

2 - 2 現地作業着手時，議事録（昭和62年3月）

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. Jatoorapreuk

MR. BAMPEN JATOORAPREUK
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. Kamakubo

B. Jatoraymunk

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 km² in the Bangkok Metropolitan and the 1/4,000 Topographic Map covering an area of approximately 300 km² at the center of Bangkok Metropolitan. 1/20,000 Aerial Photography will be carried out covering an area of approximately 4,000 km².

3. Items of Work under the 3-year Program

(1) Fiscal Year 1986 (First year)

Aerial photography (1/20,000)	4,000 km ²
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 ²
1/10,000	1,700 km ²

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

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

Field compilation

1/4,000

300 km²

1/10,000

1,700 km²

Drafting

1/4,000

300 km²

(40 sheets)

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

Scribing

1/10,000

2,000 km²

(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	1986 November	1987 January	February	March	April	May	June
Headquarters									
Tositomo Karakubo	Leader	13	19			18			16
Inao Ikeshima	Deputy leader	13	19			18			16
Chozo Obara	Mapping planner	13	19			18			16
Aerial photography									
Yoshikazu Ibusuki	Chief surveyor	13	19						25
Yoji Ebara	Mechanician	13	19				17		
Kiyoshi Ono	Pilot	13	19				17		
Masao Iwata	Cameraman	13	19					18	
Noriaki Maehida	Photo processing engineer	13	19					18	
Tsutomu Inui	"	13	19					18	
Ground control point survey									
Leveling									
Pricking	Chief surveyor	13	19						22
Kazuo Funakata	Surveyor					10			22
Ryosuke Itoh	"					10			22
Motonori Nakashima	"					10			22
Mitsuo Sasaki	"					10			22
Manabu Tsurui	"					10			22
Katsuyuki Kondô	"					10			22
Shozo Shimoda	"					10			22
Ryohji Sekiguchi	"					10			22
Kazuhiro Ishizuka	"					10			22
Yoshihika Mochizuki	"					10			22
Nobutaka Komuro	"					10			22
Kazumi Satoh	"					10			22
Hiroaki Hayashi	"					10			22
Akimasa Takahashi	"					10			22
Yukio Miyazaki	"					10			22
Masahi Kita	"					10			22
Takeshiko Ohts	"					10			22
Norio Okawa	"					10			22
Fumihiko Kashiro	"					10			22
Field identification									
Tatsuo Sakaguchi	Surveyor					18			19
Mitsuo Sunaoshi	"					18			19
Kazuya Tabuchi	"					18			19
Yasuo Hongo	"					18			19
Tetsuo Kashiô	"					18			19
Mitsuyoshi Takasaki	"					18			19
Kazutomi Maeda	"					18			19
Hiroaki Doi	"					18			19
Akihito Yamashita	"					18			19
Hiroshi Saito	"					18			19
Iikaru Iiorigome	"					18			19
Tsunao Okamura	"					18			19
Yasuki Kondô	"					18			19
Keiji Neguchi	"					18			19

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 1	March 3 ~ April 16 March 11 ~ May 17	Aerial photography 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 km²

