PART 3

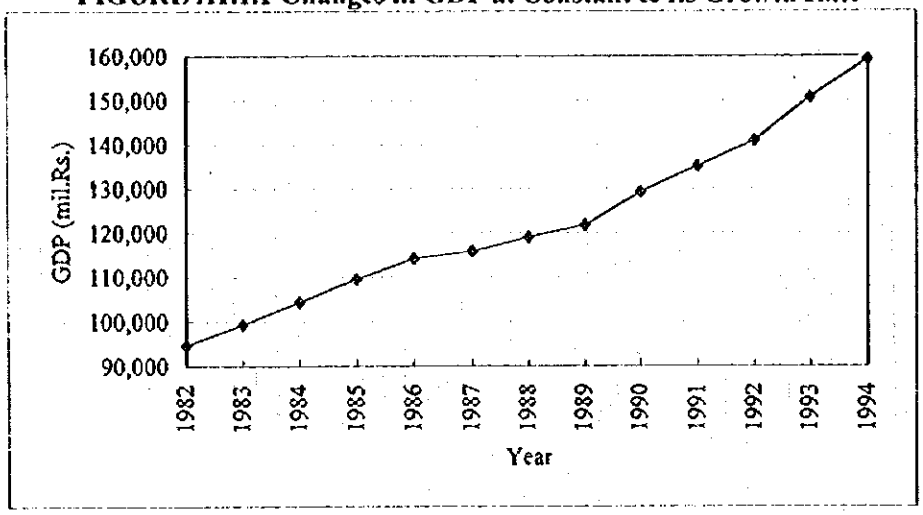
APPENDIX

TABLE A1.1.1 Key Macroeconomic Indicators 1990-1994

	Rs. Million					As percentage of G.D.P.					Average
	1990	1991	1992	1993	1994 Prov.	1990	1991	1992	1993	1994 Prov.	(1990-94)
1 Private Consumption	319,386	288,214	320,466	369,991	447,136	75	77	75	74.52	77.60	76.07
2 Public Consumption	39,273	36,633	49,972	46,173	55,889	9	10	12	9.30	9.70	9.97
3 Fixed Capital Formation	99,507	84,206	100,039	126,293	140,638	24	23	24	25.44	24.41	23.90
4 Change in stocks	1,000	950	3,200	1,800	1,100	0	0	1	0.36	0.19	0.36
5 Financing of Investment											
(a) Domestic Saving	64,631	47,498	63,845	80,327	73,146	15	13	15	16.18	12.70	14.38
(b) External inflow	35,876	37,658	39,394	47,766	68,592	8	10	9	9.62	11.90	9.88
6 Export of goods & n.f. Service	137,135	107,016	135,114	168,603	195,482	32	29	32	33.96	33.93	32.16
7 Import of goods & n.f. Service	173,011	144,674	174,508	216,369	264,074	41	39	41	43.58	45.83	42.03
8 G.D.P. at Market Price	423,290	372,345	425,283	496,485	576,171	100	100	100	100.00	100.00	100
9 Mid Year Population Mn.	17	17	17	18	18						
10 G.D.P. at factor cost const. price (1982)	140,960	135,204	140,990	150,783	159,076						
11 G.D.P. Per Capita (const.1982)	8,099	7,839	8,101	8,567	8,937						
12 Per Capita Income (Const 1982 US $)	389	377	389	412	429						

Source: Central Bank, Annual Reports and Reviews of the Economy, Relevant Years.

FIGURE A1.1.1 Changes in GDP at Constant & its Growth Rate



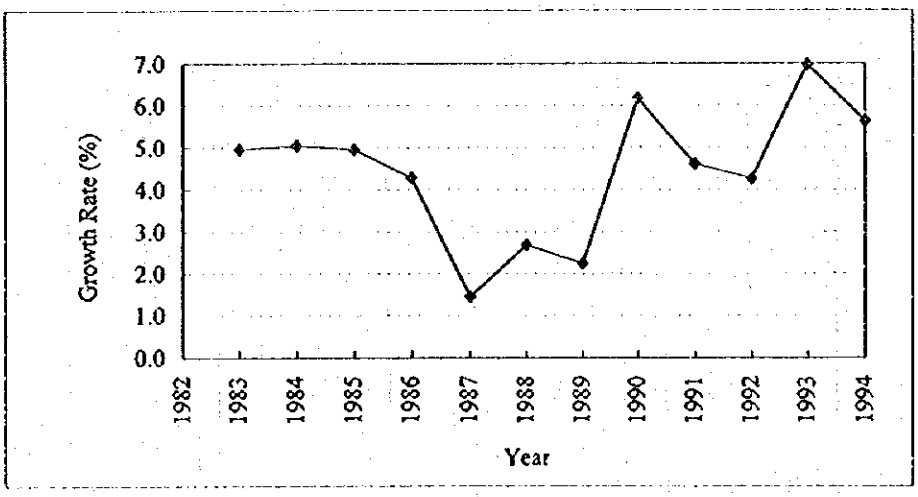
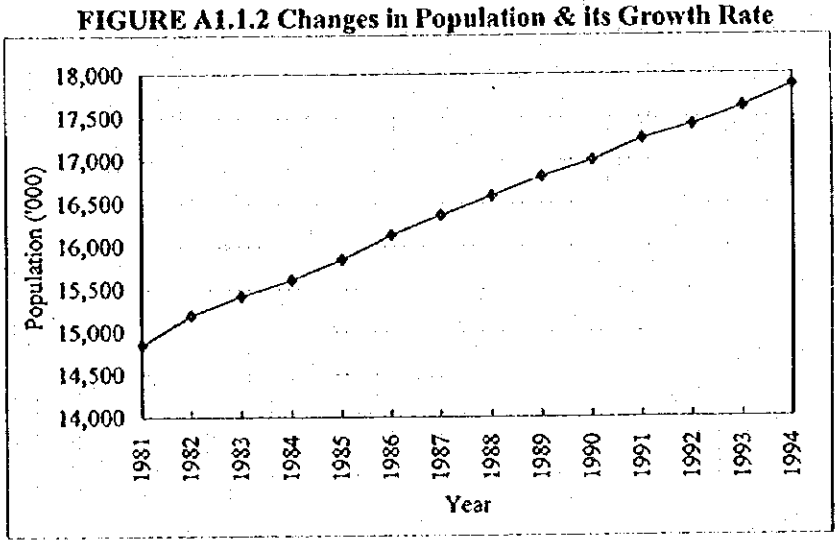


TABLE A1.1.2
Changes in Population & its Growth Rate

Year	Population ('000)	Growth Rate (%)
1981	14,847	
1982	15,195	2.3
1983	15,417	1.5
1984	15,603	1.2
1985	15,842	1.5
1986	16,127	1.8
1987	16,361	1.5
1988	16,586	1.4
1989	16,806	1.3
1990	16,993	1.1
1991	17,247	1.5
1992	17,405	0.9
1993	17,619	1.2
1994	17,865	1.4

FIGURE A1.1.2 Changes in Population & its Growth Rate



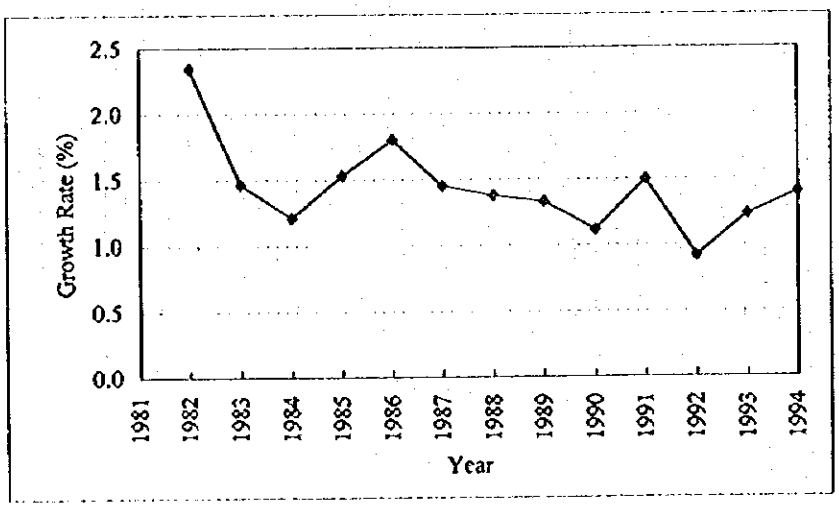


TABLE A1.1.3 Status of Regional Industrial Estates under IDB - 1995

Name of Industrial Estate	District	D.S. Division	Facilities Provided	Investment (Approximate)	Mode of the Management	Employ-ment	Problems & Constraints
Ekala	Gampaha	Ja-Ela	Internal Roadways, Water Supply, Electricity, Storm Water Drains & Waste Water Treatmnt	15 (million)	Superintendent I./E. Ekala	2,040	a) Lack of funds for maintenance of Industrial Estates b) Acquisition of Lands
Pallekele	Kandy	Kundasale	Internal Roadways, Water Supply, Electricity, Storm Water Drains	13 (million)	Superintendent I./E. Pallekele	1,000	
Horana	Kalutara	Horana	"	3 (million)	Acting Superintendent I./E. Horana	1,800	
Pannala	Kurunegala	Pannnla	"	2 (million)	Estate Clerk I./E. Pannala	75	
Lunuwila	Puttalam	Wennappuwa	"	"	Provincial Manager Provincial Office, Kurunegala	200	
Queensland	Nuwara-Eliya	Nuwara-Eliya	"	"	Provincial Manager Provincial Office, Badulla	125	
Karandeniya	Galle	Karandeniya	"	1.1 (million)	Provincial Manager Provincial Office, Matara	45	
Mihintale	Anuradhapura	Mihintale	"	2.3 (million)	Provincial Manager Provincial Office, Anuradhapura	15	
Baddegama	Galle	Baddegama	"	4 lakhs	Provincial Manager Provincial Office, Matara	27	
Galigamuwa	Kegalle	Galigamuwa	On going	7 lakhs	Provincial Manager Provincial Office, Sabaragamuwa	57	
Pussella	Ratnapura	Kuruwita	"	6 lakhs	"	-	
Wavulugala	Kalutara	Horana	"	2.1 (million)	Provincial Manager Provincial Office, Colombo	604	
Vavuniya	Vavuniya	Vavuniya	"	2 (million)	Provincial Manager Provincial Office, Vavuniya	10	
Negampaha	Anuradhapura	Galnewa	"	2.3 (million)	Provincial Manager Provincial Office, Anuradhapura	-	
Kaludewala	Matale	Matale	"	6 lakhs	Provincial Manager Provincial Office, Kandy	-	
Buttale	Moeragala	Buttale	Internal Roadways, Water Supply, Electricity, Storm Water Drains	1.9 (million)	Provincial Manager Provincial Office, Badulla		
Beliatta	Hambantota	Beliatta	On going	5 (million)	Provincial Manager Provincial Office, Matara		

Source: Ministry of Indstrial Development

TABLE A1.1.4 Proposed MID Industrial Estates International Standard

District	Division	Name of the Land	Extent (Ac.)
Colombo	Hanwella	Seethawaka	430
Gampaha	Katana	Katana	205

TABLE A1.1.5 Proposed MID Industrial Estates Local Standard

District	Division	Name of the Land	Extent (Ac.)
Hambantota	Ambalantota	Bata-atha	150
Hambantota	Ambalantota	Lunamakanda	100
Hambantota	Katuwana	Meddeniva-Farm	50
Hambantota	Beliatta	Devivimanawatta	35
Galle	Uragasmanhandiv	Yatagala	50
Kalutara	Kalutara	Fullerton Estate	50
Gampaha	Minuwangoda	Waljapalawatte	15
Puttalam	Dankotuwa	Karanawanwatta	72
Puttalam	Arachchikattuwa	Manaweriya	70
Puttalam	Arachchikattuwa	Tambankele	70
Badulla	Mahivangana	Viyanini Camp	35
Badulla	Redimalivadda	Gamunupura	80
Moneragala	Buttala	Near Gamudawa Site	35
Moneragala	Bibile	Bibile-Pitakumbura	49
Anuradhapura	Palugaswewa	Habarana	100
Anuradhapura	Talawa	Amunukole	100
Anuradhapura	Tambuttegama	Mahaweli Land	50
Anuradhapura	Ipalogama	Senapura	100
Ratnapura	Kuruwita	Paradise Estate	100
Matale	Madawala Ulpatha	Nalanda Estate	100

Source: Ministry of Indstrial Development

TABLE A1.1.6 List of Industrial Estates where Plots are Fully Occupied

Name of the Industrial Estate	Total Extent (ha)	Number of Plots
Development Plots under the IDB		
Rathmalana stage	8.8	
Ekala	22.6	
Horana	10.9	69
Pannala	7.7	32
Lunuwila	11.3	97
Karandeniya	0.6	21
Mihintale	2.0	32
Baddegama	1.0	15
Vavulugala	6.9	17
BOI		
Katunayake Expor Processing Zone	182.2	99

TABLE A1.1.7 List of Vacant Industrial Plots

Institute	Name of the Industrial Estate	Extent of Land (ha)	No. of Plots	Vacant
UDA	Modarawila	10.0	32	2
	Peliyagoda	74.5	70	11
	Katuwana	25.3	79	36
IDB	Pallekele (I)	21.4	38	8
	Queens Land (Nuwara Eliya)	-	14	13
	Pallekele (II)	-	49	9
	Galigamuwa	1.8	15	5
	Vavuniya	4.0	64	12
	Buttala	2.4	39	16
	Beliatta	14.2	30	30
North Western Provincial Council (ISB)	Heraliyawala	8.1	25	3
	Dungaspitiya Industrial Park	10.1	25	5
	St. Martin Industrial Park	6.5	9	2
	Markadura Industrial Park	31.6	8	4
BOI	Koggala Export Processing Zone	91.1	45	30
	Biyagama Export Processing Zone	91.1	50	2
	Kandy Industrial Park Pallekele	74.9	32	32
	Malwatta Industrial Park (Attanagalle)	12.6	7	7
MID	Udukawa / Weliganı	6.0	6	2
SPC / DFCC	Charlie Mount Industrial Estate Udukawa.	20.0	80	45

Source: Ministry of Indstrial Development

TABLE A1.1.8 Trend and Composition of Industrial Exports during the Period 1986 - 1992

(SDR Million)

	1986	1987	1988	1989	1990	1991	1992	1993 (a)
Total Exports	1,036	1,080	1,097	1,216	1,461	1,491	1,747	2,050
Industrial Exports	483	525	530	616	763	896	1,242	1,490
Textiles & Garments	293	339	333	382	462	588	809	948
Petroleum Products	72	68	53	49	73	58	45	56
Other	118	118	144	185	228	250	388	486

(Percentage Share)

	1986	1987	1988	1989	1990	1991	1992	1993 (a)
Total Exports	100	100	100	100	100	100	100	100
Industrial Exports	47	49	48	51	52	60	71	73
Textiles & Garments	28	31	30	31	32	39	46	46
Petroleum Products	7	6	5	4	5	4	3	3
Other	11	11	13	15	16	17	22	24

Source: Central Bank of Sri Lanka; Annual Reports

Note: (a) Provisional

TABLE A1.2.1 Container Throughput by Country/Area at the Port of Singapore

Unit : 1,000 TEUs

Country/Area	Inward		Outward	
	Jun-95	Jan-Jun 95	Jun-95	Jan-Jun. 95
All Country/Area	487.6	2,859.7	485.5	2,845.0
South East Asia	183.5	1,052.8	164.2	960.4
North East Asia	99.6	562.7	80.2	493.3
China	9.7	43.8	5.0	25.5
Shanghai	4.0	20.1	1.6	8.6
Hong Kong	21.2	143.6	24.8	144.0
Japan	35.8	188.2	27.0	171.0
Kobe	5.9	15.1	4.3	16.3
Tokyo	8.0	42.4	7.2	45.1
Yokohama	8.2	45.5	5.1	34.4
Korea	12.6	79.8	8.6	52.7
Pusan/Busan	12.3	78.2	8.0	47.5
Taiwan	20.1	107.3	14.7	100.1
Keelung	6.2	35.7	6.0	38.8
Kaohsiung	13.3	68.2	8.0	57.5
South Asia	32.4	186.0	37.3	203.0
Bangladesh	9.9	49.1	8.4	52.0
India	15.7	97.9	16.3	89.0
Bombay	3.8	26.5	4.0	23.7
Madras	6.1	35.4	6.9	37.5
Sri Lanka	4.6	23.7	7.9	39.0
Pakistan	2.2	15.3	4.7	23.0
West Asia	20.3	131.9	23.8	144.2
United Arab Emirates	12.6	84.5	13.6	79.1
Saudi Arabia	5.7	30.8	7.4	43.9
Damman	1.3	8.8	3.8	20.9
Jeddah	4.4	22.0	3.6	23.0
Africa	12.6	64.9	14.6	78.5
EC	69.4	431.5	74.6	437.5
Belgium-Luxembourg	3.7	28.6	2.5	14.4
Germany	15.1	100.2	18.8	108.6
Hamburg	10.9	76.6	16.3	91.1
Spain	5.5	32.1	5.4	35.1
France	5.0	28.2	6.6	34.8
Le Spezia	3.2	16.6	4.8	24.4
United Kingdom	11.8	67.7	13.0	75.3
Felixstowe	5.1	32.5	3.9	26.0
Southampton	5.8	31.0	7.9	41.4
Italy	10.6	55.3	6.4	40.2
La Spezia	4.9	24.9	3.4	22.2
Netherlands	16.4	108.6	20.5	120.1
Other Europe	1.6	9.2	2.3	12.7
Oceania	15.5	97.7	17.2	100.6
Australia	13.2	81.4	12.9	78.7
Melbourne	4.2	26.7	3.9	24.1
Sydney	3.9	21.7	4.6	27.0
New Zealand	1.9	12.6	3.2	15.5
North America	29.6	198.1	36.7	210.7
Canada	2.6	16.5	1.2	7.9
USA	27.0	181.6	35.5	202.8
Long Beach	10.7	63.3	6.8	36.1
Los Angeles	2.7	18.2	7.0	38.8
Central & South America	4.9	20.1	4.2	26.9

Source : PSA

TABLE A1.3.1 Break Bulk and Container Cargo for Import/Export

	Year	Import ('000 tons)			Export ('000 tons)			Total ('000 tons)			Number of Containers (1,000TEU)				
											Laden		Empty		
		Conventional	Container	Total	Conventional	Container	Total	Conventional	Container	Total	Import	Export	Import	Export	Total
Actual	1985	2,001	438	2,206	683	506	1,038	2,684	944	3,244	33	41	20	10	103
	1986	1,932	526	2,252	494	648	1,141	2,426	1,174	3,393	38	51	22	9	121
	1987	1,676	578	2,193	387	659	1,036	2,063	1,237	3,230	42	54	23	10	129
	1988	1,985	651	2,461	322	652	974	2,307	1,303	3,436	48	54	21	13	135
	1989	1,655	761	2,401	307	761	1,067	1,962	1,522	3,467	55	60	23	20	159
	1990	1,683	933	2,610	354	821	1,174	2,037	1,755	3,784	67	67	21	19	173
	1991	1,620	973	2,586	303	844	1,147	1,923	1,817	3,733	71	72	24	21	188
	1992	1,563	1,176	2,731	162	887	1,049	1,726	2,063	3,780	84	77	23	28	212
	1993	1,820	1,400	3,220	106	1,031	1,137	1,926	2,431	4,357	103	92	25	32	252
	1994	1,767	1,628	3,395	163	1,193	1,356	1,930	2,821	4,751	122	103	24	40	288

Source: Port Statistics, Sri Lanka Ports Authority

Estimate

High	2005	1,923	5,939	7,862	56	2,031	2,087	1,979	7,970	9,948	396	185	72	283	935
Medium		1,588	4,905	6,494	49	1,784	1,833	1,637	6,690	8,327	327	162	59	224	773
Low		1,368	4,224	5,592	44	1,622	1,666	1,412	5,846	7,258	282	147	51	185	665
High	2015	2,148	13,170	15,318	71	3,398	3,469	2,219	16,568	18,788	878	309	150	719	2,056
Medium		1,457	8,936	10,393	53	2,504	2,556	1,510	11,440	12,950	596	228	102	470	1,395
Low		1,104	6,768	7,872	43	2,046	2,089	1,147	8,814	9,961	451	186	77	342	1,056

