



No.	Name of Symbol	Symbol	Line Size	Color	Land Identification	Compilation	Specifications	S/W
1	PIER-JETTY BREAK WATER 栈 橋 防波堤		0.15 0.25	Gray	Red	Black	Pier: Length 0.3mm or more and width 0.5mm or more. Jetty: A bank to control tide & waves, or break to prevent the erosion of coast line. As indicated, length is 3mm or more & width 0.5mm or more. The reversal symbol is used for those made of iron or concrete. (Gray)	Name added
2	WHARF 波止場		0.3	Gray	Red	Black	Only those of size 3mm or more in length, 0.5mm or more in width, both on map. A wharf along rivers or coast line. (Black + Gray)	Change
3	RIVER/SEA 河 川		0.2	Blue	Blue	Purple	Those with width of 4m or more is indicated as double line stream. Only those the size of which is 1cm in length on map. Shore lines shall be those at the time of photography.	No change
4	STREAM 小 川		0.2	Blue	Blue	Purple	Those with width less than 4m is indicated as single line stream. Only those with length of 1cm or more on map is indicated.	"
5	DITCH 用 水 路		0.2	Blue	Blue	Purple	Used to indicate those with width less than 4m. (Gray)	No change
6	INTERMITTENT CANAL か ね 川		0.2	Blue	Blue	Purple	A river or channel on which ship transportation becomes seasonally impossible.	No change
7	CULVERT 暗 渠		0.3	Gray	Red	Black	Water way or river with width of 4m or more which passes under a road or railway. (Gray)	No change

河 川 湖 地 等 [ W ] WATER AND ASSOCIATED FEATURE

No.	Name of Symbol	Symbol	Line Size	Color	Land Identification	Compilation	Specifications	S/W
8	FERRY 渡船場			Black	Red	Black	Ferry is indicated only where there is a boat for the purpose of transporting men or cars across the river.	No change
9	FORD 渡渉場			Black	Red	Black	Used to indicate a place where there is no transportation facility (boat) but can be crossed on foot. This symbol is used for large sized river.	New
10	FLOOD GATE 水門		0.1 0.2	Black	Red	Black	Used to indicate a structure to take-in/drain water, control water level, and prevent reverse flow of water. (Changed symbol) (Blue + Black)	Change
11	WEIR せき		0.2	Black	Red	Black	A structure placed across a water bed for the purpose of controlling water flow or for taking-in water. When such structure is 10m or longer in length, it is indicated in actual shape.	New
12	SWAMP/MARSH 沼湿地			Light green Green, Blue			Used to indicate a land which is soft always containing water and on which hydrotropic plants are growing. Used for swamp and marsh of the size 5 x 5mm on map. When there is vegetation on it, appropriate symbols are used. (Changed symbol)	Change
13	FISHPOND 養魚池		0.2	Blue net	fish Blue	Note of fish Purple	Used to indicate an artificial reservoir made for the purpose of cultivating fish. In principle this symbol is used for those with size of 1 x 1cm on map.	New
14	SALT BET 塩田		0.2	Blue net 20%	Note of salt Blue	Note of salt Divided single line is purple. Purple	In principle, those with size of 1 x 1cm on map.	"

No.	Name of Symbol	Symbol	Line Size	Color	Land Identification	Compilation	Specifications	S/W
15	LAKE/POND 湖池		0.2	Blue	Note of pond Blue	Note of pond Purple	Indicates only those with size of 5 x 5 mm or more on map.	No change
16	FLOW ARROW 流水方向		0.2	Blue	Blue	Purple	This symbol is used only when the direction of flow is clear, and also where the width of river is broad enough.	"

河 川 湖 池 流水方向 地 等 WATER AND ASSOCIATED FEATURE [W]

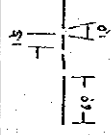
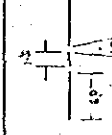
No.	Name of Symbol	Symbol	Line Size	Color	Land Identification	Compilation	Specifications	S/W
1	LIMIT OF VEGETATION 植生界	—	0.2	Green	Green	Green	Used to show the boundary between vegetations. No boundary is shown for cultivated land.	No change
2	HARD WOOD FOREST 堅木林	⊗ ⊗	0.2	Green	Red	Black	Indicates only those with size of 5 x 5mm on map.	"
3	BUSHES SCRUB かん木 雑木	~ ~		Green	Red	Black	Used to indicate coppice less than about 3m.	"
4	RICE FIELDS 水田	⊥ ⊥	0.2	Blue net 5% Green	Red	Black	Used to indicate cultivating land with footpaths around it and water is reserved on it. Indicates only the area with size of 5 x 5mm or more on map. (Rough net)	Change
5	CROPLAND AGRICULTURAL LAND 耕地	∨ ∨	0.2	Green	Red	Black	Used to indicate land to grow dry land rice and vegetable. Indicates only the area with size of 5 x 5mm or more on map. Land for growing cassava, sugar, cane, tobacco leaf, flowers and wheat.	New
6	PLANTATION ORCHARD 果樹園	○ ○ ○ ○	0.2	Green	Red	Black	Used to indicate those which grow pine-apple, mango, papaya, banana and apple. Indicates only area with size of 5 x 5mm on map.	No change
7	MANGROVE マングローブ	⌒ ⌒	0.2	Green	Red	Black	Used to indicate forest grows at the shallow place in sea or at estuary. Mangrove symbol on halftone blue.	"

No.	Name of Symbol	Symbol	Line Size	Color	Land Identification	Compilation	Specifications	S/W
8	NIPA	木	0.2	Green	Red	Black		No change
	ニツバ	木	0.2	Green	Red	Black		No change
9	COCONUT	椰子	0.2	Green	Red	Black		New
	ココナツ	椰子	0.2	Green	Red	Black		New
10	GRASS	草	0.2	Green	Red	Black	Includes the grass in meadow.	No change
	草地	草	0.2	Green	Red	Black		No change
11	BAMBOO	竹	0.2	Green	Red	Black	Used to indicate the area where bamboo grows thick.	"
	竹林	竹	0.2	Green	Red	Black		"
12	GARDEN TREES	庭木	0.2	Green	Red	Black	Used to indicate a shrub planted around houses, parks factories and in road divider strips.	"
	庭木	庭木	0.2	Green	Red	Black		"
13	OPEN AREA				Note Red		Area prepared for house construction. Also used for open area in cities.	New
	空地				Note Red			New

植

生

PLANTATION [P]

No.	Name of Symbol	Symbol	Line Size	Color	Land Identification	Compilation	Specifications	S/M
1	CHANGWAT 市界		0.3mm	Black	Red	Red	According to the material of B.M.A. Bangkok Metropolitan Administration shall be used as State boundary.	No change
2	AMPHOE 区界		0.3	Black	Red	Red	According to the materials of B.M.A. District is divided into 24 according to B.M.A.	"
3							Sub-district (King Amphoe) shall be decided upon consultation with B.M.A.	Pending

OTHERS-BOUNDARY [09]



2-2 Minutes at the initiation of field work (March 1987)

MINUTES OF DISCUSSION

OF

TOPOGRAPHIC MAPPING PROJECT OF BANGKOK METROPOLITAN AREA

BETWEEN

THE BANGKOK METROPOLITAN ADMINISTRATION

AND

THE JAPAN INTERNATIONAL COOPERATION AGENCY

ON

MARCH 26TH 1987

BANGKOK THAILAND

B. Jatorapreuk

MR. BAMPEN JATORAPREUK

DEPUTY DIRECTOR

DEPARTMENT OF PUBLIC WORKS

T. Kanakubo

MR. TOSITOMO KANAKUBO

LEADER

JICA SURVEY TEAM



The following items were discussed and agreed by the Thai side and the JICA Survey Team.

1. The first year plan of operation for the project as proposed by the JICA Survey Team and agreed by the Thai side is attached as Appendix 1.
2. The monument of new control point was discussed by the Thai side and the JICA Survey Team. The specification for the monument agreed by both sides is attached as Appendix 2.
3. The film annotation of aerial photograph was discussed by the Thai side and the JICA Survey Team. The form for the film annotation agreed by both sides is attached as Appendix 3.

The JICA Survey Team received the following data prepared by the Thai side.

1. Symbol and Specification (Draft) (1/4,000 , 1/10,000)  
This will be discussed between both sides during field survey for finalization.
2. Results of control points.
3. Results of bench marks.

The following data shall be prepared jointly by both sides:

- (1) The JICA Survey Team will supply overlays for each map sheets with intended locations to be given details by Thai side.
- (2) Details about informations of the necessary administrative boundaries and geographical names (in English and Thai) on the survey area indicated in (1) above will be supplied by Thai side.

APPENDIX- 1

PLAN OF OPERATION  
FOR  
TOPOGRAPHIC MAPPING  
OF  
BANGKOK METROPOLITAN AREA

26 MARCH 1987

JAPAN INTERNATIONAL COOPERATION AGENCY  
(JICA)

*J. Kanakubo*

*B. Jatorayunk*

## Contents

1.	Introduction .....	1
2.	Objective of the Study .....	2
3.	Items of Work under the 3-Year Program .....	2
	(1) Fiscal Year 1986 (First year)	
	(2) Fiscal Year 1987 (Second year)	
	(3) Fiscal Year 1988 (Third year)	
	(4) Work schedule	
4.	Organization and Schedule of the First Year Field Survey Team .....	5
5.	Counterparts to be Provided by BMA .....	6
	(1) For the first year field work	
	(2) For the first year in-door work in Japan	
6.	Group Formation of the Field Survey Team .....	6
7.	Measures to be Needed for First Year Field Work .....	7
	(1) Vehicles	
	(2) Labors	
8.	Facilities to be Provided by Thai Side .....	8
	(1) Office and work room to be provided by BMA	
	(2) Laboratories to be provided by Royal Thai Survey Department (RTSD)	
9.	Tax Exemption and Custom Clearance to be Provided by BMA .....	9
10.	Technical Aspects .....	10
	(1) Aerial photography	
	(2) Ground control point survey	
	(3) Leveling	
	(4) Reference ellipsoid	
	(5) Mapping	
	(6) Attachment	

## 1. Introduction

In response to the request of the Government of the Kingdom of Thailand, the Government of Japan decided to implement the Survey on Topographic Mapping of Bangkok Metropolitan Area (hereinafter referred to as the Study), within the general framework of technical cooperation between Japan and Thailand, which is set forth in the Agreement on Technical Cooperation between the Government of Japan and the Government of the Kingdom of Thailand signed on March 19, 1986.

Accordingly the Japan International Cooperation Agency (hereinafter referred to as JICA), the official agency responsible for the implementation of technical cooperation programs of the Government of Japan, will undertake the study in accordance with the relevant laws and regulations in force in Japan and in close cooperation with the authorities of Thailand.

The Bangkok Metropolitan Administration (hereinafter referred to as BMA) shall act as counterpart agency to the JICA Survey Team and also as coordinating body in relation with other relevant organization for the smooth implementation of the Study.

## 2. Objective of the Study

The objective of the Study is preparation of the 1/10,000 Topographic Map covering an area of approximately 2,000 km<sup>2</sup> in the Bangkok Metropolitan and the 1/4,000 Topographic Map covering an area of approximately 300 km<sup>2</sup> at the center of Bangkok Metropolitan. 1/20,000 Aerial Photography will be carried out covering an area of approximately 4,000 km<sup>2</sup>.

## 3. Items of Work under the 3-year Program

### (1) Fiscal Year 1986 (First year)

Aerial photography (1/20,000)	4,000 km <sup>2</sup>
Ground control point survey	67 points
Leveling	300 km
Pricking	
Control point	70 points
Bench mark	400 points
Field identification	
1/4,000	300 km <sup>2</sup>
1/10,000	1,700 km <sup>2</sup>

### (2) Fiscal Year 1987 (Second year) (tentative)

Aerial triangulation	420 Models
Stereo plotting	
1/4,000	300 km <sup>2</sup>
1/10,000	1,700 km <sup>2</sup>
Compilation	
1/4,000	300 km <sup>2</sup>
1/10,000	2,000 km <sup>2</sup>

Field compilation

1/4,000

300 km<sup>2</sup>

1/10,000

1,700 km<sup>2</sup>

Drafting

1/4,000

300 km<sup>2</sup>

(40 sheets)

(3) Fiscal Year 1988 (Third year) (tentative)

Scribing

1/10,000

2,000 km<sup>2</sup>

(61 sheets)

Printing

English

61 sheets × 500 copies

Thai

61 sheets × 500 copies

Reporting

Japanese

50 copies

English

50 copies



4. Organization and Schedule of the First Year Field Survey Team

Name	Assignment	1986 October	1987 January	February	March	April	May	June
<b>Headquarters</b>								
Toshiomo Kanakubo	Leader	13			15			14
Isao Ikeshima	Deputy leader	13			15			21
Chozo Obara	Mapping planner	13			15			25
<b>Aerial photography</b>								
Yoshikazu Ibusuki	Chief surveyor	13			15			25
Yoji Ebara	Mechanician	13			17			
Kiyoshi Ono	Pilot	13			17			
Masao Iwata	Cameraman	13						
Noriaki Machida	Photo processing engineer	15			10		15	
Tsutomu Inui	"	15			10		15	
<b>Ground control point survey</b>								
<b>Leveling</b>								
Kazuo Furukata	Chief surveyor	13			10			25
Ryojoke Itoh	Surveyor				10			21
Motomori Nakashima	"				10			22
Mitsuo Sasaki	"				10			27
Manabu Tsurui	"				10			21
Katsuyuki Kondo	"				10			21
Shozo Shimoda	"				10			21
Ryoichi Sekiguchi	"				10			21
Kazuhiko Ishizuka	"				10			21
Yoshihika Mochizuki	"				10			21
Nobutaka Komuro	"				10			21
Kazumi Saitoh	"				10			21
Hiroaki Hayashi	"				10			21
Akinasa Takahashi	"				10			21
Yukio Miyazaki	"				10			21
Masashi Kita	"				10			21
Takehiko Ohno	"				10			21
Norio Okawa	"				10			21
Fumihiko Kashiro	"				10			21
<b>Field identification</b>								
Tatsuo Sakaguchi	Surveyor				15			10
Mitsuo Sumaoshi	"				15			10
Kazuya Tabuchi	"				15			10
Yasuo Hongo	"				15			10
Tetsuo Kashio	"				15			10
Mitsuyoshi Takasaki	"				15			10
Kazutomi Masuda	"				15			10
Hiroshi Doi	"				15			10
Akihito Yamashita	"				15			10
Hiroshi Saito	"				15			10
Hiikaru Hotogome	"				15			10
Tsunao Okamura	"				15			10
Yasuki Kondo	"				15			10
Keiji Noguchi	"				15			10



5. Counterparts to be Provided by BMA

For the first year field work

	Number of counterparts	Period	Remarks
Chief counterpart	1	March 6 ~ June 24	Headquarters
Counterpart	1	March 3 ~ April 16	Aerial photography
	1	March 11 ~ May 17	Photo processing
"	6	March 11 ~ June 21	Ground control point survey, Leveling, Pricking
"	7	March 19 ~ June 9	Field identification

6. Group Formation of the Field Survey Team

	Number of chief surveyor	Field parties		
		Number of party	Break-down of a party	Total
Ground control point survey Leveling, Pricking	1	6	3 Japanese surveyors 1 BMA counterpart	18 Japanese surveyors 6 BMA counterparts
Field identification	1	7	2 Japanese surveyors 1 BMA counterpart	14 Japanese surveyors 7 BMA counterparts

7. Measures to be Needed for First Year Field Work

(1) Vehicles

Type of vehicles	Number of vehicles	Period	Remarks
Station wagon	2	March 6 ~ June 24	Headquarters
"	6	March 11 ~ June 21	Ground control point survey, Leveling, Pricking
"	7	March 19 ~ June 9	Field identification

(2) Labors

Type of laborers	Number of laborers	Period	Remarks
Assistant	2	March 11 ~ May 17	Photo processing
"	18	March 11 ~ June 21	Ground control point survey, Leveling, Pricking
"	14	March 19 ~ June 9	Field identification

8. Facilities to be Provided by Thai Side

(1) Office and work room to be provided by BMA

Type	Number of room	Space	Period	Remarks
Office and work room	1	10 m x 5 m	March 6 ~ June 24	With 5 desks & 2 large-size work tables

- 1) The rooms shall be equipped with ordinally facilities such as telephone, air condition, lock, proper lightings, etc.
- 2) Preferable time of use: 8:30 a.m. ~ 5:00 p.m.
- 3) Data, survey materials and instruments shall be stored in the rooms.

