

Appendix

APPENDIX STUDY ON DIVERSION CHANNEL

1. Outline of Study

The study on flood diversion channel has been conducted for the formulation of the Master Plan. In the study, ten (10) alternative routes for the diversion channel were examined and finally selected the Ayuthaya-East-Sea route as the suitable route.

For the Ayuthaya-East-Sea route, further discussion was made and an alternative route was proposed considering the present and future land use condition.

Herein, the study results of the rough comparison of the alternative routes, Ayuthaya-East-Sea (1) and (2) for the route were summarized.

2. Study on Route Alternatives

2.1 Alignment

The features of alignment of two (2) alternative routes are emphasized with the following points: the former one applies far eastern part of Bangkok, so as to avoid the projected urbanized area in the futures, while the latter one applies the route passing through the greenbelt area and area beside the new Bangkok Airport, which is under construction.

The features of alignment are summarized in the following table and the alignments are shown in Fig. 1 and 2.

Table 1 THE OUTLINE OF THE ALTERNATIVE ROUTES OF DIVERSION

Diversion	Area passed through	Distance (km)	Bed Elevation		Bed Slope (i=1/I)
			Diversion Point (MSL+m)	at the Mouth (MSL+m)	
Ayutthaya-East Bank-sea (1) Div.	Bang-Pa-Ing ~ RangSit ~ Khlong Phra-ong Chaiyanuchit ~ Khlong Dan	96	-3.9	-6	46,000
Ayutthaya-East Bank-sea (2) Div.	Bang-Pa-Ing ~ RangSit ~ Khlong Bang Chalong ~ Khlong Bang Pla	93	-3.9	-6	45,000

2.2 Cross-section and Longitudinal Profile

As the cross-section, compound cross-section consisting of section for low water channel and high water channel is applied. Fig. 3 shows the standard cross-sections in the case of the design discharge of 800m³/s, while Fig. 4 shows the longitudinal profiles of the two (2) alternative routes.

3. Cost Estimation

3.1 Work Volume, Number of House Relocation and Land Acquisition

For the rough estimation of the cost, work volume, number of the houses relocated, and land for acquisition are examined based on the 1/50,000 photo-mosaic map as of 1995.

Table 2 presents the quantities of house relocation and land acquisition in addition to work volume.

3.2 Unit Cost

The unit cost is based on the recently applied one for the RID project. The unit cost is discussed in Vol. 4 Supporting Report, Sector XII in detailed.

3.3 Construction Cost for Alternative Routes

Based on the above work quantity and unit cost, the construction cost was estimated for alternatives. The cost is shown in Table 3 and 4.

4. Comparison of Alternative Routes

As discussed above, the construction cost for alternative routes was obtained. Through the comparison of the results, the following are pointed out:

- Judging from the work quantity, number of house relocation, land acquisition and construction cost, alternative route-2 has a slightly advantage compared with alternative route-1.
- However, the difference is quite small and the advantage may be lost depending on the future condition, especially projected development, which has much influence to the unit cost of land acquisition and number of house relocation.
- Consequently, the further detailed study is indispensable for the selection the optimum route.

Table 2 OUTLINE OF BILL OF QUANTITIES OF
AYUTTHAYA-EAST-SEA DIVERSION

AYUTTHAYA-EAST-SEA (1) DIVERSION AT 800M3/S

Item	Quantity	Unit	Remarks
Excavation	66.3	million m ³	
Embankment	2.8	million m ³	
Diverse Point Weir	1	nos.	
Bridge			
Large-scale	7	nos.	
Middle-scale	16	nos.	
Small-scale	33	nos.	
Miscellaneous	1	L.S.	Inclusive of Small Facilities, General Works, Temporary Works, some contingency and tax
House Relocation	1,500	houses	
	570	million baht	
Land Acquisition	1,800	ha	11,100rai
	10,100	million baht	

AYUTTHAYA-EAST-SEA (2) DIVERSION AT 800M3/S

Item	Quantity	Unit	Remarks
Excavation	64.1	million m ³	
Embankment	2.8	million m ³	
Diverse Point Weir	1	nos.	
Bridge			
Large-scale	8	nos.	
Middle-scale	17	nos.	
Small-scale	29	nos.	
Miscellaneous	1	L.S.	Inclusive of Small Facilities, General Works, Temporary Works, some contingency and tax
House Relocation	1,400	houses	
	520	million baht	
Land Acquisition	1,700	ha	10,600rai
	9,800	million baht	

