

(3) Alternative K-1

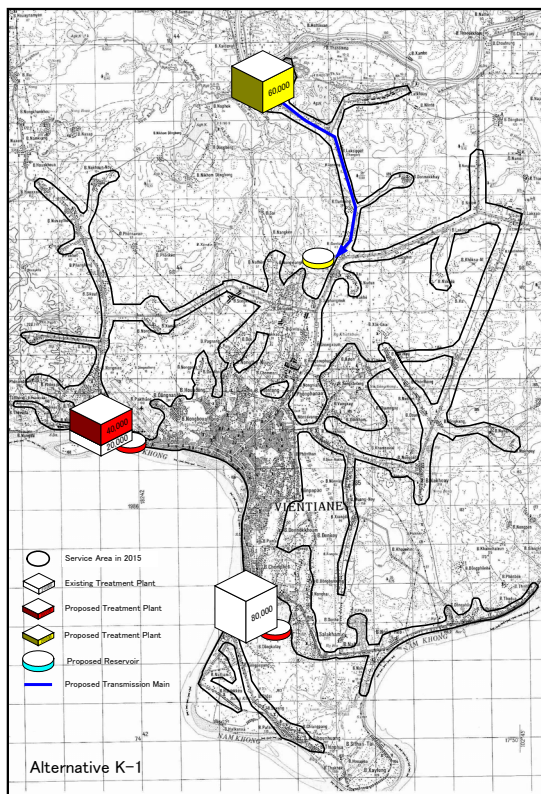
1) Intake and Treatment Plant

1st Stage (Expansion of Existing Kaolieo Water Treatment Plant, see Figure 5)

- Intake Facilities: Construction of new intake facilities in the Mekong River
- Treatment Plant: Expansion of 40,000 m³/day

2nd Stage (Construction of the new Thangone Water Treatment Plant, see Figure 8)

- Intake Facilities: Construction of new intake facilities in the Nam Ngum River
- Treatment Plant: Construction of 60,000 m³/day



Production capacity expansion of 40,000 m³/day at the existing Kaolieo Treatment Plant for the 1st Stage, and a new treatment plant with a capacity of 60,000 m³/day at Thangone for the 2nd Stage are considered for this alternative, K-1. Process treatment is planned to be the same as the existing facilities at the Chinaimo Treatment Plant. For the expansion of the existing Kaolieo Treatment Plant during the 1st Stage, additional intake structures will be required. Figure 21 and Figure 22 show the plan of treatment facilities and flow diagram for the expansion of 40,000 m³/day at the Kaolieo Treatment Plant for the 1st Stage. The plan of treatment facilities and flow diagram for the capacity expansion of 60,000 m³/day at Thangone Treatment Plant for the 2nd Stage are the same as alternative C-1, as shown in Figure 13

and Figure 14 respectively. Detailed specifications of the treatment facilities for alternative K-1 are attached to Annex 14.

2) Pipelines

1st Stage

- Clear Water Transmission Pipelines: Installation of 2.2 km of pipelines
- Booster Pumping Stations: Improvement of the Km6 BP station
- Distribution Trunk Mains: Installation of 24.2 km of pipelines

2nd Stage

- Clear Water Transmission: Installation of 10.6 km of pipelines
- Distribution Centre: Construction of a new distribution centre with a capacity of 60,000 m³/day

- Booster Pumping Stations: Improvement of the Km12 BP station
- Distribution Trunk Mains: Installation of 73.6 km of pipelines

Improvement of the Km6 BP station in the 1st Stage will secure water supply to the northern part of Vientiane, especially the Dongdok area. The improvement will include replacement of the existing pumps with new, larger capacity and higher head pumps, and construction of a pump house. Improvement of the Km12 BP station in the 2nd Stage will be mainly for water supply to the new industrial area in the eastern part of the City.

In the 2nd Stage, it is planned for clear water to be transmitted from the new Thangone Treatment Plant to a distribution centre and then distributed to the consumers. The distribution centre is proposed to be constructed near the junction of National Roads 10 and 13 in northern part of the city and near the Dongdok area.

