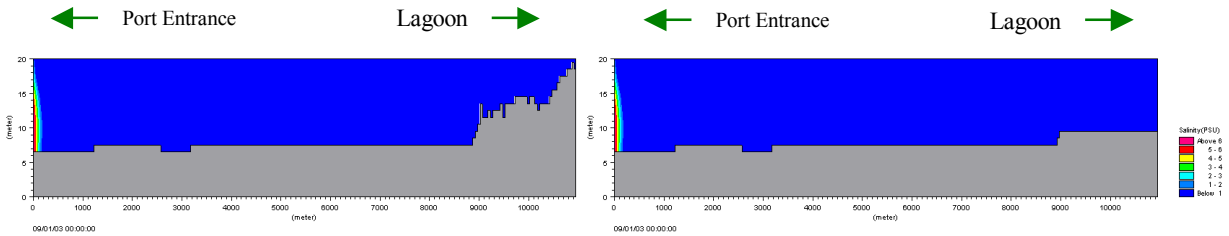
APPENDIX

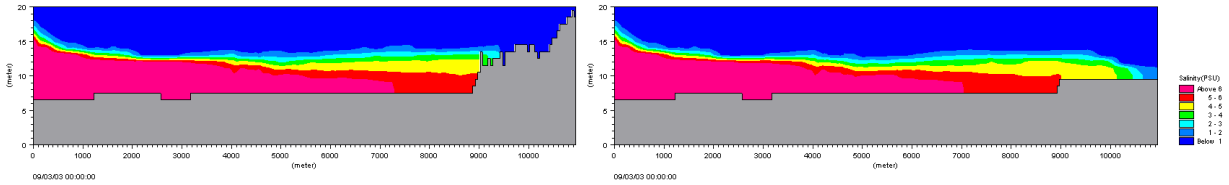
F 3

Computation Result for Salinity in the Lagoon

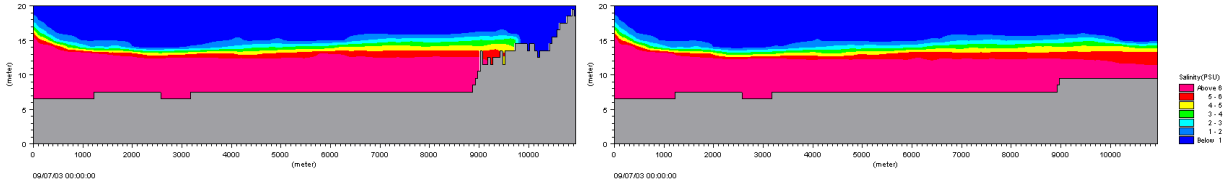
Initial Condition (No Wind)



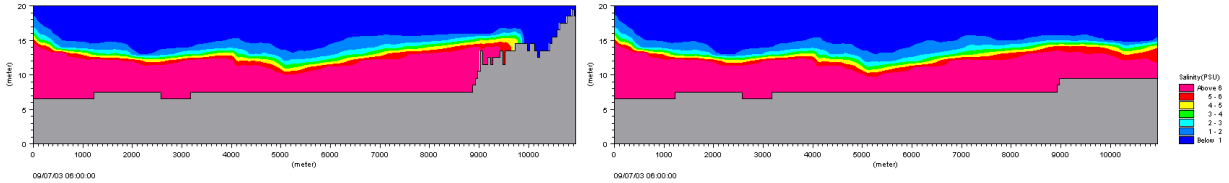
After 2days (No Wind)



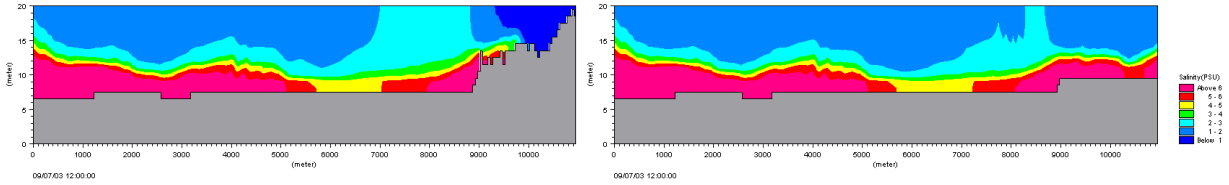
After 6days (No Wind, Steady condition)



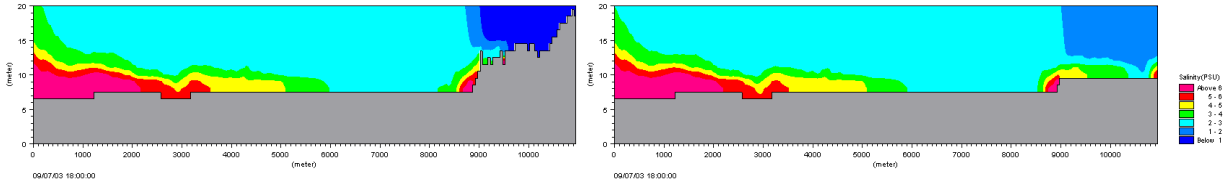
After 6hours from starting strong wind



After 12hours from starting strong wind



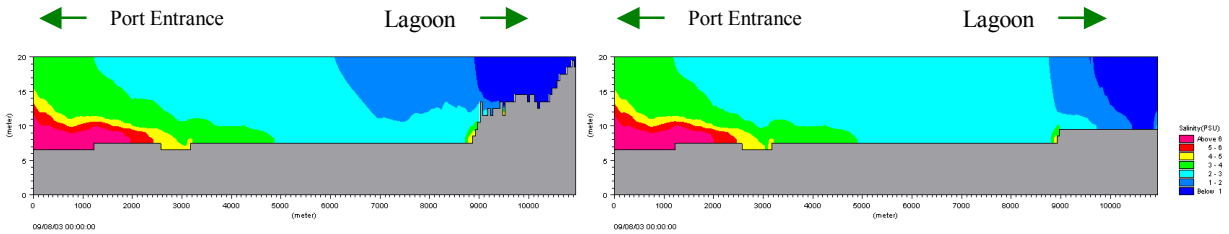
After 18hours from starting strong wind



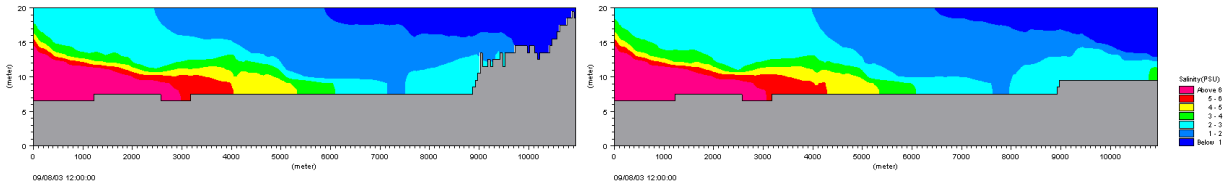
(1)Before Construction **(2)After Construction**

Figure F 3.1 (1) Vertical Distribution of Salinity in Channel (Q=450m^3/s)

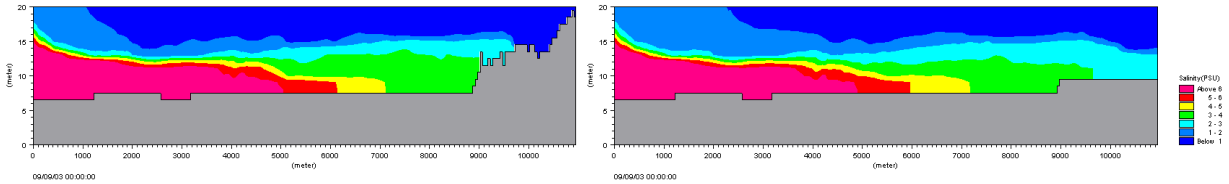
After 24hours from starting strong wind



After 36hours from starting strong wind



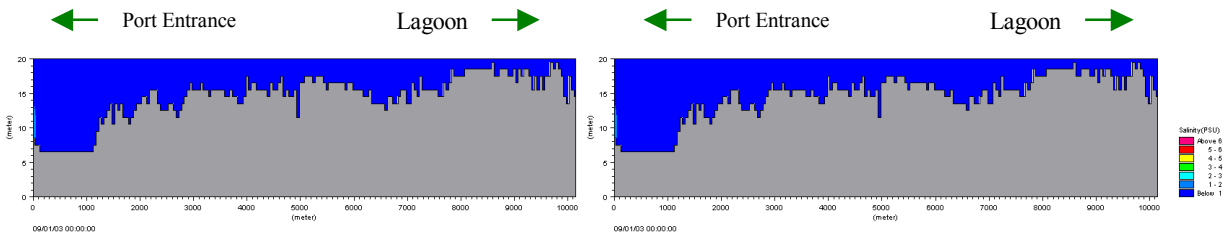
After 48hours from starting strong wind



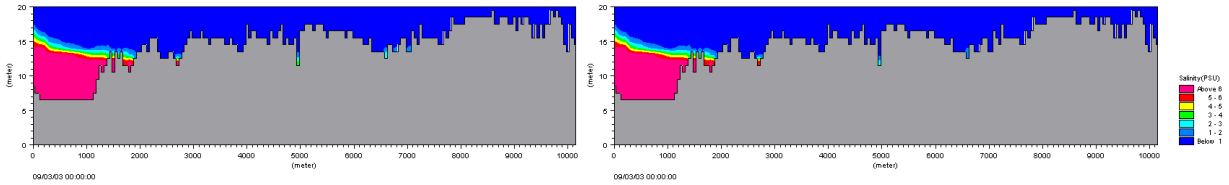
(1)Before Construction **(2)After Construction**

Figure F 3.1 (2) Vertical Distribution of Salinity in Channel (Q=450 m^3/s)

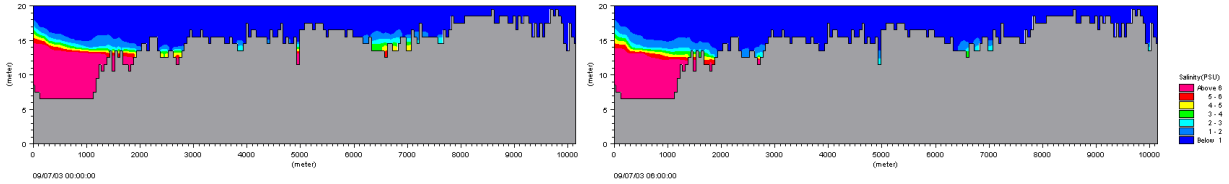
Initial Condition (No Wind)



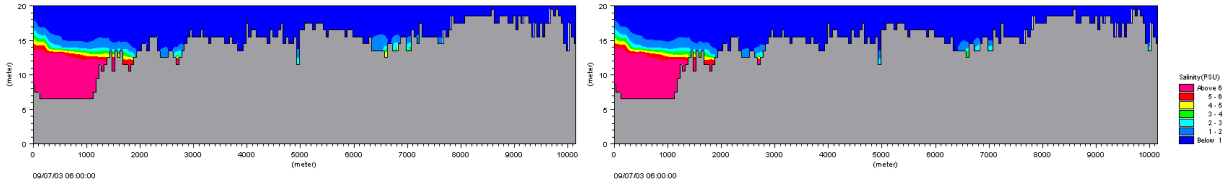
After 2days (No Wind)



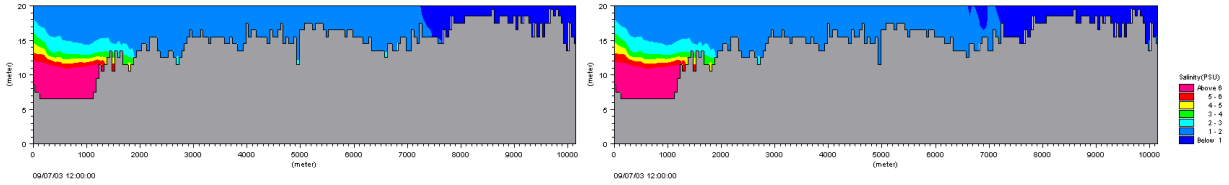
After 6days (No Wind, Steady condition)



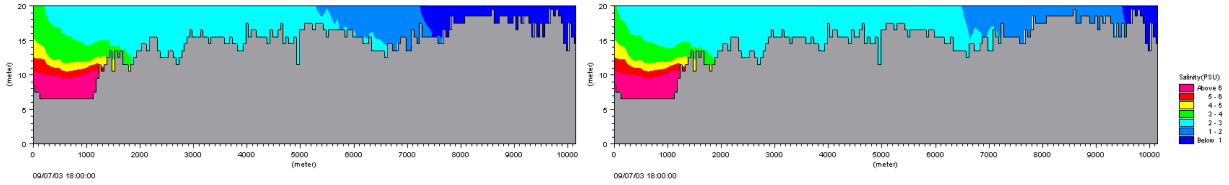
After 6hours from starting strong wind



After 12hours from starting strong wind



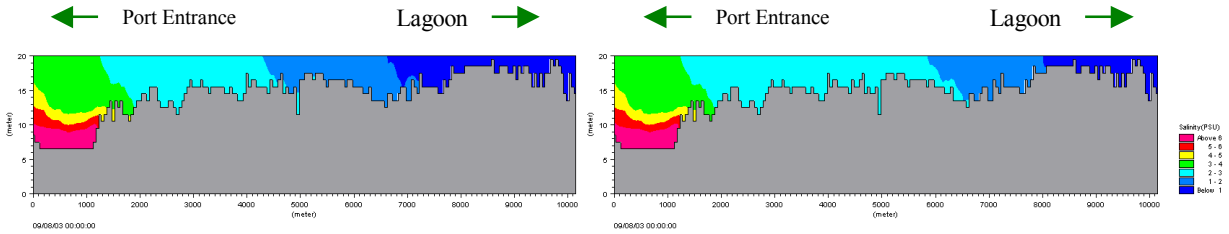
After 18hours from starting strong wind



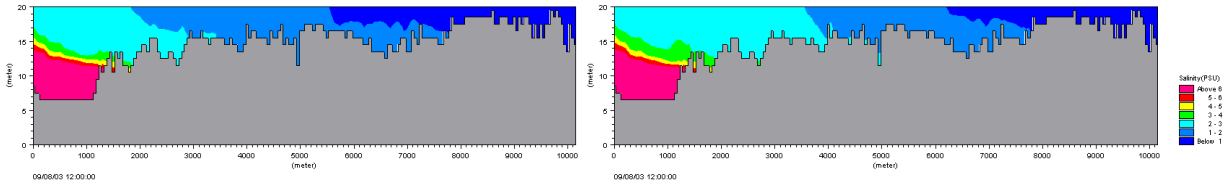
(1)Before Construction **(2)After Construction**

Figure F 3.2 (1)
Vertical Distribution of Salinity outside of Channel (Q=450 m^3/s)

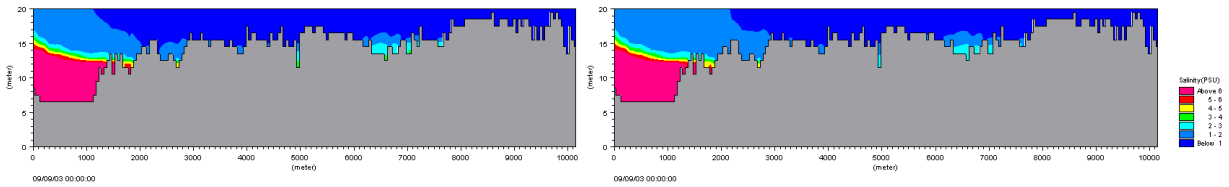
After 24hours from starting strong wind



After 36hours from starting strong wind



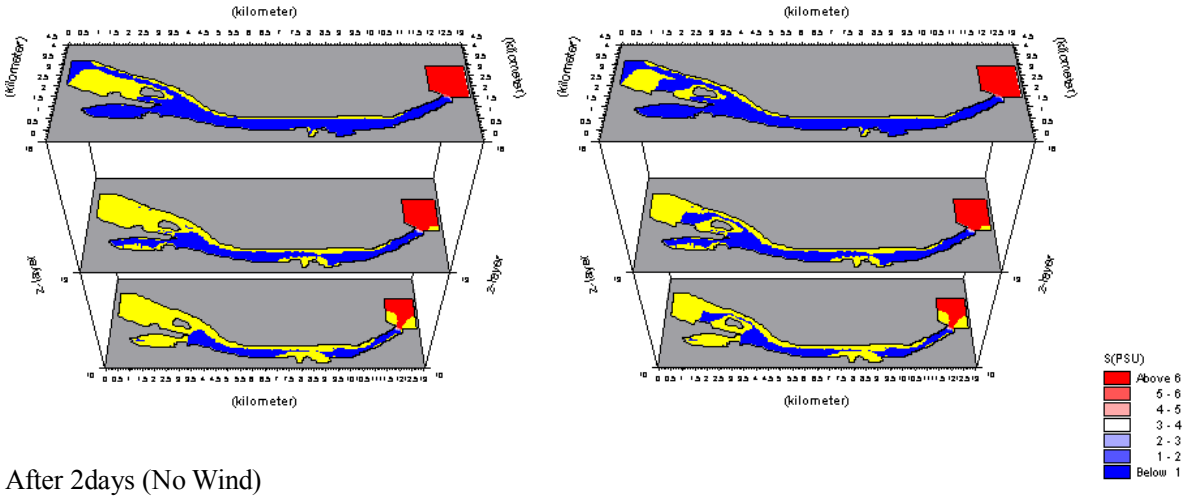
After 48hours from starting strong wind



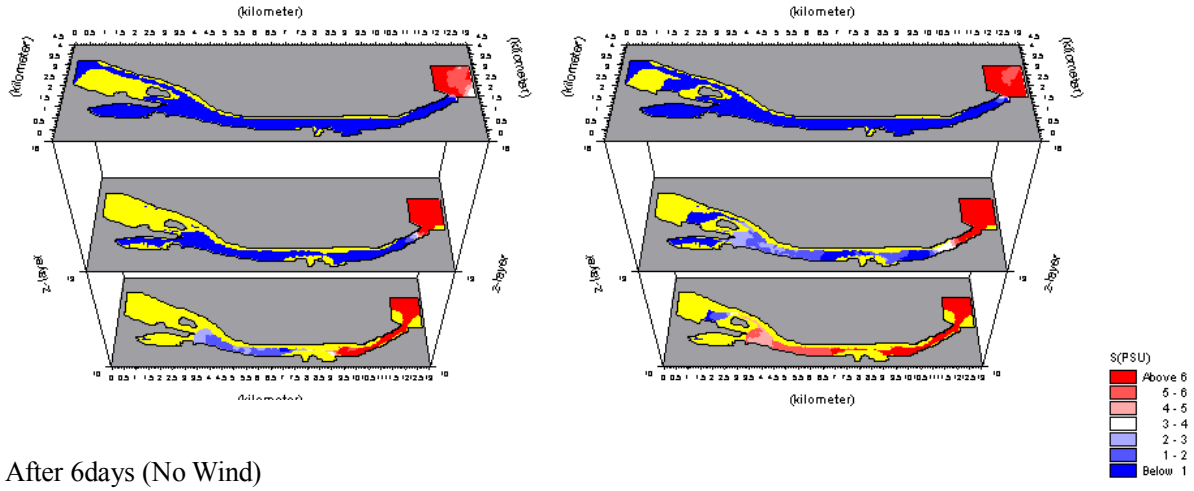
(1)Before Construction **(2)After Construction**

Figure F 3.2 (2)
Vertical Distribution of Salinity outside of Channel (Q=450 m^3/s)

Initial Condition (No Wind)



After 2days (No Wind)



After 6days (No Wind)

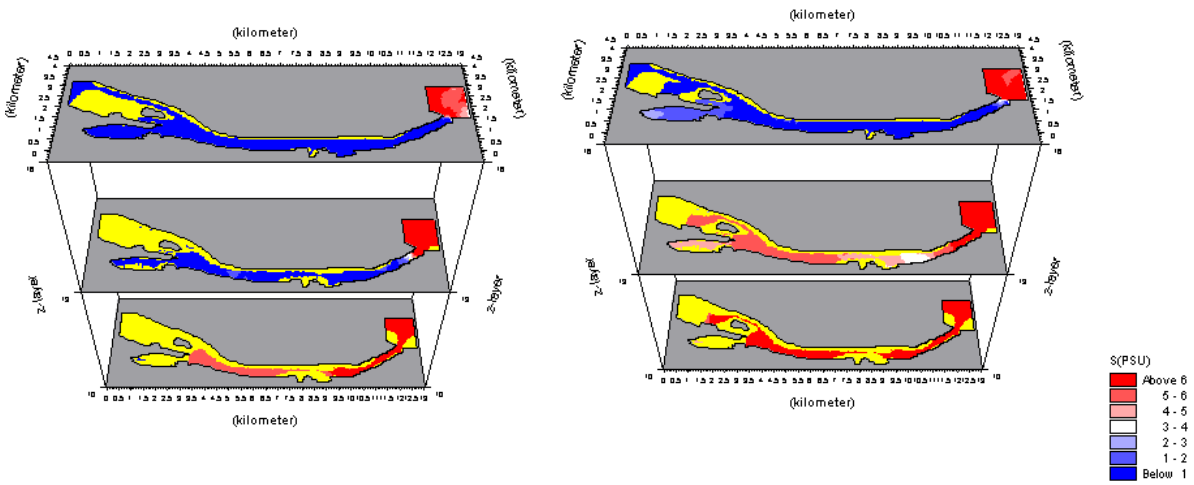
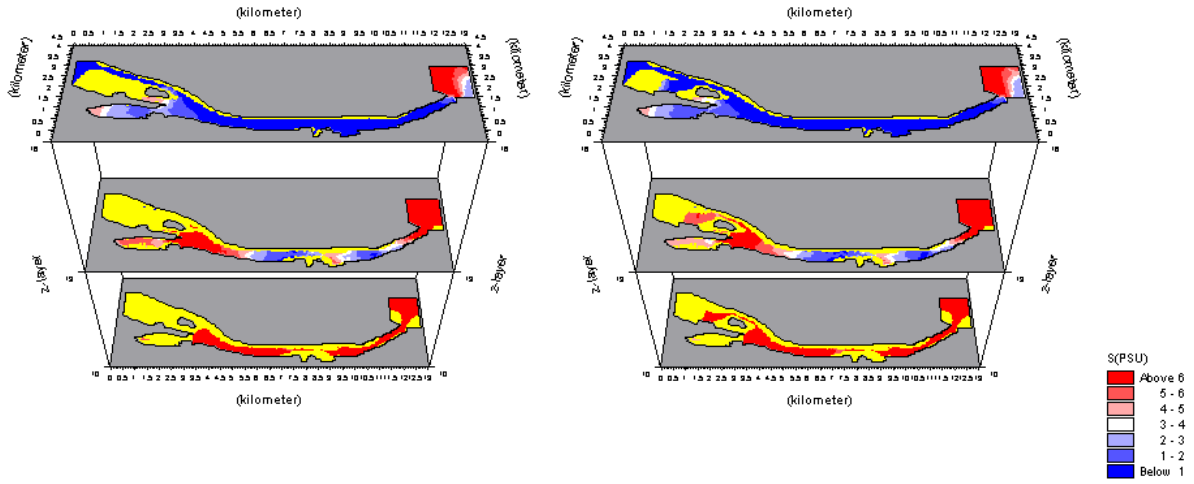
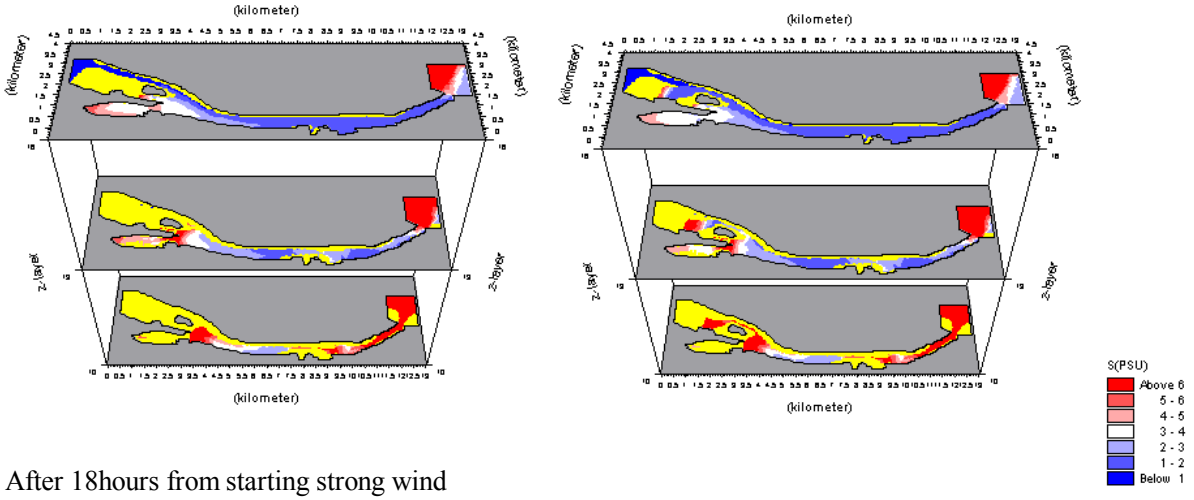


Figure F 3.3 (1)
Horizontal Distribution of Salinity (Q=450 m^3/s)