Table 3 CONSTRUCTION COST OF AYUTTHAYA-EAST-SEA-1 DIVERSION

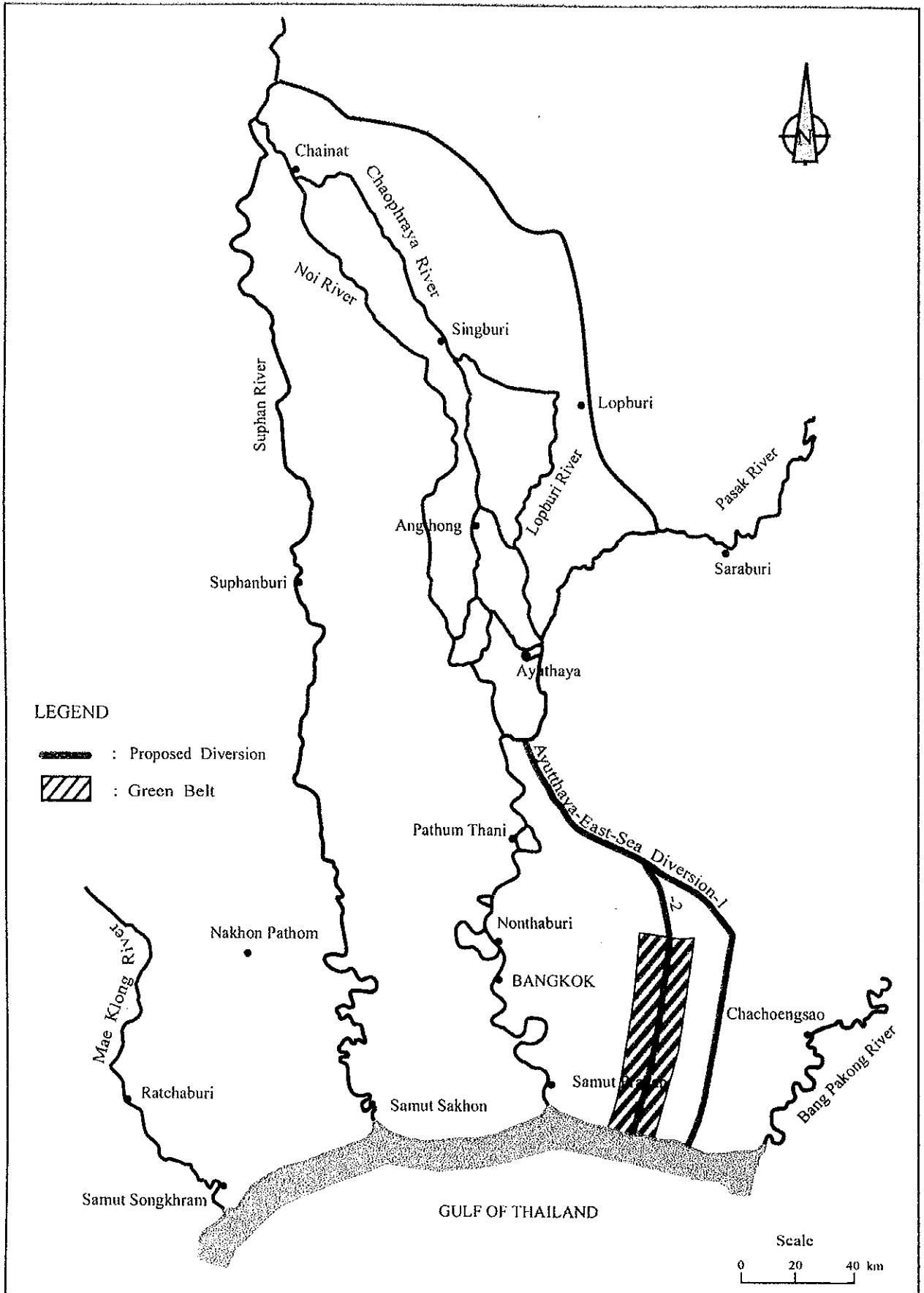
800 m ³ /s					1,100 m ³ /s				
No.	Local Cost	Foreign Cost	Total	No.	Local Cost	Foreign Cost	Total		
1	5,043.79	8,624.86	13,669	1	6,578.86	11,352.38	17,931		
	2,648.58	3,518.18	6,167		3,407.04	4,593.80	8,001		
	1,811.87	5,106.68	6,919		2,414.85	6,758.59	9,173		
	583.34	-	583		756.97	-	757		
	245.82	-	246		315.82	-	316		
	337.52	-	338		441.15	-	441		
2	10,061.81	0	10,062	2	13,065.15	-	13,065		
3	571.66	0	572	3	595.98	-	596		
4	531.67	0	532	4	683.06	-	683		
5	6.83	61.51	68	5	8.97	80.69	90		
	68.34	615.09	683		89.66	806.91	897		
6	91.54	156.53	248	6	119.40	206.03	325		
7	16,376	9,458	25,834	7	21,141	12,446	33,587		
8	2,456	1,419	3,875	8	3,171	1,867	5,038		
9	1,883	1,088	2,971	9	2,431	1,431	3,863		
10	20,715	11,964	32,680	10	26,743	15,744	42,488		
11	45	86	131	11	58	114	172		

Table 4 CONSTRUCTION COST OF AYUTHAYA-EAST-SEA DIVERSION-2
1,100 m3/s

800 m3/s

No.	Local Cost	Foreign Cost	Total
1	4,983.94	8,503.85	13,488
	2,659.29	3,484.17	6,143
	1,753.16	5,019.68	6,773
	571.48	-	571
	240.12	-	240
	331.37	-	331
2	9,828.72	0	9,829
3	527.35	0	527
4	517.80	0	518
	6.74	60.70	67
	67.44	606.95	674
6	90.45	154.33	245
7	16,022	9,326	25,348
8	2,403	1,399	3,802
9	1,843	1,072	2,915
10	20,268	11,797	32,066
11	44	85	129