(2) Laboratories to be provided by Royal Thai Survey Department (RTSD)

Type	Period
Laboratory of photoprocessing	March 11 ~ May 17

9. Tax Exemption and Custom Clearance to be Provided by BMA

Tax exemption and smooth custom clearance shall be arranged for the following items and other materials:

1) Theodolite WILD T-3 .....	1 set
2) Theodolite WILD T-2 .....	12 sets
3) Leveling instrument .....	9 sets
4) Rangemaster .....	1 set
5) Distance meter .....	6 sets
6) Plane table 30 X 40 cm .....	9 sets
7) Plane table 40 X 50 cm .....	7 sets
8) Typewriter .....	1 set
9) Camera .....	19 sets
10) Binocular .....	12 sets
11) Steel tape .....	8 sets
12) Reflector .....	36 sets
13) Staff .....	18 sets
14) Calculator .....	1 set
15) Tripod .....	30 pcs
16) Signal lamp .....	12 pcs
17) Heliotrope .....	3 pcs
18) Transformer .....	2 pcs
19) Power supplier .....	1 pc
20) Generator .....	1 pc
21) Transceiver .....	9 sets
22) Foot plate .....	18 pcs

## 10. Technical Aspects

### (1) Aerial photography

Photo scale: 1/20,000 4,000 km<sup>2</sup>

Camera: Wide angle camera (WILD RC-10)

Film: Kodak PLUS-X

### (2) Ground control point survey

3rd-order control point: 67 points

Accuracy of horizontal control survey: 1/25,000

Monument: Subject to the specification of BMA

### (3) Leveling

Accuracy

12 mm $\sqrt{s}$  : 50 km

60 mm $\sqrt{s}$  : 250 km

Leveling shall be carried out to obtain vertical controls necessary for aerial triangulation and mapping work.

### (4) Reference ellipsoid: Everest

Datum: Indian datum 1975

Vertical datum: Mean sea level at Koh Lak

Projection: Universal Transverse Mercator Projection

### (5) Mapping

Map scale

1/4,000 : 300 km<sup>2</sup>

1/10,000: 2,000 km<sup>2</sup>

Contour Lines: 2 m contour intervals

Format

1/4,000 : 2.5 km × 3.75 km (62.5 cm × 93.75 cm)

1/10,000: 5 km × 7.5 km (50 cm × 75 cm)

(6) Attachment

Mapping Area and Sheet	Fig. 1
Photography Flight Plan and Coverage	Fig. 2
Planning Map of Ground Control Survey	Fig. 3
Planning Map of Leveling	Fig. 4
Planning Map of Leveling in the Central Area	Fig. 5

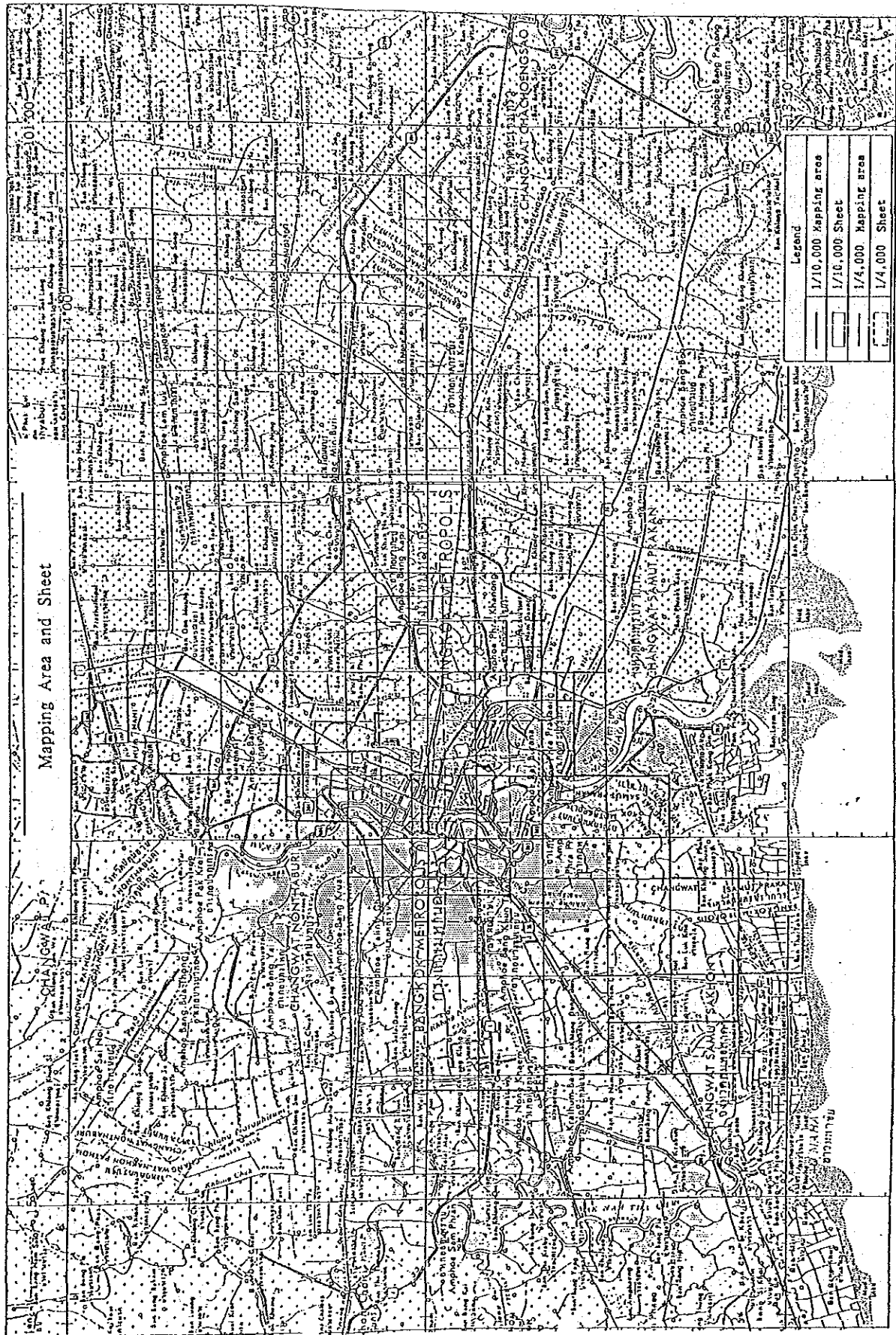
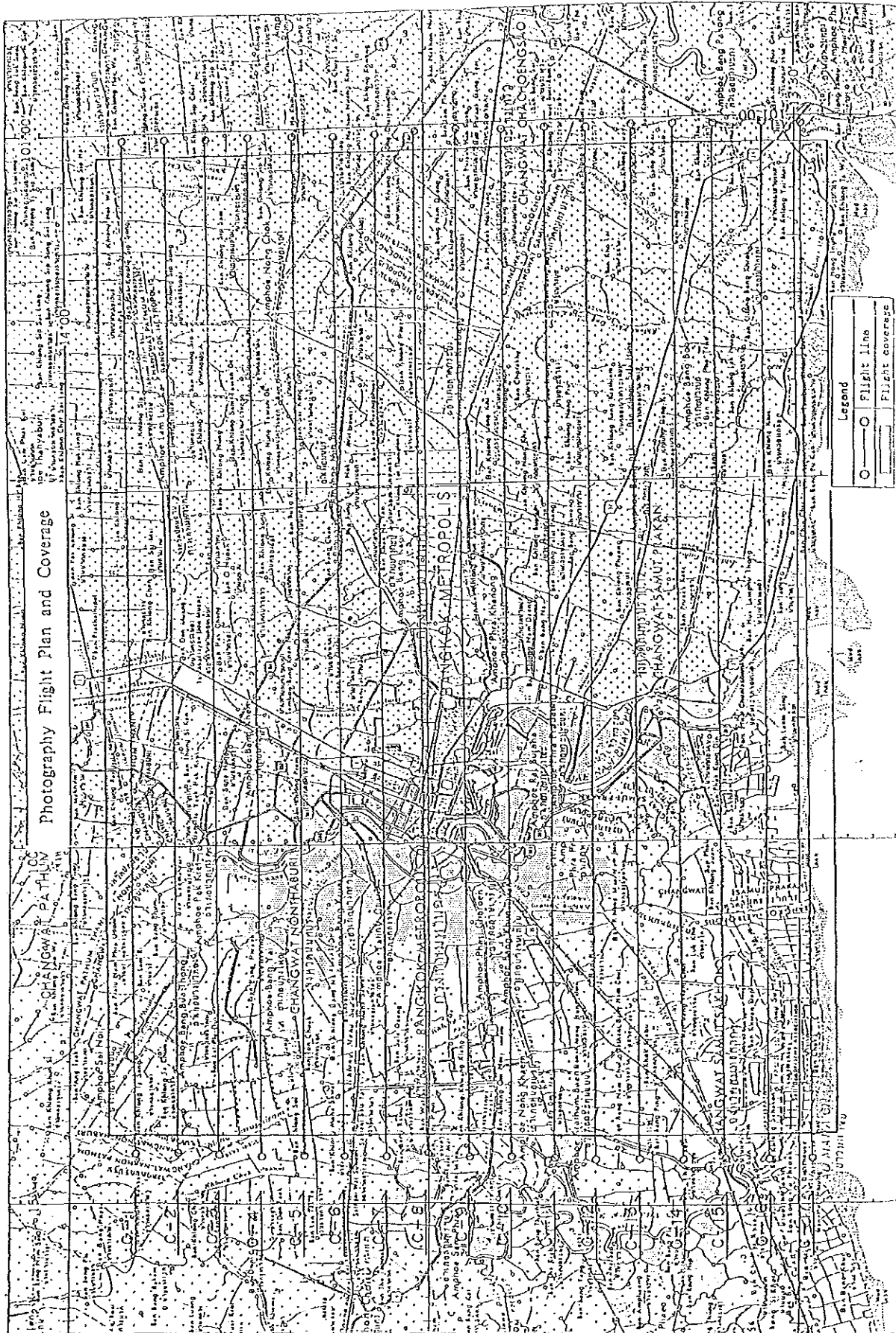
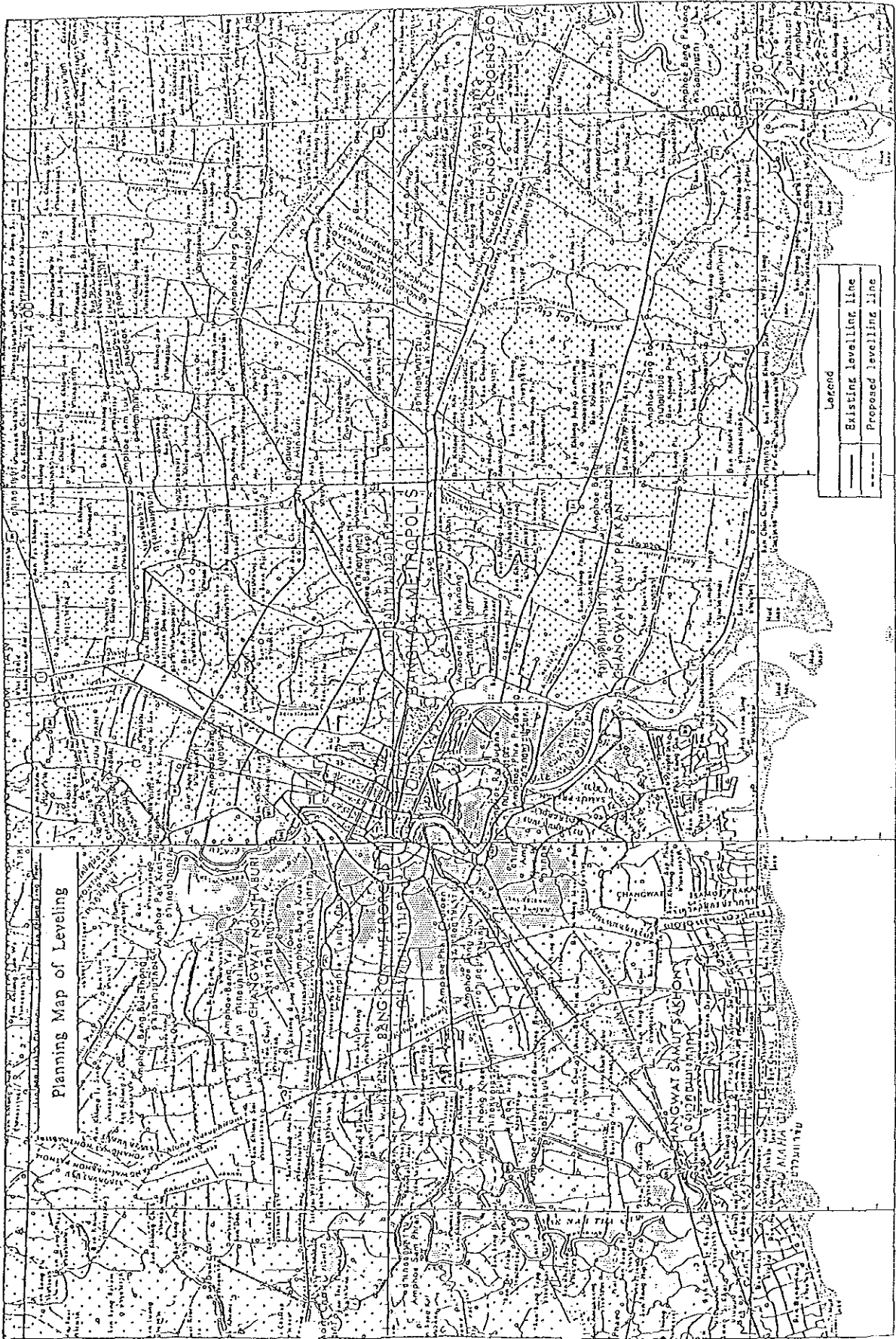