After 6hours from starting strong wind



After 12hours from starting strong wind



After 18hours from starting strong wind

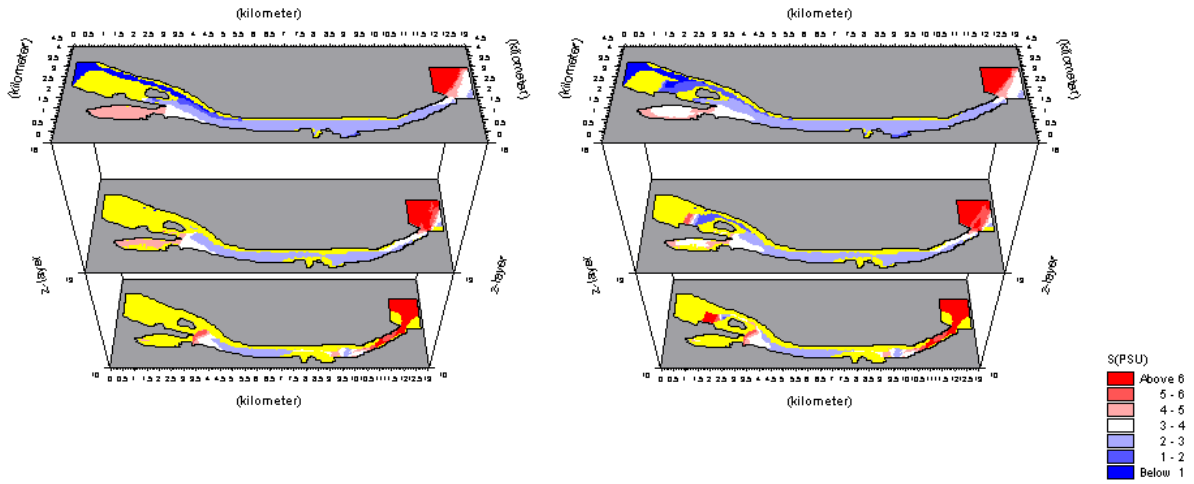
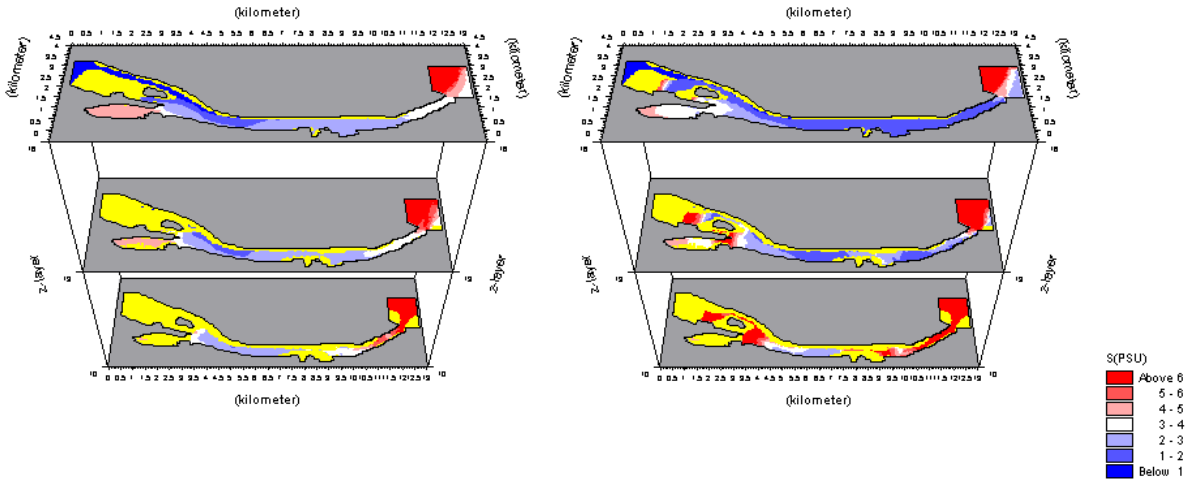
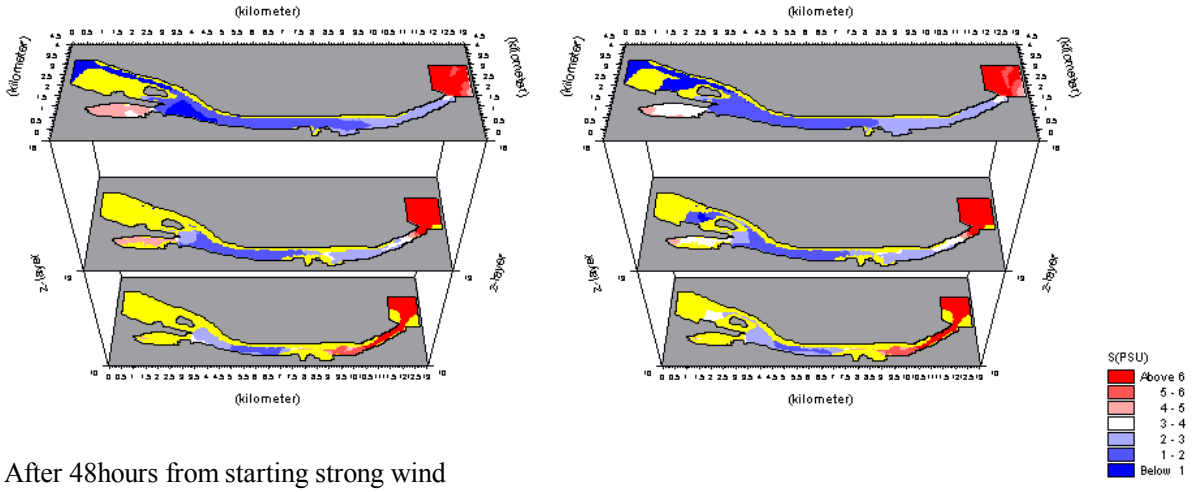


Figure F 3.3 (2)
Horizontal Distribution of Salinity (Q=450 m^3/s)

After 24hours from starting strong wind



After 36hours from starting strong wind



After 48hours from starting strong wind

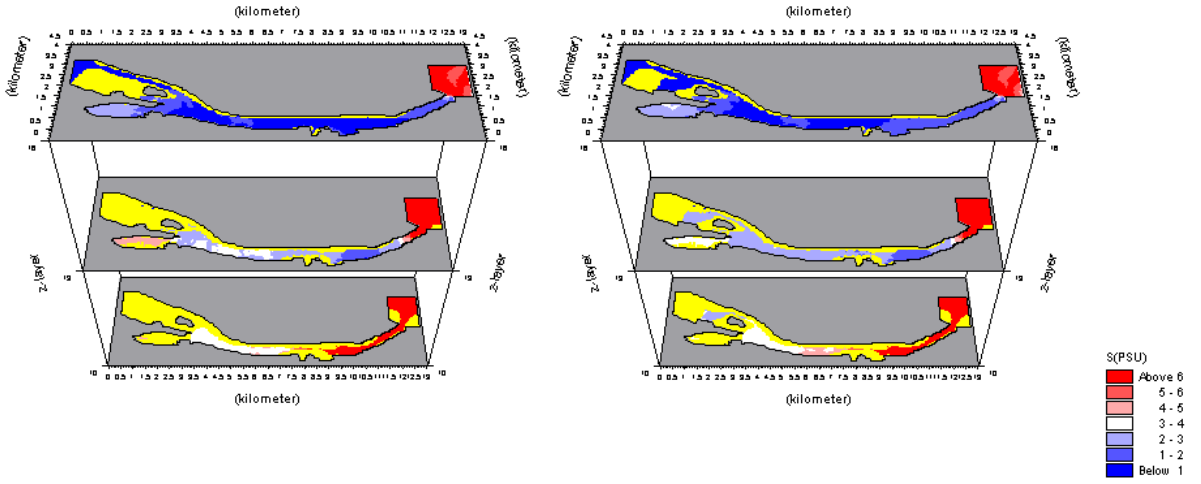
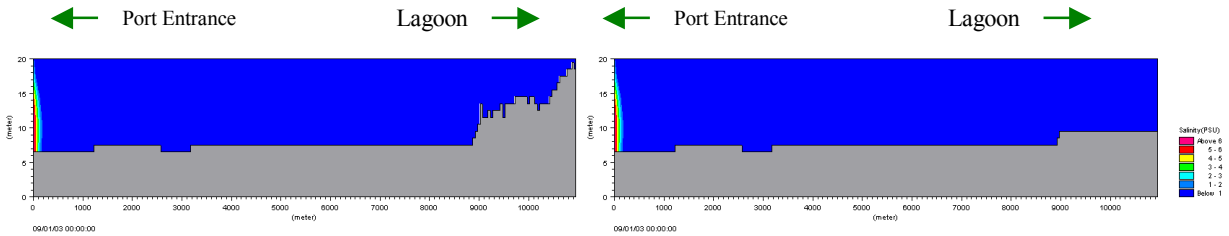
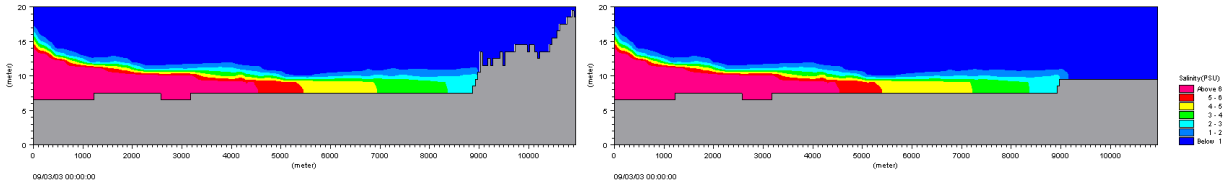


Figure F 3.3 (3)
Horizontal Distribution of Salinity (Q=450 m^3/s)

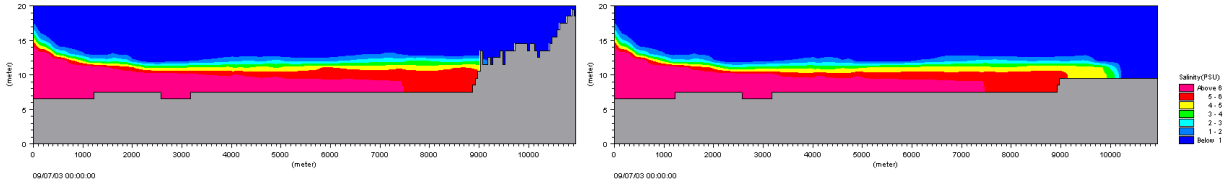
Initial Condition (No Wind)



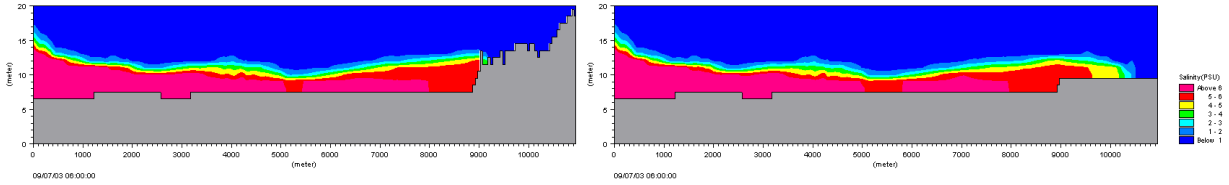
After 2days (No Wind)



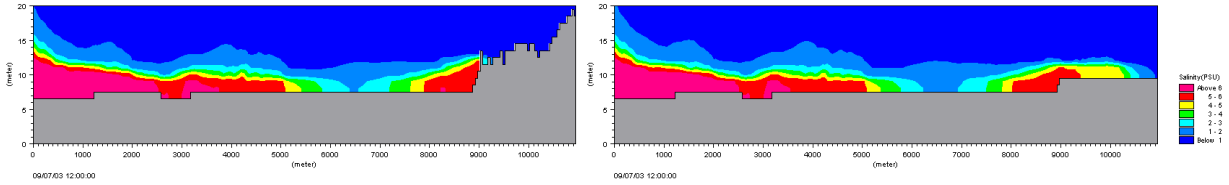
After 6days (No Wind)



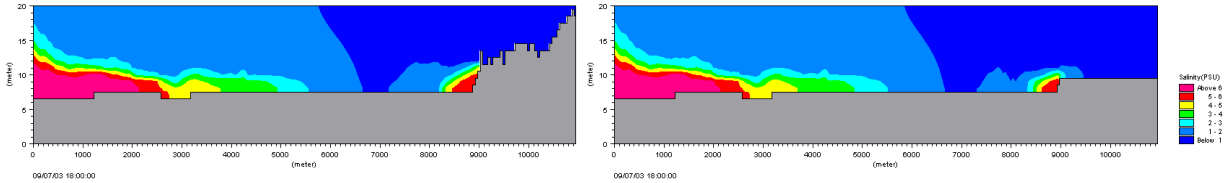
After 6hours from starting strong wind



After 12hours from starting strong wind



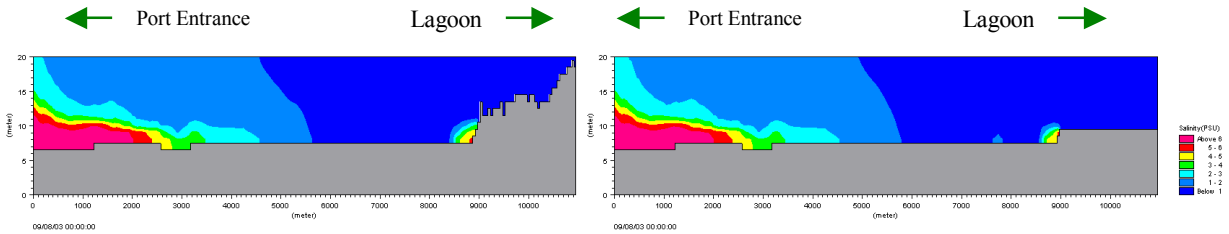
After 18hours from starting strong wind



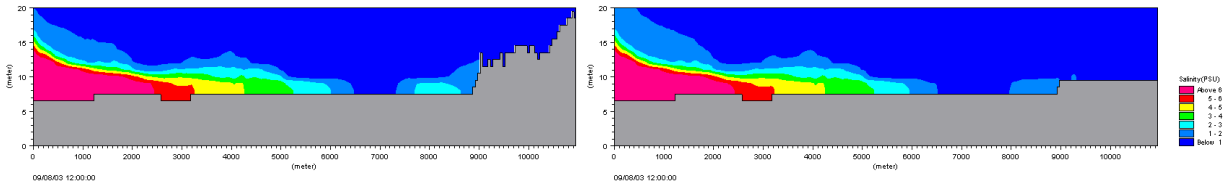
(1)Before Construction **(2)After Construction**

Figure F 3.4 (1)
Vertical Distribution of Salinity inside of Channel (Q=680 m^3/s)

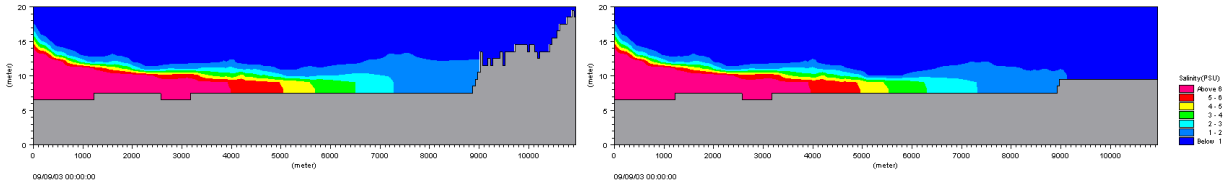
After 24hours from starting strong wind



After 36hours from starting strong wind



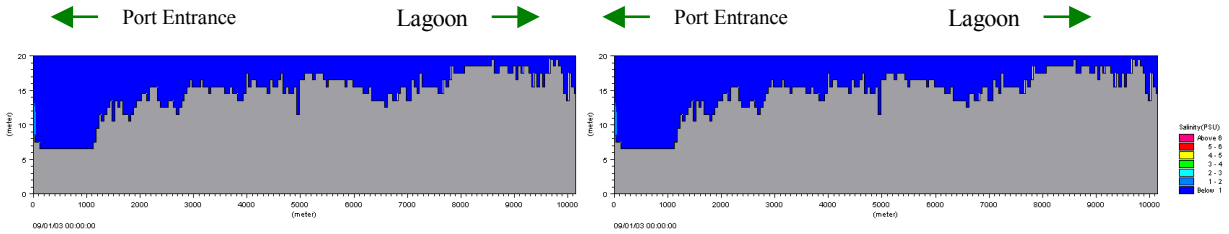
After 48hours from starting strong wind



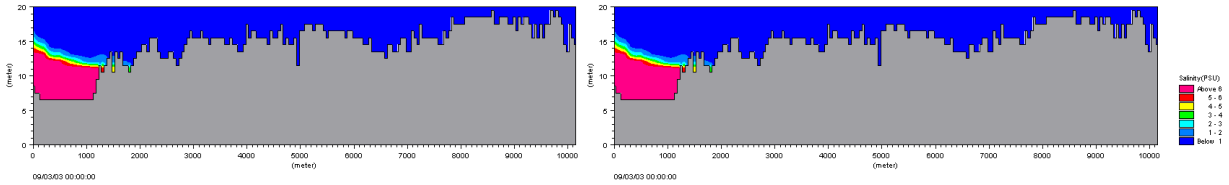
(1)Before Construction **(2)After Construction**

Figure F 3.4 (2)
Vertical Distribution of Salinity inside of Channel (Q=680 m^3/s)

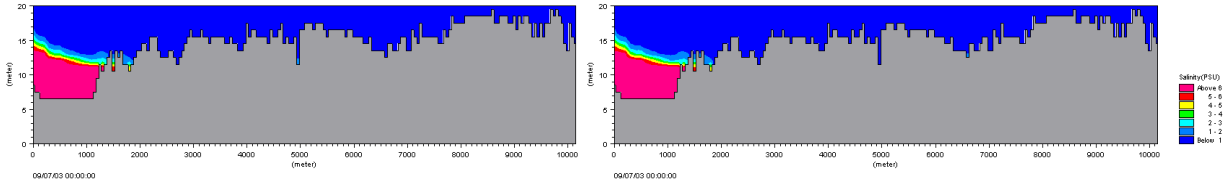
Initial Condition (No Wind)



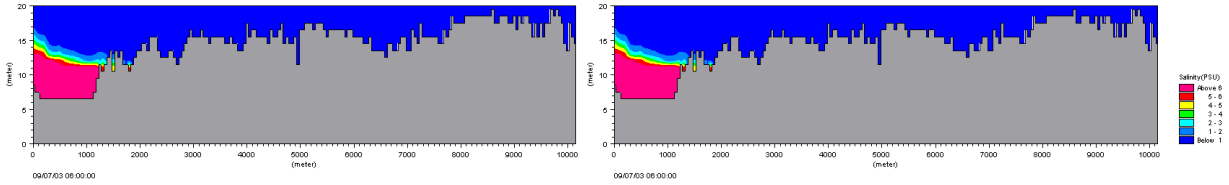
After 2days (No Wind)



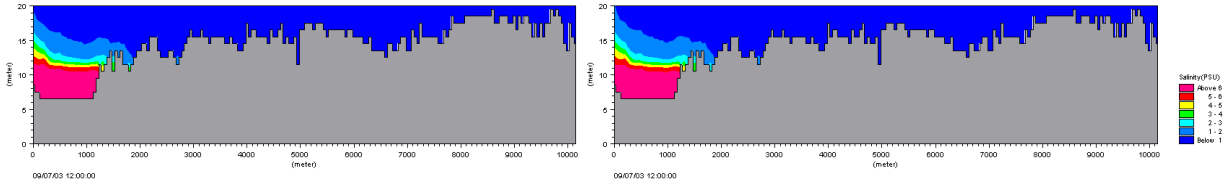
After 6days (No Wind)



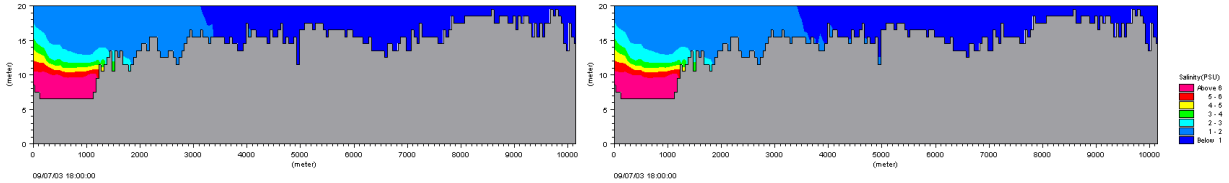
After 6hours from starting strong wind



After 12hours from starting strong wind



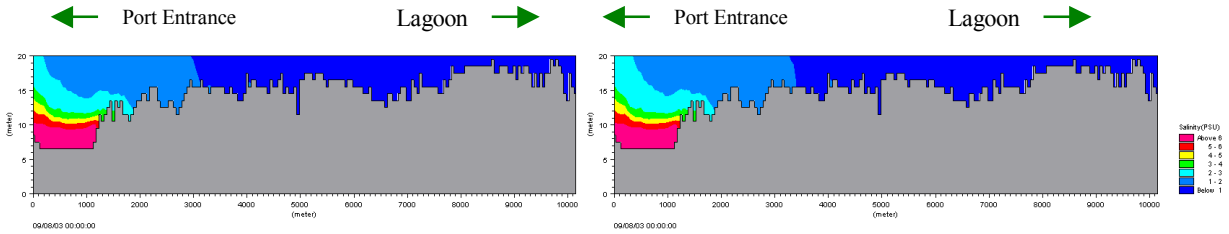
After 18hours from starting strong wind



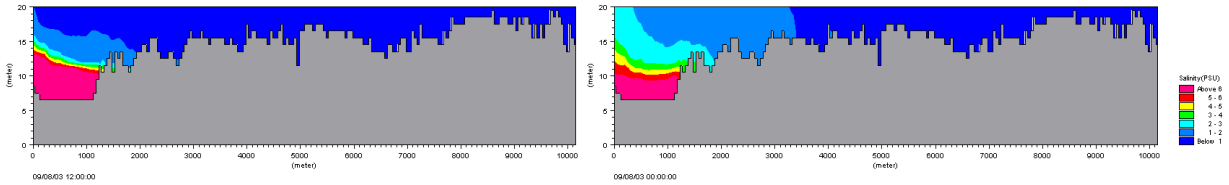
(1)Before Construction **(2)After Construction**

Figure F 3.5 (1)
Vertical Distribution of Salinity outside of Channel (Q=680 m^3/s)

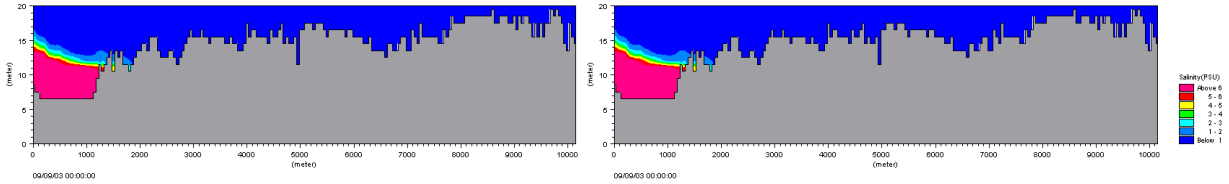
After 24hours from starting strong wind



After 36hours from starting strong wind



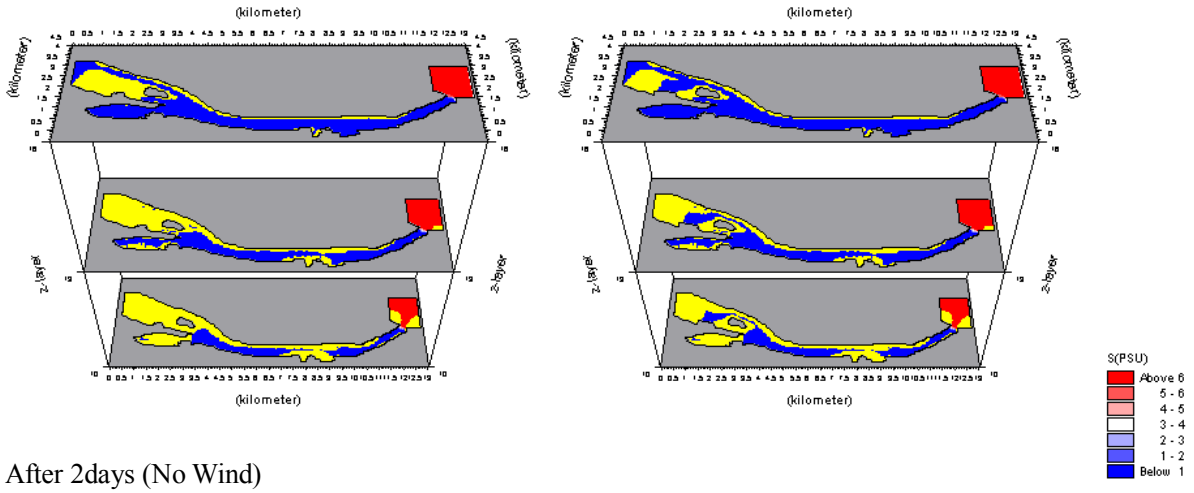
After 48hours from starting strong wind



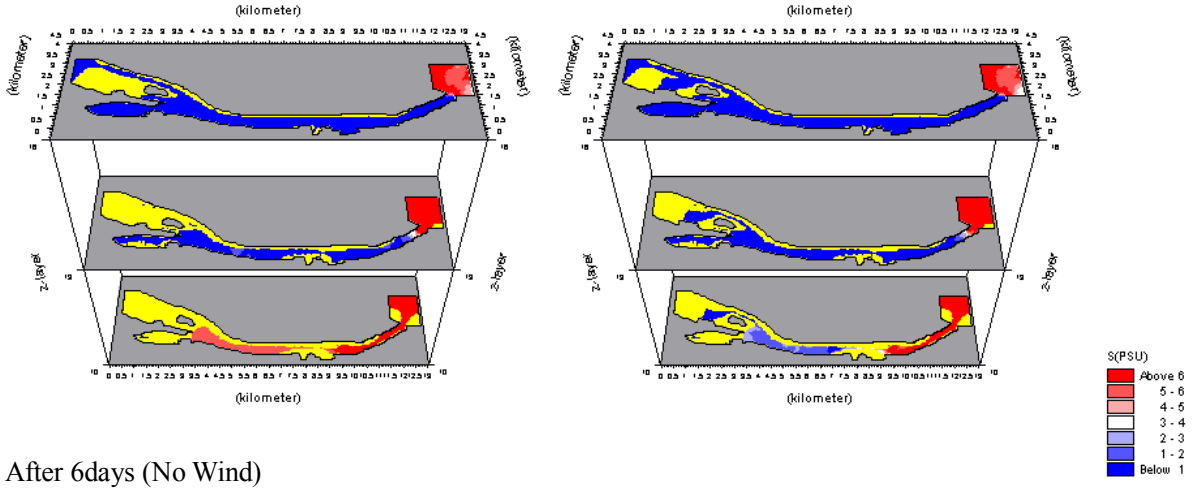
(1)Before Construction **(2)After Construction**

Figure F 3.5 (2)
Vertical Distribution of Salinity outside of Channel (Q=680 m^3/s)

Initial Condition (No Wind)



After 2days (No Wind)



After 6days (No Wind)

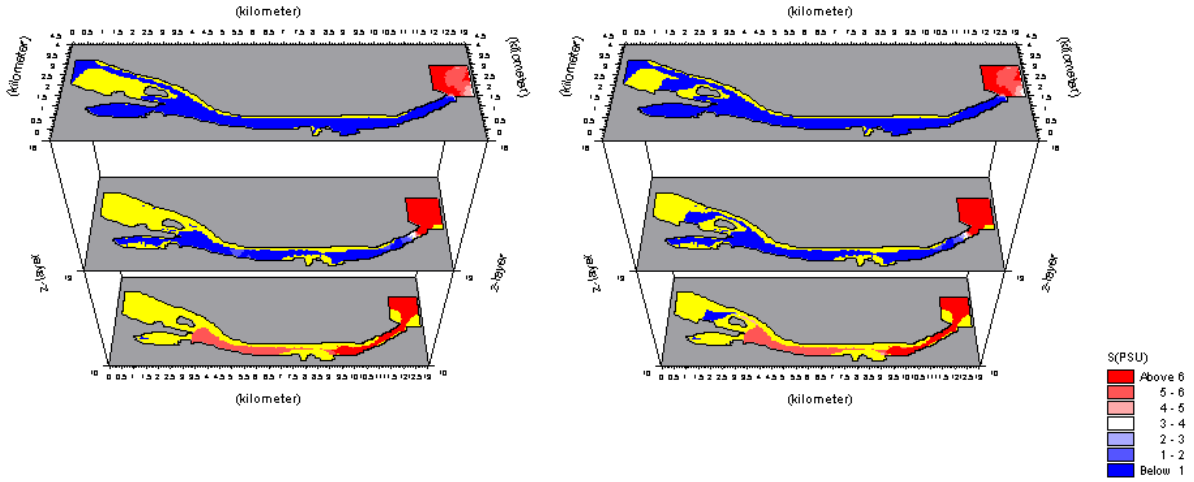
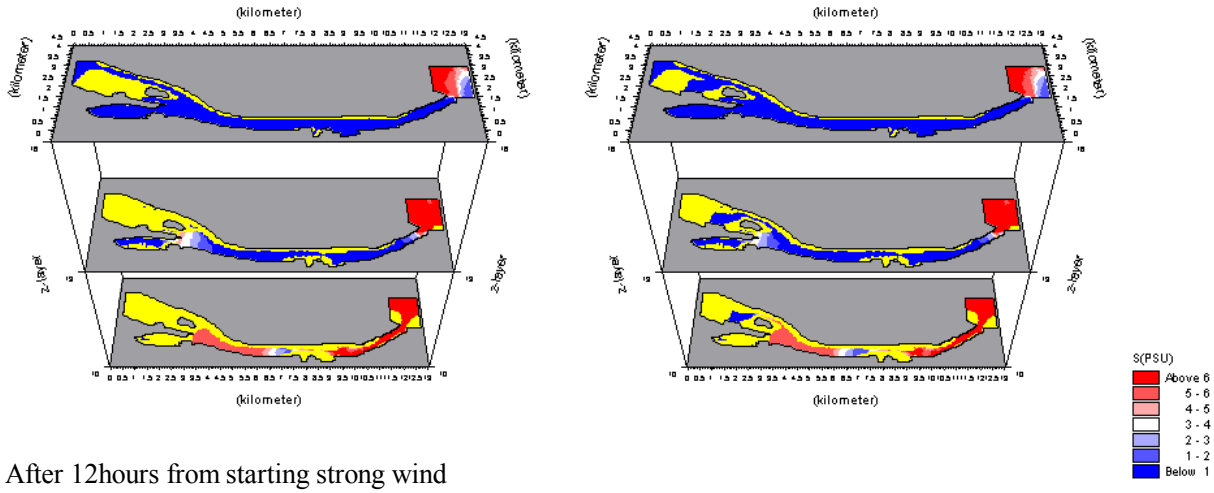
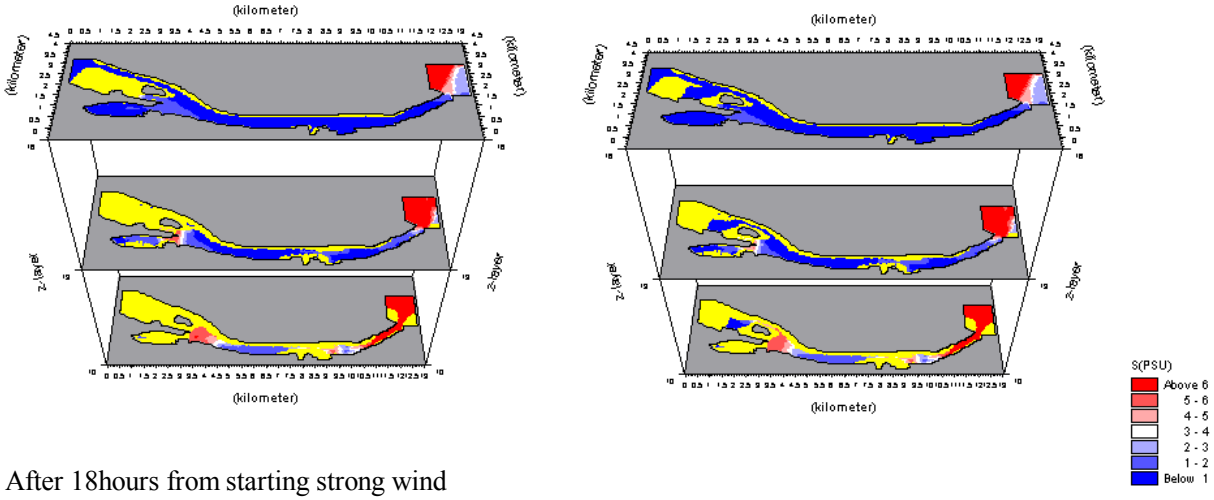