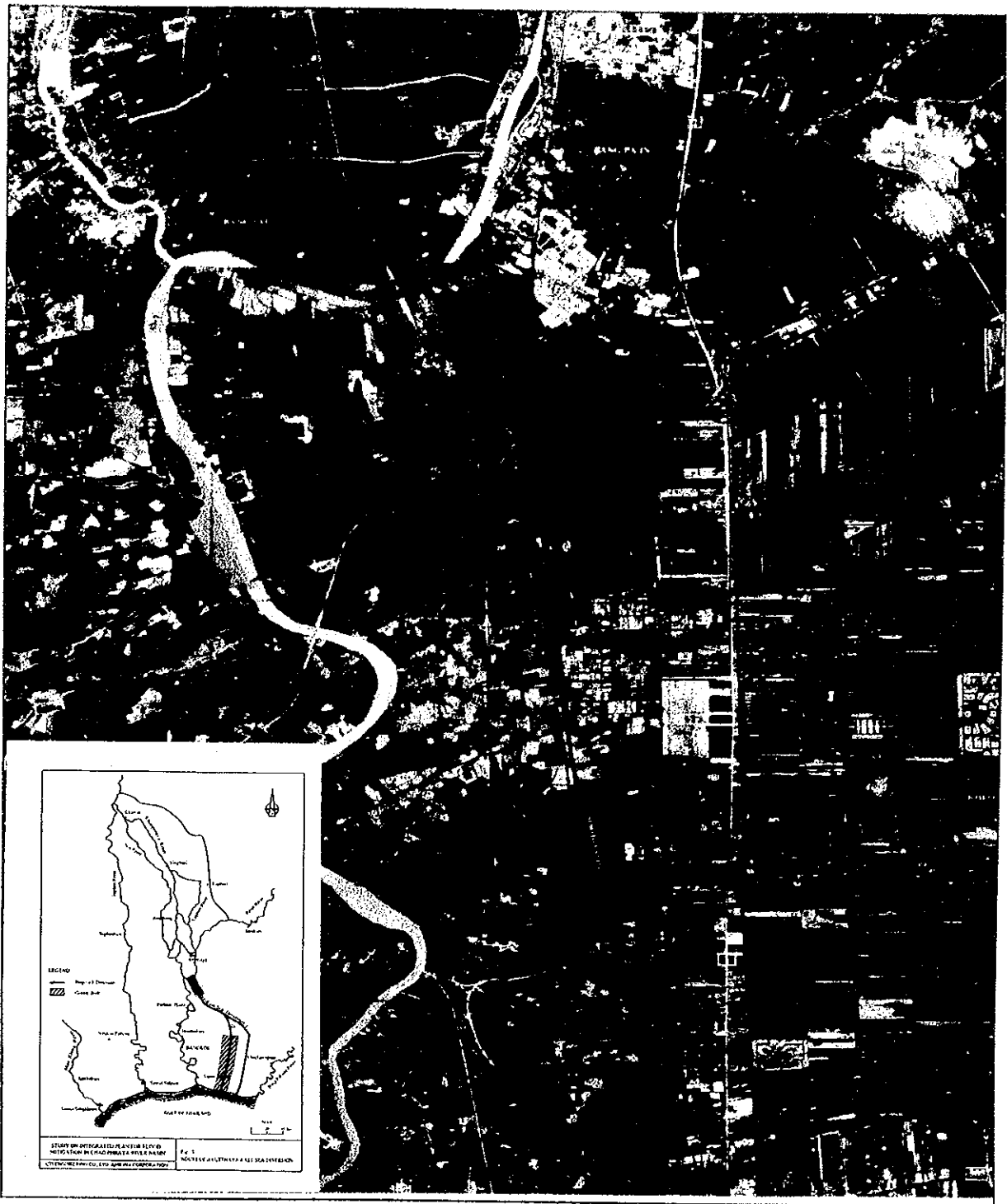
No.	Local Cost	Foreign Cost	Total
1	6,501.56	11,171.68	17,673
	3,417.97	4,547.10	7,965
	2,341.50	6,624.58	8,966
	742.10	-	742
	309.80	-	310
	432.29	-	432
2	12,636.08	-	12,636
3	545.40	-	545
4	659.07	-	659
	8.84	79.53	88
	88.37	795.30	884
6	118.00	202.75	321
7	20,557	12,249	32,807
8	3,084	1,837	4,921
9	2,364	1,409	3,773
10	26,005	15,495	41,500
11	58	112	169



STUDY ON INTEGRATED PLAN FOR FLOOD MITIGATION IN CHAO PHRAYA RIVER BASIN

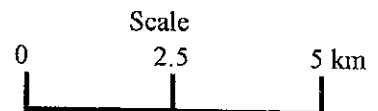
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Fig. 1
ROUTE OF AYUTTHAYA-EAST-SEA DIVERSION



Legend

- : Diversion Channel Route
- : Large Scale Road & Railway
- ⊙ : Built-up Area
- : Large Scale Canal