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 km²

1/10,000: 2,000 km²

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

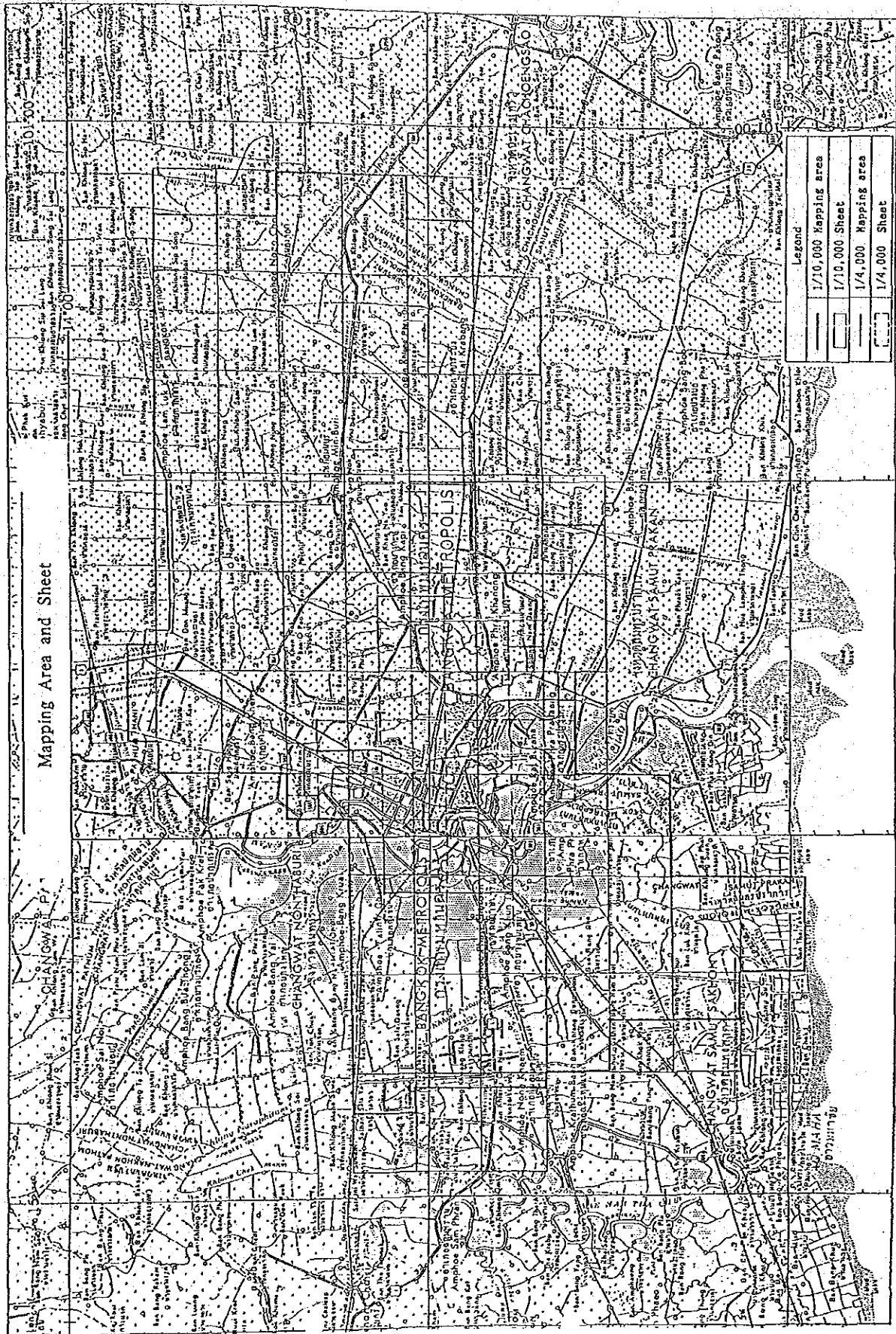


Fig - 2

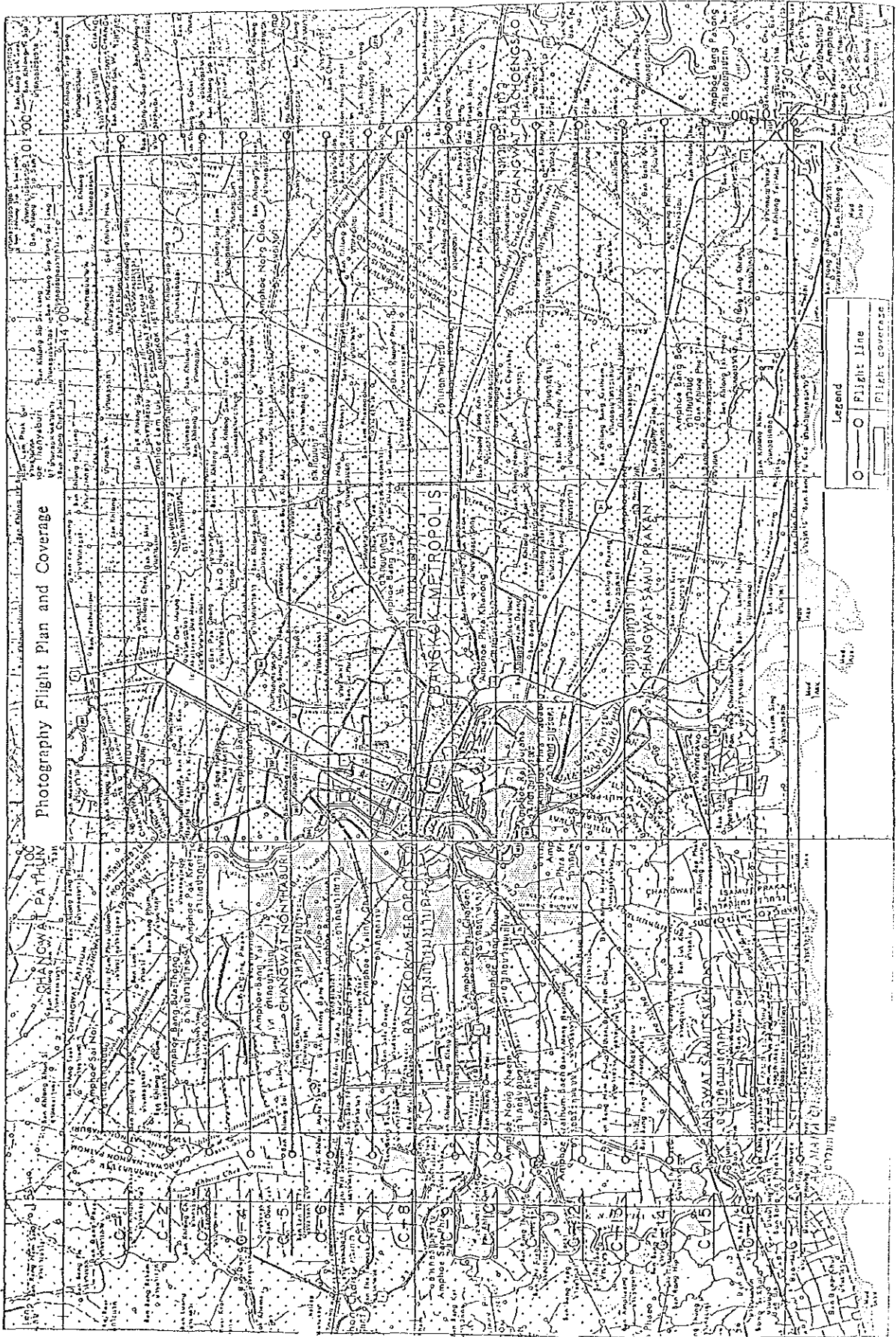
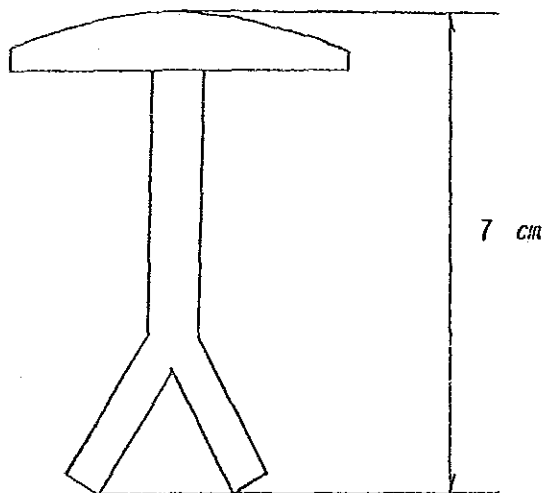
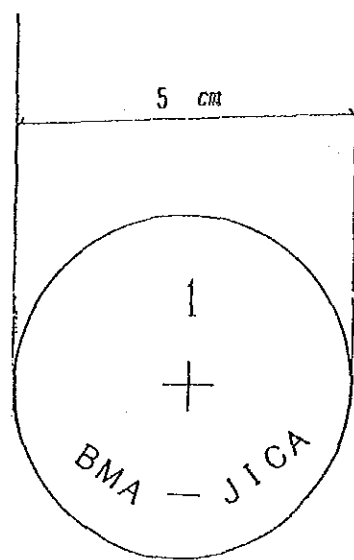


Fig - 3





The specification for the monument



Material : Brass

The form for the film annotation

Course No.

Date/Month/Year

Scale

Photo No.

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

2 - 3 現地作業終了時, 議事録 (昭和62年6月)

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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.

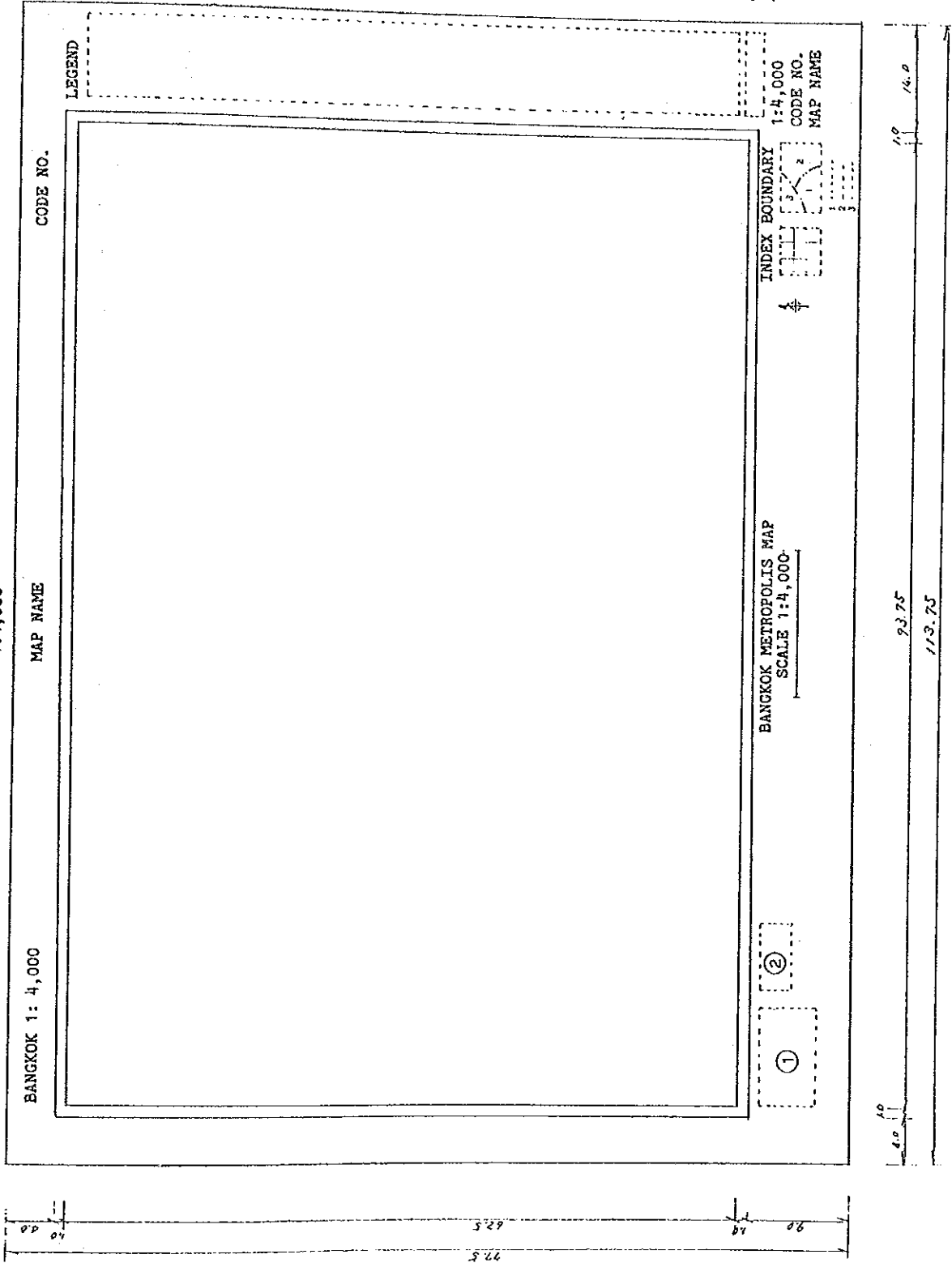
6. The BMA will inform the JICA Survey Team whether the coordinates on the map sheet should be indicated or not by December 1987.

The JICA Survey Team acknowledged.