Fig - 2



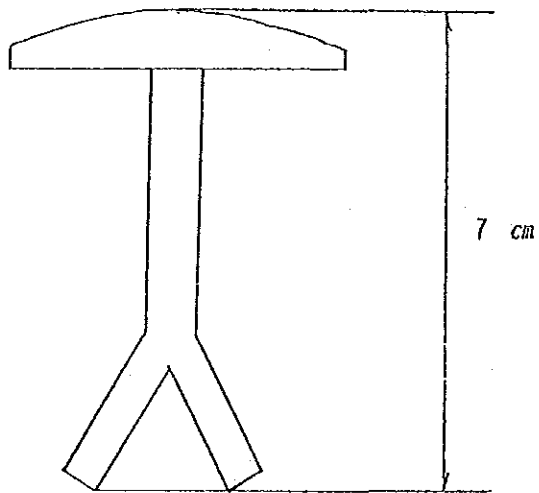
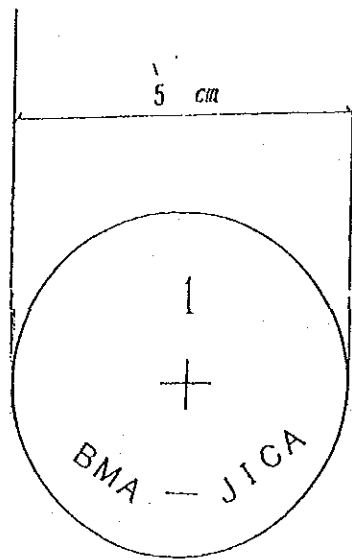








The specification for the monument



Material : Brass

The form for the film annotation

Course No.

Date/Month/Year

Scale

Photo No.

The form consists of a large rectangular frame. At the top edge, there are four circles, one in each quadrant. Below these circles, the text 'C I BMA 26 / 3 / 87 1:20,000 001' is printed. The central area of the frame is defined by a decorative, irregular border with small protrusions and indentations at the corners and midpoints of the sides.

C I BMA 26 / 3 / 87 1:20,000 001

2-3 Minutes at the termination of field work (June 1987)

MINUTES OF DISCUSSION  
OF  
TOPOGRAPHIC MAPPING PROJECT OF BANGKOK METROPOLITAN AREA  
BETWEEN  
THE BANGKOK METROPOLITAN ADMINISTRATION  
AND  
THE JAPAN INTERNATIONAL COOPERATION AGENCY SURVEY TEAM  
ON  
JUNE 23RD 1987  
BANGKOK THAILAND

*Wicha Jiwalai*

DR. WICHA JIWALAI  
DEPUTY GOVERNOR  
BANGKOK METROPOLITAN ADMINISTRATION

*Tositomo Kanakubo*

MR. TOSITOMO KANAKUBO  
LEADER  
JICA SURVEY TEAM

1. The JICA Survey Team reported that the first year field work has been finished successfully.

The Thai side acknowledged.

2. The BMA proposed the JICA Survey Team that RTSD "Wat Saket" 1st order triangulation point which was shifted should be re-observed and included in the final result calculation.

The JICA Survey Team carried out the additional observation at the point by eccentric observation method. The result will be used in the final calculation with the consent of the supervisory committee in Tokyo.

3. The JICA Survey Team suggested that the final calculation of triangulation control point should be carried out by using 6 RTSD triangulation points, because one of the RTSD triangulation point couldn't be used on account of being dislocated.

The Thai side agreed.

4. The JICA Survey Team proposed the drafts of

(1) Marginal information.....	Appendix (1) - 1
	Appendix (1) - 2
	Appendix (1) - 3
	Appendix (1) - 4
(2) Additional symbols of the.....	Appendix (2) - 1
Topographic maps	Appendix (2) - 2
	Appendix (2) - 3
	Appendix (2) - 4

The Thai side will consult with the RTSD and notify JICA as soon as they can.

5. The JICA Survey Team requested the BMA to check geographical names on 1/4,000 and 1/10,000 scale topographic maps and notify JICA by December 1st 1987.

The Thai side agreed.

6. The BMA will inform the JICA Survey Team whether the coordinates on the map sheet should be indicated or not by December 1987.

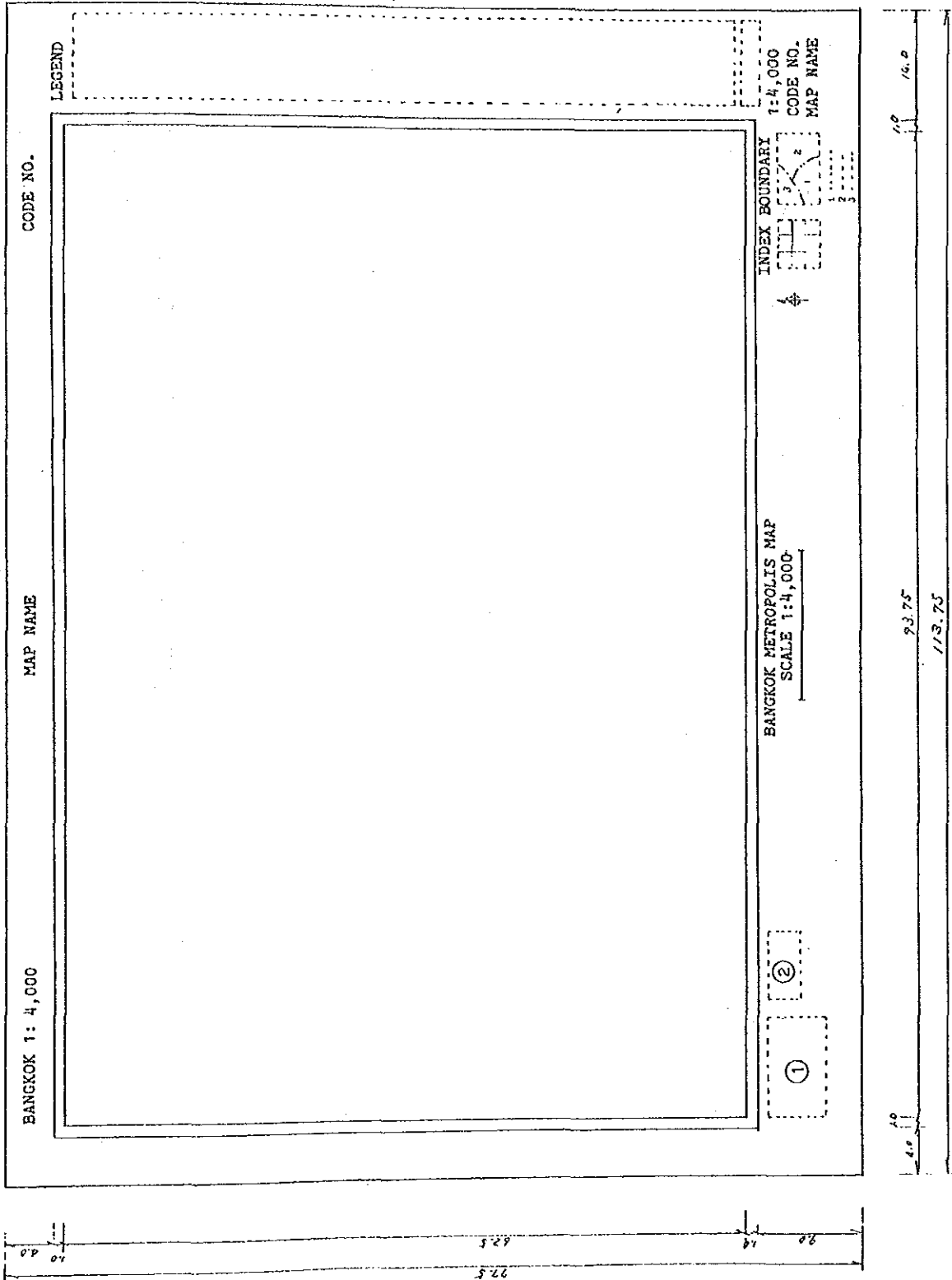
The JICA Survey Team acknowledged.



MARGINAL INFORMATION  
FOR  
1:4,000

Appendix (1) - 1

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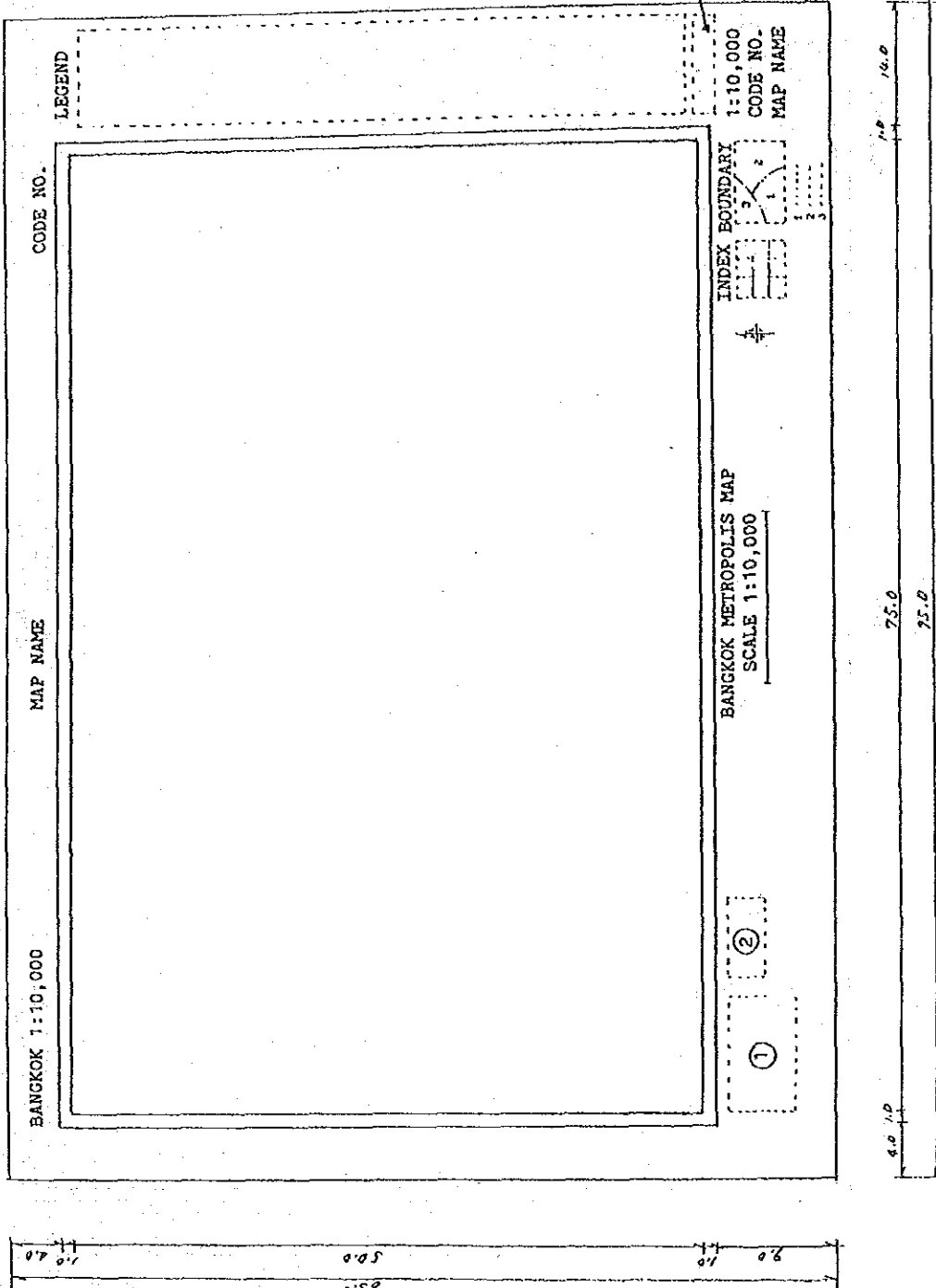


MARGINAL INFORMATION

OF

1:10,000

UNIT IS CM.





CODE NUMBER SYSTEM OF TOPOGRAPHIC MAP SERIES OF 1:4,000, 10,000 and 1:20,000

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		3-1, 3-2	4-3	4E-3
		3-3	4-4	4E-4
5	6	7	8	8E
		7-1	8-1	8E-1
		7-2	8-2	8E-2
		7-3	8-3	8E-3
		7-4	8-4	8E-4
9	10	11	12	12E
9-1	10-1	11-1	12-1	12E-1
		11-2	12-2	12E-2
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		11-4	12-4	12E-4
13	14	15	16	16E
13-1	14-1	15-1	16-1	16E-1
		15-2	16-2	16E-2
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		15-4	16-4	16E-4
17	18	19	20	
	17-2	18-1	19-1	
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CODE NUMBER

10-2-A

1:4,000

10-2

1:10,000












10

1:20,000

AMENDMENT OF SYMBOLS

FOR  
1:4,000

No. 1

Classification	No.	Name of Symbol	Symbol	Line Size	Color	Land Identification	Compilation	Specifications
M	1	Gasoline Station		0.15	Black	G.S	Red	Used to indicate an area of size 5x5 mm. or larger on map
M	2	Propane Gas Station		0.15	Black	L.P.G	Red	Used to indicate an area of size 5x5 mm. or larger on map
Bs	3	Warehouse		0.15	Black		Red	Note area added for large sized
M	4	Material Yard		0.15	Black	M	Red	Used to indicate of size 5x5 mm. or larger on map
M	5	Gate		0.15	Black		Red	Large size one suitable for landmark
M	6	Chimney		0.15	Black		Red	Large size one suitable for landmark
M	7	Radio Tower		0.15	Black		Red	Large size one suitable for landmark

AMENDMENT OF SYMBOLS  
FOR

No. 2

1:4,000

Classification	No.	Name of Symbol	Symbol	Line Size	Color	Land Identification	Compilation	Specifications
M	8	Crane		0.15	Black		Red	Large size one suitable for landmark
P	9	Turf		0.15	Black	...	Red	Used to indicate of size 5x5 mm. or larger on map
M	10	Fountain		0.15	Black		Red	Large size one suitable for landmark

AMENDMENT OF SYMBOLS  
FOR  
1:10,000



Classification	No.	Name of Symbol	Symbol	Line Size	Color	Land Identification	Compilation	Specifications
Bs	1	Warehouse		0.15	Black		Red	Note area added for large sized
M	2	Material Yard		0.15	Black		Red	Used to indicate of size 5x5 mm. or larger on map
M	3	Gate		0.15	Black		Red	Large size one suitable for landmark
M	4	Chimney		0.15	Black		Red	Large size one suitable for landmark
M	5	Radio Tower		0.15	Black		Red	Large size one suitable for landmark
M	6	Crane		0.15	Black		Red	Large size one suitable for landmark
P	7	Turf		0.15	Black	...	Red	Used to indicate on size 5x5 mm. or larger on map

AMENDMENT OF SYMBOLS

FOR

1:10,000

No. 2

Classification	No.	Name of Symbol	Symbol	Line Size	Color	Land Identification	Compilation	Specifications
M	8	Fountain		0.15	Black		Red	Large size one suitable for landmark



2-4 Minutes at the initiation of field work (December 1987)

MINUTES OF DISCUSSION  
ON  
TOPOGRAPHIC MAPPING PROJECT OF BANGKOK METROPOLITAN AREA  
BETWEEN  
THE BANGKOK METROPOLITAN ADMINISTRATION  
AND  
THE JAPAN INTERNATIONAL COOPERATION AGENCY SURVEY TEAM  
ON  
DECEMBER 9, 1987  
BANGKOK THAILAND

*Wicha Jivalai*

DR. WICHA JIVALAI  
DEPUTY GOVERNOR  
BANGKOK METROPOLITAN ADMINISTRATION

*Tositomo Kanakubo*

MR. TOSITOMO KANAKUBO  
LEADER  
JICA SURVEY TEAM

The Japanese Survey Team organized by JICA and headed by Mr. Tositomo KANAKUBO visited the Kingdom of Thailand on 1st of December, 1987 to carry out the second year survey work for the Topographic Mapping of Bangkok Metropolitan Area.