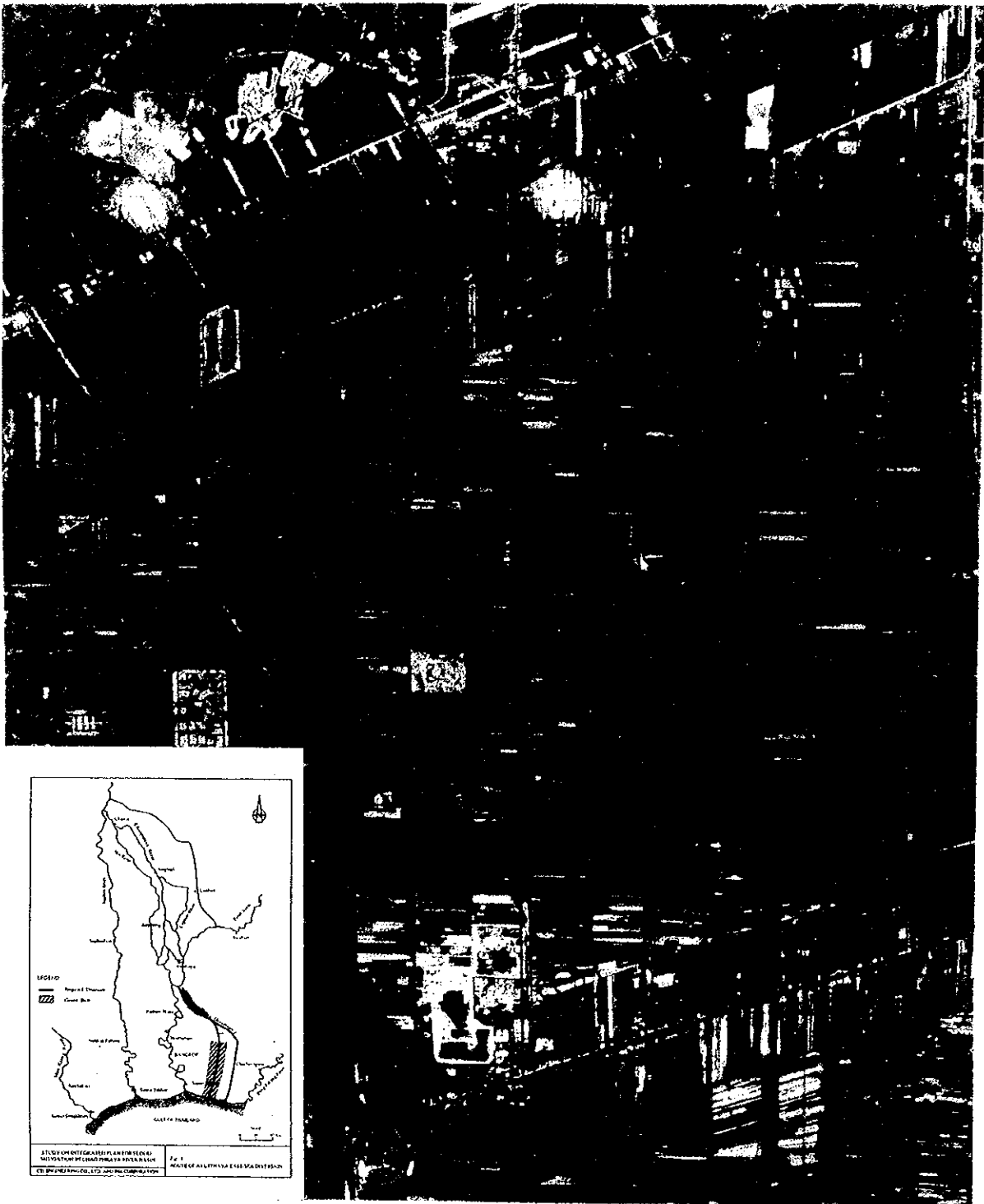


STUDY ON INTEGRATED PLAN FOR FLOOD
MITIGATION IN CHAO PHRAYA RIVER BASIN





Fig.2 (1/6)

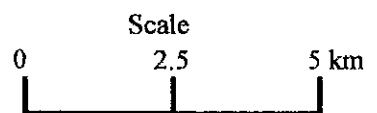
ALIGNMENT OF DIVERSION

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Legend

-  : Diversion Channel Route
-  : Large Scale Road & Railway
-  : Built-up Area
-  : Large Scale Canal