Figure 23 shows the clear water transmission pipelines and distribution trunk mains required for alternative K-1. These required pipelines are obtained from a hydraulic network analysis prepared for this alternative. The required pipeline lengths by pipeline diameters by stages are summarized in Figure 20.

Figure 20 Required Pipelines by Diameters for Alternative K-1

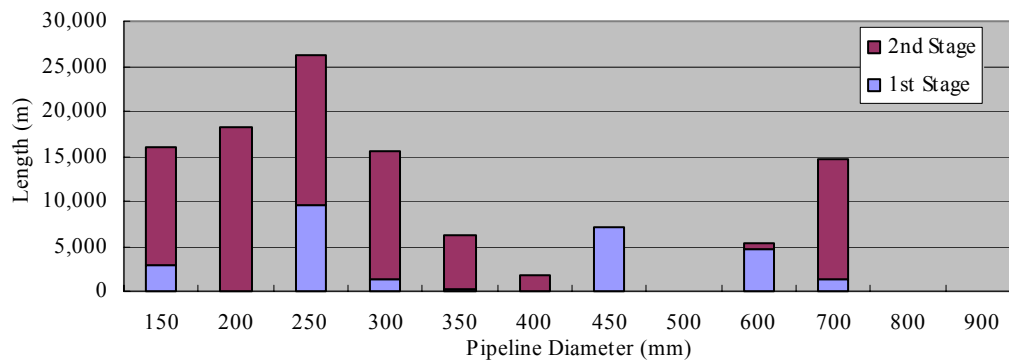


Figure 21

Plan of Treatment Facilities for Expansion of 40,000 m³/day at Kaolieo Treatment Plant

