

(2) Project Cost for Phase I

( Unit: Million VND )

Item	F/C	L/C	Total
<b>A. Construction Cost</b>			
1) Tau Hu-Ben Nghe Canal Improve.	89,232	208,208	297,439
2) Pump Drainage Improvement			
(1) Thanh Da	6,061	14,142	20,203
(2) Ben Me Coc (1)	13,593	31,718	45,311
(3) Ben Me Coc (2)	7,356	17,164	24,521
3) Rehabilitation of Combined Sewer	40,333	94,109	134,442
4) New Storm Sewer	0	0	0
5) Dredging Equipment	11,076	25,844	36,920
Sub-Total	167,651	391,185	558,836
B. Administration Cost	0	27,598	27,598
C. Engineering Cost	27,383	11,736	39,119
D. Land Acquisition and Compensation Cost	0	361,110	361,110
E. Physical Contingency	16,765	39,119	55,884
F. Price Contingency	16,273	84,850	101,123
<b>Total</b>	<b>228,072</b>	<b>915,598</b>	<b>1,143,670</b>

Construction costs and their breakdown are shown in Tables J.5.10 to J.5.16.

(3) Project Cost for Phase II

( Unit: Million VND )

Item	F/C	L/C	Total
<b>A. Construction Cost</b>			
1) Tau Hu-Ben Nghe Canal Improve.	59,365	138,519	197,884
2) Pump Drainage Improvement			
(1) Thanh Da	0	0	0
(2) Ben Me Coc (1)	6,256	14,598	20,854
(3) Ben Me Coc (2)	9,854	22,992	32,846
3) Rehabilitation of Combined Sewer	0	0	0
4) New Storm Sewer	36,560	85,306	121,865
5) Dredging Equipment	16,584	38,696	55,280
Sub-Total	128,618	300,111	428,729
B. Administration Cost	0	14,353	14,353
C. Engineering Cost	21,008	9,003	30,011
D. Land Acquisition and Compensation Cost	0	49,696	49,696
E. Physical Contingency	12,862	30,011	42,873
F. Price Contingency	26,755	102,703	129,458
<b>Total</b>	<b>189,243</b>	<b>505,877</b>	<b>695,120</b>

Construction costs and their breakdown are shown in Tables J.5.10 to J.5.16.

4.2 Sewerage System

4.2.1 General

This report deals with the construction cost estimated for the sewerage system of identified priority areas of the feasibility study.

The cost estimation consists of the wastewater treatment plant, the pumping Station, interceptor sewers, conveyance sewers, and new sewers.

#### 4.2.2 Basis of Cost Estimation

The construction cost for the projects is estimated on the basis of the design, construction plan and following conditions.

##### (I) Basic Conditions for Major Items of Works

###### 1) Excavation

###### Excavation by Equipment :

Excavation work for the wastewater treatment plant, the pumping station and other large scale excavation are mostly to be carried out by using Backhoe and Bulldozer.

###### Excavation by Manpower :

Excavation work for sewer pipe laying work, especially bedding work and other small scale structures, which generally involves small scale of the excavation work, is to be carried out by manpower.

###### 2) Backfilling with Compaction

###### Backfilling by Equipment :

The construction of large structures i.e. the wastewater treatment plant and the pumping station, generally involve large volume of backfilling at lower portion. For these structures, machinery work for backfilling and compaction by using backhoe, bulldozer and tamper are applied.

###### Backfilling by manpower :

For the backfilling and compaction around sewer pipe and of the small scale structures are to be carried out by manpower and handy type tamper.

###### 3) Removal of Surplus Soil

The removal of surplus soil is carried out by using dump truck and hopper barge for transportation to a disposal area which is about 10 km away.

###### 4) Concrete Work

Batching plant is used for producing large volumes of concrete and for controlling its quality. The concrete is transported by transit mixer and placed by using concrete pump car.

For the construction of the wastewater treatment plant, it is necessary to set up a batching plant in the construction site.

5) Reinforcement Bar Arrangement and Formworks

Bending and arrangement of steel bar are conducted at the site. The formwork is to be classified into two categories base on the height of work place and complexity of the structure.

The tall structure requires truck crane for lifting the formwork panel, while low height structure is not required.

6) R.C. Pile and Steel Sheet Pile Driving

For the driving work of R.C and Steel sheet pile, crawler crane with Diesel hammer / vibration hammer is used. Generator is associated for the main equipment.

7) Special consideration, on construction of project offices, quarters, warehouses, workshops, water supply system, electric power supply system, communication system, etc., is not considered due to availability of these facilities nearby the construction site.

(2) Components of the Project Cost

The project cost is composed of "direct cost", "indirect cost" and contingency. They are:

- 1) Direct cost : Construction work  
Procurement and Installation of equipment
- 2) Indirect cost : Land acquisition and compensation cost for house  
resettlement  
Administration cost
- 3) Contingency : Physical contingency

(3) Price Level and Unit Cost

The unit cost is based mainly market price prevailing in Ho Chi Minh City in July 1999.

(4) Mode of Contract

All the construction works are to be contracted by general contractors in international tendering process.

(5) Currency Portion

The cost is divided into foreign currency portion (F.C.) and local currency portion (L.C.). The components of each item are given as follows:

Item	F.C. (%)	L.C. (%)
Construction Cost	55	45
Land Acquisition	0	100
Compensation Cost	0	100
Engineering Cost	70	30
Administration Cost	0	100
Physical Contingency	50	50

(6) Exchange Rate

The exchange rates of foreign currencies are as follows;

US\$ 1 = 13,956 VND = Yen 113.39, Yen 1 = 123.08 VND

(7) Indirect Cost

Indirect cost is based on the following assumptions :

- Administration Cost : 3.0 % of construction cost, land acquisition and compensation cost
- Engineering Cost : 7.0 % of construction cost
- Physical Contingency : 10.0 % of construction cost

The land acquisition and compensation cost are estimated by using the collected data.

4.2.3 Unit Cost and Construction Cost

(1) Unit Cost

The unit costs are determined based on the data collected from the counterpart of this study team and other agencies concerned.

The unit cost divided into two components of foreign and local currencies based on the current data applied to the similar projects.

The diverse unit costs are shown in Tables J.5.1 to Table J.5.7.

(2) Land Acquisition and Compensation Cost

The unit prices of land acquisition and compensation for house resettlement are estimated based on the regulations of Ho Chi Minh City.

The list of unit prices is shown in Table J.5.9.

(3) Construction Cost

The construction cost is composed of direct construction cost, site expenses, overhead and profit including tax. The rates are assumed as follows :

- 1) Direct Construction Cost
- 2) Site Expenses : 12 % of (1)
- 3) Contractor's Overhead Profit and Tax : 5 % of [ (1) + (2) ]

#### 4.2.4 Estimate of Project Cost

The total project costs consisting of direct cost, indirect cost and physical contingency are estimated as follows:

##### (1) Total Project Cost

( Unit: Million VND )

Item	F/C	L/C	Total
<b>A. Construction Cost</b>			
1) Wastewater Treatment Plant	1,339,388	1,095,863	2,435,251
2) Pumping Station	113,443	92,816	206,259
3) Interceptor Sewer	293,954	240,507	534,461
4) Conveyance Sewer	225,185	184,243	409,428
5) New Separate Sewer	51,798	42,380	94,178
Sub-Total	2,023,768	1,655,809	3,679,577
B. Administration Cost	0	112,571	112,571
C. Engineering Cost	180,300	77,270	257,570
D. Land Acquisition Compensation Cost	0	72,797	72,797
E. Physical Contingency	183,980	183,978	367,958
F. Price Contingency	355,181	472,787	827,968
<b>Total</b>	<b>2,743,229</b>	<b>2,575,212</b>	<b>5,318,441</b>

The construction is to be implemented by two phases; Phase I and Phase II.  
 The break-down of construction cost is shown in Table J.5.20.

##### (2) Project Cost for Phase I

( Unit: Million VND )

Item	F/C	L/C	Total
<b>A. Construction Cost</b>			
1) Wastewater Treatment Plant	430,476	352,208	782,684
2) Pumping Station	58,097	47,533	105,630
3) Interceptor Sewer	90,932	74,398	165,330
4) Conveyance Sewer	225,185	184,243	409,428
5) New Separate Sewer	0	0	0
Sub-Total	804,690	658,382	1,463,072
B. Administration Cost	0	46,076	46,076
C. Engineering Cost	71,691	30,724	102,415
D. Land Acquisition Compensation Cost	0	72,797	72,797
E. Physical Contingency	73,154	73,153	146,307
F. Price Contingency	80,662	107,400	188,062
<b>Total</b>	<b>1,030,197</b>	<b>988,532</b>	<b>2,018,729</b>

Construction costs and their breakdown are shown in Table J.5.21.

(3) Project Cost for Phase II

Item	( Unit: Million VND )		
	F/C	L/C	Total
<b>A. Construction Cost</b>			
1) Wastewater Treatment Plant	908,912	743,655	1,652,567
2) Pumping Station	55,346	45,283	100,629
3) Interceptor Sewer	203,022	166,109	369,131
4) Conveyance Sewer	0	0	0
5) New Separate Sewer	51,798	42,380	94,178
Sub-Total	1,219,078	997,427	2,216,505
B. Administration Cost	0	66,495	66,495
C. Engineering Cost	108,609	46,546	155,155
D. Land Acquisition Compensation Cost	0	0	0
E. Physical Contingency	110,826	110,825	221,651
F. Price Contingency	274,519	365,387	639,906
<b>Total</b>	<b>1,713,032</b>	<b>1,586,680</b>	<b>3,299,712</b>

Construction costs and their breakdowns are shown in Table J.5.22.

**Table J.1.1(1/2) Unit Construction Cost for Urban Drainage Improvement**

(Unit : 1000VND)

Item	Specification	Unit	Unit Direct Cost	Unit Cost
1. Dredging				
(1) Dredging Cost	1) No treatment	m <sup>3</sup>	15 ~ 25	27 ~ 45
	2) treatment is required	m <sup>3</sup>	—	
(2) Transport and Dumping Cost				
	1) Dump to low land bank along the canal	m <sup>3</sup>		
	2) Distance of dump site : 10Km	m <sup>3</sup>	20	36
	3) Distance of dump site : 20Km	m <sup>3</sup>	40	72
	4) Distance of dump site : 30Km	m <sup>3</sup>	50	90
2. Excavation				
	1) by Man power	m <sup>3</sup>	15 - 25	27 ~ 45
	2) by Equipment	m <sup>3</sup>	10 ~ 20	18 ~ 36
3. Dike and Bank Protection				
(1) Structure Fill for Earth dike		m <sup>3</sup>	80 ~ 150	144 ~ 270
(2) Retaining Wall	T-type Retaining Wall	m	6,000	10,800
(3) Revetment	1) Grass (sod) protection; ( Type A ) Partial Repair	m <sup>2</sup>	30	54
	2) Grass (sod) protection; (Type B ) Complete Repair	m <sup>2</sup>	40	72
	3) stone masonry; ( Type C ) n = 1: 2.0	m <sup>2</sup>	300	540
	4) concrete protection ; ( Type D ) n = 1: 0.3 - Standard Cross Section -	m <sup>2</sup>	600	1,080
4. Side ditch				
	(1) waterway with rectangular section with lid	m	418	752
	(2) waterway with trapezoid section without lid	m	347	625
5. Pumping Station with Gate				
(1) Gate equipment	include civil work of a floodgate and waterway	m <sup>2</sup>	270,000	486,000
(2) Pumping Station	include civil work and bilding 1.1m <sup>3</sup> /s	Set		42,990,000
	1.4m <sup>3</sup> /s	Set		44,833,000
	11.5m <sup>3</sup> /s	Set		90,279,000
6. Bridge				
(1) Demolition cost	1) work in water	m <sup>2</sup>	583	1,049
	2) work in land	m <sup>2</sup>	417	751

**Table J.1.1(2/2) Unit Construction Cost for Urban Drainage Improvement**  
(Unit : 1000VND)

Item	Specification	Unit	Unit Direct Cost	Unit Cost
(2) Reconstruction cost for bridge including superstructure and foundation	1) RC ; 10mx36mL	m2	9,029	16,252
	2) RC ; 7mx20mL	m2	7,640	13,752
	3) RC ; 5mx10mL	m2	6,389	11,500
6. Road ( Pavement )	city road grade 1 ~ grede 2	m2	333 ~ 556	600 ~ 1,000
	Low cost road pavement	m2	100	180
7. Pipeline	1) Diameter 200mmx1.5mH	m	590	1,062
	2) Diameter 350mmx2.5mH	m	825	1,485
	3) Diameter 800mmx4.0mH	m	1,920	3,456
	4) Diameter 1500mmx7.0mH	m	6,217	11,191
	5) Diameter 2500mmx8.0mH	m	16,325	29,385
8. Box Culvert	1) 1.0 * 1.0 (m), Trench depth: 5.0m	m	5,650	10,170
	2) 1.6 * 1.6 (m), Trench depth; 5.0m	m	8,140	14,652
	3) 2.0 * 2.0 (m), Trench depth; 5.0m	m	9,630	17,334
	4) 3.0 * 3.0 (m), Trench depth; 5.0m	m	16,930	30,474
	5) Twin Type 2*(2.0*2.0) Depth; 3.0m	m	12,220	21,996
	6) Twin Type 2*(2.5*2.5) Depth; 4.0m	m	17,780	32,004
	5) Twin Type 2*(3.0*3.0) Depth; 4.0m	m	22,910	41,238



TABLE J.1.1.2(1/S) BREAKDOWN OF DIRECT CONSTRUCTION COST FOR CANAL IMPROVEMENT

(Drainage Zone) Name of Canal Canal Section	Canal Length L (m)	Item Unit cost (1000 VND)	Designed Hydraulic Section (Wb x Wu x H) (m x m x m)	Excavation/ Dredging (E/D)	Bank Protection				O/M Road			Road and Railway Crossing		Total	Land Acquisition (L/A)	Grand Total
					Type (T)	Existing Bank Reformation (BR)	Grass (SoD) (GS) (m <sup>2</sup> )	Stone Masonry (SM)	Concrete Wall (CW)	Filling (F)	Pavement (P)	Box Culvert (BC) Number (m x m x section m)	Bridge Number (BxL)			
(C - Zone)				117												
C. 1: Nhieu Loc - Thi Nghe																
C. 1. A	3,370	1500	9.3x24.0x4.5	4,886	C	0				Existing	792			10,925	14,523	25,448
C. 1. B	5,740	1500	22.3x40.0x5.5	33,172	C	0				4,147	3,082			64,984	88,824	153,808
C. 1. C (10-Year)	12,150	1500	24.3x42.0x5.5	22,754	C	0				2,566	2,349			48,182	46,353	94,535
C. 1. D	13,110	1500	25.3x43.0x5.5	22,121	C	0				5,832	3,341			57,945	48,359	106,304
C. 1. E	55,370	1500	26.3x44.0x5.5	Existing	C	0				2,250	3,096			30,043	37,989	68,032
Sub-total	89,660			82,913						14,795	12,860			212,079	236,048	448,127
C. 2: Cau Son - Tau Vat Tat																
C. 2. A	9,500	1500	16.8x30.0x4.0	Existing	C	0				641	720			5,644	9,108	14,752
C. 2. A'	47,880	1500	8.3x20.0x3.5	1,527	C	0				4,363	2,160			19,440	32,429	51,869
C. 2. A''	1,500	1500	5.3x17.0x3.5	Existing	C	0				4,363	2,160			17,913	32,429	50,342
Sub-total	58,880			1,527						9,367	5,040			42,997	73,965	116,962
C. 3: Tan Hoa - Lo Gom																
C. 3. A	57,380	1500	13.6x17.5x3.5	15,480	D	0					3,254			40,020	59,940	99,960
C. 3. B		1500	14.6x19.0x4.0	12,191	D	0					2,837			38,894	42,050	80,944
C. 3. C	1,840	1500	28.2x39.0x5.0	32,591	C	0				1,511	2,650			63,780	99,200	162,980
C. 3. C1	1,000	1500	35.6x47.0x5.3	13,018	C	0				1,127	1,440			24,291	29,850	54,141
C. 3. C2	1,500	1500	24.8x38.0x4.0	5,579	C	0				1,777	2,160			22,366	33,521	55,887
Sub-total	61,720			78,859						4,415	12,341			189,551	264,360	453,911
C. 4: Tan Hu - Ben Nghe, Doi - Te																
C. 4. A2' (R. Ba Tang)	1,370	1500	16.4x32.0x3.5	4,565	B	0				1,499	1,915			14,505	56,582	71,087
C. 4. A2 (R. Ba Tang)	2,000	1500	Existing Section	Existing	A	756				3,480	2,880			8,124	33,645	41,769
Sub-total	3,370			4,565		756				10,006	4,795			22,629	90,227	112,856
C. 4. A3 (R. Ba Lon)	8,820	1500	12.4x28.0x3.5	415	B	0				2,885	3,686			14,393	30,720	45,113
C. 4. A4 (R. Ba Lon)	3,180	1500	Existing Section	Existing	A	1202				6,842	4,579			14,226	38,160	52,386
Sub-total	12,000			415		1,202				14,249	8,265			28,619	68,880	97,499
C. 4. A1 (Tau Hu)	2,680	1500	22.0x38.6x5.7	28,465	C	0				7,524	3,859			98,202	32,160	130,362
C. 4. B (Tau Hu)	2,170	1500	22.0x38.6x5.7	24,398	C	0				2,736	3,067			81,094	25,560	106,654
C. 4. C (Tau Hu)	2,190	1500	21.0x50.4x4.5	18,054	C	0				1,968	3,154			59,825	26,280	86,105
C. 4. D (Tau Hu)	1,980	1500	21.0x50.4x4.5	6,800	C	0				2,102	2,851			44,888	23,760	68,648
C. 4. E (Ben Nghe)	3,170	1500	26.0x55.4x4.5	13,145	C	0				1,450	4,565			72,209	38,040	110,249
Sub-total	12,150			90,862						15,780	17,496			356,218	145,800	502,018
C. 4. A1	3,470	1500	Existing Section	Existing	A	1312				5,691	4,997			13,749	41,640	55,389
C. 4. B	14,660	1500	Existing Section	Existing	A	764				863	2,909			5,554	24,340	29,794
C. 4. C (Doi - Te)	14,660	1500	Existing Section	Existing	A	529				706	2,016			3,251	16,800	20,051
C. 4. D (10-year)	40,650	1500	Existing Section	Existing	A	745				1,227	2,837			5,802	23,640	29,442
C. 4. E	4,250	1500	Existing Section	Existing	A	1607				3,838	6,120			13,707	51,000	64,707
Sub-total	77,690			95,842		4,957				11,619	18,879			42,063	157,320	199,383
Sub-total	105,170			259,141		6,915				51,654	49,435			449,529	462,227	911,756
Total	315,430			259,141		6,915				80,231	79,676			893,956	1,076,799	1,970,755

