.
- 2) Projects that are already on going or will be implemented mainly by private sectors are basically allocated to planned location. (Ex. LPG terminal)
- 3) Terminals which require accommodating large vessel in the future are allocated in the South Port. (Container terminal, Grain terminal)
- 4) Cargoes which are handled at various terminals in the port at present are put together in one terminal to improve port operation in the future. (Timber and steel products)
- 5) Old North Port area should be modified to non-cargo use such as for passenger and business use, due to insufficient depth for future vessel size and its location close to the city center.
- 6) Barge operation area which includes barge and pusher/tug terminals is allocated to the South Port, due to easy connection to the canal and barge related terminals.

Figure 6.5.1 shows proposed zoning for port activities.

(2) Master Plan

Two alternatives of layout have been prepared and examined. Layout Plan -A is formulated to concentrate the terminals accommodating large vessels to the south port based on above concepts of zoning. Layout Plan -B is formulated to concentrate the required terminals to the North Port.

In Layout Plan –A, new Grain Terminal is allocated at the South Port pier S3.

Steel Product Terminal is allocated at South Port pier S1, because of the followings:

- Most steel products are hauled by barge
- A sufficient yard space is available
- 50000 DWT class vessels will be use in the future
- A substantial quantity of steel products has already been exported through Pier S1

Timber terminal is allocated at North Port pier 3, because of the followings:

- A sufficient yard space will be available
- A substantial quantity of products has already been exported through Pier 3

Figure 6.5.2 shows Layout Plan-A for the year 2020 based on the demand forecast Case-1.

Considering future vessel size, future expansion room and proximity to the Black Sea-Danube Canal, the Study Team recommends Layout Plan-A based on demand forecast Case-1 as the Master plan of the port of Constantza.