Prior to the commencement of the work, a joint meeting was held on 7th of December, 1987, and the following items were discussed and mutually agreed by and between the Bangkok Metropolitan Administration (hereinafter referred to as BMA) and JICA Survey Team.

1. Second Year Plan of Operation

The Plan of Operation for the second year survey work was proposed and explained by the JICA Survey Team and agreed by BMA.

2. Sheet names

BMA shall determine names of each sheet both 1/4,000 and 1/10,000 scale of maps and supply to the JICA Survey Team the name list in English by 20th of January, 1988.

3. Topographic Maps with Thai annotation and their marginal information including sheet name.

Both side confirmed that the maps with Thai annotation and their marginal information hereunder mentioned would be prepared by Thai side. JICA Survey Team requests that completion of this work should be by 20th January, 1988. BMA expresses intention to meet the requirement as possible as the Thai side can.

- (1) 40 sheets of 1/4,000 topographic map
- (2) 1 sheet of marginal information for 1/4,000 topographic map
- (3) 61 sheets of 1/10,000 topographic map
- (4) 1 sheet of marginal information for 1/10,000 topographic map

4. Checking of administrative boundaries and names

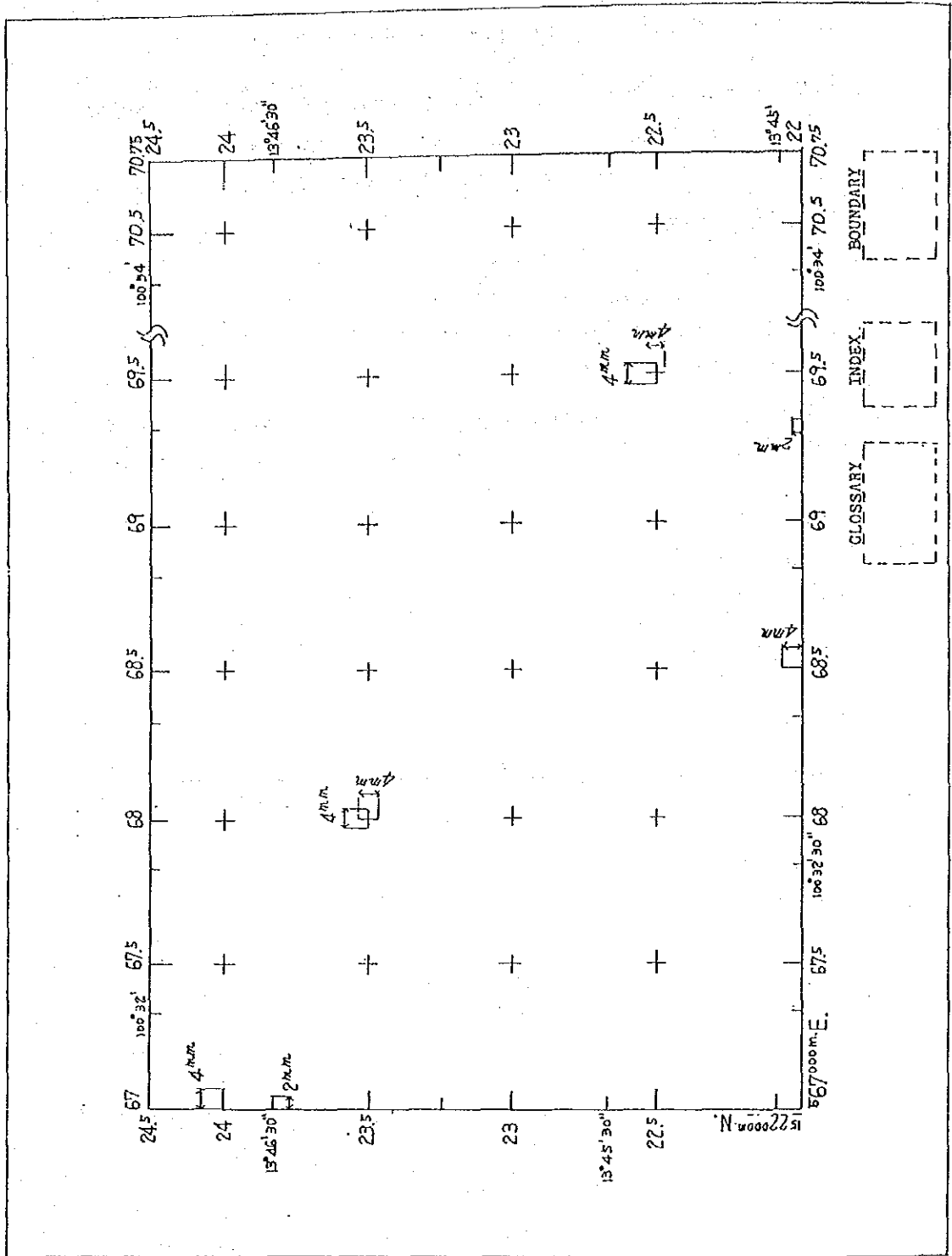
Checking of administrative boundaries and names noted on compilation manuscripts will be done by Thai side.

5. In case that an area to be mapped is too small in a sheet, the area shall be mapped on extended part from neatline of adjacent sheet.
6. Contents of map was confirmed by both side as follows;
  - (1) Cross mark for grid and coordinates shown on Appendix 1 and 2 shall be delineated on the final results.
  - (2) Magnetic north shall not be mentioned because of unavailability of the data.
  - (3) Remark on road and railway for place name connected to destination shall not be mentioned.
  - (4) Some symbols shown on appendix 3 shall be added and some others shall be changed.
7. Color tone (Hue, Value and Chroma) for printing of 1/10,000 Topographic map was suggested by JICA Survey Team as follows and Thai side agreed.

Red	2.5	R	4/12
Brown	7.5	YR	7/10
Green	5	GY	7/10
Blue	10	B	6/10
Grey	7.5	P	5/3
Black			2/N

---

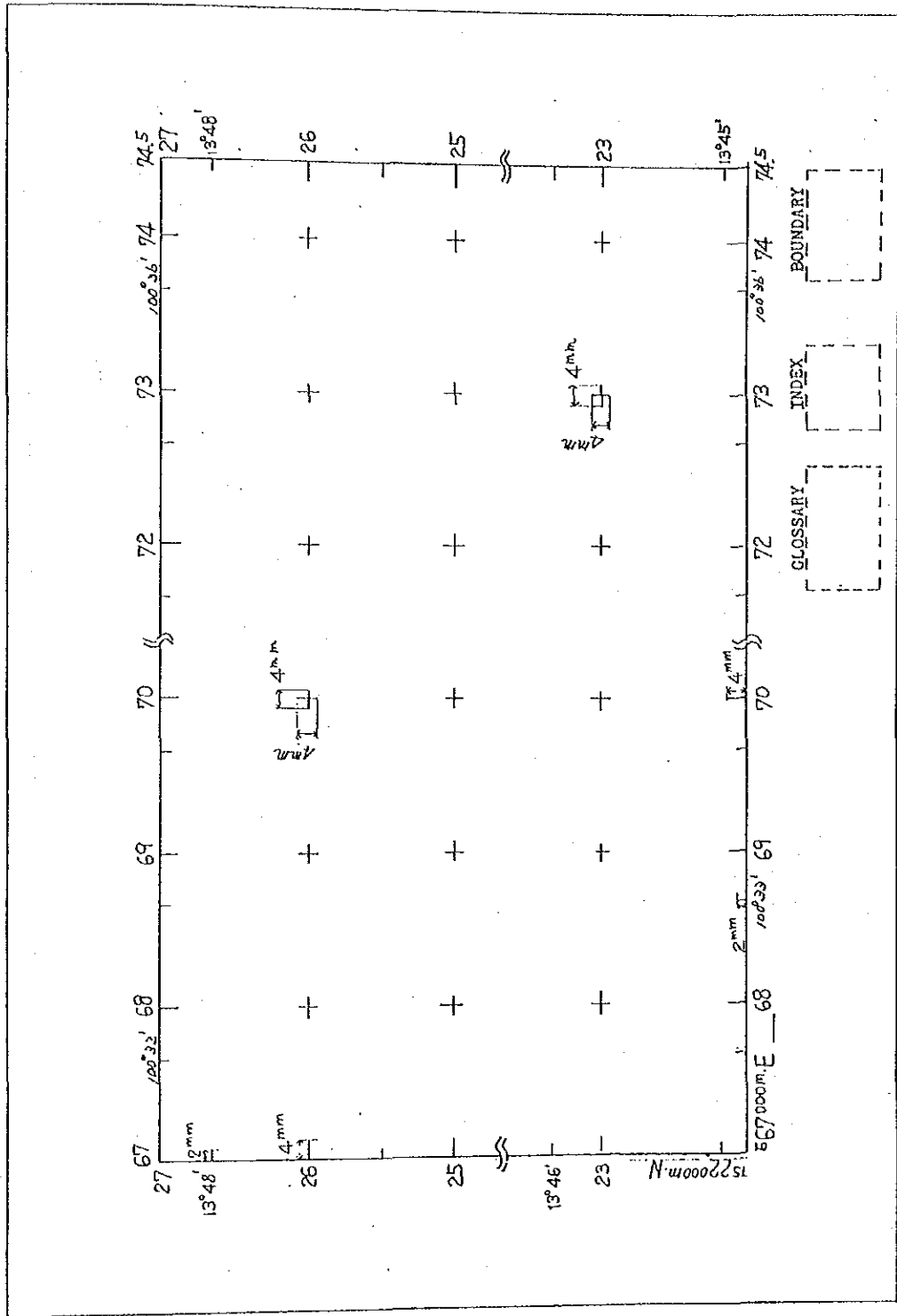
APPENDIX 1 GRID AND COORDINATES FOR 1:4,000



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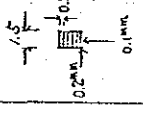
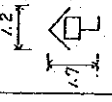
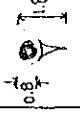
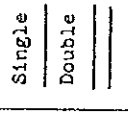
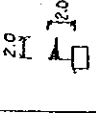




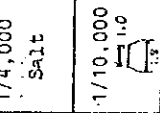
APPENDIX 2 GRID AND COORDINATES FOR 1:10,000



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APPENDIX 3 AMENDMENT OF SYMBOLS FOR 1:4,000 AND 1/10,000

CLASSIFICATION	NO	NAME OF SYMBOL	SYMBOL	LINE SIZE (mm)	COLOR	FIELD IDENTIFICATION	COMPILATION	SPECIFICATION	S/W
Ra	1	Stone Step		0.10 0.20	Black	Same as Symbol Red	Same as Symbol Black	Applied to a case of 2.5 mm in length or more on map. Smaller one may be expressed when considered necessary.	Newly added
M	2	Shrine of the Household God		0.15	Black	- do -	- do -	Applied to an area of 3m x 3m or more at site or to be principal landmark.	-do-
M	3	Golf Course		0.15	Black	- do -	- do -	The symbol set up besides the club house.	-do-
Rw	4	Railway		0.3	Black	Single Double	- do -		Changed
Bs	5	School		0.5	Black			In case of symbol and specification (Draft) of 1/4,000, symbol  was changed to 	-do-
W	6	Salt Pan		0.15	Black Blue	Salt	Salt	Name of symbol was changed salt pan from salt bed.	-do-

PLAN OF OPERATION  
FOR  
TOPOGRAPHIC MAPPING  
OF  
BANGKOK METROPOLITAN AREA

(Second Year Work)

DECEMBER 1987

JAPAN INTERNATIONAL COOPERATION AGENCY

(JICA)

Contents

1. Background -----	1
2. Outline of the Second Year Work -----	1
3. Field Completion Work -----	1
3-1 Work Contents	
3-2 Formation of JICA Survey Team and Schedule	
3-3 Party Formation Plan	
3-4 Office Space to be Provided by BMA	
4. Data and Specifications to be Discussed and Confirmed -----	3
During the Field Work	
4-1 Data Prepared by JICA Survey Team	
4-2 Data Prepared by BMA	
4-3 Specifications to be Finalized by the Field Completion	
5. Succeeding Work to be Conducted in Japan -----	4
6. Specification of Thai Annotation Sheet -----	4



Plan of Operation  
of the 2nd Year Work for Topographic  
Mapping of Bangkok Metropolitan Area

1. Background

Topographic Mapping of Bangkok Metropolitan Area was set forth in the Agreement on Technical Cooperation between the Government of Japan and the Government of the Kingdom of Thailand signed on March 19, 1986 for the three year work.

The first year work which consisted of aerial photography, ground control point survey and field identification was completed on July 30, 1987.

The second year work which consists of aerial triangulation, stereo plotting, compilation, field completion, drafting(1/4,000) was started from August 11, 1987.

2. Outline of the Second Year Work

As the 2nd Year Work, following works will be completed:

a) Aerial triangulation	425 Models
b) Stereo plotting	
1/4,000	300 sq. kms
1/10,000	1,700 sq. kms
c) Map compilation	
1/4,000	300 sq. kms (40 sheets)
1/10,000	2,000 sq. kms (61 sheets)
d) Field completion	2,000 sp. kms
e) Drafting	
1/4,000	300 sq. kms (40 sheets)

Among the above works, the work of a) through c) (Domestic Work) have completed and the copies of the compilation manuscript have been brought into Thailand for the map compilation work to be carried out in Thailand from early December, 1987 through the end of January, 1988.