TABLE J.1.2(2/5) BREAKDOWN OF DIRECT CONSTRUCTION COST FOR CANAL IMPROVEMENT

(Drainage Zone) Name of Canal Canal Section	Canal Length L (m)	Item Unit cost (1000 VND)	Designed Hydraulic Section (Wb x Wu x H) (m x m x m)	Excavation/ Dredging (E/D)	Bank Protection			O/M Road			Road and Railway Crossings		Total	Land Acquisition (LA)	Grand Total	
					Type (T)	Existing Bank Reformation (BR)	Grass (GS) (m <sup>2</sup> )	Stone Masonry (SM)	Concrete Wall (CW)	Filling (F)	Pavement (P)	Box Culvert (BC) Number (BxHxNL) (m x m x section/m)				Bridge Number (BxL)
(N - Zone)				117												
N. 1: Ben Da - Ba Hong																
N. 1. A	2,500	600	0.4x14.0x3.0	773	0	1,206	-	-	1,301	1,541	536	-	8,220	15,577		
N. 1. B	5,460	600	2.4x18.0x3.5	3,359	0	3,133	-	-	4,678	4,003	-	-	22,052	37,225		
N. 1. C	1,110	600	9.4x29.0x4.5	7,770	0	2,299	-	-	3,433	2,938	-	-	16,182	32,622		
N. 1. D	3,610	600	9.4x29.0x4.5	Existing	3051	4,068	-	-	7,633	5,198	-	-	30,166	50,116		
Sub-total	12,680			11,902	3,051	10,706	-	-	17,045	13,680	536	-	76,621	133,541		
N. 2: Tham Luong - Ben Cat																
N. 2. A	307,300	600	1.1x9.5x1.7	728	0	1,093	-	-	872	1,397	132	-	9,958	14,180		
N. 2. B		600	1.9x11.5x2.0	2,004	0	1,893	-	-	1,287	2,419	192	-	18,170	25,965		
N. 2. C		600	1.4x15.0x3.0	12,265	0	4,609	-	-	Existing	5,890	-	4,374	50,209	77,347		
N. 2. D1		600	8.9x28.5x4.5	24,014	0	2,806	-	-	366	3,586	-	-	46,154	76,926		
N. 2. D2		600	8.4x30.0x5.0	48,734	0	3,764	-	-	Existing	4,810	-	7,204	71,549	136,061		
N. 2. E		600	34.9x58.5x5.5	43,611	0	1,758	-	-	1,699	2,246	-	13,550	50,356	115,220		
N. 2. F		600	34.9x58.5x5.5	48,253	0	2,536	-	-	11,658	3,240	-	10,034	68,381	144,102		
N. 2. G1 (5-year)		600	34.9x58.5x5.5	85,030	0	4,925	-	-	22,088	6,293	-	7,427	116,626	242,389		
N. 2. G2		600	11.4x27x3.5	Existing	2620	3,494	-	-	11,353	4,464	-	-	30,151	52,082		
N. 2. G3		600	17.4x33.0x3.5	Existing	2105	2,806	-	-	5,653	3,586	-	-	21,176	35,326		
N. 2. H		600	34.9x58.5x5.5	20,087	0	1,769	-	-	6,812	2,261	-	-	16,120	47,049		
N. 2. I		600	34.9x58.5x5.5	9,722	0	2,817	-	-	13,477	3,600	-	-	27,643	57,259		
N. 2. J	2,610	600	34.9x58.5x5.5	Existing	2206	2,941	-	-	13,175	3,758	-	-	28,204	50,284		
Sub-total	309,910			294,448	6,931	37,211	-	-	88,640	47,550	324	42,589	554,695	1,072,188		
N. 2. E	1,560	600	34.9x58.5x5.5	-	0	0	-	-	22,227	-	-	-	-	22,227		
N. 2. F	2,250	600	34.9x58.5x5.5	-	0	0	-	-	32,059	-	-	-	-	32,059		
N. 2. G1 (10-year)	4,370	600	34.9x58.5x5.5	-	0	0	-	-	62,265	-	-	-	-	62,265		
N. 2. H	1,570	600	34.9x58.5x5.5	-	0	0	-	-	22,370	-	-	-	-	22,370		
N. 2. I	2,500	600	34.9x58.5x5.5	-	0	0	-	-	35,621	-	-	-	-	35,621		
N. 2. J	2,610	600	34.9x58.5x5.5	-	0	0	-	-	37,188	-	-	-	-	37,188		
Sub-total	14,860			-	0	0	-	-	211,730	-	-	-	-	211,730		
Total	337,450			306,350	9,982	47,917	-	-	105,485	61,230	860	42,589	631,315	786,143		
(W - Zone)																
W. 1: R. Cua - R. Nuoc Len																
W. 1. A		310	8.2x25x3.8	15,977	0	2,930	-	-	1,580	3,744	-	-	20,491	44,722		
W. 1. B	1,700	310	24.4x48.0x5.5	35,784	0	1,916	-	-	Existing	2,448	-	17,461	22,203	79,810		
W. 1. B'	350	310	0.4x24.0x5.5	1,124	0	394	-	-	1,396	504	-	-	2,927	5,945		
W. 1. B''		310	0.4x24.0x5.5	14,946	0	3,505	-	-	9,482	4,478	-	-	23,083	55,494		
W. 1. C1'	3,110	310	0.4x24.0x5.5	17,179	0	1,127	-	-	3,135	1,440	-	2,796	25,677	38,849		
W. 1. C1	1,000	310	24.4x48.0x5.5	20,033	0	2,479	-	-	9,673	3,168	-	-	35,353	58,504		
W. 1. C2 (5-year)		310	17.4x37.0x4.5	52,774	0	5,060	-	-	33,290	6,466	-	-	60,977	158,507		
W. 1. D1		310	24.4x48.0x5.5	11,636	0	2,333	-	-	8,415	2,981	-	-	19,412	44,777		
W. 1. D2		310	12.4x30.0x4.0	22,291	0	3,065	-	-	13,578	3,917	-	-	22,890	65,741		
W. 1. E1		310	24.4x48.0x5.5		0		-	-			-	-				

TABLE J.1.2(3/5) BREAKDOWN OF DIRECT CONSTRUCTION COST FOR CANAL IMPROVEMENT

(Drainage Zone) Name of Canal Canal Section	Canal Length L (m)	Item Unit cost (1000 VND)	Hydraulic Section (Wb x Wu x H) (m x m x m)	Excavation/ Dredging (E/D)	Bank Protection			O/M Road			Road and Railway Crossing		Total	Land Acquisition (LA)	Grand Total	
					Type (T)	Existing Bank Reformation (BR)	Grass (Sod) (GS) (m <sup>2</sup> )	Stone Masonry (SM)	Concrete Wall (CW)	Filling (F)	Pavement (P)	Box Culvert (BC) Number (BxHxNxtL) (m x m x section m)				Bridge Number (BxL)
W. 1. E2	-	310	Existing Section	Existing	A	1852	2,470	-	-	17,555	7,056	-	-	28,933	18,793	47,726
W. 1. E3	-	310	Existing Section	Existing	A	514	685	-	-	1,915	1,938	-	-	5,072	4,635	9,707
W. 1. F	-	310	Existing Section	Existing	A	446	595	-	-	1,881	1,699	-	-	4,621	4,067	8,688
W. 1. G	-	310	Existing Section	Existing	A	699	932	-	-	4,314	2,664	-	-	8,609	6,652	15,261
W. 1. H	-	310	Existing Section	Existing	A	665	887	-	-	2,948	2,664	-	-	7,164	6,096	13,260
Sub-total	6,160			191,744		4,176	28,378	-	-	109,162	45,187	-	-	398,904	250,501	649,405
W. 1. B'	1,700	310	24.4x48.0x5.5	-	C	0	-	24,222	-	-	-	-	-	24,222	-	24,222
W. 1. C1	1,000	310	24.4x48.0x5.5	-	C	0	-	14,248	-	-	-	-	-	14,248	-	14,248
W. 1. D1	-	310	24.4x48.0x5.5	-	C	0	-	63,974	-	-	-	-	-	63,974	-	63,974
W. 1. E1 (10-year)	-	310	24.4x48.0x5.5	-	C	0	-	38,755	-	-	-	-	-	38,755	-	38,755
W. 1. F	-	310	Existing Section	-	A	0	-	-	-	-	-	-	-	-	-	-
W. 1. G	-	310	Existing Section	-	A	0	-	-	-	-	-	-	-	-	-	-
W. 1. H	-	310	Existing Section	-	A	0	-	-	-	-	-	-	-	-	-	-
Sub-total	2,700			-		-	-	141,199	-	-	-	-	-	141,199	-	141,199
Total	8,860			191,744		4,176	28,378	141,199	-	109,162	45,187	-	-	540,103	250,501	790,604
(S - Zone)																
S. 1: R. Nom Qui - R. Ba Lao																
S. 1. A	-	310	10.4x28.0x4.0	259	B	0	2,863	-	-	15,959	3,658	-	-	22,739	15,534	38,073
S. 1. B1	-	310	Existing Section	Existing	A	949	1,265	-	-	5,897	3,614	-	-	11,725	9,034	20,759
S. 1. B2	-	310	Existing Section	Existing	A	1512	2,016	-	-	9,319	5,760	-	-	18,607	14,382	32,989
S. 1. B3	-	310	Existing Section	Existing	A	779	1,038	-	-	4,124	2,966	-	-	8,907	7,272	16,179
S. 1. C	1,390	310	Existing Section	Existing	A	525	701	-	-	1,995	2,002	-	-	5,223	4,745	9,968
Sub-total	1,390			259		3,765	7,883	-	-	37,294	18,000	-	-	67,201	50,767	117,968
S. 2: R. Ong Lon - K. Cay Ko																
S. 2. A1	-	310	Existing Section	Existing	A	764	1,018	-	-	10,168	2,909	-	-	14,859	8,274	23,133
S. 2. A2	-	310	Existing Section	Existing	A	718	958	-	-	9,251	2,736	-	-	13,663	7,728	21,391
S. 2. B	-	310	Existing Section	Existing	A	571	761	-	-	726	2,174	-	-	4,232	4,845	9,077
S. 2. C	3,390	310	Existing Section	Existing	A	1281	1,709	-	-	4,925	4,882	-	-	12,797	11,585	24,382
Sub-total	3,390			-		3,334	4,446	-	-	25,070	12,701	-	-	45,551	32,431	77,982
S. 3: Tan - Ca Cam - Roi - Tom - Muong choui																
S. 3. A	-	310	8.4x28.0x4.0	Existing	B	1327	1,769	-	-	7,414	2,261	-	-	12,771	8,568	21,339
S. 3. B1	-	310	Existing Section	Existing	A	919	1,225	-	-	9,478	3,499	-	-	15,121	9,462	24,583
S. 3. B2	-	310	Existing Section	Existing	A	1179	1,572	-	-	12,139	4,493	-	-	19,383	12,144	31,527
S. 3. B3	-	310	Existing Section	Existing	A	0	-	-	-	13,952	5,155	-	-	19,107	13,939	33,046
S. 3. C (5-year)	-	310	Existing Section	Existing	A	0	-	-	-	8,065	3,744	-	-	11,809	9,737	21,546
S. 3. D1	-	310	Existing Section	Existing	A	0	-	-	-	9,978	3,787	-	-	13,765	10,190	23,955
S. 3. D2	-	310	Existing Section	Existing	A	0	-	-	-	8,741	4,910	-	-	13,651	12,417	26,068
S. 3. E	2,410	310	Existing Section	Existing	A	0	-	-	-	7,572	3,470	-	-	11,042	9,044	20,086
Sub-total	2,410			-		3,425	4,566	-	-	77,339	31,319	-	-	116,649	85,501	202,150

TABLE J.1.2(4/5) BREAKDOWN OF DIRECT CONSTRUCTION COST FOR CANAL IMPROVEMENT

(Drainage Zone) Name of Canal Canal Section	Canal Length L (m)	Item Unit cost (1000 VND)	Excavation/ Dredging (E/D)		Bank Protection			O/M Road		Road and Railway Crossing		Total	Land Acquisition (LA)	Grand Total	
			Designed Hydraulic Section (W x W <sub>u</sub> x H) (m x m x m)	Type (T)	Existing Bank Reformation (BR)	Grass (GS) (m <sup>2</sup> )	Stone Masonry (SM)	Concrete Wall (CW)	Filling (F)	Pavement (P)	Box Culvert (BC) Number (max:sectionxm)				Bridge Number (BxL)
S. 3. A	1,570	310	8.4x28.0x4.0	117	0	72	540	1,080	270	180	17,152	18,578	-	18,578	
S. 3. B1	2,430	310	Existing Section	Existing	0	-	18,578	-	-	-	-	-	-	-	
S. 3. C (10-year)	2,600	310	Existing Section	Existing	0	-	-	-	-	-	-	-	-	-	
S. 3. D1	2,630	310	Existing Section	Existing	0	-	-	-	-	-	-	-	-	-	
S. 3. E	2,410	310	Existing Section	Existing	0	-	18,578	-	-	-	-	-	-	18,578	
Sub-total	11,640														
S. 4: R. Cau Kinh	1,920	310	Existing Section	Existing	726	968	-	-	7,864	2,765	-	-	-	12,323	
S. 4. A	1,920	310	Existing Section	Existing	726	968	-	-	7,864	2,765	-	-	-	12,323	
Sub-total															
S. 5: R. AP3Phu My	1,860	310	Existing Section	Existing	703	937	-	-	7,745	2,678	-	-	-	12,063	
S. 5. A	1,860	310	Existing Section	Existing	703	937	-	-	7,745	2,678	-	-	-	12,063	
Sub-total	22,610	239			11,953	18,800	18,578	-	155,312	67,463	-	-	272,365	455,940	
(NE-Zone)															
NE. 1: R. Ong Dua	2,250	310	12.4x28.0x3.5	7,825	0	2,536	-	-	4,035	3,240	-	-	-	17,636	
NE. 1. A	2,250	310	12.4x28.0x3.5	7,825	0	2,536	-	-	4,035	3,240	-	-	-	17,636	
Sub-total															
NE. 2: R. Go Dua	2,200	310	12.4x32.0x4.5	4,513	0	2,896	-	-	7,662	3,701	-	-	-	18,772	
NE. 2. A	2,200	310	12.4x32.0x4.5	4,513	0	2,896	-	-	7,662	3,701	-	-	-	18,772	
NE. 2. B	2,200	310	16.5x36.1x4.5	4,513	1,859	2,479	-	-	5,165	3,168	-	-	-	12,671	
Sub-total	2,200	310	16.5x36.1x4.5	4,513	1,859	5,375	-	-	12,827	6,869	-	-	-	31,443	
NE. 3: R. Thu Duc	2,140	310	18.4x38.0x4.5	9,008	0	2,412	-	-	1,598	3,082	-	-	-	20,011	
NE. 3. A	2,140	310	18.4x38.0x4.5	9,008	0	2,412	-	-	1,598	3,082	-	-	-	20,011	
Sub-total															
NE. 4: R. Truong Tho	2,170	310	9.4x27.0x4.0	6,537	0	2,446	-	-	15,602	3,125	-	-	-	31,329	
NE. 4. A	2,170	310	9.4x27.0x4.0	6,537	0	2,446	-	-	15,602	3,125	-	-	-	31,329	
Sub-total															
NE. 5: R. Nhum - R. Cau - R. Go Gong	4,440	310	10.7x20.0x2.7	36,497	0	3,775	-	-	Existing	4,824	-	-	-	45,096	
NE. 5. A1	4,440	310	10.7x20.0x2.7	36,497	0	3,775	-	-	Existing	4,824	-	-	-	45,096	
NE. 5. A2	4,440	310	6.0x15.0x2.6	24,269	0	2,637	-	-	Existing	3,370	-	-	-	30,276	
NE. 5. B	4,440	310	17.0x29.0x3.6	34,055	0	1,916	-	-	Existing	2,448	-	-	-	43,393	
NE. 5. C	4,440	310	61.3x79.0x5.5	129,302	0	3,189	-	-	Existing	4,075	-	-	-	144,284	
NE. 5. D1	4,440	310	61.3x79.0x5.5	81,559	0	5,004	-	-	Existing	6,394	-	-	-	108,229	
NE. 5. D1	4,440	310	61.3x79.0x5.5	305,682	0	16,521	-	-	Existing	21,111	-	-	-	538,942	
Sub-total															
NE. 5. A1	4,440	310	9.8x20.0x3.0	-	0	-	27,507	-	Existing	-	-	-	-	27,507	
NE. 5. A2	4,440	310	4.8x15.0x3.0	-	0	-	19,213	-	Existing	-	-	-	-	19,213	
NE. 5. B	4,440	310	15.8x29.0x4.0	-	0	-	18,064	-	Existing	-	-	-	-	18,064	
NE. 5. C	4,440	310	59.8x79.0x6.0	-	0	-	43,739	-	Existing	-	-	-	-	43,739	
NE. 5. D1	4,440	310	59.8x79.0x6.0	-	0	-	68,623	-	Existing	-	-	-	-	68,623	
Sub-total	4,440	310		333,565	1,859	29,290	177,146	-	44,583	37,427	-	-	-	648,843	
Total	8,850													884,478	