Figure 6.5.1 Zoning for Port Activities

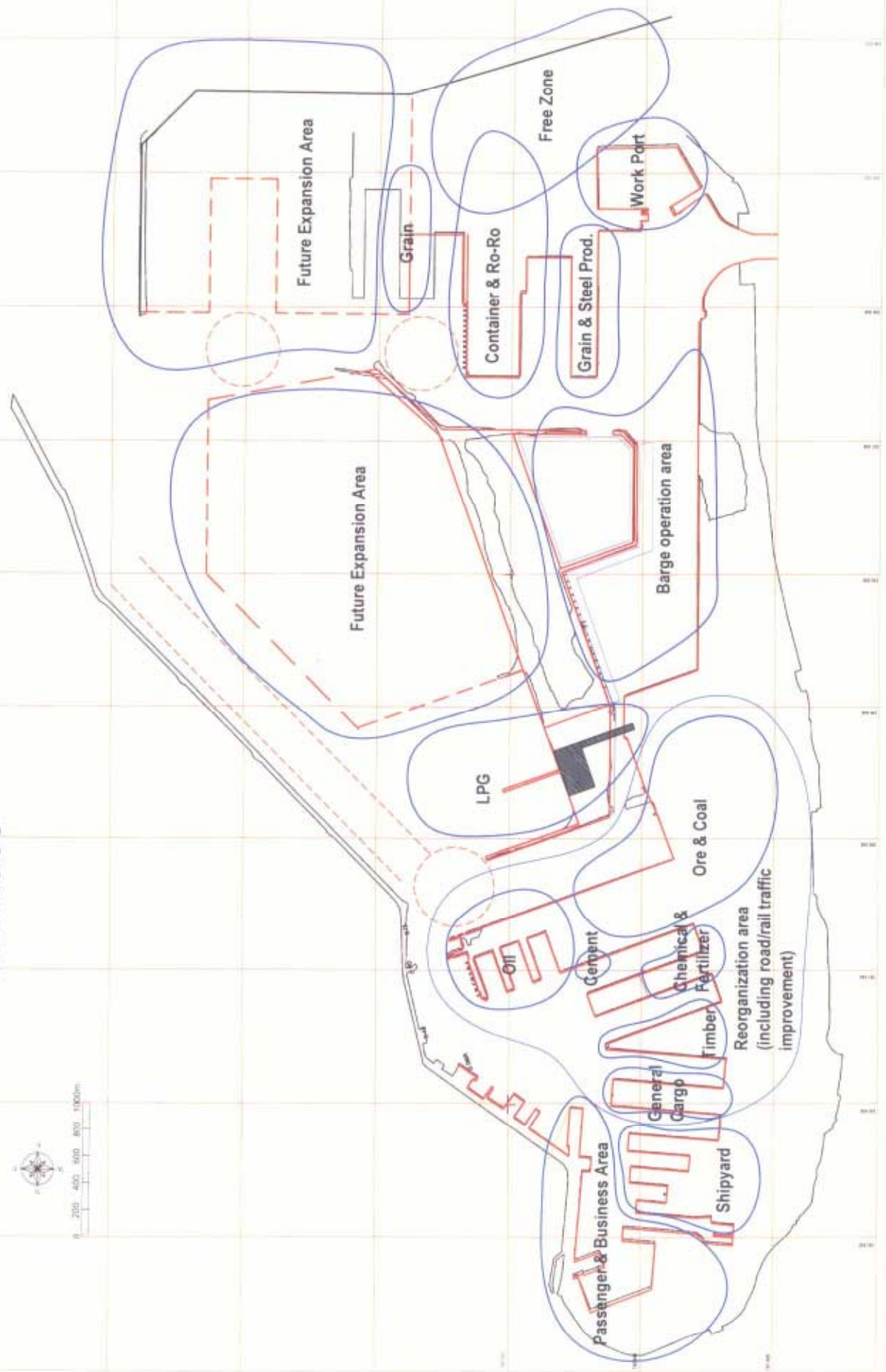
