

CHAPTER 10

COST ESTIMATION

The cost estimation in this scheme based on the cost of materials from available reports¹ which was prepared by sanitary engineers of Department of Town and Country Planning. It provides for use of either asbestos-cement pipe or reinforced concrete pipes. Costs include excavation, backfill, laying and jointing, manholes, clean up.

SANITARY SEWERS

The following costs are estimated when sewers are buried at 1.5 metres deep.

THE COST OF SANITARY SEWERS IN SELECTED AREA

(asbestos-cement pipe, class C)

size	cost per metre baht	length	TOTAL COST BAHT
Ø10"	100	21,280	2,128,000
Ø12"	150	10,130	1,519,500
Ø15"	220	2,590	569,500
Ø18"	270	1,500	405,000
Ø21"	300	800	240,000
		sum	4,862,300

¹Vichai Pakdeedindan, Report on Sewerage and Drainage Disposal in Bangkok (Engineering Division, Department of Town & Country Planning)

The depth of the excavation in calculation is about 2 metres deep. The total cost would increase 8 % due to increasing excavation from 1.50 metres to 1.80 metres and plus 17 % for increasing sewers in the areas left. (areas do not include in calculation)

The cost in selected area	=	4,860,000 + $\frac{.25}{.100} \times 4,860,000$, baht.	
	=	4,860,000 + 1,215,000	"
	=	6,075,000	"
Cost of pumps	=	1,000,000	"
Land Values at pumps	=	800,000	"
Total cost in selected area	=	6,075,000 + 1,000,000 + 800,000	"
	=	7,875,000	"

Population in area under consideration = 633,275 persons

Population in selected area = 43,124 "

ratio = $\frac{633,275}{43,124} = 14.7$

Total cost in area under consideration = 7.86 x 14.7 million baht
= 116 " "

COST OF FORCED MAIN OF SANITARY SEWERS

asbestos cement pipe (super simplex joint), class C

size	cost per metre baht	length	TOTAL COST BAHT
Ø8"	60	700	42,000
Ø10"	120	1050	126,000
Ø12"	180	2300	414,000
Ø14"	230	4800	1,102,000

size	cost per metre baht	length	TOTAL COST BAHT
ø15"	250	3250	812,000
ø16"	300	2000	600,000
ø18"	320	26000	832,000
ø20"	400	2250	900,000
ø22"	500	1700	850,000
ø23"	800	1650	1,320,000
ø30"	1200	500	600,000
ø42"	2000	1950	3,900,000
ø48"	3200	1850	5,920,000
ø54"	3600	1550	5,590,000
ø60"	4000	2800	11,200,000
		sum	<u>34,208,000</u>

Remark ø30", ø42", ø48", ø54", ø60" are R.C. pipe C = 130

COST OF VARIOUS PUMPS

Pump no	capacity mgd.	cost baht
1.	8.96	900,000
2.	9.65	1,000,000
3.	6.55	700,000
4.	10.15	1,100,000
5.	1.98	200,000
6.	13.90	1,400,000

Pump No	capacity mgd.	cost baht
7.	4.64	500,000
8.	1.90	200,000
9.	1.68	200,000
10.	10.65	1,100,000
11.	11.80	1,200,000
12.	3.91	400,000
13.	3.10	350,000
14.	9.90	1,000,000
15.	11.75	1,200,000
16.	9.35	1,000,000
17.	6.55	700,000
18.	3.87	400,000
19.	5.65	600,000
20.	6.24	650,000
	Total	<u>14,800,000</u>

The cost of sewerage system = 116+34.21+14.80 million baht
= 165 "

²The cost of treatment plant (included land values) 30 %
= 49.5 million baht

²Gordon H. Fair and John C. Geyer, Water Supply and Wastewater Disposal (New York: John Wiley & Sons, Inc., 1954), p. 84.

other factor 10 % = $(165+49.5) \times 10 = 21.4$ million baht

Total cost of sewerage systems = $165+49.5+21.4$ "

= 236

Average sewerage work per capita = $\frac{236}{.653} = 372$ baht

COST OF STORM SEWERS

(R.C. pipe)

size	cost per metre baht	length	TOTAL COST BAHT
φ.60	300	17,650	5,300,000
φ.80	540	6,620	3,570,000
φ1.00	800	3,510	2,808,000
▭ 1.20x1.20	1400	1,540	2,160,000
▭ 1.20x1.40	1600	1,000	1,600,000
▭ 1.40x1.60	2200	1,090	2,400,000
		Total	<u>17.6</u>

But it would use the existing sewer 40 %

Total cost would be = $17.6 \times .6 = 10.5$

Total area = 20,778 rais

Selected area = 1,257 "

The ratio = $\frac{\text{total area}}{\text{selected area}} = \frac{20,778}{1,257} = 16.5$

Cost of drainage system = $10.5 \times 16.5 = 174$ million baht

Gate and Pump = 16 "

Other factors 10 % = $(174+16) \times 10 = 19$ "

Total cost of drainage system = $174+16+19 = 209$ "

Average drainage work per capita = $\frac{206}{.653} = 325$ baht

Total sewerage and drainage system = 445 baht

Average sewerage and drainage work per capita

$$= \frac{445}{.633} = 704 \quad \text{baht}$$