TABLE J.1.2(5/5) BREAKDOWN OF DIRECT CONSTRUCTION COST FOR CANAL IMPROVEMENT

(Drainage Zone) Name of Canal Canal Section	Canal Length L (m)	Item Unit cost (1000 VND)	Designed Hydraulic Section (Wb x Wu x H) (m x m x m)	Excavation/ Dredging (E/D)	Bank Protection				OM Road			Road and Railway Crossing		Total	Land Acquisition (L/A)	Grand Total
					Type (T)	Existing Bank Reformation (BR)	Grass (GS) (m <sup>2</sup> )	Stone Masonry (SM)	Concrete Wall (CW)	Filling (F)	Pavement (P)	Box Culvert (BxCl) Number (mmxsectionxm)	Bridge Number (BxL)			
(SE - Zone)				117								17,152				
SE. 1: R. Binh Khanh	2,320	310	Existing Section	Existing	877	1,169	-	-	446	3,341	-	-	-	5,833	7,294	13,127
SE. 1. A	2,320	310	Existing Section	Existing	877	1,169	-	-	446	3,341	-	-	-	5,833	7,294	13,127
Sub-total																
SE. 2: R. Ch Tre Nho	2,080	310	Existing Section	Existing	786	1,048	-	-	1,371	2,995	-	-	-	6,200	6,756	12,956
SE. 2. A	2,080	310	Existing Section	Existing	786	1,048	-	-	1,371	2,995	-	-	-	6,200	6,756	12,956
Sub-total																
SE. 3: R. Da Do	2,500	310	Existing Section	Existing	945	1,260	-	-	3,000	3,600	-	-	-	8,805	8,411	17,216
SE. 3. A	2,500	310	Existing Section	Existing	945	1,260	-	-	3,000	3,600	-	-	-	8,805	8,411	17,216
Sub-total																
SE. 4: R. Giang Ong To		310	Existing Section	Existing	1,289	1,719	-	-	2,883	4,910	-	-	-	10,801	11,213	22,014
SE. 4. A		310	Existing Section	Existing	1,289	1,719	-	-	2,883	4,910	-	-	-	10,801	11,213	22,014
SE. 4. B	2,050	310	Existing Section	Existing	775	1,033	-	-	875	2,952	-	-	-	5,635	6,553	12,188
Sub-total	2,050				2,064	2,752	-	-	3,758	7,862	-	-	-	16,436	17,766	34,202
SE. 5: R. Muong		310	Existing Section	Existing	0	1,251	-	-	-	1,598	-	-	-	7,180	3,441	10,621
SE. 5. A	1,110	310	Existing Section	Existing	0	1,251	-	-	-	1,598	-	-	-	7,180	3,441	10,621
Sub-total	1,110				0	1,251	-	-	-	1,598	-	-	-	7,180	3,441	10,621
SE. 6: R. Ky Ha	4,390	310	Existing Section	Existing	0	4,947	-	-	-	6,322	-	-	-	21,810	15,609	35,419
SE. 6. A	4,390	310	Existing Section	Existing	0	4,947	-	-	-	6,322	-	-	-	21,810	15,609	35,419
Sub-total	4,390				0	4,947	-	-	-	6,322	-	-	-	21,810	15,609	35,419
SE. 7: R. Kim Ong Hong - R. Chui		310	Existing Section	Existing	2,113	2,817	-	-	7,913	3,600	-	-	-	16,443	12,023	28,466
SE. 7. A		310	Existing Section	Existing	2,113	2,817	-	-	7,913	3,600	-	-	-	16,443	12,023	28,466
SE. 7. B	3,200	310	Existing Section	Existing	1,210	1,613	-	-	2,583	4,608	-	-	-	10,014	10,497	20,511
Sub-total	3,200				3,323	4,430	-	-	10,496	8,208	-	-	-	26,457	22,520	48,977
SE. 8: R. Ong Cay - R. Ba Cua - R. Ong Kieu		310	Existing Section	Existing	237	983	-	-	-	2,808	-	-	-	4,528	6,045	10,573
SE. 8. A		310	Existing Section	Existing	237	983	-	-	-	2,808	-	-	-	4,528	6,045	10,573
SE. 8. B	4,120	310	Existing Section	Existing	1,557	2,076	-	-	1,422	5,933	-	-	-	10,988	13,094	24,082
Sub-total	4,120				2,294	3,059	-	-	1,422	8,741	-	-	-	15,516	19,139	34,655
SE. 9: R. Tan - R. Ong Nhie		310	Existing Section	Existing	0	2,784	-	-	11,916	3,557	-	-	-	18,257	24,638	42,895
SE. 9. A		310	Existing Section	Existing	0	2,784	-	-	11,916	3,557	-	-	-	18,257	24,638	42,895
SE. 9. B		310	Existing Section	Existing	1,603	2,137	-	-	6,359	6,106	-	-	-	16,205	14,531	30,736
SE. 9. C	2,830	310	Existing Section	Existing	1,070	1,426	-	-	3,520	4,075	-	-	-	10,091	9,547	19,638
Sub-total	2,830				2,673	6,347	-	-	21,795	13,738	-	-	-	44,553	48,716	93,269
SE. 10: Tac River		310	Existing Section	Existing	0	-	-	-	4,937	5,213	-	-	-	10,150	12,304	22,454
SE. 10. A		310	Existing Section	Existing	0	-	-	-	4,937	5,213	-	-	-	10,150	12,304	22,454
SE. 10. B		310	Existing Section	Existing	0	-	-	-	4,328	5,875	-	-	-	10,203	15,606	25,809
SE. 10. C	2,410	310	Existing Section	Existing	0	-	-	-	3,198	3,470	-	-	-	6,668	8,175	14,843
Sub-total	2,410				0	-	-	-	12,463	14,558	-	-	-	27,021	34,082	61,103
Total	27,010			14,872	12,962	26,263	-	-	58,751	70,963	-	-	-	179,811	181,733	361,544
Grand Total				1,105,931	47,847	164,251	937,000	42,219	569,524	361,946	860	111,643	3,321,221	2,519,558	5,840,779	

**Table J.1.3 Pumping Stations in Pump Drainage Areas**

(Million VND)

Pump Drainage Area	Pumping Station		Water Gate			Total
	Capacity	Cost	Gate Size	Unit Cost	Cost	
	m <sup>3</sup> /sec		m <sup>2</sup>			
Than Da	1.1	42,990	4.0 (2mx2mx1)	486	1,944	44,934
Vissan	11.5	90,279	64.0 (4mx4mx4)	486	31,104	121,383
Ben Me Coc (1)	1.4	44,833	6.25 (2.5x2.5x1)	486	3,038	47,871
Ben Me Coc (2)	1.4	44,833	6.25 (2.5x2.5x1)	486	3,038	47,871
Total	15.4	268,381	80.5		39,124	262,059

**Table J.1.4 Construction Cost of Onsite Detention Pond in NE Zone**

(Unit : Million VND)

Item	Unit Cost	NE 3			NE 4		NE 5		Total
		31000m <sup>3</sup> x 4ponds	25500m <sup>3</sup> x 2ponds	44400m <sup>3</sup> x 12ponds					
Excavation	(m <sup>3</sup> )	31,000	25,500	44,400					707.8
		0.117	2984	5195					11806
Slope Protection	(m <sup>2</sup> )	2773	2281	3572					8626
		0.54	1232	1929					4658
O/M Road	(m <sup>2</sup> )	2211	1819	3167					7197
		0.18	327	570					1295
Inlet/Outlet Structure	(m)	20	20	20					60
		21,996	440	440					1520
Gate equipment	(m <sup>2</sup> )	4 x 2gates = 8	4 x 2gates = 8	4 x 2gates = 8					24
		486	3888	3888					11664
Land Acquisition	(m <sup>2</sup> )	10,000	8,100	14,400					32500
		0.31	2511	4464					10075
Total Construction Cost of Pond		12950	11582	16486					40818
Total		51800	22764	197832					272596

**Tabel J.1.5 Construction Cost of Drainage Pipeline**

[ Combined System ]

Zone	Type	Main Sewer				Secondary/Tertiary Sewer				Sub-total
		Diameter (mm)	Length (m)	Unit Cost (1000 VND)	Construction Cost	Diameter (mm)	Length (m)	Unit Cost 1000 VND	Construction Cost	
C-Zone	10,641	800	239,834	3,456	828,866	200	77,784	1,062	82,607	911,473
		1,500	119,917	11,191	1,341,991	350	77,784	1,485	115,509	1,457,500
		Sub-total	359,751		2,170,857	Sub-total	155,568		198,116	2,368,973
N-Zone	13,620	800	79,476	3,456	274,669	200	25,776	1,062	27,374	302,043
		1,500	39,738	11,191	444,708	350	25,776	1,485	38,277	482,985
		Sub-total	119,214		719,377	Sub-total	51,552		65,651	785,028
W-Zone	7,291	800	35,520	3,456	122,757	200	11,520	1,062	12,234	134,991
		1,500	17,760	11,191	198,752	350	11,520	1,485	17,107	215,859
		Sub-total	53,280		321,509	Sub-total	23,040		29,341	350,850
S-Zone	8,174	800	0	3,456	0	200	0	1,062	0	0
		1,500	0	11,191	0	350	0	1,485	0	0
		Sub-total	0		0	Sub-total	0		0	0
NE-Zone	6,491	800	0	3,456	0	200	0	1,062	0	0
		1,500	0	11,191	0	350	0	1,485	0	0
		Sub-total	0		0	Sub-total	0		0	0
SE-Zone	11,936	800	0	3,456	0	200	0	1,062	0	0
		1,500	0	11,191	0	350	0	1,485	0	0
		Sub-total	0		0	Sub-total	0		0	0
Grand Total			532,245		3,211,743		230,160		293,108	3,504,851

[ Separate System ] : Storm Sewer

Zone	Type	Main			Secondary/Tertiary			Sub-total
		Length (m)	Unit Cost 1000 VND	Construction Cost	Length (m)	Unit Cost 1000 VND	Construction Cost	
C-Zone	Pipe	5,655	8,330	47,104	0	0	0	47,104
	Open	81,599	752	61,362	138,938	752	104,481	165,844
	Sub-total	87,254		108,466	138,938		104,481	212,948
N-Zone	Pipe	28,627	8,330	238,466	0	0	0	238,466
	Open	413,094	752	310,646	703,376	752	528,939	839,585
	Sub-total	441,721		549,112	703,376		528,939	1,078,051
W-Zone	Pipe	9,368	8,330	78,039	0	0	0	78,039
	Open	135,186	752	101,660	230,182	752	173,097	274,757
	Sub-total	144,554		179,699	230,182		173,097	352,796
S-Zone	Pipe	16,226	8,330	135,162	0	0	0	135,162
	Open	234,140	752	176,073	398,670	752	299,800	475,873
	Sub-total	250,366		311,235	398,670		299,800	611,035
NE-Zone	Pipe	16,954	8,330	141,226	0	0	0	141,226
	Open	244,644	752	183,972	416,556	752	313,250	497,222
	Sub-total	261,598		325,198	416,556		313,250	638,448
SE-Zone	Pipe	22,609	8,330	188,330	0	0	0	188,330
	Open	326,243	752	245,335	555,495	752	417,732	663,067
	Sub-total	348,851		433,665	555,495		417,732	851,397
Grand Total		1,534,344		1,907,375	2,443,217		1,837,300	3,744,675

[Note] 1. Storm Sewer : Diameter 3000mm x 4.0 m Depth  
 2. Open Canne : Waterway with rectangular section with lid; 1.0m x 1.5mH



**Table J.1.6 House Compensation**

( Million VND )

Canal	Canal Length (m)	Compensation Area		Legal Houses Area			Illegal Houses Area			Total
		Canal Length	Area (m <sup>2</sup> ) (5m wide)	Area (m <sup>2</sup> ) (%)	Unit Cost	Cost	Area (m <sup>2</sup> ) (%)	Unit Cost	Cost	Cost
Doi-Te	13,110	13,110 (100%)	131,100	55,062 (42.0)	1.2	66,074	76,038 (58.0)	0.75	57,029	123,103
Tau Hu	12,150	12,150 (100%)	121,500	29,889 (24.6)	1.2	35,867	91,611 (75.4)	0.75	68,708	104,575
Nhieu Loc	8,930	8,930 (100%)	89,300	35,274 (39.5)	1.2	42,329	54,026 (60.5)	0.75	40,520	82,849
Tan Hoa	8,570	4,285 (50%)	42,850	14,998 (35.0)	1.2	17,998	27,852 (65.0)	0.75	20,889	38,887
<b>Total</b>	<b>42,760</b>	<b>38,475</b>	<b>384,750</b>	<b>135,223</b>		<b>162,268</b>	<b>249,527</b>		<b>187,146</b>	<b>349,414</b>

- [ Note ]
1. Unit Cost : Legal Houses Area ; Land Acquisition Cost x 0.8 (80%)  
Illegal Houses Area ; Land Acquisition Cost x 0.5 (50%)
  2. Compensation Area : Compensation Area = Canal Length x 2 x 5(m)

Table J.1.7(1/12) Annual Disbursement of Construction Cost

Cost Component	2000			2001			2002			2003			2004			2005			
	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	
1. Sewerage system																			
(1) Direct construction cost	3,856,384			21,383	539,894	771,277	231,383	539,894	771,277	231,383	539,894	771,277	231,383	539,894	771,277	231,383	539,894	771,277	
(2) Land acquisition + Compensation	1,386,213		1,386,213																
(3) Engineering cost	269,947	40,492	134,974	18,896	8,098	26,995	18,896	8,098	26,995	18,896	8,098	26,995	18,896	8,098	26,995	18,896	8,098	26,995	
(4) Administration cost	78,639					15,728			15,728			15,728			15,728			15,728	
(5) Physical contingency	385,638			23,138	53,989	77,128	23,138	53,989	77,128	23,138	53,989	77,128	23,138	53,989	77,128	23,138	53,989	77,128	
Sub total	5,976,821	1,426,705	1,521,187	273,418	617,709	891,127	273,418	617,709	891,127	273,418	617,709	891,127	273,418	617,709	891,127	273,418	617,709	891,127	
Price contingency																			
Total	5,976,821	1,426,705	1,521,187	273,418	617,709	891,127	273,418	617,709	891,127	273,418	617,709	891,127	273,418	617,709	891,127	273,418	617,709	891,127	

Cost Component	2000			2001			2002			2003			2004			2005			
	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	
1. Sewerage system																			
(1) Direct construction cost	2,649,222																		
(2) Land acquisition + Compensation	631,315																		
(3) Engineering cost	185,446																		
(4) Administration cost	49,208																		
(5) Physical contingency	264,922																		
Sub total	3,780,113																		
Price contingency																			
Total	3,780,113																		

Cost Component	2000			2001			2002			2003			2004			2005			
	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	
1. Sewerage system																			
(1) Direct construction cost	1,243,749																		
(2) Land acquisition + Compensation	250,501																		
(3) Engineering cost	97,062																		
(4) Administration cost	22,414																		
(5) Physical contingency	124,375																		
Sub total	1,728,101																		
Price contingency																			
Total	1,728,101																		

Table J.1.7(2/12) Annual Disbursement of Construction Cost

Cost Component	2000			2001			2002			2003			2004			2005					
	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total			
																			Construction cost (Mil. VND)	Total	
1. Sewerage system																					
(1) Direct construction cost			893,400																		
(2) Land acquisition + Compensati			193,575																		
(3) Engineering cost			61,838																		
(4) Administration cost			16,005																		
(5) Physical contingency			88,340																		
Sub total			1,253,158																		
Price contingency																					
Total			1,253,158																		

Cost Component	2000			2001			2002			2003			2004			2005					
	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total			
																			Construction cost (Mil. VND)	Total	
1. Sewerage system																					
(1) Direct construction cost			1,559,687																		
(2) Land acquisition + Compensati			235,635																		
(3) Engineering cost			109,178																		
(4) Administration cost			26,930																		
(5) Physical contingency			155,969																		
Sub total			2,087,399																		
Price contingency																					
Total			2,087,399																		

Cost Component	2000			2001			2002			2003			2004			2005					
	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total			
																			Construction cost (Mil. VND)	Total	
1. Sewerage system																					
(1) Direct construction cost			1,031,208																		
(2) Land acquisition + Compensati			181,733																		
(3) Engineering cost			72,185																		
(4) Administration cost			18,194																		
(5) Physical contingency			103,121																		
Sub total			1,406,441																		
Price contingency																					
Total			1,406,441																		