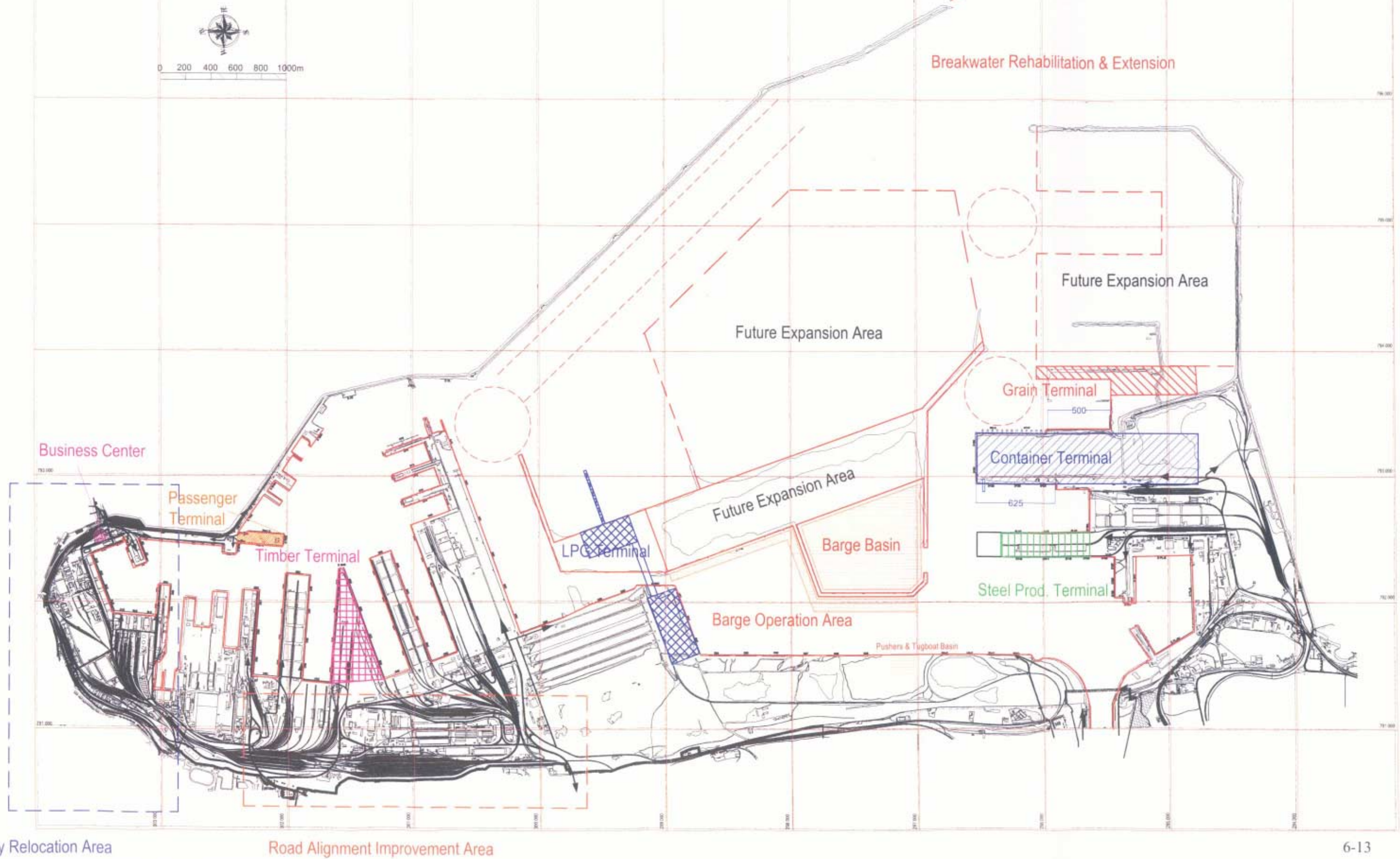
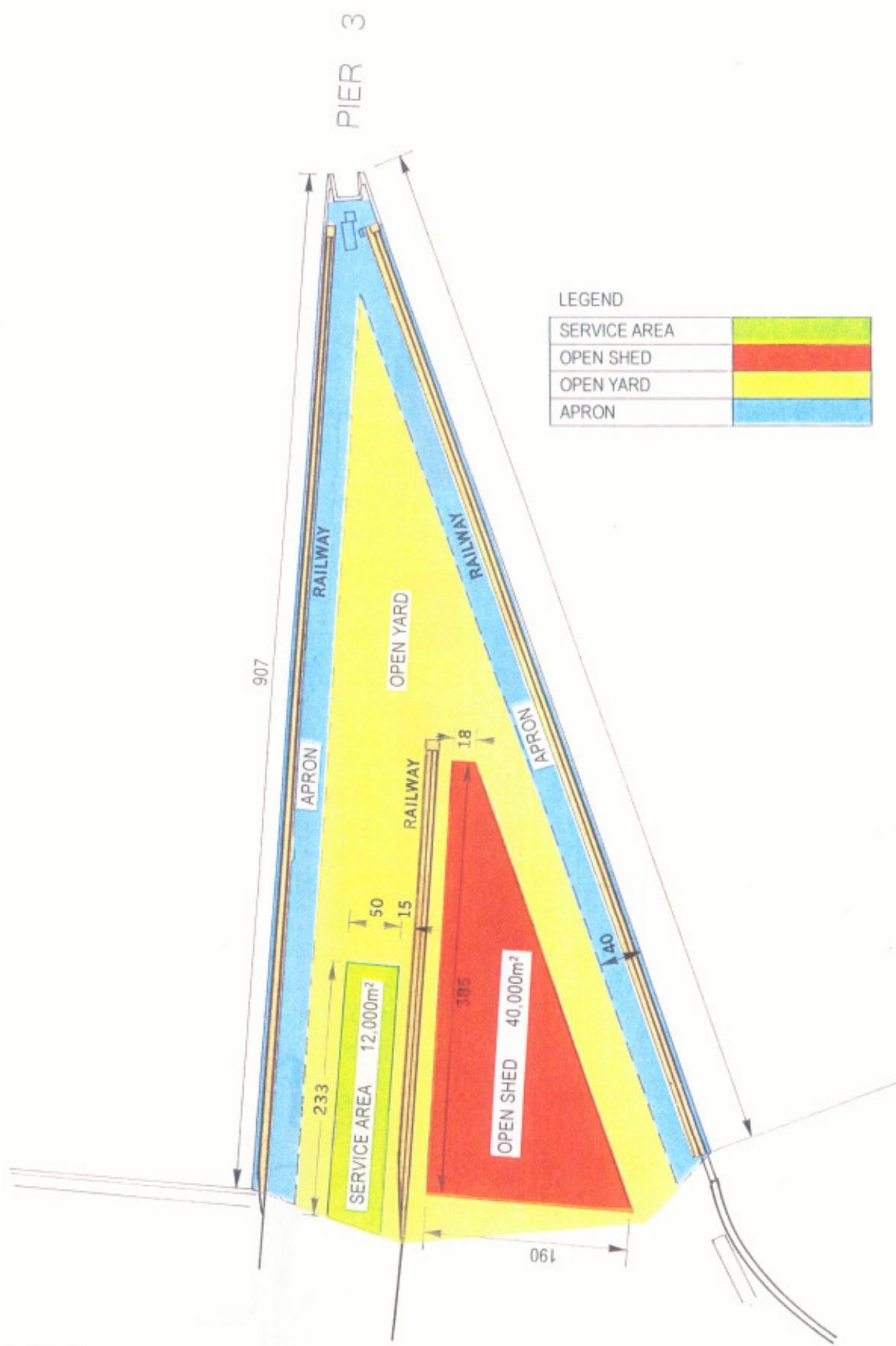