TABLE A1.3.2 Paddy Production, Import and Consumption

Year	Production Paddy ('000 Tons)	Production Rice equivalent(4) ('000 Tons) (1)	Area sown ('000 ha.) (2)	Area harvested ('000 ha.)	Fertilizer Used ('000 Tons) (3)	(kg./ha.) (3)/(2)	(kg/ton) (3)/(1)	Yield / hectare (kg.)	Imports Rice ('000 Tons) (4)	Domestic Con-sumption Rice ('000 Tons) (5)	Population ('000) (6)	(5)/(6)	Available Rice ('000 Tons) (1)+(4)
1985	2,661	1,810	882	865	203	230	112	3,465	182	1,790	15,842	113	1,992
1986	2,588	1,760	895	835	233	260	132	3,500	220	1,667	16,127	103	1,980
1987	2,128	1,446	781	679	217	278	150	3,564	102	1,545	16,361	94	1,549
1988	2,477	1,684	868	816	226	260	134	3,413	199	1,670	16,586	101	1,883
1989	2,063	1,403	727	690	238	327	170	3,374	139	1,544	16,806	92	1,542
1990	2,538	1,726	857	828	161	188	93	3,453	116	1,724	16,993	101	1,842
1991	2,389	1,625	817	791	179	219	110	3,398	133	1,727	17,247	100	1,757
1992	2,340	1,591	803	766	208	259	131	3,428	237	1,707	17,405	98	1,828
1993	2,570	1,748	835	820	248	297	142	3,511	207	1,697	17,619	96	1,955
1994	2,684	1,825	930	897	249	268	137	3,363	58	1,691	17,865	95	1,883
Total	24,438	16,618							1,594	16,760			18,211

Source : Annual Report 1994, Central Bank of Sri Lanka
Agricultural Statistics of Sri Lanka 1992, Department of Census & Statistics, Ministry of Policy Planning & Implementation

TABLE A1.3.3 Rice Production, Consumption and Imports

('000 tons)

Year	Production	Consumption	Stock	Imports
1994	1,825	1,691	193	58
2005	1,825	2,039	88	303
2015	1,825	2,306	100	580

TABLE A1.3.4 Sugar Import and Consumption

Year	Production ('000 Tons)	Import ('000 Tons)	Consumption ('000 Tons)	Population ('000)	Consumption per Capita (kg)
1985	20	267	383	15,842	24.2
1986	35	324	358	16,127	22.2
1987	35	339	373	16,361	22.8
1988	54	319	375	16,586	22.6
1989	54	320	373	16,806	22.2
1990	57	258	362	16,993	21.3
1991	66	358	424	17,247	24.6
1992	60	370	426	17,405	24.5
1993	69	394	451	17,619	25.6
1994	73	492	548	17,865	30.7

Source : Annual Report 1992, 1994, Central Bank of Sri Lanka

Agriculturol Statistics of Sri Lanka 1992, Department of Census & Statistics, Ministry of Policy Planning & Implementation

Public Investment 1991-1996, Department of National Planning, Ministry of Policy Planning & & Implementation

TABLE A1.3.5 Sugar Production, Consumption and Imports

('000 tons)

Year	Production	Consumption	Imports
1994	73	548	492
2005	131	602	471
2015	183	665	482

TABLE A1.3.6 Fertilizer Import and Consumption (Unit : '000 Tons)

Year	Production	Import	Consumption	Tea	Rubber	Coconut	Paddy	Other Crops
1985	17.2	508.5	493.4	149.9	24.2	41.0	202.5	75.7
1986	15.0	423.2	497.1	128.8	26.3	31.5	232.6	77.7
1987	21.2	382.2	505.3	136.7	23.2	41.3	217.1	87.2
1988	23.1	544.2	525.2	138.0	25.1	42.0	226.0	93.9
1989	24.4	364.9	522.3	127.9	22.6	38.5	238.0	95.2
1990	32.6	507.7	437.1	134.1	22.2	24.0	161.0	96.0
1991	19.7	385.0	453.8	118.9	13.7	28.8	179.3	113.0
1992	25.7	369.5	475.8	110.2	13.1	34.3	207.8	110.4
1993	30.2	479.4	548.1	147.2	17.9	35.1	248.0	99.9
1994	26.9	455.2	521.8	131.0	16.7	30.2	249.4	94.5
1995			532.4					
1996			543.4					

Source : National Fertilizer Secretariat, Ministry of Agriculture Lands & Forestry
Public Investment 1995-1999, Department of National Planning
Annual Report 1992, 1996, Central Bank of Sri Lanka

TABLE A1.3.7 Fertilizer Production, Consumption and Imports ('000 tons)

Year		Production	Consumption	Tea	Rubber	Coconut	Paddy	Other Crops	Imports		
									Break Bulk	Dry Bulk	Total
1994		27	522	131	17	30	249	95	411	28	439
2005	High	24	670	170	25	67	239	168	97	549	646
	Medium	24	642	158	22	55	239	168	93	525	618
	Low	24	613	146	18	42	239	168	88	501	590
2015	High	24	767	192	30	91	239	214	111	632	743
	Medium	24	713	169	24	66	239	214	103	586	689
	Low	24	659	146	18	42	239	214	95	540	636

TABLE A1.3.8 Cement Production, Import and Consumption

Year	Production	Import					Consumption	Population	Consumption per Capita
		Bags		Dry Bulk		Total			
	('000 Tons)	('000 Tons)	(%)	('000 Tons)	(%)	('000 Tons)	('000 Tons)	('000)	(kg)
1985	380	n.a.		n.a.		363	743	15,842	46.9
1986	558	156	45	192	55	347	905	16,127	56.1
1987	641	149	41	213	59	362	1,003	16,361	61.3
1988	633	113	29	271	71	383	1,016	16,586	61.3
1989	596	76	20	311	80.39	387	983	16,806	58.5
1990	579	121	29	304	71	425	1,004	16,993	59.1
1991	620	161	44	201	56	362	981	17,247	56.9
1992	553	88	22	322	78	410	963	17,405	55.3
1993	466	216	39	333	61	549	1,015	17,619	57.6
1994	n.a.	232	37	403	63.46	635	n.a.	17,865	n.a.

Source : 1) Statistical Pocket Book of the Democratic Socialist Republic of Sri Lanka 1993, 1995, Department of Census and Statistics, Ministry of Finance, Planning, Ethnic Affairs and National Integration
2) Annual Report 1992, 1994, Central Bank of Sri Lanka
3) Port Statistics, Sri Lanka Ports Authority

TABLE A1.3.9 Cement Production, Consumption and Imports ('000 tons)

Year		Production	Consumption	Imports		
				Break Bulk	Dry Bulk	Total
1993		466	1,015	216	333	549
1994		n.a.	n.a.	232	403	635
2005	High	641	2,358	337	1,380	1,717
	Medium	821	2,358	301	1,236	1,538
	Low	1,000	2,358	266	1,092	1,358
2015	High	641	3,716	603	2,472	3,075
	Medium	1,071	3,716	519	2,127	2,646
	Low	1,500	3,716	434	1,782	2,216

TABLE A1.3.10 Imports of Other Break Bulk Cargo
(including Container Cargo) ('000 tons)

Year		Imports
1994		2,412
2005	High	6,634
	Medium	5,280
	Low	4,388
2015	High	13,923
	Medium	9,077
	Low	6,596

TABLE A1.3.11 Imports of Dry Bulk Cargo ('000 tons)

Year		Imports			
		Fertilizer	Cement	Other Dry Bulk	Total
1994		28	403	158	589
2005	High	549	1,380	210	2,139
	Medium	525	1,236	197	1,959
	Low	501	1,092	185	1,778
2015	High	632	2,472	245	3,348
	Medium	586	2,127	215	2,927
	Low	540	1,782	185	2,506

TABLE A1.3.12 Imports of Liquid Bulk Cargo ('000 tons)

Year		Imports		
		Crude Oil, Oil Products	Palm Oil, Tallow	Total
1994		2,288	39	2,327
2005	High	3,013	77	3,090
	Medium	2,811	58	2,869
	Low	2,609	40	2,649
2015	High	3,869	107	3,977
	Medium	3,458	74	3,532
	Low	3,047	40	3,087

TABLE A1.3.13 Imports of Motor Vehicles

(No.)

Year		Imports
1993		84,469
2005	High	371,643
	Medium	294,651
	Low	243,900
2015	High	890,375
	Medium	582,385
	Low	424,698

TABLE A1.3.14 Tea Production, Export and Consumption

Year	Production (1) ('000 Tons)	Registered Extent under Tea (2) (hectares)	Annual Replanted Area (hectares)	Cumulative Replanted Area (hectares)	Fertilizer Used (3) ('000 Tons)	(3)/(2) (kg/hectare)	(3)/(1) (kg/ton)	Yield per Hectare (1)/(2) (kg/hectare)	Cost of Production (Rs./kg)	Average Price Colombo net (Rs./kg)	Average Price Export f.o.b. (Rs./kg)	Exports ('000 Tons)	Domestic Consumption (4) ('000 Tons)
1985	214	231,650	1,672	45,082	150	647	700	924	35	35	61	198	23.2
1986	211	222,905	1,618	46,700	129	578	610	948	n.a.	30	45	208	22.4
1987	213	221,498	1,503	48,203	137	617	641	963	n.a.	38	53	201	21.7
1988	227	221,683	1,592	49,795	138	623	608	1,024	44	42	56	220	20.9
1989	207	221,110	1,551	51,346	128	578	618	936	50	52	67	204	20.3
1990	233	221,758	1,586	52,932	134	605	575	1,052	61	66	92	216	20.3
1991	241	221,691	1,773	54,705	119	536	494	1,086	61	57	84	212	21.7
1992	179	221,836	1,417	56,122	110	497	616	806	72	61	82	182	21.2
1993	232	n.a.	1,311	57,433	147	n.a.	635	n.a.	76	69	91	218	22.8
1994	242	n.a.	1,239	58,672	131	n.a.	541	n.a.	74	65	91	230	23.1

Source : Annual Report 1994, Central Bank of Sri Lanka

TABLE A1.3.15 Tea Production, Consumption and Exports

('000 tons)

Year		Production	Consumption	Exports
1994		242	23	230
2005	High	282	26	256
	Medium	262	26	236
	Low	242	26	216
2015	High	319	29	290
	Medium	280	29	252
	Low	242	29	214

TABLE A1.3.16 Rubber Production, Export and Consumption

Year	Production (1) ('000 Tons)	Total Extent under Rubber (hectares)	Area under Tapping (2) (hectares)	Annual Replanted Area (hectares)	Annual Newplanted Area (hectares)	Subsidies fo Replanting & Newplanting mn.Rs.	Collection of Cesses mn.Rs.	Collection of Duties mn.Rs.	Fertilizer Used (3) ('000 Tons)	(3)/(2) (kg/hectare)	(3)/(1) (kg/ton)	Yield per Hectare (kg)	Cost of Production (Rs./kg)	Average Price Colombo RSS 1 (Rs./kg)	Average Price Export f.o.b. (Rs./kg)	Exports ('000 Tons)	Domestic Consumption ('000 Tons)
1985	138	204,298	154,436	6,514	2,723	140	256	255	24.2	157	176	890	12.5	15.9	23.8	120	15
1986	138	202,771	149,918	5,910	1,808	136	152	307	26.3	175	191	919	13.3	16.6	23.8	110	16
1987	122	201,861	147,484	5,512	1,760	126	143	525	23.2	157	190	826	14.3	19.9	27.7	106	19
1988	122	200,248	145,495	4,115	1,338	113	139	827	25.1	173	205	841	17.2	24.4	37.3	99	20
1989	111	199,648	147,285	6,147	1,336	121	133	766	22.6	153	204	752	19.4	22.6	36.2	86	21
1990	113	199,048	146,325	5,202	1,297	150	152	747	22.2	152	196	773	21.4	22.9	35.5	87	24
1991	104	198,130	146,004	5,361	1,803	142	138	476	13.7	94	132	706	22.9	23.6	34.6	77	27
1992	106	194,556	146,265	3,918	914	128	131	318	13.1	90	123	725	24.5	29.3	34.6	79	29
1993	104	161,479	115,058	2,418	907	137	138	0	17.9	156	172	714	31.0	35.5	44.3	70	33
1994	105	161,149	122,083	1,623	670	113	40	0	17	137	159	862	34.5	50.5	51.8	69	36

Source : Sri Lanka Rubber Statistics 1994-1995, Rubber Control Department, Planning & Statistics Division
Annual Report 1994, Central Bank of Sri Lanka

TABLE A1.3.17 Rubber Production, Consumption and Exports

('000 tons)

Year		Production	Consumption	Exports
1994		105	36	69
2005	High	143	56	87
	Medium	124	56	68
	Low	105	56	49
2015	High	173	77	96
	Medium	139	77	62
	Low	105	77	29

TABLE A1.3.18 Coconut Production, Export and Consumption

Year	Production (mn.Nuts)	Production ('000 Tons) (1)	Fertilizer Used (2) ('000 Tons)	(2)/(1) (kg/ton)	Cost of Production (Rs./Nut)	Average Price Export f.o.b. (Rs./Nut)	Domestic Consumption of Kernel Products (mn.Nut Equivalent)	Domestic Consumption of Kernel Products ('000 Tons)	Export of Kernel Products (mn.Nut Equivalent)	Export of Kernel Products ('000 Tons)	Export of Fibre Products ('000 Tons)	Export of Shell Products ('000 Tons)	Total Exports of Coconut Products ('000 Tons)	Export of Coconut Oil ('000 Tons)	Total Exports of Coconut Products Excluding Coconut Oil ('000 Tons)
1985	2,958	#REF!	41.0	#REF!	0.64	2.55	2,027	#REF!	931	#REF!	76	29	#REF!	#REF!	#REF!
1986	3,039	#REF!	31.5	#REF!	0.66	1.46	1,877	#REF!	1,162	#REF!	86	35	#REF!	#REF!	#REF!
1987	2,292	#REF!	41.3	#REF!	0.73	2.64	1,731	#REF!	561	#REF!	77	39	#REF!	#REF!	#REF!
1988	1,937	#REF!	42.0	#REF!	0.81	4.00	1,701	#REF!	236	#REF!	67	22	#REF!	#REF!	#REF!
1989	2,484	#REF!	38.5	#REF!	0.85	3.36	1,896	#REF!	588	#REF!	77	33	#REF!	#REF!	#REF!
1990	2,532	#REF!	24.0	#REF!	1.11	3.63	2,018	#REF!	514	#REF!	68	22	#REF!	#REF!	#REF!
1991	2,184	#REF!	28.8	#REF!	1.70	4.82	1,795	#REF!	389	#REF!	63	25	#REF!	#REF!	#REF!
1992	2,296	#REF!	34.3	#REF!	1.97	6.47	1,859	#REF!	437	#REF!	64	24	#REF!	#REF!	#REF!
1993	2,164	#REF!	35.1	#REF!	2.03	6.31	1,847	#REF!	317	#REF!	54	18	#REF!	#REF!	#REF!
1994	2,610	#REF!	30.2	#REF!	2.09	5.67	1,982	#REF!	473	#REF!	61	21	#REF!	#REF!	#REF!

Source : Sri Lanka Coconut Statistics 1993, Coconut Development Authority
Annual Report 1994, Central Bank of Sri Lanka

TABLE A1.3.19 Coconut Production, Consumption and Exports ('000tons)

Year		Production	Consumption	Exports of Coconut Oil	Exports of Coconut Products Exluding Coconut Oil
1994		398	302	5	149
2005	High	741	299	72	370
	Medium	599	299	28	272
	Low	456	299	4	154
2015	High	1,001	299	115	587
	Medium	728	299	40	390
	Low	456	299	4	154

TABLE A1.3.20 Exports of Other Break Bulk Cargo
(including Containerized Cargo) ('000 tons)

Year		Exports
1994		908
2005	High	1,998
	Medium	1,735
	Low	1,472
2015	High	4,955
	Medium	3,416
	Low	1,878

TABLE A1.3.21 Exports of Lquid Bulk Cargo ('000 tons)

Year		Oil Products	Coconut Oil	Total
1994		202	0	202
2005	High	175	72	247
	Medium	175	28	203
	Low	175	4	178
2015	High	175	115	290
	Medium	175	40	215
	Low	175	4	178

TABLE A1.3.22 Container Cargo Volume and Number of Containers for Imprt/Export

Year		Container Cargo Volume ('000 tons)			Number of Containers (1,000TEU)				
					Laden		Empty		
		Import	Export	Total	Import	Export	Import	Export	Total
1994		1,628	1,193	2,821	122	103	24	40	288
2005	High	5,896	2,639	8,535	393	240	71	224	929
	Medium	4,870	2,250	7,120	325	205	59	179	767
	Low	4,193	1,841	6,034	280	167	51	163	660
2015	High	13,426	5,807	19,232	895	528	153	520	2,096
	Medium	9,252	4,035	13,288	617	367	105	355	1,444
	Low	7,112	2,227	9,339	474	202	81	353	1,110

TABLE A1.3.23 Coastal Trade at Colombo Port ('000 tons)

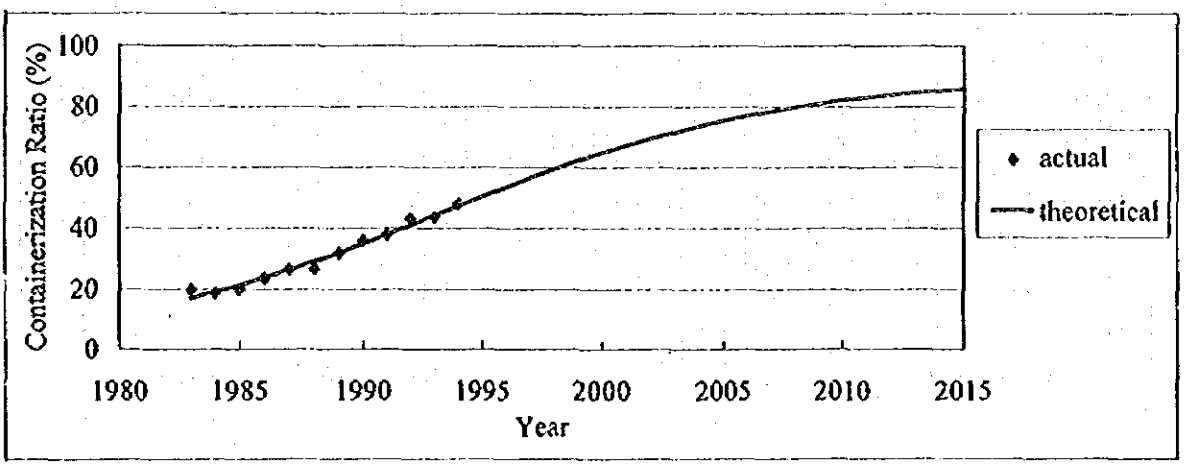
Year		Break Bulk		Liquid Bulk	Total
		Discharged	Loaded	Loaded	
1994		194	77	39	310
2005	High	235	98	43	376
	Medium	204	52	22	277
	Low	173	6	0	179
2015	High	235	98	43	376
	Medium	204	52	22	277
	Low	173	6	0	179

TABLE A1.3.24 Passengership Traffic

Year		Number of Passengerships
1994		27
2005	High	63
	Medium	51
	Low	42
2015	High	136
	Medium	92
	Low	62

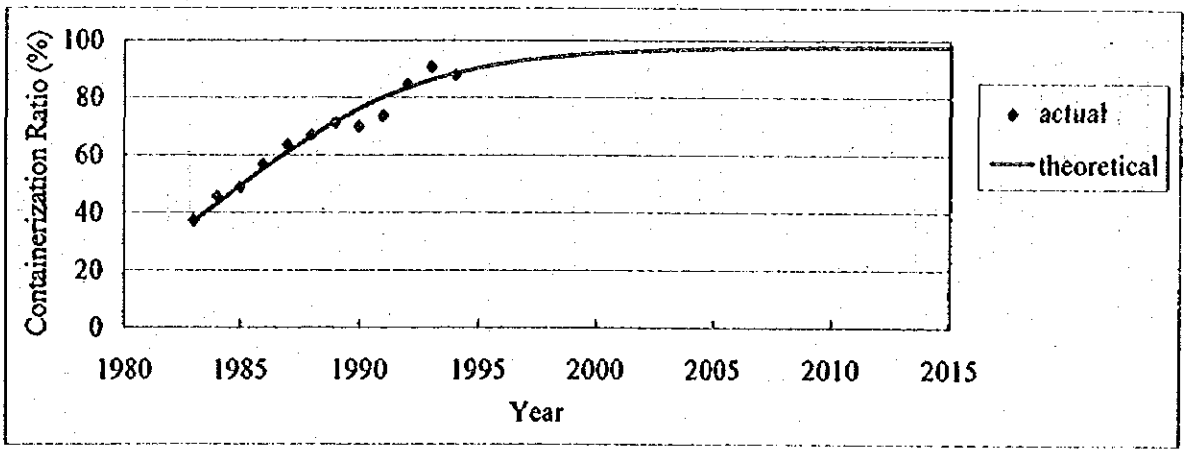
FIGURE A1.3.1 Containerization Ratio (Import)