Table J.1.7(3/12) Annual Disbursement of Construction Cost

Cost Component	Construction cost (Mill. VND) Total	2000			2001			2002			2003			2004			2005			
		FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	Sub-total	
1. Sewerage system																				
(1) Direct construction cost	1,223,650				231,383	539,894	771,277	231,383	539,894	771,277	231,383	539,894	771,277	306,008	714,019	1,020,027	306,008	714,019	1,020,027	813,048
(2) Land acquisition + Compensation	2,868,972		1,386,213																	
(3) Engineering cost	785,656	94,481	40,492	154,974	18,896	8,098	26,995	18,896	8,098	26,995	49,368	21,158	70,526	24,991	10,710	35,701	115,161	49,355	164,516	
(4) Administration cost	211,590					15,728	15,728		15,728	15,728		15,728	15,728		20,211	20,211		20,211	20,211	
(5) Physical contingency	1,122,365				23,138	53,989	77,128	23,138	53,989	77,128	23,138	53,989	77,128	30,601	71,402	102,003	30,601	71,402	102,003	71,402
Sub total	16,212,033	94,481	1,426,705	1,521,187	273,418	617,709	891,127	273,418	617,709	891,127	303,889	881,270	1,185,159	361,599	816,341	1,177,941	451,770	1,068,034	2,119,804	
Price contingency																				
Total	16,212,033	94,481	1,426,705	1,521,187	273,418	617,709	891,127	273,418	617,709	891,127	303,889	881,270	1,185,159	361,599	816,341	1,177,941	451,770	1,068,034	2,119,804	

Table J.1.7(4/12) Annual Disbursement of Construction Cost

Cost Component	Construction cost (Mill. VND) Total	2006				2007				2008				2009				2010				2011			
		FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total			
																							FC	LC	Sb-total
1. Sewerage system																									
(1) Direct construction cost	3,856,384																								
(2) Land acquisition + Compensation	1,386,213																								
(3) Engineering cost	209,947																								
(4) Administration cost	78,639																								
(5) Physical contingency	385,638																								
Sub total	5,976,821																								
Price contingency																									
Total	5,976,821																								

(2) N Drainage Zone

Cost Component	Construction cost (Mill. VND) Total	2006				2007				2008				2009				2010				2011			
		FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total			
																							FC	LC	Sb-total
1. Sewerage system																									
(1) Direct construction cost	2,649,222																								
(2) Land acquisition + Compensation	631,315																								
(3) Engineering cost	185,446																								
(4) Administration cost	49,208																								
(5) Physical contingency	264,922																								
Sub total	3,780,113																								
Price contingency																									
Total	3,780,113																								

(3) W Drainage Zone

Cost Component	Construction cost (Mill. VND) Total	2006				2007				2008				2009				2010				2011			
		FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total			
																							FC	LC	Sb-total
1. Sewerage system																									
(1) Direct construction cost	1,243,749																								
(2) Land acquisition + Compensation	250,501																								
(3) Engineering cost	87,062																								
(4) Administration cost	22,414																								
(5) Physical contingency	124,375																								
Sub total	1,728,101																								
Price contingency																									
Total	1,728,101																								

Table J.1.7(5/12) Annual Disbursement of Construction Cost

Cost Component	2006			2007			2008			2009			2010			2011					
	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total			
																			Construction cost (Mill. VND)	Total	
1. Sewerage system																					
(1) Direct construction cost			883,400																		
(2) Land acquisition + Compensation			183,575																		
(3) Engineering cost			61,838																		
(4) Administration cost			16,005																		
(5) Physical contingency			88,340																		
Sub total			1,233,158																		
Price contingency																					
Total			1,233,158																		

Cost Component	2006			2007			2008			2009			2010			2011					
	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total			
																			Construction cost (Mill. VND)	Total	
1. Sewerage system																					
(1) Direct construction cost			1,559,687																		
(2) Land acquisition + Compensation			235,635																		
(3) Engineering cost			109,178																		
(4) Administration cost			26,930																		
(5) Physical contingency			155,969																		
Sub total			2,087,399																		
Price contingency																					
Total			2,087,399																		

Cost Component	2006			2007			2008			2009			2010			2011					
	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total			
																			Construction cost (Mill. VND)	Total	
1. Sewerage system																					
(1) Direct construction cost			1,031,208																		
(2) Land acquisition + Compensation			181,733																		
(3) Engineering cost			72,185																		
(4) Administration cost			18,194																		
(5) Physical contingency			100,121																		
Sub total			1,406,441																		
Price contingency																					
Total			1,406,441																		

Table J.1.7(6/12) Annual Disbursement of Construction Cost

Cost Component	Construction cost (Mil. VND)	2006			2007			2008			2009			2010			2011			
		FC	Sb-total	LC	FC	Sb-total	LC	FC	Sb-total	LC	FC	Sb-total	LC	FC	Sb-total	LC	FC	Sb-total	LC	
I. Sewerage system																				
(1) Direct construction cost	11,223,650	185,038	616,793	431,755	185,038	616,793	431,755	616,793	616,793	185,038	616,793	431,755	185,038	616,793	431,755	185,038	616,793	431,755	185,038	616,793
(2) Land acquisition - Compensation	2,868,972	-	-	-	-	-	-	183,575	183,575	-	-	-	-	-	-	-	-	-	-	-
(3) Engineering cost	785,656	15,111	21,588	15,111	6,476	21,588	15,111	52,507	52,507	13,346	5,720	19,065	51,558	19,065	5,720	19,065	51,558	19,065	5,720	19,065
(4) Administration cost	211,390	-	11,223	11,223	-	11,223	11,223	-	9,941	-	9,941	-	9,941	-	9,941	-	9,941	-	9,941	-
(5) Physical contingency	1,122,365	18,504	61,679	43,176	18,504	61,679	43,176	61,679	61,679	16,342	38,131	54,472	16,342	38,131	54,472	16,342	38,131	54,472	16,342	38,131
Sub total	16,212,033	218,653	711,283	492,630	218,653	711,283	492,630	925,777	925,777	193,104	435,098	628,202	231,317	628,202	231,317	628,202	231,317	628,202	231,317	628,202
Price contingency																				
Total	16,212,033	218,653	711,283	492,630	218,653	711,283	492,630	925,777	925,777	193,104	435,098	628,202	231,317	628,202	231,317	628,202	231,317	628,202	231,317	628,202

Table J.1.7(7/12) Annual Disbursement of Construction Cost

Cost Component	Construction cost (Mill. VND) Total	2012		2013		2014		2015		2016		2017	
		FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	Sub-total
<b>(1) C Drainage Zone</b>													
1. Sewerage system													
(1) Direct construction cost	3,856,384												
(2) Land acquisition + Compensation	1,366,213												
(3) Engineering cost	269,947												
(4) Administration cost	78,639												
(5) Physical contingency	365,638												
Sub total	5,976,821												
Price contingency													
Total	5,976,821												

Cost Component	Construction cost (Mill. VND) Total	2012		2013		2014		2015		2016		2017	
		FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	Sub-total
<b>(2) N Drainage Zone</b>													
1. Sewerage system													
(1) Direct construction cost	2,649,222	79,477	185,446	264,922	79,477	185,446	264,922	79,477	185,446	264,922			
(2) Land acquisition + Compensation	631,315												
(3) Engineering cost	185,446	6,491	2,782	9,272	6,491	2,782	9,272	6,491	2,782	9,272			
(4) Administration cost	49,208												
(5) Physical contingency	264,922	7,948	18,545	26,492	7,948	18,545	26,492	7,948	18,545	26,492			
Sub total	3,780,113	93,915	211,693	305,608	93,915	211,693	305,608	93,915	211,693	305,608			
Price contingency													
Total	3,780,113	93,915	211,693	305,608	93,915	211,693	305,608	93,915	211,693	305,608			

Cost Component	Construction cost (Mill. VND) Total	2012		2013		2014		2015		2016		2017	
		FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	Sub-total
<b>(3) W Drainage Zone</b>													
1. Sewerage system													
(1) Direct construction cost	1,243,749												
(2) Land acquisition + Compensation	250,501												
(3) Engineering cost	87,062												
(4) Administration cost	22,414												
(5) Physical contingency	124,375												
Sub total	1,728,101												
Price contingency													
Total	1,728,101												



Table J.1.7(8/12) Annual Disbursement of Construction Cost

Cost Component	Construction cost (Mil. VND) Total	2012		2013		2014		2015		2016		2017	
		FC	L.C	Sb-total	FC	L.C	Sb-total	FC	L.C	Sb-total	FC	L.C	Sb-total
1. Sewerage system													
(1) Direct construction cost	883,400	53,004	123,676	176,680	53,004	123,676	176,680						
(2) Land acquisition + Compensation	183,575												
(3) Engineering cost	61,838	4,329	1,855	6,184	4,329	1,855	6,184						
(4) Administration cost	16,005	3,201	3,201	3,201	3,201	3,201	3,201						
(5) Physical contingency	88,340	5,300	12,368	17,668	5,300	12,368	17,668						
Sub total	1,233,158	62,633	141,100	203,733	62,633	141,100	203,733						
Price contingency													
Total	1,233,158	62,633	141,100	203,733	62,633	141,100	203,733						

Cost Component	Construction cost (Mil. VND) Total	2012		2013		2014		2015		2016		2017	
		FC	L.C	Sb-total	FC	L.C	Sb-total	FC	L.C	Sb-total	FC	L.C	Sb-total
1. Sewerage system													
(1) Direct construction cost	1,559,687	93,581	218,356	311,917	93,581	218,356	311,917	93,581	218,356	311,917			
(2) Land acquisition + Compensation	235,635												
(3) Engineering cost	109,178	7,642	3,275	10,918	7,642	3,275	10,918	7,642	3,275	10,918			
(4) Administration cost	26,930	5,386	5,386	5,386	5,386	5,386	5,386	5,386	5,386	5,386			
(5) Physical contingency	155,969	9,358	21,836	31,194	9,358	21,836	31,194	9,358	21,836	31,194			
Sub total	2,087,399	110,582	248,853	359,435	110,582	248,853	359,435	110,582	248,853	359,435			
Price contingency													
Total	2,087,399	110,582	248,853	359,435	110,582	248,853	359,435	110,582	248,853	359,435			

Cost Component	Construction cost (Mil. VND) Total	2012		2013		2014		2015		2016		2017	
		FC	L.C	Sb-total	FC	L.C	Sb-total	FC	L.C	Sb-total	FC	L.C	Sb-total
1. Sewerage system													
(1) Direct construction cost	1,031,208	30,936	72,185	103,121	30,936	72,185	103,121	30,936	72,185	103,121			
(2) Land acquisition + Compensation	181,733												
(3) Engineering cost	72,185	2,526	1,083	3,609	2,526	1,083	3,609	2,526	1,083	3,609			
(4) Administration cost	14,104	1,819	1,819	1,819	1,819	1,819	1,819	1,819	1,819	1,819			
(5) Physical contingency	103,121	3,094	7,218	10,312	3,094	7,218	10,312	3,094	7,218	10,312			
Sub total	1,406,441	36,556	82,305	118,862	36,556	82,305	118,862	36,556	82,305	118,862			
Price contingency													
Total	1,406,441	36,556	82,305	118,862	36,556	82,305	118,862	36,556	82,305	118,862			

Table J.1.7(9/12) Annual Disbursement of Construction Cost

(10) Total	Construction cost (Mil. VND)	2012		2013		2014		2015		2016		2017	
		FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	Sub-total
1. Sewerage system		256,998	599,662	856,660	256,998	599,662	856,660	203,994	475,986	679,980	203,994	475,986	679,980
(1) Direct construction cost	11,223,650												
(2) Land acquisition + Compensation	2,868,977												
(3) Engineering cost	783,656	20,988	8,995	29,983	20,988	8,995	29,983	16,660	7,140	23,799	16,660	7,140	23,799
(4) Administration cost	211,390		15,327	15,327		15,327			12,126	12,126		12,126	12,126
(5) Physical contingency	1,122,165	25,700	59,966	85,666	25,700	59,966	85,666	20,399	47,599	67,998	20,399	47,599	67,998
Sub-total	16,212,033	303,686	683,951	987,637	303,686	683,951	987,637	241,053	542,851	783,904	241,053	542,851	783,904
Price contingency													
Total	16,212,033	303,686	683,951	987,637	303,686	683,951	987,637	241,053	542,851	783,904	241,053	542,851	783,904

Table J.1.7(10/12) Annual Disbursement of Construction Cost

Cost Component	Construction cost (Mill. VND) Total	2018			2019			2020			Grand total		
		FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	Sub-total
		1. Sewerage system	-	-	-	-	-	-	-	-	-	-	-
(1) Direct construction cost	3,856,384	-	-	-	-	-	-	-	-	-	-	-	-
(2) Land acquisition + Compensation	1,386,213	-	-	-	-	-	-	-	-	-	-	-	-
(3) Engineering cost	269,947	-	-	-	-	-	-	-	-	-	-	-	-
(4) Administration cost	78,639	-	-	-	-	-	-	-	-	-	-	-	-
(5) Physical contingency	385,638	-	-	-	-	-	-	-	-	-	-	-	-
Sub total	5,976,821	-	-	-	-	-	-	-	-	-	-	-	-
Price contingency	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	5,976,821	-	-	-	-	-	-	-	-	-	-	-	-

Cost Component	Construction cost (Mill. VND) Total	2018			2019			2020			Grand total		
		FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	Sub-total
		1. Sewerage system	-	-	-	-	-	-	-	-	-	-	-
(1) Direct construction cost	2,649,222	-	-	-	-	-	-	-	-	-	-	-	-
(2) Land acquisition + Compensation	631,315	-	-	-	-	-	-	-	-	-	-	-	-
(3) Engineering cost	185,446	-	-	-	-	-	-	-	-	-	-	-	-
(4) Administration cost	49,208	-	-	-	-	-	-	-	-	-	-	-	-
(5) Physical contingency	264,922	-	-	-	-	-	-	-	-	-	-	-	-
Sub total	3,780,113	-	-	-	-	-	-	-	-	-	-	-	-
Price contingency	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	3,780,113	-	-	-	-	-	-	-	-	-	-	-	-

Cost Component	Construction cost (Mill. VND) Total	2018			2019			2020			Grand total		
		FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	Sub-total
		1. Sewerage system	-	-	-	-	-	-	-	-	-	-	-
(1) Direct construction cost	1,243,749	-	-	-	-	-	-	-	-	-	-	-	-
(2) Land acquisition + Compensation	250,501	-	-	-	-	-	-	-	-	-	-	-	-
(3) Engineering cost	87,062	-	-	-	-	-	-	-	-	-	-	-	-
(4) Administration cost	22,414	-	-	-	-	-	-	-	-	-	-	-	-
(5) Physical contingency	124,375	-	-	-	-	-	-	-	-	-	-	-	-
Sub total	1,728,101	-	-	-	-	-	-	-	-	-	-	-	-
Price contingency	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	1,728,101	-	-	-	-	-	-	-	-	-	-	-	-

Table J.1.7(11/12) Annual Disbursement of Construction Cost

(4.) S Drainage Zone

Cost Component	Construction cost (Mill. VND) Total	2018			2019			2020			Grand total		
		FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total
1. Sewerage system													
(1) Direct construction cost	883,400										265,020	618,380	883,400
(2) Land acquisition + Compensation	183,575											183,575	183,575
(3) Engineering cost	61,838										43,297	18,551	61,838
(4) Administration cost	16,005											16,005	16,005
(5) Physical contingency	89,340										26,562	61,838	88,340
Sub total	1,233,158										334,809	898,349	1,233,158
Price contingency													
Total	1,233,158										334,809	898,349	1,233,158

(5.) NE Drainage Zone

Cost Component	Construction cost (Mill. VND) Total	2018			2019			2020			Grand total		
		FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total
1. Sewerage system													
(1) Direct construction cost	1,559,687										467,906	1,091,781	1,559,687
(2) Land acquisition + Compensation	235,635											235,635	235,635
(3) Engineering cost	109,178										76,825	32,353	109,178
(4) Administration cost	26,930											26,930	26,930
(5) Physical contingency	155,969										46,791	109,178	155,969
Sub total	2,087,399										591,121	1,496,278	2,087,399
Price contingency													
Total	2,087,399										591,121	1,496,278	2,087,399

(6.) SE Drainage Zone

Cost Component	Construction cost (Mill. VND) Total	2018			2019			2020			Grand total		
		FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total
1. Sewerage system													
(1) Direct construction cost	1,031,208										309,362	721,846	1,031,208
(2) Land acquisition + Compensation	181,733											181,733	181,733
(3) Engineering cost	72,185										50,530	21,656	72,185
(4) Administration cost	18,194											18,194	18,194
(5) Physical contingency	103,121										30,936	72,185	103,121
Sub total	1,406,441										390,828	1,015,613	1,406,441
Price contingency													
Total	1,406,441										390,828	1,015,613	1,406,441

**Table J.1.7(12/12) Annual Disbursement of Construction Cost**

Cost Component	Construction cost (M.L VND) Total	2018			2019			2020			Grand total			
		FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	Sub-total	
		1. Sewerage system												
(1) Direct construction cost	11,223,650											3,567,695	7,856,555	11,223,650
(2) Land acquisition - Compensati	2,868,972												2,868,972	2,868,972
(3) Engineering cost	785,656											549,959	235,697	785,656
(4) Administration cost	211,390												211,390	211,390
(5) Physical contingency	1,122,365											396,710	785,656	1,122,365
Sub total	16,212,033											4,253,764	11,958,269	16,212,033
Price contingency														
Total	16,212,033											4,253,764	11,958,269	16,212,033