3. Field Completion Work

3-1 Work Contents

In order to supplement the geographical information, topographic features and contour lines drawn by the stereo-plotter, following field completion work shall be conducted:

- a) Uncertain items during the course of the stereo-plotting and/or compilation work, shall be checked and confirmed.
- b) Major changes after the aerial photography done in the first year shall be corrected. If necessary, supplementary survey will be conducted using total station, plain table and level.
- c) Survey data to be provided by BMA shall be incorporated in the compilation manuscripts.

### 3-2 Formation of JICA Survey Team and Schedule

Name	Assignment	1987 December	1988 January
(Head quarters) Tositomo Kanakubo	Leader	1 10	20 29
Isao Ikeshima	Deputy leader	1	29
Chozo Obara	Mapping planner	1	29
(Field completion) Yoshikazu Ibusuki	Chief surveyor	1	29
Kazuo Furukata	Surveyor	4	27
Mitsuo Sunaoshi	"	4	27
Kazuo Tabuchi	"	4	27
Yasuo Hongo	"	4	27
Mitsuyoshi Takahashi	"	4	27
Kazuhiro Ishizuka	"	4	27
Hiroshi Saitoh	"	4	27
Yasuki Kondo	"	4	27
Akimasa Takahashi	"	4	27
Masashi Kita	"	4	27

### 3-3 Party Formation Plan

Work	Number of chief surveyor	Field parties		
		Number of party	Break-down of a party	Total number of surveyor
Field completion	1	5	2 Japanese surveyors 1 BMA counterpart	10 Japanese surveyors 5 BMA counterparts

### 3-4 Office Space to be Provided by BMA

Number of room	Space	Period
1	10m x 5m	2 months

- 1) The rooms shall be equipped with ordinally facilities such as telephone, air condition, lock, proper lightings, etc.
- 2) Data, survey materials and instruments shall be stored in the rooms.

### 4. Data and Specifications to be Discussed and Confirmed During the Field Work

#### 4-1 Data Prepared by JICA Survey Team

- a) Second copy of compilation manuscript 101 x 2 sheets
- b) Delumina copy of compilation manuscript 101 x 1 sheets
- c) Copy of English annotation sheet 101 x 2 sheets
- d) Copy of English marginal information sheets  
(1/4,000, 1/10,000) 2 sheets
- e) Sample of drafting sheet (1/4,000, 1/10,000) 1 sheet
- f) Sample of color proof for printing (1/10,000) 1 sheet
- g) Polyester sheet for Thai annotation 101 sheets
- h) Others data  
(Mapping sheet index : refer appendix 1)

#### 4-2 Data Prepared by BMA

- a) Confirmation data of administive names and boundaries
- b) Thai annotation sheet (1/4,000) 40 sheets  
" (1/10,000) 61 sheets
- c) Thai marginal information sheet (1/4,000) 40 sheets  
" (1/10,000) 61 sheets

#### 4-3 Specification to be Finalized by the Field Completion

- a) Specification of amendatory and additional symbols (Refer appendix 2)
- b) Specification of marginal information sheet
- c) Specification of photo-composition style (Refer appendix 3)
- d) Specification of printing map

#### 5. Succeeding Work to be Conducted in Japan

Original manuscript of the field completion shall be made using the scribed sheets (1/10,000) and the polyester sheets (1/4,000).

#### 6. Specification of Thai Annotation Sheet

- a) Period of preparation

From Dec.7, 1987 to Jan. 22, 1988

- b) Number of map sheets

Topographic map (1/4,000) 40 sheets

Topographic map (1/10,000) 61 sheets

- c) Annotation method

Photo composition and stick or lettering

- d) Character size and style

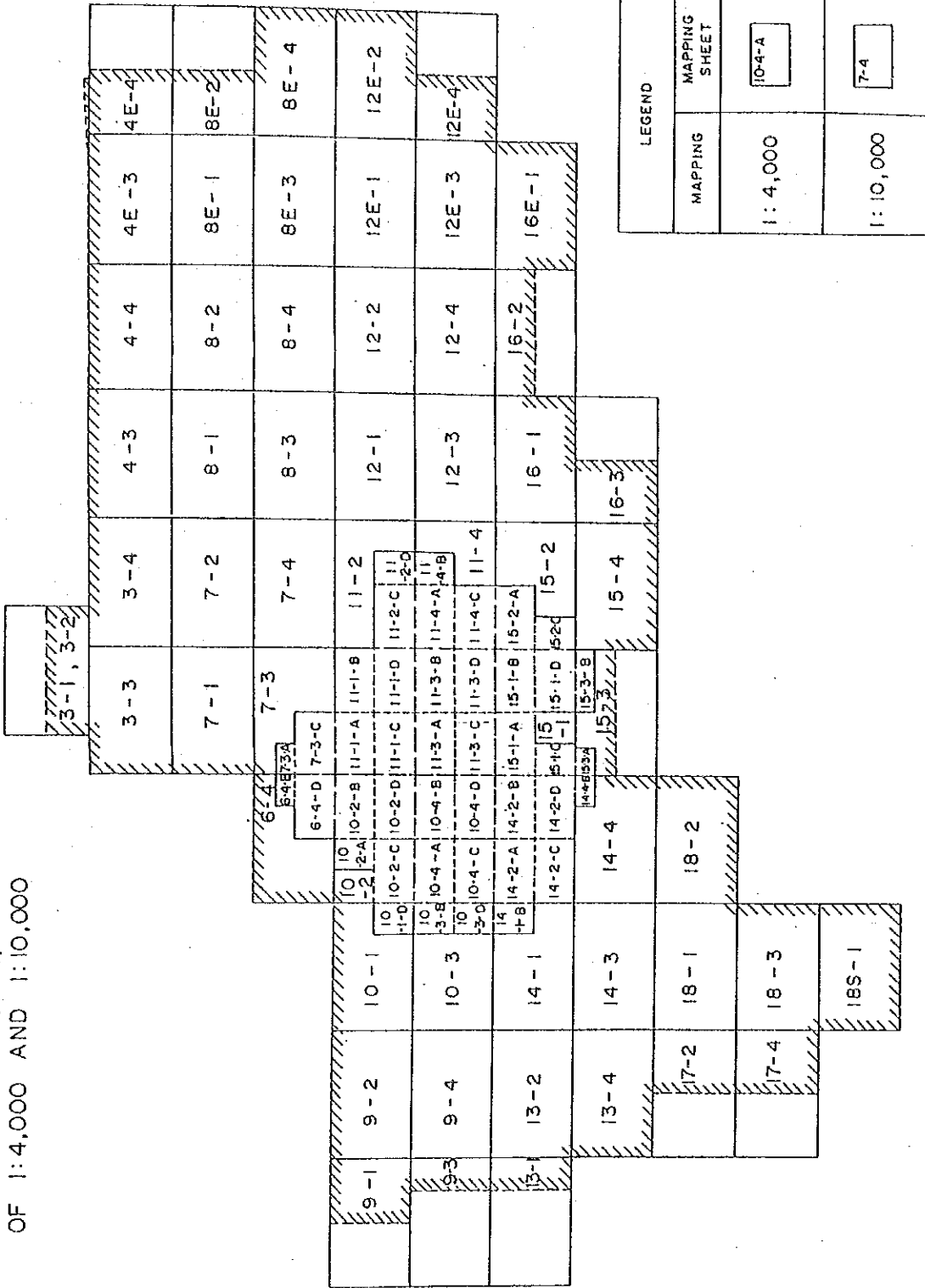
Size and style of Thai annotation should be same as English one

- e) Position of stick

Same position as in the English annotation sheets

TOPOGRAPHIC MAPPING SHEET INDEX  
 (FOR)  
 OF 1:4,000 AND 1:10,000

Appendix 1


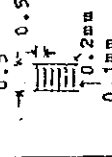
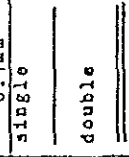


LEGEND	
MAPPING	MAPPING SHEET
1: 4,000	10-4-A
1: 10,000	7-4

AMENDATORY AND ADDITIONAL SYMBOLS (Draft)

Appendix 2

FOR 1:4,000 AND 1:10,000

Classi- fication	No.	Name of Symbol	Symbol	Line Size (mm)	Color	Field Identification	Compilation	Specifications	S/W
	1	Spot Height	432.1	Dot: 0.3	Black			Elevation point described by plotter; one point per 5cm square Unit of expression; 0.1m unit (Unit: 1m → 0.1m)	Change
M	2	Way side Statue		0.15	Black	Same as Symbol Red	Same as Symbol Black	Applied to an area of 3m x 3m or more at site or to be principal target.	NEW
Ra	3	Stone Step		0.10 0.20	Black	Same as Symbol Red	Same as Symbol Black	Applied to a case of 2.5mm in length or more on map. Smaller one may be expressed when considered necessary.	NEW
RW	4	Railway		0.30	Black	 single double Red	Same as Symbol Black	Indicate national railway. Distinguish between single track line and double.	Change

Topographic Mapping of Bangkok Metropolitan Area  
Photo-composition Style of English (Draft)

Classification		Style	Rank	mm	Color	Size 1/10,000	Name	Remark
Boundary	Metropolis	E08-42- <del>%</del>	20	4.5			Bangkok Metropolis	
	Province	E08-24-C	16	3.5			SAMUT PRAKAN PROVINCE	
	District	//	//	//			BANG KAPI DISTRICT	
	Town	//	14	3.0				
	Village	E08-24- <del>%</del>	14	3.0			Ban Khlong Bang Bon	
New Residence	Development Area	//	12	2.5			Mu Ban Sala Daeng	
Building	School	//	10	2.2			Wat Nong School	
	Post Office	//	//	//			Khlong Sip Post Office	
	Temple	//	//	//			Sala Daeng Temple	
Miscellaneous Landmark Feature	Monument	E08-24- <del>%</del>	8	1.8			Democracy Monument	
	Park	E05-14- <del>%</del>	10	2.2			Rungtani Park	
	Air Port	E05-14-C	//	//			DON MUANG AIR PORT	
Road	National Highway	E08-25-C	//	//			THANONH PAHOLOYTHIN	
	Express Way	//	//	//			DIN DAENG PORT EXPRESSWAY	
	Provincial Road	//	//	//			THANONH SUKUMVIT	
	Another Road	//	//	//			SOI WANITI	
Rail Way	Rail Way	//	//	//			NORTHERN RAIL WAY LINE	
	Station	//	//	//			HUA LAMPONG ST.	
	Road Under Construction	E08-25- <del>%</del>	8	1.8			Road Construction	
Placecation		E05-14- <del>%</del>	//	//				
River	Large	E01-25-C	18	4.0			CHAO PHRAYA RIVER	
	Middle	//	14	3.0			KHLONG MAHANAK	
	Small	//	10	2.2			SAKILA DITCH	
Sea	Gulf	//	18	4.0			GULF OF THAILAND	
	Beach	E01-24- <del>%</del>	10	2.2			Pataya Beach	

2-5 Minutes at the termination of field work (January 1988)

MINUTES OF DISCUSSION

ON

TOPOGRAPHIC MAPPING PROJECT OF BANGKOK METROPOLITAN AREA

BETWEEN

THE BANGKOK METROPOLITAN ADMINISTRATION

AND

THE JAPAN INTERNATIONAL COOPERATION AGENCY

ON

JANUARY 26, 1988

BANGKOK THAILAND

*Wicha Jiwalai*

DR. WICHA JIWALAI  
DEPUTY GOVERNOR

BANGKOK METROPOLITAN ADMINISTRATION

*J. Kanakubo*

MR. TOSITOMO KANAKUBO  
LEADER

JICA SURVEY TEAM



Minutes of Discussion  
on  
Topographic Mapping Project of Bangkok Metropolitan Area

The Japanese Survey Team organized by JICA and headed by Mr. Tositomo KANAKUBO stayed at the Kingdom of Thailand from 1st of December 1987 till 26th of January 1988 to carry out the second year survey work for the Topographic Mapping of Bangkok Metropolitan Area.

Upon the completion of field completion work in the second year survey work, a joint meeting was held during the period of 21st to 26th of January 1988, and the following items were discussed and mutually agreed upon between the Bangkok Metropolitan Administration (hereinafter referred to as BMA) and JICA Survey Team.

List of attendants is shown in Annex A.

I. SECOND YEAR WORK

I-1 Progress of the 2nd Year Work

<u>Items of Work</u>	<u>Coverage</u>	<u>Progress at Present</u>
Aerial Triangulation	425 models	100%
Stereo-plotting 1: 4,000	300 Km <sup>2</sup> 40 Sheets	100%
1:10,000	1,700 Km <sup>2</sup> 57 Sheets	100%
Compilation 1: 4,000	300 Km <sup>2</sup> 40 Sheets	100%
1:10,000	2,000 Km <sup>2</sup> 61 Sheets	100%
Field Completion	2,000 Km <sup>2</sup>	100%
Drafting 1: 4,000	300 Km <sup>2</sup> 40 Sheets	*
*Expected to be completed by the end of March 1988.		

I-2 Field Completion

1) Style and Size of Annotation

Style and size of annotation in Thai and English shall be in Appendix 1-1 and 1-2.

T. K.  
Wichu

2) Marginal Information

- (1) Glossary as shown in Appendix 1-3 shall be mentioned on the map of English annotation.
- (2) One part of explanation of marginal information shall be changed as shown in Appendix 2-1, 2-2, 2-3 and 2-4.

3) Spot Height

Spot height on map of 1:4,000 and 1:10,000 shall be shown in meter with one decimal point.

4) Data and Map List

The data and map which JICA Survey Team received from Thai side are as follows:

(1) Map for Administrative Name and Boundary

1:4,000	40 sheets
1:10,000	61 sheets

(2) List of Annotation in Thai and English

1:4,000	40 sheets
1:10,000	61 sheets

(3) List of Sheet Name

as shown in Appendix 2-5, 2-6.

(4) Annotation Sheet

1:4,000	40 sheets
---------	-----------

As for 1:10,000 the map for 61 sheets shall be sent to Japan side by February 29, 1988.

I-3. Delivery of the ground control point survey results

The Japanese side handed over to the Thai side the survey results of ground control points as shown in Appendix 3-1.

## II. THIRD YEAR WORK

In the 3rd year (Final year), the following work is expected to be carried out:

Drafting (1:10,000)	2,000 Km <sup>2</sup>	61 sheets
Printing (1:10,000)	2,000 Km <sup>2</sup>	61 sheets

As to the 3rd year work the both sides confirmed that the drafting shall be conducted by the Japanese side in Japan and the printing shall be carried out by the Thai side in the reproduction facilities of Royal Thai Survey Department (hereinafter referred to as RTSD) using the materials to be provided by the Japanese side. Both sides also confirmed to make close cooperation for smooth implementation of the Work.