MARGINAL INFORMATION
FOR

1:4,000

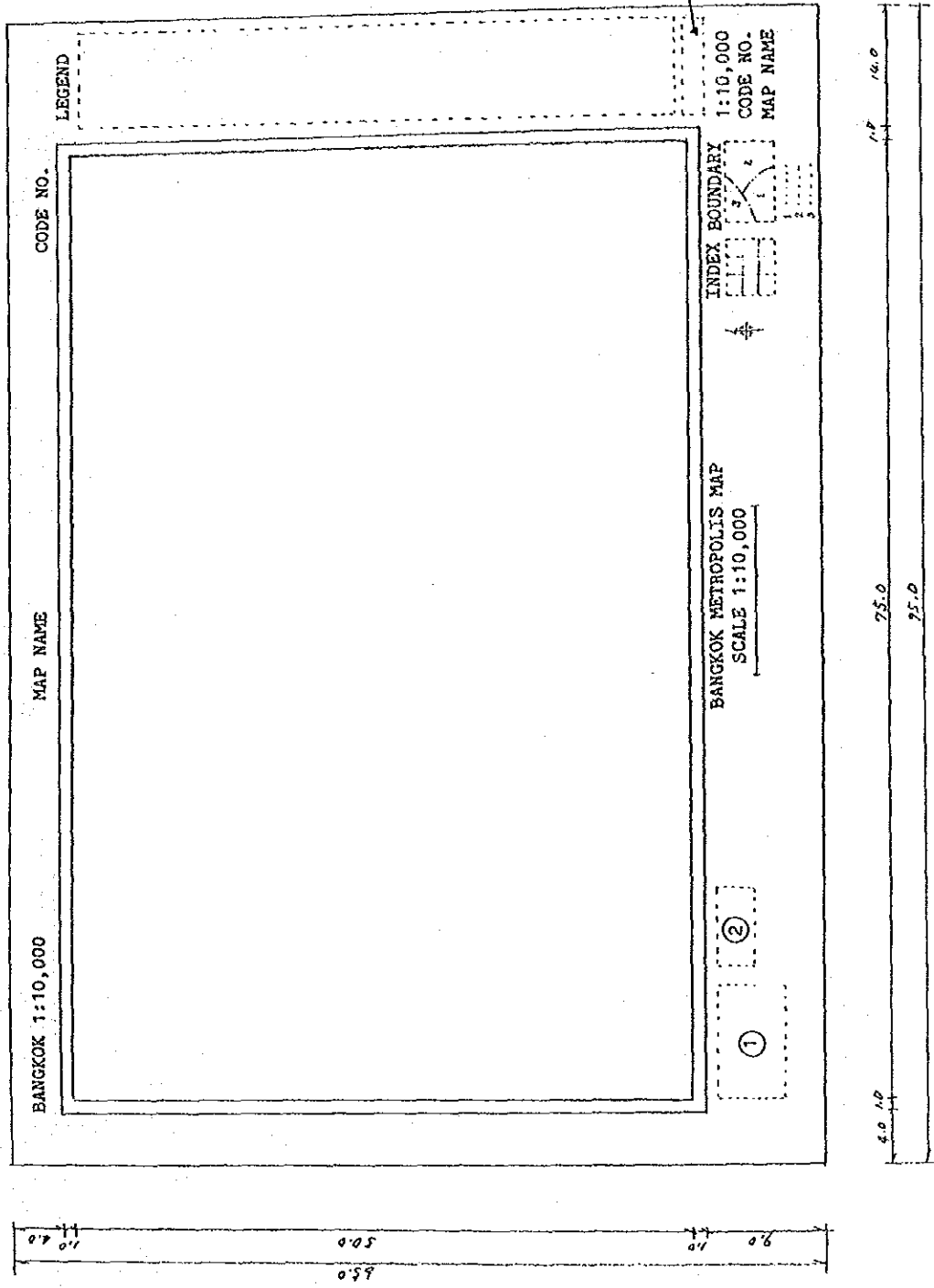
UNIT IS CM.



MARGINAL INFORMATION

OF
1:10,000

UNIT IS CM.



NOTES OF ① AND ②

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)
Plotting, Compilation and Drafting : July 1987 to March 1988
Printing : Royal Thai Survey Department 1988
Distributor : (Bangkok Metropolitan Administration (BMA))
(Dinso Road, Bangkok, Thailand.)

② Spheroid : Everest
Projection : Universal Transverse Mercator
Horizontal Datum : Indian Datum 1975
Vertical Datum : Mean Sea Level at Ko Lak
Administrative Boundary are shown by Data of BMA
(Grid Interval : 1 Km.)

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

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

10-2-A

1:4,000

10-2

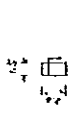
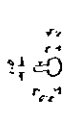
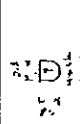


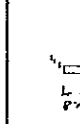

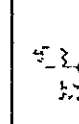
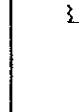
1:10,000

10

1:20,000






AMENDMENT OF SYMBOLS
FOR
1:4,000

No. 1

Classi- fifi- cation	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
Es	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	—□ D—	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

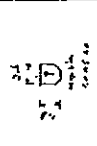


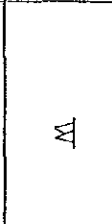

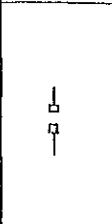
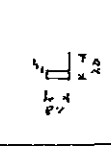

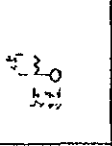
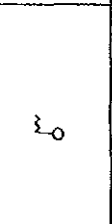


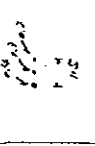

AMENDMENT OF SYMBOLS
FOR
1:4,000

No. 2

Classification	No.	Name of Symbol	Symbol	Line Size	Color	Land Identification	Completion	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

No. 1

Class- sifi- cation	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

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DECEMBER 9, 1987
BANGKOK THAILAND

Wicha Jiwalai

DR. WICHA JIWALAI
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.

- 1 -

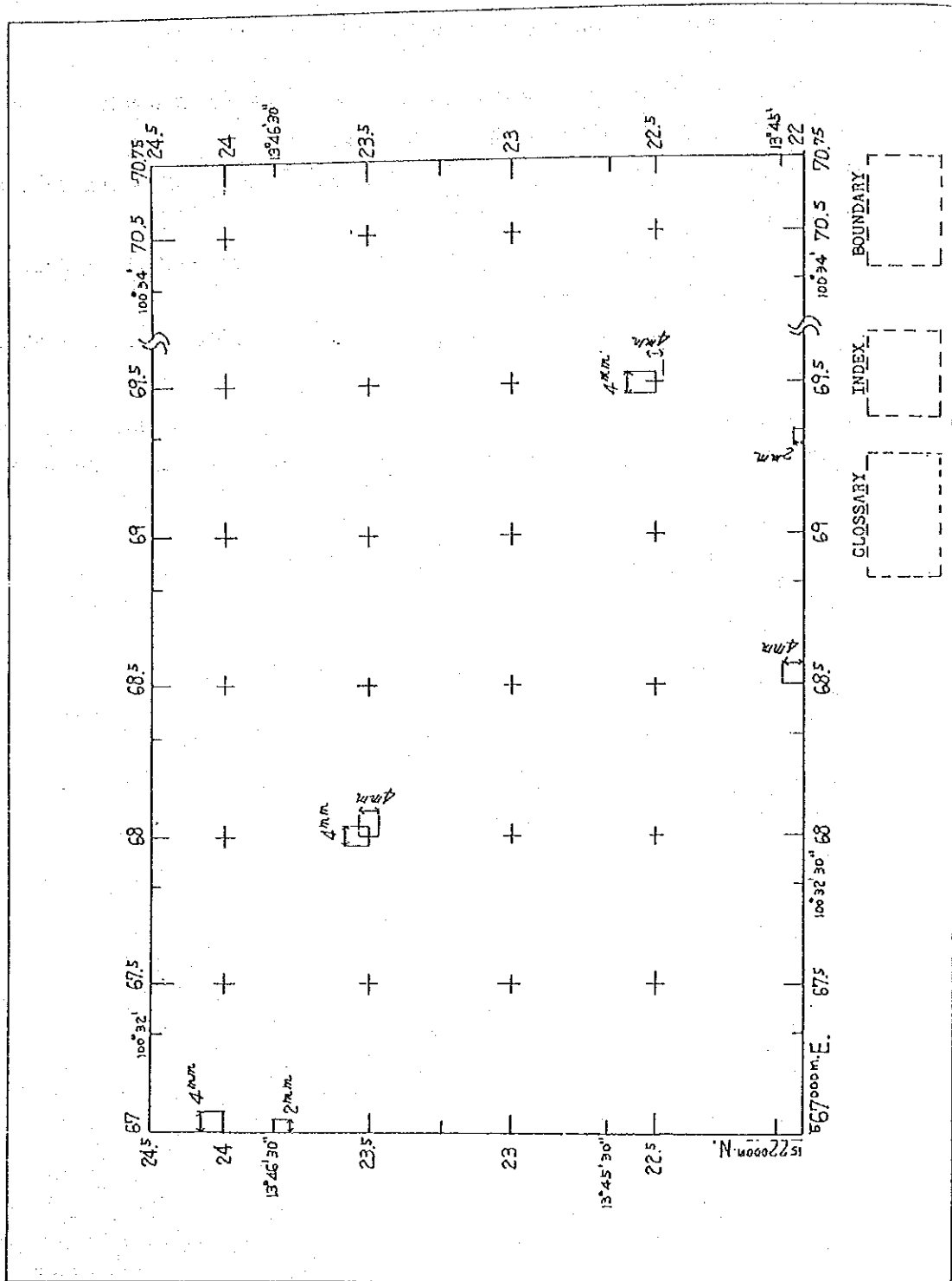
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5. In case that an area to be mapped is too small in a sheet, the area shall be mapped on extended part from neatline of adjacent sheet.
6. Contents of map was confirmed by both side as follows;
- (1) Cross mark for grid and coordinates shown on Appendix 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