Year	T	P actual	P theoretical
1983	1	19.7	17.1
1984	2	18.7	19.2
1985	3	19.9	21.4
1986	4	23.4	23.8
1987	5	26.4	26.3
1988	6	26.4	29.0
1989	7	31.7	31.9
1990	8	35.8	34.8
1991	9	37.6	37.9
1992	10	43.1	41.0
1993	11	43.5	44.2
1994	12	48.0	47.3
1995	13		50.5
1996	14		53.6
1997	15		56.6
1998	16		59.5
1999	17		62.2
2000	18		64.9
2001	19		67.3
2002	20		69.7
2003	21		71.8
2004	22		73.7
2005	23		75.5
2006	24		77.2
2007	25		78.6
2008	26		80.0
2009	27		81.2
2010	28		82.2
2011	29		83.2
2012	30		84.0
2013	31		84.7
2014	32		85.4
2015	33		86.0



Containerization Ratio (Export)

Year	T	P actual	P theoretical
1983	1	37.3	37.3
1984	2	45.5	43.2
1985	3	48.7	49.3
1986	4	56.7	55.3
1987	5	63.6	61.2
1988	6	67.0	66.7
1989	7	71.3	71.8
1990	8	70.0	76.3
1991	9	73.6	80.2
1992	10	84.5	83.5
1993	11	90.7	86.3
1994	12	88.0	88.7
1995	13		90.6
1996	14		92.1
1997	15		93.3
1998	16		94.3
1999	17		95.1
2000	18		95.7
2001	19		96.2
2002	20		96.6
2003	21		96.9
2004	22		97.2
2005	23		97.3
2006	24		97.5
2007	25		97.6
2008	26		97.7
2009	27		97.8
2010	28		97.8
2011	29		97.9
2012	30		97.9
2013	31		97.9
2014	32		97.9
2015	33		97.9



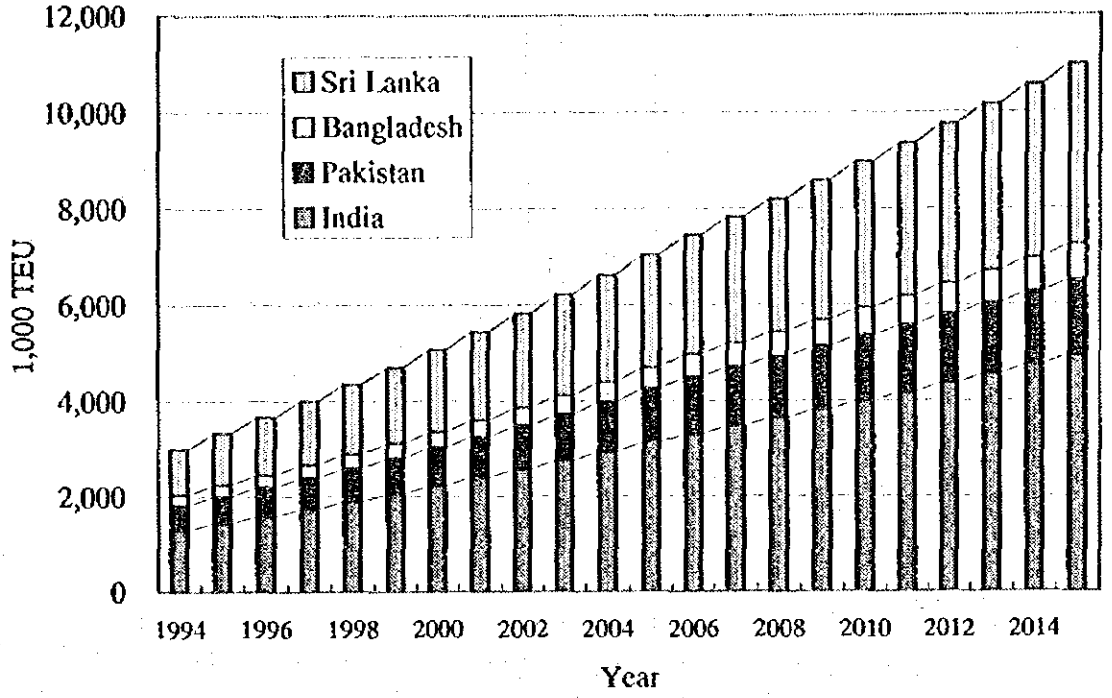


FIGURE A1.3.2 Container Cargo Forecast in South Asia (Low Case)
(including Transhipment at the port of Colombo)

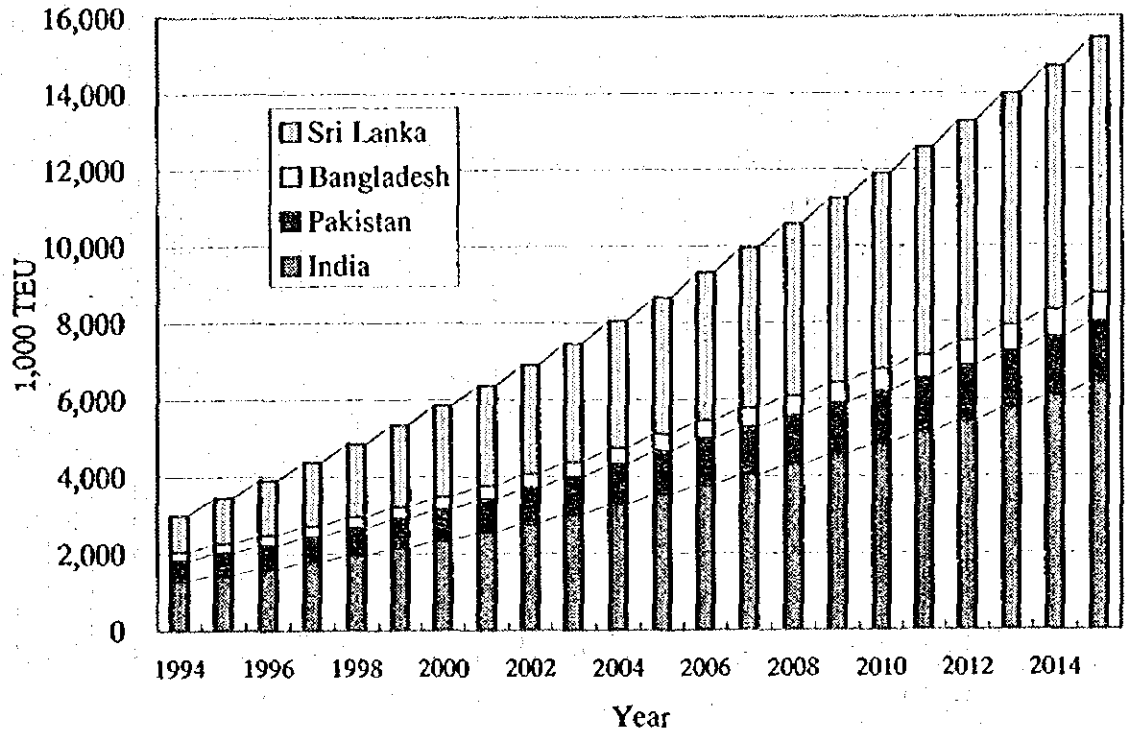


FIGURE A1.3.3 Container Cargo Forecast in South Asia (High Case)
(including Transhipment at the port of Colombo)

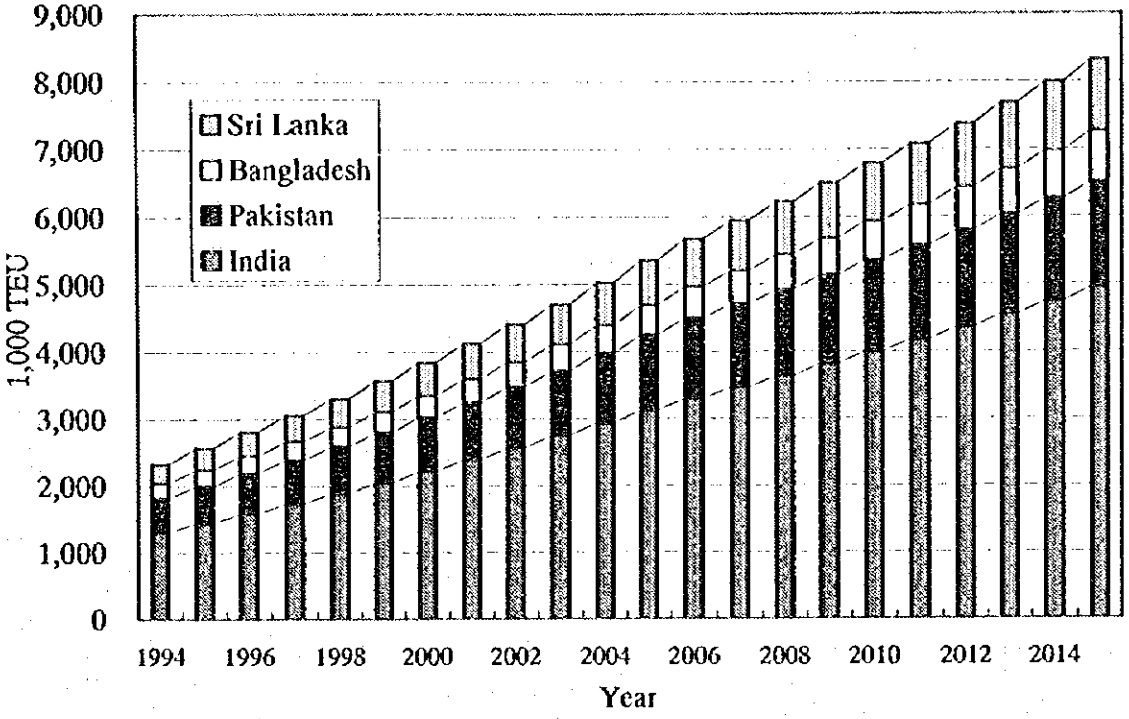


FIGURE A1.3.4 Container Cargo Forecast in South Asia (Low Case)
(excluding Transhipment at the port of Colombo)

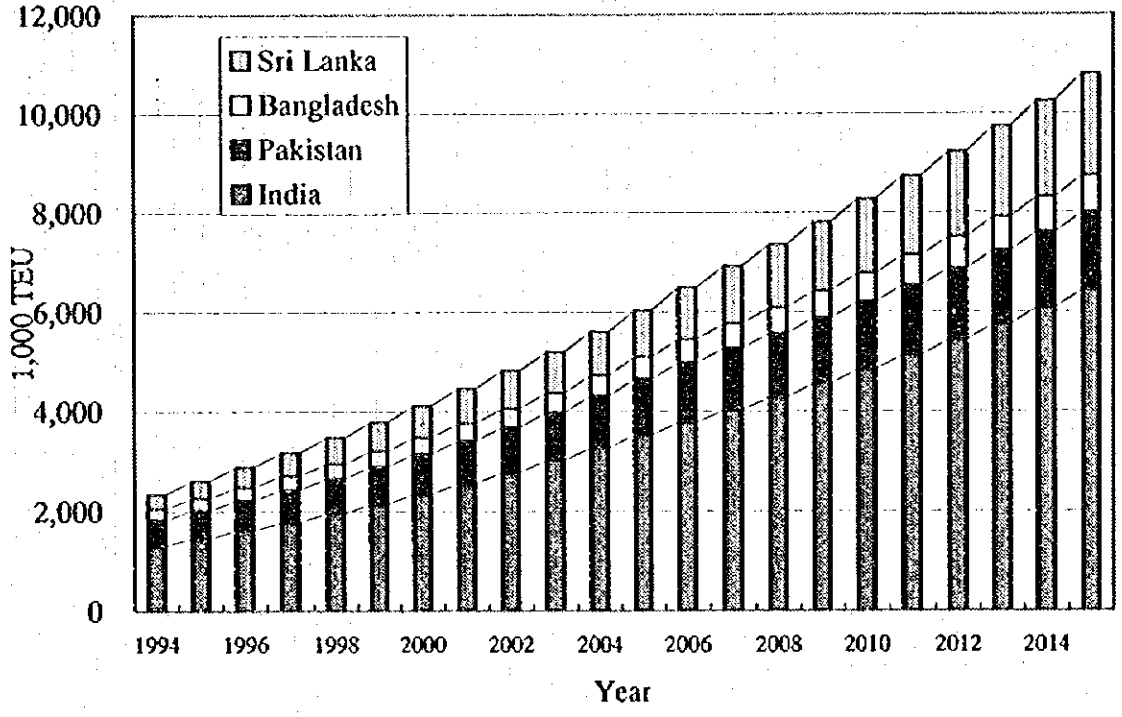


FIGURE A1.3.5 Container Cargo Forecast in South Asia (High Case)
(excluding Transhipment at the port of Colombo)

FIGURE A1.3.6 Container Cargo Forecast in South Asia (Medium Case)
(including transhipment at the port of Colombo)

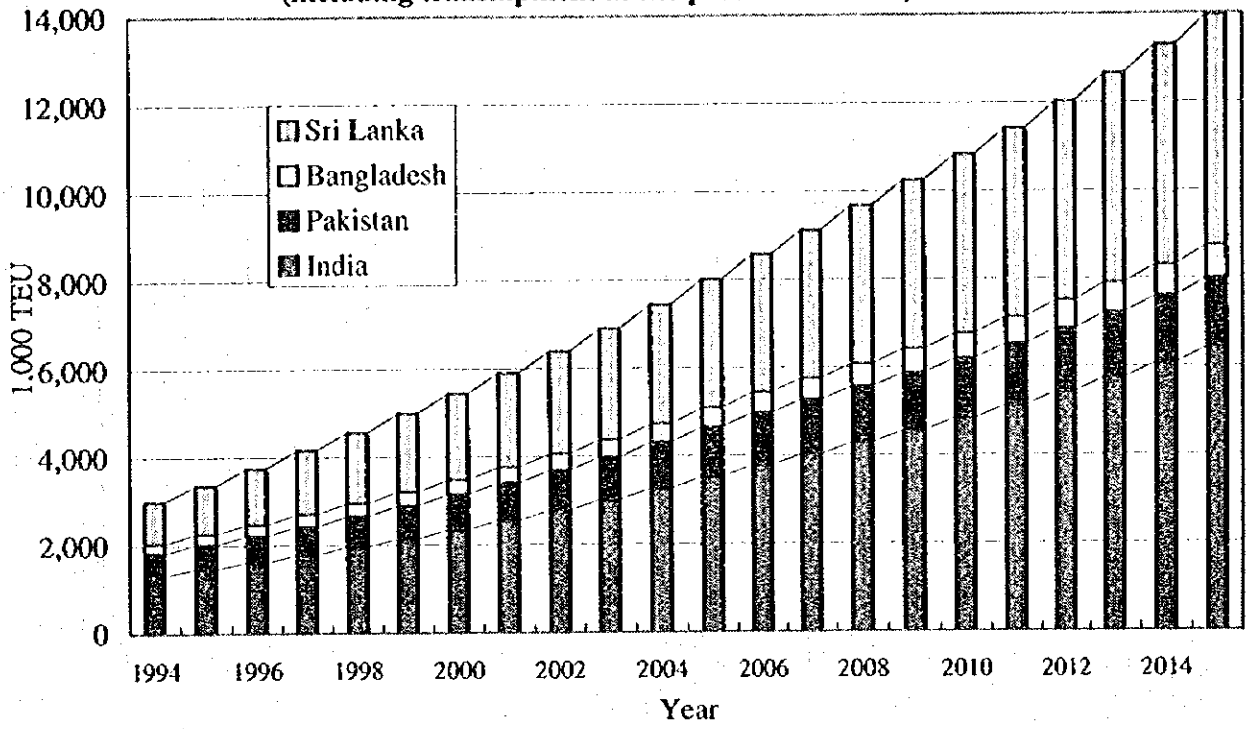


TABLE A1.4.1 Trends of Vessels Capacity by ship type (1,000 N.T.)

	1986	1987	1988	1989	1990	1991	1992	1993	1994	2005	2015
Conventional Cargo	3.86	3.48	3.66	4.35	4.20	3.80	3.71	3.72	3.74	3.75	3.75
Dry Bulk Carrier	7.64	8.26	8.58	8.49	8.86	8.39	7.49	7.36	6.32	9.69	13.05
Oil Tanker	8.43	7.18	6.39	5.08	6.97	6.93	7.20	6.06	6.88	6.88	6.88
Roll on / Roll off	4.37	6.52	6.75	6.60	8.15	9.48	9.41	9.56	11.33	15.22	19.11

FIGURE A1.4.1 Trends of Vessels Capacity by ship type

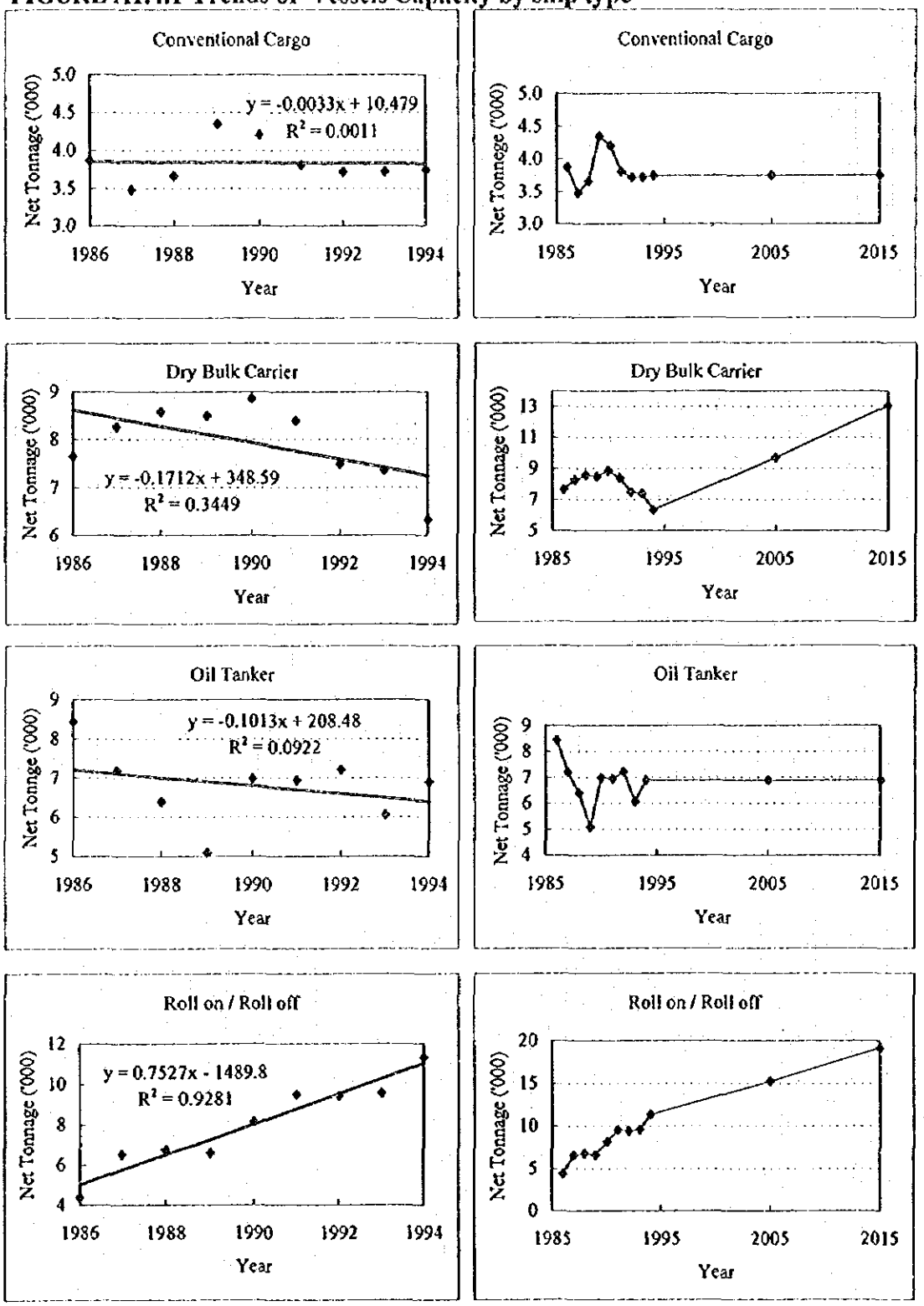


Table A2.1.1 Estimate of Container Handling Capacity in the Port of Colombo

(1) Berth Capacity

<1> In 1996 : Completion of JCT No4

Precondition: a) 40' Container Ratio:30% of total boxes
b) Three-shift *364day Operation(8736Hr/Yr)
c) Productivity of Container Crane:JM18/JF15/GM15/GF15/SG6-8 Box/Hr Cr