Figure F 3.6 (1)
Horizontal Distribution of Salinity (Q=680 m^3/s)

After 6hours from starting strong wind



After 12hours from starting strong wind



After 18hours from starting strong wind

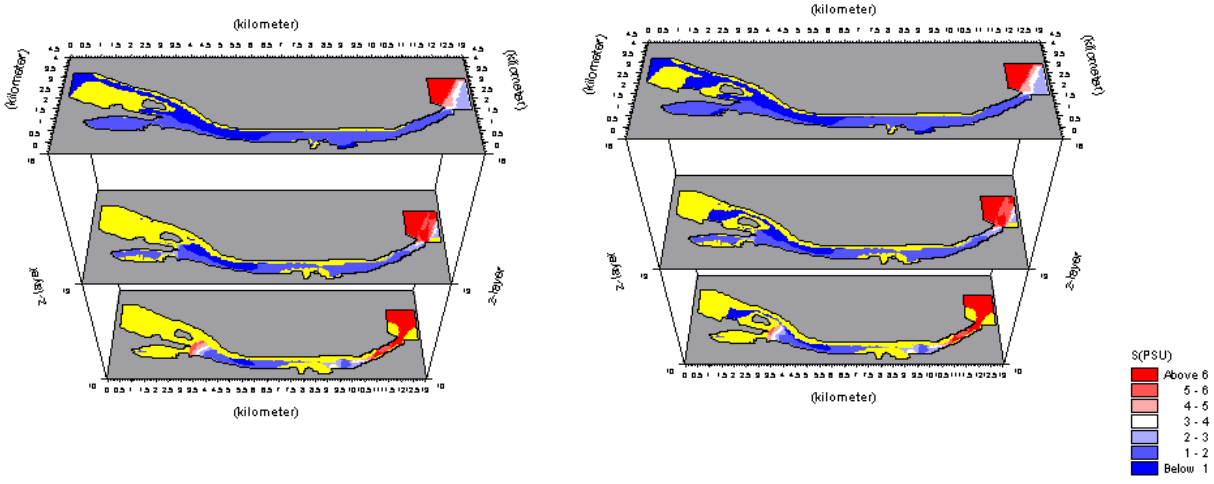
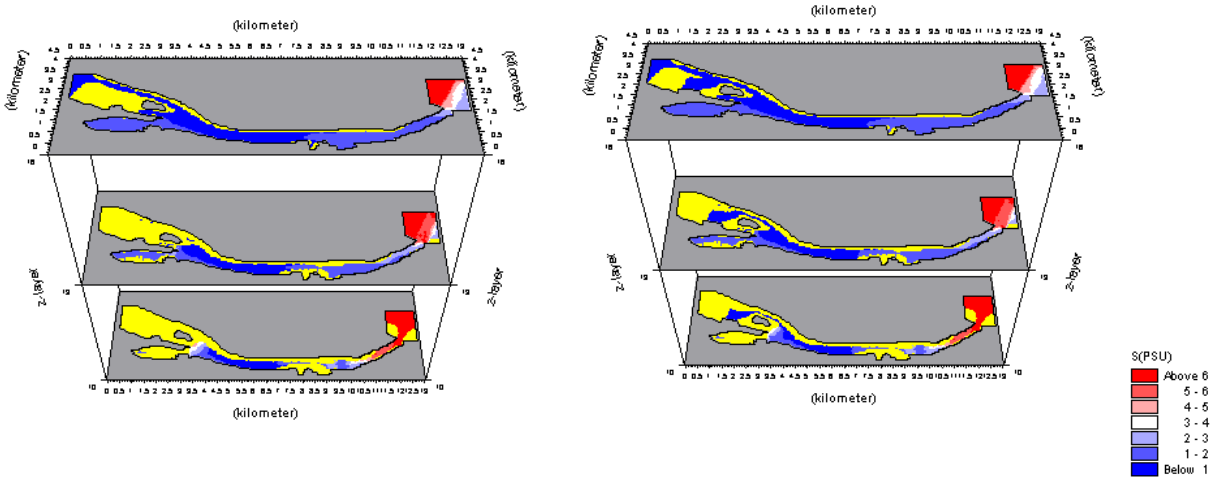
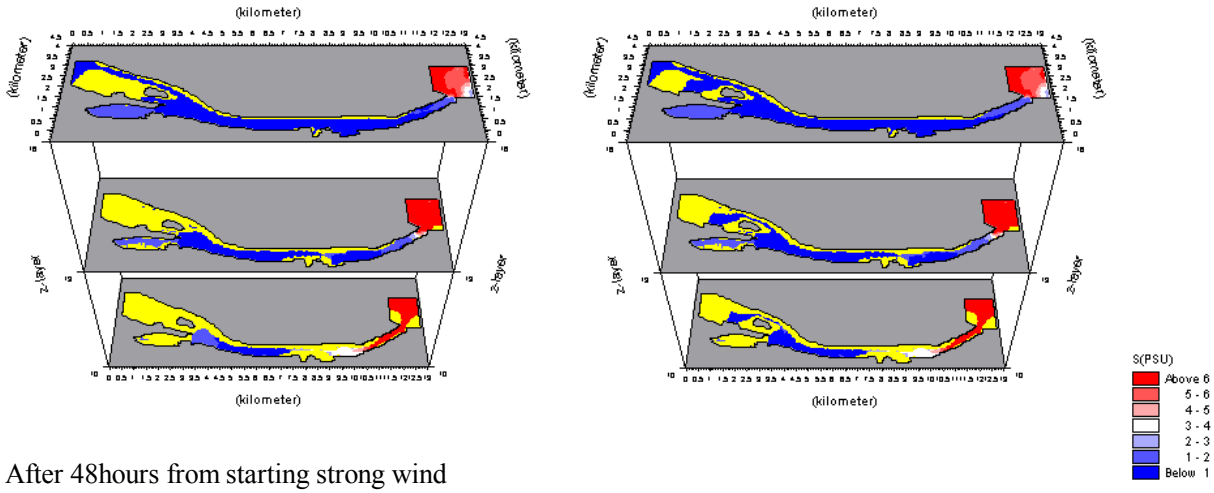


Figure F 3.6 (2)
Horizontal Distribution of Salinity (Q=680 m^3/s)

After 24hours from starting strong wind



After 36hours from starting strong wind



After 48hours from starting strong wind

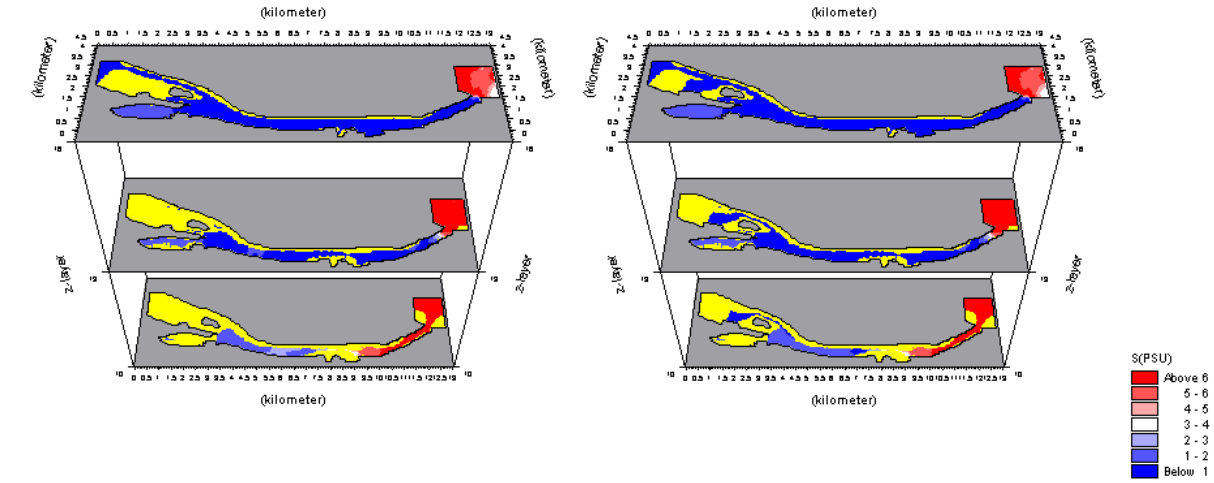


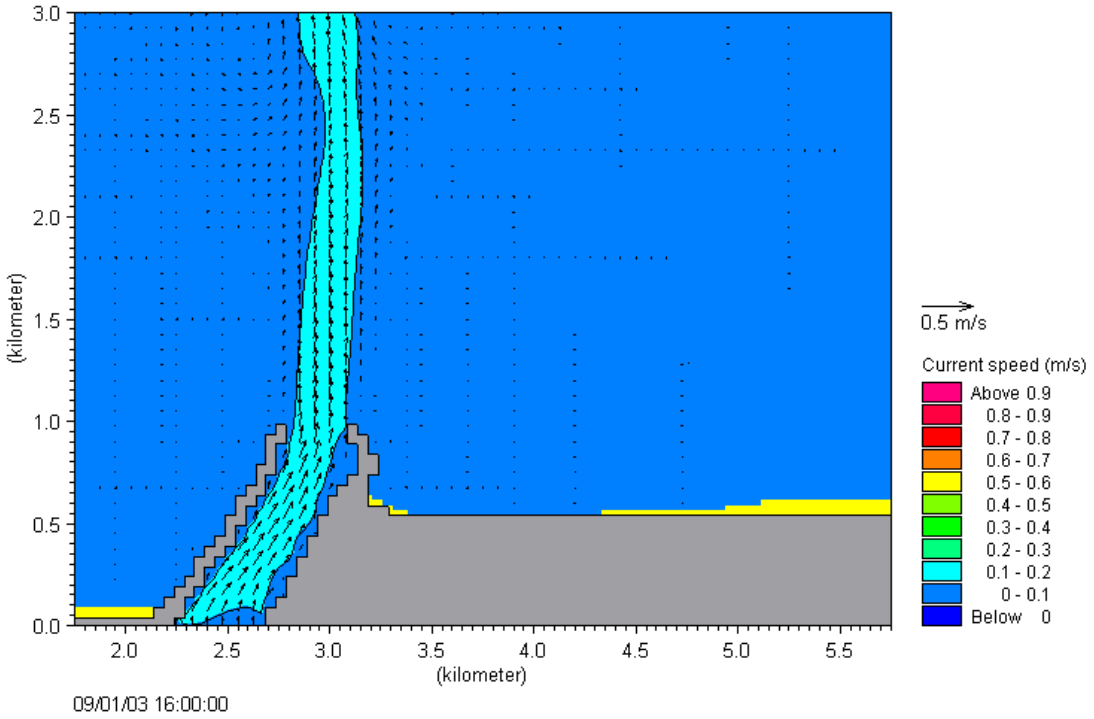
Figure F 3.6 (3)
Horizontal Distribution of Salinity (Q=680 m^3/s)

APPENDIX

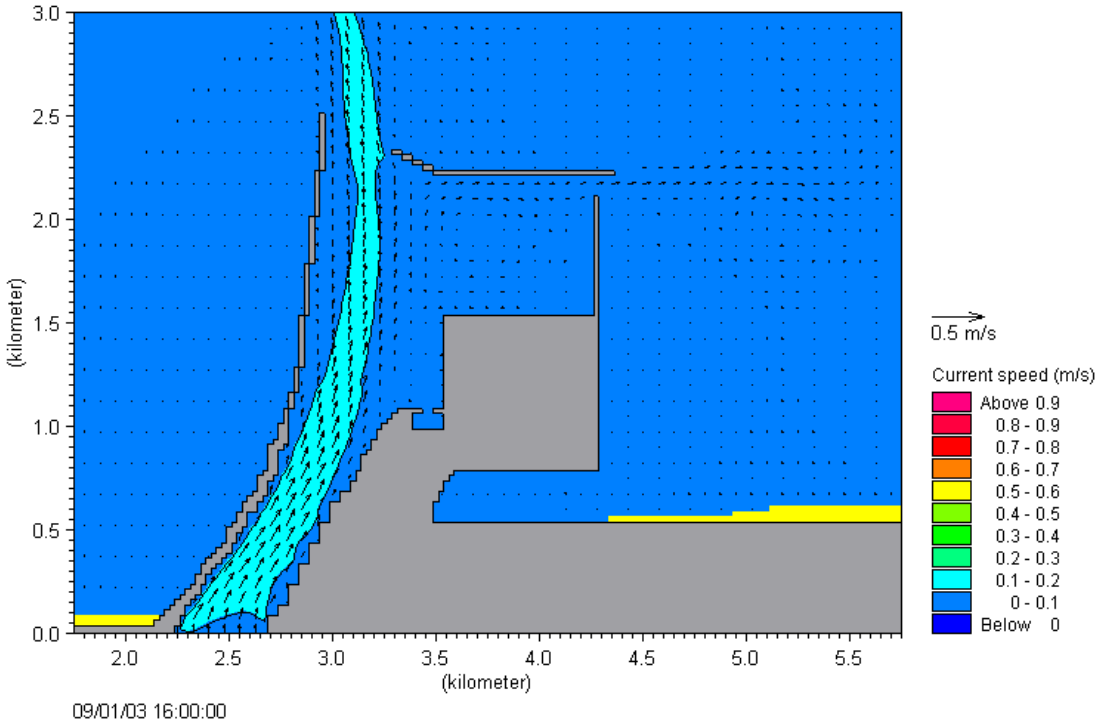
F 4

Computation Result of Sedimentation Analysis

in case of Outer Port Development Plan

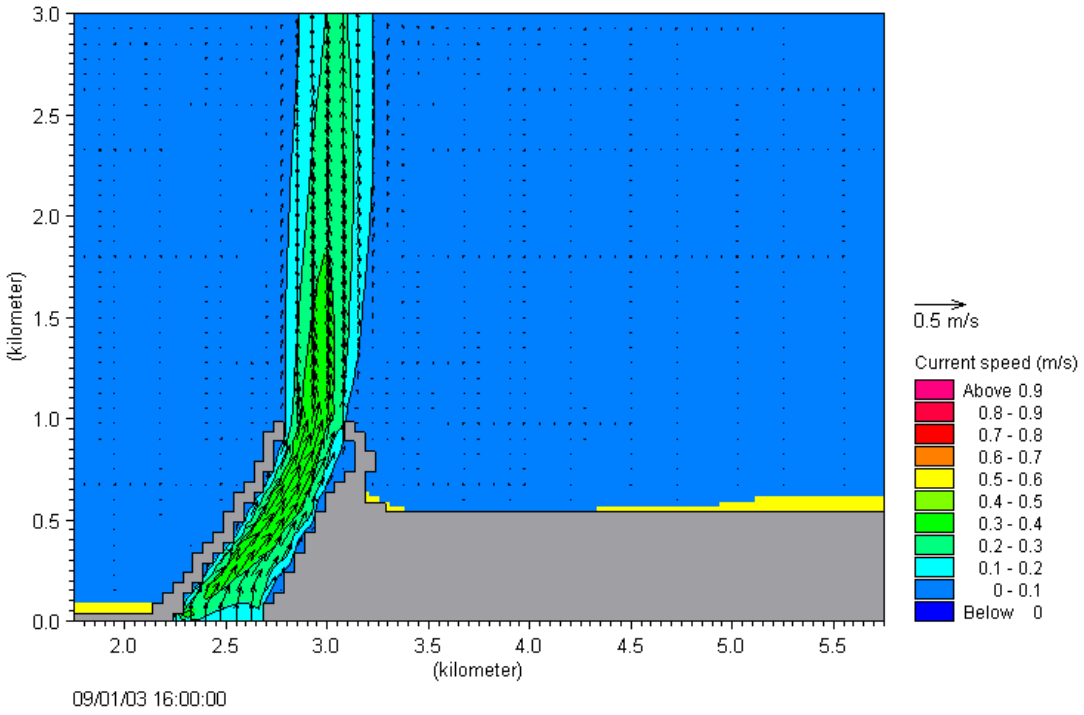


(1)Before Construction

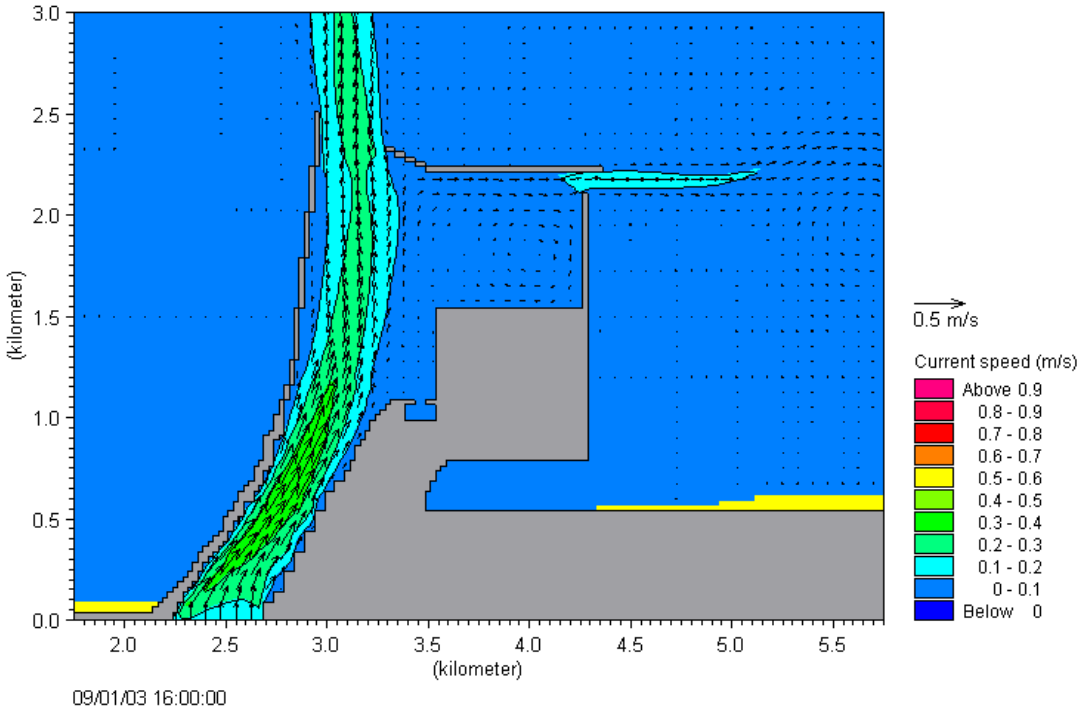


(2)After Construction

Figure F 4.1 Computation Result of Current Field for Short Term Plan (Q=600 m^3/s)

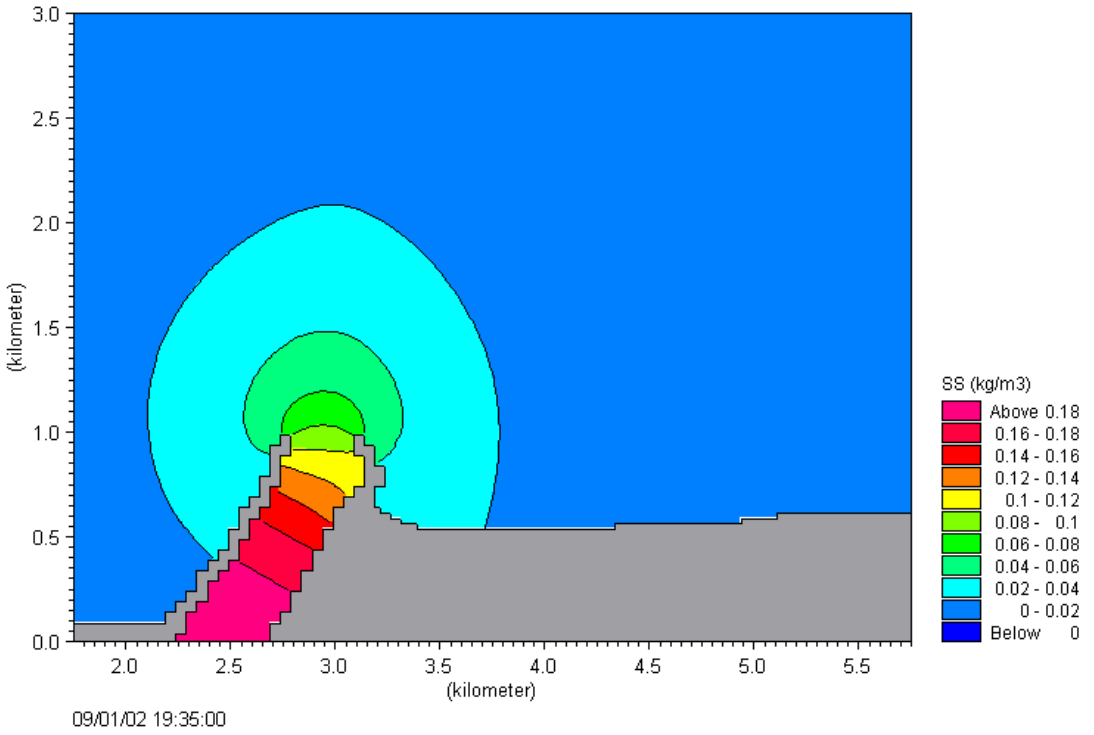


(1)Before Construction

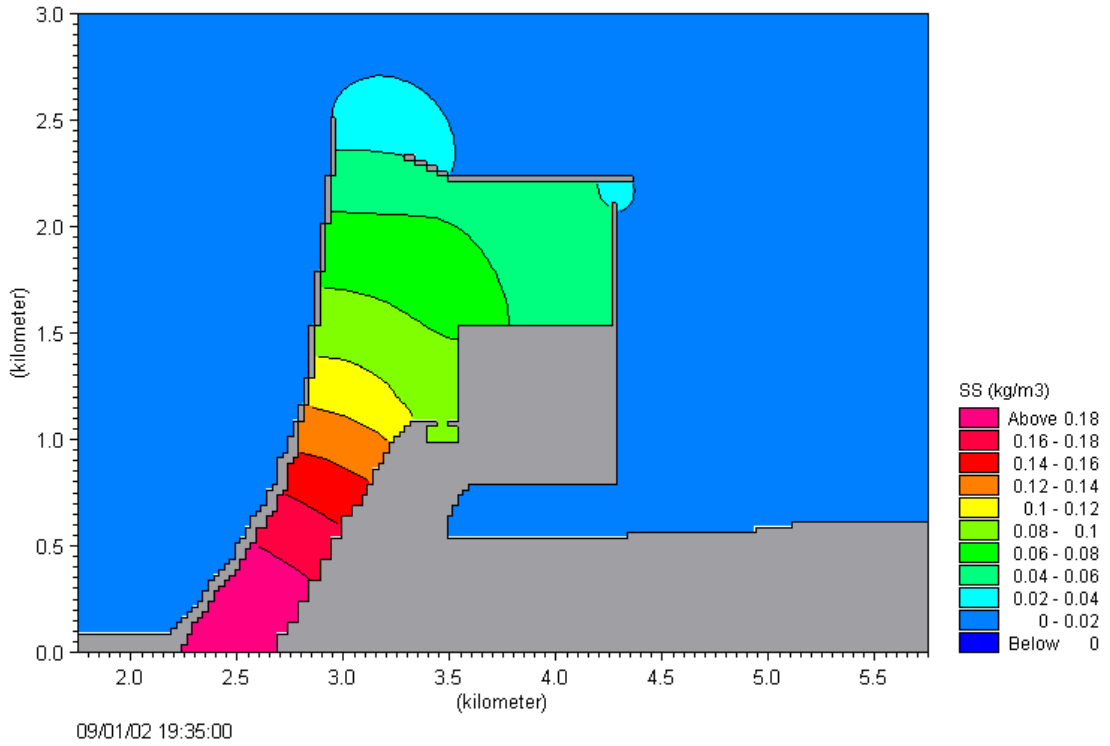


(2)After Construction

Figure F 4.2 Computation Result of Current Field for Short Term Plan (Q=1200 m^3/s)