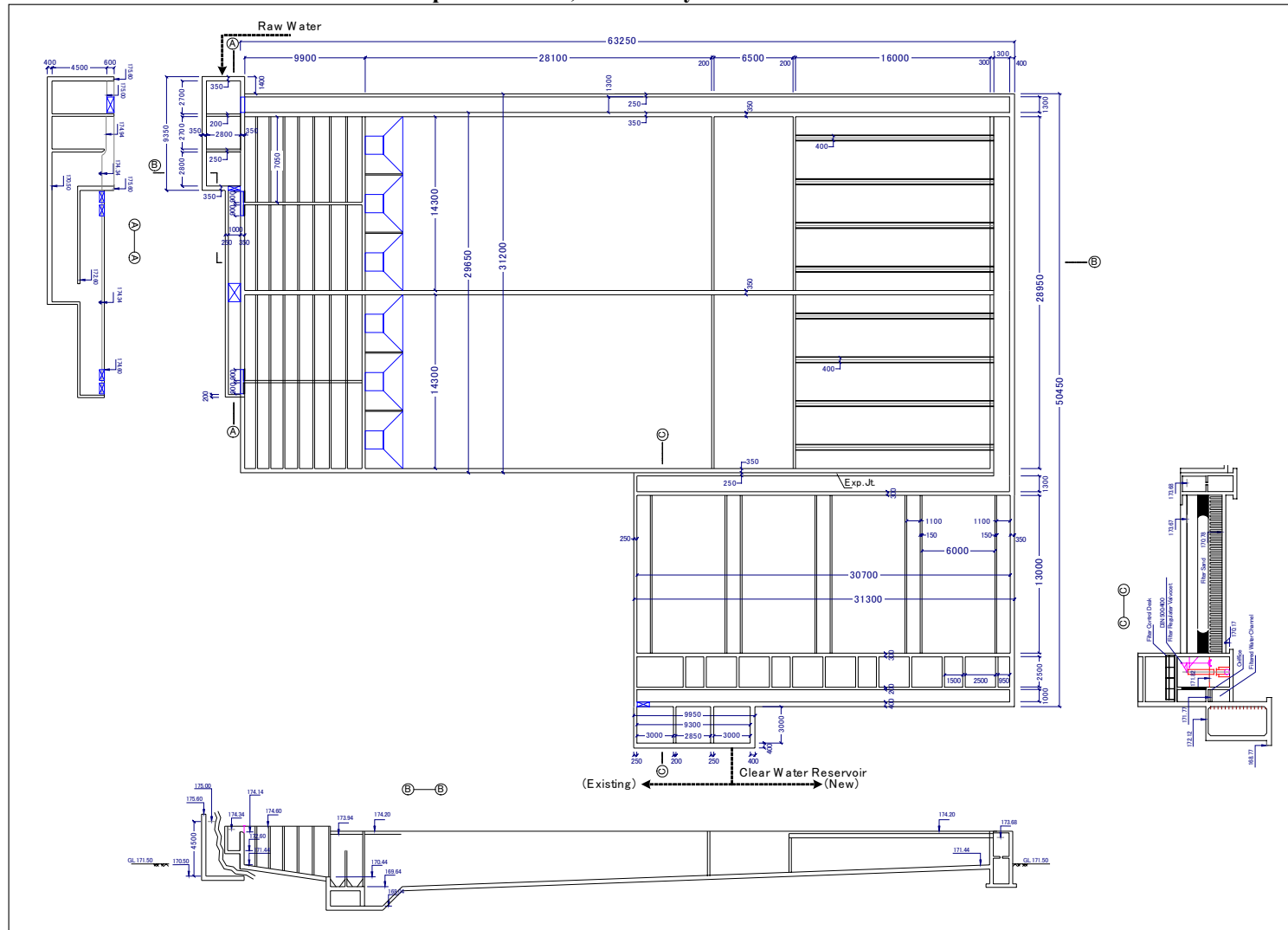


Figure 22

Flow Diagram for Expansion of 40,000 m³/day at Kaolieo Treatment Plant
FLOW DIAGRAM OF EXPANSION OF KAOLIEO WATER TREATMENT PLANT (Case K-1)

177.10
176.70
176.30
175.90
175.50
175.10
174.70
174.30
173.90
173.50
173.10
172.70
172.30
171.90
171.50
171.10
170.70
170.30
169.90
169.50
169.10
168.70
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165.90
165.50
165.10
164.70
164.30
163.90