Name of the berth	Quay Length (m)	Quay Depth (m)	Number of Berth		Unit Berth Length (m)	Average Ld/Dis Boxes per Ship (Box)	Container Crane: Prodc-tivity (Box/Hr.Cr)	Container Crane: Number of Crane per Berth	Container Crane: Effective Number of Crane	Berth Occupancy Ratio (%)	Berthing Time: Net Handing Time	Berthing Time: Idle Time	Berthing Time: Start & End Time	Berthing Time: Total (Hr)	Number of Ship Calls	40' Container Ratio	Unit Berth Capacity: 1000Box per Year	Unit Berth Capacity: 1000TEU per Year	Total Berth Capacity (1000TEU)	Berth Capacity per Unit Length
JCT No1-2	632	12/13	2	M	316	500	18	2.5	2.15	0.75	12.92	2.28	1.25	16.45	398	0.3	199	259	518	819
JCT No3-4	660	13.5/14	2	M	330	500	18	3.0	2.40	0.75	11.57	2.04	1.25	14.87	441	0.3	220	286	573	868
JCT CrB(s)	170	9	1	F	170	500	8	2.0	1.60	0.75	34.72	6.13	1.25	42.10	156	0.3	78	101	101	595
JCT CrB(n)	180	9	1	F	180	500	8	2.0	1.60	0.75	34.72	6.13	1.25	42.10	156	0.3	78	101	101	562
JCT Total	1642		6		996			11.0	10.80	0.75					1,989		995	1,293	1,293	787
OCT No 5-6	320	12.8	1	M	320	360	15	2	1.90	0.75	12.63	2.23	1.25	16.11	407	0.3	146	190	190	595
OCT No 4	160	10.8	1	F	160	360	15	1	1.00	0.75	24.00	4.24	1.25	29.49	222	0.3	80	104	104	650
OEO No2	200	10.8	1	F	200	360	6	2	1.80	0.75	33.33	5.88	1.25	40.47	162	0.3	58	76	76	379
OEO No3	220	10.8	1	F	220	360	6	2	1.80	0.75	33.33	5.88	1.25	40.47	162	0.3	58	76	76	344
OEO/OCT Total	900		4		900			3	6.50	0.75					953		343	446	446	495
New North Pier	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	2,542		10												2,942				1,739	684

<2> In 2000 : Completion of OEO Rehabilitation, NNP development and JCT Equipment Reinforcing Plan

Precondition: a) 40' Container Ratio;30% of total boxes
b) Three-shift *364day Operation(8736Hr/Yr)
c) Productivity of Container Crane:JM18/JF15/GM15/GF15/SG6-8 Box/Hr Cr

Facility : a) JCT Cloth Berth-South:+2 Container Crane
a) JCT No1-2 Berth:+1 Container Crane
c) JCT Empty Container Stacking Facility
d) OEO Rehabilitation
b) New North Pier Development

Name of the berth	Quay Length (m)	Quay Depth (m)	Number of Berth		Unit Berth Length (m)	Average Ld/Dis Boxes per Ship (Box)	Container Crane: Prodc-tivity (Box/Hr.Cr)	Container Crane: Number of Crane per Berth	Container Crane: Effective Number of Crane	Berth Occupancy Ratio (%)	Berthing Time: Net Handing Time	Berthing Time: Idle Time	Berthing Time: Start & End Time	Berthing Time: Total (Hr)	Number of Ship Calls	40' Container Ratio	Unit Berth Capacity: 1000Box per Year	Unit Berth Capacity: 1000TEU per Year	Total Berth Capacity (1000TEU)	Berth Capacity per Unit Length
JCT No1-2	632	12/13	2	M	316	500	18	3.0	2.40	0.75	11.57	2.04	1.25	14.87	441	0.3	220	286	573	907
JCT No3-4	660	13.5/14	2	M	330	500	18	3.0	2.40	0.75	11.57	2.04	1.25	14.87	441	0.3	220	286	573	868
JCT CrB(s)	170	9	1	F	170	500	15	2.0	1.90	0.75	17.54	3.10	1.25	21.89	299	0.3	150	195	195	1,144
JCT CrB(n)	180	9	1	F	180	500	8	2.0	1.80	0.75	34.72	6.13	1.25	42.10	156	0.3	78	101	101	562
JCT Total	1642		6		996			14.0	11.50	0.75					2,218		1,109	1,442	1,442	878
OCT No 5-6	320	12.8	1	M	320	360	18	2	1.90	0.75	10.53	1.86	1.25	13.63	481	0.3	173	225	225	703
OCT No 4	160	10.8	1	F	160	360	15	1	1.00	0.75	24.00	4.24	1.25	29.49	222	0.3	80	104	104	650
OEO No2	200	10.8	1	F	200	360	15	1	1.00	0.75	24.00	4.24	1.25	29.49	222	0.3	80	104	104	520
OEO No3	220	10.8	1	F	220	360	15	1	1.00	0.75	24.00	4.24	1.25	29.49	222	0.3	80	104	104	473
OEO/OCT Total	900		4		900			5	4.90	0.75					1147				537	597
New North Pier	190	7.5/11	1		190	360	15	1	1.00	0.75	24.00	4.24	1.25	29.49	227	0.3	80	104	104	547
Total	2,732		11												3,587				2,082	762

Table A2.1.2 Estimate of Container Handling Capacity in the Port of Colombo<2>

(1) Yard Capacity and Terminal Capacity

<1> In 1996 : Completion of JCT No4

Preconditions: a) Impor and Export: 30% Transhipment: 70%
b) YOR:60%
c) Dwelling Time: 7days

Name of the Berth	Number of Ground Slots (TEU)		Dwelling Time (Days)	Rotation Rate (Rev/Yr)	Average Stacking Height (Tier)	Yard Storage Capacity (TEU)	Yard Handling Capacity (1000TEU/Y)	Berth Capacity (1000TEU/Y)	Terminal Capacity (1000TEU/Y)	Remarks
JCT No1-2	Dry	4,092	7.0	52.1	1.80	7,366	591			
	Ref	144	7.0	52.1	1.80	259	21			
	SubTotal	4,236	7.0	52.1	1.80	7,625	612			
JCT No3-4	Dry	3,936	7.0	52.1	2.40	9,446	758			
	Ref	234	7.0	52.1	1.80	421	34			
	Sub Total	4,170	7.0	52.1	2.37	9,868	792			
JCT Empty Con.	Empty	-	7.0	52.1	4.80	-	-			
JCT Total		8,406	7.0	52.1	2.08	17,492	1,403	1,293		Berth Neck
New North Pier	Dry	-	7.0	52.1	1.80	-	-	-		Yard Neck Inter Terminal Shift
JCT+NNP Total		8,406	7.0	52.1	2.08	17,492	1,403	1,293	1,293	Berth Neck
QEQ/QCT	Dry	1,500	7.0	52.1	1.80	2,700	217			
	Ref	-	7.0	52.1	1.80	-	-			
QEQ/QCT Total		1,500	7.0	52.1	1.80	2,700	217	446	217	Yard Neck
Total		9,906				20,192	1,620	1,739	1,510	

Table A2.1.2 Estimate of Container Handling Capacity in the Port of Colombo<2>

<2> In 2000 : Completion of JCT Equipment Reinforcing Plan, NNP Development and QEQ Rehabilitation Plan

Preconditions: a) Impor and Export: 30% Transhipment: 70%
b) YOR:60%
c) Dwelling Time: 7days

Facilities: a) JCT Equipment Reinforcing Plan (JCT Empty Container Stacking Facility)
b) QEQ Rehabilitation Plan
c) New North Pier Development Plan

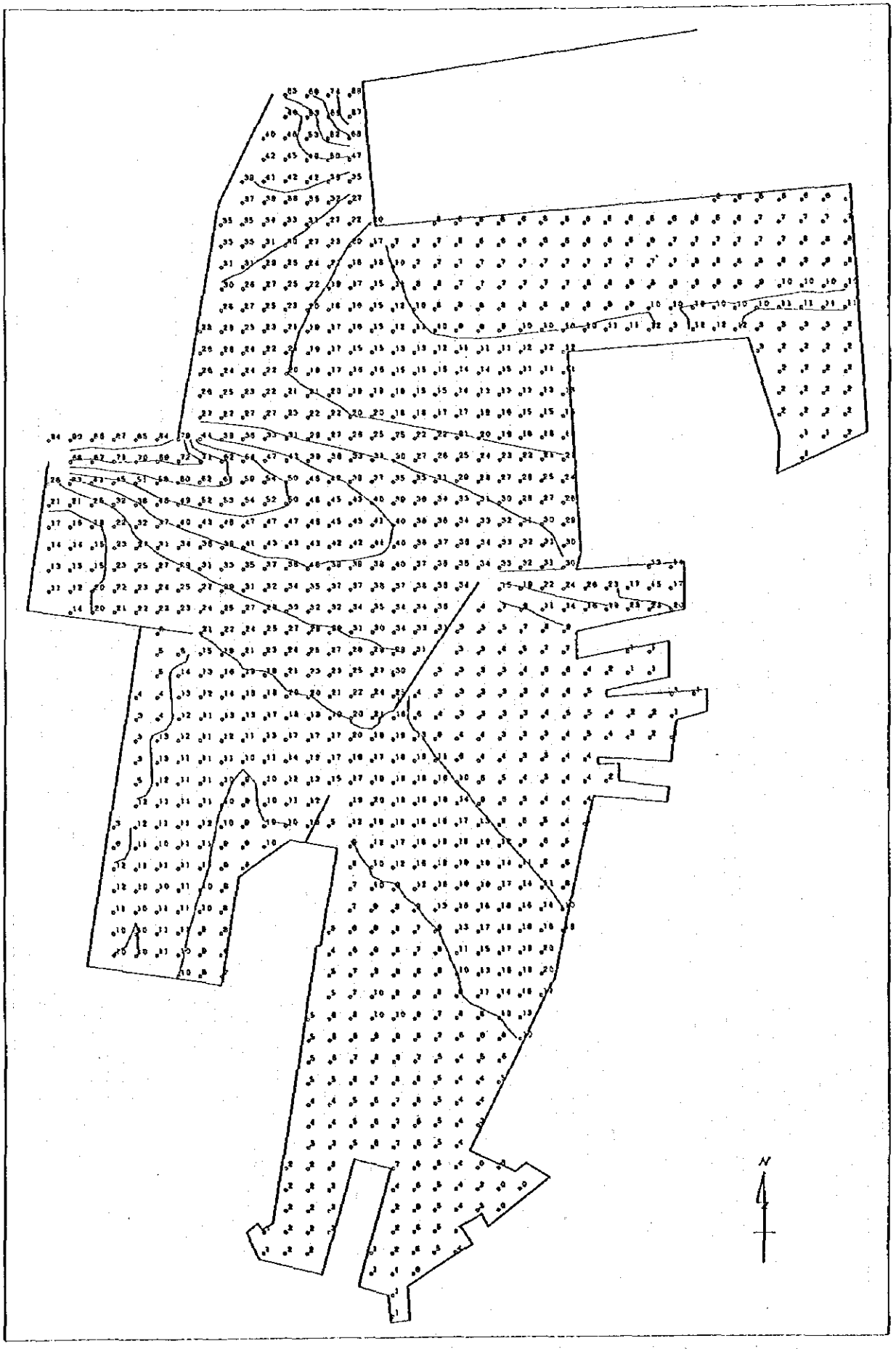
Name of the Berth	Number of Ground Slots (TEU)		Dwelling Time (Days)	Rotation Rate (Rev/Yr)	Average Stacking Height (Tier)	Yard Storage Capacity (TEU)	Yard Handling Capacity (1000TEU/Y)	Berth Capacity (1000TEU/Y)	Terminal Capacity (1000TEU/Y)	Remarks
JCT No1-2	Dry	4,092	7.0	52.1	1.80	7,366	591			
	Ref	144	7.0	52.1	1.80	259	21			
	SubTotal	4,236	7.0	52.1	1.80	7,625	612			
JCT No3-4	Dry	3,936	7.0	52.1	2.40	9,446	758			
	Ref	234	7.0	52.1	1.80	421	34			
	Sub Total	4,170	7.0	52.1	2.37	9,868	792			
JCT Empty Con.	Empty	720	7.0	52.1	4.80	3,456	277			
JCT Total		9,126	7.0	52.1	2.30	20,948	1,680	1,442		Berth Neck
New North Pier	Dry	330	7.0	52.1	1.80	594	48	104		Yard Neck Inter Terminal Shift
JCT+NNP Total		9,456	7.0	52.1	2.28	21,542	1,728	1,546	1,546	Berth Neck
QEQ/OCT	Dry	1,700	7.0	52.1	2.40	4,080	327			
	Ref	80	7.0	52.1	1.80	144	12			
QEQ/OCT Total		1,780	7.0	52.1	2.37	4,224	339	537	339	Yard Neck
Total		11,236				25,766	2,067	2,083	1,885	

TABLE A2.1.3 Case parameters and Results of the Container Terminal Simulation by WITNESS

CASE	NAME OF BERTH		Productivity and Operation Condition of Container Crane: Number of Crane Installed (Set)	Number of Crane Effective (Set)	Productivity of Crane: Main Vessel (Box/Hr)	Productivity of Crane: Feeder Vessel (Box/Hr)	Idle Time Ratio (Hr)	Start & End Time (Hr)	Additional Container Crane Installed (set)	Container Through-put (TEU/Yr)	Number of Ship Called: Contar Ship (Ship/Yr)	Number of Ship Called: Other Ship (Ship/Yr)	Result of Simulation: Waiting Time: Total (Hr)	Waiting Time: JCT: Main Vessel (Hr)	Waiting Time: JCT: Feeder Vessel (Hr)	Waiting Time: QCT: Main Vessel (Hr)	Waiting Time: QCT: Feeder Vessel (Hr)	Berth Occupancy Ratio: JCT (%)	Berth Occupancy Ratio: QCT (%)	T.B Occupancy Ratio (%)	Remarks
Case O	JCT	1	2.5	2.15	17.4	14.0															
		2	2.5	2.15	17.4	14.0															
(Actual		3	3.0	2.40	17.4	14.0	0.70	1.25		965,000	2,009	1,295	7.7	4.5	10.5	12.8	8.3	70	70	50	
Peformance		4	ship gear	1.80	-	6.0							(8.4)	(5.2)	(11.9)	(11.1)	(10.2)	(80)	(70)		
of		CB-S	-	-	-	-															
Present		CB-N	ship gear	1.80	-	6.0															
Terminal)	NP		-	-	-	-															
-1995 July-	GP		ship gear	1.80	-	6.0															
	PVQ2		ship gear	1.80	-	6.0															
	QCT	2	ship gear	1.80	-	8.0															
		3	ship gear	1.80	-	8.0															
		4	1.0	1.00	-	15.0															
		5&6	2.0	1.90	15.0	15.0															
Case A	JCT	1	2.5	2.15	18.0	15.0															
		2	2.5	2.15	18.0	15.0															
(Maximum		3	3.0	2.40	18.0	15.0	0.85	1.25		1,800,000	3,125	1,418	3.4	3.1	2.5	5.6	2.9	75	60	50	
Capacity		4	3.0	2.40	18.0	15.0															
of		CB-S	1.0	1.00	-	15.0															
Present		CB-N	-	1.80	-	8.0															
Terminal)	NP		1.0	1.00	-	15.0															
	GP		-	1.80	-	6.0															
	PVQ2		-	1.80	-	6.0															
	QCT	2	1.0	1.00	-	15.0															
		3	1.0	1.00	-	15.0															
		4	1.0	1.00	-	15.0															
		5&6	2.0	1.90	18.0	15.0															
Case B	JCT	1	3.0	2.40	20.0	15.0			+1												
		2	3.0	2.40	20.0	15.0															
(Maximum		3	3.0	2.40	20.0	15.0	0.85	1.25		2,400,000	1,542	4,166	3.4	2.8	5.9	3.4	2.3	75	68	70	
Capacity		4	3.0	2.40	20.0	15.0															
of		CB-S	2.0	1.90	-	15.0			+1												
Present		CB-N	-	1.80	-	8.0															
Harbor	NP		1.0	1.00	-	15.0															
Area)	GP		-	1.80	-	6.0															
	PVQ2		-	1.80	-	6.0															
	QCT	2	2.0	1.90	-	15.0			+1												
		3	2.0	1.90	-	15.0			+1												
		4	3.0	2.40	18.0	15.0			+2												
		5&6	3.0	2.40	18.0	15.0			+1												