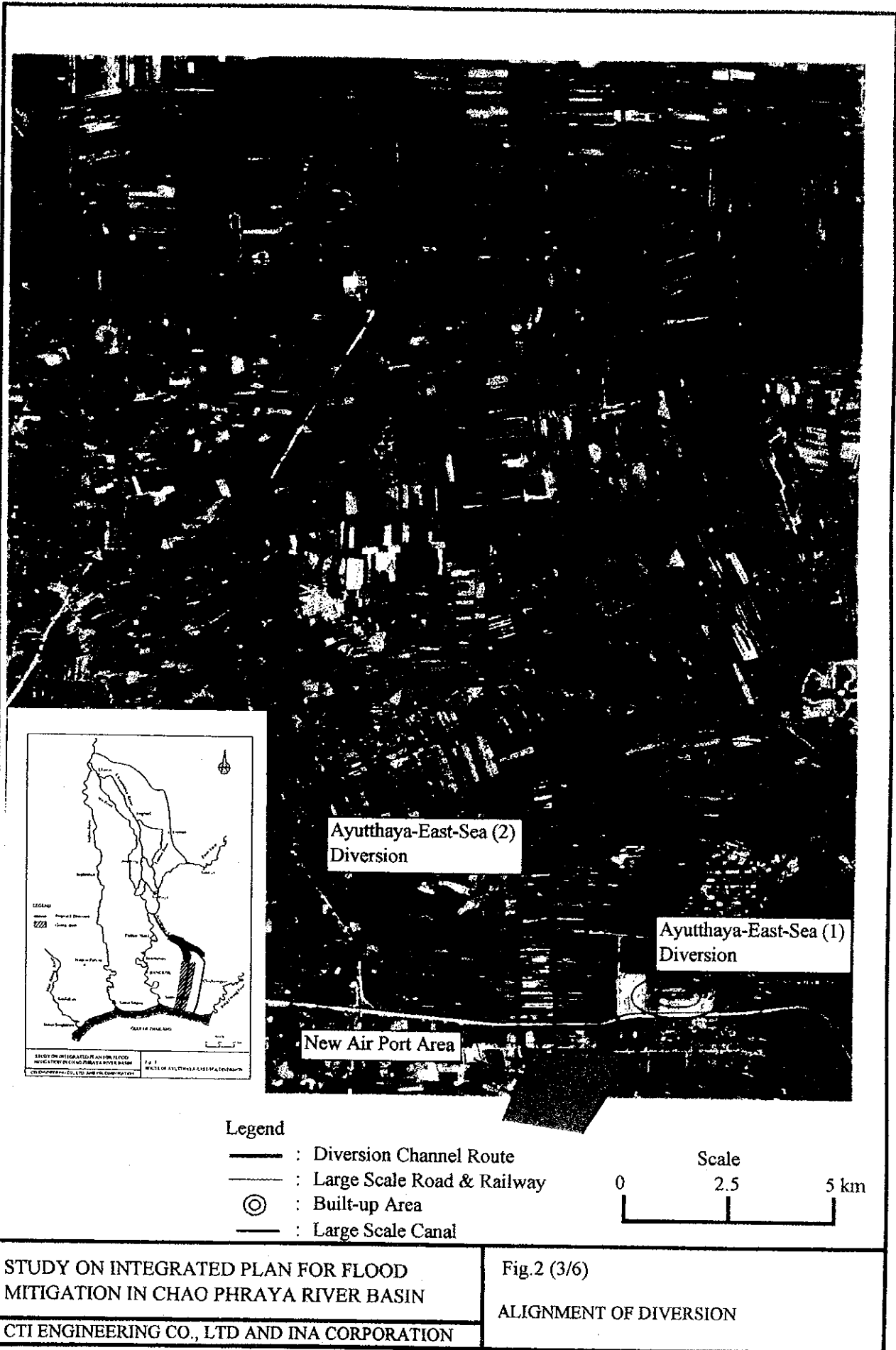


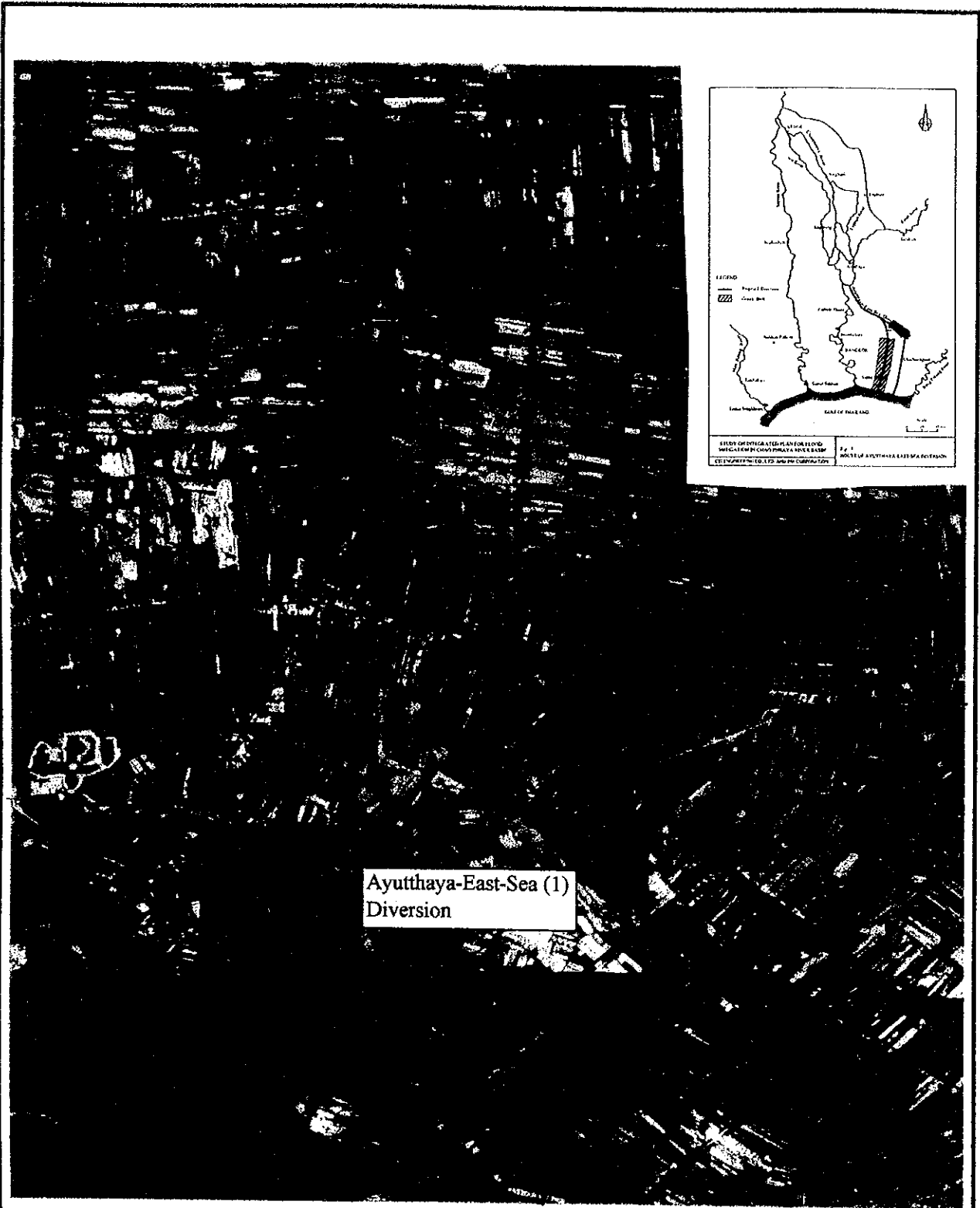
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Fig.2 (2/6)