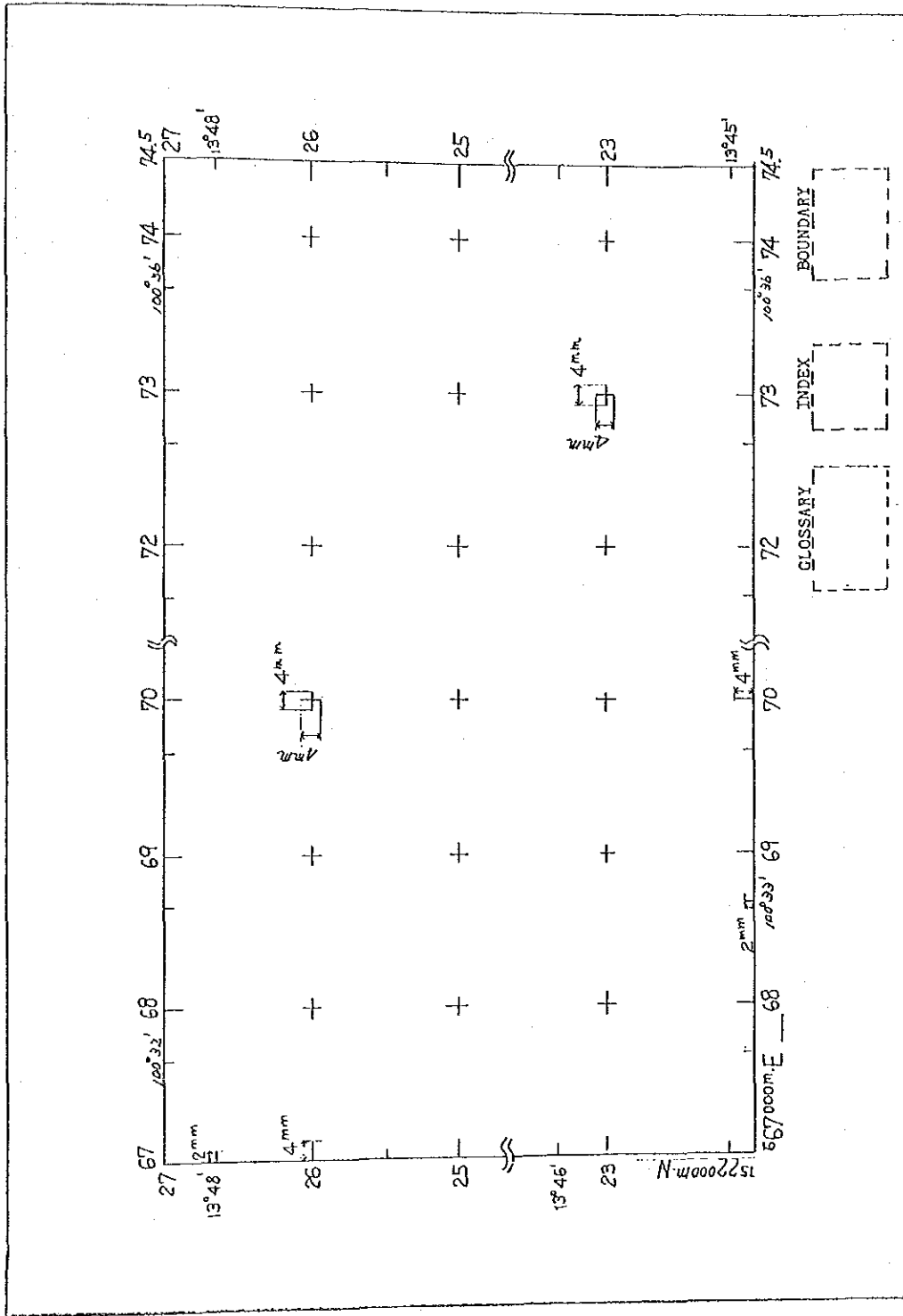
APPENDIX 1 GRID AND COORDINATES FOR 1:4,000



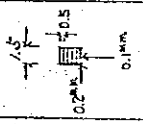
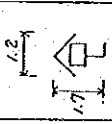
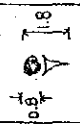
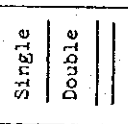
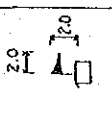




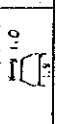
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APPENDIX 2 GRID AND COORDINATES FOR 1:10,000



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 administrative 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

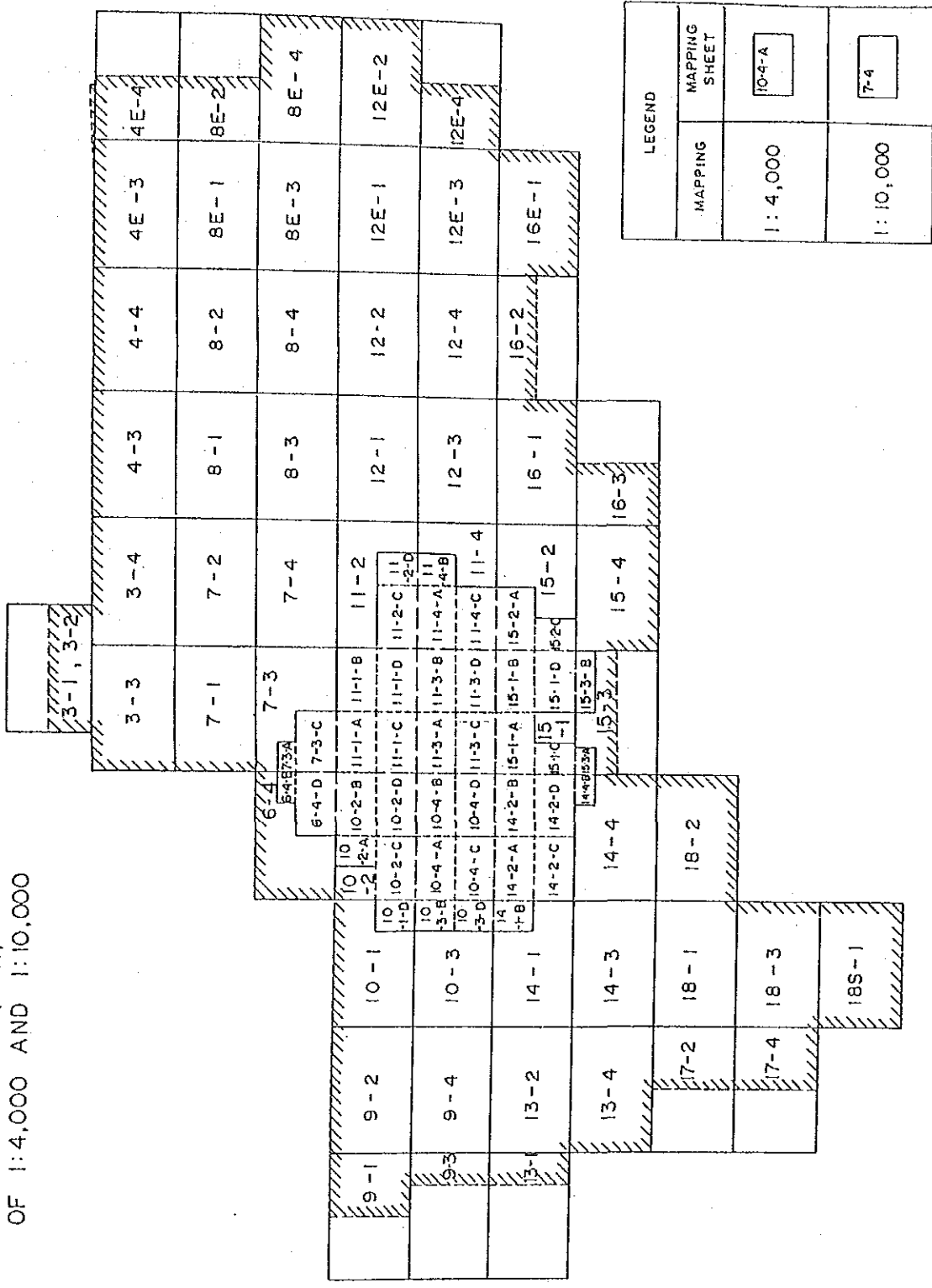
Size and style of Thai annotation should be same as English one

- 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


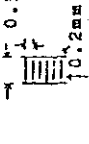
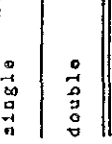
Appendix 1



Appendix 2

AMENDATORY AND ADDITIONAL SYMBOLS (Draft)

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

Class- sific- ations	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	 2.0 1.0	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	 0.5 0.5 10.2mm 0.1mm	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	 single double	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	E 08-42-5%	20	4.5			Bangkok Metropolis	
	Province	E 08-24-C	16	3.5			SAMUT PRAKAN PROVINCE	
	District	//	//	//			BANG KAPI DISTRICT	
	Town	//	14	3.0				
	Village	E 08-24-5%	14	3.0			Ban Khlong Bang Bon	
New Residence	Development Area	//	12	2.5			Mu Ban Sala Daeng	
	School	//	10	2.2			Wat Hong School	
Building	Post Office	//	//	//			Khlong Sip Post Office	
	Temple	//	//	//			Sala Daeng Temple	
	Miscellaneous Landmark Feature	Monument	E 08-24-5%	8	1.8		Democracy Monument	
Road	Park	E 05-14-5%	10	2.2			Rumpit Park	
	Air Port	E 05-14-C	//	//			DON MUANG AIR PORT	
	National Highway	E 08-25-C	//	//			THANONN PAHOLYOTHIN	
	Express Way	//	//	//			DIN DAENG PORT EXPRESSWAY	
Rail Way	Provincial Road	//	//	//			THANONN SUKUMVIT	
	Another Road	//	//	//			SOI WANIT	
	Rail Way	//	//	//			NORTHERN RAIL WAY LINE	
Place	Station	//	//	//			HUA LAMPONG ST.	
	Road Under Construction	E 08-25-5%	8	1.8			Road Construction	
River	Large	E 05-14-5%	//	//				
	Middle	E 01-25-C	18	4.0			CHAO PHRAYA RIVER	
	Small	//	14	3.0			KHLONG MAHANAK	
Sea	Small	//	10	2.2			SAKILA DITCH	
	Gulf	//	18	4.0			GULF OF THAILAND	
	Beach	E 01-24-5%	10	2.2			Pataya Beach	

2 - 5 現地作業終了時，議事録

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 ² 40 Sheets	100%
1:10,000	1,700 Km ² 57 Sheets	100%
Compilation 1: 4,000	300 Km ² 40 Sheets	100%
1:10,000	2,000 Km ² 61 Sheets	100%
Field Completion	2,000 Km ²	100%
Drafting 1: 4,000	300 Km ² 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.