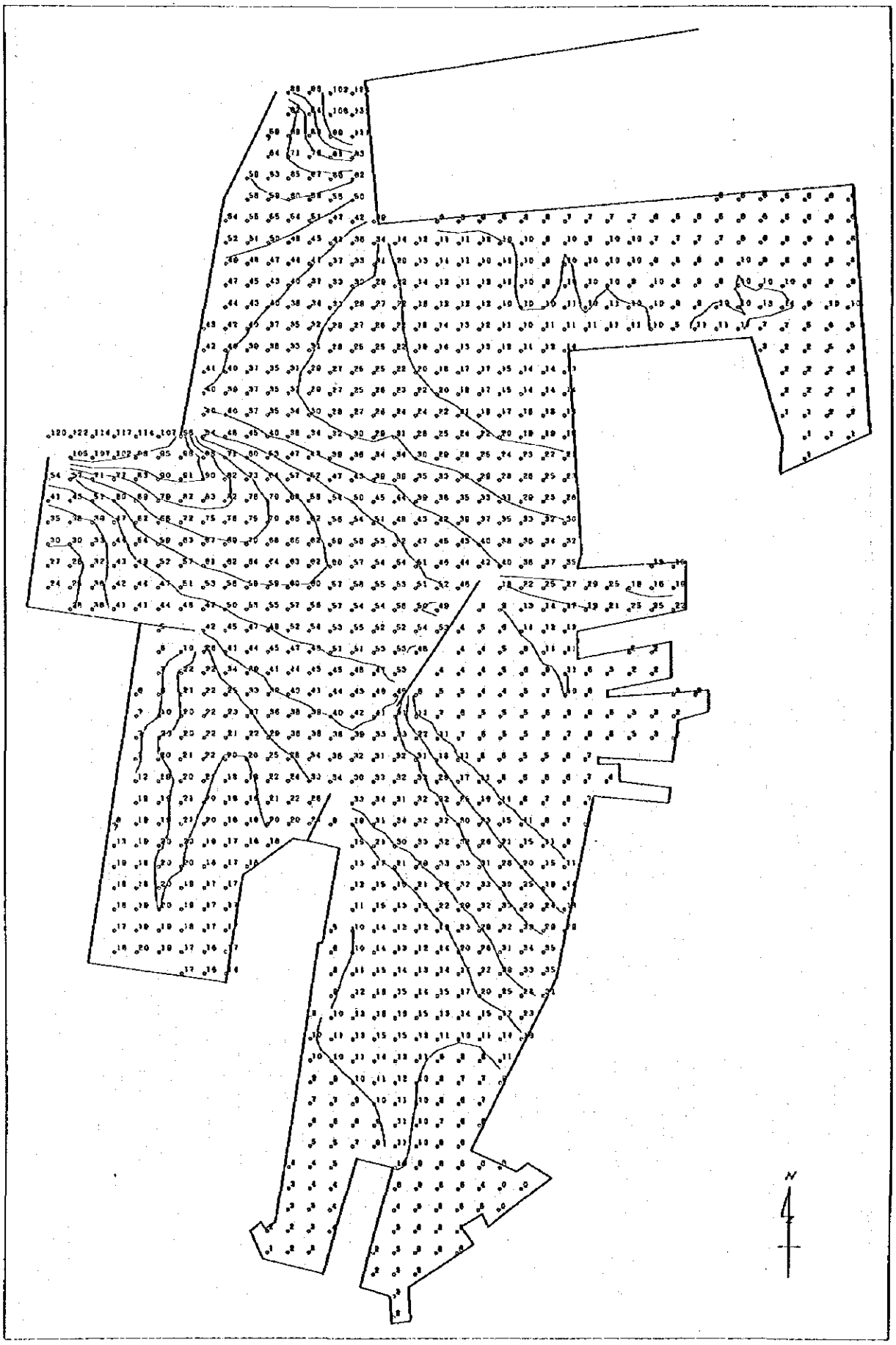
Note: (1) T.B.:Turning Basin

FIGURE A2.5.1 WAVE HEIGHT RATIO
HIGH GROWTH CASE (CROW ISLAND OFFSHORE DEV.); WEST



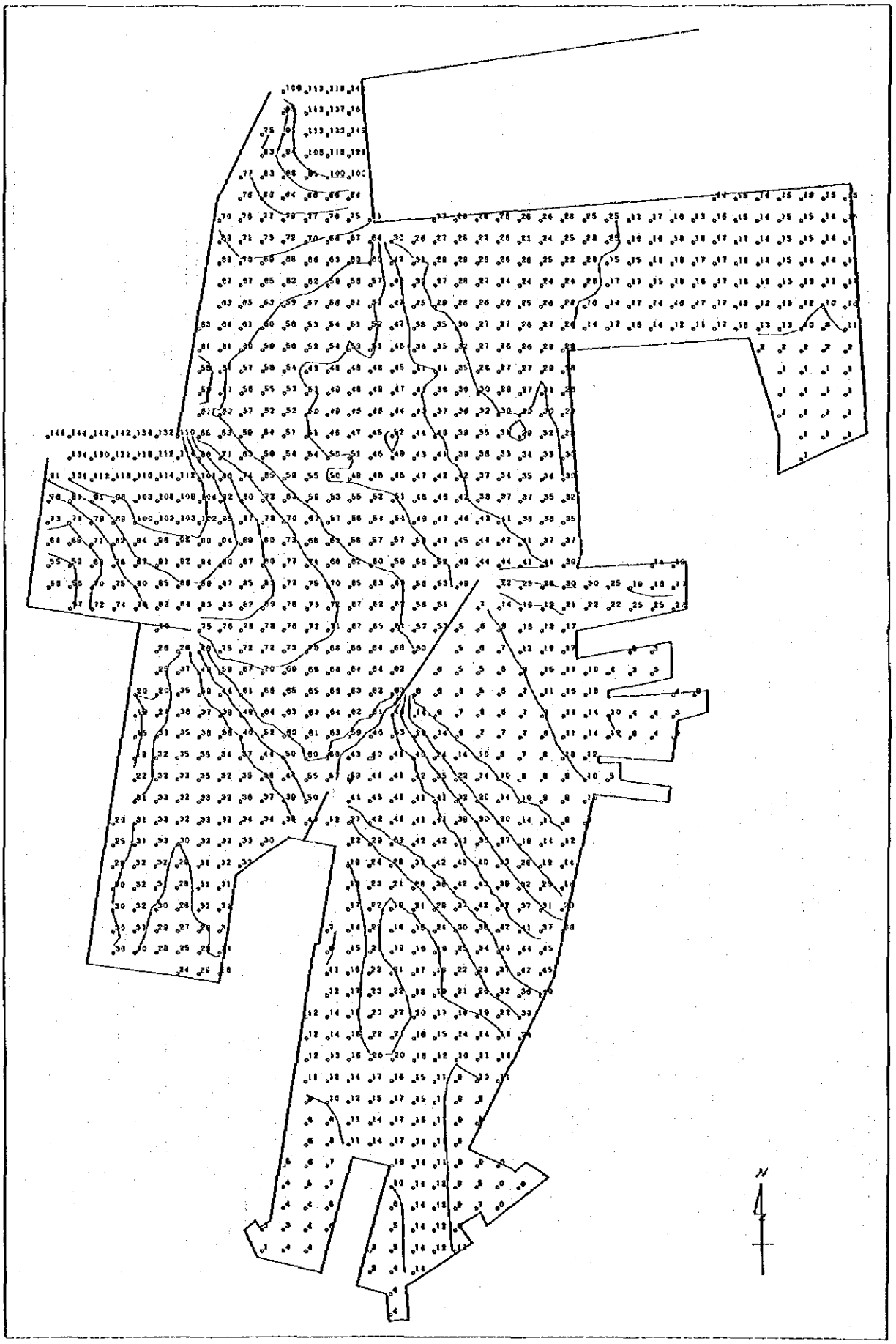
WAVE DIRECTION: W $H_{1/3}$=3.0 m, $T_{1/3}$=6.9 sec

FIGURE A2.5.2 WAVE HEIGHT RATIO
HIGH GROWTH CASE (CROW ISLAND OFFSHORE DEV.); WNW



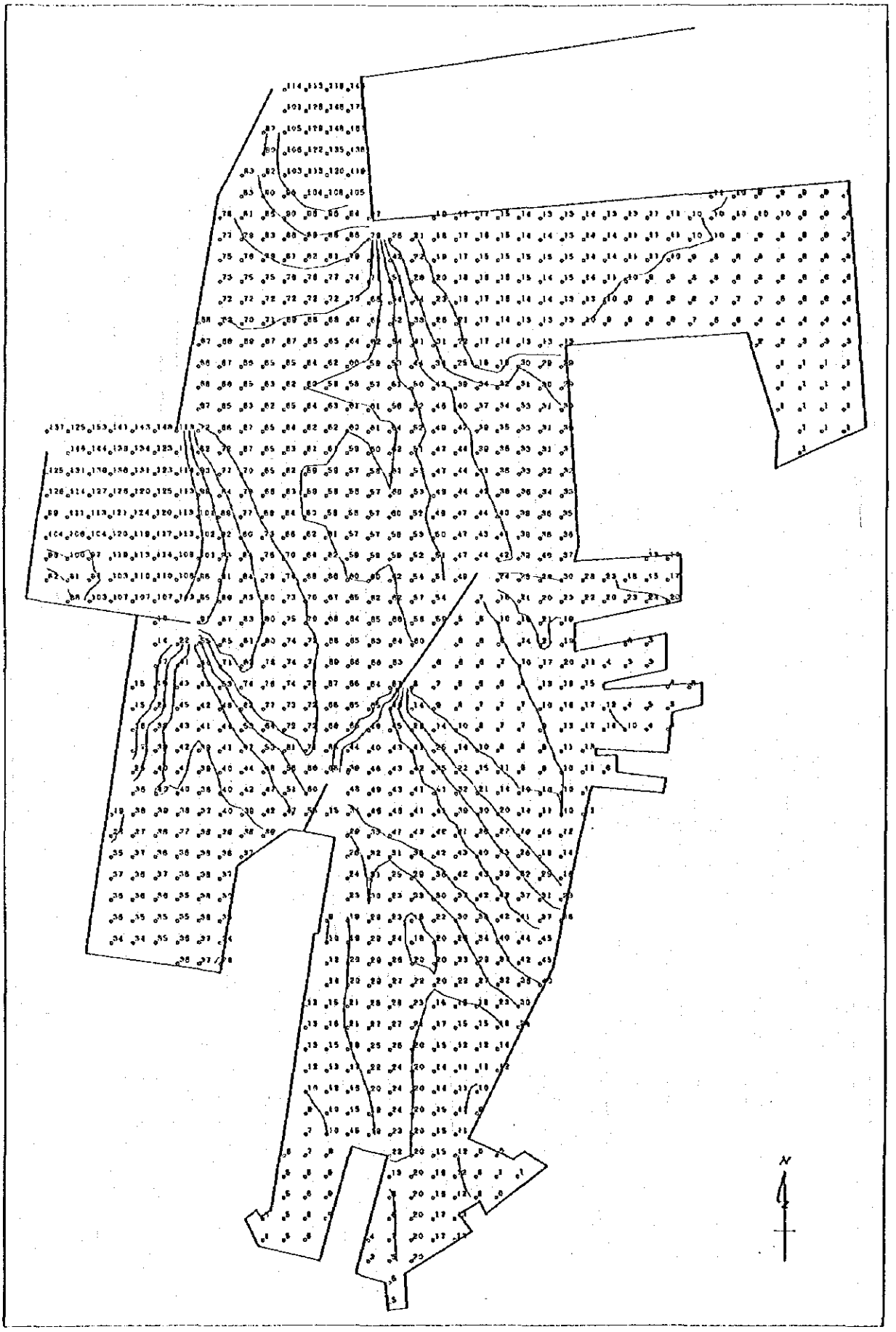
WAVE DIRECTION: WNW $H_{1/3}$=3.0 m, $T_{1/3}$=6.9 sec

FIGURE A2.5.3 WAVE HEIGHT RATIO
HIGH GROWTH CASE (CROW ISLAND OFFSHORE DEV.); NW



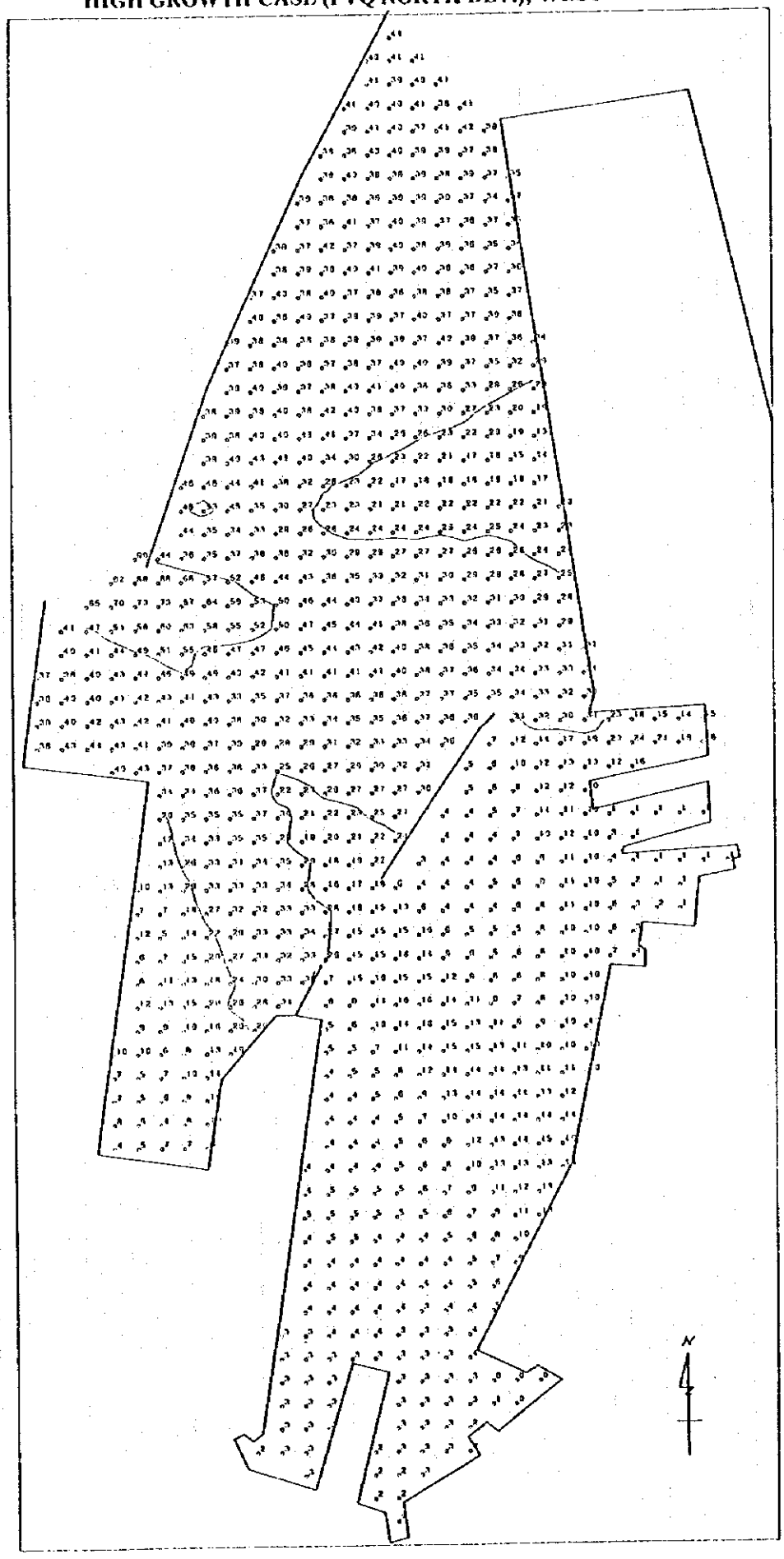
WAVE DIRECTION: NW **$H_{1/3}$=1.5 m, $T_{1/3}$=4.9 sec**

FIGURE A2.5.4 WAVE HEIGHT RATIO
HIGH GROWTH CASE (CROW ISLAND OFFSHORE DEV.); NNW



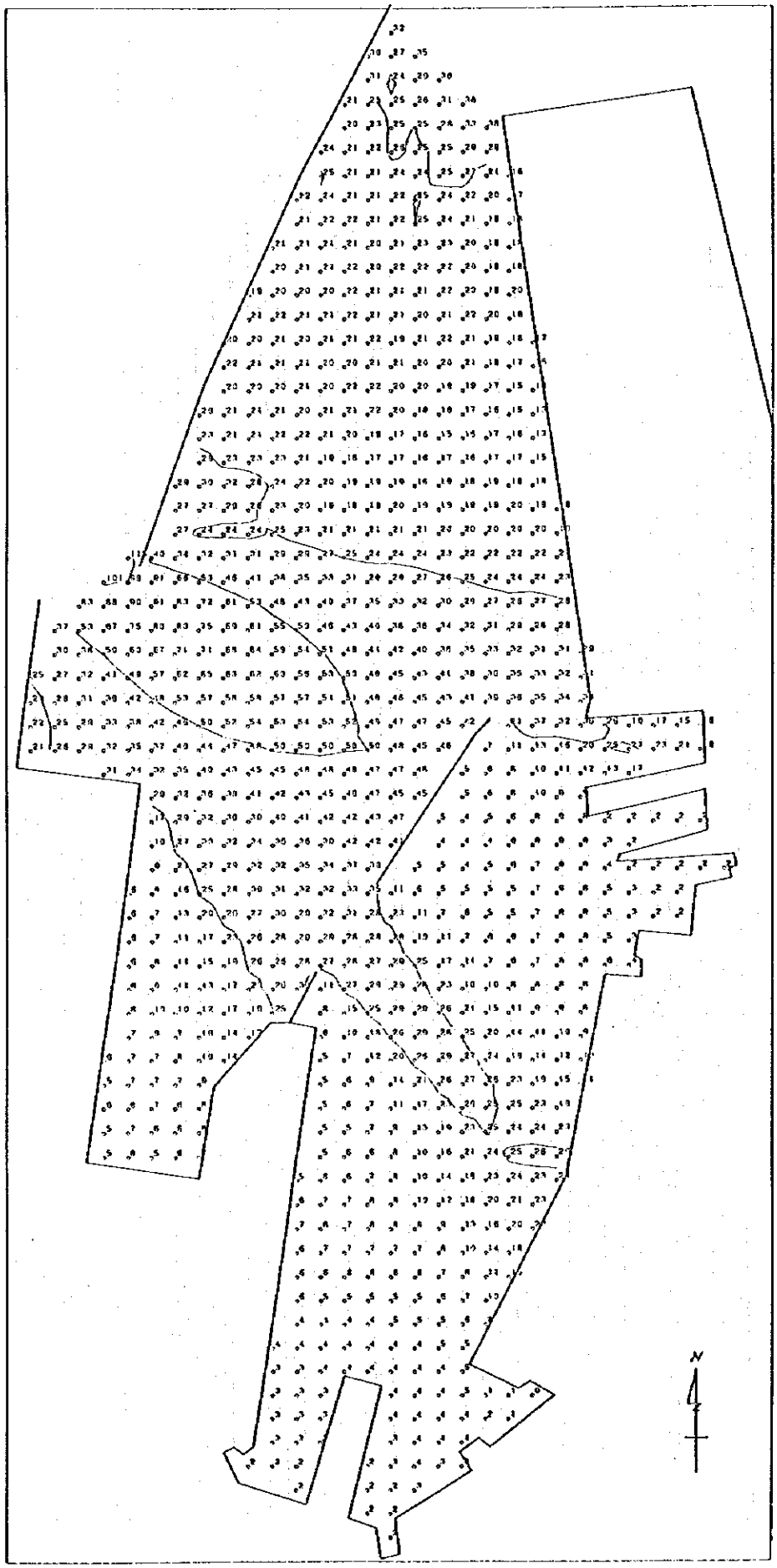
WAVE DIRECTION: NNW $H_{1/3}$=1.5 m, $T_{1/3}$=4.9 sec

FIGURE A2.5.5 WAVE HEIGHT RATIO
HIGH GROWTH CASE (PVQ NORTH DEV.); WEST



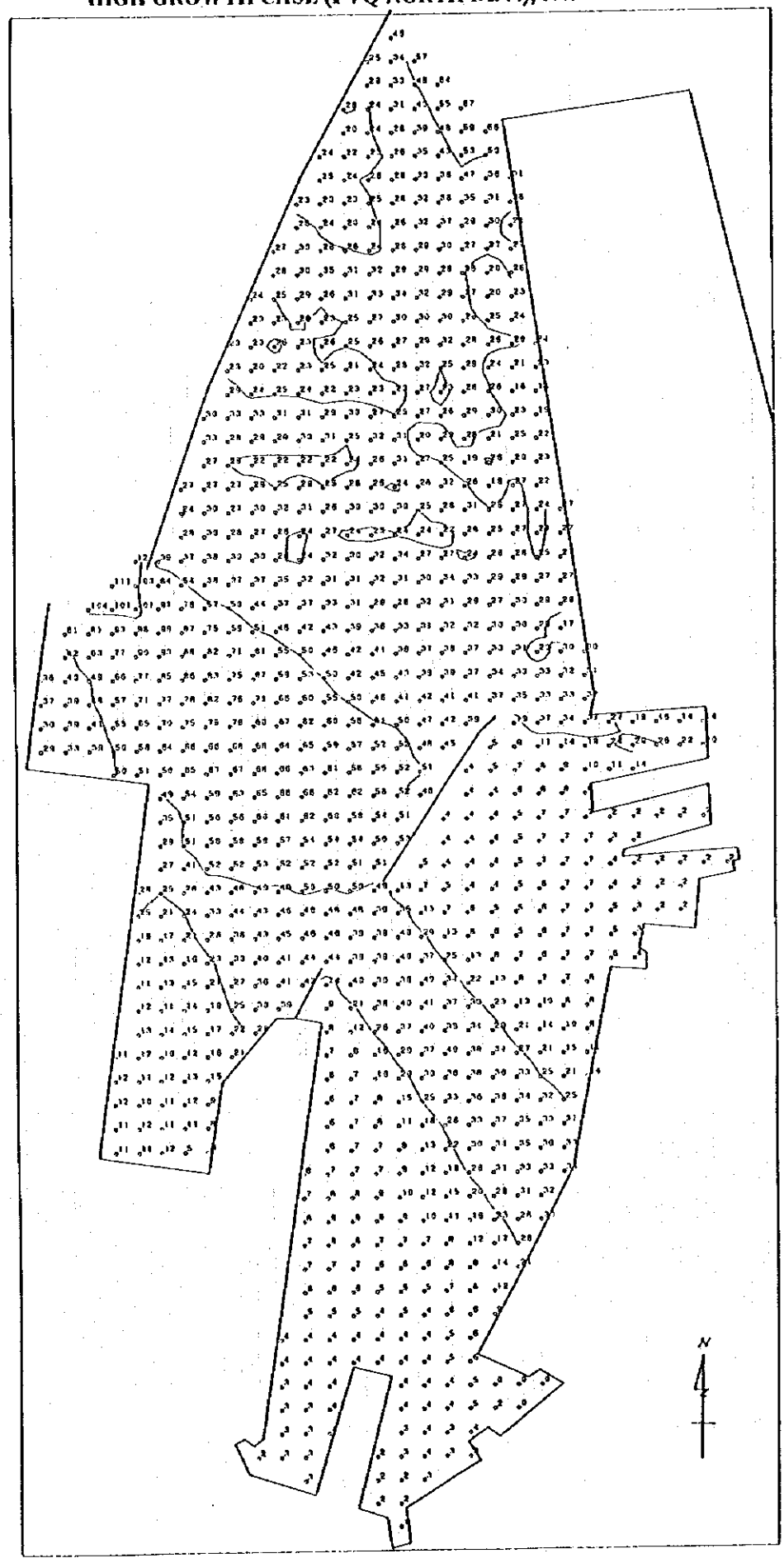
WAVE DIRECTION: W $H_{1/3}$=3.0 m, $T_{1/3}$=6.9 sec