Table J.1.8 CONSTRUCTION SCHEDULE OF URBAN DRAINAGE

ZONE ( Km )	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039		
C-Zone (68.1)					█																																					
N-Zone (35.2)						█																																				
W-Zone (47.5)							█																																			
S-Zone (75.4)																																										
NE-Zone (18.2)																																										
SE-Zone (64.7)																																										

█ : Design and preparation period ( ) : Length of navigation canals  
 □ : Construction period  
 --- : Replacement of M&E period

**Table J.2.1 Construction Cost of Wastewater Treatment Plant**

(1,000,000Yen / 1,000,000VND)

Zone	Wastewater (m <sup>3</sup> /day)	Plant Area (ha)	Construction Cost				Site Preparation		Total
			a	b	Japan-Yen	VND	Unit Cost	C-Cost	
TLBC	130,765	11	200	0.730	7,016	779,440	7,946	87,406	866,846
NLTN	501,001	33	185	0.730	17,300	1,922,065	7,946	262,218	2,184,283
THLG	241,566	20	200	0.730	10,981	1,220,002	7,946	158,920	1,378,922
THBNDT	512,319	37	185	0.730	17,585	1,953,668	7,946	294,002	2,247,670
SS	89,056	8	209	0.730	5,539	615,383	7,946	63,568	678,951
SE	166,980	12	200	0.730	8,386	931,685	7,946	95,352	1,027,037
SN-I	139,150	10	200	0.730	7,341	815,585	7,946	79,460	895,045
SN-II	54,686	7	209	0.730	3,880	431,068	7,946	55,622	486,690
SW	110,763	11	200	0.730	6,215	690,487	7,946	87,406	777,893
Total	1,946,516	149	--	--	84,296	9,365,271	--	1,183,954	10,549,225

**Table J.2.2 Construction Cost of Pumping Station**

(1,000,000Yen / 1,000,000VND)

No	Zone	Max Hourly Flow(m <sup>3</sup> /D)	Design Flow (m <sup>3</sup> /min)	N	Construction Cost	
					Japan-Yen	VND
1	TLBC	183,071 (127.1m <sup>3</sup> /min)	64 (50%)	1	616.9	68,537
			146 (30%)	2	2020.4	224,463
2	NLTN	701,402 (487.1m <sup>3</sup> /min)	244 (50%)	1	1373.3	152,578
			487(100%)	2	2076.4	230,689
			70(30%)	1	650.9	72,310
3	THLG	338,193 (234.9m <sup>3</sup> /min)	117(50%)	1	884.9	98,312
			188(80%)	1	1175.1	130,551
			498 (100%)	1	2104.1	233,762
4	THBNDT	717,246 (498.1m <sup>3</sup> /min)	26 (30%)	1	360.0	39,996
			43 (50%)	1	486.3	54,031
5	SS	124,678 (86.6m <sup>3</sup> /min)	16 (10%)	1	269.3	29,915
			49 (30%)	1	525.8	58,421
			81 (50%)	1	710.2	78,905
6	SE	233,772 (162.3m <sup>3</sup> /min)	14 (10%)	1	248.6	27,619
			41 (30%)	1	472.7	52,517
			68 (50%)	1	639.7	71,071
7	SN-I	194,810 (135.3m <sup>3</sup> /min)	16 (30%)	1	269.3	29,919
			27 (50%)	1	368.2	40,907
8	SN-II	76,560 (53.1m <sup>3</sup> /min)	32 (30%)	1	407.6	45,284
			54 (50%)	1	557.3	61,916
9	SW	155,068 (107.7m <sup>3</sup> /min)	16 (30%)	1	269.3	29,919
			27 (50%)	1	368.2	40,907
Total		1,974,188			16,217.0	1,801,703

Table J.2.3 Unit Direct Cost of Sewer Installation (Unit Cost = Unit Direct Cost x 1.8)

(Unit: 1,000 VND)

Pipe	Diameter (mm)	Unit	Trench Depth (m)											Pipe Cost	
			1.5	2.0	2.5	3.0	4.0	5.0	6.0	7.0	8.0	H < 4m	H = 5 - 8m		
RC : SP Pipe	200	m	590	680	770	1,190	1,510	3,071	3,691	4,431	5,131	130	209		
	300	m	620	710	800	1,220	1,550	3,106	3,736	4,506	5,226	170	274		
	350	m	640	735	825	1,245	1,575	3,121	3,761	4,546	5,251	195	314		
	400	m	660	760	850	1,270	1,600	3,136	3,786	4,586	5,276	220	354		
	450	m	715	815	905	1,330	1,655	3,188	3,858	4,683	5,398	250	403		
	500	m	770	870	960	1,390	1,710	3,239	3,929	4,779	5,519	280	451		
	600	m	850	940	1,040	1,470	1,800	3,288	4,108	4,908	5,708	380	612		
	700	m	900	995	1,095	1,530	1,860	3,336	4,086	5,006	5,831	425	684		
	800	m	950	1,050	1,150	1,590	1,920	3,383	4,153	5,103	5,953	470	757		
	900	m	1,020	1,120	1,220	1,660	1,990	3,404	4,214	5,224	6,144	600	966		
	1000	m	1,080	1,170	1,270	1,720	2,060	3,444	4,294	5,324	6,274	650	1,047		
	1100	m	1,285	1,400	1,510	1,840	2,185	3,448	4,390	5,545	6,640	975	1,570		
	1200	m	1,400	1,520	1,640	1,960	2,310	3,457	4,487	5,767	7,007	1,300	2,093		
	1300	m	1,487	1,610	1,730	2,053	2,403	3,504	4,587	5,917	7,204	1,377	2,216		
	1400	m	1,573	1,700	1,830	2,147	2,497	3,570	4,687	6,067	7,408	1,453	2,340		
	1500	m	1,660	1,790	1,920	2,240	2,590	3,637	4,787	6,217	7,597	1,530	2,463		
	1600	m	1,320	1,450	1,580	2,330	2,688	3,644	5,691	7,213	8,689	1,744	2,808		
	1800	m	2,034	2,210	2,384	2,528	3,080	3,639	7,525	9,207	10,375	2,172	3,497		
	2,000	m	2,210	2,400	2,590	2,728	3,350	3,674	9,350	11,200	13,068	2,600	4,186		
	2,500	m	3,400	3,850	4,293	4,593	5,111	5,611	11,688	14,880	16,325	3,250	5,233		
	3,000	m	4,628	5,111	5,593	6,111	6,628	7,145	14,025	16,300	19,590	3,900	6,279		

[Note]

- Above costs include laying, excavation, backfilling, dewatering and pavement works.
- The conditions of excavation and retaining wall methods are as follows. (H: Trench Depth)  
 H < 3m : Direct Excavate  
 H = 3 to less than 4m : 1/2 steep slope Excavate  
 H > 4m : Direct Excavate + Retaining Wall
- Cost : as of November 1998.
- Unit Cost : Unit Cost = Unit Direct Cost x 1.8 : Unit costs include manhole construction, indirect cost, and overhead, ect.



**Table J.2.4 Unit Cost of Pipe Jacking Method & Shield Tunneling Method**

(Unit : 1,000 VND)

Item	Specification	Unit	Unit Cost	Remarks
1. Pipe Jacking Method	Dia. 500	m	34,965	
	Dia. 800	m	34,188	
	Dia. 1000	m	44,289	
	Dia. 1200	m	52,059	
	Dia. 1500	m	55,167	
	Dia. 2500	m	73,038	
	Dia. 800	m	90,909	
2. Shield Tunnelling Work	Dia. 2000	m	108,780	
	Dia. 2500	m	132,090	
	Dia. 3000	m	155,400	
	Dia. 3500	m	178,710	
	Dia. 4000	m	202,020	
	Dia. 4500	m	225,330	
3. Shield Tunnelling Work Crossing Canal	Dia. 2000	m	147,630	
	Dia. 2500	m	178,710	
	Dia. 3000	m	209,790	
	Dia. 3500	m	240,870	
	Dia. 4000	m	271,950	
	Dia. 4500	m	303,030	

[ Note ]

1. Above costs include site expense, indirect cost and overhead charge.

Table J.2.5(1/2) Construction Cost of Interceptor by Each Sewerage Development Zone

Sewerage Development Zone	Diameter (mm)	Construction Cost (Million VND)														Nos. of Diversion Chamber						
		Earth Covering Depth (1 - 3 m)				Earth Covering Depth (4 - 6 m)				Earth Covering Depth (7 - 9m)				Earth Covering Depth (10 - 12m)				Total		600 mm	1,500 mm	Total
		Unit cost (1000 VND)	Length (m)	Construction Cost	Unit cost (1000 VND)	Length (m)	Construction Cost	Unit cost (1000 VND)	Length (m)	Construction Cost	Unit cost (1000 VND)	Length (m)	Construction Cost	Unit cost (1000 VND)	Length (m)	Construction Cost	600 mm	1,500 mm	Total			
1) TLBC	600	1,692	1,404	2,376	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,376	-	-	
	700	1,791	2,079	3,723	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3,723	-	-	
	900	-	-	-	6,127	2,041	12,505	-	-	-	-	-	-	-	-	-	-	-	12,505	-	-	
	1,200	2,250	2,616	5,886	6,207	1,216	7,543	-	-	-	-	-	-	-	-	-	-	-	13,434	-	-	
					52,059	374	19,470	-	-	-	-	-	-	-	-	-	-	-	19,470	-	-	
	<b>Sub - Total</b>		6,099	11,985		3,631	39,523										36	12	48	51,508		
	2) NL - TN	400	1,368	1,583	2,166	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,166	-	-
		500	1,566	3,223	5,047	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5,047	-	-
		600	1,692	2,860	4,839	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4,839	-	-
		700	-	-	-	6,005	297	1,783	-	-	-	-	-	-	-	-	-	-	-	1,783	-	-
900		2,016	810	1,633	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,633	-	-	
900		2,016	2,577	5,195	6,127	732	4,485	-	-	-	-	-	-	-	-	-	-	-	9,680	-	-	
1,100		2,313	3,388	7,836	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7,836	-	-	
		52,059	544	28,320	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28,320	-	-	
1,100		2,313	1,554	3,594	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3,594	-	-	
1,200		2,520	1,866	4,702	6,206	3,362	20,865	-	-	-	-	-	-	-	-	-	-	-	25,567	-	-	
1,400	-	-	-	6,426	2,771	17,806	-	-	-	-	-	-	-	-	-	-	-	17,806	-	-		
1,400	2,831	3,841	10,874	6,426	1,498	9,626	55,167	84	4,634	-	-	-	-	-	-	-	-	25,134	-	-		
1,600	-	-	-	6,559	1,043	6,841	-	-	-	-	-	-	-	-	-	-	-	6,841	-	-		
2,000	3,978	3,073	12,224	6,613	4,489	29,686	-	-	-	-	-	-	-	-	-	-	-	41,910	-	-		
				73,038	1,200	87,646	-	-	-	-	-	-	-	-	-	-	-	87,646	-	-		
<b>Sub - Total</b>		25,319	86,492		15,392	178,758										130	40	173	269,804			
3) THLC	600	1,692	2,099	3,552	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3,552	-	-	
	900	-	-	-	6,127	1,956	11,984	-	-	-	-	-	-	-	-	-	-	-	11,984	-	-	
	1,000	2,106	1,669	3,515	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3,515	-	-	
	1,100	2,313	2,892	6,689	6,206	981	6,088	-	-	-	-	-	-	-	-	-	-	-	12,777	-	-	
	1,100	2,313	1,934	4,473	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4,473	-	-	
	1,200	2,520	1,323	3,334	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3,334	-	-	
	1,400	-	-	-	6,426	3,451	22,176	-	-	-	-	-	-	-	-	-	-	-	22,176	-	-	
<b>Sub - Total</b>		9,917	21,563		14,652	94,452										91	30	121	116,015			

Table J.2.5(2/2) Construction Cost of Interceptor by Each Sewerage Development Zone

Sewerage Development Zone	Diameter (mm)	Construction Cost (Million VND)														Total		Nos. of Diversion Chamber								
		Earth Covering Depth (1 - 3 m)				Earth Covering Depth (4 - 6m)				Earth Covering Depth (7 - 9m)				Earth Covering Depth (10 - 12m)												
		Unit cost (1000 VND)	Length (m)	Construction Cost	Unit cost (1000 VND)	Length (m)	Construction Cost	Unit cost (1000 VND)	Length (m)	Construction Cost	Unit cost (1000 VND)	Length (m)	Construction Cost	Unit cost (1000 VND)	Length (m)	Construction Cost	Unit cost (1000 VND)	Length (m)	Construction Cost							
4) THBNDT	400	1,368	OC	634	867	5,645	OC	2,213	12,492										13,360							
	400	1,368	OC	1,604	2,194	5,645	OC	2,132	12,035										14,229							
	500	1,566	OC	897	1,405														1,405							
	600	1,692	OC	1,646	2,785	5,918	OC	2,100	12,428										15,213							
	600	1,692	OC	868	1,469														1,469							
	700	1,791	OC	1,692	3,030														4,206							
	800	1,890	OC	1,945	3,676	6,089	OC	1,739	10,589										30,005							
	900																		20,422							
	900	2,016	OC	1,165	2,349	6,127	OC	2,126	13,026										8,843							
	1,000	2,106	OC	1,106	2,329														2,329							
	1,100	2,313	OC	277	641														13,764							
	1,100																		24,259							
1,400	2,831	OC	1,548	4,382	6,206	OC	1,208	7,497										21,875								
1,400																		12,408								
1,600																		3,721								
1,600																		27,584								
2,000	3,978	OC	1,573	6,257	147,630	ST	1,500	221,445										97,652								
Sub - Total			14,985		31,385		16,406	555,337				6,295	211,248					7,996	585,366							
Grand Total			56,290		151,364		50,081	648,050				6,379	215,882					7,396	1,022,693							

Note: OC means "Open Cut Method"  
 PJ means "Pipe Jacking Method"  
 ST means "Shield Tunneling Method"

**Table J.2.6 Construction Cost of Sewer Pipeline**

(Unit: Million VND)

Zone	Area (ha)	Sewer						Storm Overflow Chamber			House Connection			Total				
		Trunk Sewer		Branch Sewer		Diameter (mm)	Length (m)	C. Cost (1,000 VND)	Unit Co (000 VND)	C. Cost	Number	Unit Cost (Million D)	C. Cost		Number	Unit Cost (1,000 VND)	C. Cost	
		Diameter (mm)	Length (m)	Unit Cost (1,000 VND)	C. Cost													Unit Cost
TLBC	1,495																	
NLTN	3,935																	
THLG	2,447																	
THBNDT	3,065																	
SS	1,555																	
SE	1,690																	
SN-I	2,324																	
SN-II	1,152																	
SW	1,315																	
Total																		

[ Note ] 1. Storm Overflow Chamber : Large :  $\phi$  1500mm - 7.0m X 10.0m X 5.0mH, Small ;  $\phi$  600mm - 3.0m X 4.0m X 2.0mH

**Table J.2.7 Total Length of Construction Sewer Pipeline**

Estimation Division	Zone	Zone Area (ha)	Out of Existing Sewer Area	Branch Sewer Length (km)	Trunk Sewer Length (km)	Total (km)
Urban Drainage (Combined Sewer)	TLBC	1,495	1,074	51,552	119,214	170,766
	NLTN	3,935	1,803	86,544	200,133	286,677
	THLG	2,447	1,256	60,288	139,416	199,704
	THBNDT	3,065	662	31,776	73,482	105,258
Sewerage System (Separate sewer)	SS	1,555	1,488	71,424	165,168	236,592
	SE	1,690	1,690	81,120	187,590	268,710
	SN-1	2,324	2,324	101,472	234,654	336,126
	SN-2	1,152	1,152	127,872	55,296	183,168
	SW	1,315	1,315	63,120	145,965	209,085
Total		18,978	12,764	675,168	1,320,918	1,996,086

**Table J.2.8 Number of House Connection**

No	Zone	Zone Area (ha)	Out of Existing Sewer Area	Population Density (person/ha)	Population in Out of Existing	Number of House (5 person/house)
1	TLBC	1,495	1,074	237	254,538	50,908
2	NLTN	3,935	1,803	346	623,838	124,768
3	THLG	2,447	1,256	268	336,608	67,322
4	THBNDT	3,065	662	454	300,548	60,110
5	SS	1,555	1,488	206	306,528	61,306
6	SE	1,690	1,690	355	600,000	120,000
7	SN- I	2,324	2,324	215	500,000	100,000
8	SN- II	1,152	1,152	170	196,500	39,300
9	SW	1,315	1,315	303	398,000	79,600
Total		18,978	12,764	---	3,515,655	703,319

**Table J.2.9 Land Acquisition Cost**

(Unit: 1,000,000VND)