ALIGNMENT OF DIVERSION

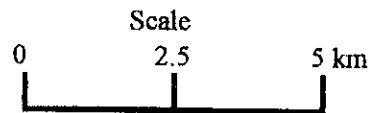




Ayutthaya-East-Sea (1)
Diversion

Legend

- : Diversion Channel Route
- : Large Scale Road & Railway
- ⊙ : Built-up Area
- : Large Scale Canal

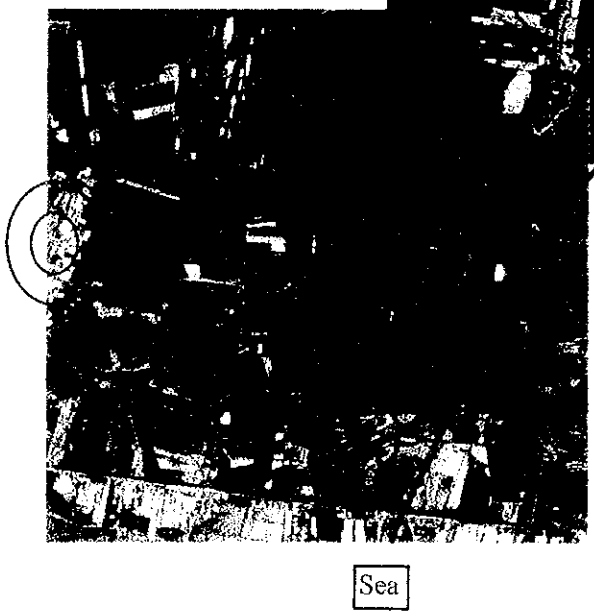
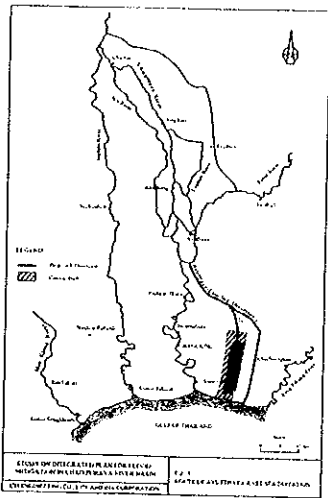


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Fig.2 (4/6)

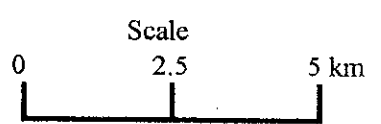
ALIGNMENT OF DIVERSION



Ayutthaya-East-Sea (2) Diversion

Legend

- ▬ : Diversion Channel Route
- ▬ : Large Scale Road & Railway
- ⊙ : Built-up Area
- ▬ : Large Scale Canal