FIGURE A2.5.6 WAVE HEIGHT RATIO
HIGH GROWTH CASE (PVQ NORTH DEV.); WNW



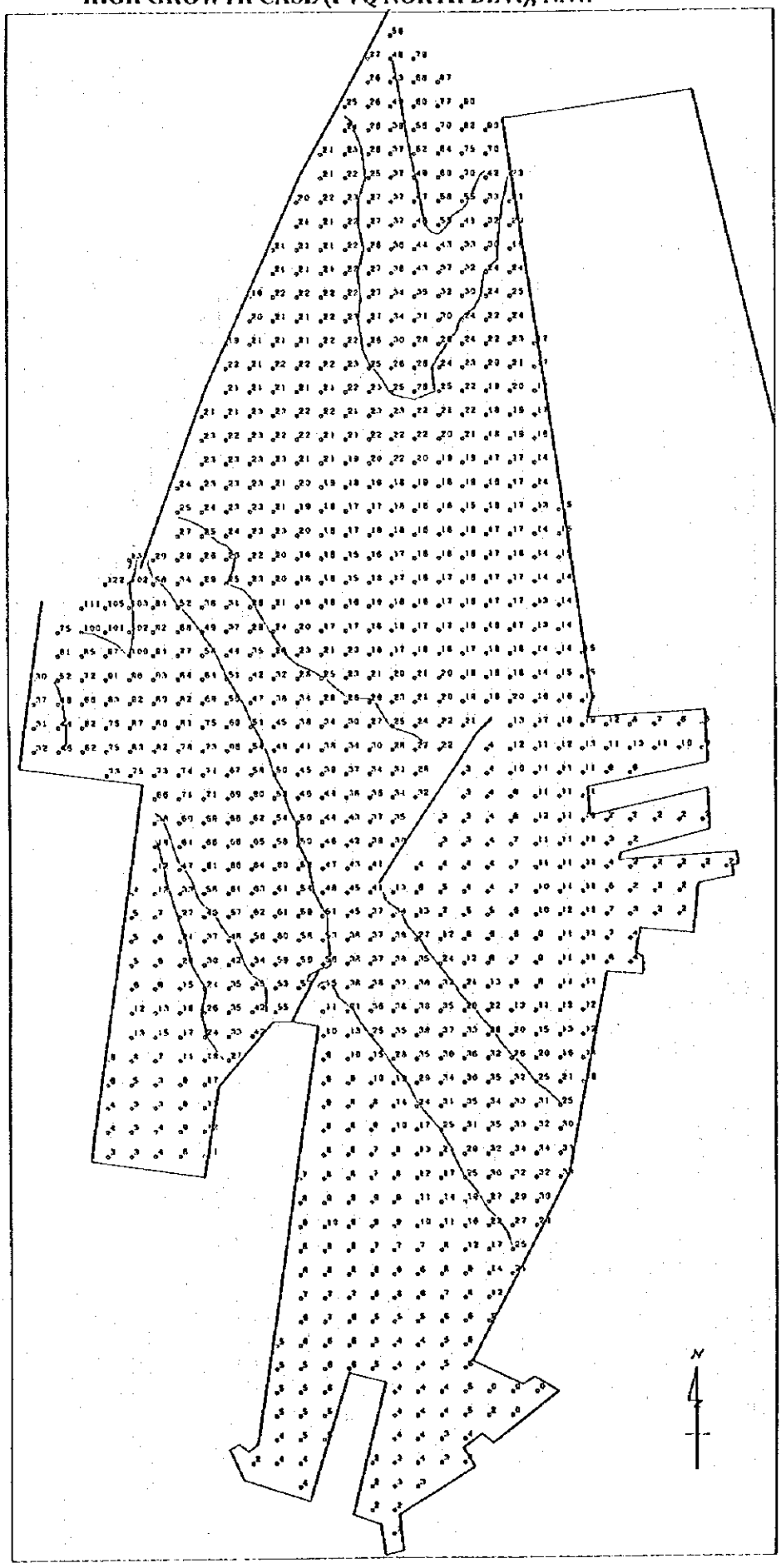
WAVE DIRECTION: WNW $H_{1/3}$=3.0 m, $T_{1/3}$=6.9 sec

FIGURE A2.5.7 WAVE HEIGHT RATIO
HIGH GROWTH CASE (PVQ NORTH DEV.); NW



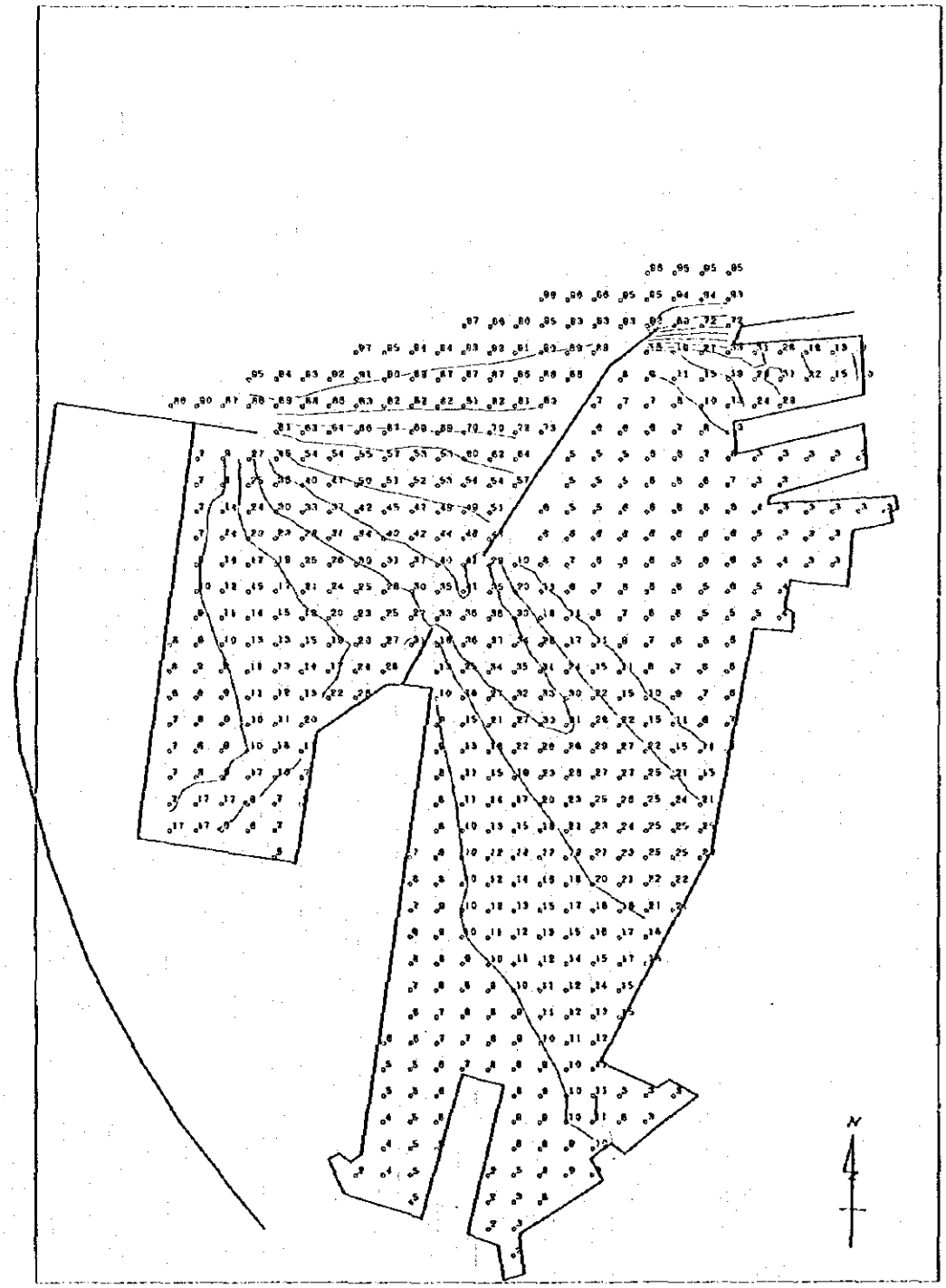
WAVE DIRECTION: NW $H_{1/3}$=1.5 m, $T_{1/3}$=4.9 sec

FIGURE A2.5.8 WAVE HEIGHT RATIO
HIGH GROWTH CASE (PVQ NORTH DEV.); NNW



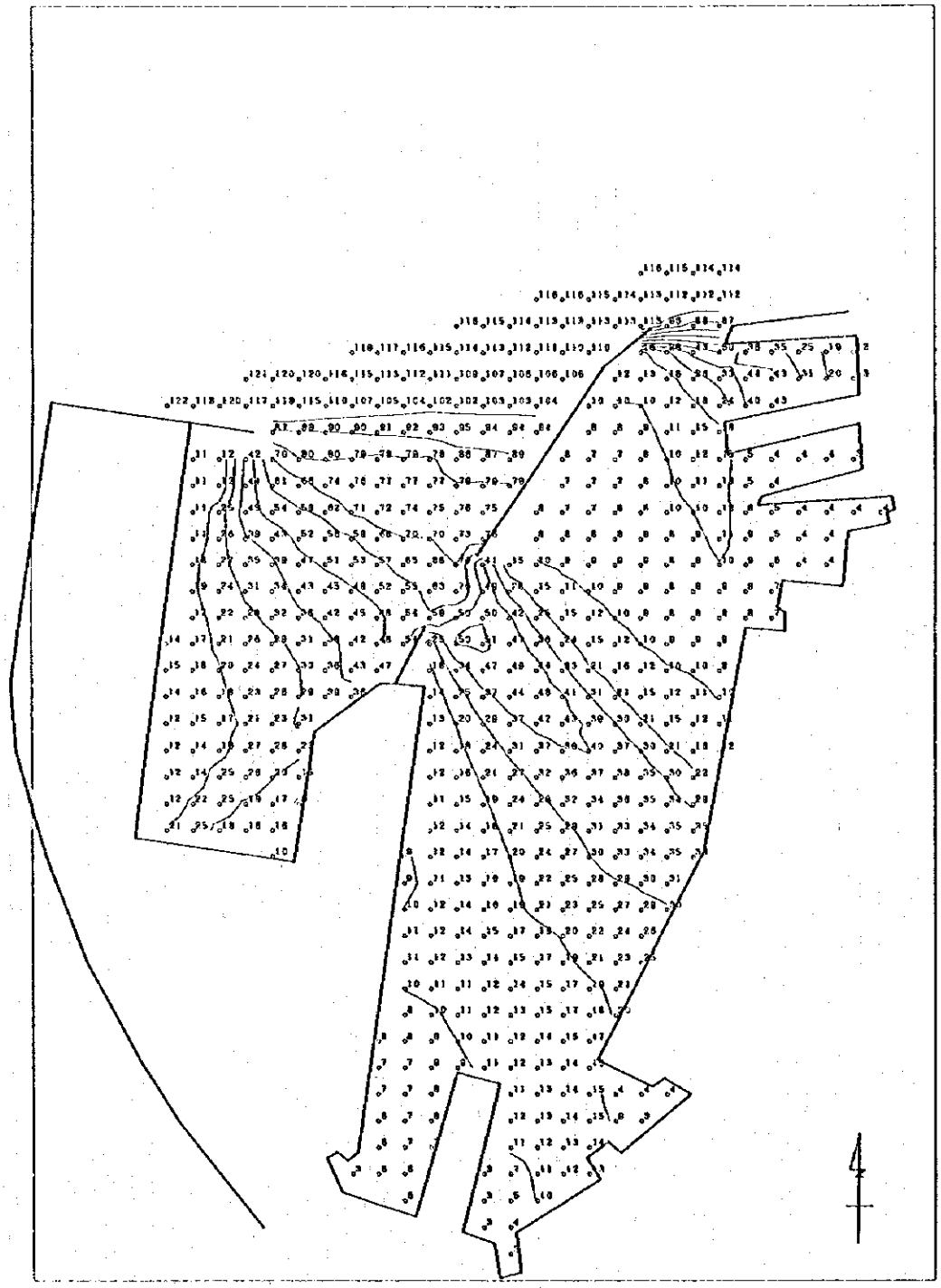
WAVE DIRECTION: NNW $H_{1/3}$=1.5 m, $T_{1/3}$=4.9 sec

FIGURE A2.5.9 WAVE HEIGHT RATIO
LOW/MEDIUM GROWTH CASE MASTER PLAN; WEST



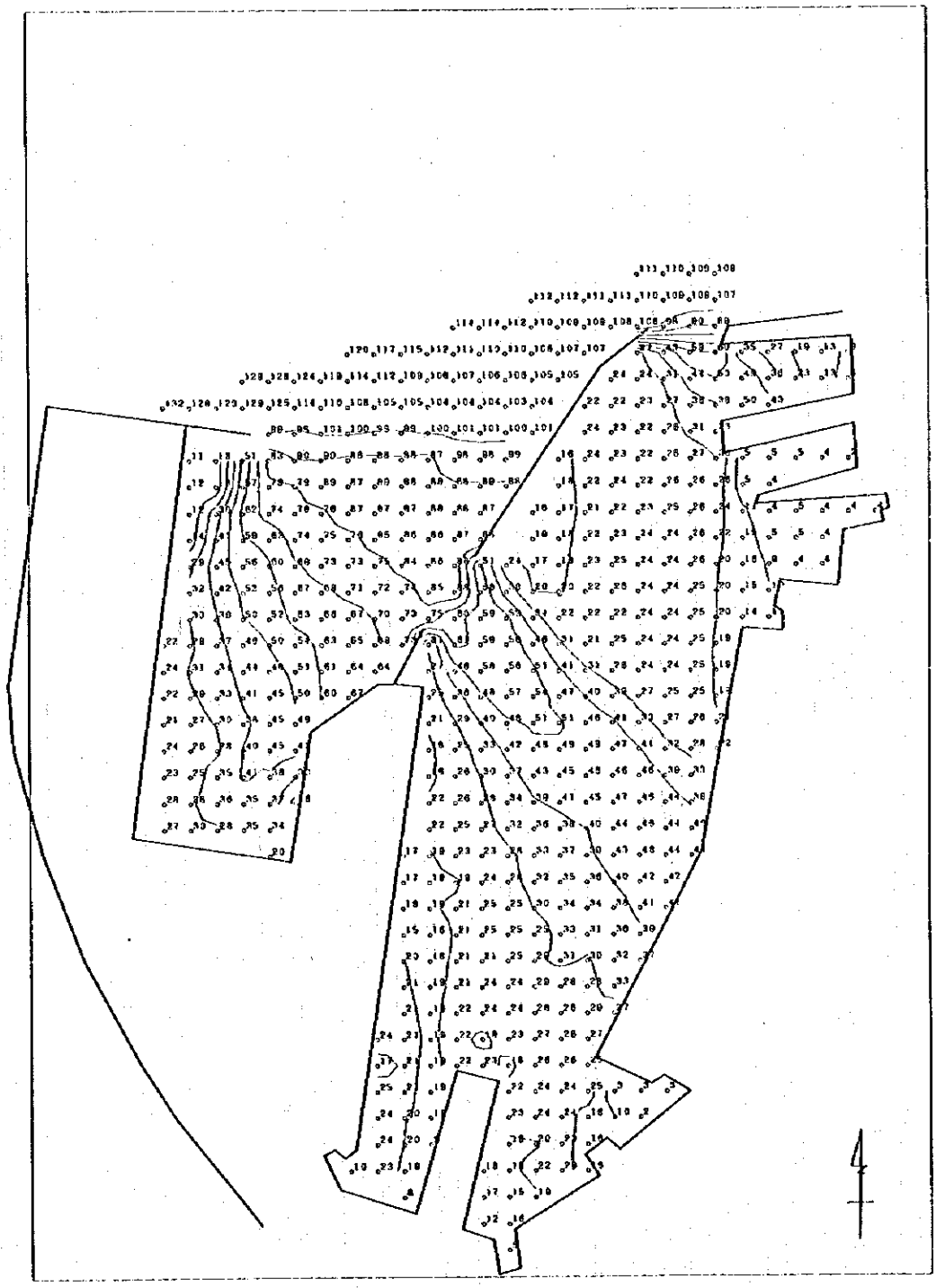
WAVE DIRECTION: W **$H_{1/3}$=3.0 m, $T_{1/3}$=6.9 sec**

FIGURE A2.5.10 WAVE HEIGHT RATIO
LOW/MEDIUM GROWTH CASE MASTER PLAN; WNW



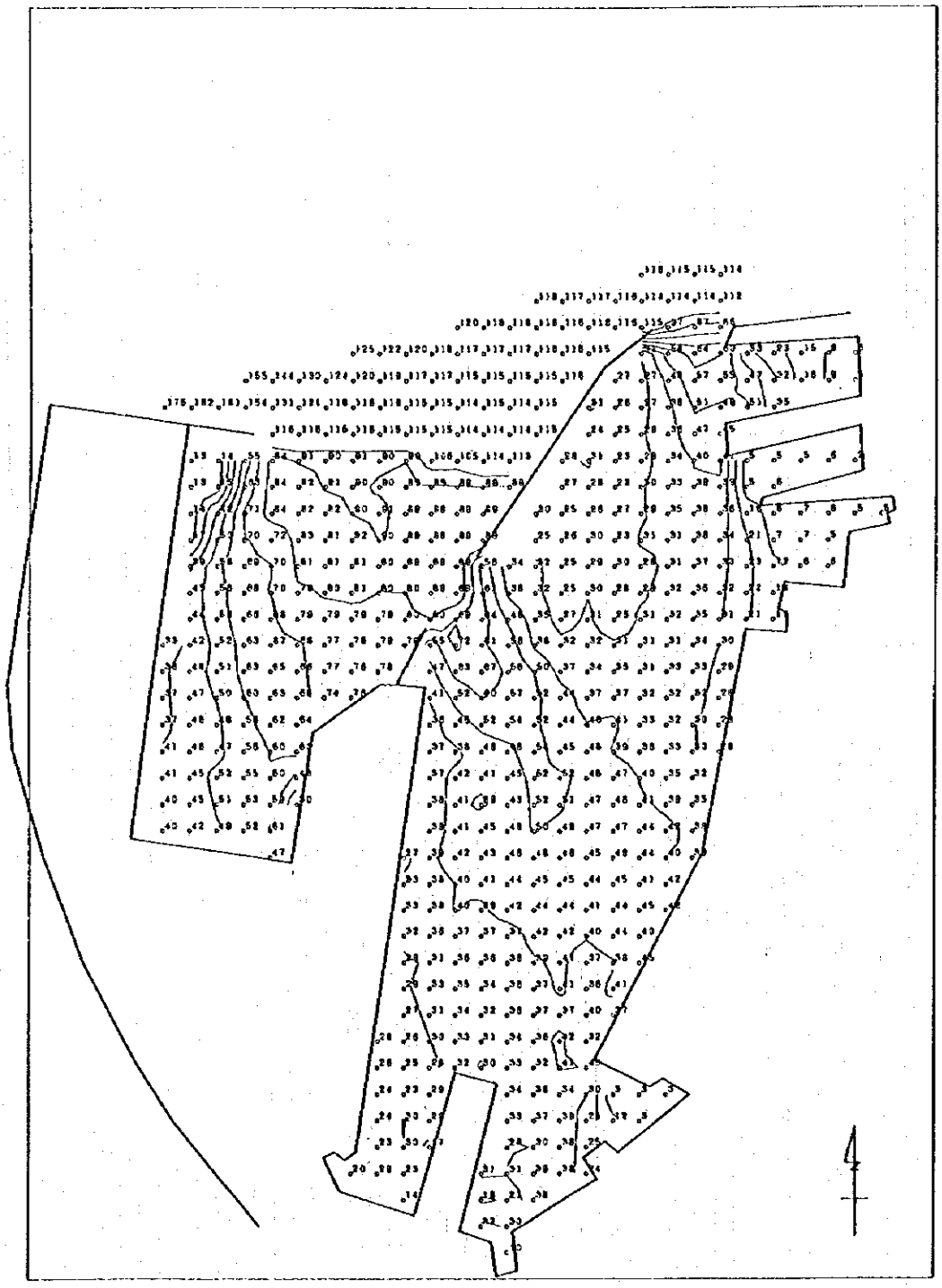
WAVE DIRECTION: WNW $H_{1/3}$=3.0 m, $T_{1/3}$=6.9 sec