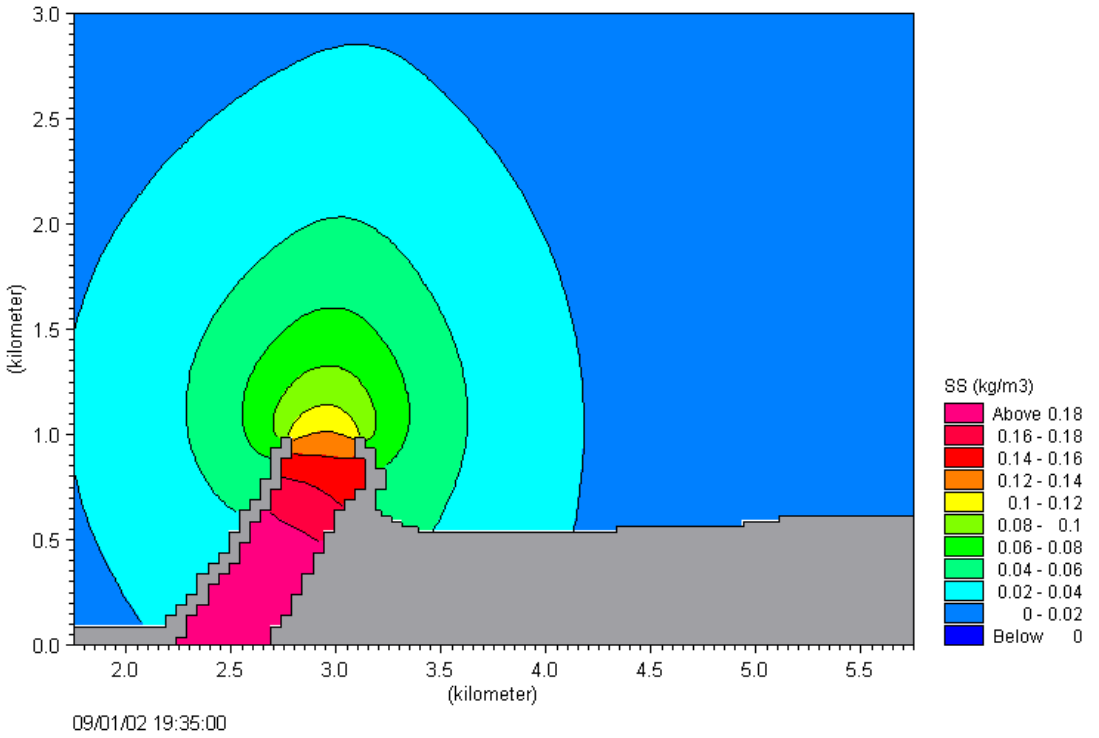


(1)Before Construction

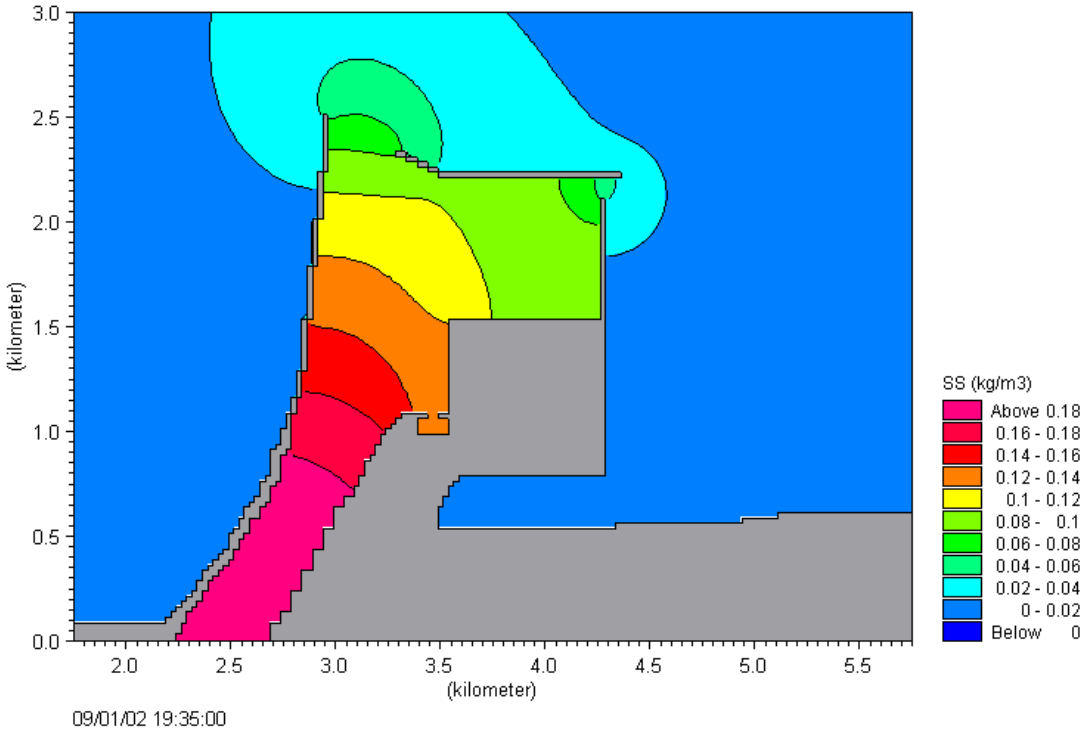


(2)After Construction

Figure F 4.3 Concentration of Suspended Solid for Short Term Plan (Q=600 m^3/s)

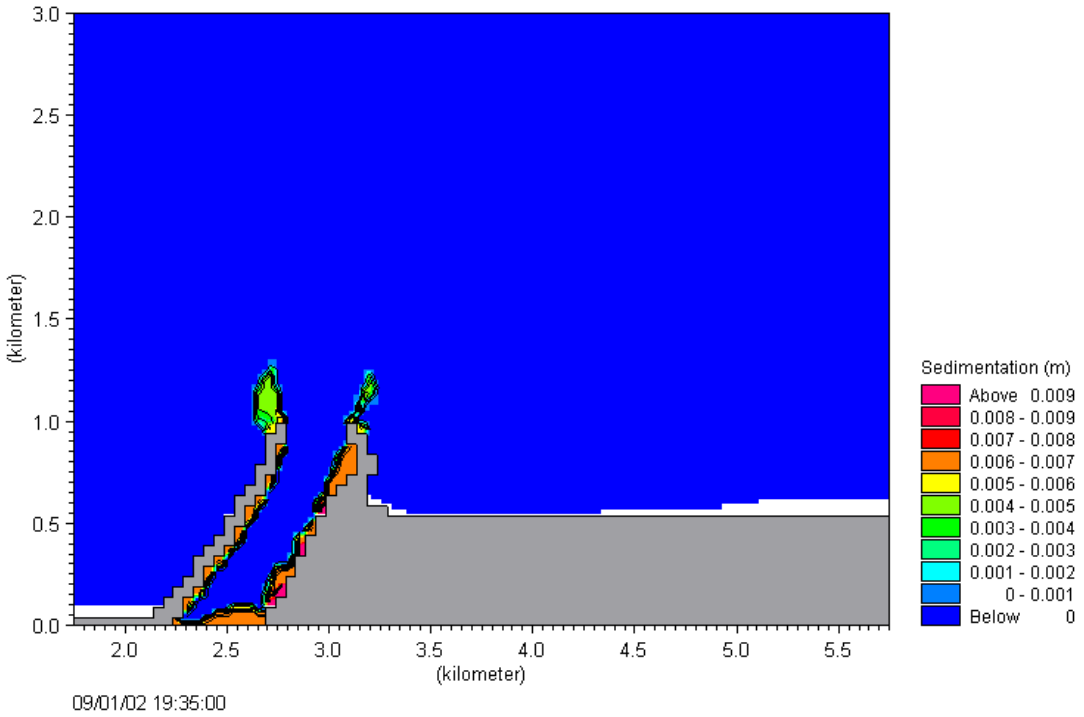


(1)Before Construction

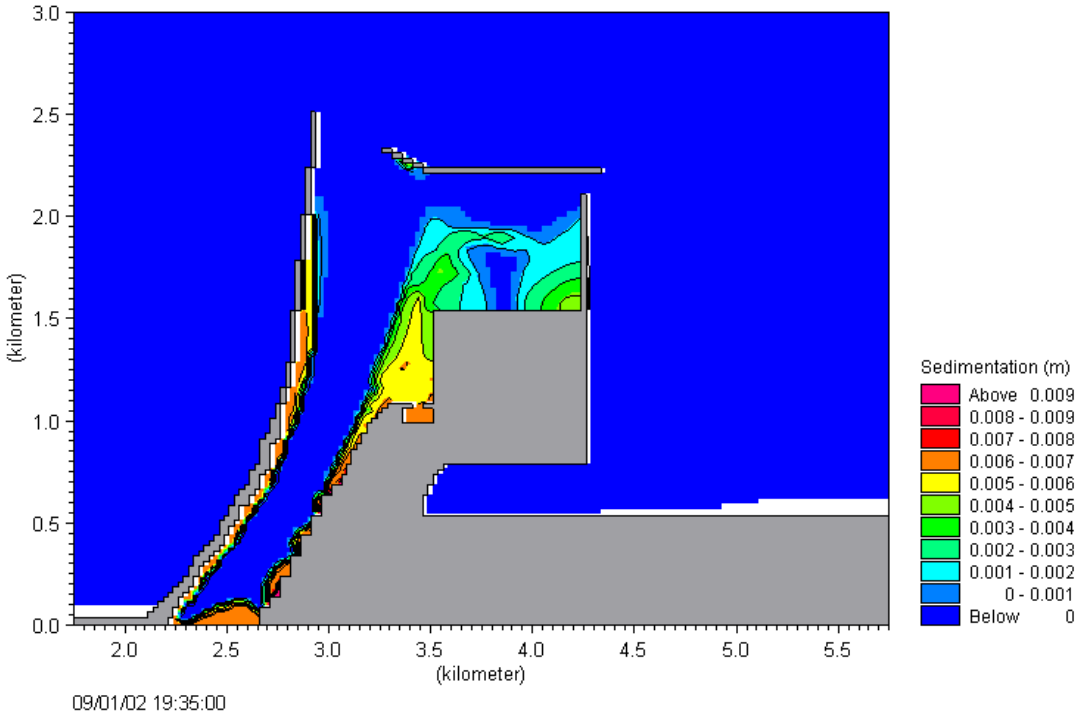


(2)After Construction

Figure F 4.4 Concentration of Suspended Solid for Short Term Plan (Q=1200 m^3/s)

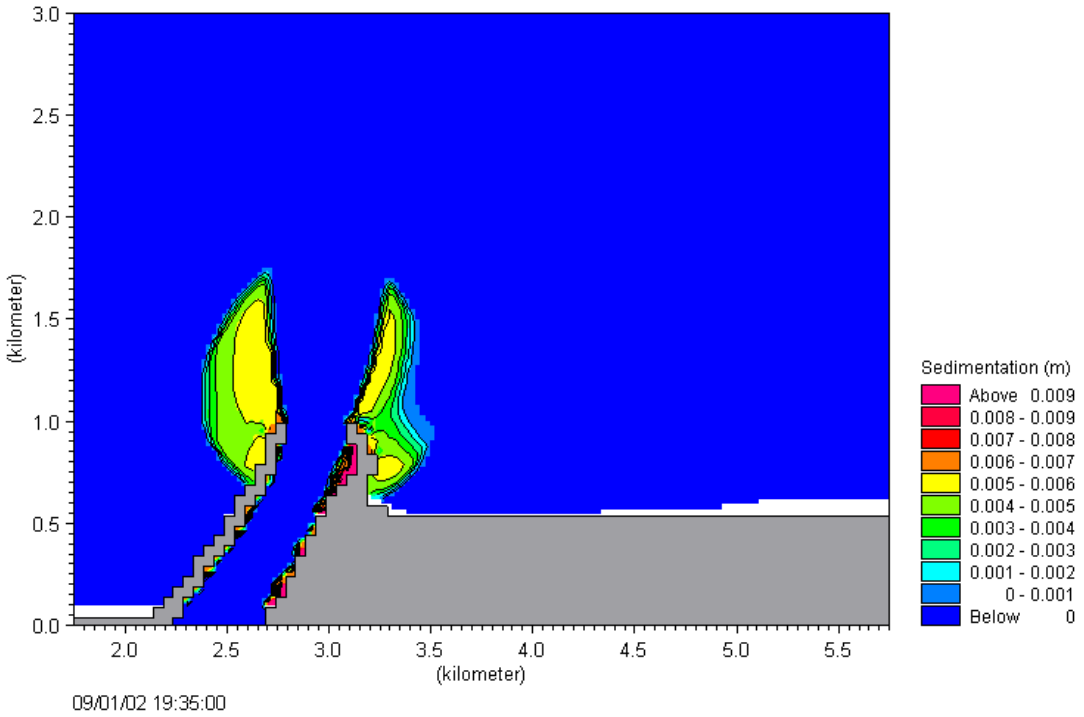


(1)Before Construction

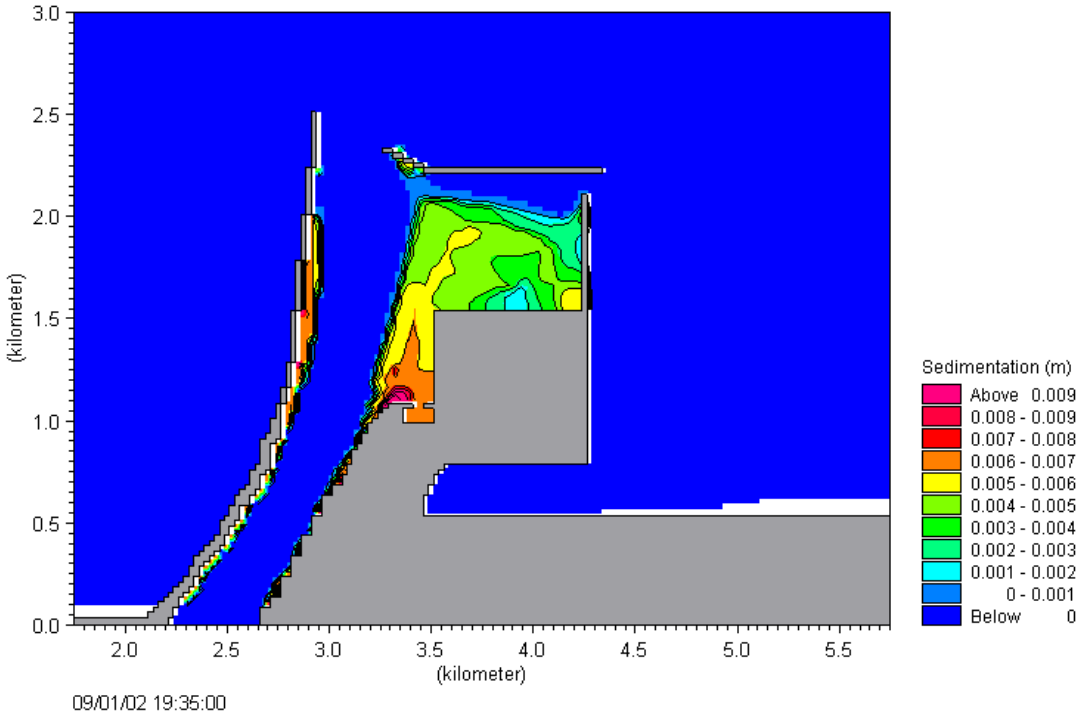


(2)After Construction

Figure F 4.5 Computation Result of Sedimentation for Short Term Plan (Q=600 m^3/s)

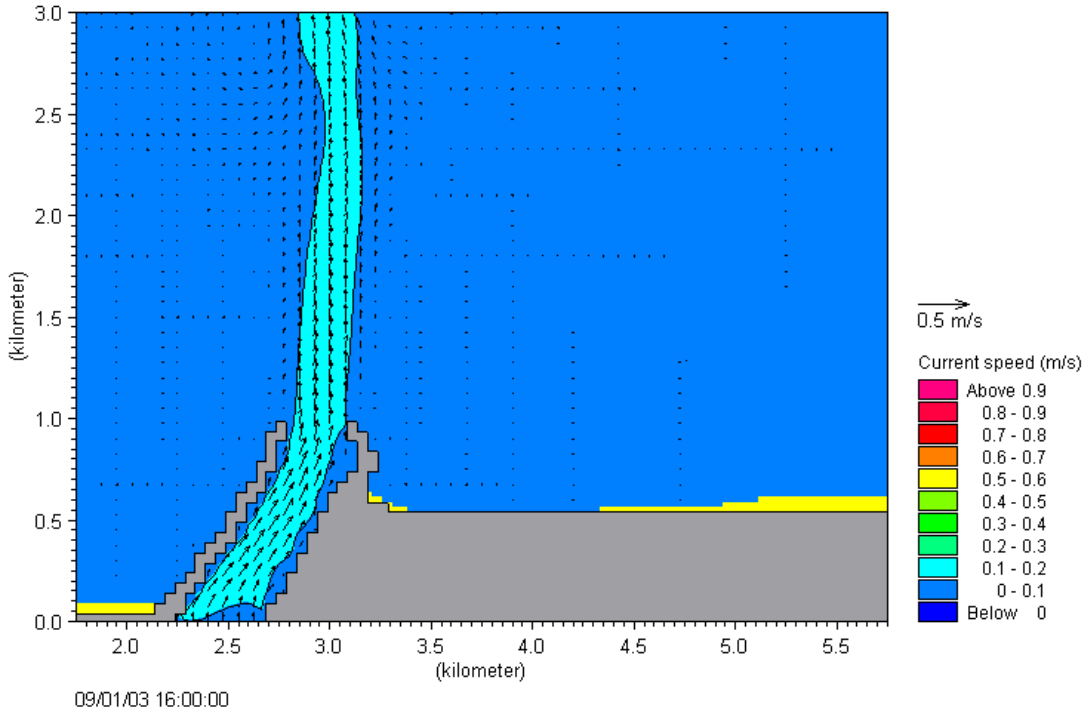


(1)Before Construction

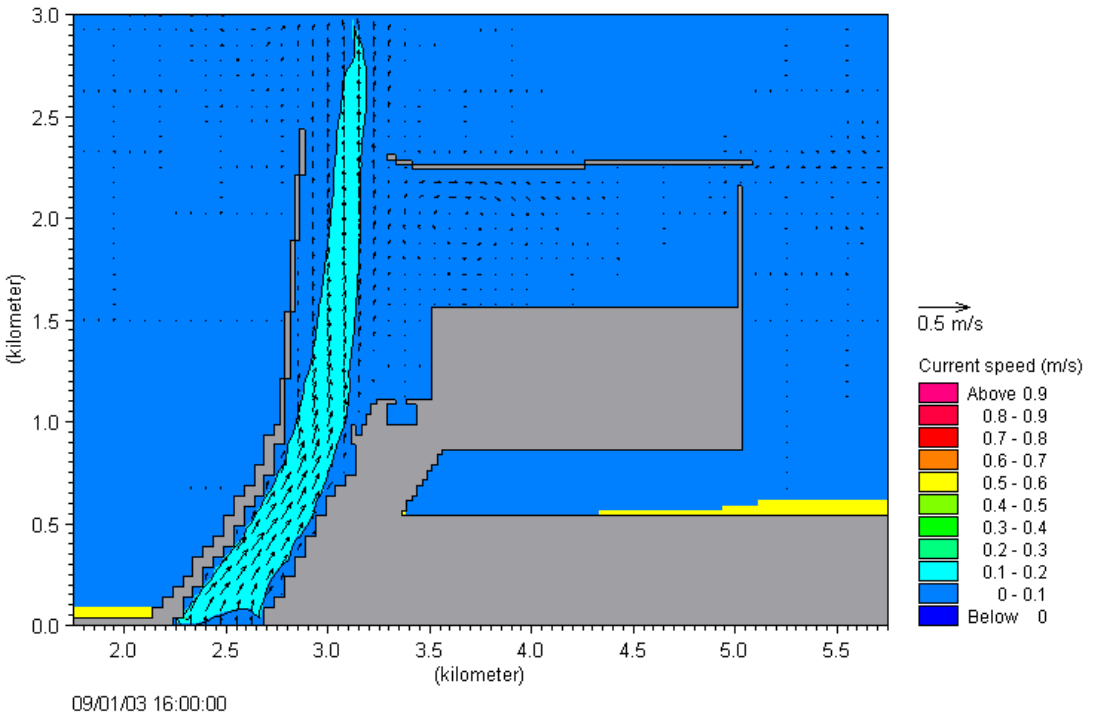


(2)After Construction

Figure F 4.6 Computation Result of Sedimentation for Short Term Plan (Q=1200 m^3/s)

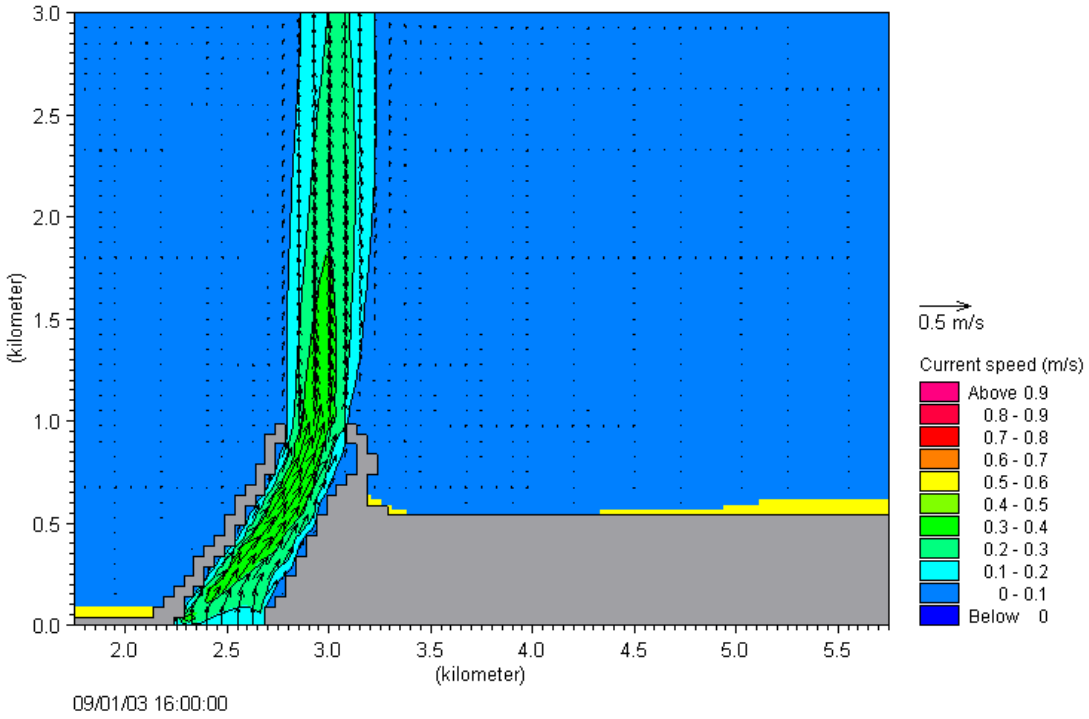


(1)Before Construction

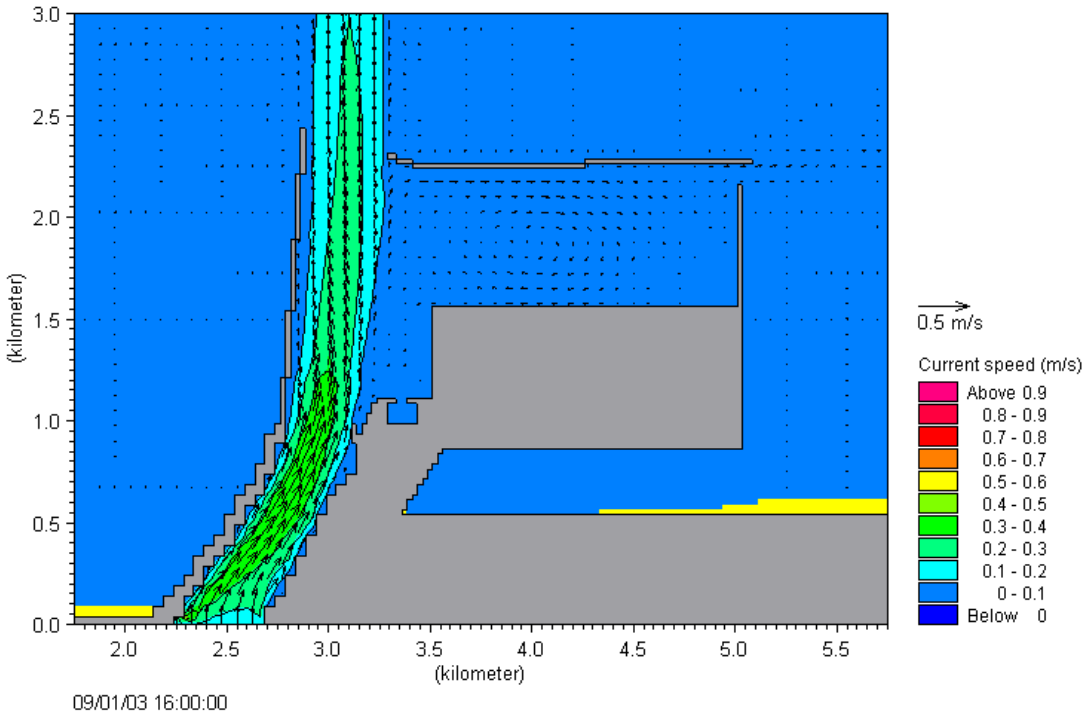


(2)After Construction

Figure F 4.7 Computation Result of Current Field for Master Plan (Q=600 m^3/s)

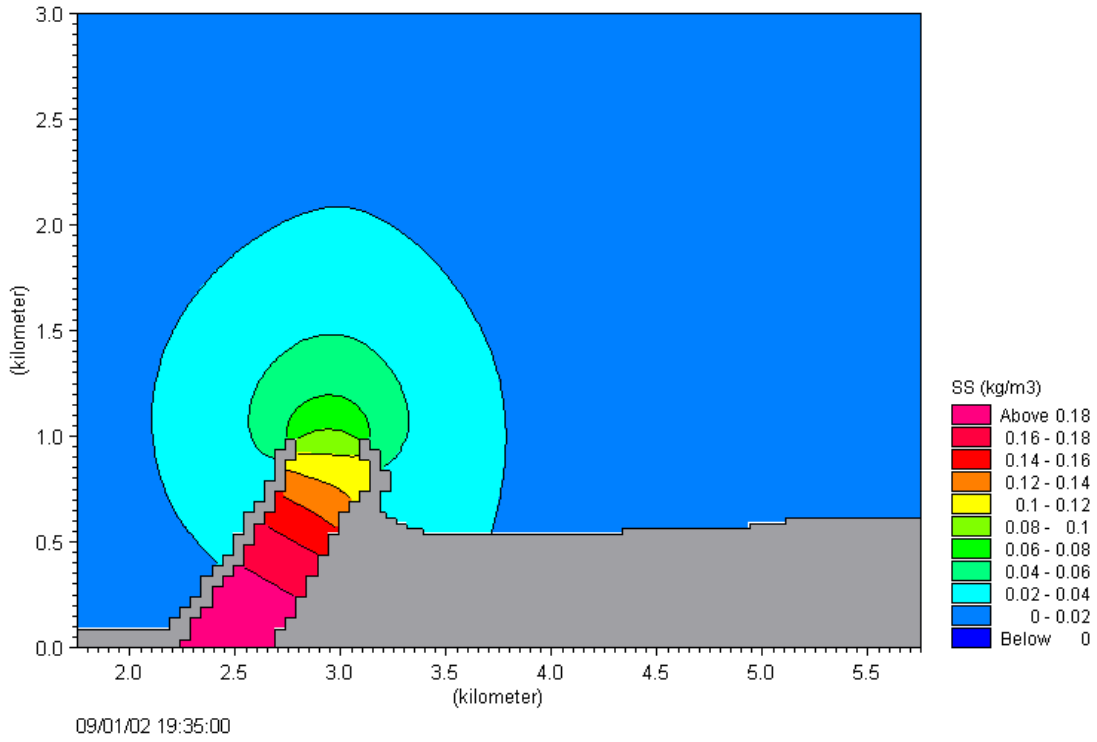


(1)Before Construction

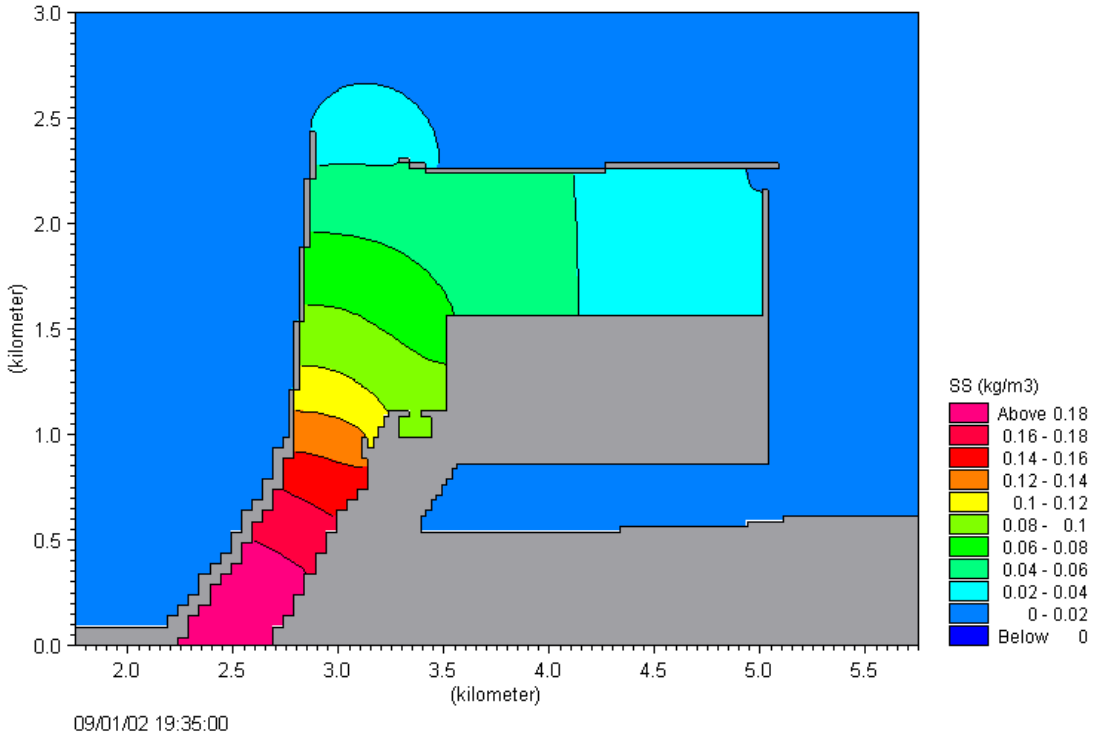


(2)After Construction

Figure F 4.8 Computation Result of Current Field for Master Plan (Q=1200 m^3/s)