Sewerage Zone	Components	Required Area (ha)	Unit Price (1,000,000VND/ha)	Amount
TLBC	Pumping Station	0.3	193	58
	Wastewater Treatment Plant	11	193	2,123
	Subtotal	11.3		2,181
NLIN	Pumping Station	2.5	386	965
	Wastewater Treatment Plant	33	386	12,738
	Subtotal	35.5		13,703
THH.G	Pumping Station	1.0	386	386
	Wastewater Treatment Plant	20	386	7,720
	Subtotal	21.0		8,106
THBNDT	Pumping Station	0.7	386	270
	Wastewater Treatment Plant	37	386	14,282
	Subtotal	37.7		14,552
SS	Pumping Station	0.3	260	78
	Wastewater Treatment Plant	8	260	2,080
	Subtotal	8.3		2,158
SE	Pumping Station	0.5	193	97
	Wastewater Treatment Plant	12	193	2,316
	Subtotal	12.5		2,413
SN- I	Pumping Station	0.5	193	97
	Wastewater Treatment Plant	10	193	1,930
	Subtotal	10.5		2,027
SN- II	Pumping Station	0.2	193	39
	Wastewater Treatment Plant	7	193	1,351
	Subtotal	7.2		1,390
SW	Pumping Station	0.3	960	288
	Wastewater Treatment Plant	11	960	10,560
	Subtotal	11.3		10,848
Total		155.3		57,378

[Note] 1. Cost : Cost as of February 1999

Table J.2.10(1/9) Annual Disbursement of Construction Cost

Cost Component	Construction cost (Mil. VND)																
	2000		2001		2002		2003		2004		2005		2006		2007		
	FC	LC	FC	LC	FC	LC	FC	LC	FC	LC	FC	LC	FC	LC	FC	LC	
<b>(1.1) TLBC Sewerage Development Zone</b>	<b>Construction cost (Mil. VND)</b>																
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1. Sewerage system	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1) Direct construction cost	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(2) Land acquisition	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(3) Engineering cost	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(4) Administration cost	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(5) Physical contingency	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Price contingency	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>(2) NLTN Sewerage Development Zone</b>	<b>Construction cost (Mil. VND)</b>																
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1. Sewerage system	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1) Direct construction cost	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(2) Land acquisition	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(3) Engineering cost	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(4) Administration cost	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(5) Physical contingency	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Price contingency	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>(3) THLG Sewerage Development Zone</b>	<b>Construction cost (Mil. VND)</b>																
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1. Sewerage system	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1) Direct construction cost	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(2) Land acquisition	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(3) Engineering cost	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(4) Administration cost	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(5) Physical contingency	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Price contingency	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>(4) THBNDT Sewerage Development Zone</b>	<b>Construction cost (Mil. VND)</b>																
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1. Sewerage system	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1) Direct construction cost	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(2) Land acquisition	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(3) Engineering cost	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(4) Administration cost	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(5) Physical contingency	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Price contingency	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0





Table J.2.10(3/9) Annual Disbursement of Construction Cost

Cost Component	2000			2001			2002			2003			2004			2005			2006			2007		
	FC	LC	Sh-total	FC	LC	Sh-total	FC	LC	Sh-total	FC	LC	Sh-total	FC	LC	Sh-total	FC	LC	Sh-total	FC	LC	Sh-total			
																						Construction cost (Mil. VND)	Total	
1. Sewerage system	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
(1) Direct construction cost	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
(2) Land acquisition	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
(3) Engineering cost	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
(4) Administration cost	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
(5) Physical contingency	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Sub total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Price contingency	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		

Cost Component	2000			2001			2002			2003			2004			2005			2006			2007		
	FC	LC	Sh-total	FC	LC	Sh-total	FC	LC	Sh-total	FC	LC	Sh-total	FC	LC	Sh-total	FC	LC	Sh-total	FC	LC	Sh-total			
																						Construction cost (Mil. VND)	Total	
1. Sewerage system	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
(1) Direct construction cost	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
(2) Land acquisition	0	14,552	14,552	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
(3) Engineering cost	77,321	23,138	110,459	13,464	6,628	20,092	22,092	94,501	40,501	135,002	31,272	13,402	44,674	103,265	44,256	147,521	30,206	12,945	43,151	30,206	12,945	43,151		
(4) Administration cost	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
(5) Physical contingency	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Sub total	77,321	14,552	91,873	13,464	6,628	20,092	22,092	94,501	40,501	135,002	31,272	13,402	44,674	103,265	44,256	147,521	30,206	12,945	43,151	30,206	12,945	43,151		
Price contingency	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Total	77,321	14,552	91,873	13,464	6,628	20,092	22,092	94,501	40,501	135,002	31,272	13,402	44,674	103,265	44,256	147,521	30,206	12,945	43,151	30,206	12,945	43,151		

Table J.2.10(4/9) Annual Disbursement of Construction Cost

Cost Component	2008		2009		2010		2011		2012		2013		2014		2015	
	Sh-total		Sh-total		Sh-total		Sh-total		Sh-total		Sh-total		Sh-total		Sh-total	
	FC	LC	FC	LC	FC	LC	FC	LC	FC	LC	FC	LC	FC	LC	FC	LC
<b>(1) TLHC Sewerage Development Zone</b>	<b>Construction cost (Mill. VND)</b>															
Total	1,051,337	63,080	1,47,187	210,267	63,080	147,187	210,267	0	0	0	0	0	0	0	0	0
1. Sewerage system	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1) Direct construction cost	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(2) Land acquisition	2,181	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(3) Engineering cost	71,508	5,152	2,208	7,359	5,152	2,208	7,359	0	0	0	0	0	0	0	0	0
(4) Administration cost	15,803	0	3,161	0	3,161	0	0	0	0	0	0	0	0	0	0	0
(5) Physical contingency	105,124	6,308	14,719	21,027	6,308	14,719	21,027	0	0	0	0	0	0	0	0	0
Sub total	1,248,040	74,540	167,274	241,814	74,540	167,274	241,814	0	0	0	0	0	0	0	0	0
Price contingency	1,248,040	74,540	167,274	241,814	74,540	167,274	241,814	0	0	0	0	0	0	0	0	0
Total	1,248,040	74,540	167,274	241,814	74,540	167,274	241,814	0	0	0	0	0	0	0	0	0
<b>(2) NLTN Sewerage Development Zone</b>	<b>Construction cost (Mill. VND)</b>															
Total	3,225,994	193,560	451,639	645,199	0	0	0	0	0	0	0	0	0	0	0	0
1. Sewerage system	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1) Direct construction cost	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(2) Land acquisition	13,720	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(3) Engineering cost	225,820	15,807	6,775	22,582	0	0	0	0	0	0	0	0	0	0	0	0
(4) Administration cost	48,595	0	9,719	0	0	0	0	0	0	0	0	0	0	0	0	0
(5) Physical contingency	322,599	19,356	45,164	64,520	0	0	0	0	0	0	0	0	0	0	0	0
Sub total	3,836,711	228,723	513,297	745,020	0	0	0	0	0	0	0	0	0	0	0	0
Price contingency	3,836,711	228,723	513,297	745,020	0	0	0	0	0	0	0	0	0	0	0	0
Total	3,836,711	228,723	513,297	745,020	0	0	0	0	0	0	0	0	0	0	0	0
<b>(3) TRIG Sewerage Development Zone</b>	<b>Construction cost (Mill. VND)</b>															
Total	1,897,145	119,229	256,200	377,429	113,229	264,200	377,429	0	0	0	0	0	0	0	0	0
1. Sewerage system	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1) Direct construction cost	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(2) Land acquisition	8,106	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(3) Engineering cost	132,100	9,247	3,963	13,210	9,247	3,963	13,210	0	0	0	0	0	0	0	0	0
(4) Administration cost	28,429	0	5,686	0	5,686	0	0	0	0	0	0	0	0	0	0	0
(5) Physical contingency	188,715	11,323	26,420	37,743	11,323	26,420	37,743	0	0	0	0	0	0	0	0	0
Sub total	2,244,495	133,799	300,269	434,068	133,799	300,269	434,068	0	0	0	0	0	0	0	0	0
Price contingency	2,244,495	133,799	300,269	434,068	133,799	300,269	434,068	0	0	0	0	0	0	0	0	0
Total	2,244,495	133,799	300,269	434,068	133,799	300,269	434,068	0	0	0	0	0	0	0	0	0
<b>(4) THBNDT Sewerage Development Zone</b>	<b>Construction cost (Mill. VND)</b>															
Total	3,155,965	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1. Sewerage system	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1) Direct construction cost	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(2) Land acquisition	14,532	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(3) Engineering cost	220,918	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(4) Administration cost	47,538	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(5) Physical contingency	315,597	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub total	3,754,590	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Price contingency	3,754,590	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	3,754,590	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table J.2.10(S/9) Annual Disbursement of Construction Cost

(5) SS Sewerage Development Zone

Cost Component	2008			2009			2010			2011			2012			2013			2014			2015		
	FC	LC	Sh-total	FC	LC	Sh-total	FC	LC	Sh-total	FC	LC	Sh-total	FC	LC	Sh-total	FC	LC	Sh-total	FC	LC	Sh-total			
Construction cost (Mil VND)																								
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
1. Sewerage system	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
(1) Direct construction cost	1,932,343	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
(2) Land acquisition	2,138	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,138	0		
(3) Engineering cost	135,264	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	47,342	20,390		
(4) Administration cost	29,018	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
(5) Physical contingency	193,234	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Sub total	2,322,017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	47,342	20,448		
Price contingency	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Total	2,322,017	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	47,342	20,448		

(6) SE Sewerage Development Zone

Cost Component	2008			2009			2010			2011			2012			2013			2014			2015		
	FC	LC	Sh-total	FC	LC	Sh-total	FC	LC	Sh-total	FC	LC	Sh-total	FC	LC	Sh-total	FC	LC	Sh-total	FC	LC	Sh-total			
Construction cost (Mil VND)																								
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
1. Sewerage system	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
(1) Direct construction cost	2,469,065	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
(2) Land acquisition	2,413	0	0	0	0	0	2,413	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
(3) Engineering cost	170,998	0	0	0	0	0	62,994	24,995	89,949	12,593	5,397	17,990	12,593	5,397	17,990	12,593	5,397	17,990	12,593	5,397	17,990	5,397		
(4) Administration cost	38,586	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
(5) Physical contingency	256,997	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Sub total	3,047,859	0	0	0	0	0	62,994	24,995	89,949	12,593	5,397	17,990	12,593	5,397	17,990	12,593	5,397	17,990	12,593	5,397	17,990	5,397		
Price contingency	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Total	3,047,859	0	0	0	0	0	62,994	24,995	89,949	12,593	5,397	17,990	12,593	5,397	17,990	12,593	5,397	17,990	12,593	5,397	17,990	5,397		

(7) SN-1 Sewerage Development Zone

Cost Component	2008			2009			2010			2011			2012			2013			2014			2015		
	FC	LC	Sh-total	FC	LC	Sh-total	FC	LC	Sh-total	FC	LC	Sh-total	FC	LC	Sh-total	FC	LC	Sh-total	FC	LC	Sh-total			
Construction cost (Mil VND)																								
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
1. Sewerage system	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
(1) Direct construction cost	2,708,458	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
(2) Land acquisition	2,027	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
(3) Engineering cost	180,592	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
(4) Administration cost	40,657	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
(5) Physical contingency	270,846	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Sub total	3,211,580	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Price contingency	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Total	3,211,580	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		

(8) SN-2 Sewerage Development Zone

Cost Component	2008			2009			2010			2011			2012			2013			2014			2015		
	FC	LC	Sh-total	FC	LC	Sh-total	FC	LC	Sh-total	FC	LC	Sh-total	FC	LC	Sh-total	FC	LC	Sh-total	FC	LC	Sh-total			
Construction cost (Mil VND)																								
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
1. Sewerage system	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
(1) Direct construction cost	1,445,338	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
(2) Land acquisition	1,390	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
(3) Engineering cost	101,188	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
(4) Administration cost	21,704	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
(5) Physical contingency	144,554	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Sub total	1,714,374	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Price contingency	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Total	1,714,374	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		

Table J.2.10(6/9) Annual Disbursement of Construction Cost

Cost Component	2008			2009			2010			2011			2012			2013			2014			2015		
	FC	LC	Sh-total	FC	LC	Sh-total	FC	LC	Sh-total	FC	LC	Sh-total	FC	LC	Sh-total	FC	LC	Sh-total	FC	LC	Sh-total			
<b>(9) SW Sewerage Development Zone</b>																								
Construction cost (Mil. VND)																								
<b>Total</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
1. Sewerage system	1,954,410	0	0	0	0	0	0	10,848	10,848	0	0	0	0	0	0	0	0	0	0	0	0			
(1) Direct construction cost	0	0	0	0	0	0	0	10,848	10,848	0	0	0	0	0	0	0	0	0	0	0	0			
(2) Land acquisition	10,848	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
(3) Engineering cost	134,739	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
(4) Administration cost	29,254	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
(5) Physical contingency	192,941	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Sub total	2,309,212	0	0	0	0	0	0	10,848	10,848	0	0	0	0	0	0	0	0	0	0	0	0			
Price contingency	2,309,212	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
<b>Total</b>	4,618,424	0	0	0	0	0	0	10,848	10,848	0	0	0	0	0	0	0	0	0	0	0	0			
<b>(10) Total</b>																								
Construction cost (Mil. VND)																								
<b>Total</b>	19,916,155	369,860	863,027	212,895	176,009	411,387	587,696	176,309	411,387	587,696	176,309	411,387	587,696	176,309	411,387	587,696	176,309	411,387	587,696	176,309	411,387			
(1) Direct construction cost	57,378	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
(2) Land acquisition	1,194,133	30,206	12,945	43,131	14,099	6,171	20,569	124,879	43,519	178,398	22,096	9,470	31,566	22,096	9,470	31,566	22,096	9,470	31,566	22,096	9,470			
(3) Engineering cost	299,604	0	18,565	18,565	0	8,846	8,846	0	8,846	8,846	0	13,568	13,568	0	13,568	13,568	0	13,568	13,568	0	13,568			
(4) Administration cost	1,991,617	36,987	86,303	123,200	17,631	41,139	58,770	17,631	41,139	58,770	17,631	41,139	58,770	17,631	41,139	58,770	17,631	41,139	58,770	17,631	41,139			
(5) Physical contingency	23,658,887	437,061	980,840	417,902	208,338	467,544	675,882	219,818	528,153	846,972	319,715	717,482	1,037,196	319,715	717,482	1,037,196	319,715	717,482	1,037,196	319,715	717,482			
Sub total	21,658,887	437,061	980,840	417,902	208,338	467,544	675,882	219,818	528,153	846,972	319,715	717,482	1,037,196	319,715	717,482	1,037,196	319,715	717,482	1,037,196	319,715	717,482			
Price contingency	21,658,887	437,061	980,840	417,902	208,338	467,544	675,882	219,818	528,153	846,972	319,715	717,482	1,037,196	319,715	717,482	1,037,196	319,715	717,482	1,037,196	319,715	717,482			
<b>Total</b>	43,317,774	874,122	1,961,680	835,804	416,676	935,088	1,351,764	439,636	1,056,306	1,693,944	639,430	1,434,964	2,074,392	639,430	1,434,964	2,074,392	639,430	1,434,964	2,074,392	639,430	1,434,964			

Table J.2.10(7/9) Annual Disbursement of Construction Cost

Cost Component	2016			2017			2018			2019			2020			Grand total			
	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	
																			Construction cost (Mil. VND)
1. Sewerage system	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1) Direct construction cost	1,051,337	0	1,051,337	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,051,337
(2) Land acquisition	2,181	0	2,181	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,181
(3) Engineering cost	73,594	0	73,594	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	73,594
(4) Administration cost	15,803	0	15,803	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15,803
(5) Physical contingency	105,134	0	105,134	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	105,134
Sub total	1,248,049	0	1,248,049	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,248,049
Price contingency	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1,248,049	0	1,248,049	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,248,049

Cost Component	2016			2017			2018			2019			2020			Grand total			
	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	
																			Construction cost (Mil. VND)
1. Sewerage system	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1) Direct construction cost	3,225,994	0	3,225,994	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3,225,994
(2) Land acquisition	13,703	0	13,703	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13,703
(3) Engineering cost	221,820	0	221,820	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	221,820
(4) Administration cost	48,595	0	48,595	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	48,595
(5) Physical contingency	322,599	0	322,599	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	322,599
Sub total	3,836,711	0	3,836,711	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3,836,711
Price contingency	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	3,836,711	0	3,836,711	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3,836,711

Cost Component	2016			2017			2018			2019			2020			Grand total			
	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	
																			Construction cost (Mil. VND)
1. Sewerage system	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1) Direct construction cost	1,887,145	0	1,887,145	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,887,145
(2) Land acquisition	8,106	0	8,106	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8,106
(3) Engineering cost	132,100	0	132,100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	132,100
(4) Administration cost	28,429	0	28,429	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	28,429
(5) Physical contingency	188,715	0	188,715	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	188,715
Sub total	2,244,495	0	2,244,495	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,244,495
Price contingency	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	2,244,495	0	2,244,495	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,244,495

Cost Component	2016			2017			2018			2019			2020			Grand total			
	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	FC	LC	Sb-total	
																			Construction cost (Mil. VND)
1. Sewerage system	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
(1) Direct construction cost	3,155,965	0	3,155,965	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3,155,965
(2) Land acquisition	14,552	0	14,552	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14,552
(3) Engineering cost	220,918	0	220,918	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	220,918
(4) Administration cost	47,558	0	47,558	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	47,558
(5) Physical contingency	315,597	0	315,597	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	315,597
Sub total	3,754,590	0	3,754,590	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3,754,590
Price contingency	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	3,754,590	0	3,754,590	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3,754,590