## III. PROCESS OF THE FINAL PRODUCT PREPARATION

The process of the final product preparation to be carried out by both sides is as follows:

### III-1. Drafting

1:4,000 topographic map:

The Japanese side shall send one set of the final draft sheets to the Thai side by the middle of April 1988.

1:10,000 topographic map:

Checking on the surprints shall be made by the Thai counterpart in Japan. The Japanese side shall send the surprints checked by the counterpart to Thailand by the middle of July 1988 for the final confirmation by the Thai side. The Thai side shall make final check and return them to Japan by the middle of August 1988.

### III-2. Proof printing

The Japanese side shall complete the proof printing of 1:10,000 Topographic map by the end of September 1988.

III-3. Modification of the specifications of topographic map

The Japanese side shall make slight symbol modifications and map color adjustment for better map representation of the final products.

III-4. Provision of the reference and consumable materials for printing

The Japanese side shall provide to the Thai side with the reference and consumable materials for printing by the end of September 1988. The Thai side shall be in charge of custom clearance, transportation to warehouse and storage under proper temperature and humidity at its expenses.

1) Reference materials

Specification for printing	1 set
Composite films (Negative)	1 set
Proof (sample map)	61 sheets (1 set)

2) Consumable materials

PS aluminum plate (74.1 x 92.5 cm )	450 sheets
Printing paper (75 x 95 cm)	100,000 sheets
Printing ink (2 Kg/can)	200 cans (for the above)
Blanket Rubber (113.5 x 130 cm )	4 sheets
Gum Airobic	15 gallon
Others	1 set

Thai side strongly requested, considering usefulness of the map, to increase the account of consumable materials which would be enough for printing 1,500 sets of 1:10,000 topographic Map in Thai version instead of 500 sets originally agreed in the Scope of Work (The number of printing paper shall be 171,000 sheets for 2,000 sets).

Japanese side stated to convey this request to the JICA Headquarters for its consideration.

III-5. Dispatch of the Japanese expert group for printing

The Thai side requested the Japanese side to dispatch the expert group for guidance of plate composition and color scheme.

The Japanese side shall take necessary measures for dispatching the expert group for initiation of the printing work as well as for confirmation of the completion of the printing process.

III-6. Completion of the project

- (1) The work of topographic map of 1:4,000 shall be completed upon the consignment of the original manuscripts from Japan to Thailand by the end of September 1988. The Thai side shall obtain the approval from the authorities concerned to send at least one set of the blue print copies in order for Japanese side to confirm the completion of the work of producing 1:4,000 topographic map. Japanese side shall keep above map confidentially and send back them to Thai side after the confirmation.
- (2) The work for topographic map 1:10,000 shall be completed upon the completion of the Printing work in RTSD printing facilities by the end of Feb. 1989. Thai side shall obtain the approval from the authorities concerned to send at least one set (1 set : 122 sheets) of each of English and Thai editions with security stamp to JICA by the end of March 1989 in order for Japanese side to confirm the completion of the work of producing 1:10,000 topographic map. Japanese side shall keep above map confidentially and send back them to Thai side after the confirmation.
- (3) Japanese side shall submit BMA 50 copies of final report in English version by the end of March, 1989.
- (4) The technical cooperation program for this project shall be finalized by the completion of the above works.

#### IV. SEMINAR

Thai side requested Japanese side to cooperate in the occasion of holding seminar for technology transfer of topographic mapping and utilization of the topographic map in March 1989.

Japanese side stated to convey this request to JICA Headquarters for its consideration.

List of Attendants

THAI SIDE :

Bangkok Metropolitan Administration

Dr. Wicha Jiwalai	Deputy Governor
Mr. Bampen Jatoorapreuk	Director General, Department of Public Works
Mr. Supot Pongkidakan	Chief of Public Works Planning Sub-Division
Mr. Chailurt Panjatevakupt	Staff of Public Works Planning Sub-Division

The Royal Thai Survey Department

Maj. Gen. Thamnoon Udomsorayuth
Col. Anan Phunsanong
Lt. Col. Somsak Nuanurai
Lt. Col. Ronnachai Bamphenyu

JAPANESE SIDE :

G.S.I

Mr. K. Mimura	Technical Advisor
---------------	-------------------

JICA Headquarters

Mr. T. Nakano	Deputy Head, Social Development Cooperation Department
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JICA Thailand Office

Mr. T. Hino	Assistant Resident Representative
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JICA Survey Team

Mr. T. Kanakubo	Leader
Mr. I. Ikeshima	Deputy Leader
Mr. C. Obara	Mapping Leader

SAMPLE OF PHOTO LETTERING  
1/4,000

ITEM	ENGLISH			THAI		
	STYLE	SIZE	TYPE	STYLE	SIZE	TYPE
ADMINISTRATION	E08-24-C	16	A	จังหวัดสมุทรปราการ	20	A
PROVINCE	E08-24-C	16	A	จังหวัดสมุทรปราการ	20	A
DISTRICT	E08-24-C	16	A	เขตบางกะปิ	20	A
VILLAGE	E08-24-C/L	14	A	บ้านคลองบางบอน	18	A
NEW RESIDENCE	E08-24-C/L	12	A	หมู่บ้านบางบอน	16	A
BUILDING	E08-24-C/L	9	A	โรงเรียนบางบอน	12	A
SCHOOL	E08-24-C/L	9	A	โรงเรียนบางบอน	12	A
POST OFFICE	E08-24-C/L	9	A	สำนักงานไปรษณีย์บางบอน	12	A
TEMPLE	E08-24-C/L	9	A	วัดบางบอน	12	A
MONUMENT	E08-24-C/L	8	A	อนุสาวรีย์ประชาธิปไตย	10	A
PARK	E05-14-C/L	10	A	สวนลุมพินี	12	A
AIRPORT	E05-14-C	10	A	ท่าอากาศยานนานาชาติสุวรรณภูมิ	12	A
ROAD	E08-25-C	10	A	ถนนสุขุมวิท	12	A
NATIONAL ROAD	E08-25-C	10	A	ถนนสุขุมวิท	12	A
HIGHWAY	E08-25-C	10	A	ถนนสุขุมวิท	12	A
PROVINCIAL ROAD	E08-25-C	10	A	ถนนสุขุมวิท	12	A
LANE/STREET	E08-25-C	10	A	ถนนสุขุมวิท	10	A
RAILWAY	E08-25-C	10	A	ทางรถไฟสายเหนือ	12	A
STATION	E08-25-C	9	A	สถานีรถไฟกรุงเทพ	10	A
CONSTRUCTION	E08-25-C/L	8	A	ท่าอากาศยานสุวรรณภูมิ	10	A
RIVER	E01-25-C	18	B	แม่น้ำเจ้าพระยา	24	B
(LARGE)	E01-25-C	14	B	แม่น้ำเจ้าพระยา	18	B
(MEDIUM)	E01-25-C	10	B	แม่น้ำเจ้าพระยา	12	B
(SMALL)	E01-25-C	10	B	แม่น้ำเจ้าพระยา	12	B
SEA	E01-25-C	18	B	อ่าวไทย	24	B
GULF	E01-24-C/L	10	B	อ่าวไทย	12	B
BEACH	E01-24-C/L	10	B	หาดบางแสน	12	B

Remarks: Above sample is for type of letter only  
NOTE : A TYPE IS UP RIGHT LETTER  
B TYPE IS SLANT LETTER

Wicha T.K.



SAMPLE OF PHOTO LETERING  
1/10,000

ITEM	ENGLISH		THAI	
	STYLE	SIZE	TYPE	SIZE
ADMINISTRATION	E08-24-C	3-5	A	16
PROVINCE	CHANGWAT SAMUT PRAKAN		จังหวัดสมุทรปราการ	
DISTRICT	E08-24-C	3-5	A	16
KHET BANG KAPI			เขตบางกะปิ	
VILLAGE	E08-24-C/L	3.0	A	14
Ban Khlong Bang Bon			บ้านคลองบางบอน	
NEW RESIDENCE	E08-24-C/L	2-2	A	10
Mu Bua Sala Daeng			หมู่บ้านสวน	
BUILDING	E08-24-C/L	1.8	A	8
SCHOOL	1st King School		โรงเรียนกษัตริย์	
POST OFFICE	E08-24-C/L	1.8	A	8
along the Post Office			ที่ทำการไปรษณีย์	
TEMPLE	E08-24-C/L	1.8	A	8
Sala Daeng			ศาลาแดง	
MONUMENT	E08-24-C/L	1.8	A	8
Democracy Monument			อนุสาวรีย์ประชาธิปไตย	
PARK	E05-14-C/L	1.8	A	8
Suan Lumpini			สวนลุม	
AIRPORT	E05-14-C	1.8	A	8
BANGKOK INTERNATIONAL AIRPORT			ท่าอากาศยานนานาชาติ	
ROAD	E08-25-C	2-2	A	10
NATIONAL ROAD	THANON FAKHOLORN		ถนนพหลโยธิน	
HIGHWAY	E08-25-C	2-2	A	10
CHALERT MAMARAKON			ทางพิเศษเฉลิมเกล้า	
PROVINCIAL ROAD	E08-25-C	1.8	A	8
PHAYATHAI			ถนนพญาไท	
LANE/STREET	E08-25-C	1.8	A	8
POI KHAI			ซอยขาว	
RAILWAY	E08-25-C	2-2	A	10
NORTHER RAILWAY LINE			รถไฟสายเหนือ	
STATION	E08-25-C	1.8	A	8
BANGKOK RAILWAY ST.			สถานีกรุงเทพ	
CONSTRUCTION	E08-25-C/L	1.8	A	8
Road Construction			การก่อสร้าง	
RIVER	E01-25-C	3-5	B	16
MAE NAM CHAO PHRAYA			แม่น้ำเจ้าพระยา	
(MEDIUM)	E01-25-C	2.6	B	12
KILONG MAHAKON			คลองมหากอน	
(SMALL)	E01-25-C	1.8	B	8
LAT SAKHA			ลำสะแกก	
SEA	E01-25-C	3-5	B	16
GULF OF THAILAND			อ่าวไทย	
BEACH	E01-24-C/L	1.8	B	8
PHU THAI			หาดหัวหิน	

NOTE : A TYPE IS UP RIGHT LETTER  
B TYPE IS SLANT LETTER

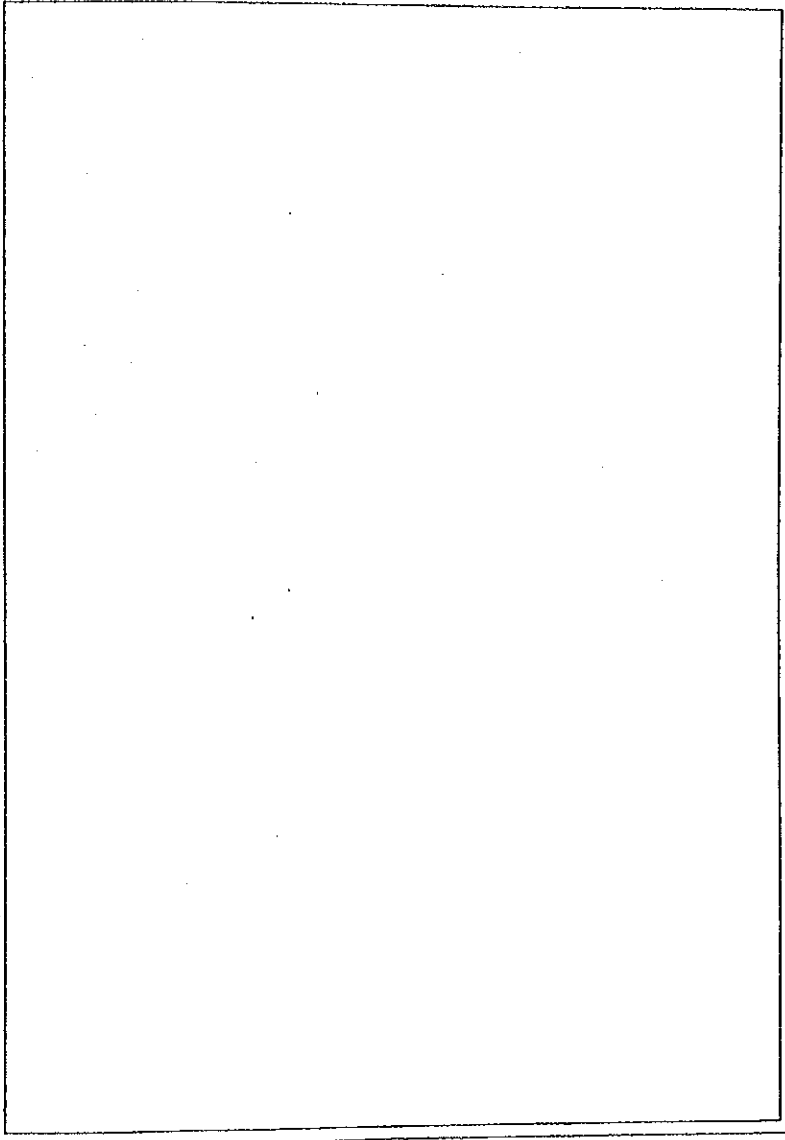
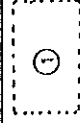

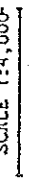
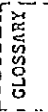

Remarks: Above sample is for type of letter only.

Wichai J.K.

## GLOSSARY

AMPHOE	.....	SECONDARY ADMINISTRATIVE DIVISION, DISTRICT
BAN	.....	VILLAGE
BUNG	.....	POND
CHANGWAT	.....	PRIMARY ADMINISTRATIVE DIVISION, PROVINCE
KHET	.....	SECONDARY ADMINISTRATIVE DIVISION, DISTRICT
KHLONG	.....	CANAL
LAM	.....	DITCH
MAE NAM	.....	RIVER
MU BAN	.....	HOUSING ESTATE
SOI	.....	LANE, STREET
SUAN	.....	PUBLIC PARK
THANON	.....	ROAD
WAT	.....	TEMPLE

MARGINAL INFORMATION  
FOR  
1:4,000

BANGKOK 1: 4,000	MAP NAME	CODE NO.
		
 	BANGKOK METROPOLIS MAP SCALE 1:4,000 	GLOSSARY  INDEX BOUNDARY 1:4,000  SYMBOL MARKS OF AGENCIES CONCERNED 1:4,000 CODE NO. MAP NAME
LEGEND		

*wish* T.K.

① This map was produced under cooperation between the Royal Thai Government and the Government of Japan. The Bangkok Metropolitan Administration served as implementing agency in closed coordination with the Royal Thai Survey Department.