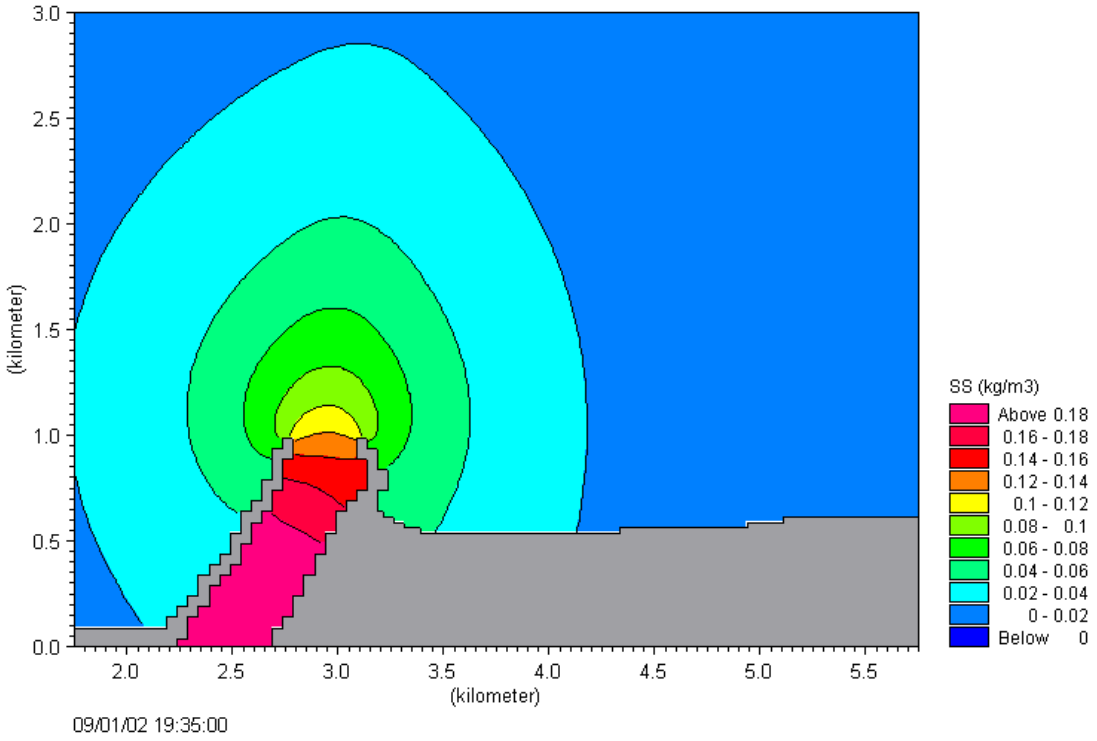


(1)Before Construction

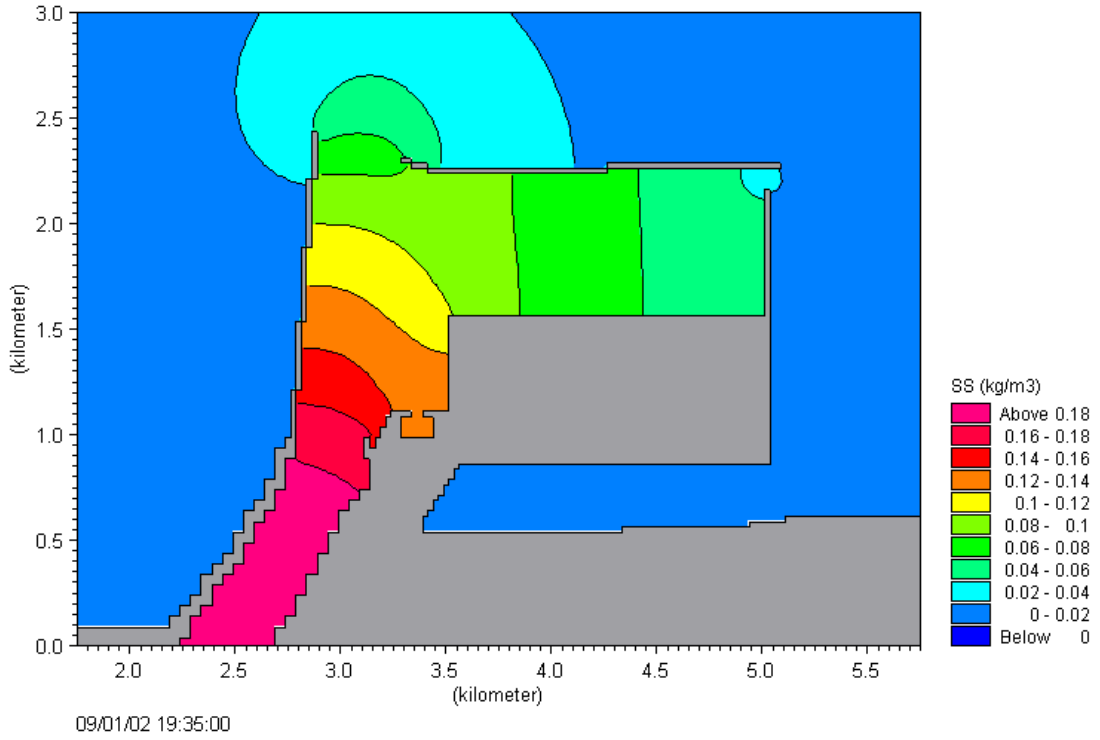


(2)After Construction

Figure F 4.9 Concentration of Suspended Solid for Master Plan (Q=600 m^3/s)

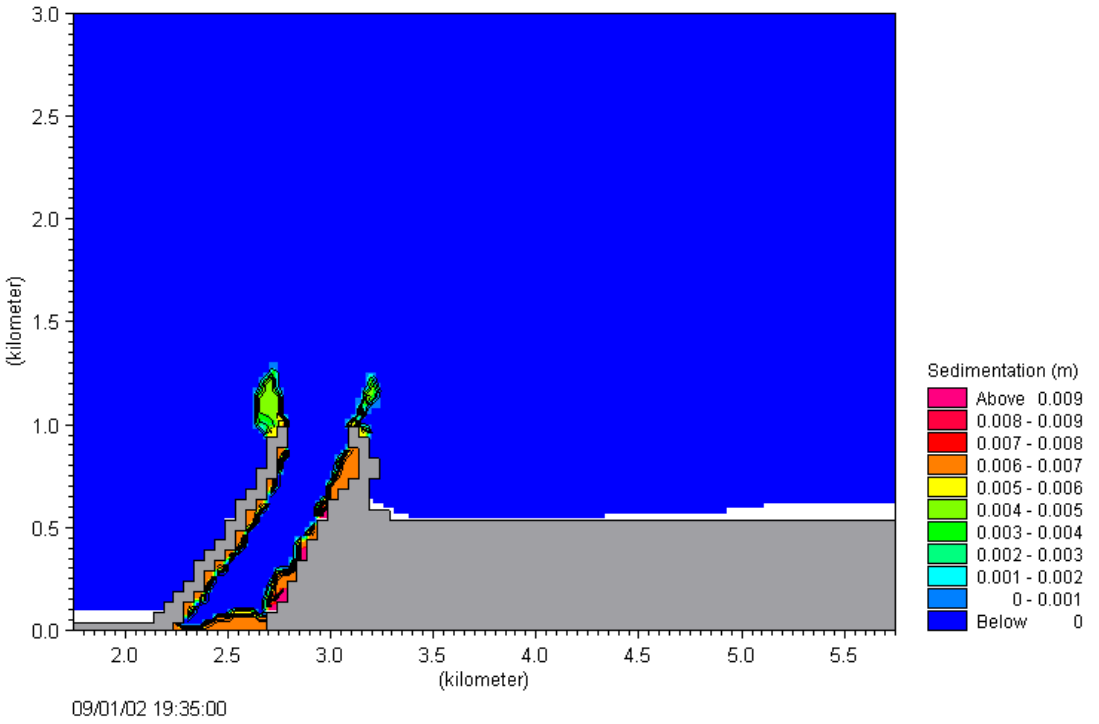


(1)Before Construction

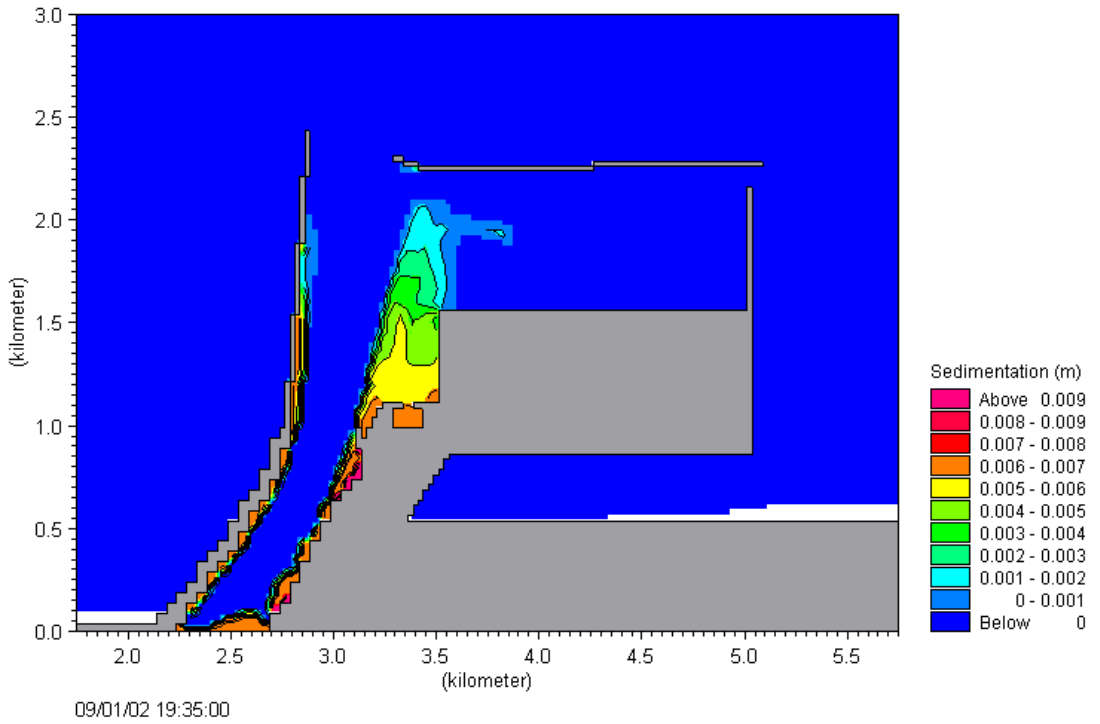


(2)After Construction

Figure F 4.10 Concentration of Suspended Solid for Master Plan (Q=1200 m3/s)

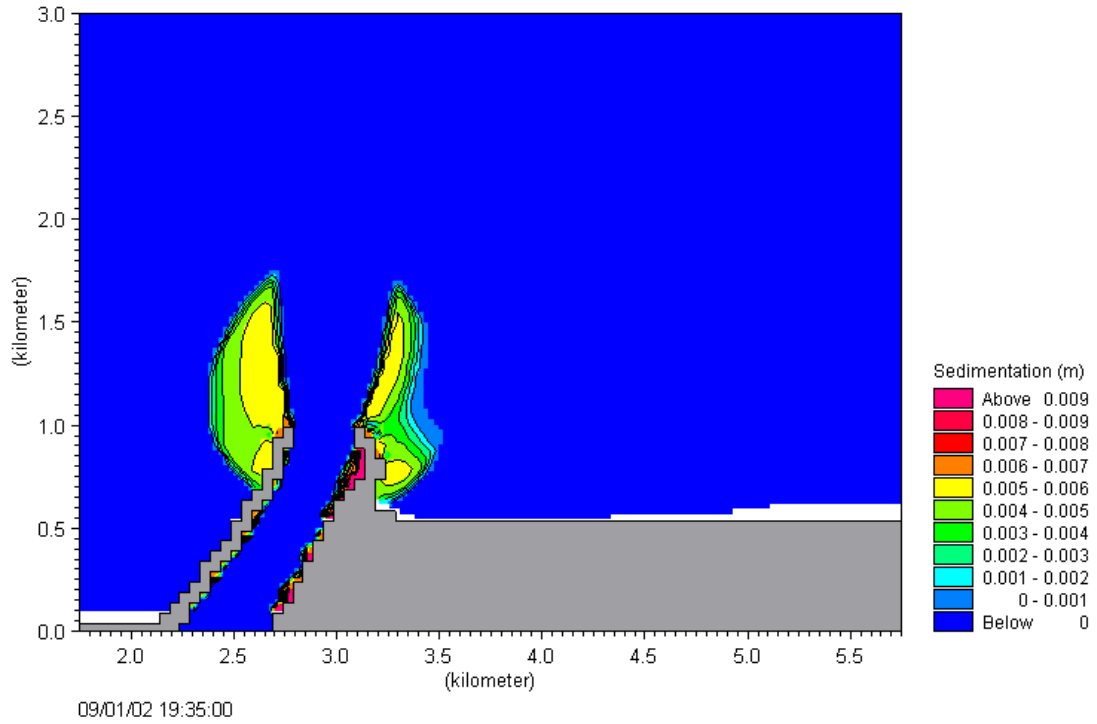


(1)Before Construction

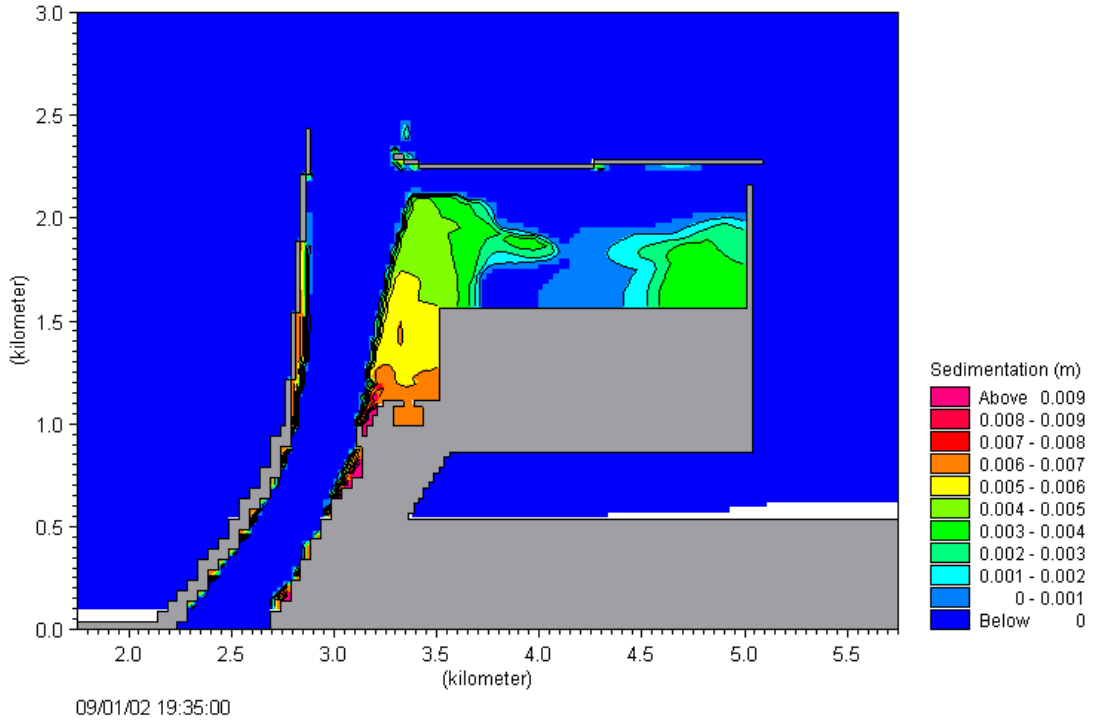


(2)After Construction

Figure F 4.11 Computation Result of Sedimentation for Master Plan (Q=600 m^3/s)



(1)Before Construction



(2)After Construction

Figure F 4.12 Computation Result of Sedimentation for Master Plan (Q=1200 m3/s)

APPENDIX

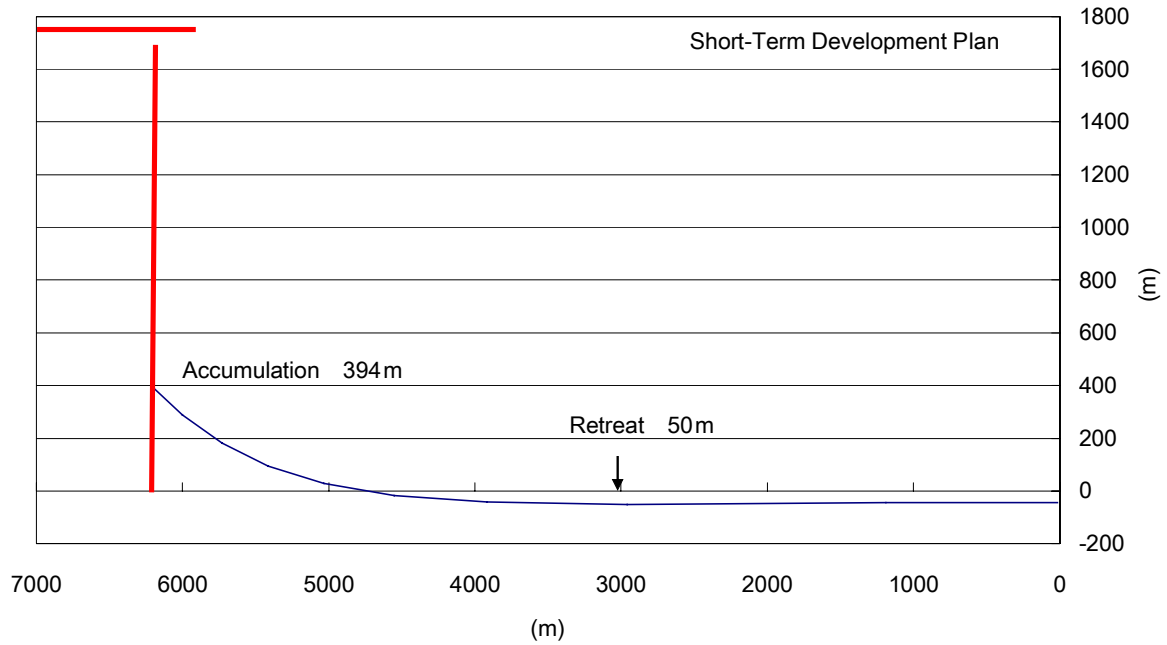
F 5

Analysis of Beach Line Change

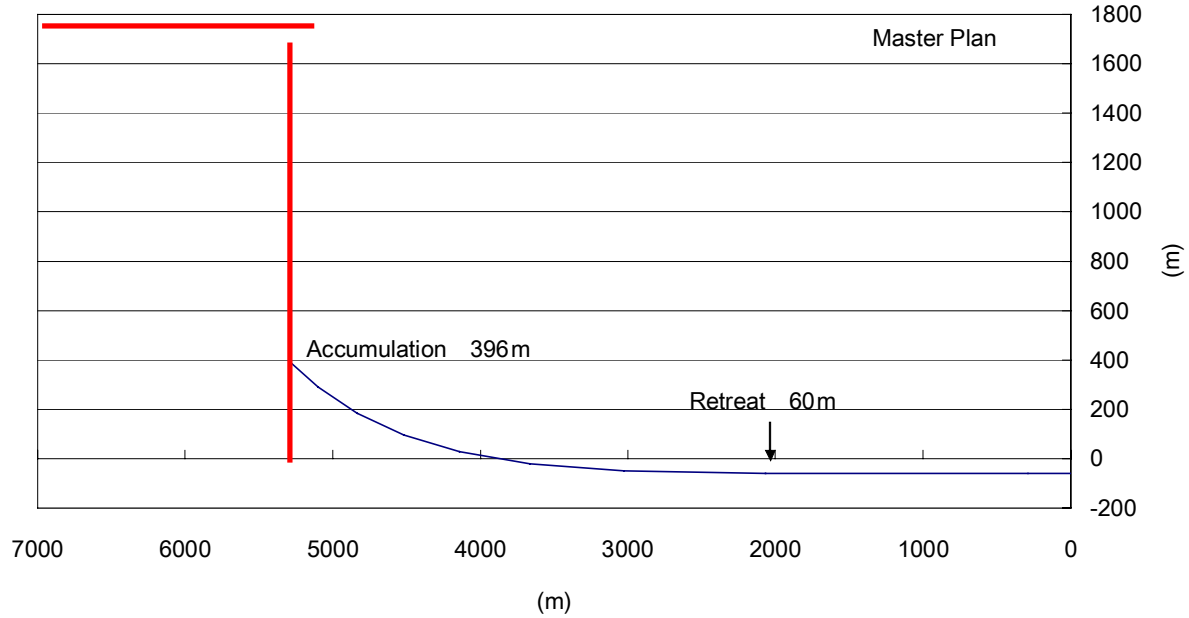
by Experimental Formula (Hsu Method)

And

by Case Study for Island-Type Port

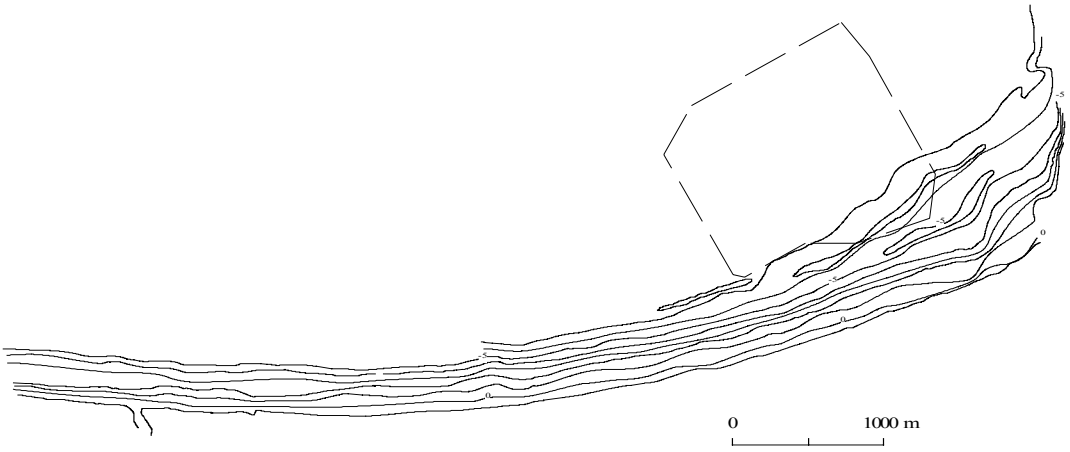


(1) Short Term Plan

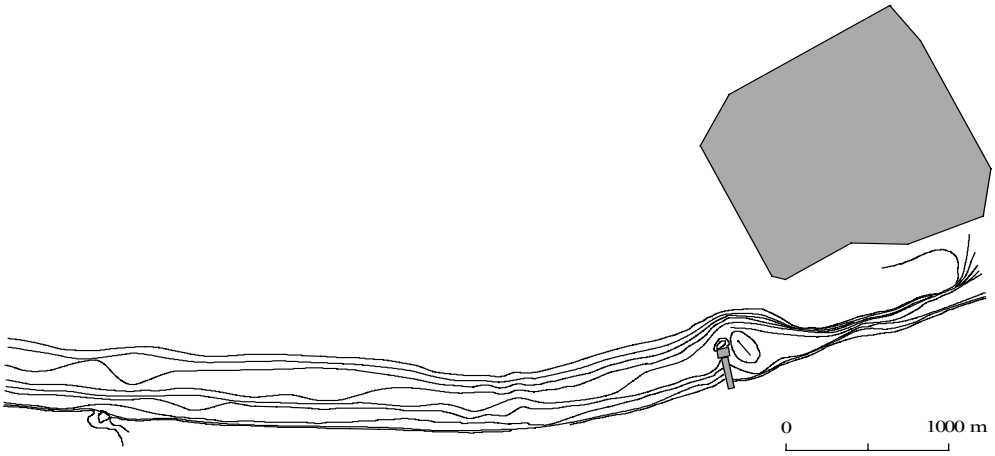


(2) Master Plan

Figure F 5.1 Calculation Result of Beach Line by Experimental formula (Hsu Method)