FIGURE A2.5.11 WAVE HEIGHT RATIO
LOW/MEDIUM GROWTH CASE MASTER PLAN; NW



WAVE DIRECTION: NW $H_{1/3}$=1.5 m, $T_{1/3}$=4.9 sec

FIGURE A2.5.12 WAVE HEIGHT RATIO
LOW/MEDIUM GROWTH CASE MASTER PLAN; NNW



WAVE DIRECTION: NNW $H_{1/3}$=1.5 m, $T_{1/3}$=4.9 sec

FIGURE A.3.2.1 Concrete Caisson Type

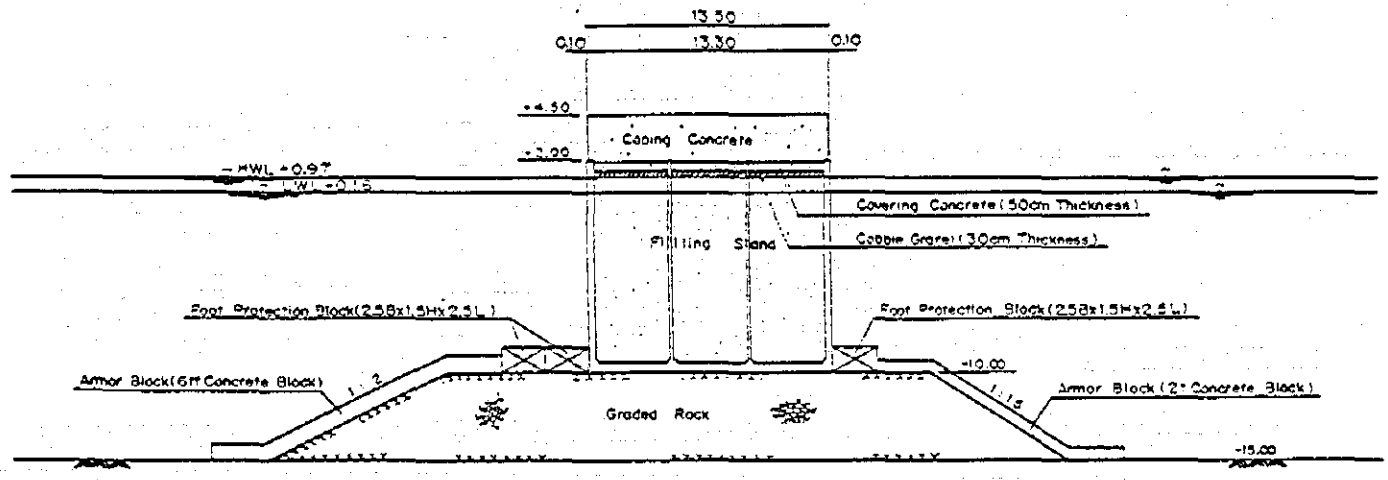


TABLE A3.2.1 Evaluation of Concrete Caisson Type

Item	Characteristics (Advantage/disadvantage)	Score	Score of Concrete Caisson Type
Construction Materials	Main materials are rubble stones, sand and cement. The materials other than cement are locally available. Difference in quantity of these materials are small.	***	***
Construction Execution	Depending on the accuracy of levelling the rubble mound surface beneath the caisson, many divers may be required for the trimming work.	***	***
Construction Cost	The cost consists mainly of hiring cost of a floating dock, and fabrication of caissons and procurement of local materials.	***	***
Construction Period	If construction machines are heavily introduced, it is possible to construct the breakwater by 350 m in a year. Construction can be actually done throughout the year, because it takes only a few days to install a caisson which can be fabricated all the year.	***	***
Overall Evaluation	There are many examples of this type of breakwater. It is the most popular type in Japan. Critical path is the execution of levelling work of rubble mound surface. This type is advantageous superior to Composite Block Type among the candidate structures.	***	***

FIGURE A.3.2.2 Armored Caisson Type

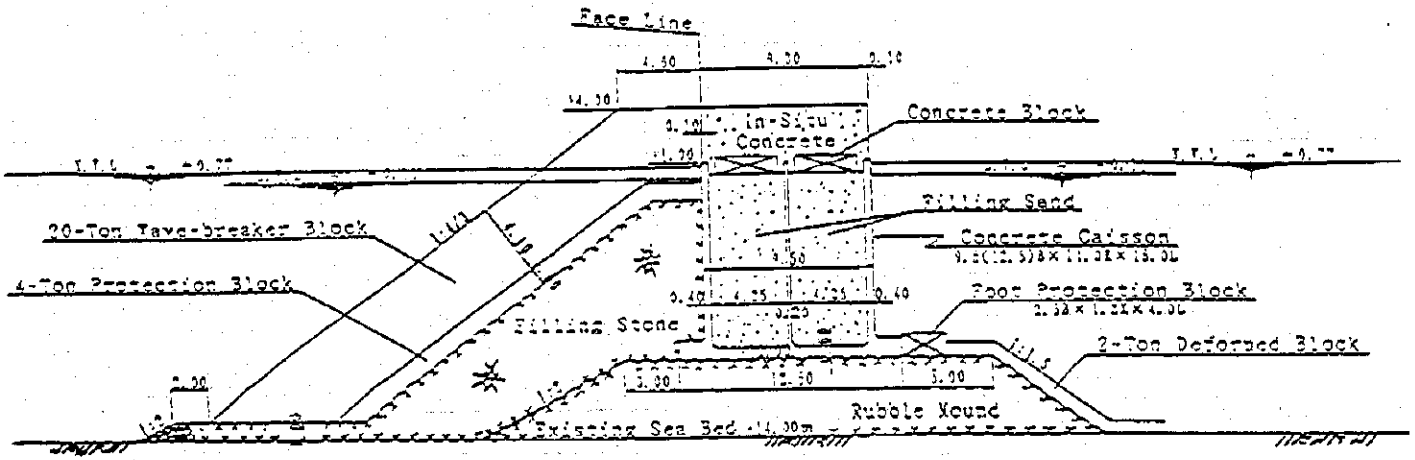


TABLE A3.2.2 Evaluation of Armored Caisson Type

Item	Characteristics (Advantage/disadvantage)	Score	Score of Concrete Caisson Type
Construction Materials	Owing to decrease in caisson size, the quantity of stones and sand for caisson portion decreases. On the contrary, the quantity for armored blocks and bed filling stones increases. As the result, the total quantity of materials does not differ substantially.	***	***
Construction Execution	The effect of this type of structure can be realized after placing the wave-dissipating blocks. Hence, care shall be taken until completion of armor structure. There is rather variety of kind of materials and structural components. There is not difficult construction work. A caisson construction yard is required.	***	***
Construction Cost	The cost becomes higher than that of ordinary caisson type due to manufacturing and placement of wave breaking blocks and construction of stone bed.	**	***
Construction Period	Planning and adjustment of construction schedule is difficult because it is necessary to proceed with partial completion in order to avoid failure by stormy seas.	**	***
Overall Evaluation	Because of relatively many structural components and difficulty of schedule adjustment, this type could not be adopted.	**	***
Remarks	Introducing wave dissipating blocks, the size of caisson can be smaller than that of bare caisson type.		

FIGURE A.3.2.3 Sloped Capping Caisson Type

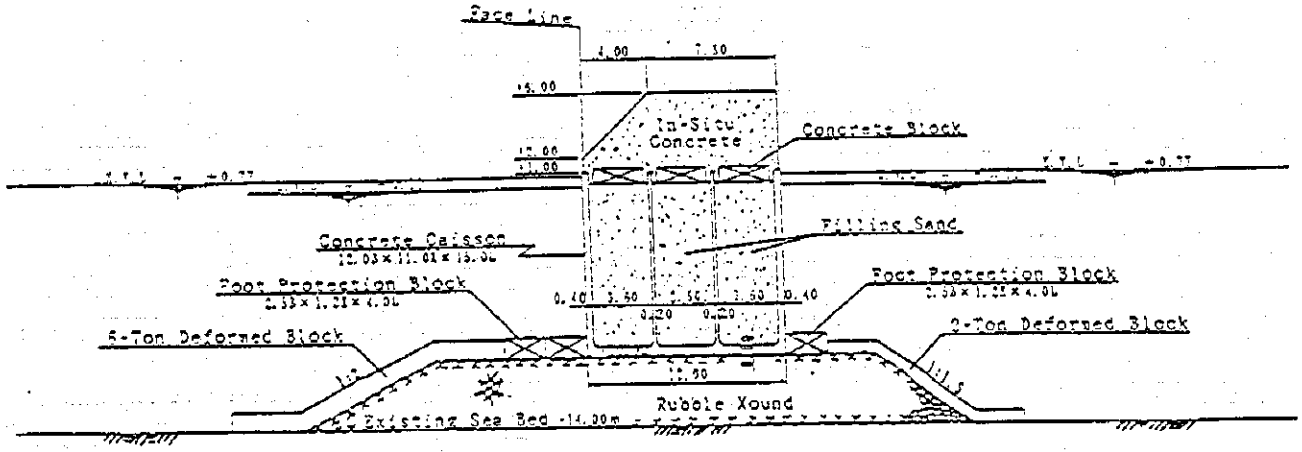


TABLE A3.2.3 Evaluation of Lateral Capping Caisson Type

Item	Characteristics (Advantage/disadvantage)	Score	Score of Concrete Caisson Type
Construction Materials	Evaluation items are almost same as those for Concrete Caisson Type. Difference is the width of caisson and volume of capping concrete. The total amount of materials is smaller parallel to decrease in the width.	****	***
Construction Execution	There is no substantial difference from Concrete Caisson Type.	***	***
Construction Cost	The cost can be saved owing to decrease in size of the caisson compared with Concrete Caisson Type.	****	***
Construction Period	The construction period can be shortened, compared with Concrete Caisson Type, owing mainly to decrease in the area of mound surface levelling. The shortening effect, however, cannot be significant.	***	***
Overall Evaluation	There is a little ambiguity in designing theoretically, but this type is more advantageous owing to decrease in volume of materials than ordinary concrete caisson type. One demerit is higher crown height, which hinders view of crew on small boats and pilot boats, and could be a defect in navigational safety. Thus, this type might not be adoptable.	***	***
Remarks	The technical characteristics of this type is to employ sloped coping on seaward face with a slightly higher crown height so that horizontal wave pressure can be decreased and vertical component of the wave pressure can have an effect equivalent to increase dead weight of caisson, and eventually the caisson width can be narrowed.		

FIGURE A.3.2.4 Composite Block Type

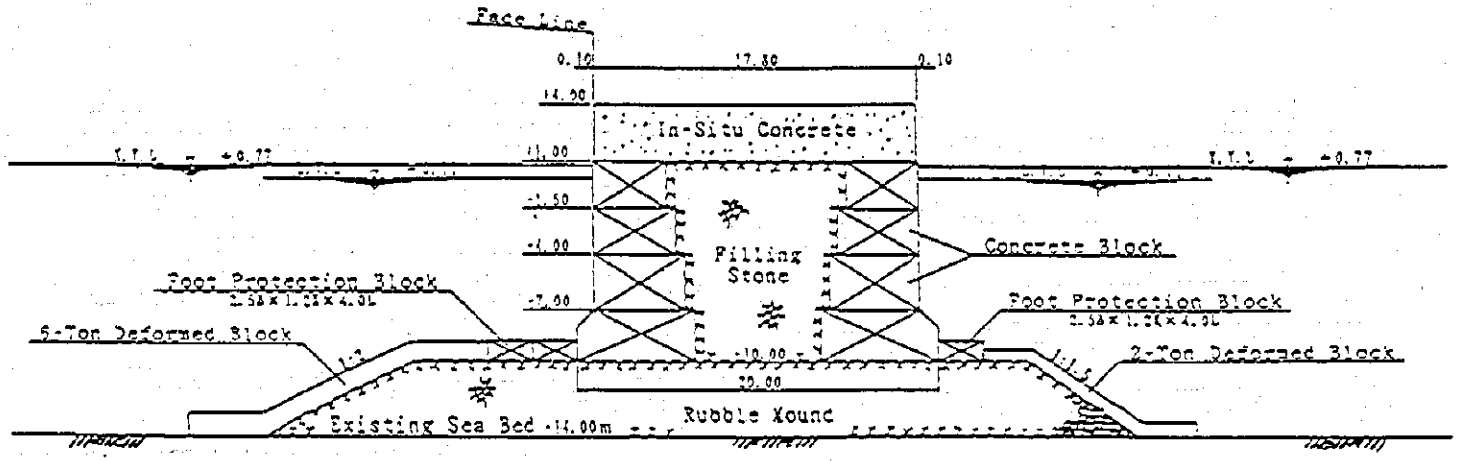


TABLE A3.2.4 Evaluation of Composite Block Type

Item	Characteristics (Advantage/disadvantage)	Score	Score of Concrete Caisson Type
Construction Materials	All the materials, i.e. rubbles in the mound, cement and aggregate for blocks and filling stones, are available locally.	***	***
Construction Execution	Construction can be expedited by dropping filling stones at each stage of two-tier block placing, which allows cyclic execution. Construction is relatively easy owing to small kinds of works. Block construction/stocking yards are required.	***	***
Construction Cost	This type may rank first in the cost among the alternative structures under consideration because of relatively small number of blocks and easy construction works.	***	***
Construction Period	Construction period can be shortened by introducing cyclic execution, but will be practically prolonged because construction works are executed merely except SW monsoon season and repair works will be possibly repeated by the damage of SW high waves.	**	***
Overall Evaluation	Under the present circumstances, this type could be considered to be suitable taking account of local availability of all materials, high job opportunity for local labour, and unnecessity of high introduction of skilled labor. It is necessary, however, to further clarify the method of structural analysis and design, and damage. It is to be reminded that similar structure do exist in Colombo Port. It has sustained for about hundred years.	***	***

FIGURE A.3.2.5 All-block Type

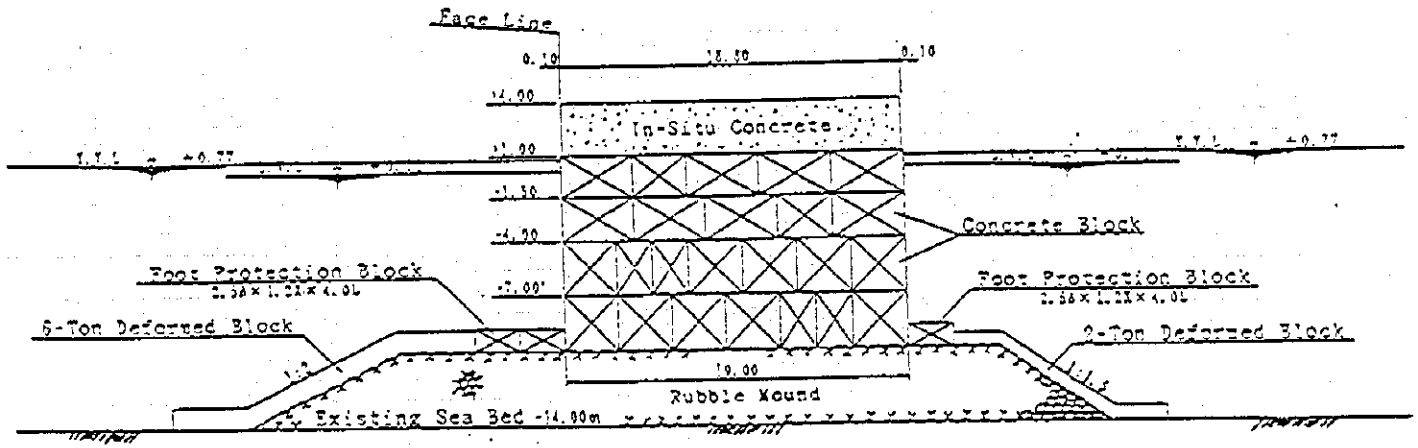


TABLE A3.2.5 Evaluation of All-block Type

Item	Characteristics (Advantage/disadvantage)	Score	Score of Concrete Caisson Type
Construction Materials	The structure consists of cement and aggregate except rubble stones for the mound. Huge volume of cement is required.	**	***
Construction Execution	A broad yard area is necessary for building and preparation of blocks. Construction is rather easy. The block placing work in the sea is rather bothering in classifying blocks by size. The requirement for mound levelling accuracy is rather high.	**	***
Construction Cost	Placing work of blocks in the sea may require skilled divers, which constitutes significant part of the total cost.	**	***
Construction Period	The critical path is the block placing work. It may take time usually beyond expectation. Construction period is restricted except SW monsoon season and repair works are possibly repeated.	*	***
Overall Evaluation	This type of breakwater is most advantageous in shallow water where required number of blocks is relatively small. Unskilled labor are mostly employed for the construction of blocks. It might be difficult to adopt this type because of deep water depth at the location of breakwaters.	*	***

FIGURE A.3.2.6 Rubble and Armor Block Type

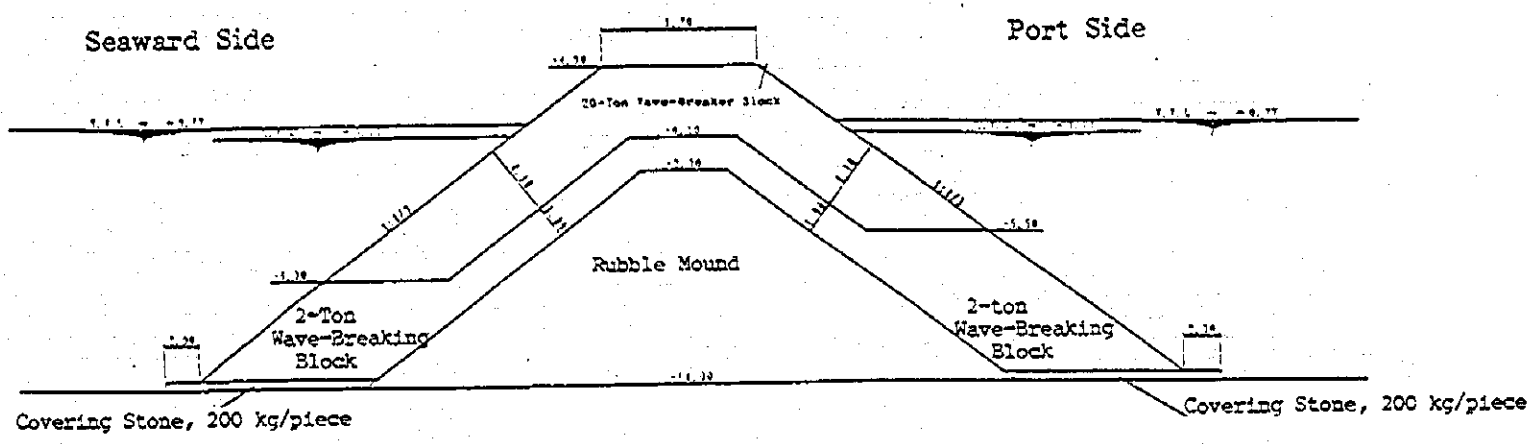


TABLE A3.2.6 Evaluation of Rubble and Armor Block Type

Item	Characteristics (Advantage/disadvantage)	Score	Score of Concrete Caisson Type
Construction Materials	Rubble mound should be of large stones of each 150-200 kg and requires large quantity of stones, e.g. 160 m³/m, which is not easy to be secured.	**	***
Construction Execution	Structure and construction are quite simple. Dumping of rubbles should be done one by one, which is very laborious. A large size work vessel shall be employed for placement of 20 ton blocks.	***	***
Construction Cost	The cost could be considerably high due to expensive works for manufacturing and placement of concrete blocks, although it also depends on the price of stones.	**	***
Construction Period	Construction period may be governed by the capacity and speed of forming the rubble mound. It also takes time to produce and transport stones. Construction works are executed only except SW monsoon season.	*	***
Overall Evaluation	In addition to disadvantage of required large quantity of big stones, long construction period shall be expected for their placement. This type might not be adopted at this stage.	**	***

FIGURE A.3.2.7 Hull Caisson Type

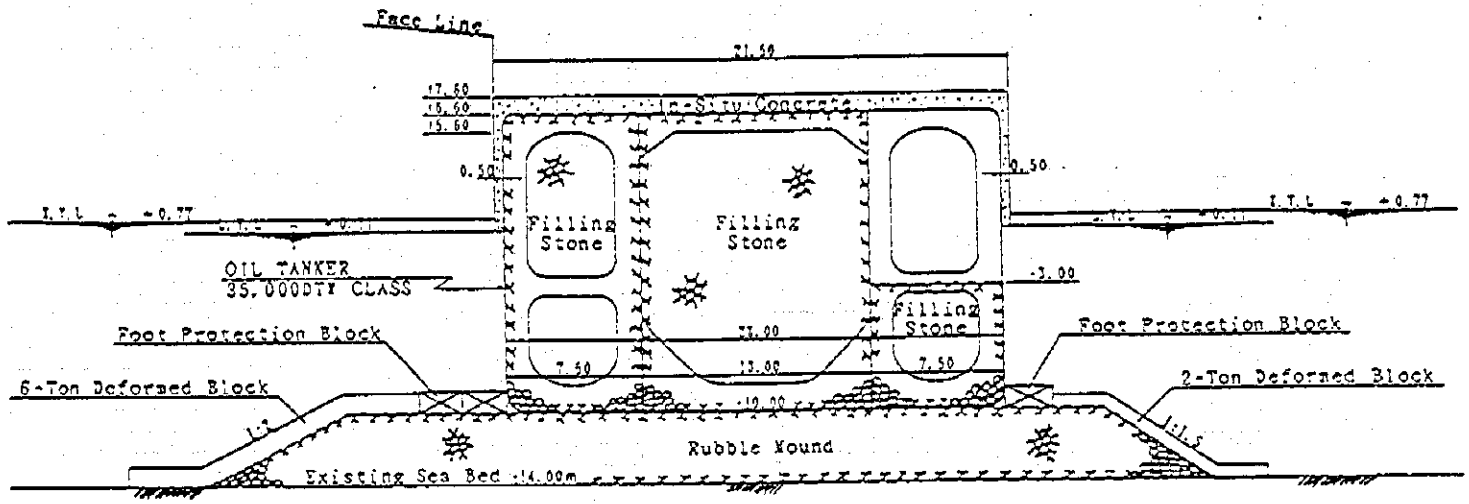


TABLE A3.2.7 Evaluation of Hull Caisson Type

Item	Characteristics (Advantage/disadvantage)	Score	Score of Concrete Caisson Type
Construction Materials	It is very difficult to purchase and arrange hulks with similar particulars. The quality of filling stones can be poor.	*	***
Construction Execution	In order to divert a ship to the hull of the breakwater, the bottoms and decks should be reinforced and the stem and stern should be reformed in a dry dock. It may be necessary to employ a large-size grab crane ship for filling stones in the hull.	*	***
Construction Cost	The price of hulks is usually cheap equivalent to that of scrap. This economic advantage, however, could be compensated by expenses for reinforcement, reformation, bringing, corrosion prevention, etc. Locally available material is stones only.	*	***
Construction Period	In case of a tanker with a length of 200 m, it may take about six months from reformation (to a length of about 140 m) to completion.	**	***
Overall Evaluation	Apart from difficulty in procuring large size and number of hulks, a question is whether this type of breakwater could be considered as a semi-permanent structure. Contribution to local economy is purchase of rocks only. Thus, it might be difficult to adopt this type at this stage.	*	***