Table J.2.10(8/9) Annual Disbursement of Construction Cost

Cost Component	2016		2017		2018		2019		2020		Grand total	
	FC	LC	Sh-total	FC	LC	Sh-total	FC	LC	Sh-total	FC	LC	Sh-total
Construction cost (Mill. VND)												
Total	115,941	270,528	386,469	115,941	270,528	386,469	115,941	270,528	386,469	115,941	270,528	386,469
1. Sewerage system												
(1) Direct construction cost	1,912,343	115,941	2,028,284	115,941	2,028,284	115,941	2,028,284	115,941	2,028,284	115,941	2,028,284	2,154,325
(2) Land acquisition	2,158	0	2,158	0	2,158	0	2,158	0	2,158	0	2,158	2,158
(3) Engineering cost	135,264	9,468	144,732	9,468	144,732	9,468	144,732	9,468	144,732	9,468	144,732	144,732
(4) Administration cost	29,018	0	29,018	0	29,018	0	29,018	0	29,018	0	29,018	29,018
(5) Physical contingency	193,214	11,594	204,808	11,594	204,808	11,594	204,808	11,594	204,808	11,594	204,808	204,808
Sub total	2,292,017	127,003	2,419,020	127,003	2,419,020	127,003	2,419,020	127,003	2,419,020	127,003	2,419,020	2,546,031
Price contingency	2,292,017	127,003	2,419,020	127,003	2,419,020	127,003	2,419,020	127,003	2,419,020	127,003	2,419,020	2,419,020
Total	4,584,034	254,006	4,838,040	254,006	4,838,040	254,006	4,838,040	254,006	4,838,040	254,006	4,838,040	4,965,051

Cost Component	2016		2017		2018		2019		2020		Grand total	
	FC	LC	Sh-total	FC	LC	Sh-total	FC	LC	Sh-total	FC	LC	Sh-total
Construction cost (Mill. VND)												
Total	2,569,965	2,413	2,572,378	0	0	0	0	0	0	0	0	2,572,378
1. Sewerage system												
(1) Direct construction cost	2,569,965	0	2,569,965	0	0	0	0	0	0	0	0	2,569,965
(2) Land acquisition	2,413	0	2,413	0	0	0	0	0	0	0	0	2,413
(3) Engineering cost	179,898	0	179,898	0	0	0	0	0	0	0	0	179,898
(4) Administration cost	38,586	0	38,586	0	0	0	0	0	0	0	0	38,586
(5) Physical contingency	236,997	0	236,997	0	0	0	0	0	0	0	0	236,997
Sub total	3,047,859	0	3,047,859	0	0	0	0	0	0	0	0	3,047,859
Price contingency	3,047,859	0	3,047,859	0	0	0	0	0	0	0	0	3,047,859
Total	6,095,718	0	6,095,718	0	0	0	0	0	0	0	0	6,095,718

Cost Component	2016		2017		2018		2019		2020		Grand total	
	FC	LC	Sh-total	FC	LC	Sh-total	FC	LC	Sh-total	FC	LC	Sh-total
Construction cost (Mill. VND)												
Total	2,708,458	162,507	2,870,965	541,692	162,507	704,199	541,692	162,507	704,199	541,692	162,507	704,199
1. Sewerage system												
(1) Direct construction cost	2,708,458	162,507	2,870,965	541,692	162,507	704,199	541,692	162,507	704,199	541,692	162,507	704,199
(2) Land acquisition	2,027	0	2,027	0	0	0	0	0	0	0	0	2,027
(3) Engineering cost	189,592	13,271	202,863	18,959	13,271	32,230	18,959	13,271	32,230	18,959	13,271	32,230
(4) Administration cost	40,657	0	40,657	8,131	0	8,131	8,131	0	8,131	8,131	0	16,262
(5) Physical contingency	270,846	16,251	287,097	54,169	16,251	70,419	54,169	16,251	70,419	54,169	16,251	70,419
Sub total	3,211,580	182,029	3,393,609	622,951	182,029	822,951	622,951	182,029	822,951	622,951	182,029	822,951
Price contingency	3,211,580	182,029	3,393,609	622,951	182,029	822,951	622,951	182,029	822,951	622,951	182,029	822,951
Total	6,423,160	364,058	6,787,218	1,245,902	364,058	1,645,902	1,245,902	364,058	1,645,902	1,245,902	364,058	1,645,902

Cost Component	2016		2017		2018		2019		2020		Grand total	
	FC	LC	Sh-total	FC	LC	Sh-total	FC	LC	Sh-total	FC	LC	Sh-total
Construction cost (Mill. VND)												
Total	1,445,538	86,732	1,532,270	289,108	86,732	375,840	289,108	86,732	375,840	289,108	86,732	375,840
1. Sewerage system												
(1) Direct construction cost	1,445,538	86,732	1,532,270	289,108	86,732	375,840	289,108	86,732	375,840	289,108	86,732	375,840
(2) Land acquisition	1,390	0	1,390	0	0	0	0	0	0	0	0	1,390
(3) Engineering cost	101,188	7,083	108,271	10,119	7,083	17,202	10,119	7,083	17,202	10,119	7,083	17,202
(4) Administration cost	21,704	0	21,704	4,341	0	4,341	4,341	0	4,341	4,341	0	8,682
(5) Physical contingency	144,554	8,673	153,227	28,911	8,673	37,584	28,911	8,673	37,584	28,911	8,673	37,584
Sub total	1,714,374	102,489	1,816,863	332,478	102,489	435,007	332,478	102,489	435,007	332,478	102,489	435,007
Price contingency	1,714,374	102,489	1,816,863	332,478	102,489	435,007	332,478	102,489	435,007	332,478	102,489	435,007
Total	3,428,748	204,978	3,633,726	664,956	204,978	870,014	664,956	204,978	870,014	664,956	204,978	870,014

Table J.2.10(9/9) Annual Disbursement of Construction Cost

Cost Component	Construction cost (Mil. VND)	2016			2017			2018			2019			2020			Grand total			
		FC		LC	FC		LC	FC		LC	FC		LC	FC		LC	FC		LC	
		Sub-total	FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	
1. Sewerage system		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	581,873	1,352,587	1,939,410
(1) Direct construction cost	1,939,410	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10,948	10,948
(2) Land acquisition	10,948	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40,728	135,759
(3) Engineering cost	135,759	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	55,031	0	0
(4) Administration cost	29,254	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29,254	29,254
(5) Physical contingency	190,941	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	58,182	135,759	190,941
Sub-total	2,309,212	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	735,037	1,576,175	2,309,212
Price contingency		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	2,309,212	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	735,037	1,576,175	2,309,212

Cost Component	Construction cost (Mil. VND)	2016			2017			2018			2019			2020			Grand total			
		FC		LC	FC		LC	FC		LC	FC		LC	FC		LC	FC		LC	
		Sub-total	FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	Sub-total	FC	LC	
1. Sewerage system		365,140	852,087	217,268	365,140	852,087	217,268	365,140	852,087	217,268	365,140	852,087	217,268	365,140	852,087	217,268	365,140	852,087	217,268	365,140
(1) Direct construction cost	19,916,155	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	57,378
(2) Land acquisition	57,378	29,823	12,781	42,604	29,823	12,781	42,604	29,823	12,781	42,604	29,823	12,781	42,604	29,823	12,781	42,604	29,823	12,781	42,604	1,394,133
(3) Engineering cost	1,394,133	0	18,276	18,276	0	18,276	18,276	0	18,276	18,276	0	18,276	18,276	0	18,276	18,276	0	18,276	18,276	0
(4) Administration cost	299,604	0	18,276	18,276	0	18,276	18,276	0	18,276	18,276	0	18,276	18,276	0	18,276	18,276	0	18,276	18,276	0
(5) Physical contingency	1,991,617	36,518	85,209	121,727	36,518	85,209	121,727	36,518	85,209	121,727	36,518	85,209	121,727	36,518	85,209	121,727	36,518	85,209	121,727	1,991,617
Sub-total	23,658,887	431,521	1,968,353	3,999,875	431,521	1,968,353	3,999,875	431,521	1,968,353	3,999,875	431,521	1,968,353	3,999,875	431,521	1,968,353	3,999,875	431,521	1,968,353	3,999,875	23,658,887
Price contingency		23,658,887	431,521	1,968,353	3,999,875	431,521	1,968,353	3,999,875	431,521	1,968,353	3,999,875	431,521	1,968,353	3,999,875	431,521	1,968,353	3,999,875	431,521	1,968,353	3,999,875
Total	23,658,887	431,521	1,968,353	3,999,875	431,521	1,968,353	3,999,875	431,521	1,968,353	3,999,875	431,521	1,968,353	3,999,875	431,521	1,968,353	3,999,875	431,521	1,968,353	3,999,875	23,658,887

Table J.2.11 Replacement Cost of Sewer System

Cost Component	2021		2022		2023		2024		2025		Total	
	FC	Sb-total	FC	LC	FC	LC	FC	LC	FC	LC	FC	Sb-total
TLBC												
NLTN							95,141	221,996	317,137	95,141	221,996	317,137
THLG											190,282	443,992
THBNDT	69,058	161,136	230,194	69,058	161,136	230,194	69,058	161,136	230,194	69,058	161,136	805,680
SS												
SE												
SN-1												
SN-2												
SW												
Sub-total	69,058	161,136	230,194	69,058	161,136	230,194	164,199	383,132	547,331	164,199	383,132	1,249,672

Cost Component	2026		2027		2028		2029		2030		Total	
	FC	Sb-total	FC	LC	FC	LC	FC	LC	FC	LC	FC	Sb-total
TLBC	26,437	61,686	88,123	26,437	61,686	88,123	26,437	61,686	88,123	26,437	61,686	440,615
NLTN	95,141	221,996	317,137	95,141	221,996	317,137	95,141	221,996	317,137	95,141	221,996	951,411
THLG	50,082	116,857	166,939	50,082	116,857	166,939	50,082	116,857	166,939	50,082	116,857	834,695
THBNDT												
SS												
SE												
SN-1												
SN-2												
SW												
Sub-total	171,660	400,539	572,199	171,660	400,539	572,199	76,519	178,543	255,062	76,519	178,543	2,226,721

Cost Component	2031		2032		2033		2034		2035		Total	
	FC	Sb-total	FC	LC	FC	LC	FC	LC	FC	LC	FC	Sb-total
TLBC												
NLTN												
THLG												
THBNDT												
SS												
SE	32,968	76,925	109,893	32,968	76,925	109,893	32,968	76,925	109,893	32,968	76,925	549,465
SN-1												
SN-2	23,931	55,838	79,769	23,931	55,838	79,769	23,931	55,838	79,769	23,931	55,838	398,845
SW	56,899	132,763	189,662	56,899	132,763	189,662	56,899	132,763	189,662	56,899	132,763	948,310
Sub-total	113,808	265,526	378,324	113,808	265,526	378,324	113,808	265,526	378,324	113,808	265,526	1,815,085

Cost Component	2036		2037		2038		2039		2040		Total	
	FC	Sb-total	FC	LC	FC	LC	FC	LC	FC	LC	FC	Sb-total
TLBC												
NLTN												
THLG												
THBNDT												
SS	21,459	50,071	71,530	21,459	50,071	71,530	21,459	50,071	71,530	21,459	50,071	357,650
SE												
SN-1	29,004	67,675	96,679	29,004	67,675	96,679	29,004	67,675	96,679	29,004	67,675	483,395
SN-2	15,057	35,132	50,189	15,057	35,132	50,189	15,057	35,132	50,189	15,057	35,132	250,945
SW	65,520	152,878	218,398	65,520	152,878	218,398	65,520	152,878	218,398	65,520	152,878	1,091,990
Sub-total	131,040	305,756	426,394	131,040	305,756	426,394	131,040	305,756	426,394	131,040	305,756	2,652,865

Total	1,815,085	4,236,580	6,052,265
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**Table J.5.1 Unit Prices of Typical Materials**

Unit : VND ( 1999 Price )

Item	Description	Unit	Price	Remarks
Earth Material	Black Sand	m3	44,000	for Filling
	Red Soil	m3	63,800	
Crushed Stone	(0 ~ 4 cm)	m3	102,850	
Gravel	(1 x 2 cm)	m3	145,200	
Cobble	(4 x 6 cm, 5 x 7 cm)	m3	119,900	
Sand	Yellow Sand	m3	51,700	for Concrete
	Standard Sand	m3	88,000	
Cement	PC 40, PC 30	ton	990,000	for Concrete
Reinforcing Bar	> 10 mm	ton	4,510,000	
Ready Mixed Concrete	200 kg/cm2	m3	525,000	
	300 kg/cm2	m3	636,000	
	400 kg/cm2	m3	746,000	
Bricks	10 x 10 x 20 cm	1000 pieces	451,000	
Concrete Blocks	60 x 60 x 5 cm	sheet	15,684	RC.Sheet
Structural Steel	First Class	ton	4,985,800	
Glass	t = 5 mm	m2	78,936	
Timber	Low Class : group 5	m3	2,310,000	
	High Class : group 4	m3	4,070,000	
Wooden Pile	80 ~ 100, H = 5 m	pile	16,500	
Gasoline		kg	5,390	1L = 0.8 kg
Diesel Oil		kg	4,625	

**Table J.5.2 Labour Wages**

Unit : VND (1999 Price)

Type of Labour	Labour Wage	Remarks
1. Common Labour	626,000	
2. Mason and Plasterer	626,000 ~ 2,053,280	class I ~ class VII
3. Reinforcement Worker	626,000 ~ 2,053,280	class I ~ class VII
4. Concrete Worker	626,000 ~ 2,053,280	class I ~ class VII
5. Pavement Worker	626,000 ~ 2,053,280	class I ~ class VII
6. Carpenter	626,000 ~ 2,053,280	class I ~ class VII
7. Painter	626,000 ~ 2,053,280	class I ~ class VII
8. Welder	626,000 ~ 2,053,280	class I ~ class VII
9. Car Driver and Operator	876,400 ~ 2,159,700	class I ~ class VII
10. Heavy Equipment Operator	876,400 ~ 2,159,700	class I ~ class VII
11. Boat Operator	876,400 ~ 2,159,700	class I ~ class VII
12. Mechanic	876,400 ~ 2,159,700	class I ~ class VII
13. Electrician	876,400 ~ 2,159,700	class I ~ class VII
14. Plumber	876,400 ~ 2,159,700	class I ~ class VII
15. Surveyor	876,400 ~ 2,159,700	class I ~ class VII
16. Foreman	876,400 ~ 2,159,700	class I ~ class VII
17. Engineer & Architect :	1,114,280 ~ 2,491,480	class I ~ class X
	skilled	2,040,760 ~ 3,449,260

Table J.5.3(1) Unit Construction Cost

(Unit : 1,000VND)

Item	Specification	Unit	Unit Cost	Remarks
<b>1. Civil Work</b>				
<b>1) Piling Work</b>				
(1) Precast Concrete Pile	200*200	m	185	
	250*250	m	289	
	300*300	m	324	
	350*350	m	468	
	400*400	m	600	
	450*450	m	1,054	
	φ 600	m	1,912	
	φ 800	m	2,666	
	φ 1000	m	3,629	
	φ 1200	m	4,605	
φ 1500	m	5,820		
<b>2) Earth Work</b>				
(1) Excavation	Small Scale	m3	66.3	include steel sheet pile and dewatering
	Large Scale	m3	55.8	
(2) Back Filling		m3	34.9	
(3) Surplus Soil		m3	48.8	
<b>3) Concrete Work</b>				
	σ = 150 kg/cm2	m3	1,521	
	σ = 200 kg/cm2	m3	1,703	
	σ = 250 kg/cm2	m3	1,703	
	σ = 300 kg/cm2	m3	1,703	
	σ = 350 kg/cm2	m3	1,926	
	σ = 400 kg/cm2	m3	2,093	
4) Form of Concrete Work	σ = 160 ~ 250 kg/cm2	m2	205	
<b>5) Reinforced Bar</b>				
	AI (1700kg/cm2)	t	8,890	
	AII (2100kg/cm2)	t	9,071	
	AIII (2700kg/cm2)	t	9,211	
	AIV (3600kg/cm2)	t	9,979	
6) Lean Concrete	σ = 100 kg/cm2	m3	1,186	
7) Form of Lean Concrete	σ = 100 kg/cm2	m2	140	
8) Cobble Stone	t = 10cm	m3	893	
9) Red Soil	t = 20cm	m3	70	
<b>2. Site Preparation</b>				
1) Filling Soil	Ex : 1000 x 1000m	m3	145	
2) Leveling		m2	5.6	
3) Geotextile Sheet		m2	35	
<b>3. Road</b>				
(earth work, pavement)	1) Low cost road pavement	m2	328	
	2) City road grade 5	m2	500	
	3) City road grade1 ~ grade2	m2	1,000	