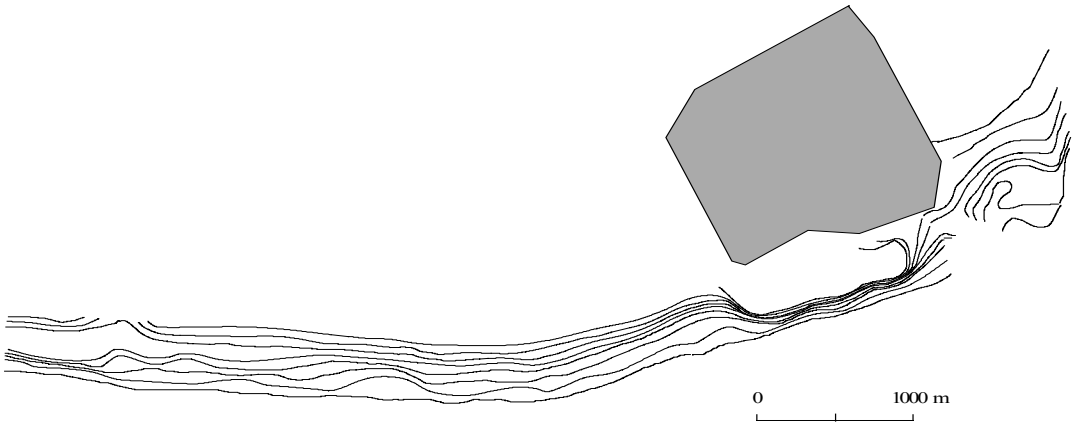


(1) Before Construction

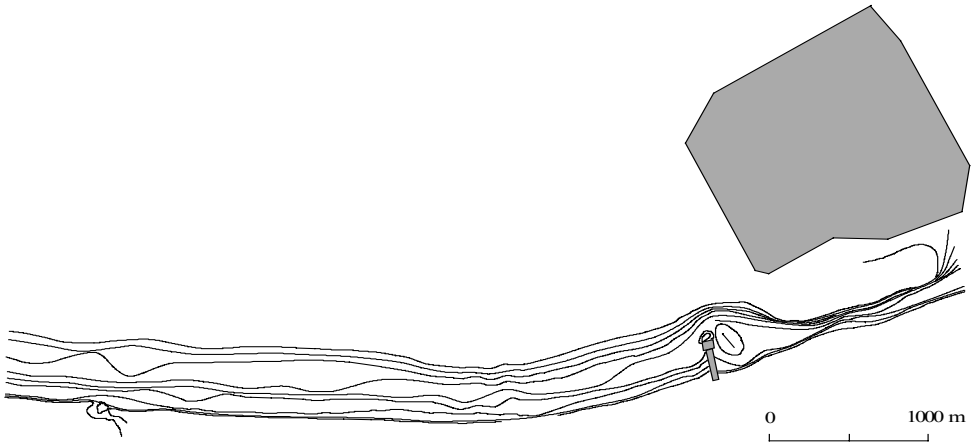


(2) After 5 years

Figure F 5.2 Case Study for Island-Type Port in Japan

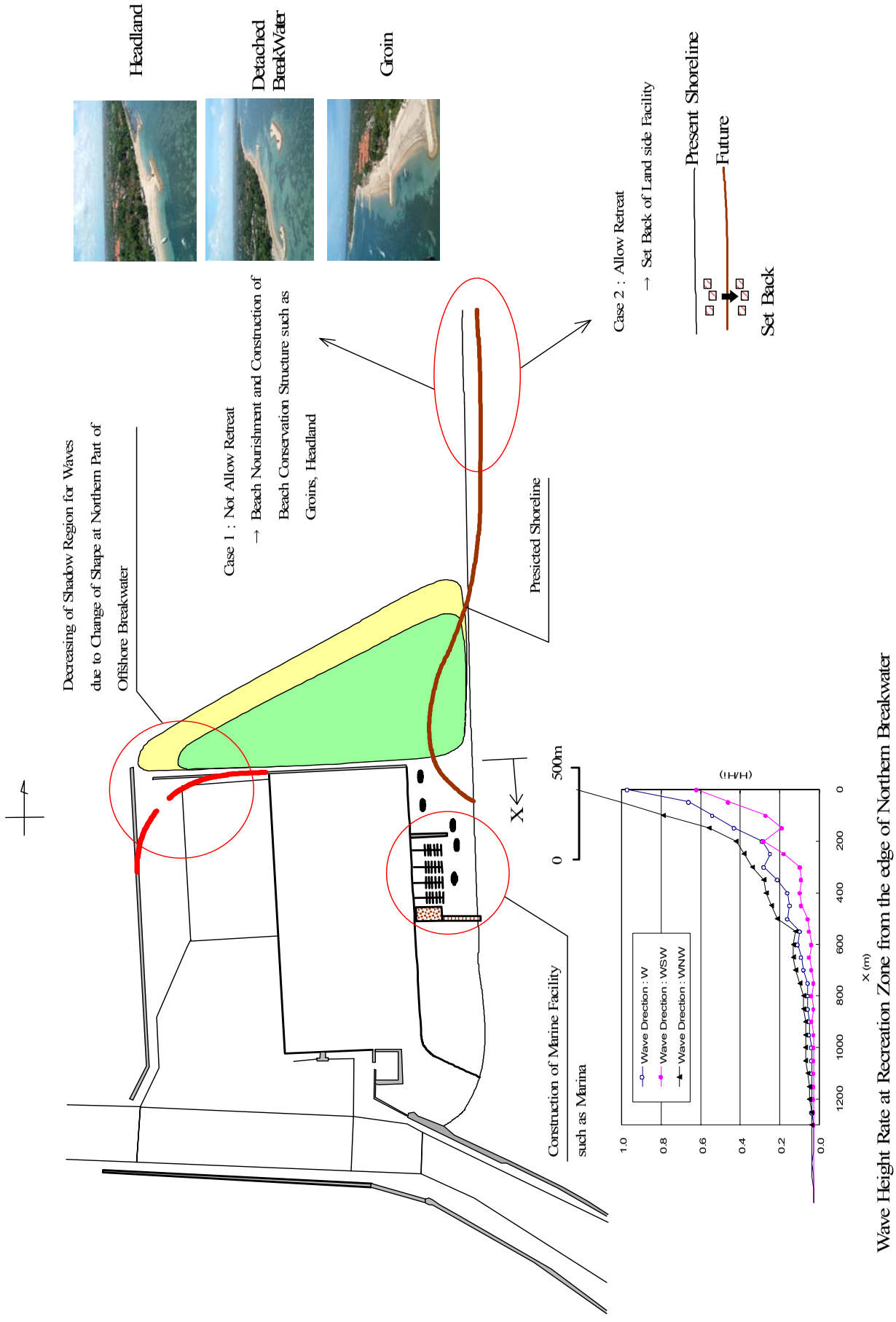


(3) After 10 years



(4) After 15 years

Figure F 5.3 Case Study for Island-Type Port in Japan



F5.4 Image of Countermeasure for Beach Retreat

APPENDIX G CONSTRUCTION COST

APPENDIX G CONSTRUCTION COST

G.1 Marine Structures of Klaipeda Port

G.1.1 Inventory of Quays and Breakwaters

The Port has a total quay length of 19,880m and is composed of 153 berths. Out of that, 76 berths are used for loading and unloading of cargoes, 65 berths for ship repair/building, 5 berths for the City and Navy, and 7 berths for other function. The location of each berth of the Port is shown in Figure G.1.1.

Table G.1.1 Berth Number of Klaipeda Port by Function

Main Function	Number of Berth
1) Loading/Unloading Cargoes	76 Berths
2) Ship Repair/Building	65 Berths
3) Owned by Klaipeda City and Navy	5 Berths
4) Other Function	7 Berths
Total	153 Berths

Source : JICA Study Team summarized based on the information from KSSA

The inventory of quay and breakwater facilities, presented in Table G.1.2, shows the information of berth length, berth depth, quay structure type, and year of built/rehabilitation.

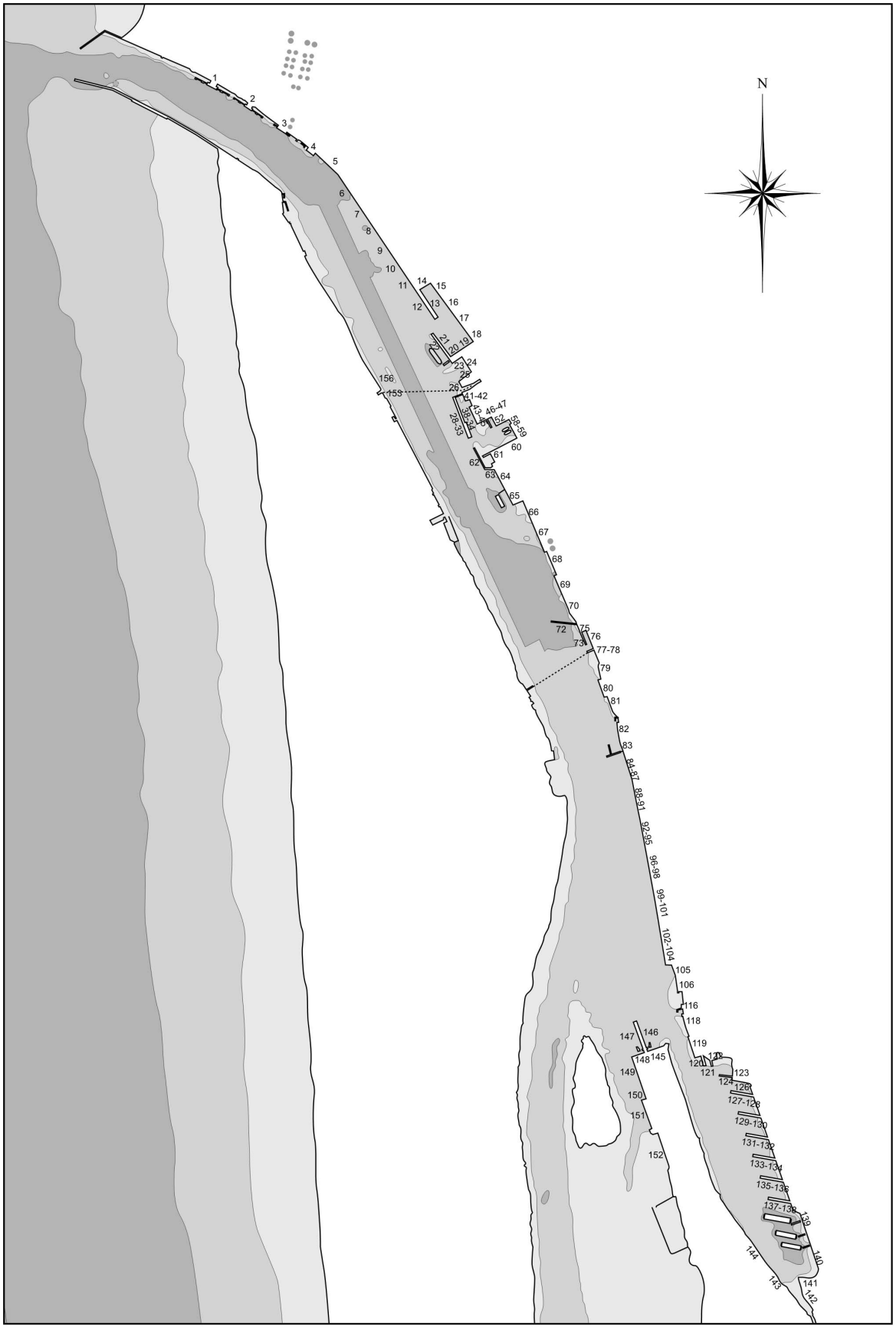


Figure G.1.1 Location of Quays at Klaipeda Port

Table G.1.2 Inventory of Quay and Breakwater of Klaipeda Port

Berth No.	Length of Berth (m)	Depth of Berth (m)	Structural Type	Year of Construction/ Rehabilitation	Major Purpose of Berth
No.1	369.60	-14.00	Steel Sheet Pile with steel piped piles for breasting and mooring dolphines	1958, 1965, 1996	Oil products (fuel oil, diesel, benzine, JET A-1)
No.2	278.00	-14.00	"	1977, 1996	Fuel oil, diesel
No.3	300.59	-14.00	Steel Sheet Pile	1905/06/22	Export-import cargo
No.4	260.38	-14.00	"	1978, 1999	"
No.5	264.41	-14.00	"	1961-156m; 1978-94m, 2003	"
No.6	156.00	-14.00	"	1960, 1973-1975, 2003	"
No.7	180.00	-13.00	Steel Sheet Pile with high pressure concrete	1933, 1957, 1997, 2003	"
No.8	180.00	-13.00	"	1935, 1938, 1964, 1997, 2003	"
No.9	165.00	-12.50	"	1922, 1933, 1964, 1997	"
No.10	179.00	-9.20	Steel Sheet Pile	1922.1966	"
No.11	170.00	-9.20	"	1922.1966	"
No.12	270.00	-10.20	"	1985	"
No.13	260.51	-8.00	"	1985	Ship mooring
No.14	95.34	-7.00	"	1932, 1971	Export-import cargo
No.15	133.99	-8.00	Concrete Caisson	1930-1933, 1965	"
No.16	130.00	-8.00	"	1930-1933, 1965	"
No.17	130.00	-8.00	"	1930-1933, 1957, 1965	"
No.18	132.95	-8.00	"	1930-1933, 1965	"
No.19	102.00	-8.00	"	1930-1933, 1957, 1965, 1968	"
No.20	106.40	-8.00	"	1930-1933, 1965-1968	"
No.21	232.76	-6.05	Concrete Blocks	1970-1971	Ship repair
No.22	290.90	-8.00	Concrete Caisson	1970-1972	Cargo/Ship repair
No.23	85.25	-3.50	Wooden Sheet Pile	1930-1932, 1956	Wrecker
No.24	131.45	-3.50	"	1930-1932, 1963, 1969, 1976-	Ship repair, mooring
No.25	126.45	-5.50	"	1930-1932, 1976-1979	"
No.26					Owned by Plaipeda City
No.27	87.55	-6.63	Steel Sheet Pile	1959, 2003	Ship repair
No.28	58.10	-10.00	"	1986, 2003	"
No.29	57.00	-10.00	"	1986, 2003	"
No.30	57.00	-10.00	"	1986, 2003	Cargo/Ship repair
No.31	57.00	-10.00	"	1986, 2003	Cargo/Ship repair
No.32	57.00	-10.00	"	1988-1989, 2003	"
No.33	65.15	-10.00	"	1988-1989, 2003	Cargo/Ship repair
No.34	58.50	-7.00	Cellular Concrete	1988-1989, 2003	"
No.35	55.00	-7.00	"	1988-1989, 2003	"
No.36	55.00	-6.63	"	1959, 2003	"
No.37	55.00	-6.63	"	1959, 2003	"
No.38	55.00	-6.63	"	1959, 2003	Cargo/Ship repair
No.39				1959, 2003	Disappeared by rehabilitation work
No.40	60.61	-6.63	Steel Sheet Pile	1959, 2003	Ship repair
No.41				1959, 2003	Disappeared by rehabilitation work
No.42	34.36	-4.00	Steel Sheet Pile	1959, 2003	Ship repair
No.43	49.30	-4.50	Wooden Sheet Pile	1963	"
No.44	49.31	-4.50	"	1963	Cargo/Ship repair
No.45	42.18	-5.50	Steel Sheet Pile	1990	"
No.46	39.00	-4.50	Wooden Sheet Pile	NA	"
No.47	40.72	-4.50	"	NA	Ship repair
No.48 to 51					Disappeared by rehabilitation work
No.52	40.00	-5.00	Wooden Sheet Pile	1960	Vehicle
No.53	39.90	-5.00	"	1960	"
No.54	27.00	-4.50	"	1963	Cargo
No.55	27.00	-4.50	"	1963	Vehicle
No.56	27.00	-4.50	"	1963	Cargo
No.57	27.98	-4.50	"	1963	Ship repair
No.58	94.26	-5.10	Concrete Blocks	1983	Docks, official position
No.59	73.69	-6.50	Steel Sheet Pile	1964	Cargo, ship repair
No.60	290.12	-6.10	"	1952, 1988	Cargo/Ship repair
No.61	72.46	-6.10	"	1952, 1988	"
No.62	427.04	-7.00	Concrete Blocks	1952, 1972, 1988, 2000	Ship repair, mooring
No.63	71.83	-7.00	Steel Sheet Pile	1952	"
No.64	137.60	-6.50	"	1963, 1988, 2000	"
No.65	164.19	-6.50	"	1963, 1988	"
No.65a	91.42	-7.50/-4.50	"	1963, 1988	"
No.66	148.43	-6.10	Concrete Blocks	NA	Ship mooring
No.67	261.93	-6.10/12.50	Steel Sheet Pile	NA	Cargo
No.68	229.58	-12.00	"	1967, 1999	"
No.69	150.85	-12.50	"	1967, 2000, 2003	"
No.70	227.61	-12.50	"	1967, 2003	"
No.71	195.13	-12.00	"	1981, 1996, 2003	"
No.72	204.25	-12.00	Trestle w/sheet pile dolphines	1981, 1996, 2003	"
No.73	147.50	-7.00	Steel Sheet Pile	1981	Ship mooring
No.74	95.58	-7.00	"	1981	"
No.75	35.75	-4.00	"	1965, 1967, 1981	"
No.76	147.53	-4.00	"	1981	Ship mooring
No.77	64.63	-4.00/-7.00	"	1981, 2001	Passengers' transportation
No.78	64.78	-4.00/-7.01	"	1981	"
No.79	111.74	-4.00	"	1981	Revetment
No.80	204.28	-9.75	"	1979	Oil products
No.81	175.21	-3.30	Concrete Blocks	1979	Revetment
No.82	183.07	-4.50	Wooden Sheet Pile	to be implemented in 2004, 1977	Emergency
No.83	44.15	-6.50	Concrete Blocks	- " - ,1960	Ship repair
No.84	50.00	-6.50	"	- " - ,1960, 2000	"
No.85	50.00	-6.50	"	- " - ,1959, 2000	Cargo
No.86	50.00	-6.50	"	- " - ,1959, 2000	"
No.87	50.00	-6.50	"	- " - ,1959, 2000	"
No.88	61.00	-6.50	"	- " - ,1968	"
No.89	50.00	-6.50	"	- " - ,1968	"
No.90	50.00	-6.50	"	1968	"
No.91	50.00	-6.50	"	1968	"
No.92	50.01	-6.50	"	1967-1968	"
No.93	65.85	-6.50	"	1967, 1968	"
No.94	100.01	-8.00	Steel Sheet Pile	1966-1967	"
No.95	100.00	-8.00	"	1965	"
No.96	100.00	-8.00	"	1965	"
No.97	100.00	-8.00	"	1957	"
No.98	100.00	-8.00	"	1957, 2000	"
No.99	106.32	-8.00	"	1957, 2000	"
No.100	92.50	-8.00	Concrete Blocks	1963	"
No.101	113.20	-12.50	Steel Sheet Pile	1963, 2001	"
No.102	100.00	-12.50	"	1964, 2001	"
No.103	100.00	-12.50	"	1964-1965, 2001	"
No.104	167.10	-12.50	"	1965-1966, 2001	"
No.105	90.66	-6.50	Concrete Blocks	1979	"
No.106	120.04	-6.50	Steel Sheet Pile	1965	Ship repair
No.107	36.39	-4.00	Wooden Sheet Pile	1967-1968, 2001	Emergency
No.108	26.10	-4.00	"	1966, 2001	Ship repair, mooring
No.109	24.20	-4.00	"	1966, 2001	"
No.110	24.20	-4.00	"	1966, 2001	"
No.111	26.58	-4.00	"	1966, 2001	"
No.112	21.30	-4.00	"	1966, 2001	"
No.113	23.26	-4.00	"	1966, 2001	"
No.114	42.94	-4.00	"	1966, 2001	"
No.115	17.94	-4.00	"	1966, 2001	"
No.116	57.46	-4.00	"	1966, 2001	"
No.117	56.67	-4.00	"	1996, 2001	"
No.118	186.54	-7.50	Steel Sheet Pile	1961, 1988	Cargo
No.119	162.51	-4.00	Steel Sheet Pile + Concrete Blocks	1961, 1967	"
No.120	45.06	-6.00	Concrete Blocks	1967, 1984	"
No.121	69.49	-6.50	"	1983	Ship repair, mooring
No.121a	59.15	-6.50	"	1983	"
No.122	47.97	-5.00	Steel Sheet Pile	1990	Disappeared by rehabilitation work
No.122a	117.51	-7.50	"	1990	Ship repair
No.123 to 126				NA	Navy
No.127	172.35	-7.70	RC Piled Pier	1983	Cargo
No.127a	86.12	-3.50	"	1970	Revetment
No.128	220.83	-7.70	"	1983	Cargo
No.129	174.27	-7.70	"	1974	Ship repair, mooring
No.129a	123.08	-3.50	"	1970	Revetment
No.130	184.25	-7.70	"	1974	Cargo
No.131	176.37	-7.70	"	1973	Disappeared by rehabilitation work
No.131a	147.20	-3.50	"	1970	Ship repair, mooring
No.132	188.76	-7.70	"	1973	"
No.133	176.24	-7.70	"	1972	"
No.133a	146.56	-3.50	"	1970	"
No.134	188.12	-7.70	"	1972	"
No.135	177.04	-7.70	"	1969	"
No.136	188.37	-7.70	"	1969	Docks, official position
No.137	176.97	-7.70	"	1969	Ship building and repair
No.137a	148.33	-3.50	"	1970	"
No.138	188.15	-7.70	"	1969	"
No.138a	50.29	-3.50	"	1970	"
No.139	345.25	-3.50	"	1970, 1980	"
No.140	188.05	-10.00	Steel Sheet Pile	2000	Cargo
No.141	168.34	-10.00	"	2000	"
No.142	123.24	-4.00	"	2000	Ship building and repair
No.143	546.80	-10.00	"	1998	Container
No.144	100.00	NA	"	1996	Botanical Reserve
No.145	141.50	-6.50	"	1986-1987	Revetment
No.146	259.50	-10.00	"	1986	Vehicle
No.147	259.50	-10.00	"	1987	"
No.148	110.40	-6.50	"	1986-1987	Revetment
No.149	220.00	-6.65	"	1986-1987, 1999	Repair
No.150	175.39	-8.00	"	1986-1987, 1999	Vehicle
No.151	307.78	-9.00	"	1998	"
No.152	504.39	NA	Steel Sheet Pile		"
Total:	**19,880m**				Ship mooring
Dane's River	231.53	-4.00	Wooden Berths		Passengers' transportation
Smiltyne Berth	255.98	-4.00	Wooden Berths		"

G.1.2 Structural Types of Existing Quay Structures

The old quays constructed before 1960s are mainly wooden sheet pile type, concrete block type, and steel sheet pile with shallow water depth (see Table 5.3.2). The quays with a depth shallower than –4.5m are mostly of wooden sheet pile type and can be seen in the areas of Klaipeda Ship Repair Yard, Senoji Baltija, and Klaipedos Hidrotechnika. Wooden piles are driven to the seabed by 4 to 5 meters and tied with anchor plate. Figure G.1.2 shows a representative quay structure of wooden sheet pile type.

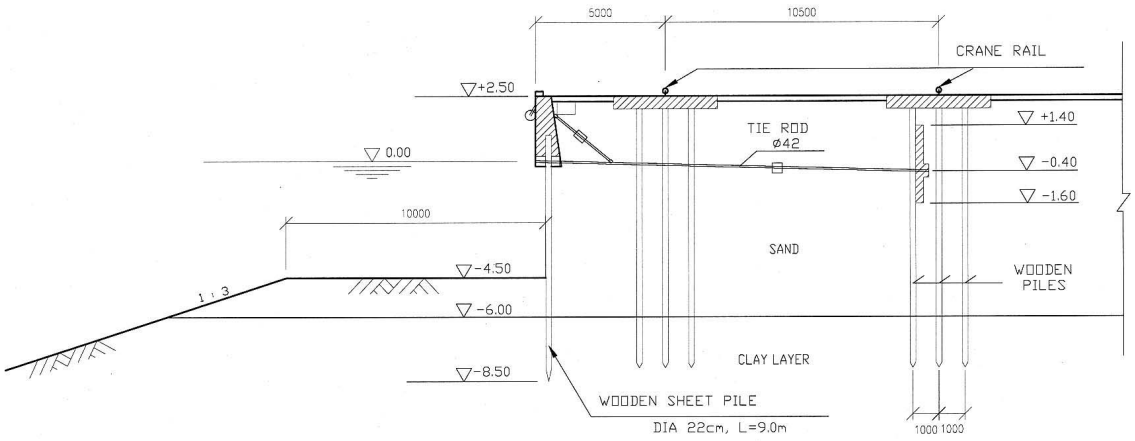


Figure G.1.2 Wooden Sheet Pile Type Quay Structure

The concrete block type was applied for the quays with a depth between –4.5m and –8.0m (see Figure G.1.3). It shows that the subsoil layer has significant bearing capacity to support vertical loads of structure and it is well consolidated without potential land settlement.

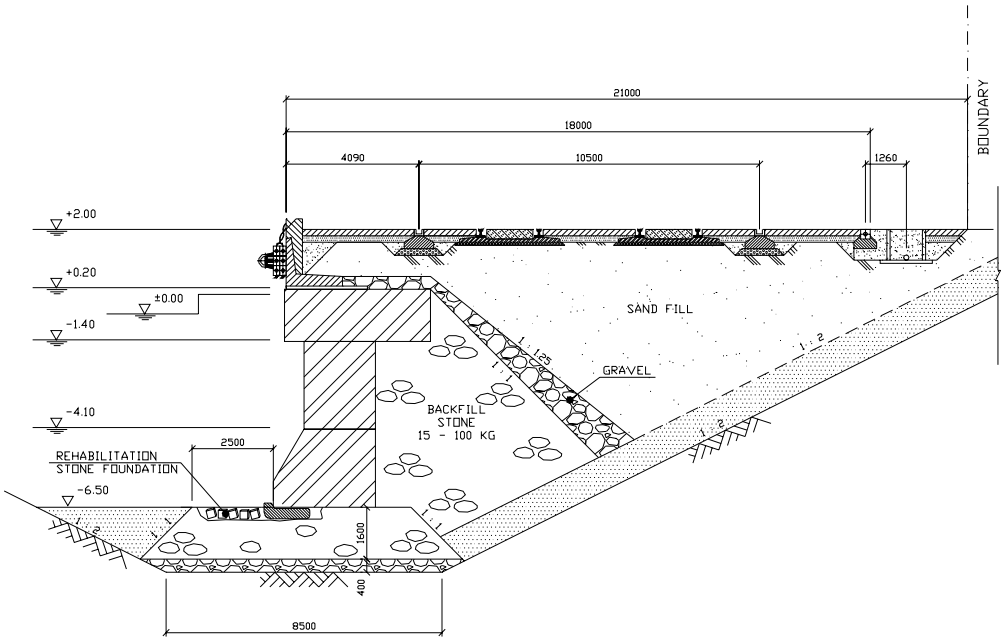


Figure G.1.3 Concrete Block Type Quay Structure

In addition to the wooden sheet pile type and concrete block type, cellular concrete block type was applied mainly for the piers of Klaipeda Ship Repair Yard and BEGA.

These old type structures are being renewed to obtain more deeper water depth of quays to accommodate larger vessels.

(3) Recent Rehabilitation Works Performed in Klaipeda Port

In the recent years, several major rehabilitation and renewal works have been carried out for the Port which include:

- World Bank - assisted Projects : the Rehabilitation of the Existing Breakwaters, North and South Breakwater Extension, and Dredging of the Channel Entrance,
- EIB - assisted Project : the Rehabilitation of Klaipeda Seaport Quays Nos. 5 and 6, and
- Other : reconstruction works of exisiting berths executed by KSSA.

Also KSSA is carrying out rehabilitation of quaywall and onland facilities such as coping concrete, pavement, and other associated works using own fund.

1) Breakwater Extension

The North and South Breakwaters were in poor condition and were repeatedly damaged by storm waves. Also the geometrical design of breakwaters did not allow safe maneuvers of in/out vessels and cargo handling under severe weather conditions being experienced at the oil berths located near the entrance of the port. In order to mitigate the cargo handling problem and alleviate the potential risk of oil spills from the oil terminal, KSSA has decided to extende the breakwaters and provide additional breakwater.

The extension of two breakwaters and construction of additional breakwater have started in March 2001. The North breakwater has extended by 205m and the South breakwater by 278m. With the completion of the work in August 2002, North and South breakwaters at present have 733m and 1,347m respectively.

In designing breakwaters, its layout was examined by hydraulic model tests to minimise wave agitation in the port basin especially at the oil berths and to keep safe navigation of ships coming in and out through the entrance of the channnel. In analysisng structural stability, hydraulic model testing was also carried out to determine the size of armour materials.

The nearshore design waves were analysed based on the probable offshore waves of 9.3 m with a direction of W. The design wave heights for the North breakwater was set at 4.8 m, while the South breakwater at 5.3 m. It was determined to place 25 tons tetrapods (concrete blocks as a primary armour) on the top of rock mound at the head porttion for both breakwaters. Since large sized rock materials were not available, the rocks for underlayers and core were transported from Sweden.

Figure G.1.4 shows the typical cross section of the North breakwater at the head portion.

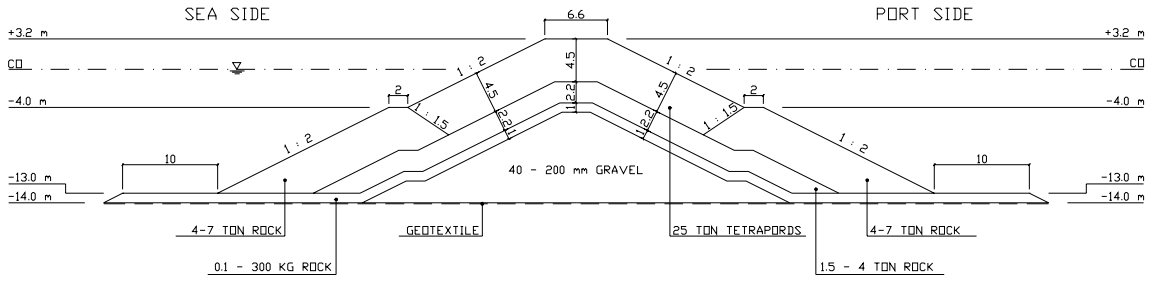


Figure G.1.4 Typical Cross Section of North Breakwater at Head Portion

2) Rehabilitation of Quay Nos. 5 and 6

The rehabilitation work for the Quay Nos. 5 and 6 are being carried out in the year 2003 to provide deeper water depth alongside these quays. The project is being implemented with financial assistance of the European Investment Bank (EIB) for procurement of the consultant for supervision and construction work.