Table A 3.3.1

Cost Estimate of Renovation of Bandaranaike Quay

Thousand US$

No.	Description	Quantity	Unit	Construction Cost			Remarks
				Foreign	Local	Total	
1	Demolition of Warehouse	4	Bldg	1,335	890	2,225	
2	Paving						
2-1	Surface Grading	53,300	m2	1,299	556	1,855	130m*410m
2-2	Asphalt Paving	53,300	m2	1,556	667	2,223	
2-3	Marking	53,300	m2	251	107	358	
2-4	Surface Drainage	53,300	m2	629	209	838	
3	Rehabilitation of Wharf	1,080	m	3,568	892	4,460	
4	Yard Lighting	53,300	m2	1,740	307	2,047	
5	Sub Total of Construction Cost			10,378	3,628	14,006	
6	Physical Contingency	10 % of No.5		1,038	363	1,401	
7	Engineering Service	10 % of No.5		1,038	363	1,401	
8	Total			12,454	4,354	16,808	

Table A 3.3.2

Cost Estimate of Navigation Assistance

Navigation Assistance 1. (Master Plan 2015)

No.	Description	Quantity	Unit	Unit Cost (US$)	Amount ('000US$)	Remarks
1	Communication System	1	sum		20,000	
2	Tug Boat	10	No	4,000,000	40,000	
3	Navigating Aids	1	sum		3,100	
4	Sub Total				63,100	
5	Contingency	1	sum		6,310	10% of Sub Total
6	Engineering	1	sum		4,417	7% of Sub Total
7	Total				73,827	

Navigation Assistance 2. (Short Term Plan 2005 & Master Plan 2015-Low Growth)

No.	Description	Quantity	Unit	Unit Cost (US$)	Amount ('000US$)	Remarks
1	Communication System	1	sum		3,200	
2	Tug Boat	6	No	4,000,000	24,000	
3	Navigating Aids	1	sum		1,400	
4	Sub Total				28,600	
5	Contingency	1	sum		2,860	10% of Sub Total
6	Engineering	1	sum		2,002	7% of Sub Total
7	Total				33,462	

Navigation Assistance 3. (Urgent Plan 2000)

No.	Description	Quantity	Unit	Unit Cost (US$)	Amount ('000US$)	Remarks
1	Communication System	1	sum		0	
2	Tug Boat	2	No	4,000,000	8,000	
3	Navigating Aids	1	sum		1,400	
4	Sub Total				9,400	
5	Contingency	1	sum		940	10% of Sub Total
6	Engineering	1	sum		658	7% of Sub Total
7	Total				10,998	

Table A 3.3.3

Cost Estimate of Channel Dredging

Widening Main Channel

Thousand US$

No.	Description	Quantity	Unit	Construction Cost			Remarks
				Foreign	Local	Total	
1	Mobilization	1	sum	2,000	0	2000	
2	Dredging (- 16.5 m)	1,460,000	m3	4,599	511	5,110	
3	Hard Material	100,000	m3	8,800	2,200	11,000	
4	Demolition of NW Breakwater	100	m	3,748	937	4,685	
5	Sub Total			19,147	3,648	22,795	
6	Contingency	1	sum	1,915	365	2,280	10% of Sub Total
7	Engineering	1	sum	1,340	256	1,596	7% of Sub Total
8	Total			22,402	4,269	26,671	

North Channel Dredging

Thousand US$

No.	Description	Quantity	Unit	Construction Cost			Remarks
				Foreign	Local	Total	
1	Mobilization	1	sum	2,000	0	2000	
2	Dredging (- 12.0 m)	230,000	m3	725	80	805	
3	Hard Material	20,000	m3	1,760	440	2200	
4	Sub Total			4,485	520	5,005	
5	Contingency	1	sum	449	52	501	10% of Sub Total
6	Engineering	1	sum	449	52	501	10% of Sub Total
7	Total			5,383	624	6,007	

Table A 3.3.4
Cost Estimate of Road Construction

1. Port Road Construction - from QEQ to No.11 Gate

(Fort Road)

Thousand US$

No.	Work Item	Quantity	Unit	Construction Cost			Remarks
				Foreign	Local	Total	
							L=3,350m
1	Land Grading	73,700	m2	1,496	641	2,137	W=0.5+9.5+2.0+9.5+0.5
2	Road Paving	73,700	m2	1,793	769	2,562	= 22.0m
3	Marking	73,700	m2	289	124	413	
4	Surface Drainage	73,700	m2	676	289	965	
5	Road Lighting	3,350	m	612	262	874	
6	Sub Total of Road Construction			4,866	2,085	6,951	
7	Canal Bridge	1	sum	6,831	1,602	8,433	
8	Sub Total of Construction Cost			11,697	3,687	15,384	
9	Physical Contingency	10 % 0f No.8		1,170	368	1,538	
10	Engineering Service	10 % 0f No.8		1,170	368	1,538	
11	Total			14,037	4,423	18,460	

2. Port Road Construction - from PVQ to No.11 Gate

(Mutwal Road)

Thousand US$

No.	Work Item	Quantity	Unit	Construction Cost			Remarks
				Foreign	Local	Total	
1	Land Grading	19,800	m2	402	172	574	W=22.0m, L=900m
2	Road Paving	19,800	m2	482	206	688	
3	Marking	19,800	m2	78	33	111	
4	Surface Drainage	19,800	m2	181	78	259	
5	Road Lighting	900	m	165	70	235	
6	Sub Total of Construction Cost			1,308	559	1,867	
7	Physical Contingency	10 % of No.6		131	56	187	
8	Engineering Service	10 % of No.6		131	56	187	
9	Total			1,570	671	2,241	

3. Port Road Construction - from Crow Island to PVQ

(Crow Island Road)

Thousand US$

No.	Work Item	Quantity	Unit	Construction Cost			Remarks
				Foreign	Local	Total	
1	Revetment	900	m	8,883	3,807	12,690	W=22.0m, L=1,600m
2	Reclamation Work	135,000	m3	725	80	805	V=900m*5m*25m*1/2
3	Land Grading	35,200	m2	715	306	1,021	= 135,000m3
4	Road Paving	35,200	m2	857	367	1,224	
5	Marking	35,200	m2	138	59	197	
6	Surface Drainage	35,200	m2	323	138	461	
7	Road Lighting	1,600	m	293	125	418	
8	Sub Total of Construction Cost			11,934	4,882	16,816	
9	Physical Contingency	10 % of No.7		1,193	489	1,682	
10	Engineering Service	10 % of No.7		1,193	489	1,682	
11	Total			14,320	5,860	20,180	

Table A 3.3.5

Cost Estimate of Relocation work for Submarine Pipeline

No.	Work Item		Quantity	Unit	Amount ('000US$)
1	Construction Cost of SPBM Pipeline		7,750	m	32,421
2	Submarine Line	1500 Inside Diameter	5,700	m	38,456
3	Physical Contingency				7,088
4	Engineering Service				7,088
5	Total				85,053

1. Submarine Pipeline for SPBM

No.	Work Item		Quantity	Unit	Unit Cost (US$)	Amount ('000US$)	Remarks
1	Submarine Pipeline	36" diameter pipe	7,750	m	3,100	24,025	
2	Onshore Pipeline	36" diameter pipe	1,000	m	1,680	1,680	
3	Dredging of Hard Material		18,000	m3	165	2,968	
4	Tie-in to Existing Pipeline		1	sum	3,748,000	3,748	
5	Sub Total of Construction Cost					32,421	
6	Physical Contingency	10 % of No.5				3,242	
7	Engineering Service	10 % of No.5				3,242	
8	Total					38,905	

2. Sewerage Submarine Line and Outfall

No.	Work Item		Quantity	Unit	Unit Cost (US$)	Amount ('000US$)	Remarks
1	Submarine Line	1500 Inside Diameter	5,700	m	6,747	38,456	
2	Physical Contingency	10 % of No.1				3,846	
3	Engineering Service	10 % of No.1				3,846	
4	Total					46,148	

TABLE A3.3.6 Preliminary Cost Estimate of South Port Development MASTER PLAN 2015 (Medium Growth and Low Growth Case)

No.	Work Item		Remarks	Unit	Quantity	Unit Cost	Amount
						(US$)	('000US$)
I	**South Port Development**						
I-1	**Civil Work**						
I-1-1	QEQ No.6 Extension	Quaywall	-14.0 m	m	380	73,431	27,904
I-1-2		Revetment	-14m to -8m	m	170	52,675	8,955
I-1-3	South Container Terminal	Quaywall	-16.0 m	m	1,920	94,243	180,947
I-1-4		Revetment in Basin	-16.0 m	m	360	74,849	26,946
I-1-5		New S-W Seawall Type-A	upto -7m	m	240	43,827	10,518
I-1-6		New S-W Seawall Type-B	-7m to-12m	m	300	57,602	17,281
I-1-7		New S-W Seawall Type-C	-12m or more	m	1,990	70,426	140,148
I-1-8		North Revetment	-15.0 m	m	390	50,323	19,626
I-1-9	Breakwater	New S-W Breakwater	-15.0 m	m	510	60,607	30,910
I-1-10		Inner Breakwater	-15.0 m	m	180	49,763	8,957
I-1-11		Breakwater Demolition	Existing	m	450	38,887	17,499
I-1-12	Dredging of Turning Basin		-16.0 m	m3	3,800,000	6.6	25,080
I-1-13	Reclamation		+2.7 m	m3	13,000,000	4.9	63,700
I-1-14	Paving of Container Yard	PC slab, stacking plate, Electric conduit		m2	707,000	157.5	111,353
I-1-15	Paving of Terminal Area and Road			m2	506,000	28.9	14,623
I-1-16	Surface Drainage			m2	1,213,000	11.5	13,950
I-1-17	Sub Total						718,397
I-1-18	Contingency	10% of sub total					71,840
I-1-19	Total						790,237
I-2	**Building, Electric and Water Supply**						
I-2-1	CFS	40m by 150m		Bldg.	2	4,722,639	9,445
I-2-2	Gate Building	20m by 45m		Bldg.	1	959,520	960
I-2-3	Administration Building	32m by 32m		Bldg.	1	7,196,402	7,196
I-2-4	Maintenance Shop	30m by 70m		Bldg	1	2,098,951	2,099
I-2-5	Facilities Building	18m by 32m		Bldg.	2	359,820	720
I-2-6	Power Station Building	40m by 40m		Bldg.	1	1,049,475	1,049
I-2-7	Sump and Pump House			sum	1	509,745	510
I-2-8	Sub Total of Building						21,979
I-2-9	Electric Supply, Reefer, Yard Illumination etc. in Yard			sum	1	24,597,076	24,597
I-2-10	Generator		2,500 KVA	No.	4	2,108,321	8,433
I-2-11	Sub Station Equipment		10,000KVA	sum	1	9,838,831	9,839
I-2-12	Water Supply and drainage			sum	1	1,686,657	1,687
I-2-13	Sub-Total of Services						44,556
I-2-14	Sub Total of No.8and No.13						66,535
I-2-15	Contingency	10% of No.14 above					6,654
I-2-16	Total						73,189
I-3	**Cargo Handling Equipment**						
I-3-1	Container Crane	Post Panmax	4No. 6Berth	No.	24	7,421,289	178,111
I-3-2	Container Crane	Panamax to QEQ No.2,3		No.	3	5,772,114	17,316
I-3-3	Transfer Crane		(24+3)*3=81	No.	81	1,269,865	102,859
I-3-4	Trailer Chassis		81*4=324	No.	324	112,144	36,335
I-3-5	Sub Total						334,621
I-3-6	Contingency	5% of Sub Total					16,731
I-3-7	Total						351,352
I-4	**Total**	I-1, I-2, I-3					1,214,778
I-5	**Engineering Service**	5 % of Total					60,739
I-6	**Grand Total**						1,275,517

TABLE A3.3.7 Preliminary Cost Estimate for Crow Island offshore Development MASTER PLAN 2015 (High Growth Case)

No.	Work Item		Remarks	Unit	Quantity	Unit Cost (US$)	Amount ('000US$)
II	**North Port Development**						
II-1	**Civil Work**						
II-1-1	North Container Terminal	Quaywall NT 3,4,5	-16.0 m	m	1,080	94,243	101,782
II-1-2		Quaywall NT 2	-11.0 m	m	350	58,704	20,546
II-1-3		Quaywall NT 1	-9.0 m	m	220	41,288	9,083
II-1-4		West Seawall	-13.0 m	m	520	50,323	26,168
II-1-5		North Seawall Type-1	-12.0 m to -13.0 m	m	350	44,126	15,444
II-1-6		North Seawall Type-2	-10.0 m to -12.0 m	m	850	40,542	34,461
II-1-7		North Seawall Type-3	-8.0 m to -10.0 m	m	450	36,174	16,278
II-1-8		North Revetment	-3.0 m to -8.0 m	m	970	18,666	18,106
II-1-9		Inner Revetment	-3.0 m to -8.0 m	m	840	18,666	15,679
II-1-10	Mutwal Terminal	Quaywall MT 3	-16.0 m	m	380	94,243	35,812
II-1-11		Quaywall MT 2	-13.0 m	m	410	73,431	30,107
II-1-12		Quaywall MT 1,4	-11.0 m	m	510	58,704	29,939
II-1-13		Quaywall MT 5,6	-5.0 m	m	350	22,473	7,866
II-1-14	Breakwater	New N-W Breakwater	-12m to -15m	m	1,250	60,607	75,759
II-1-15	Dredging of Turning Basin		-16.0 m	m3	8,000,000	6.6	52,800
II-1-16	Reclamation		+2.7 m	m3	14,000,000	4.9	68,600
II-1-17	Paving of Container Yard	PC slab, stacking plate, Electric conduit		m2	717,000	157.5	112,928
II-1-18	Paving of Terminal Area and Road			m2	533,000	28.9	15,404
II-1-19	Surface Drainage			m2	1,250,000	11.5	14,375
II-1-20	Groin at Estuary			m	600	18,666	11,200
II-1-21	Sub Total						712,337
II-1-22	Contingency	10% of sub total					71,234
II-1-23	Total						783,571
II-2	**Building, Electric and Water Supply**						
II-2-1	CFS	40m by 150m		Bldg.	3.0	4,722,639	14,168
II-2-2	Gate Building	20m by 45m		Bldg.	2.0	959,520	1,919
II-2-3	Administration Building	32m by 32m		Bldg.	1.5	7,196,402	10,795
II-2-4	Maintenance Shop	30m by 70m		Bldg.	1.5	2,098,951	3,148
II-2-5	Facilities Building	18m by 32m		Bldg.	3.0	359,820	1,079
II-2-6	Power Station Building	40m by 40m		Bldg.	1.5	1,049,475	1,574
II-2-7	Sump and Pump House			sum	1.5	509,745	765
II-2-8	Sub Total of Building						33,448
II-2-9	Electric Supply, Reefer, Yard Illumination etc. in Yard			sum	1.5	24,597,076	36,896
II-2-10	Generator		2,500 KVA	No.	5.0	2,108,321	10,542
II-2-11	Sub Station Equipment		10,000KVA	sum	1.5	9,838,831	14,758
II-2-12	Water Supply and drainage			sum	1.5	1,686,657	2,530
II-2-13	Sub-Total of Services						64,726
II-2-14	Sub Total of No.8and No.13						98,174
II-2-15	Contingency	10% of No.14 above					9,817
II-2-16	Total						107,991
II-3	**Cargo Handling Equipment**						
II-3-1	Container Crane	Post Panamax	4*3+3*1	No.	15	7,421,289	111,319
II-3-2	Container Crane	Panamax	3*1+2*2	No.	7	5,772,114	40,405
II-3-3	Transfer Crane		(12+10) * 3 = 66	No.	66	1,269,865	83,811
II-3-4	Trailer Chassis		66*4=264	No.	264	112,144	29,606
II-3-5	Sub Total						265,141
II-3-6	Contingency	5% of Sub Total					13,257
II-3-7	Total						278,398
II-4	**Total**	II-1, II-2, II-3					1,169,960
II-5	**Engineering Service**	5 % of Total					58,498
II-6	**Grand Total**						1,228,458

TABLE A3.3.8 Preliminary Cost Estimate of PVQ North Development MASTER PLAN 2015 (High Growth Case)

No.	Work Item		Remarks	Unit	Quantity	Unit Cost (US$)	Amount ('000US$)
II	**PVQ North Development**						
II-1	***Civil Work***						
II-1-1	NCT West Quay	Quaywall	-16.0 m	m	1,430	94,243	134,767
II-1-2		Quaywall	-11.0 m	m	380	58,704	22,308
II-1-3	NCT East Quay	Quaywall	-9.0 m	m	700	41,288	28,902
II-1-4		Quaywall	-8.0 m	m	470	36,790	17,291
II-1-5		Quaywall	-5.0 m	m	370	22,473	8,315
II-1-6	New North Seawall	Revetment	-10m to-12m	m	600	50,323	30,194
II-1-7	Breakwater	New North	-10.0 m	m	130	49,763	6,469
II-1-8		New North West	-12m to -15m	m	2,010	60,607	121,820
II-1-9	Dredging of Turning Basin		-16.0 m	m3	7,200,000	6.6	47,520
II-1-10	Reclamation		+2.7 m	m3	7,500,000	4.9	36,750
II-1-11	Paving of Container Yard	PC slab, stacking plate, Electric conduit		m2	520,000	157.5	81,900
II-1-12	Paving of Terminal Area and Road			m2	467,000	28.9	13,496
II-1-13	Surface Drainage			m2	987,000	11.5	11,351
II-1-14	Sub Total						561,083
II-1-15	Contingency	10% of sub total					56,108
II-1-16	Total						617,191
II-2	**Building, Electric and Water Supply**						
II-2-1	CFS	40m by 150m		Bldg.	2	4,722,639	9,445
II-2-2	Gate Building	20m by 45m		Bldg.	1	959,520	960
II-2-3	Administration Building	32m by 32m		Bldg.	1	7,196,402	7,196
II-2-4	Maintenance Shop	30m by 70m		Bldg	1	2,098,951	2,099
II-2-5	Facilities Building	18m by 32m		Bldg.	2	359,820	720
II-2-6	Power Station Building	40m by 40m		Bldg.	1	1,049,475	1,049
II-2-7	Sump and Pump House			sum	1	509,745	510
II-2-8	Sub Total of Building						21,979
II-2-9	Electric Supply, Reefer, Yard Illumination etc. in Yard			sum	1	24,597,076	24,597
II-2-10	Generator		2,500 KVA	No.	4	2,108,321	8,433
II-2-11	Sub Station Equipment		10,000KVA	sum	1	9,838,831	9,839
II-2-12	Water Supply and drainage			sum	1	1,686,657	1,687
II-2-13	Sub-Total of Services						44,556
II-2-14	Sub Total of No.8and No.13						66,535
II-2-15	Contingency	10% of No.14 above					6,654
II-2-16	Total						73,189
II-3	**Cargo Handling Equipment**						
II-3-1	Container Crane	Post Panamax	4 No.×4Berth	No.	16	7,421,289	118,741
II-3-2	Container Crane	Panamax	2 No.×5Berth	No.	10	5,772,114	57,721
II-3-3	Transfer Crane		(16+10)*3 =78	No.	78	1,269,865	99,049
II-3-4	Trailer Chassis		78*4=312	No.	312	112,144	34,989
II-3-5	Sub Total						310,500
II-3-6	Contingency	5% of Sub Total					15,525
II-3-7	Total						326,025
II-4	**Total**	II-1, II-2, II-3					1,016,405
II-5	**Engineering Service**	5 % of Total					50,820
II-6	**Grand Total**						1,067,225