Aerial Photography : March 1987  
 Field Survey Work : Japan International Cooperation Agency (JICA)  
 March to June 1987  
 Plotting, Compilation and Drafting : July 1987 to March 1988  
 Printing : Royal Thai Survey Department 1988  
 Distributor : Bangkok Metropolitan Administration (BMA)  
 Dinso Road, Bangkok, Thailand.

① This map was produced under cooperation between the Royal Thai Government and the Government of Japan. Department of Public Works, Bangkok Metropolitan Administration (BMA) served as implementing agency in closed coordination with the Royal Thai Survey Department, Supreme Command Headquarters.

Aerial Photography : March 1987 by JICA  
 Field Survey Work : March to June 1987 by JICA  
 Field Completion : December 1987 to January 1988 by JICA  
 Plotting, Compilation and Drafting : July 1987 to March 1988 by JICA  
 Distributor : Department of Public Works, BMA.

② Users are urged to refer corrections and comment for increasing the usefulness of this map to the Department of Public Works, Bangkok Metropolitan Administration, Mit Maitri Road, Khet Huai Khwang, Bangkok 10400.

MARGINAL INFORMATION  
OF  
1:10,000

BANGKOK 1:10,000	LEGEND	SYMBOL MARKS OF AGENCIES CONCERNED
MAP NAME	INDEX BOUNDARY	CODE NO. MAP NAME
CODE NO.	GLOSSARY	INDEX BOUNDARY
BANGKOK 1:10,000	BANGKOK METROPOLIS MAP SCALE 1:10,000	INDEX BOUNDARY

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## LIST OF SHEET NAME

(1)

1:4,000

SHEET NO.	THAI	ENGLISH
6-4-B, 7-3-A	ประชาชื่น	PRACHA CHUN
6-4-D	บางซื่อ	BANG SON
7-3-C	ทองวัง	HO WANG
10-1-D	ทลิ่งชัน	TALING CHAN
10-2-A	บางพลัด	BANG PHLAT
10-2-B	บางซื่อ	BANG SU
10-2-C	บางยี่ขัน	BANG YIKHAN
10-2-D	ดุสิต	DUSIT
10-3-B	พรานนก	PHRAN NOK
10-3-D	คลองบางแหวก	KHLONG BANG WAEX
10-4-A	พระนคร	PHRA NAKHON
10-4-B	จตุรพงษ์	URUPHONG
10-4-C	วังเวียนใหญ่	WONG WIAN YAI
10-4-D	บางรัก	BANG RAK
11-1-A	สวนจตุจักร	SUAN CHATUCHAK
11-1-B	ลาดพร้าว	LAT PHRAO
11-1-C	ดินแดง	DIN DAENG
11-1-D	ห้วยขวาง	HUAI KHUANG
11-2-C	คลองจั่น	KHLONG CHAN
11-2-D	บางกะปิ	BANG KAPI
11-3-A	มักกะสัน	MAKKASAN
11-3-B	คลองสามเสน	KHLONG SAMSEN
11-3-C	สวนลุมพินี	SUAN LUMPINI
11-3-D	เอกมัย	EKKAMAI
11-4-A	รามคำแหง	RAMKHAMHAENG
11-4-B	ลำสาลี	LAM SALI
11-4-C	ห้วยหมาก	HUA MARK
14-1-B	บางขุนเทียน	BANG KHUN THIAN
14-2-A	สะพานกรุงเทพ	KRUNG THEP BRIDGE



## LIST OF SHEET NAME

(1)

1:10,000

SHEET NO.	THAI	ENGLISH
3-1, 3-2	ลำลูกกา	LAM LUK KA
3-3	บ้านตลาดใหม่ดอนเมือง	BAN TALAT MAI DON MUANG
3-4	บ้านตลาดวัดเกาะ	BAN TALAT WAT KO
4-3	บ้านคลองสามวา	BAN KHLONG SAM WA
4-4	บ้านคลองแปด	BAN KHLONG PAET
4E-3	บ้านคลองสิบสอง	BAN KHLONG SIP SONG
4E-4	บ้านคลองสิบสี่	BAN KHLONG SIP SI
6-4	บางซ้อ	BANG SOH
7-1	บางเขน	BANG KHEN
7-2	บ้านบัว	BAN BUA MON
7-3	เกษตรศาสตร์	KASETSART
7-4	บ้านเกาะดอน	BAN KO DON
8-1	บ้านคลองตะวันตก	BAN KHLONG TAWAN TOK
8-2	บ้านถนนชะโด	BAN BAEN CHADO
8-3	มีนบุรี	MIN BURI
8-4	บ้านเกาะ	BAN KO
8E-1	หนองจอก	NONG CHOK
8E-2	บางน้ำเปรี้ยว	BANG NAM PRIEO
8E-3	บ้านคลองยุดใหม่	BAN KHLONG YUK MAI
8E-4	บ้านบึงทองหลาง	BAN BUNG THONGIANG
9-1	พุทธมณฑล	PHUTTHA MONTHON
9-2	บ้านคลองบางขุนศรี	BAN KHLONG BANG KHUNSI
9-3	กระทุ่มแบน	KRATHUM BAEN
9-4	บ้านคลองบางไผ่	BAN KHLONG BANG PHAI
10-1	ทลิ่งชัน	TALING CHAN
10-2	ดุสิต	DUSIT
10-3	คลองบางแวก	KHLONG BANG WAEK
10-4	พระนคร	PHRA NAKHON
11-1	หัวขวาง	HUAI KHUANG

## LIST OF SHEET NAME

(2)

1:10,000

SHEET NO.	THAI	ENGLISH
11 -2	บางกะปิ	BANG KAPI
11 -3	มักกะสัน	MAKKASAN
11 -4	หัวหมาก	HUA MAK
12 -1	บ้านคลองหลอแหล	BAN KHLONG LO LAE
12 -2	บ้านบึงบัว	BAN BUNG BUA
12 -3	บ้านคลองนึ่ง	BAN KHLONG NUNG
12 -4	ลาดกระบัง	LAT KRABANG
12E-1	บ้านลำแขก	BAN LAM KHAEK
12E-2	บ้านบึงลำไศล	BAN BUNG LAM KHLO
12E-3	บ้านอ้ายแหม	BAN AI BAEN
12E-4	บ้านลำต้อยตั้ง	BAN LAM TOITING
13 -1	บ้านสะแกงาม	BAN SAKAE NGAM
13 -2	หนองแขม	NONG KHAEM
13 -4	บ้านคลองบางบอน	BAN KHLONG BANG BON
14 -1	ปทุมเจวิญ	PHASI CHAROEN
14 -2	ราษฎร์บูรณะ	RAT BURANA
14 -3	บางขุนเทียน	BANG KHUN THIEN
14 -4	บ้านคลองบางมด	BAN KHLONG BANG MOT
15 -1	พระโขนง	PHRA KHANONG
15 -2	บ้านหนองบอน	BAN NONG BON
15 -3	พระประแดง	PHRA PRADAENG
15 -4	บ้านคลองหนามแดง	BAN KHLONG NAM DAENG
16 -1	บ้านมะขามเทศ	BAN MAKHAM THET
16 -2	บางพลี	BANG PHLI
16 -3	บ้านคลองบางแก้วใหญ่	BAN KHLONG BANG KAE0 YAI
16E-1	บ้านทับยาว	BAN THAP YAO
17 -2	บ้านระหาญ	BAN RAHAN
17 -4	บ้านเกาะโพธิ์	BAN KO PHO
18 -1	บ้านหัวกระบือ	BAN HUA KRABU



List of the Final Results of  
the Ground Control Point Survey

1. Horizontal control
  - (1) Observation and calculation sheet for control point
  
2. Vertical control survey
  - (1) Observation and calculation sheet for determination of control point height
  - (2) Levelling note and result (3rd order levelling)
  - (3) Levelling note and result (supplemental levelling)
  
3. Computation sheets
  - (1) Original draft result
  - (2) Calculation sheet
  
4. Field notes
  - (1) Distance observation sheet (3rd order control point survey)
  - (2) Horizontal angle observation sheet
  - (3) Vertical angle observation sheet
  
5. Description of Points
  - (1) Control point description
  - (2) Final result and description
  - (3) Bench mark description No.1
  - (4)           -ditto-           No.2
  - (5)           -ditto-           No.3
  - (6)           -ditto-           No.4
  - (7)           -ditto-           No.5
  - (8)           -ditto-           No.6

Total 17 Files

3. Plan of Operation (Third Year Work)

PLAN OF OPERATION  
FOR  
TOPOGRAPHIC MAPPING  
OF  
BANGKOK METROPOLITAN AREA

(Third Year Work)

November 1988

JAPAN INTERNATIONAL COOPERATION AGENCY  
(JICA)

## Contents

1. Background	-----	1
2. Outline of the Third Year Work	-----	1
3. Technical Guidance of Printing	-----	2
4. Specification of Printing	-----	2
4-1 Outline of Work		
4-2 Material		
4-3 Quantity and Number of Color of Printing		
4-4 Technical Guidance		
5. Final Confirmation and Technical Explanation	-----	4
Appendix 1	Sheet Plan and Sheet Name	
Appendix 2	Color Block Classification	

Plan of Operation  
of the 3rd Year Work for Topographic  
Mapping of Bangkok Metropolitan Area

1. Background

Topographic Mapping of Bangkok Metropolitan Area was set forth in the Agreement of Technical Cooperation between the Government of Japan and the Government of the Kingdom of Thailand signed on March 19, 1986 for the three year work.

The second year work which consisted of aerial triangulation, stereo plotting, compilation, field completion and 1/4,000 drafting was completed on March 31, 1988.

The third year work which consists of following 1/10,000 scribing and proofprinting in Japan and printing in Thai was started on July 6, 1988.

2. Outline of the Third Year Work

As the 3rd year work, following works will be completed:

a) scribing	Thai	61 sheets
	English	61 sheets
b) color proof	Thai	1 copy per sheet
	English	1 copy per sheet
c) printing	Thai	1,500 copies per sheet
	English	500 copies per sheet

After the scribing work is finished the surprint will be prepared and sent to BMA by July 7, 1988 for check by BMA.

After check, BMA is requested to send checked surprint back to Japan by the middle of August, 1988.

The results and all materials will be sent to BMA by the end of September, 1988 and printing work will be carried out in Thailand. Meanwhile, 1/4,000 topographic map was sent to BMA in April, 1988 for final inspection by BMA and received some inspections for amendment in early July, 1988. The final map after such amendment will be also delivered to BMA by the end of September, 1988.

### 3. Technical Guidance for Printing

Following JICA team will be dispatched for technical guidance for plate making, printing, etc. in Thailand:

#### Member and Schedule

Name	1988 Assignment	November	December
Tositomo Kanakubo	Leader	29	8
Isao Ikeshima	Deputy Leader	29	22
Eiki Yanagisawa	Plate making	29	22
Zen-ichiro Sekiguchi	Printing	29	22

### 4. Specification of Printing

#### 4-1 Outline of Work

Following the scribing work, PS plate will be made for proof print and after check of the color proof by BMA, composite negative film will be prepared in Japan.

Based on the composite negative film, final PS plate will be made for the color proof, and final run will be made in Thailand.





## 5. Final Confirmation and Seminar

Below mentioned JICA team will be despatched to confirm whether the specified quantity of the copies is finally printed within the specified time or not.

At the same time, an seminar on the final results and how to use of the topographic map in future.

### Member and Schedule

Name	Assignment	1989 March
Tositomo Kanakubo	Leader	<u>7</u> <u>16</u>
Isao Ikeshima	Deputy Leader	<u>7</u> <u>16</u>
Chozo Obara	Mapping Planner	<u>7</u> <u>16</u>
Yoshikazu Ibusuki	Chief Surveyor	<u>7</u> <u>16</u>