The quay, after deepening to –14.0m, will be able to accommodate the vessels up to 80,000 DWT. The new faceline of the berth has been shifted 35m to 40m seaward, except for the area near to Quay No. 7.

As seen from the cross section in Figure G.1.5, the structural type of steel sheet pile was applied for the rehabilitation of Quays No. 5 and 6. This structural type has been employed for other berths of the Port. The sheet piles was designed to drive down to –22.0m where a hard sandy clay layer exists. As a foundation of crane rails, steel piles with a diameter of 1,020mm were used at an interval of 3.48m.

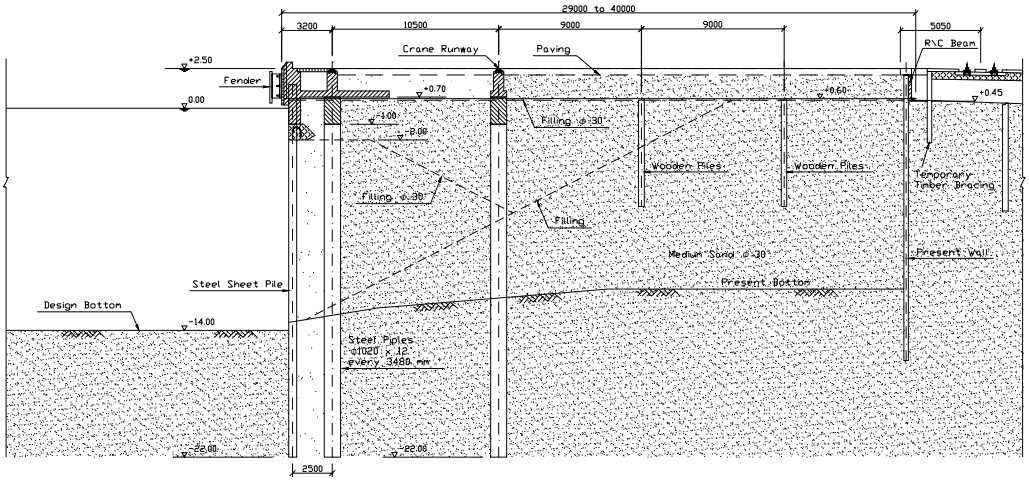


Figure G.1.5 Cross Section of Structure for Rehabilitation of Quays Nos. 5 and 6

G.2 Unit Cost

Unit costs of labour, materials, equipment assumed in estimating construction cost are shown in Tables G.2.1, G.2.2, and G.2.3.

Table G.2.1 Unit Material Cost

Item	Specification	Unit	Unit Cost in LTL	Unit Cost in Euro	Remarks
Diesel Fuel		ltr	1.98	0.57	at gas station
Gasoline	Regular	ltr	2.27	0.66	at gas station
Gasoline	Super	ltr	2.35	0.68	at gas station
Bunker Fuel		ltr	0.41	0.12	at ship
Grease		kg	45.00	13.07	at gas station
Carbide		kg	2.00	0.58	
Oxygen		cu.m	2.50	0.73	
Nail		kg	3.50	1.02	at Klaipeda Port
Concrete Aggregate		cu.m	130.00	37.75	at Klaipeda Port
Concrete Sand		cu.m	39.00	11.32	at Klaipeda Port
Portland Cement		ton	280.00	81.30	at Klaipeda Port
Re-Bar	Round 10-13mm	ton	1,350.00	391.99	at Klaipeda Port
Re-Bar	Deformed 13-35	ton	1,350.00	391.99	at Klaipeda Port
Binding Wire	0.8 mm #21	kg	1,200.00	348.43	at Klaipeda Port
Wire	3 mm	kg	1,200.00	348.43	at Klaipeda Port
Anti-corrosion paint		kg	45.00	13.07	at Klaipeda Port
Clay brick	for building	pc	0.63	0.18	at Klaipeda Port
Concrete block	for building	pc	3.09	0.90	at Klaipeda Port
Asphalt Concrete		ton	165.50	48.05	at plant
Strait Asphalt	60/80	ton	250.00	72.59	at Klaipeda Port
H-Beam	H200x200~H400x40(	ton	1,400.00	406.50	at Klaipeda Port
Channel	[-125 ～[-250	ton	1,500.00	435.54	at Klaipeda Port
Angle	L50~100	ton	1,400.00	406.50	at Klaipeda Port
Steel Plate	t=6mm ~ 25mm	ton	1,600.00	464.58	at Klaipeda Port
Plywood	t=12mm, 90x182	sheet	36.00	10.45	at Klaipeda Port
Plywood (coated-acrylic)	t=12mm, 90x180	sheet		0.00	at Klaipeda Port
Plywood (waterproof)	t=12mm, 3' x 6'	sheet	100.00	29.04	at Klaipeda Port
Wood	200 x 150	cu.m	504.00	146.34	at Klaipeda Port
Wood	100 x 100	cu.m	480.00	139.37	at Klaipeda Port
Wood	50 x 30	cu.m	440.00	127.76	at Klaipeda Port
Metal Form	(100, 200, 300) x 180	sq.m	203.00	58.94	at Klaipeda Port
Steel Pipe Pile	dia 300 - 500	ton	1,800.00	522.65	at Klaipeda Port
Steel Pipe Pile	dia 600 t=9mm	ton	1,900.00	551.68	at Klaipeda Port
Steel Pipe Pile	dia 1300 t=20mm	ton	2,000.00	580.72	at Klaipeda Port
RC Pile	dia 400 l=12 m	no	885-1150	257-334	at Klaipeda Port
RC Pile	dia 500 l=12 m	no		0.00	at Klaipeda Port
RC Pile	dia 600 l=12 m	no		0.00	at Klaipeda Port
PC Pile (pre-stress)	dia 400 l=12 m	no		0.00	at Klaipeda Port
PC Pile	dia 500 l=12 m	no		0.00	at Klaipeda Port
PC Pile	dia 600 l=12 m	no		0.00	at Klaipeda Port
PVC Pipe (light duty)	dia 40mm t=1.8mm	m	4.90	1.42	at Klaipeda Port
PVC Pipe (light duty)	dia 50mm t=1.8mm	m	5.50	1.60	at Klaipeda Port
PVC Pipe (light duty)	dia 75mm t=2.8mm	m	10.30	2.99	at Klaipeda Port
PVC Pipe (light duty)	dia 100mm t=3.1mm	m	14.20	4.12	at Klaipeda Port
PVC Pipe (light duty)	dia 150mm t=5.1mm	m	25.80	7.49	at Klaipeda Port
Bollard	40 ton	no	2,600.00	754.94	at Klaipeda Port
Rubber Fender	dia 400 x 1500L	no	1,500.00	435.54	at Klaipeda Port
Rubber Fender	dia 1,000 x 1,500L	no	6,000.00	1,742.16	at Klaipeda Port
Rock 0 ~ 1000 kg		cu.m	140.00	40.65	at Klaipeda Port
Electricity		KWH	0.35	0.10	at Klaipeda Port
Water		cu.m	3.64	1.06	at Klaipeda Port

Source : JICA Study Team

Table G.2.2 Unit Labour Cost

Description	Unit	Bare Salary Rate in LTL wo/benefit	Unit Labour Cost in LTL w/benefits	Unit Labour Cost in Euro w/benefits	Remarks
Field Worker					
Common Labour	Day	56	75	22	
Semi-skilled Labour	Day	62	84	24	
Workshop Assistant	Day	88	120	35	
Carpenter	Day	64	86	25	
Bar-bender	Day	64	86	25	
Concreter	Day	64	86	25	
Welder	Day	88	120	35	
Piling Crew	Day	72	100	29	
Light Machine Operator	Day	72	100	29	
Vehicle Driver	Day	64	86	25	
Heavy Equipment Operator	Day	80	110	32	
Dump Truck Driver	Day	64	86	25	
Mechanic	Day	72	100	29	
Electrician	Day	64	86	25	
Gang Leader	Day	96	130	38	
Foreman	Day	96	130	38	
Chief Mechanic	Day	152	200	58	
Surveyor	Day	120	160	47	
Marine Work					
Captain (foreign)	Day	1,200	1,610	470	
Boatswain (foreign)	Day	960	1,290	380	
Crew (foreign/German)	Day	800	1,070	310	
Captain (local)	Day	96	190	55	include 50% overtime
Boatswain (local)	Day	80	160	47	include 50% overtime
Crew (local)	Day	64	130	38	include 50% overtime
Diver (local)	Day	135	180	52	3 hours diving per day
Diver (foreign/German)	Day	1,120	1,500	440	3 hours diving per day
Office Work					
Engineer (14-15 years)	Month	2,500	3,360	980	
Engineer (7-10 years)	Month	2,000	2,680	780	
Engineer (1-5 years)	Month	1,800	2,420	700	
Secretary (Lithuania)	Month	1,000	1,340	390	
Secretary (English)	Month	1,200	1,610	470	
CAD Operator	Month	2,000	2,680	780	

Source : JICA Study Team

Note : As the benefits (income tax, annual leave, and administration costs State Social Security Fund contribution of 31% by employer and 3% by employee. Employer's contribution for the Guarantee Fund is 0.2%. Thus, the total contribution for Social Security and Social Benefits is 34.2% of gross wage.

Table G.2.3 Unit Equipment Cost

(1) Floating Equipment

Code	Equipment	Capcity	PS	Purchase cost (1000 €)	E Daily Equip't Owning cost (€/day)	F Total Man-power (€/day)	G Total Fuel Cost (€/day)	Daily Rate of Equip't /Operation E+F+G €/day	Remarks
M 101	Crane Barge	50 t	139	457	491	970	108	1,569	
M 102	Crane Barge	100 t	263	911	977	1,029	205	2,211	
M 103	Crane Barge	150 t	265	1,102	1,183	1,088	207	2,478	
M 104	Anchor Boat	5 t	60	255	288	851	13	1,152	
M 105	Anchor Boat	10 t	180	505	569	924	39	1,532	
M 105a	Anchor Boat	15 t	240	754	474	515	26	1,015	
M 106	Anchor Boat	20 t	360	1,002	1,130	984	77	2,191	
M 106a	Anchor Boat	35 t	600	1,648	1,036	686	129	1,851	
M 107	Tug Boat		100	68	63	792	11	865	4 hour operation
M 108	Tug Boat		200	129	119	792	22	933	4 hour operation
M 109	Tug Boat		250	160	148	865	27	1,040	4 hour operation
M 110	Tug Boat		350	212	195	865	38	1,098	4 hour operation
M 111	Tug Boat		500	292	269	924	54	1,248	4 hour operation
M 112	Tug Boat		600	342	316	924	97	1,337	6 hour operation
M112A	Tug Boat		1,000	555	512	984	53,760	55,256	Towing 2 hours
M112B	Tug Boat		1,000	555	512	984	161	1,657	Towing 6 hours
M112C	Tug Boat		1,500	775	716	984	242	1,941	Towing 6 hours
M 113	Tug Boat		2,000	1,012	934	984	538	2,456	10 hour operation
M 114	Flat barge	100 t		49	47	118	0	166	
M 115	Flat barge	200 t		93	90	118	0	208	
M 116	Flat barge	300 t		128	123	118	0	241	
M 117	Flat barge	500 t		170	163	118	0	282	
M 118	Flat barge	1000 t		299	288	118	0	407	
M 119	Piling Barge D-25	D 25	140	899	609	698	917	2,224	
M 120	Piling Barge D-45	D 45	300	1,922	1,301	1,078	1,636	4,015	
M 121	Piling Barge D-72	D 72	550	3,807	2,166	1,154	2,626	5,946	
M 122	Cutter Suction Dredger	3200 PS	3,200	8,400	4,980	3,296	1,475	9,751	16 hour Operation
M 123	Cutter Suction Dredger	4000 PS	4,000	10,823	6,417	3,448	1,843	11,708	16 hour Operation
M 124	Cutter Suction Dredger	6000 PS	6,000	15,400	9,130	3,676	2,765	15,571	16 hour Operation
M 125	Cutter Suction Dredger	8000 PS	8,000	19,277	11,428	3,752	3,686	18,867	16 hour Operation
M 126	Grub Barge 7.5 m3 for hard soil		1,900	5,169	3,840	1,239	427	5,506	8 hours operation
M 127	Grub Barge 11.5 m3 for hard soil		2,600	8,508	6,320	1,315	584	8,219	8 hours operation
M127A	Grub Barge 23 m3 for hard soil		2,600	8,023	5,960	1,315	584	7,859	8 hours operation
M 128	Grab Gutt Barge (for hard layer)	7.5 cu.m	1,900	5,169	3,840	1,239	427	5,506	
M 129	Grab Gutt Barge (for hard layer)	11.5 cu.m	2,600	8,508	6,320	1,315	584	8,219	
M 130	Diver Boat	51KW	70	81	96	73	41	210	
M 131	Transportation Boat	4.9ton	50	20	120	93	5	218	
M 132	Floating Dock	6500 t	-	4,895	2,886		99	2,984	
M 133	Floating Dock	8500 t	-	6,510	3,838		109	3,947	
M 134	Sand Transportation Barge	650 m3		555	544		0	544	
M 135	Sand Transportation Barge	1,300 m3		878	861		0	861	

(2) Onland Equipment

Code	Equipment	Capcity	PS	Purchase cost	E Daily Equip't Owning cost	F Total Man-power (€/day)	G Total Fuel Cost (€/day)	Daily Rate of Equip't /Operation E+F+G €/day	Remarks
Land Construction Equipment									
M201	Truck Crane (hydraulic type)	25 ton	274	136	122	32	120	274	6 hours Operation
M202	Truck Crane (hydraulic type)	35 ton	325	186	167	32	143	342	6 hours Operation
M203	Truck Crane (hydraulic type)	45 ton	338	233	209	32	149	390	6 hours Operation
M204	Crawler Crane (mechanical)	35 ton	117	161	147	32	97	276	6 hours Operation
M205	Crawler Crane (mechanical)	40 ton	128	176	160	32	106	299	6 hours Operation
M206	Crawler Crane (mechanical)	45 ton	130	181	165	32	108	305	6 hours Operation
M207	Crawler Crane (mechanical)	50 ton	139	224	204	32	116	352	6 hours Operation
M208	Crawler Crane (mechanical)	80 ton	219	395	360	32	182	574	6 hours Operation
M209	Crawler Crane (mechanical)	100 ton	263	535	488	32	219	739	6 hours Operation
M210	Crawler Crane (mechanical)	150 ton	265	727	663	32	220	915	6 hours Operation

G.3 Unit Construction Cost

G.3.1 Unit Construction Cost of Breakwater

(1) West Breakwater – Rock Mound Type with ACCROPOD

Description	Unit	Q'ty	Unit Rate	Amount	Remarks
1. Depth -16m					
Manufacture, Store, and Place 9.0 m3 Accropod	no	7.82	1,299	10,155	
Manufacture, Store, and Place 5.0 m3 Accropod	no	4.45	897	3,991	
Triming Rock Surface	m2	75.10	33	2,493	
Supply and Placing 4 to 7 ton Rock	m3	129.60	41	5,314	
Supply and Placing Quarry Run	m3	532.30	33	17,566	
				39,519	
2. Depth -15m					
Manufacture, Store, and Place 9.0 m3 Accropod	no	7.58	1,299	9,848	
Manufacture, Store, and Place 5.0 m3 Accropod	no	4.08	897	3,663	
Triming Rock Surface	m2	71.70	33	2,380	
Supply and Placing 4 to 7 ton Rock	m3	122.90	41	5,039	
Supply and Placing Quarry Run	m3	480.60	33	15,860	
				36,789	
3. Depth -14m					
Manufacture, Store, and Place 9.0 m3 Accropod	no	7.34	1,299	9,540	
Manufacture, Store, and Place 5.0 m3 Accropod	no	3.71	897	3,325	
Triming Rock Surface	m2	68.40	33	2,270	
Supply and Placing 4 to 7 ton Rock	m3	116.30	41	4,768	
Supply and Placing Quarry Run	m3	431.50	33	14,240	
				34,143	
4. Depth -13m					
Manufacture, Store, and Place 9.0 m3 Accropod	no	7.11	1,299	9,233	
Manufacture, Store, and Place 5.0 m3 Accropod	no	3.33	897	2,987	
Triming Rock Surface	m2	65.10	33	2,161	
Supply and Placing 4 to 7 ton Rock	m3	109.60	41	4,494	
Supply and Placing Quarry Run	m3	385.10	33	12,708	
				31,582	
5. Depth -12m					
Manufacture, Store, and Place 9.0 m3 Accropod	no	6.87	1,299	8,925	
Manufacture, Store, and Place 5.0 m3 Accropod	no	2.96	897	2,658	
Triming Rock Surface	m2	61.70	33	2,048	
Supply and Placing 4 to 7 ton Rock	m3	102.90	41	4,219	
Supply and Placing Quarry Run	m3	341.40	33	11,266	
				29,116	
6. Depth -11m					
Manufacture, Store, and Place 9.0 m3 Accropod	no	6.63	1,299	8,618	
Manufacture, Store, and Place 5.0 m3 Accropod	no	2.59	897	2,320	
Triming Rock Surface	m2	58.40	33	1,938	
Supply and Placing 4 to 7 ton Rock	m3	96.30	41	3,948	
Supply and Placing Quarry Run	m3	300.30	33	9,910	
				26,734	
7. Breakwater Head at Depth -15m					
Manufacture, Store, and Place 9.0 m3 Accropod	no	7.58	1,299	9,848	
Manufacture, Store, and Place 5.0 m3 Accropod	no	3.33	1,299	4,323	
Triming Rock Surface	m2	71.70	33	2,380	
Supply and Placing 4 to 7 ton Rock	m3	122.90	41	5,039	
Supply and Placing Quarry Run	m3	480.60	33	15,860	
				37,449	

(2) South and North Breakwater – Rock Mound Type with ACCROPOD

Description	Unit	Q'ty	Unit Rate	Amount	Remarks
1. Depth -18m					
Manufacture, Store, and Place 3.0 m3 Accropod	no	17.21	626	10,775	
Manufacture, Store, and Place 1.5 m3 Accropod	no	12.27	413	5,066	
Triming Rock Surface	m2	70.30	33	2,333	
Supply and Placing 1 to 3 ton Rock	m3	211.20	38	8,026	
Supply and Placing Quarry Run	m3	486.70	33	16,061	
				42,261	
2. Depth -17m					
Manufacture, Store, and Place 3.0 m3 Accropod	no	16.68	626	10,443	
Manufacture, Store, and Place 1.5 m3 Accropod	no	11.43	413	4,722	
Triming Rock Surface	m2	67.00	33	2,224	
Supply and Placing 1 to 3 ton Rock	m3	200.20	38	7,608	
Supply and Placing Quarry Run	m3	437.60	33	14,441	
				39,437	
3. Depth -16m					
Manufacture, Store, and Place 3.0 m3 Accropod	no	16.16	626	10,121	
Manufacture, Store, and Place 1.5 m3 Accropod	no	10.60	413	4,378	
Triming Rock Surface	m2	63.60	33	2,111	
Supply and Placing 1 to 3 ton Rock	m3	189.30	38	7,193	
Supply and Placing Quarry Run	m3	391.10	33	12,906	
				36,710	
4. Depth -15m					
Manufacture, Store, and Place 3.0 m3 Accropod	no	15.63	626	9,789	
Manufacture, Store, and Place 1.5 m3 Accropod	no	9.77	413	4,034	
Triming Rock Surface	m2	60.30	33	2,001	
Supply and Placing 1 to 3 ton Rock	m3	178.40	38	6,779	
Supply and Placing Quarry Run	m3	347.40	33	11,464	
				34,067	
5. Depth -14m					
Manufacture, Store, and Place 3.0 m3 Accropod	no	15.10	626	9,457	
Manufacture, Store, and Place 1.5 m3 Accropod	no	8.93	413	3,689	
Triming Rock Surface	m2	57.00	33	1,892	
Supply and Placing 1 to 3 ton Rock	m3	167.40	38	6,361	
Supply and Placing Quarry Run	m3	306.30	33	10,108	
				31,507	
6. Depth -13m					
Manufacture, Store, and Place 3.0 m3 Accropod	no	14.59	626	9,135	
Manufacture, Store, and Place 1.5 m3 Accropod	no	8.10	413	3,345	
Triming Rock Surface	m2	53.60	33	1,779	
Supply and Placing 1 to 3 ton Rock	m3	156.50	38	5,947	
Supply and Placing Quarry Run	m3	267.80	33	8,837	
				29,044	
7. Depth -12m					
Manufacture, Store, and Place 2.5 m3 Accropod	no	16.19	562	9,090	
Manufacture, Store, and Place 1.5 m3 Accropod	no	7.27	413	3,001	
Triming Rock Surface	m2	49.90	33	1,656	
Supply and Placing 1 to 3 ton Rock	m3	147.90	38	5,620	
Supply and Placing Quarry Run	m3	227.30	33	7,501	
				26,868	
8. Depth -11m					
Manufacture, Store, and Place 2.5 m3 Accropod	no	15.60	562	8,761	
Manufacture, Store, and Place 1.5 m3 Accropod	no	6.43	413	2,657	
Triming Rock Surface	m2	46.60	33	1,547	
Supply and Placing 1 to 3 ton Rock	m3	136.70	38	5,195	
Supply and Placing Quarry Run	m3	194.70	33	6,425	
				24,584	
9. Depth -10m					
Manufacture, Store, and Place 2.5 m3 Accropod	no	15.01	562	8,431	
Manufacture, Store, and Place 1.5 m3 Accropod	no	5.60	413	2,313	
Triming Rock Surface	m2	43.30	33	1,437	
Supply and Placing 1 to 3 ton Rock	m3	125.60	38	4,773	
Supply and Placing Quarry Run	m3	164.80	33	5,438	
				22,392	
10. Depth -9m					
Manufacture, Store, and Place 2.5 m3 Accropod	no	14.41	562	8,090	
Manufacture, Store, and Place 1.5 m3 Accropod	no	4.77	413	1,969	
Triming Rock Surface	m2	39.90	33	1,324	
Supply and Placing 1 to 3 ton Rock	m3	114.40	38	4,347	
Supply and Placing Quarry Run	m3	137.50	33	4,538	
				20,268	

(3) South Breakwater – Caisson Type

Description	Unit	Q'ty	Unit Rate	Amount	Remarks
1. Depth -17m					
Supply and Placing 1 to 3 ton Rock for Mound	m3	3,014.40	38	114,547	per 12 m
Trimming of Rock Surface - High Grade	m2	192.00	68	13,108	- do -
Trimming of Rock Surface - Common Grade	m2	280.80	33	9,320	- do -
Supply and Placing Toe Concrete Block 37 t	no	4.80	2,411	11,574	- do -
Supply and Placing Toe Concrete Block 18.5 t	no	4.80	1,308	6,277	- do -
Suppy and Placing Toe Protection Block 6.0 t	no	40.19	633	25,423	- do -
Manufacture, Store, and Place Caisson 12 x 12m	no	1.00	253,388	253,388	- do -
Form Work for Coping Concrete	m2	104.91	32	3,344	- do -
Supply and Placing Coping Concrete	m3	207.75	89	18,500	- do -
			per 12 m	**455,480**	
			per 1 m	**37,957**	
2. Depth -16m					
Supply and Placing 1 to 3 ton Rock for Mound	m3	2,428.80	38	92,294	per 12 m
Trimming of Rock Surface - High Grade	m2	192.00	68	13,108	- do -
Trimming of Rock Surface - Common Grade	m2	267.60	33	8,882	- do -
Supply and Placing Toe Concrete Block 37 t	no	4.80	2,411	11,574	- do -
Supply and Placing Toe Concrete Block 18.5 t	no	4.80	1,308	6,277	- do -
Suppy and Placing Toe Protection Block 6.0 t	no	34.45	633	21,791	- do -
Manufacture, Store, and Place Caisson 12 x 12m	no	1.00	253,388	253,388	- do -
Form Work for Coping Concrete	m2	104.91	32	3,344	- do -
Supply and Placing Coping Concrete	m3	207.75	89	18,500	- do -
			per 12 m	**429,158**	
			per 1 m	**35,763**	
3. Depth -15m					
Supply and Placing 1 to 3 ton Rock for Mound	m3	1,878.00	38	71,364	per 12 m
Trimming of Rock Surface - High Grade	m2	192.00	68	13,108	- do -
Trimming of Rock Surface - Common Grade	m2	240.00	33	7,966	- do -
Supply and Placing Toe Concrete Block 37 t	no	4.80	2,411	11,574	- do -
Supply and Placing Toe Concrete Block 18.5 t	no	4.80	1,308	6,277	- do -
Suppy and Placing Toe Protection Block 6.0 t	no	28.71	633	18,159	- do -
Manufacture, Store, and Place Caisson 12 x 12m	no	1.00	253,388	253,388	- do -
Form Work for Coping Concrete	m2	104.91	32	3,344	- do -
Supply and Placing Coping Concrete	m3	207.75	89	18,500	- do -
			per 12 m	**403,679**	
			per 1 m	**33,640**	
4. Depth -14m					
Supply and Placing 1 to 3 ton Rock for Mound	m3	1,345.20	38	51,118	per 12 m
Trimming of Rock Surface - High Grade	m2	192.00	68	13,108	- do -
Trimming of Rock Surface - Common Grade	m2	213.60	33	7,089	- do -
Supply and Placing Toe Concrete Block 24.8 t	no	6.00	2,411	14,467	- do -
Supply and Placing Toe Concrete Block 12.5 t	no	6.00	1,308	7,846	- do -
Suppy and Placing Toe Protection Block 6.0 t	no	22.97	633	14,527	- do -
Manufacture, Store, and Place Caisson 12 x 12m	no	1.00	253,388	253,388	- do -
Form Work for Coping Concrete	m2	104.91	32	3,344	- do -
Supply and Placing Coping Concrete	m3	207.75	89	18,500	- do -
			per 12 m	**383,387**	
			per 1 m	**31,949**	
5. Depth -13m					
Supply and Placing 1 to 3 ton Rock for Mound	m3	895.20	38	34,018	per 12 m
Trimming of Rock Surface - High Grade	m2	192.00	68	13,108	- do -
Trimming of Rock Surface - Common Grade	m2	187.20	33	6,213	- do -
Supply and Placing Toe Concrete Block 24.8 t	no	6.00	2,411	14,467	- do -
Supply and Placing Toe Concrete Block 12.5 t	no	6.00	1,308	7,846	- do -
Suppy and Placing Toe Protection Block 6.0 t	no	17.22	633	10,896	- do -
Manufacture, Store, and Place Caisson 12 x 12m	no	1.00	253,388	253,388	- do -
Form Work for Coping Concrete	m2	104.91	32	3,344	- do -
Supply and Placing Coping Concrete	m3	207.75	89	18,500	- do -
			per 12 m	**361,779**	
			per 1 m	**30,148**	
6. Depth -12m (North Breakwater)					
Supply and Placing 1 to 3 ton Rock for Mound	m3	1,906.80	38	72,458	per 12 m
Trimming of Rock Surface - High Grade	m2	192.00	68	13,108	- do -
Trimming of Rock Surface - Common Grade	m2	247.20	33	8,205	- do -
Supply and Placing Toe Concrete Block 24.8 t	no	6.00	2,411	14,467	- do -
Supply and Placing Toe Concrete Block 18.5 t	no	4.80	1,308	6,277	- do -
Suppy and Placing Toe Protection Block 12.0 t	no	22.81	633	14,431	- do -
Manufacture, Store, and Place Caisson 12 x 12m	no	1.00	209,629	209,629	- do -
Form Work for Coping Concrete	m2	104.91	32	3,344	- do -
Supply and Placing Coping Concrete	m3	207.75	89	18,500	- do -
			per 12 m	**360,419**	
			per 1 m	**30,035**	