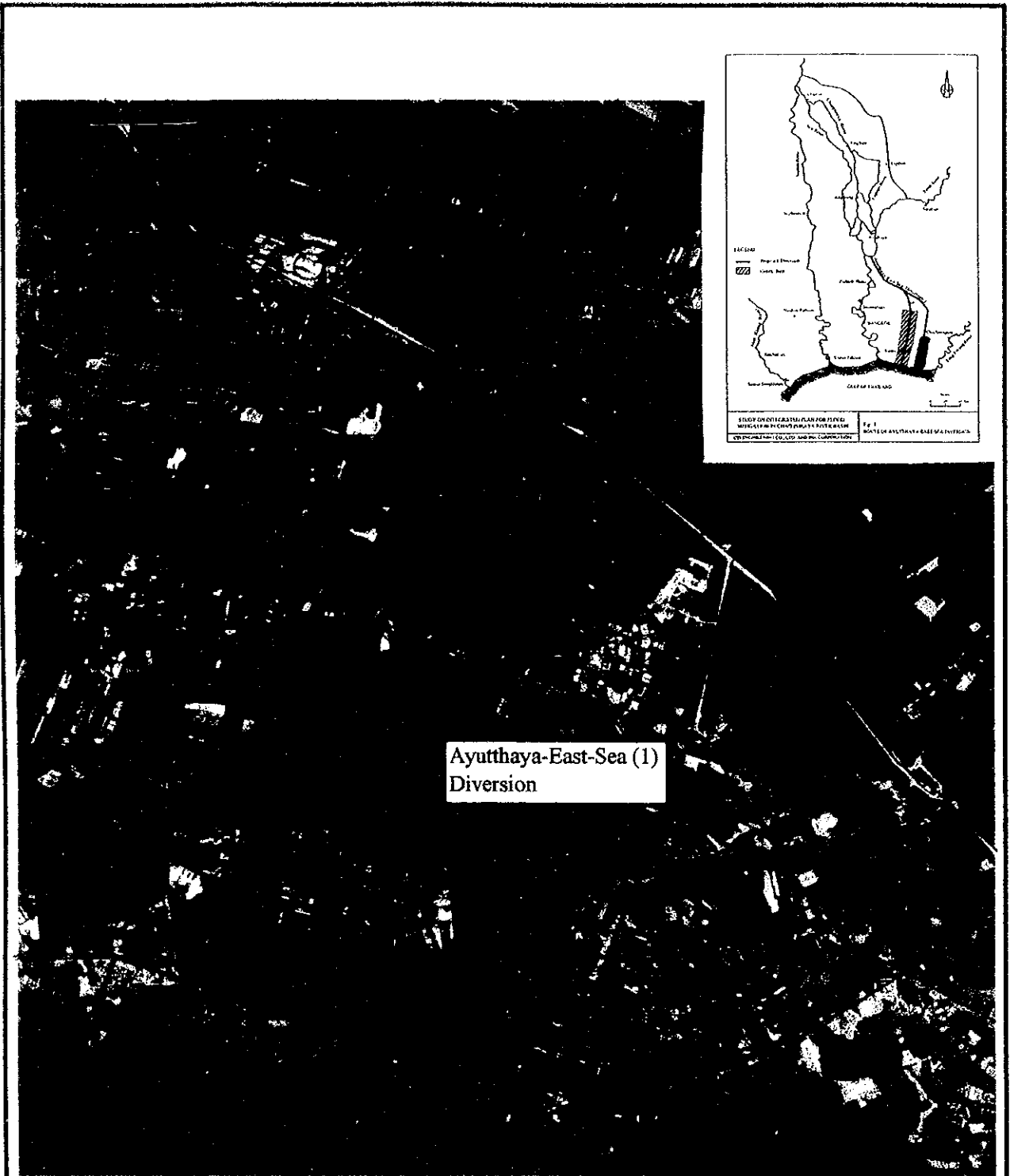


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Fig.2 (5/6)

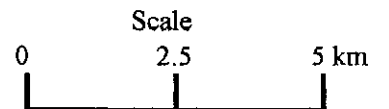
ALIGNMENT OF DIVERSION



Ayutthaya-East-Sea (1)
Diversion

Legend

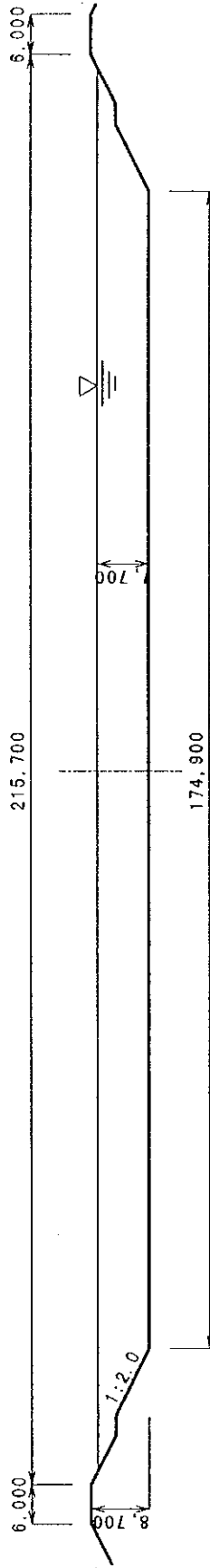
- : Diversion Channel Route
- : Large Scale Road & Railway
- ⊙ : Built-up Area
- : Large Scale Canal



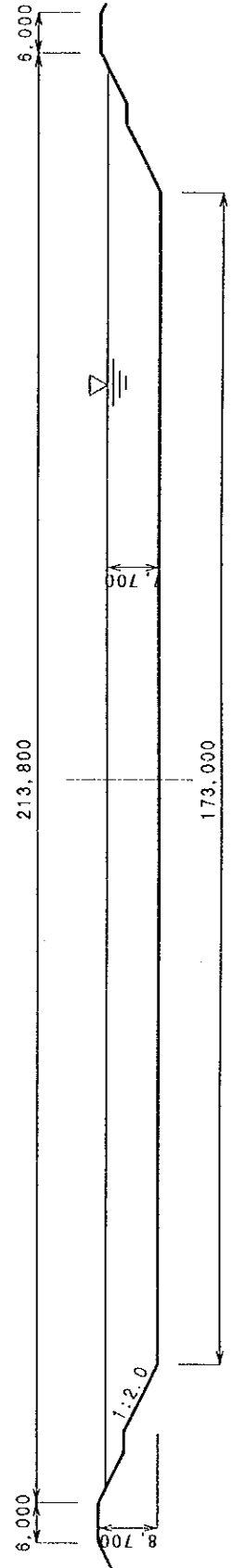
STUDY ON INTEGRATED PLAN FOR FLOOD
MITIGATION IN CHAO PHRAYA RIVER BASIN
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Fig.2 (6/6)
ALIGNMENT OF DIVERSION