Figure 6.5.2 Master Plan Layout (Case-1, 2020, Layout Plan-A)





LEGEND

SERVICE AREA	
OPEN SHED	
OPEN YARD	
APRON	

Scale: 1:5000

Figure 6.5.3 Conceptual Layout of Timber Terminal

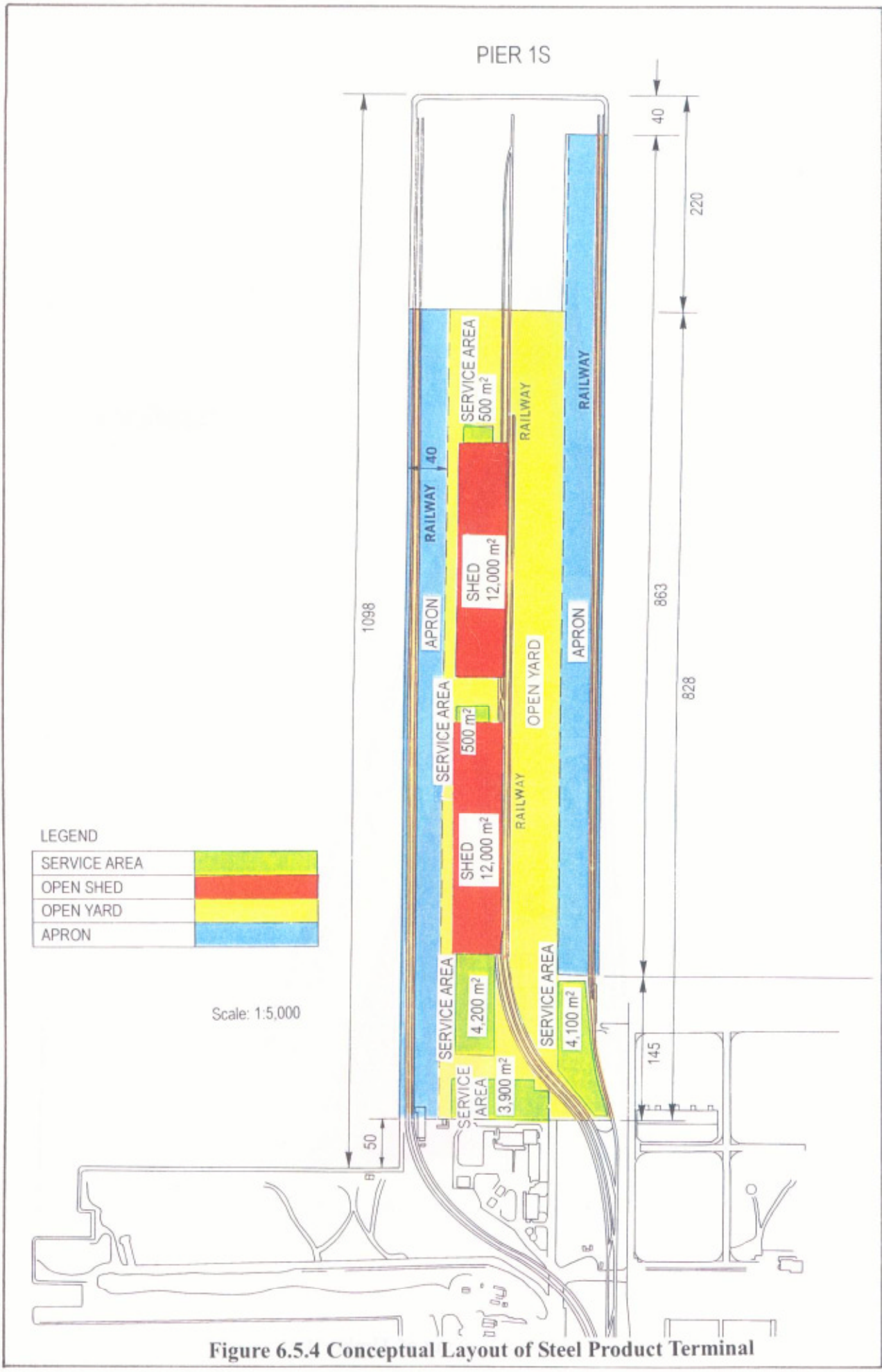


Figure 6.5.4 Conceptual Layout of Steel Product Terminal

Figure 6.5.3 Shows conceptual layout of Timber Terminal. Figure 6.5.4 shows conceptual layout of Steel Product Terminal.

(3) Future Expansion Area

About the future expansion areas, alternative plan, which had different berth and breakwater configuration, were also examined. However, it was confirmed that the master plan can secure enough calmness of waterways and basins in the South Port by reviewing the wave calmness study. In addition, ongoing breakwater extension project is necessary to secure the calmness in the south Port.

6.6 Phased Implementation Plan

The projects and implementation schedules are summarized in Table 6.6.1.

Table 6.6.1 Summary of Phased Implementation Plan

projects		2010	2020	
Traffic Demand Related	Container Terminal	Forecast Case-1	2 Berths 4 Gantry Cranes	3 Berths 8 Gantry Cranes
		Forecast Case-2	2 Berths 3 Gantry Cranes	2 Berths 6 Gantry Cranes
	Grain Terminal		2.0 Million Ton per annum	
Improvement Port Operation	Steel Products Terminal			○
	Timber Terminal			○
	Reorganization of General Cargo Terminal			△
Inland Transportation Access Improvement	Barge Terminal		○	
	Railway Relocation			△
	Road Improvement		○	