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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 ²	61 sheets
Printing (1:10,000)	2,000 Km ²	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.

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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 Jatooapreuk	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
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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	SIZE
ADMINISTRATION	E08-24-C	16	A	20
PROVINCE	CHANGWAT SAMUT PRAKAN		จังหวัดสมุทรปราการ	
DISTRICT	E08-24-C	16	A	20
KHET BANG KAPI			เขตบางกะปิ	
VILLAGE	E08-24-C/L	14	A	18
Ban Khlong Bang Bon			บ้านคลองบอน	
NEW RESIDENCE	E08-24-C/L	12	A	16
Ma Ban Sae Dong			หมู่บ้านเสด็จ	
BUILDING	E08-24-C/L	9	A	12
SCHOOL	Ma Hong School		โรงเรียนห้วยผึ้ง	
POST OFFICE	E08-24-C/L	9	A	12
Post Office			ที่ทำการไปรษณีย์	
TEMPLE	E08-24-C/L	9	A	12
Sae Dong			เสด็จ	
MONUMENT	E08-24-C/L	8	A	10
Monument			อนุสาวรีย์ประชาธิปไตย	
PARK	E05-14-C/L	10	A	12
Suan Lumpini			สวนลุมพินี	
AIRPORT	E05-14-C	10	A	12
BANGKOK INTERNATIONAL AIRPORT			ท่าอากาศยานนานาชาติ	
ROAD	E08-25-C	10	A	12
NATIONAL ROAD	THANON PAVOLITHIN		ถนนพหลโยธิน	
HIGHWAY	E08-25-C	10	A	12
CHALESI MAHANAK			ทางรถไฟสายเหนือ	
PROVINCIAL ROAD	E08-25-C	10	A	12
MAHARAJA SUKUMVIT			ถนนสุโขทัย	
LANE/STREET	E08-25-C	10	A	10
Ma Hong			ห้วยผึ้ง	
RAILWAY	E08-25-C	10	A	12
NORTHER RAILWAY LINE			รถไฟสายเหนือ	
STATION	E08-25-C	9	A	10
BANGKOK RAILWAY ST.			สถานีกรุงเทพ	
CONSTRUCTION	E08-25-C/L	8	A	10
Road Construction			การก่อสร้าง	
RIVER	E01-25-C	18	B	24
(LARGE)	MAE NAM CHAO PHRAYA		แม่น้ำเจ้าพระยา	
(MEDIUM)	E01-25-C	14	B	18
KILONG MAIANAK			คลองมหาสาร	
(SMALL)	E01-25-C	10	B	12
LAM BANHA			ลำบาง	
SEA	E01-25-C	18	B	24
GULF OF THAILAND			อ่าวไทย	
BEACH	E01-24-C/L	10	B	12
Patong Beach			หาดป่าตอง	

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

Remarks: Above sample is for type of letter only

Wicha T.K.

1/10,000

ITEM		ENGLISH		THAI	
	STYLE	SIZE		TYPE	SIZE
ADMINISTRATION	E08-24-C	3-5	CHANGWAT SAMUT PRAKAN	A	16
DISTRICT	E08-24-C	3-5	KHET BANG KAPI	A	16
VILLAGE	E08-24-C/L	3-0	Ban Khlong Bang Bon	A	14
NEW RESIDENCE	E08-24-C/L	2-2	44 Ban Sae Dong	A	10
BUILDING	E08-24-C/L	1-8	Wat Phung Samed	A	8
POST OFFICE	E08-24-C/L	1-8	Building Sir Pood Office	A	8
TEMPLE	E08-24-C/L	1-8	Suk Ong	A	8
MONUMENT	E08-24-C/L	1-8	Samuday Monument	A	8
PARK	E05-14-C/L	1-8	Suan Lumpini	A	8
AIRPORT	E05-14-C	1-8	BANGKOK INTERNATIONAL AIRPORT	A	8
ROAD	E08-25-C	2-2	THANON PHACHODIM	A	10
HIGHWAY	E08-25-C	2-2	CHALERT KHAMSAKON	A	10
PROVINCIAL ROAD	E08-25-C	1-8	PHUCHI SORAKHIT	A	8
LANE/STREET	E08-25-C	1-8	BO WAKH	A	8
RAILWAY	E08-25-C	2-2	MORNER RAILWAY LINE	A	10
STATION	E08-25-C	1-8	BANGKOK RAILWAY ST.	A	8
CONSTRUCTION	E08-25-C/L	1-8	Boon Construction	A	8
RIVER	E01-25-C	3-5	MAE NAM CHAO PHRAYA	B	16
(MEDIUM)	E01-25-C	2-6	KILONG MAHANAK	B	12
(SMALL)	E01-25-C	1-8	LAT SAHINA	B	8
SEA	E01-25-C	3-5	GULF OF THAILAND	B	16
BEACH	E01-24-C/L	1-8	Phueng Beach	B	8

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

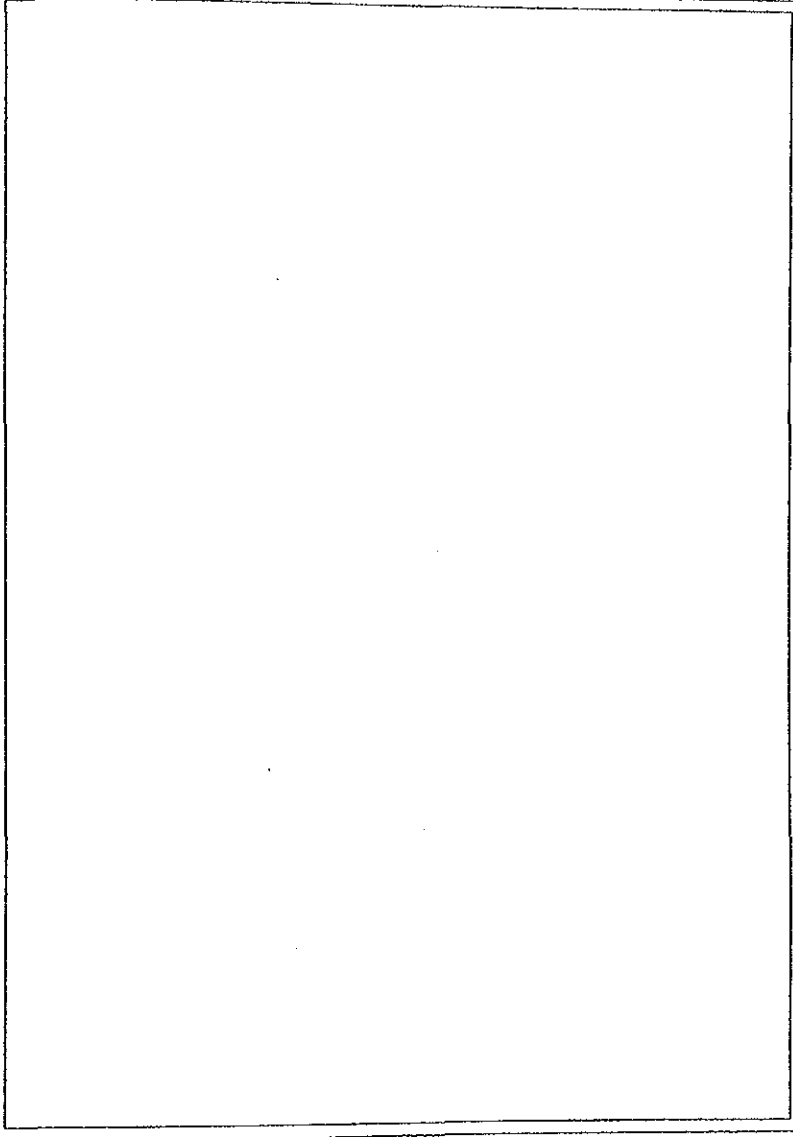
Remarks: Above sample is for type of letter only.