Standard Cross-section for Ayutthaya-East (1) Diversion
1,000 m³/s



Standard Cross-section for Ayutthaya-East (2) Diversion
1,000 m³/s



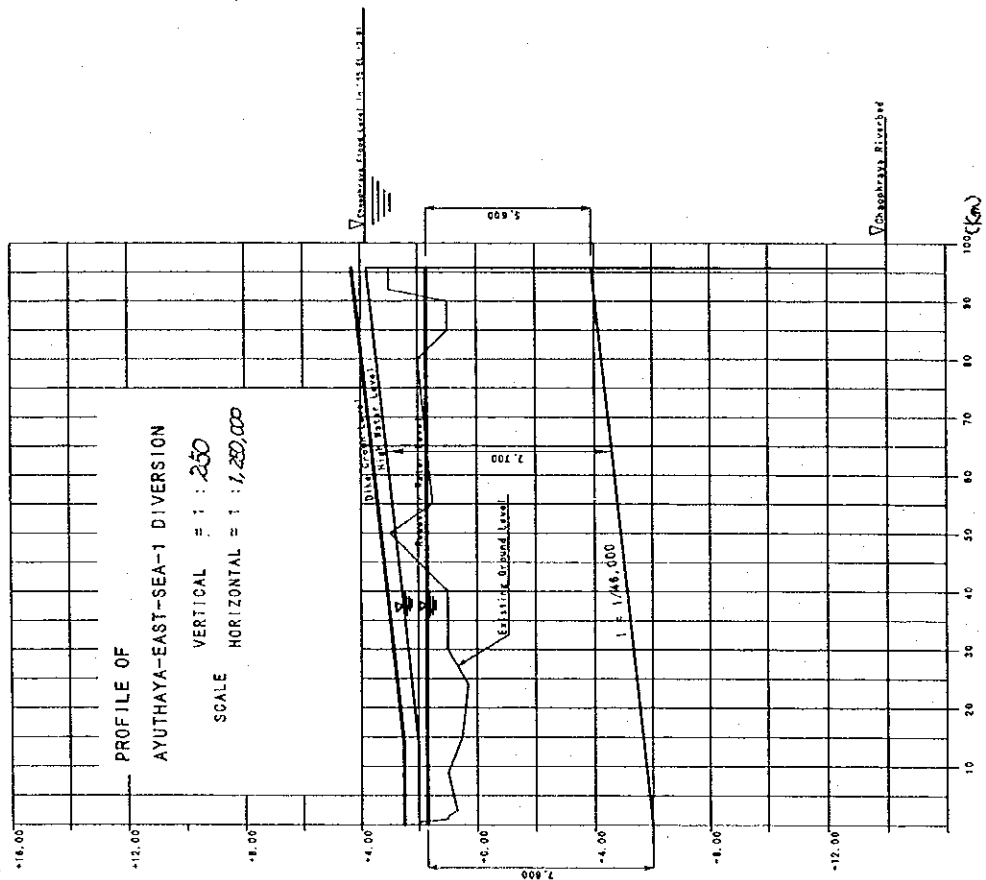
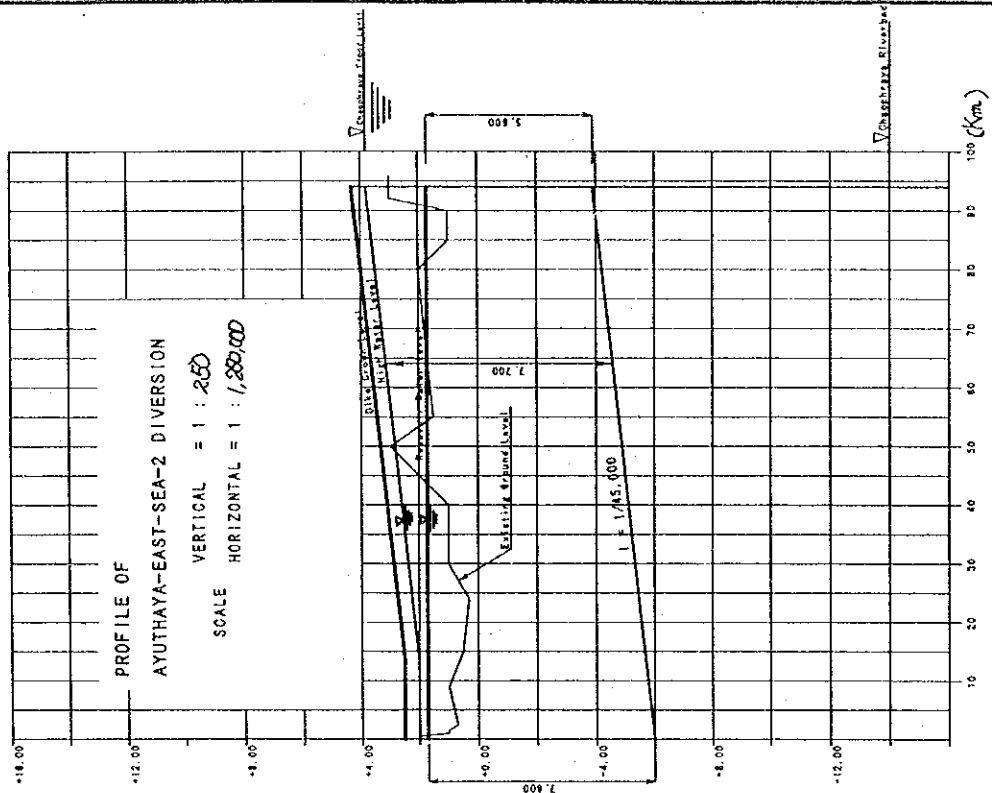
Scale
S = 1 : 1,000

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Fig. 3

STANDARD CROSS-SECTION OF
AYUTTHAYA-EAST-SEA DIVERSION



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Fig. 4
PROFILE OF AYUTTHAYA-EAST-SEA
DIVERSION



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