Description	Unit	Q'ty	Unit Rate	Amount	Remarks
7. Depth -11m					
Supply and Placing 1 to 3 ton Rock for Mound	m3	1,366.80	38	51,938	per 12 m
Trimming of Rock Surface - High Grade	m2	192.00	68	13,108	- do -
Trimming of Rock Surface - Common Grade	m2	220.80	33	7,328	- do -
Supply and Placing Toe Concrete Block 24.8 t	no	6.00	2,411	14,467	- do -
Supply and Placing Toe Concrete Block 12.5 t	no	6.00	1,308	7,846	- do -
Suppy and Placing Toe Protection Block 12.0 t	no	18.25	633	11,545	- do -
Manufacture, Store, and Place Caisson 12 x 12m	no	1.00	209,629	209,629	- do -
Form Work for Coping Concrete	m2	104.91	32	3,344	- do -
Supply and Placing Coping Concrete	m3	207.75	89	18,500	- do -
			per 12 m	**337,705**	
			per 1 m	**28,142**	
8. Depth -10m					
Supply and Placing 1 to 3 ton Rock for Mound	m3	909.60	38	34,565	per 12 m
Trimming of Rock Surface - High Grade	m2	192.00	68	13,108	- do -
Trimming of Rock Surface - Common Grade	m2	194.40	33	6,452	- do -
Supply and Placing Toe Concrete Block 24.8 t	no	6.00	2,411	14,467	- do -
Supply and Placing Toe Concrete Block 12.5 t	no	6.00	1,308	7,846	- do -
Suppy and Placing Toe Protection Block 12.0 t	no	13.69	633	8,658	- do -
Manufacture, Store, and Place Caisson 12 x 12m	no	1.00	209,629	209,629	- do -
Form Work for Coping Concrete	m2	104.91	32	3,344	- do -
Supply and Placing Coping Concrete	m3	207.75	89	18,500	- do -
			per 12 m	**316,569**	
			per 1 m	**26,381**	
9. Depth -9m					
Supply and Placing 1 to 3 ton Rock for Mound	m3	909.60	38	34,565	per 12 m
Trimming of Rock Surface - High Grade	m2	192.00	68	13,108	- do -
Trimming of Rock Surface - Common Grade	m2	194.40	33	6,452	- do -
Supply and Placing Toe Concrete Block 24.8 t	no	6.00	2,411	14,467	- do -
Supply and Placing Toe Concrete Block 12.5 t	no	6.00	1,308	7,846	- do -
Suppy and Placing Toe Protection Block 12.0 t	no	13.69	633	8,658	- do -
Manufacture, Store, and Place Caisson 12 x 12m	no	1.00	189,742	189,742	- do -
Form Work for Coping Concrete	m2	104.91	32	3,344	- do -
Supply and Placing Coping Concrete	m3	207.75	89	18,500	- do -
			per 12 m	**296,682**	
			per 1 m	**24,724**	
10. Depth -8m (not applicable as minimum depth of North Breakwater is -9.0m)					
Supply and Placing 1 to 3 ton Rock for Mound	m3	909.60	38	34,565	per 12 m
Trimming of Rock Surface - High Grade	m2	192.00	68	13,108	- do -
Trimming of Rock Surface - Common Grade	m2	194.40	33	6,452	- do -
Supply and Placing Toe Concrete Block 24.8 t	no	6.00	2,411	14,467	- do -
Supply and Placing Toe Concrete Block 12.5 t	no	6.00	1,308	7,846	- do -
Suppy and Placing Toe Protection Block 12.0 t	no	13.69	633	8,658	- do -
Manufacture, Store, and Place Caisson 12 x 12m	no	1.00	169,855	169,855	- do -
Form Work for Coping Concrete	m2	104.91	32	3,344	- do -
Supply and Placing Coping Concrete	m3	207.75	89	18,500	- do -
			per 12 m	**276,795**	
			per 1 m	**23,066**	

G.3.2 Unit Construction Cost of Wharf

(1) Berth No.1 – Dolphin Type

Unit Construction Cost of Open Pile Type Wharf - Berth No. 1

Work Item : Berth No. 1

Per : 1 L.S.

(Unit : Euro)

	Description	Unit	Q'ty	Unit Rate	Total Amount	Remarks
B1-1	Platform	unit	1.0	981,682.6	981,683	
B1-2	Bresting Dolphin	unit	3.0	304,992.9	914,979	
B1-3	Mooring Dolphin 100 t	unit	2.0	298,760.4	597,521	
B1-4	Mooring Dolphin 50 t	unit	4.0	176,372.3	705,489	
B1-5	Cat Walk	m	220.0	2,000.0	440,000	
B1-6	Cat Walk Pier	unit	6.0	26,555.5	159,333	
B1-7	Scoring Protection at Seabed	m3	7,963.2	149.7	1,192,011	
	Grand Total				4,991,016	
	Unit Rate per	1	L.S.		4,991,016	

(2) Berth No.2 – Caisson Type

Unit Construction Cost of Caisson Type Wharf - Berth No. 2

Work Item : Berth No. 2

Per : 16 m

(Unit : Euro)

	Description	Unit	Q'ty	Unit Rate	Total Amount	Remarks
1-1	Dredging under the Rock Mound	m3	8,112	4.4	35,878	
1-2	Supply and Placing 0.1 to 300 kg Ro	m3	1,640.0	38.0	62,320	
1-3	Trimming of Rock Surface High Gra	m2	288.0	52.7	15,175	
1-4	Supply and Placing Caisson 14 x 16	no	1.0	465,897.8	465,898	
1-5	Supply and Placing Toe Protection B	no	16.0	946.7	15,148	
1-6	Form Work for Coping Concrete	m2	218.0	16.1	3,507	
1-7	Coping Concrete B30	m3	505.0	77.0	38,864	
1-8	Fender System	no	1.0	30,000.0	30,000	
1-9	Mooring Bollard 100 t	no	1.0	2,500.0	2,500	
1-10	Seal and Other Attachement	%	3.0		20,079	
1-11	Back Filling Stone		1,800	38.0	68,400	
1-12	Back Filling	m3	2,040	7.1	14,491	
	Grand Total				772,258	
	Unit Rate per	1	m		48,266	

(3) Berth No.3 – Caisson Type

Unit Construction Cost of Caisson Type Wharf - Berth No. 3

Work Item : Berth No. 3

Per : 16 m

(Unit : Euro)

	Description	Unit	Q'ty	Unit Rate	Total Amount	Remarks
1-1	Dredging under the Rock Mound	m3	8,604	4.4	38,054	
1-2	Supply and Placing 0.1 to 300 kg Ro	m3	1,700.0	38.0	64,600	
1-3	Trimming of Rock Surface High Gra	m2	312.0	52.7	16,439	
1-4	Supply and Placing Caisson 15.5 x 1	no	1.0	492,884.7	492,885	
1-5	Supply and Placing Toe Protection B	no	16.0	946.7	15,148	
1-6	Form Work for Coping Concrete	m2	221.0	16.1	3,555	
1-7	Coping Concrete B30	m3	534.0	77.0	41,096	
1-8	Fender System	no	1.0	30,000.0	30,000	
1-9	Mooring Bollard 100 t	no	1.0	2,500.0	2,500	
1-10	Seal and Other Attachement	%	3.0		21,128	
1-11	Back Filling Stone		1,800	38.0	68,400	
1-12	Back Filling	m3	2,040	7.1	14,491	
	Grand Total				808,295	
	Unit Rate per	1	m		50,518	

(4) Berths No.4 and No.5 – Caisson Type

Unit Construction Cost of Caisson Type Wharf - Berth No. 4 & 5

Work Item : Berth No. 4 and 5

Per : 16 m

(Unit : Euro)

	Description	Unit	Q'ty	Unit Rate	Total Amount	Remarks
1-1	Dredging under the Rock Mound	m3	6,896	4.4	30,500	
1-2	Supply and Placing 0.1 to 300 kg Ro	m3	1,640.0	38.0	62,320	
1-3	Trimming of Rock Surface High Gra	m2	288.0	52.7	15,175	
1-4	Supply and Placing Caisson 14 x 16	no	1.0	425,757.9	425,758	
1-5	Supply and Placing Toe Protection B	no	16.0	946.7	15,148	
1-6	Form Work for Coping Concrete	m2	207.0	16.1	3,330	
1-7	Coping Concrete B30	m3	421.0	77.0	32,399	
1-8	Fender System	no	1.0	25,000.0	25,000	
1-9	Mooring Bollard 100 t	no	1.0	2,500.0	2,500	
1-10	Seal and Other Attachement	%	3.0		18,364	
1-11	Back Filling Stone		1,640	38.0	62,320	
1-12	Back Filling	m3	1,880	7.1	13,354	
	Grand Total				706,167	
	Unit Rate per	1	m		44,135	

(5) Berth No.6 – Caisson Type

Unit Construction Cost of Caisson Type Wharf - Berth No. 6

Work Item : Berth No. 6

Per : 16 m

(Unit : Euro)

	Description	Unit	Q'ty	Unit Rate	Total Amount	Remarks
1-1	Dredging under the Rock Mound	m3	6,190	4.4	27,377	
1-2	Supply and Placing 0.1 to 300 kg Ro	m3	1,580.0	38.0	60,040	
1-3	Trimming of Rock Surface High Gra	m2	264.0	52.7	13,910	
1-4	Supply and Placing Caisson 14 x 16	no	1.0	382,383.0	382,383	
1-5	Supply and Placing Toe Protection B	no	16.0	946.7	15,148	
1-6	Form Work for Coping Concrete	m2	195.0	16.1	3,137	
1-7	Coping Concrete B30	m3	320.0	77.0	24,627	
1-8	Fender System	no	1.0	25,000.0	25,000	
1-9	Mooring Bollard 100 t	no	1.0	2,500.0	2,500	
1-10	Seal and Other Attachement	%	3.0		16,624	
1-11	Back Filling Stone		1,640	38.0	62,320	
1-12	Back Filling	m3	1,880	7.1	13,354	
1-13	Steel Pipe Pile Dia 800 t14 L27.5	no	3.3	12,126.1	40,420	
1-14	Concrete for Rear Rail Foundation	m3	64.0	77.0	4,925	
1-15	Form Work for Coping Concrete	m2	96.0	16.1	1,544	
1-16	Re-Bar	t	7.7	624.0	4,792	
	Grand Total				698,101	
	Unit Rate per	1	m		43,631	

G.4 Estimated Costs of Key Projects 1 and 2

The details of estimated costs for the Pey Projects 1 and 2 were shown in Table G.4-1 and G.4-2.

Table G.4-1 Estimated Cost of Key Project 1

(Unit : EURO)

Description	Unit	Q'ty	Unit Rate	Amount	Share of Cost by Financing Entity: KSSA	Port Concessionnaire	LG
Mobilization Cost of Floating and Heavy Equipment							
Dredging Fleet	L.S.	1	200,000	200,000	200,000		
Other Floating Equipment	L.S.	1	300,000	300,000	300,000		
			Sub Total	**500,000**	**500,000**	**0**	**0**
West Breakwater - Rock Mound with Accropod							
Depth -15m	m	100	36,800	3,680,000	3,680,000		
Depth -14m	m	650	34,100	22,165,000	22,165,000		
Depth -13m	m	270	31,600	8,532,000	8,532,000		
Breakwater Head	L.S	1	3,740,000	3,740,000	3,740,000		
			Sub Total	**38,117,000**	**38,117,000**	**0**	**0**
South Breakwater - Caisson or Rock Mound with Accropod							
Depth -16m	m	130	35,800	4,654,000	4,654,000		
Depth -15m	m	210	33,600	7,056,000	7,056,000		
Depth -14m	m	280	31,500	8,820,000	8,820,000		
Depth -13m	m	760	29,000	22,040,000	22,040,000		
Breakwater Head	L.S.	1	2,424,000	2,424,000	2,424,000		
			Sub Total	**44,994,000**	**44,994,000**	**0**	**0**
North Breakwater - Rock Mound with Accropod							
Depth -14m							
Depth -13m							
Depth -12m	m	70	26,900	1,883,000	1,883,000		
Depth -11m	m	190	24,600	4,674,000	4,674,000		
Depth -10m	m	180	22,400	4,032,000	4,032,000		
Depth -9m	m	60	38,000	2,280,000	2,280,000		
Breakwater Head	L.S.	1	807,000	807,000	807,000		
			Sub Total	**13,676,000**	**13,676,000**	**0**	**0**
Dredging and Reclamation							
Dredging Sand and Reclamation	m3	6,730,000	1.9	12,787,000	12,787,000		
Dredging Hard Clay and Dumping Offshore	m3	180,000	5.4	972,000	972,000		
Supply and Place Reclamation Fill	m3	300,000	3.0	900,000	900,000		
			Sub Total	**14,659,000**	**14,659,000**	**0**	**0**
Quay Facilities							
Berth No. 1 (-17m) - Petroleum	L.S	1	5,000,000	5,000,000	5,000,000		
Berth No. 2 (-17m) - Grain Bulk	m	310	48,300	14,973,000	14,973,000		
Berth No. 3 (-17m) - Fertilizer	m	310	50,500	15,655,000	15,655,000		
Berth No. 4 (-15m) - Bulk	m			0	0		
Berth No. 5 (-15m) - General Cargo	m			0	0		
Berth No. 6 (-15m) - Container	m			0	0		
Transition Part	m	50.0	48,400	2,420,000	2,420,000		
			Sub Total	**38,048,000**	**38,048,000**	**0**	**0**
Navigation Aid							
Navigation Light	nos	2	290,000	580,000	580,000		
Light Buoy	nos	5	35,000	175,000	175,000		
Marker Buoy	nos	4	28,000	112,000	112,000		
Port Control Tower	L.S.	1	2,000,000	2,000,000	2,000,000		
			Sub Total	**2,867,000**	**2,867,000**	**0**	**0**
Revetments							
North Revetment - -9m	m	140	14,600	2,044,000	2,044,000		
North Revetment - -8m	m	240	13,100	3,144,000	3,144,000		
North Revetment - -7m	m	180	11,500	2,070,000	2,070,000		
North Revetment - -6m	m	100	9,700	970,000	970,000		
North Revetment - -5m	m	40	8,400	336,000	336,000		
South Revetment - Transition	m	50	48,300	2,415,000	2,415,000		
South Revetment - -8m	m	410	13,100	5,371,000	5,371,000		
South-East Revetment - 8m	m	230	13,100	3,013,000	3,013,000		
South-East Revetment - 7m	m	70	11,500	805,000	805,000		
East Revetment - -5m	m	750	8,400	6,300,000	6,300,000		
East Revetment - -3m	m	250	4,300	1,075,000	1,075,000		
			Sub Total	**27,543,000**	**27,543,000**	**0**	**0**
Basin for Port Service Boats							
Wharf	m	400	6,000	2,400,000	2,400,000		
Breakwater	m	120	4,300	516,000	516,000		
			Sub Total	**2,916,000**	**2,916,000**	**0**	**0**
Removal of Existing North Breakwater							
Removal of 8.4 ton Tetrapods	nos	1,600	308	492,800	492,800		
Removal of 10 - 13 ton Rock	m3	6,500	16	104,000	104,000		
Removal of 7 - 10 ton Rock	m3	7,200	21	151,200	151,200		
Removal of 4 - 7 ton Rock	m3	31,000	50	1,550,000	1,550,000		
Removal of 0.3 to 1.5 ton Rock	m3	16,000	45	720,000	720,000		
Removal of Quarry Run	m3	40,000	40	1,600,000	1,600,000		
			Sub Total	**4,618,000**	**4,618,000**	**0**	**0**
Road and Pavement							
Asphalt Pavement	m2	47,000	35.0	1,645,000	1,645,000	0	0
Concrete Pavement	m2	18,600	50.0	930,000	930,000	0	0
Flyover Bridge	m	200	35,000.0	7,000,000	7,000,000	0	0
Approach Road	m	200	12,000.0	2,400,000	2,400,000	0	0
Container Yard Pavement	m2	0		0	0	0	0
			Sub Total	**11,975,000**	**11,975,000**	**0**	**0**
Drainage & Water Supply							
	L.S			**3,000,000**	**3,000,000**		
Electrical Work							
	L.S			**3,000,000**	**3,000,000**		
Railway							
Port Area Railway	L.S			5,830,000	3,860,000	1,970,000	
Access Railway from Pauoscio Yard to Port	L.S			1,700,000	1,700,000		
Pauoscio Yard Improvement	L.S			4,320,000			4,320,000
	L.S			**11,850,000**	**5,560,000**	**1,970,000**	**4,320,000**
Cargo Handling System and Storage							
Loader for Berth No. 2 (1,500 t/hr)	no	1	3,000,000	3,000,000		3,000,000	
Jib Crane for Berth No. 3 (40 ton)	no	2	1,100,000	2,200,000		2,200,000	
Loader/Unloader for Berth No. 4 (2,500/1,000 ton/hr)	no	0		0		0	
Jib Crane for Berth No. 5 (40 ton)	no	0		0		0	
Gantry Crane for Berth No. 6	no	0		0		0	
Belt Conveyor for Berth No. 2	m	400	3,000	1,200,000		1,200,000	
Belt Conveyor for Berth No. 3	m	0		0		0	
Belt Conveyor for Berth No. 4	m	0		0		0	
Silo for Grain - Berth 2	L.S.	1	9,000,000	9,000,000		9,000,000	
UAN Solution Tank - Berth 2	tank	5	1,500,000	7,500,000		7,500,000	
Warehouse for Fertilizer - Berth 3	m2	10,800	1,000	10,800,000		10,800,000	
Warehouse for Fertilizer - Berth 3	m2	0	1,600	0		0	
Warehouse for Fertilizer - Berth 4	m2	0	1,600	0		0	
Warehouse for Fertilizer - Berth 4	m2	0	1,600	0		0	
Warehouse - Berth 5	m2	0		0		0	
RTG	no	0		0		0	
Rail Transfer Crane	no	0		0		0	
Miscellaneous Buildings of Concessionnaires	L.S.	1		2,000,000		2,000,000	
Other Cargo Handling Equipment	L.S.	1	885,000	885,000		885,000	
			Sub Total	**36,585,000**	**0**	**36,585,000**	**0**
Total for Construction Cost				**254,348,000**	**211,473,000**	**38,555,000**	**4,320,000**
Engineering Cost (6%)				**15,261,000**	**12,688,380**	**2,313,300**	**259,200**
Total excluding VAT				**269,609,000**	**224,161,380**	**40,868,300**	**4,579,200**
VAT (18%)				**48,529,620**	**40,349,048**	**7,356,294**	**824,256**
Total including VAT				**318,138,620**	**264,510,428**	**48,224,594**	**5,403,456**
Contingencies (10%)				**31,813,862**	**26,451,043**	**4,822,459**	**540,346**

Table G.4-2 Estimated Cost of Key Project 2

Description	Unit	Q'ty	Unit Rate	Amount	KSSA	Port Concessionnaire	LG
Southern Access Railway Improvement	sum			**3,410,000**	**3,410,000**	**0**	**0**
Engineering Cost (6%)				**204,600**	**204,600**	**0**	**0**
Total excluding VAT				**3,614,600**	**3,614,600**	**0**	**0**
VAT (18%)				**650,628**	**650,628**	**0**	**0**
Total including VAT				**4,265,228**	**4,265,228**	**0**	**0**
Contingencies (10%)				**426,523**	**426,523**	**0**	**0**
Grand Total				**4,265,000**	**4,265,228**	**0**	**0**

APPENDIX H ALTERNATIVE PORT EXPANSION PLANS

APPENDIX H ALTERNATIVE PORT EXPANSION PLANS

As to port expansion plan, the Outer Port Development Plan has been proposed in the main report (see Section 2.4 in Chapter 2 of Volume II). Before the proposal of the Outer Port Development Plan, port expansion plans by the development on the south of the southernmost port area and within the existing port area were studied as alternatives. Theses three alternatives were compared with each other and consequently the Outer Port Development Plan has been selected as the optimum port expansion plan. The alternatives except for the Outer Port Development Plan are outlined below with the reason why not to consider as proposed plans.

H.1 Inner Port Development Plan

The areas in the south of the southernmost port road are designated as the conservation areas for fresh water intake by law that strictly prohibits any development activities. There, the mouth of Curonian Lagoon runs from south to north and behind the mouth, Curonian Spit lies. In addition, behind the existing waterfront, potentially available land is scarce. Thus, in the south of the Port, many constraints exist there for port development. Considering the above constraints, the rough layout of port land to be created by reclamation, and basins and an access waterway to be created by dredging is shown in Figure. H1.1.

The alternative of “Inner Port Development Plan” needs to be ruled out as mentioned previously on the port capacity analysis (see Section 2.2 in Chapter 2 of Volume II); if the plan is materialized as additional port, it will paralyse the inner channel navigation before the stage of the Master Plan in 2025.

H.2 Middle Port Development Plan

In the vicinity of the existing and reserved port territory, the port territory is not expandable to the east where the urbane areas of Klaipeda City are situated. The only way to expand port area is to convert non-port use areas within the existing port area into genuine port use. The way, however, seems to be not realistic at least in the foreseeable future. Even if converted as mentioned, convertible areas within the existing port area are still limited. In addition, if the plan is materialized as additional port, it will paralyse the inner channel navigation before the stage of the Master Plan in 2025 as well as “Inner Port Development Plan”. Thus, the alternative of “Middle Port Development Plan” also needs to be ruled out.

Figure H1.1 Inner Port Development Plan

APPENDIX I SAMPLE PRINCIPLE OF COMPENSATION FOR REAL ESTATE DEVALUATION

CHAPTER I SAMPLE PRINCIPLE OF COMPENSATION FOR REAL ESTATE DEVALUATION

I.1 Introduction

At the meeting with the Steering Committee on 25 February 2004, the JICA Study Team was requested to provide further information on a topic raised in Progress Report II. This is explained in the minutes of the meeting as:

"1. Lithuanian side requested to show a sample principle of compensation for real estate devaluation in Japan or other countries that resembles to the case of Melnrage I residential zone potentially involved in the implementation of the proposed project suggested in Chapter 6 of Volume III"

This paper is the response of the JICA Study Team to that request.

I.2 Clarification

The report describes the Environmental Impact Assessment (EIA) of the Short-Term Plan. It is important to note that this does not suggest that financial compensation should be paid for devaluation of real estate.

The EIA suggests that when the port is being built the value of property in Melnrage could fall, as the site will be both visible and audible from the village and the beach, and potential purchasers may be deterred by the knowledge that a new port will soon be operating nearby.

The report also explains that in the operational period this issue is more complex as the total development will include the port and a recreational area. Property values might be expected to fall near a new industrial development, but they could rise at a site where there is investment in new recreational facilities and attractions.

No mitigation was proposed for these impacts, and the report explained that: "Mitigating action is not possible because property values are determined by so many factors that cannot be influenced by a construction project, including the general economic health of an area, public perceptions and aspirations, etc".

Financial compensation was mentioned as an action that KSSA might consider, but not to compensate for a decrease in the value of property. This was one of three measures that the report suggested could be taken if there was public opposition to the scheme. These are:

- Provision of financial compensation;
- Development of a voluntary resettlement plan to allow people to move to alternative accommodation elsewhere if they wish;
- Considering alternatives to the recreational developments or even the new outer port plan if large numbers of objections are raised.

I.3 Compensation in relation to construction in the UK

The issue of compensation in relation to construction projects is considered here from a UK perspective because as an EU Member State, this is likely to be more relevant to the situation in Lithuania than examples from Japan or elsewhere.

In the UK the principle of compensating residents for inconvenience and loss suffered as a result of construction projects is established under the Land Compensation Act 1973 – Part 1 (as amended). Guidance is provided in several booklets, available on the Internet, from the Government, Local Authorities, and others. These include:

- *"Your Home and Nuisance from Public Development"* (Department of Environment, Transport and the Regions, 1999);
- *"Your Home and Compulsory Purchase"* (DETR);
- *"Compensation to Residential Owners and Occupi*ers"

Aspects of this legislation are relevant to the Klaipeda situation. These are:

(1) If land has to be purchased so that a development can be built

In the UK developers of public projects have legal powers to buy enough land to build the development and shield the surrounding land from the noise and other effects of constructing and using the development;

- Houses and land are bought under a Compulsory Purchase Order, and owners are given forms and guidance on how to claim compensation;
- If a property is purchased, the developer normally pays the full market value of the property as it would be if the scheme had never been proposed;
- Owners are normally also entitled to a "home loss payment" and "disturbance allowance" to compensate for the distress and inconvenience of losing their home and the reasonable cost of moving to another;

The home loss payment is currently 10% of the market value, and is a minimum of £1,500 and a maximum of £15,000.

(2) Compensation to residents whose property is not purchased

- People who live near the site of a public project can still be compensated, even if no part of their land or property is bought;
- In the construction stage this can involve the developer:

  - Paying part of the cost if a family moves to temporary accommodation elsewhere to avoid excessive noise, vibration and disturbance;

  - Buying the house if the occupants will be exposed to severe and prolonged construction nuisance;

  - Buying the house if the owner is unable to sell because a public project is being built nearby;

  - Providing insulation in houses that will be affected by noise;

- The proponent also pays compensation to residents whose properties have reduced in value because of a development nearby;

- The depreciation must be caused by "physical factors", which are: noise, vibration, smell, fumes, smoke, artificial lighting, and the discharge onto the owner's land of any solid or liquid substance;
- The physical factors must arise from the use of the development (not its construction) and the source must be on or in the new/altered development;
- Compensation is paid for the amount by which the land or property has devalued, 12 months after the development begins operation;
- Compensation is calculated as the amount by which the market value of the house has decreased as a result of the physical factors;
- The amount of compensation is decided by negotiation, and if the parties cannot agree, the case is referred to an independent Lands Tribunal;
- Compensation cannot be claimed for the loss of a view or for personal inconvenience, and property is valued on the basis of its present use, not its future potential.

I.4 Environmental issues in current UK port developments

Currently there is a lot of focus on the environmental impacts of port development in the UK, as four major schemes are in the planning process. Because ports are mainly located at coastal or estuarine sites, which are often important for nature conservation, then it is this issue, rather than impacts upon people or property that is the main concern. Large parts of the UK coast are protected under UK and EU legislation, and many such sites are important for birds, habitats, landscape and other features. Ports are normally excluded from such areas, but often site boundaries adjoin port areas, so proposals for port extensions enter into protected areas and require loss or damage of protected habitats.

Dibden Bay near Southampton is the most high profile of the schemes. Associated British Ports (ABP) submitted plans for a 1.85 km, six berth terminal to meet projected increases in deep-sea container, ro-ro and aggregates traffic. The proposals included compulsory purchase of land, and loss of intertidal zone within Southampton Water Special Protection Area (SPA) and the proposed New Forest National Park, and close to a candidate Special Area of Conservation (SAC). ABP proposed the creation of new habitat to compensate for areas that would be lost, but after a Public Inquiry the proposal was rejected because of the uncertain viability of the project and its impacts on internationally important wildlife habitat. In his judgement the inspector concluded that the scheme would have an adverse effect on the amenity of local residents, particularly through noise disturbance and visual impact. The character of the nationally important New Forest Heritage Site would be undermined and the project would have an urbanising effect and a widespread visual impact.

The proposed **London Gateway** port lies adjacent to the Thames Estuary and Marshes SPA and Site of Special Scientific Interest (SSSI) and would require the loss of 60 ha of protected intertidal habitat. The Public Inquiry has closed and a decision is awaited.

The extension of Harwich port at **Bathside Bay** is in a SSSI and would involve the loss of 69 ha of intertidal habitat. The Public Inquiry began on 20 April and is still ongoing.

Felixstowe South is similar in size to Bathside Bay and the main issue is the impact of the port on geomorphology of the estuary. A Public Inquiry will be announced soon.