Wichai T.K.

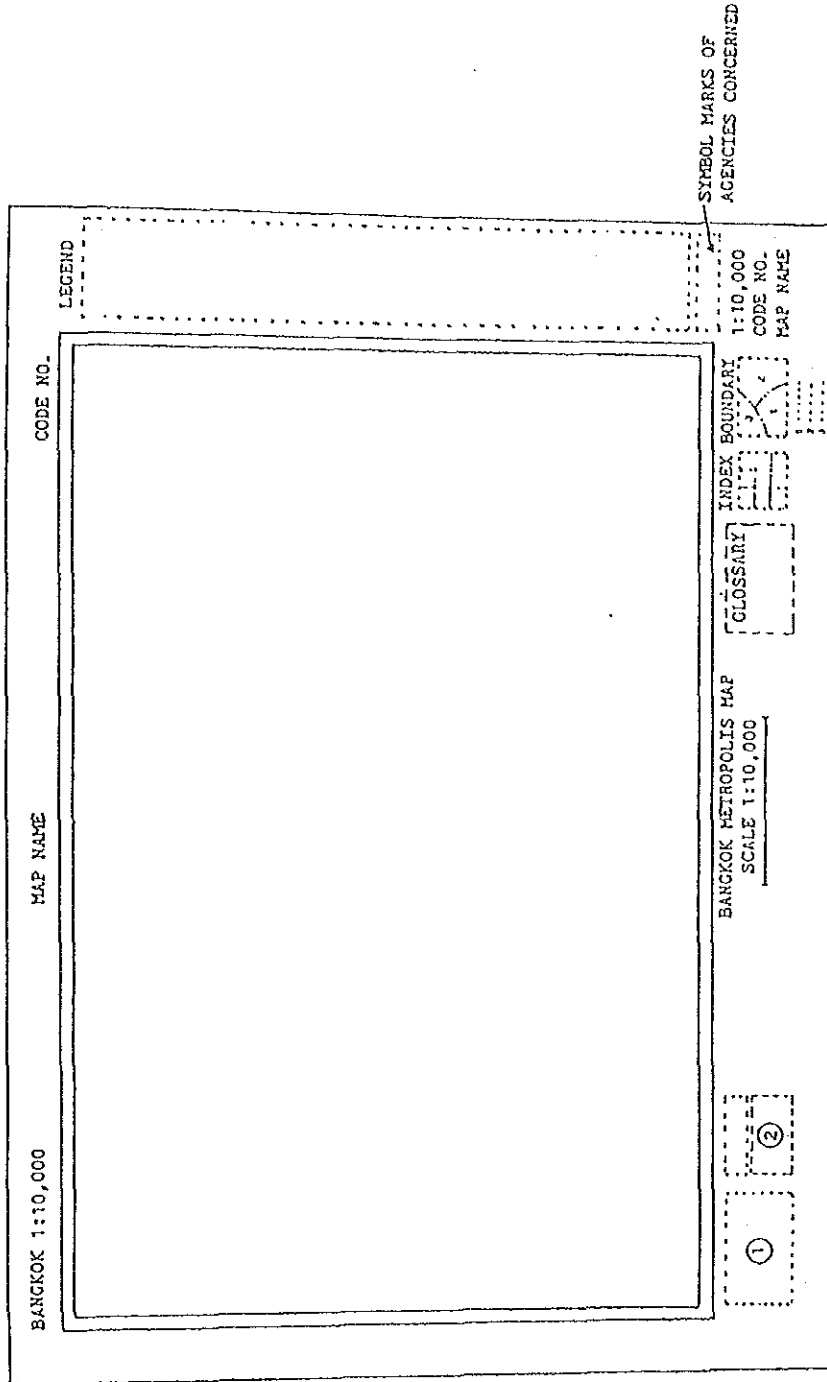
GLOSSARY

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.
		
LEGEND		
①	②	GLOSSARY
BANGKOK METROPOLIS MAP SCALE 1:4,000		
INDEX BOUNDARY		
1:4,000 CODE NO. MAP NAME		
SYMBOL MARKS OF AGENCIES CONCERNED		

MARGINAL INFORMATION
OF
1:10,000



Wicha T.K.

NOTE OF ① AND ② (IN CASE OF 1:10,000)

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 September 1988 by JICA

Printing : Royal Thai Survey Department 1988

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 Matri Road, Khet Huai Kwang, Bangkok 10400.

LIST OF SHEET NAME

(1)

1:4,000

SHEET NO.	THAI	ENGLISH
6-4-B, 7-3-A	ประชาจีน	PRACHA CHUN
6-4-D	บางสอน	BANG SON
7-3-C	หลวง	HO WANG
10-1-D	ทลิ่งชัน	TALING CHAN
10-2-A	บางพลัด	BANG PHLAT
10-2-B	บางสู	BANG SU
10-2-C	บางยี่ขัน	BANG YIKHAN
10-2-D	ดุสิต	DUSIT
10-3-B	พรวนบก	PHRAN NOK
10-3-D	คลองบางแหวก	KHLONG BANG WAEK
10-4-A	พระนคร	PHRA NAKHON
10-4-B	อุรุพงษ์	URUPHONG
10-4-C	วงเวียนใหญ่	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 KHWANG
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	หัวหมาก	HUA MARK
14-1-B	บางขุนเทียน	BANG KHUN THIAN
14-2-1	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	บ้านตลาดใหม่คองเมือง	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	บางซ่อน	BANG SON
7 -1	บางเขน	BANG KHEN
7 -2	บ้านบ้าน	BAN BUA MOH
7 -3	เกษตรศาสตร์	KASETSART
7 -4	บ้านเกาะดอน	BAN KO DON
8 -1	บ้านคลองตะวันตก	BAN KHLONG TAWAN TOK
8 -2	บ้านแบ่นชะโด	BAN BAEN CHADO
8 -3	มีนบุรี	MIN BURI
8 -4	บ้านเกาะ	BAN KO
8E-1	หนองจอก	NONG CHOK
8E-2	บางน้ำเปรี้ยว	BANG NAM PRIEND
8E-3	บ้านคลองยุกใหม่	BAN KHLONG YUK MAI
8E-4	บ้านบึงทองกลาง	BAN BUNG THONGLANG
9 -1	พุทธมณฑล	PHUTTHA MONTHON
9 -2	บ้านคลองบางขุนศรี	BAN KHLONG BANG KHUNSI
9 -3	ตระหนัสน	KRATHUM BAEN
9 -4	บ้านคลองบางไผ่	BAN KHLONG BANG PHAI
10 -1	คลังชั้น	TALING CHAN
10 -2	ดุสิต	DUSIT
10 -3	คลองบางแวก	KHLONG BANG WAEK
10 -4	พระนคร	PHRA NAKHON
11 -1	ห้วยขวาง	HUAI KHANG

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	บ้านคลองหลอด	BAN KHLONG LO LAE
12 -2	บ้านบึงบัว	BAN BUNG BUA
12 -3	บ้านคลองหนึ่ง	BAN KHLONG NUNG
12 -4	ลาดกระบัง	LAT KRABANG
12E-1	บ้านลำแขก	BAN LAM KHAEK
12E-2	บ้านบึงลำไศล	BAN BUNG LAM KHLO
12E-3	บ้านอ้ายแบน	BAN AI BAEN
12E-4	บ้านลำค้อยตั้ง	BAN LAM TOITING
13 -1	บ้านสะแกงาม	BAN SAKAE NGAM
13 -2	หนองแขม	ONG KHAEM
13 -4	บ้านคลองบางบอน	BAN KHLONG BANG BON
14 -1	ภาษีเจริญ	PHASI CHAROEN
14 -2	ราษฎร์บูรณะ	RAT BURANA
14 -3	บางขุนเทียน	BANG KHUN THIAN
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	บ้านระหัด	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

Wichu T.K.

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.

4-2 Material

For the printing work in Thailand, following materials will be granted by Japan.

item	name of product	specification	quantity
PS plate	aluminium ware	1035 x 1270mm (0.3mm in thickness)	460 sheets
printing paper	star map	750 x 950mm (90 kg)	171,000 sheets
printing paper	Tokyo ink	2 kg / can	200 cans
plate protective liquid	super gum		15 gallons
blanket	Continental Co., Ltd.	1135 x 1300mm	4 sheets

4-3 Quantity and Number of Color

Number of color: each six colors

Quantity: Thai 1,500 copies per sheet
 English 500 copies per sheet

4-4 Technical Guidance

Technical transfer in respect of printing will be made based on separately attached technical manual of printing and plate making by Japanese experts to counterparts of Thailand. Special attention will be made to the inspection regarding the gap of position, uneven color, divergence of color.

The experts will also supervise the work schedule so that all works will be completed by the end of February in 1989.