**Table J.5.3(2) Unit Construction Cost**

Item	Specification	Unit	Unit Cost	Remarks
4. Building				
1) Administrative Building	Ex ; 3000m <sup>2</sup>	m <sup>2</sup>	3,698	
2) Control Building	Ex ; 2000m <sup>2</sup>	m <sup>2</sup>	4,745	
3) Blower Building	Ex ; 500m <sup>2</sup> , RC	m <sup>2</sup>	4,815	
4) Sludge Process Building	Ex ; 3000m <sup>2</sup> , RC	m <sup>2</sup>	4,815	
5) Compost Plant	Ex ; 10000m <sup>2</sup>	m <sup>2</sup>	2,589	
5. Tank				
1) RC Tank (Small)	Ex ; D=2m, 500m <sup>3</sup>	m <sup>3</sup>	1,116	include steel sheet pile and dewatering
2) RC Tank (Large)	Ex ; D=5m, 3000m <sup>3</sup>	m <sup>3</sup>	1,186	
	D=5m, 5000m <sup>3</sup>	m <sup>3</sup>	1,186	
	D=7m, 10000m <sup>3</sup>	m <sup>3</sup>	1,186	
3) Steel Tank	Ex ; D=4, $\phi$ 10m	m <sup>3</sup>	2,791	
6. Bridge				
1) RC Bridge	Ex ; 10m x 50m	m <sup>2</sup>	17,351	
	Ex ; 10m x 100m	m <sup>2</sup>	19,913	
2) Steel Bridge for Pipe Line	Ex ; 8m x 100m	m <sup>2</sup>	4,885	
7. Vertical Drain	L = 30m (3.3US\$/m)	drain	1,382	
8. Temprary Pier		m <sup>2</sup>	8,676	
9. Pile Foundation	400x400x25mH	pile	15,000	
	350x350x25mH	pile	11,700	
	300x300x25mH	pile	8,100	
10. Steel Sheet Pile				
1) Dry Condition	Length<12mH , grade I	m	301	
	Length<12mH , grade II	m	308	
	Length>12mH , grade I	m	298	
	Length>12mH , grade II	m	305	
2) Mud or Water Condition	Length<12mH , grade I	m	361	
	Length<12mH , grade II	m	397	
	Length>12mH , grade I	m	357	
	Length>12mH , grade II	m	381	
11. Landscape Work	Net Fence	m	209	
	Bar Fence	m	181	
12. House Connection		house	1,170	
13. O/M Road for Conveyance Sewer				
1) Undeveloped Area		m	7,296	
2) Narrow Farm Road		m	5,326	

**Table J.5.4 Unit Cost of Construction for Urban Drainage**

(Unit: 1,000VND)

Item	Specification	Unit	Unit Cost
1. Dredging			
(1) Dredging	1) No Treatment	m <sup>3</sup>	45
	2) With Treatment	m <sup>3</sup>	
(2) Transport and Dumping	1) Dump to low land area along the canal	m <sup>3</sup>	
	2) Distance of Disposal Site : 10 km	m <sup>3</sup>	40
	3) Distance of Disposal Site : 20 km	m <sup>3</sup>	75
	4) Distance of Disposal Site : 40 km	m <sup>3</sup>	90
2. Side Ditch	(1) Wwaterway with Rectangular Section with Lid	m	752
	(2) Waterway with Trapezoid Section without Lid	m	625
3. Rip Rap	Cobble : t = 50cm	m <sup>3</sup>	133
4. Dike and Bank Protection			
(1) Structure Fill for Earth Dike		m <sup>3</sup>	200 ~ 270
(2) Retaining Wall	T-type Retaining Wall	m	10,800
(3) Revetment	1) Sodding Protection	m <sup>2</sup>	72
	2) Stone Masonry; n = 1: 1.5, include pile, etc.	m <sup>2</sup>	412
	3) O/M Road;		
	(a) Concrete Block (t = 100)	m <sup>2</sup>	220
	(b) Low Cost Pavement + Concrete Block	m <sup>2</sup>	212
	- Typical Cross Section -		
5. Pump Station			
(1) Gate Equipment	include Installation Work	m <sup>2</sup>	72,000
(2) Pump Equipment	include Electrical & Installation Work		
	1) Thanh Da : 0.35m <sup>3</sup> /s x 3.5mH	Set	8,699,400
	2) Ben Me Coc (1) : 0.35m <sup>3</sup> /s x 3.7mH (Phase I)	Set	10,711,300
	Ben Me Coc (1) : 0.40m <sup>3</sup> /s x 3.3mH (Phase II)	Set	11,066,600
	3) Ben Me Coc (2) : 0.7m <sup>3</sup> x3.5mH + 0.35m <sup>3</sup> x3.5mH	Set	11,232,500
(3) Concrete Work	include Form, Reinforced Bar & Foundation Work	m <sup>3</sup>	4,800
(4) O/M Building	Ex: 10m x 4m x 3.5mH ~ 6m x 5m x 3.5mH	m <sup>2</sup>	1,000
6. Flap Gate			
(1) Quadrilateral	1) 800 x 800 mm	Set	22,100
	2) 1000 x 1000 mm	Set	24,600
	3) 1500 x 1500 mm	Set	30,800
(2) Circle	1) φ1000 mm	Set	18,500
	2) φ1500 mm	Set	21,500
	3) φ2000 mm	Set	24,600

**Table J.5.5 Unit Construction Cost of Sewer Pipe by Pipe Jacking and Shield Tunneling Methods**

(Unit : 1,000 VND)

Method	Diameter (mm)	Unit	Unit Cost	Remarks
1. Pipe Jacking	φ500	m	27,972	
	φ800	m	27,350	
	φ1000	m	35,431	
	φ1100	m	38,539	
	φ1200	m	41,647	
	φ1300	m	43,305	
	φ1500	m	44,134	
	φ2000	m	58,430	
	φ2500	m	72,727	
2. Shield Tunneling	φ2000	m	87,024	
	φ2500	m	105,672	
	φ3000	m	124,320	
	φ3500	m	142,968	
	φ4000	m	161,616	
	φ4500	m	180,264	
3. Shield Tunneling Crossing Canal	φ2000	m	118,104	
	φ2500	m	142,968	
	φ3000	m	167,832	
	φ3500	m	192,696	
	φ4000	m	217,560	
	φ4500	m	242,424	

**Table J.5.6 Unit Construction Cost of Sewer Pipe by Trench Method**

(Unit: 1,000 VND)

Pipe	Diameter (mm)	Unit	Trench Depth(m)										Pipe Cost	
			1.5	2.0	2.5	3.0	4.0	5.0	6.0	7.0	8.0	H < 4m	H = 5 ~ 8m	
RC : SP Pipe	200	m	590	680	770	1,190	1,510	3,071	3,691	4,431	5,131	130	209	
	300	m	620	710	800	1,220	1,550	3,106	3,736	4,506	5,226	170	274	
	350	m	640	735	825	1,245	1,575	3,121	3,761	4,546	5,251	195	314	
	400	m	660	760	850	1,270	1,600	3,136	3,786	4,586	5,276	220	354	
	450	m	715	815	905	1,330	1,655	3,188	3,858	4,683	5,398	250	403	
	500	m	770	870	960	1,390	1,710	3,239	3,929	4,779	5,519	280	451	
	600	m	850	940	1,040	1,470	1,800	3,288	4,108	4,908	5,708	380	612	
	700	m	900	995	1,095	1,530	1,860	3,336	4,086	5,006	5,831	425	684	
	800	m	950	1,050	1,150	1,590	1,920	3,383	4,153	5,103	5,953	470	757	
	900	m	1,020	1,120	1,220	1,660	1,990	3,404	4,214	5,224	6,144	600	966	
	1000	m	1,080	1,170	1,270	1,720	2,060	3,444	4,294	5,324	6,274	650	1,047	
	1100	m	—	1,285	1,390	1,840	2,185	3,448	4,390	5,545	6,640	975	1,570	
	1200	m	—	1,400	1,510	1,960	2,310	3,437	4,487	5,767	7,007	1,300	2,093	
	1300	m	—	1,487	1,597	2,053	2,403	3,504	4,587	5,917	7,204	1,377	2,216	
	1400	m	—	1,573	1,683	2,147	2,497	3,570	4,687	6,067	7,408	1,453	2,340	
	1500	m	—	1,660	1,770	2,240	2,590	3,637	4,787	6,217	7,597	1,530	2,463	
	1600	m	—	1,320	1,858	2,330	2,688	3,644	5,691	7,213	8,689	1,744	2,808	
	1800	m	—	—	2,034	2,528	2,884	3,639	7,525	9,207	10,375	2,172	3,497	
	2000	m	—	—	2,210	2,728	3,080	3,674	9,350	11,200	13,068	2,600	4,186	
	2500	m	—	—	—	3,400	3,850	4,593	11,688	14,880	16,325	3,250	5,233	
	3000	m	—	—	—	—	4,628	6,511	14,025	16,300	19,590	3,900	6,279	

[Note]

1. Above costs include laying, excavation, backfilling, dewatering and pavement works.
2. The conditions of excavation and retaining wall methods are as follows. (H: Trench Depth)  
 H < 3m : Direct Excavate  
 H = 3 to less than 4m : 1/2 steep slope Excavate  
 H > 4m : Direct Excavate + Retaining Wall
3. Cost : as of 1999 in Ho Chi Minh City.

Table J.5.7 Unit Construction Cost of Manhole

(Unit : 1,000VND)

NO	Manhole Dimension (cm)	Depth (m)								Remark
		1	2	3	4	5	6	8		
1	75 * 75	2,620	4,130	5,670	7,210	18,940	20,858	—	—	
2	90 * 90	3,030	4,880	6,680	8,480	21,570	24,332	—	—	
3	120 * 120	—	6,720	9,000	11,280	27,090	32,000	41,830	—	
4	150 * 150	—	8,360	11,100	13,840	32,330	38,117	49,690	—	
5	180 * 120	—	8,310	11,320	14,330	32,580	38,385	49,990	—	
6	210 * 120	—	—	11,920	23,840	35,270	41,535	54,060	—	
7	300 * 120	—	—	—	—	42,460	49,877	64,710	—	

[Note] The above cost includes excavation, ladder and concrete works.

**Table J.5.8(1) Unit Construction Cost of Flap Gate for Pump Drainage Improvement**

(Unit : 1000VND)

Item	Unit	Quantity	Unit Cost	Construction Cost	Remarks
<b>1. Type : A-1</b>					
1) Excavation	m3	30.7	66.3	2,035	
2) Backfill	m3	25.5	34.9	890	
3) Surplus Soil	m3	5.2	48.8	254	
4) RC Pile; 200x200x5mH	pile	4	925	3,700	
5) R.Concrete	m3	8.3	1,926	15,986	
6) Flap Gate	set	1	18,500	18,500	include installation
7) Miscellaneous		10%		4,137	
Sub-Total				45,502	
Site Expenses		15%		6,825	
Overhead		10%		5,233	
Total of 1.				57,559	
<b>2. Type : A-2</b>					
1) Excavation	m3	31.9	66.3	2,115	
2) Backfill	m3	27.9	34.9	974	
3) Surplus Soil	m3	4.0	48.8	195	
4) RC Pile; 200x200x5mH	pile	4	925	3,700	
5) R.Concrete	m3	6.1	1,926	11,749	
6) Flap Gate	set	1	18,500	18,500	include installation
7) Miscellaneous		10%		3,723	
Sub-Total				40,956	
Site Expenses		15%		6,143	
Overhead		10%		4,710	
Total of 2.				51,809	
<b>3. Type : B-1</b>					
1) Excavation	m3	45.8	66.3	3,037	
2) Backfill	m3	35.7	34.9	1,246	
3) Surplus Soil	m3	10.1	48.8	493	
4) RC Pile; 200x200x5mH	pile	4	925	3,700	
5) R.Concrete	m3	12.15	1,926	23,401	
6) Flap Gate	set	1	21,500	21,500	include installation
7) Miscellaneous		10%		5,338	
Sub-Total				58,714	
Site Expenses		15%		8,807	
Overhead		10%		6,752	
Total of 3.				74,273	
<b>4. Type : B-2</b>					
1) Excavation	m3	53.9	66.3	3,574	
2) Backfill	m3	43.7	34.9	1,525	
3) Surplus Soil	m3	10.2	48.8	498	
4) RC Pile; 200x200x5mH	pile	4	925	3,700	
5) R.Concrete	m3	10.3	1,926	19,838	
6) Flap Gate	set	1	21,500	21,500	include installation
7) Miscellaneous		10%		5,063	
Sub-Total				55,698	
Site Expenses		15%		8,355	
Overhead		10%		6,405	
Total of 4.				70,458	



**Table J.5.8(2) Unit Construction Cost of Flap Gate for Pump Drainage Improvement**

(Unit: 1000 VND)

Item	Unit	Quantity	Unit Cost	Construction Cost	Remarks
<b>5. Type : C-1</b>					
1) Excavation	m3	65.8	66.3	4,363	
2) Backfill	m3	47.3	34.9	1,651	
3) Surplus Soil	m3	18.5	48.8	903	
4) RC Pile; 200x200x5mH	pile	4	925	3,700	
5) R.Concrete	m3	16.2	1,926	31,201	
6) Flap Gate	set	1	24,600	24,600	include installation
7) Miscellaneous		10%		6,642	
Sub-Total				73,059	
Site Expenses		15%		10,959	
Overhead		10%		8,402	
<b>Total of 5.</b>				<b>92,420</b>	
<b>6. Type : C-2</b>					
1) Excavation	m3	62.3	66.3	4,131	
2) Backfill	m3	48.9	34.9	1,707	
3) Surplus Soil	m3	13.4	48.8	654	
4) RC Pile; 200x200x5mH	pile	4	925	3,700	
5) R.Concrete	m3	13.6	1,926	26,194	
6) Flap Gate	set	1	24,600	24,600	include installation
7) Miscellaneous		10%		6,099	
Sub-Total				67,083	
Site Expenses		15%		10,063	
Overhead		10%		7,715	
<b>Total of 6.</b>				<b>84,860</b>	

**Table J.5.9 Land Acquisition and Compensation Cost**

(Unit : Million VND)

Project Area	Land Acquisition			Compensation Cost			Resettlement Cost			Remark		
	Quantity	Unit	Unit Price (1000 VND)	Cost	Quantity	Unit	Unit Price (1000 VND)	Cost	Quantity		Unit	Unit Price (1000 VND)
1. Urban Drainage 1) Thanh Da Common place Adjacent to main road	5,018	m2	500	2,509	96	houses	45,477.4	4,366	96	houses	162,811.40	15,630
	1,255	m2	1,000	1,255								
	20,000	m2	550	11,000	10	houses	45,477.4	455	10	houses	162,811.4	1,628
	20,000	m2	450	9,000	11	houses	45,477.4	500	11	houses	162,811.4	1,791
4) Tan Hu - Ben Nghe Canal Common place Adjacent to main road	95,916	m2	300	28,775	1,557	houses	45,477.4	70,808	1,557	houses	162,811.4	253,497
	23,979	m2	400	9,592								
Sub-Total				62,131	1674			76,129				272,546
2. Sewerage System 1) Wastewater Treatment Plant 2) Pumping Station 3) Conveyance Sewer Farm road area Undeveloped area	522,600	m2	39	20,381	60	houses	45,477.4	2,729	60	houses	162,811.4	9,769
	5,832	m2	2,000	11,664	522,600	m2	45.4	23,726	20	houses	162,811.4	3,256
	2,800	m2	39	109								
	6,300	m2	20	126	20	houses	45,477.4	910	20	houses	162,811.4	3,256
Sub-Total			32,280	1754	1754	(houses)		27,492				13,025
Total				94,411				103,621				285,571

**Table J.5.10(1) Construction Cost of Pump Drainage Improvement**

**1. Thanh Da**

( Unit : Million VND )

Item	Phase I	Phase II	Total	Remark
1. Pump Station	12,114	0	12,114	Table J.5.11
2. Dike	1,038	0	1,038	Table J.5.12
3. Retarding Pond	4,870	0	4,870	Table J.5.13
4. Flap Gate	311	0	311	Table J.5.14
5. Storm Sewer	1,870	0	1,870	Table J.5.15(1)
Total	20,203	0	20,203	

**2. Ben Me Coc (1)**

Item	Phase I	Phase II	Total	Remark
1. Pump Station	14,523	13,480	28,003	Table J.5.11
2. Controle Gate	1,423	0	1,423	Table J.5.11
3. Dike	10,302	0	10,302	Table J.5.12
4. Retarding Pond	2,600	7,375	9,975	Table J.5.13
5. Flap Gate	859	0	859	Table J.5.14
6. Storm Sewer	15,604	0	15,604	Table J.5.15(1)
Total	45,311	20,854	66,166	

**3. Ben Me Coc (2)**

Item	Phase I	Phase II	Total	Remark
1. Pump Station	0	16,847	16,847	Table J.5.11
2. Dike	10,881	0	10,881	Table J.5.12
3. Retarding Pond	0	15,999	15,999	Table J.5.13
4. Flap Gate	596	0	596	Table J.5.14
5. Storm Sewer	13,044	0	13,044	Table J.5.15(1)
Total	24,521	32,846	57,367	

**Table J.5.10(2) Construction Cost of Tau Hu - Ben Nghe Canal Improve**

Item	Phase I	Phase II	Total	Remark
1. Ben Nghe	128,107	0	128,107	Table J.5.16
2. Tau Hu (Down-stream)	169,333	0	169,333	Table J.5.16
3. Tau Hu (Up-stream)	0	157,160	157,160	Table J.5.16
4. Nbang No. 1	0	13,168	13,168	Table J.5.16
5. Nbang No. 2	0	6,504	6,504	Table J.5.16
6. Nbang No. 3	0	21,051	21,051	Table J.5.16
<b>Total</b>	<b>297,439</b>	<b>197,884</b>	<b>495,323</b>	

**Table J.5.10(3) Construction Cost of Sewer**

Item	Phase I	Phase II	Total	Remark
1. New Storm Sewer	0	121,865	121,865	Table J.5.15(2)
2. Rehabilitation of Combined Sewer	134,442	0	134,442	Table J.5.15(2)
<b>Total</b>	<b>134,442</b>	<b>121,865</b>	<b>256,307</b>	
<b>Grand Total</b>	<b>521,916</b>	<b>373,449</b>	<b>895,365</b>	