TOPOGRAPHIC MAPPING SHEET INDEX  
FOR  
1:10,000

9-1 PHU THUA BAN BAN KHUAT	9-2 BAN KHUONG BAN KHUONG BAN KHUONG	10-1 TALANG CHAI	10-2 QUYET	6-4 BAN SON	7-3 BAN KHUONG BAN KHUONG	7-1 BAN KHUONG BAN KHUONG	7-2 BAN KHUONG BAN KHUONG	7-4 BAN KHUONG BAN KHUONG	8-3 KHU KHUONG KHU KHUONG	8-4 KHU KHUONG KHU KHUONG	8E-1 KHU KHUONG KHU KHUONG	8E-2 KHU KHUONG KHU KHUONG	8E-3 KHU KHUONG KHU KHUONG	8E-4 KHU KHUONG KHU KHUONG	12E-1 KHU KHUONG KHU KHUONG	12E-2 KHU KHUONG KHU KHUONG	12E-3 KHU KHUONG KHU KHUONG	12E-4 KHU KHUONG KHU KHUONG	16E-1 KHU KHUONG KHU KHUONG	16E-2 KHU KHUONG KHU KHUONG	16E-3 KHU KHUONG KHU KHUONG	16E-4 KHU KHUONG KHU KHUONG	
9-3 KHU KHUONG KHU KHUONG	9-4 KHU KHUONG KHU KHUONG	10-3 KHU KHUONG KHU KHUONG	10-4 KHU KHUONG KHU KHUONG	11-1 KHU KHUONG KHU KHUONG	11-2 KHU KHUONG KHU KHUONG	11-3 KHU KHUONG KHU KHUONG	11-4 KHU KHUONG KHU KHUONG	11-5 KHU KHUONG KHU KHUONG	12-1 KHU KHUONG KHU KHUONG	12-2 KHU KHUONG KHU KHUONG	12-3 KHU KHUONG KHU KHUONG	12-4 KHU KHUONG KHU KHUONG	12E-1 KHU KHUONG KHU KHUONG	12E-2 KHU KHUONG KHU KHUONG	12E-3 KHU KHUONG KHU KHUONG	12E-4 KHU KHUONG KHU KHUONG	12E-5 KHU KHUONG KHU KHUONG	12E-6 KHU KHUONG KHU KHUONG	16E-1 KHU KHUONG KHU KHUONG	16E-2 KHU KHUONG KHU KHUONG	16E-3 KHU KHUONG KHU KHUONG	16E-4 KHU KHUONG KHU KHUONG	
13-1 KHU KHUONG KHU KHUONG	13-2 KHU KHUONG KHU KHUONG	13-3 KHU KHUONG KHU KHUONG	13-4 KHU KHUONG KHU KHUONG	14-1 KHU KHUONG KHU KHUONG	14-2 KHU KHUONG KHU KHUONG	14-3 KHU KHUONG KHU KHUONG	14-4 KHU KHUONG KHU KHUONG	15-1 KHU KHUONG KHU KHUONG	15-2 KHU KHUONG KHU KHUONG	15-3 KHU KHUONG KHU KHUONG	15-4 KHU KHUONG KHU KHUONG	15-5 KHU KHUONG KHU KHUONG	15-6 KHU KHUONG KHU KHUONG	15-7 KHU KHUONG KHU KHUONG	15-8 KHU KHUONG KHU KHUONG	15-9 KHU KHUONG KHU KHUONG	15-10 KHU KHUONG KHU KHUONG	15-11 KHU KHUONG KHU KHUONG	15-12 KHU KHUONG KHU KHUONG	15-13 KHU KHUONG KHU KHUONG	15-14 KHU KHUONG KHU KHUONG	15-15 KHU KHUONG KHU KHUONG	15-16 KHU KHUONG KHU KHUONG
17-1 KHU KHUONG KHU KHUONG	17-2 KHU KHUONG KHU KHUONG	17-3 KHU KHUONG KHU KHUONG	17-4 KHU KHUONG KHU KHUONG	17-5 KHU KHUONG KHU KHUONG	17-6 KHU KHUONG KHU KHUONG	17-7 KHU KHUONG KHU KHUONG	17-8 KHU KHUONG KHU KHUONG	17-9 KHU KHUONG KHU KHUONG	17-10 KHU KHUONG KHU KHUONG	17-11 KHU KHUONG KHU KHUONG	17-12 KHU KHUONG KHU KHUONG	17-13 KHU KHUONG KHU KHUONG	17-14 KHU KHUONG KHU KHUONG	17-15 KHU KHUONG KHU KHUONG	17-16 KHU KHUONG KHU KHUONG	17-17 KHU KHUONG KHU KHUONG	17-18 KHU KHUONG KHU KHUONG	17-19 KHU KHUONG KHU KHUONG	17-20 KHU KHUONG KHU KHUONG	17-21 KHU KHUONG KHU KHUONG	17-22 KHU KHUONG KHU KHUONG	17-23 KHU KHUONG KHU KHUONG	17-24 KHU KHUONG KHU KHUONG
18-1 KHU KHUONG KHU KHUONG	18-2 KHU KHUONG KHU KHUONG	18-3 KHU KHUONG KHU KHUONG	18-4 KHU KHUONG KHU KHUONG	18-5 KHU KHUONG KHU KHUONG	18-6 KHU KHUONG KHU KHUONG	18-7 KHU KHUONG KHU KHUONG	18-8 KHU KHUONG KHU KHUONG	18-9 KHU KHUONG KHU KHUONG	18-10 KHU KHUONG KHU KHUONG	18-11 KHU KHUONG KHU KHUONG	18-12 KHU KHUONG KHU KHUONG	18-13 KHU KHUONG KHU KHUONG	18-14 KHU KHUONG KHU KHUONG	18-15 KHU KHUONG KHU KHUONG	18-16 KHU KHUONG KHU KHUONG	18-17 KHU KHUONG KHU KHUONG	18-18 KHU KHUONG KHU KHUONG	18-19 KHU KHUONG KHU KHUONG	18-20 KHU KHUONG KHU KHUONG	18-21 KHU KHUONG KHU KHUONG	18-22 KHU KHUONG KHU KHUONG	18-23 KHU KHUONG KHU KHUONG	18-24 KHU KHUONG KHU KHUONG
19-1 KHU KHUONG KHU KHUONG	19-2 KHU KHUONG KHU KHUONG	19-3 KHU KHUONG KHU KHUONG	19-4 KHU KHUONG KHU KHUONG	19-5 KHU KHUONG KHU KHUONG	19-6 KHU KHUONG KHU KHUONG	19-7 KHU KHUONG KHU KHUONG	19-8 KHU KHUONG KHU KHUONG	19-9 KHU KHUONG KHU KHUONG	19-10 KHU KHUONG KHU KHUONG	19-11 KHU KHUONG KHU KHUONG	19-12 KHU KHUONG KHU KHUONG	19-13 KHU KHUONG KHU KHUONG	19-14 KHU KHUONG KHU KHUONG	19-15 KHU KHUONG KHU KHUONG	19-16 KHU KHUONG KHU KHUONG	19-17 KHU KHUONG KHU KHUONG	19-18 KHU KHUONG KHU KHUONG	19-19 KHU KHUONG KHU KHUONG	19-20 KHU KHUONG KHU KHUONG	19-21 KHU KHUONG KHU KHUONG	19-22 KHU KHUONG KHU KHUONG	19-23 KHU KHUONG KHU KHUONG	19-24 KHU KHUONG KHU KHUONG

LEGEND

8-3  
BAN SON

— CODE NUMBER  
— SHEET NAME



1:4,000  
MAPPING AREA

Appendix 2

Color Block Classification

Color plate	Plate	
Black	Guide image scribed plate Scribe plate Positive plate  Mask plate Positive plate  Mask plate	Planimetric feature Grid Marginal information English Annotation English letter Marginal information Thai Annotation Thai letter
Red	Guide image scribed plate Mask plate Mask plate Mask plate	Building Road (screen 60%) Road (screen 10%) Road (solid)
Brown	Guide image scribed plate Mask plate Mask plate	Building Building (screen 50%) Building (solid)
Blue	Guide image scribed plate Mask plate Mask plate Mask plate Mask plate	River River (screen 30%) Salt pan (screen 20%) Fish pond (screen 20%) Rice field (screen 10%)
Purple	Guide image scribed plate Mask plate	Road Cemetery (screen 10%)
Green	Guide image scribed plate Positive plate symbolized mask plate symbolized mask plate Mask plate  Mask plate	Vegetation, Parks Symbol * group A * group B Antiquity & Fort (screen 20%) Cropland & Agricultural land (screen 30%)
total six colors                      26 plates		

\* Grouping by density of vegetation symbol

4. Technical Manual for Plate Making and Printing

TECHNICAL MANUAL  
FOR  
PLATE MAKING AND PRINTING  
OF  
TOPOGRAPHIC MAPPING OF BANGKOK METROPOLITAN AREA

NOVEMBER 1988

JAPAN INTERNATIONAL COOPERATION AGENCY  
(JICA)

1. Foreward

This manual shall be used for the technical guidance to be performed for plate making and printing in the Royal Thai Survey Department (RTSD) for the topographic mapping of Bangkok metropolitan area.

2. Previous work completed

The following works have been completed until the plate making and printing :

First year (1986)

(1) Aerial photography (1:20,000)	17 courses	4,000 km <sup>2</sup>
(2) Ground control point survey	67 points	
(3) Leveling 3rd order	50 km	
Minor order	250 km	
(4) Pricking Ground control point	70 points	
Bench mark	400 points	
(5) Field identification		
	1: 4,000 area	300 km <sup>2</sup>
	1:10,000 area	1,700 km <sup>2</sup>

Second year (1987)

- |                          |            |                       |
|--------------------------|------------|-----------------------|
| (1) Aerial triangulation | 17 courses | 425 models            |
| (2) Stereo plotting      |            |                       |
| 1: 4,000 area            | 40 sheet   | 300 km <sup>2</sup>   |
| 1:10,000 area            | 57 sheet   | 1,700 km <sup>2</sup> |
| (3) Compilation          |            |                       |
| 1: 4,000 area            | 40 sheets  | 300 km <sup>2</sup>   |
| 1:10,000 area            | 61 sheets  | 2,000 km <sup>2</sup> |
| (4) Field completion     |            |                       |
| 1: 4,000 area            | 40 sheets  | 300 km <sup>2</sup>   |
| 1:10,000 area            | 57 sheets  | 1,700 km <sup>2</sup> |
| (5) Drafting             |            |                       |
| 1: 4,000 area            | 40 sheets  | 300 km <sup>2</sup>   |

Third year (1988)

- |                               |   |                       |
|-------------------------------|---|-----------------------|
| (1) Scribing                  |   |                       |
| 1:10,000 area                 | 61 sheets                                       | 2,000 km <sup>2</sup> |
| (2) Composite negative films  |   |                       |
| For English and Thai versions | 61 sheets x 6 composite negative films for each |                       |
| (3) Proof printing            |   |                       |
| For English and Thai versions | 61 sheets for each                              |                       |

3. Main Instruments and Materials for Plate Making

The main instruments and the specification of the materials used for the plate making are as follows :

(1) Main instruments

Vacuum printing frame  
Automatic or manual processor

(2) Specifications of materials

PS plate

Size : 103.5 x 127 cm  
Thickness : 0.3 mm  
Quantity : 460 sheets

Developer

Quantity : 17 bottles (340 l)

4. Topographic Mapping Sheet Index (1:10,000) and Composite Negative Films

The 1:10,000 topographic mapping sheet index is shown as per attached table-1.

The composite negative films (6 colors) shall, based on the scribed sheets, be prepared for English and Thai versions. Details of those composite negative films are shown on the attached tables. (see Table-2 and -3)





















1:10,000 Topographic Map (English Plate)

Color	Black			Red			Purple			Brown			Blue					Green			Total					
	S.B	N.F	P.F	S.B	S.B	Mask	S.B	Mask	Mask	S.B	Mask	Mask	S.B	Mask	Mask	S.B	Mask	Mask	N.F							
Plate of Name	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
	Plane	Grid	Marginal Information of English Annotation	Fish Pond	Mask for English Annotation	Concrete Building 3 Stories	Primary National Highway (60%)	Secondary National Highway (10%)	Expressway (100%)	Road	Cemetery (10%)	House	House (50%)	Prominent Building (100%)	River	Reticulate Mask for River (30%)	Rice Field (10%)	Reticulate Mask for Salt Pan	Reticulate Mask for Fish Pond (20%)	Swamp	Limit of Vegetation, Park	Fort (20%)	Field orchard No.2(30%)	Field orchard No.1(30%)	Symbol of Vegetation	
Sheet No.				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
3-1-2				X	X	X																				22
3-3				X	X	X																				22
3-4				X																						22
4-3																										24
4-4																										22
4E-3				X																						23
4E-4				X																						22
6-4				X																						21
7-1				X																						21
7-2				X																						22
7-3				X																						21
7-4				X																						21
8-1																										23
8-2				X																						24
8-3				X																						21
8-4				X																						21
8E-1				X																						22
8E-2				X																						22
8E-3				X																						23
8E-4				X																						21
C-1				X																						21
9-2				X																						20
9-3				X																						20
9-4				X																						20
10-1				X																						20
10-2				X																						20
10-3				X																						21
10-4				X																						22
11-1				X																						21
11-2				X																						21
11-3				X																						23
11-4				X																						21
12-1				X																						21
12-2				X																						21
12-3				X																						21
12-4				X																						21
12E-1				X																						21
12E-2				X																						21
12E-3				X																						21
12E-4				X																						21
13-1				X																						22
13-2				X																						22
13-4				X																						22
14-1				X																						22
14-2				X																						23
14-3				X																						22
14-4				X																						23
15-1				X																						22
15-2				X																						22
15-3				X																						22
15-4				X																						21
16-1				X																						21
16-2				X																						21
16-3				X																						21
16E-1				X																						21
17-2																										23
17-4																										23
18-1																										24
18-2																										24
18-3																										22
18S-1																										23

\* S.B ....Scribe Base  
 N.F ....Negative Film  
 P.F .... Positive Film



1:10,000 Topographic Map (Thai Plate)

Color	Black		Purple		Brown			Blue					Green				Total										
	Plate	S.B	N.F	P.F	S.B	S.B	Mask	S.B	Mask	Mask	S.B	Mask	Mask	Mask	R.F												
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
		Plane	Grid	Marginal Information of Thai Annotation	Fish Pond	Mask for English Annotation	Concrete Building 3 Stories	Primary National Highway (60%)	Secondary National Highway (10%)	Expressway (100%)	Road	Cemetery (10%)	House	House (50%)	Prominent Building (100%)	River	Reticulate Mask for River (30%)	Rice Field (10%)	Reticulate Mask for Salt Pan	Reticulate Mask for Fish Pond (20%)	Swamp	Limit of Vegetation, Park	Fort (20%)	Field orchard No.2(30%)	Field orchard No.1(30%)	Symbol of Vegetation	
Sheet No.																											
3-1-2					X														X	X			X	X	X		22
3-3					X														X	X			X	X	X		22
3-4					X														X	X			X	X	X		22
4-3																			X	X			X	X	X		24
4-4																			X	X			X	X	X		22
4E-3					X														X	X			X	X	X		23
4E-4					X														X	X			X	X	X		22
6-4					X														X	X			X	X	X		21
7-1					X														X	X			X	X	X		21
7-2					X														X	X			X	X	X		22
7-3					X														X	X			X	X	X		21
7-4					X														X	X			X	X	X		21
8-1					X														X	X			X	X	X		23
8-2					X														X	X			X	X	X		24
8-3					X														X	X			X	X	X		21
8-4					X														X	X			X	X	X		21
8E-1					X														X	X			X	X	X		22
8E-2					X														X	X			X	X	X		23
8E-3					X														X	X			X	X	X		21
8E-4					X														X	X			X	X	X		21
9-1					X					X	X								X	X			X	X	X		20
9-2					X					X	X								X	X			X	X	X		20
9-3					X					X	X								X	X			X	X	X		20
9-4					X					X	X								X	X			X	X	X		20
10-1					X					X	X								X	X			X	X	X		20
10-2					X					X	X								X	X			X	X	X		20
10-3					X					X	X								X	X			X	X	X		20
10-4					X					X	X								X	X			X	X	X		20
11-1					X					X	X								X	X			X	X	X		21
11-2					X					X	X								X	X			X	X	X		22
11-3					X					X	X								X	X			X	X	X		21
11-4					X					X	X								X	X			X	X	X		23
12-1					X					X	X								X	X			X	X	X		21
12-2					X					X	X								X	X			X	X	X		21
12-3					X					X	X								X	X			X	X	X		21
12-4					X					X	X								X	X			X	X	X		21
12E-1					X					X	X								X	X			X	X	X		21
12E-2					X					X	X								X	X			X	X	X		21
12E-3					X					X	X								X	X			X	X	X		21
12E-4					X					X	X								X	X			X	X	X		21
13-1					X					X	X								X	X			X	X	X		21
13-2					X					X	X								X	X			X	X	X		22
13-4					X					X	X								X	X			X	X	X		22
14-1					X					X	X								X	X			X	X	X		22
14-2					X					X	X								X	X			X	X	X		22
14-3					X					X	X								X	X			X	X	X		22
14-4					X					X	X								X	X			X	X	X		23
15-1					X					X	X								X	X			X	X	X		22
15-2					X					X	X								X	X			X	X	X		22
15-3					X					X	X								X	X			X	X	X		22
15-4					X					X	X								X	X			X	X	X		22
16-1					X					X	X								X	X			X	X	X		21
16-2					X					X	X								X	X			X	X	X		21
16-3					X					X	X								X	X			X	X	X		21
16E-1					X					X	X								X	X			X	X	X		23
17-2					X					X	X								X	X			X	X	X		23
17-4					X					X	X								X	X			X	X	X		24
18-1					X					X	X								X	X			X	X	X		24
18-2					X					X	X								X	X			X	X	X		22
18-3					X					X	X								X	X			X	X	X		23
18S-1					X					X	X								X	X			X	X	X		23

\* S.B ....Scribe Base  
 N.F ....Negative Film  
 P.F ....Positive Film





JICA