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 THA BACH	9-2 BAN KHONG BANH BACH	10-1 TALANG CHAU	10-2 DUST	11-1 HUU KHONG	11-2 BANH THAP	11-3 WANGZAR	11-4 HUA BAN	15-1 PHU KHONG	15-2 BAN KHONG BANH	15-3 PHU KHONG	15-4 BAN KHONG KHAM KHONG	16-1 BAN KHONG KHAM KHONG YU	16-2 BAN KHONG KHAM KHONG YU	16-3 BAN KHONG KHAM KHONG YU	16-4 BAN KHONG KHAM KHONG YU	16E-1 BAN KHONG KHAM KHONG YU	
13-1 BAN BANH KHAN	13-2 KHONG KHACH	14-1 PHU KHONG	14-2 BAT SURANA	14-3 PHU KHONG	14-4 BAN KHONG KHAM KHONG	15-1 PHU KHONG	15-2 BAN KHONG BANH	15-3 PHU KHONG	15-4 BAN KHONG KHAM KHONG	16-1 BAN KHONG KHAM KHONG YU	16-2 BAN KHONG KHAM KHONG YU	16-3 BAN KHONG KHAM KHONG YU	16-4 BAN KHONG KHAM KHONG YU	16E-1 BAN KHONG KHAM KHONG YU	16E-2 BAN KHONG KHAM KHONG YU	16E-3 BAN KHONG KHAM KHONG YU	16E-4 BAN KHONG KHAM KHONG YU
17-1 BAN KHONG KHAM KHONG	17-2 BAN KHONG KHAM KHONG	17-3 BAN KHONG KHAM KHONG	17-4 BAN KHONG KHAM KHONG	17-5 BAN KHONG KHAM KHONG	17-6 BAN KHONG KHAM KHONG	17-7 BAN KHONG KHAM KHONG	17-8 BAN KHONG KHAM KHONG	17-9 BAN KHONG KHAM KHONG	17-10 BAN KHONG KHAM KHONG	17-11 BAN KHONG KHAM KHONG	17-12 BAN KHONG KHAM KHONG	17-13 BAN KHONG KHAM KHONG	17-14 BAN KHONG KHAM KHONG	17-15 BAN KHONG KHAM KHONG	17-16 BAN KHONG KHAM KHONG	17-17 BAN KHONG KHAM KHONG	17-18 BAN KHONG KHAM KHONG
18-1 BAN KHONG KHAM KHONG	18-2 BAN KHONG KHAM KHONG	18-3 BAN KHONG KHAM KHONG	18-4 BAN KHONG KHAM KHONG	18-5 BAN KHONG KHAM KHONG	18-6 BAN KHONG KHAM KHONG	18-7 BAN KHONG KHAM KHONG	18-8 BAN KHONG KHAM KHONG	18-9 BAN KHONG KHAM KHONG	18-10 BAN KHONG KHAM KHONG	18-11 BAN KHONG KHAM KHONG	18-12 BAN KHONG KHAM KHONG	18-13 BAN KHONG KHAM KHONG	18-14 BAN KHONG KHAM KHONG	18-15 BAN KHONG KHAM KHONG	18-16 BAN KHONG KHAM KHONG	18-17 BAN KHONG KHAM KHONG	18-18 BAN KHONG KHAM KHONG
19-1 BAN KHONG KHAM KHONG	19-2 BAN KHONG KHAM KHONG	19-3 BAN KHONG KHAM KHONG	19-4 BAN KHONG KHAM KHONG	19-5 BAN KHONG KHAM KHONG	19-6 BAN KHONG KHAM KHONG	19-7 BAN KHONG KHAM KHONG	19-8 BAN KHONG KHAM KHONG	19-9 BAN KHONG KHAM KHONG	19-10 BAN KHONG KHAM KHONG	19-11 BAN KHONG KHAM KHONG	19-12 BAN KHONG KHAM KHONG	19-13 BAN KHONG KHAM KHONG	19-14 BAN KHONG KHAM KHONG	19-15 BAN KHONG KHAM KHONG	19-16 BAN KHONG KHAM KHONG	19-17 BAN KHONG KHAM KHONG	19-18 BAN KHONG KHAM KHONG
20-1 BAN KHONG KHAM KHONG	20-2 BAN KHONG KHAM KHONG	20-3 BAN KHONG KHAM KHONG	20-4 BAN KHONG KHAM KHONG	20-5 BAN KHONG KHAM KHONG	20-6 BAN KHONG KHAM KHONG	20-7 BAN KHONG KHAM KHONG	20-8 BAN KHONG KHAM KHONG	20-9 BAN KHONG KHAM KHONG	20-10 BAN KHONG KHAM KHONG	20-11 BAN KHONG KHAM KHONG	20-12 BAN KHONG KHAM KHONG	20-13 BAN KHONG KHAM KHONG	20-14 BAN KHONG KHAM KHONG	20-15 BAN KHONG KHAM KHONG	20-16 BAN KHONG KHAM KHONG	20-17 BAN KHONG KHAM KHONG	20-18 BAN KHONG KHAM KHONG

LEGEND

8-3
KHU PHU

-- 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

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 ²
(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 ²
	1:10,000 area	1,700 km ²

Second year (1987)

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

Third year (1988)

(1) Scribing		
1:10,000 area	61 sheets	2,000 km ²
(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)

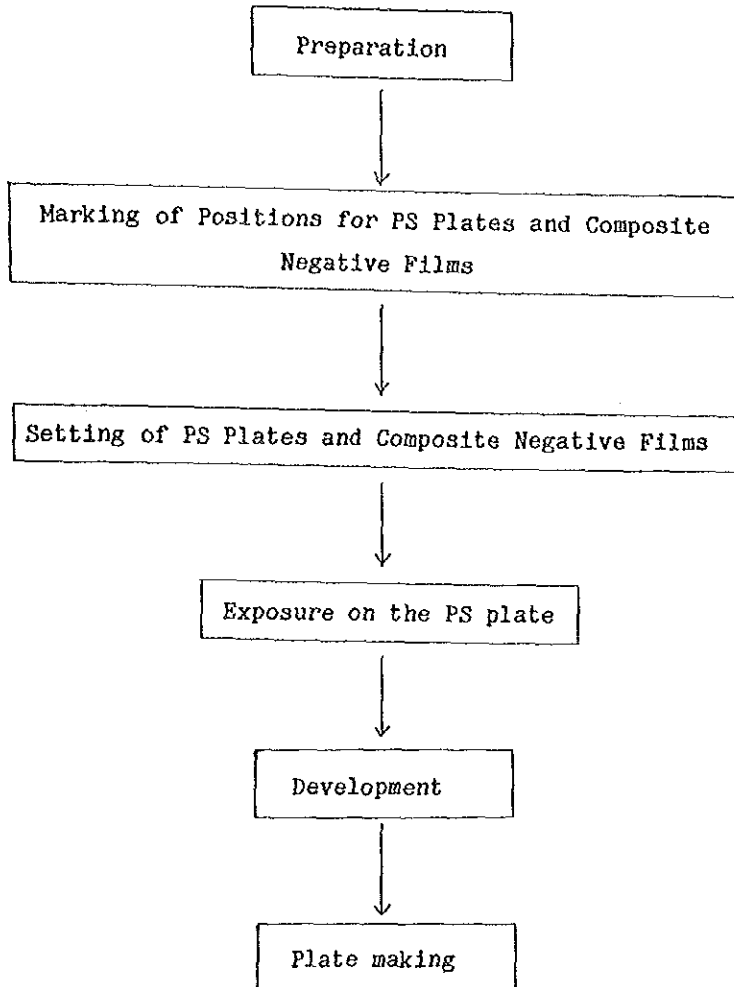
4. Topographic Mapping Sheet Index (1:10,000) and Composite Negative Films

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)

5. Process of Plate Making

The plate making shall be made in the following process :

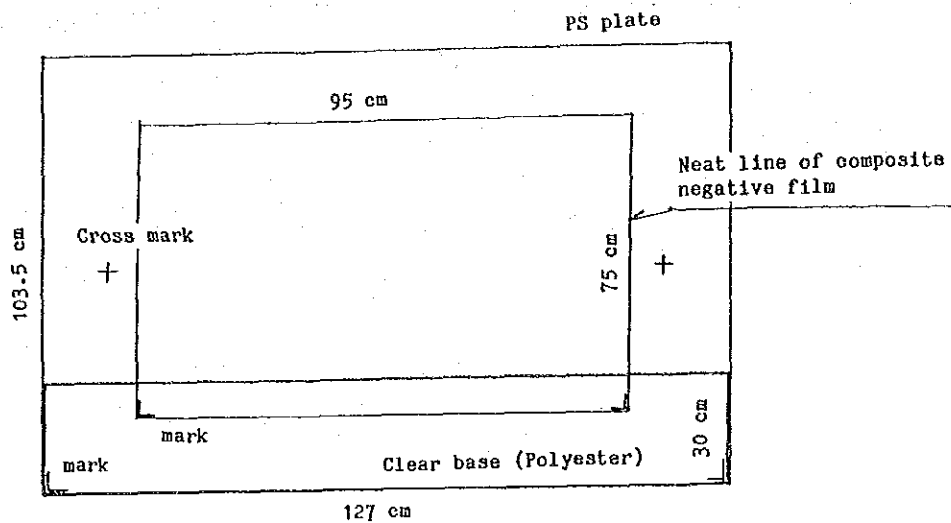


(1) Preparation

Color patch portion (margin) of the composite negatives shall be masked by tape.