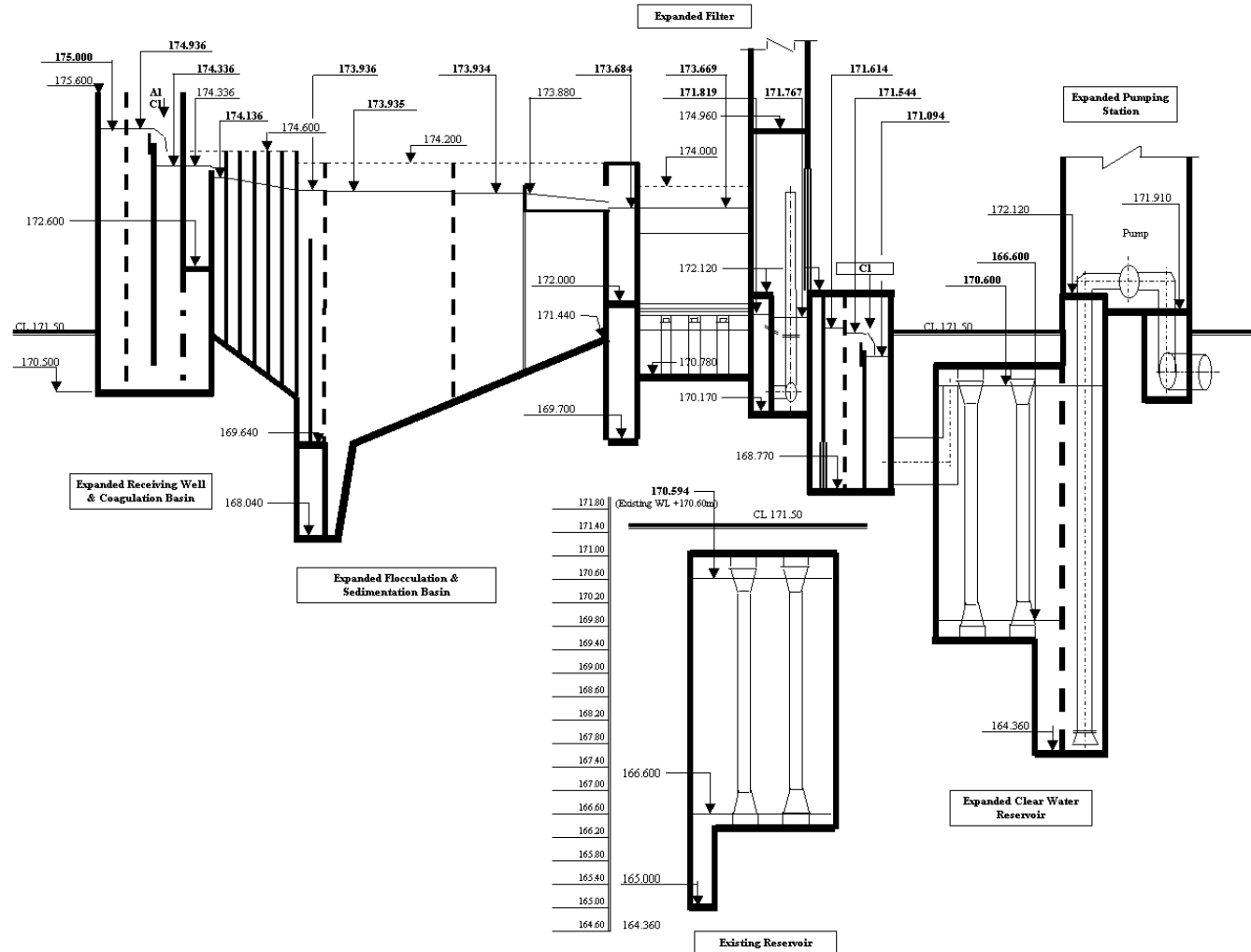
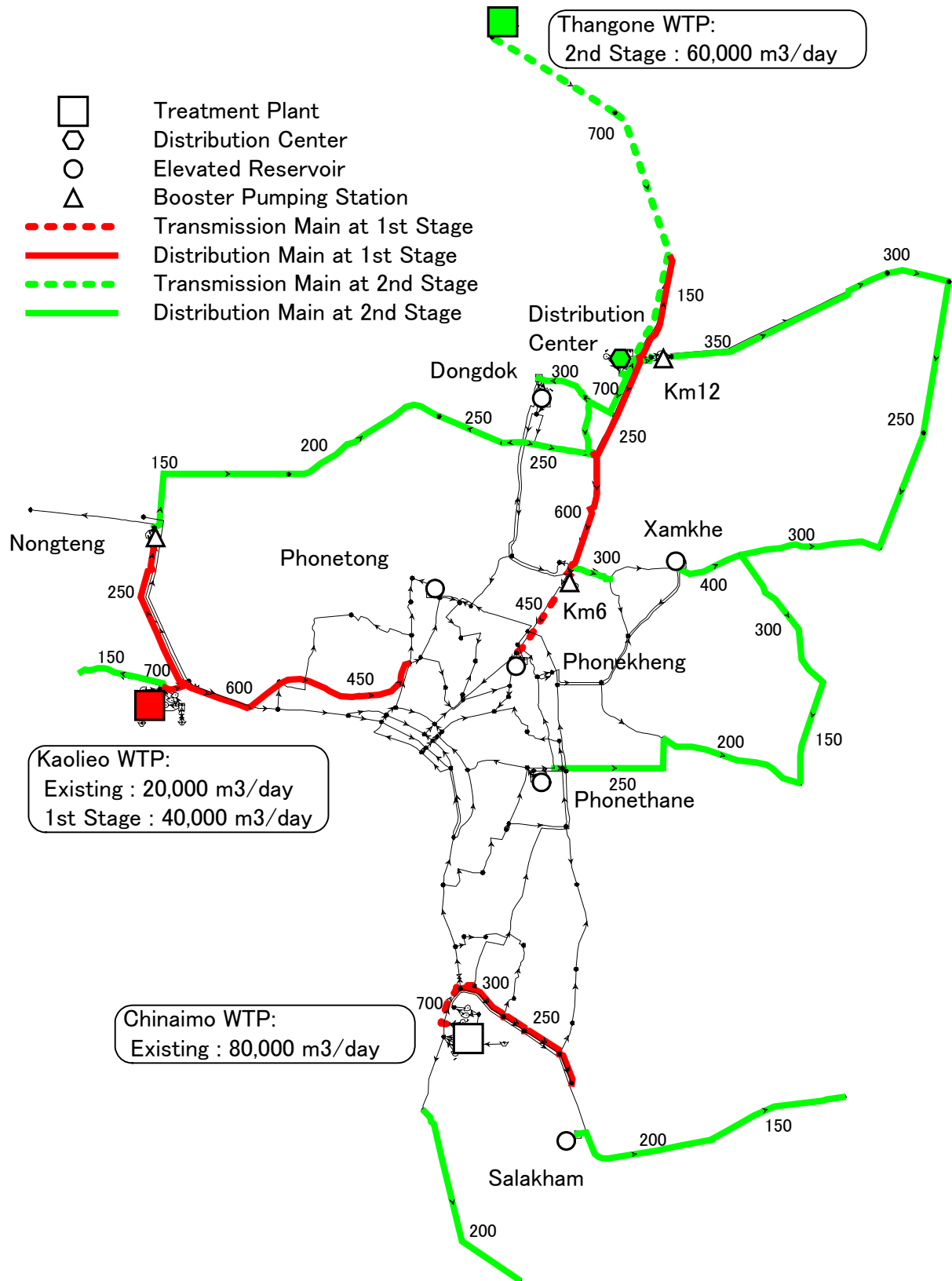