(2) Marking of positions of PS plates and composite negative films

In order to determine the positions of both PS plates and composite negative films, the marks specified hereunder shall be plotted using a clear base (polyester) of about 127 cm x 30 cm as follows :



(3) Setting of PS plates and composite negative films

The PS plates shall be fixed in alignment with the outer base line of the clear base and adhered to the rubber of the printing frame with cloth tape. Then, the composite negative films shall be fixed to the corner marks of the clear base with cellophane tape. The clear base shall then be removed.

(4) Exposure

The exposure shall be done using a 3 kw metal halard lamp at the height of 130 cm with the exposure time of 90 seconds.

At the exposures, the following points are to be noted :

- 1) To wipe off dirt so as to keep the glass surface completely clean.
- 2) To keep perfect vacuum of the printing frame.

(5) Developing

The process of developing is as follows :

Developing → Rinsing → Gumming → Drying

- The development of a PS plate requires 600 ml of developer.
- One bottle of developer can be used for about 33 PS plates
- The rinsing shall be done sufficiently with running water. Then, lightly rub off the developer with a sponge so that none of developer may remain.
- The gumming shall be applied for removing dust and other foreign substance by absorption method and for forming protective membrane.
- A dryer or fan shall be used for drying the PS plates.

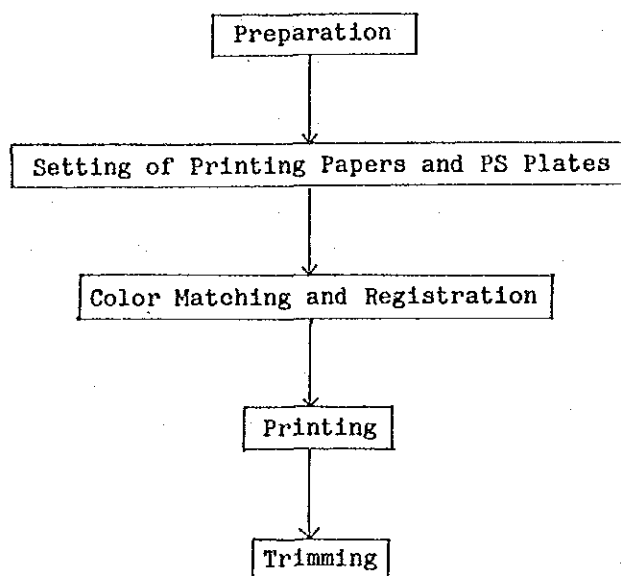
6. Materials for Printing

The principal materials for printing shall be as follows :

Printing paper (STAR MAP)	75 cm x 95 cm, 90 km/1,000 sheet
	171,000 sheets
Printing ink (TOKYO INK)	400 kg (6 colors)
Plate protective liquid (SUPER GUM)	15 Gallons
Blancket Continental Co., Ltd.	4 sheets
Roll clean	90 l

7. Printing

Flow of the printing work is as follows :



(1) Preparation

The printing room shall be air-conditioned as follows :

Humidity	: 60 - 70 %
Temperature	: 18 - 25 C

The printing papers shall, for seasoning, be stored in the same room for at least one week prior to the printing to avoid the expansion or contraction of papers.

(2) Setting of Printing papers and PS plates

In order to print 500 copies of English version and 1,500 copies of Thai version as the final products, 800 and 2,000 sheets of printing papers shall be set for both versions respectively for each topographic map sheet.

Setting of the PS plates (for 6 colors) shall, with the first priority given to the plate for purple (road) which represent many linear features, be made as follows :

Purple → Black(2 plates) → Red → Blue → Brown → Green

(3) Color matching and registration

Color matching shall be checked in comparison with the proof prints.

Note : The 10% or 20% green color of the proof prints shall be prepared in 30% green on the final prints (see Table-1).

The registration shall be carefully conducted so as not to make any misregistering because the PS plates are to be changed six times for each map sheet. Delete the cross marks and corner mark after the registration has been completed. As for the first 50 copies of purple, however, leave the corner marks and cross marks for the registration of other colors.

(4) Printing

For each map sheet, 800 and 2,000 copies include 300 and 500 spare papers shall be printed for English and Thai versions respectively. Eliminate the copies which have defects with regard to registration, color tone, clearness, etc.

In total, 500 copies in English and 1,500 copies in Thai shall be produced for each map sheet as the copies in Thai shall be produced for each map sheet as the final products.

(5) Trimming

The printed maps shall be trimmed to the specified size by cutting machine.

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	S.B	S.B	Mask	S.B	Mask	Mask	Mask	S.B	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.																											
3-1-2				X																							22
3-3				X																							22
3-4				X																							22
4-3																											24
4-4																											22
4E-3																											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
9-1				X					X	X																	21
9-2				X					X	X																	20
9-3				X					X	X																	20
9-4				X					X	X																	20
10-1				X					X	X																	20
10-2				X					X	X																	20
10-3				X					X	X																	21
10-4				X					X	X																	22
11-1				X					X	X																	21
11-2				X					X	X																	21
11-3				X					X	X																	23
11-4				X					X	X																	21
12-1				X					X	X																	21
12-2				X					X	X																	21
12-3				X					X	X																	21
12-4				X					X	X																	21
12E-1				X					X	X																	21
12E-2				X					X	X																	21
12E-3				X					X	X																	21
12E-4				X					X	X																	21
13-1				X					X	X																	22
13-2				X					X	X																	22
13-4				X					X	X																	22
14-1				X					X	X																	22
14-2				X					X	X																	23
14-3				X					X	X																	22
14-4				X					X	X																	23
15-1				X					X	X																	22
15-2				X					X	X																	22
15-3				X					X	X																	21
15-4				X					X	X																	21
16-1				X					X	X																	21
16-2				X					X	X																	21
16-3				X					X	X																	21
16E-1				X					X	X																	23
17-2				X					X	X																	23
17-4				X					X	X																	24
18-1				X					X	X																	24
18-2				X					X	X																	24
18-3				X					X	X																	22
18S-1				X					X	X																	23

* S.BScribe Base
 N.FNegative Film
 P.FPositive Film

1:10,000 Topographic Map (Thai Plate)

Color	Black		Purple		Brown		Blue				Green				Total												
	S.B	N.F	S.B	Mask	S.B	Mask	S.B	Mask	S.B	Mask	S.B	Mask	N.F														
Plate	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							22
	3-3			X											X	X			X	X							22
	3-4			X											X	X			X	X							22
	4-3																										21
	4-4																										22
	4E-3														X	X			X	X							23
	4E-4														X	X			X	X							22
	6-4														X	X			X	X							21
	7-1														X	X			X	X							21
	7-2														X	X			X	X							22
	7-3														X	X			X	X							21
	7-4														X	X			X	X							21
	8-1														X	X			X	X							23
	8-2														X	X			X	X							21
	8-3														X	X			X	X							21
	8-4														X	X			X	X							23
	8E-1														X	X			X	X							21
	8E-2														X	X			X	X							21
	8E-3														X	X			X	X							20
	8E-4														X	X			X	X							20
	9-1														X	X			X	X							20
	9-2														X	X			X	X							20
	9-3														X	X			X	X							20
	9-4														X	X			X	X							20
	10-1														X	X			X	X							20
	10-2														X	X			X	X							20
	10-3														X	X			X	X							20
	10-4														X	X			X	X							20
	11-1														X	X			X	X							21
	11-2														X	X			X	X							22
	11-3														X	X			X	X							21
	11-4														X	X			X	X							23
	12-1														X	X			X	X							21
	12-2														X	X			X	X							21
	12-3														X	X			X	X							21
	12-4														X	X			X	X							21
	12E-1														X	X			X	X							21
	12E-2														X	X			X	X							21
	12E-3														X	X			X	X							21
	12E-4														X	X			X	X							21
	13-1														X	X			X	X							21
	13-2														X	X			X	X							22
	13-4														X	X			X	X							22
	14-1														X	X			X	X							22
	14-2														X	X			X	X							22
	14-3														X	X			X	X							23
	14-4														X	X			X	X							22
	15-1														X	X			X	X							22
	15-2														X	X			X	X							22
	15-3														X	X			X	X							22
	15-4														X	X			X	X							21
	16-1														X	X			X	X							21
	16-2														X	X			X	X							21
	16-3														X	X			X	X							21
	16E-1														X	X			X	X							21
	17-2														X	X			X	X							23
	17-4														X	X			X	X							23
	18-1														X	X			X	X							24
	18-2														X	X			X	X							24
	18-3														X	X			X	X							22
	18S-1														X	X			X	X							23

* S.BScribe Base
 N.FNegative Film
 P.FPositive Film

JICA