Figure 23 Clear Water Transmission and Distribution Trunk Mains Required for Alternative K-1



3) Costs (Construction, O/M)

Based on the results of facility planning for alternative K-1, preliminarily cost estimates have been conducted for the alternative comparison. The results of the cost estimates are as shown in Table 6 in US Dollars.

Table 6 Preliminary Cost Estimates for Alternative K-1

(x 1,000 US\$)			
Alternative K-1	Total	Foreign	Local
1. Construction Cost	54,835	37,497	17,338
1.1 Treatment Plants	23,051	14,455	8,596
Expansion of Kaolieo T.P.	9,624	5,762	3,862
Construction of Thangone T.P.	13,427	8,693	4,734
1.2 Clear Water Transmission Pipelines	7,930	6,535	1,395
For the 1st Stage	409	337	72
For the 2nd Stage	7,521	6,198	1,323
1.3 Distribution Center	4,376	2,984	1,392
For the 1st Stage	-	-	-
For the 2nd Stage	4,376	2,984	1,392
1.4 Booster Pump Station	1,103	901	202
For the 1st Stage	737	607	130
For the 2nd Stage	366	294	72
1.5 Distribution Trunk Mains	18,375	12,622	5,753
For the 1st Stage	7,219	5,342	1,877
For the 2nd Stage	11,156	7,280	3,876
2. Operation and Maintenance Cost	6,157	1,208	4,949
2.1 Electricity	4,817	-	4,817
Expanded Kaolieo T.P.	1,944	-	1,944
Thangone T.P.	1,030	-	1,030
Distribution Center	809	-	809
Booster Pump Station	1,034	-	1,034
2.2 Chemical Cost	1,208	1,208	-
Expanded Kaolieo T.P.	895	895	-
Alum	620	620	-
Polymer	18	18	-
Chlorine	257	257	-
Thangone T.P.	313	313	-
Alum	154	154	-
Chlorine	159	159	-
2.3 Salary	132	-	132
Treatment Plant	132	-	132
Expanded Kaolieo T.P.	36	-	36
Thangone T.P.	96	-	96
Total Costs	60,992	38,705	22,287