

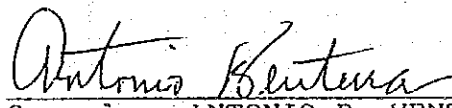
2) Minutes for plan of operation


MINUTES OF DISCUSSIONS  
ON  
THE ESTABLISHMENT OF A GRAPHIC INFORMATION BASE PROJECT  
FOR THE NATIONAL CAPITAL REGION  
BETWEEN  
THE JAPAN INTERNATIONAL COOPERATION AGENCY  
AND  
THE BUREAU OF COAST AND GEODETIC SURVEY

Dated: 26th July 1985  
in Manila, Philippines

FOR THE BUREAU OF COAST  
AND GEODETIC SURVEY

FOR THE JAPAN INTERNATIONAL  
COOPERATION AGENCY

  
Commodore ANTONIO P. VENTURA  
Director of BCGS

  
Mr. MASAYOSHI TAKASAKI  
Leader of JICA Survey  
Team

The Japanese Survey Team organized by JICA and headed by Mr. MASAYOSHI TAKASAKI visited the Republic of the Philippines on 18th July 1985 to carry out the first year survey work for the establishment of a graphic information base project for the National Capital Region (Metro Manila).

Prior to the commencement of the first year survey work, a series of joint meetings had been held from 19th to 26th July and the following items were discussed and agreed by the BCGS and the survey team.

1. The Plan of Operation for the project as proposed by the Japanese survey team and agreed by the BCGS is attached as Appendix 1.
2. Regarding the first survey work, BCGS promised to complete their assigned task and provide the necessary data as follows:

Name of Work	Quantity	To be Submitted
Results of Newly Established Ground Control Points	2 points in Southern area	Middle of August 1985
Results of Existing Leveling Points		Middle of August 1985
Results of New leveling survey		(Eastern Area) Middle of August 1985 (Southern Area) End of August 1985

3. Concerning the new request letter for the change of 1/A (Appendix 2) addressed to Mr. Masayoshi Takasaki, JICA Survey Team Leader, informed BCGS that the team is not in a position to reply on the request for the transfer of the pro-

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posed area for land condition maps.

4. In relation to the delineation of barangay and their annotation, JICA team informed BCGS that it is quite impossible to accept the request due to the enormous number of these political subdivision, the presentation on the map will become too congested and complicated, and BCGS agreed.

*M.*

Plan of Operation  
for  
Establishment of Graphic Information Base Project  
of the National Capital Region (Metro Manila)  
the Republic of the Philippines

Contents:

1. Outline of the Project.....	1
2. Items of work under the 4-Year Programme.....	1
(1) F.Y. 1985 (First Year)	
(2) " 1986 (Second " )	
(3) " 1987 (Third " )	
(4) " 1988 (Fourth " )	
(5) Work Schedule	
3. Shares of Work to be carried out by the both Sides, Japan and the Philippines.....	3
4. Organization and Schedule of the First Year Field Survey Team.....	3
5. Counterparts to be provided by BCGS.....	4
(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.....	4
7. Measures to be taken by BCGS.....	5
(1) Vehicles	
(2) Laborers	
(3) Office and Work Rooms	
(4) Tax Exemption and Custom Clearance	
8. Technical Aspects.....	7
Project Location Map .....	9
Distribution Plan of Ground	
Control Points.....	10
Plan of Leveling Routes.....	11

July 1985

Japan International Cooperation Agency (JICA)

*M. J.*

1. Outline of the Project

The establishment of graphic information base project aims at preparing the following maps which are essential information materials for various urban development plannings in the Metro Manila area:

1	10,000 Contoured maps	(57 sheets)	for approx.	1,500 km <sup>2</sup>
"	Planimetric maps	(57 " )	" "	1,500 "
"	Land use maps	(33 " )	" "	823 "
"	Land condition maps	(16 " )	" "	484 "

The Project shall be implemented, based on the Implementing Arrangement agreed between the Japan International Cooperation Agency (JICA) and the Bureau of Coast and Geodetic Survey (BCGS) of the Republic of the Philippines on March 26, 1985, from the year of 1985 to 1988 under the 4-Year Programme.

2. Items of work under the 4-Year Programme

(1) F.Y. 1985 (First Year)

Ground Control Point Survey	12 Points
Pricking	
Ground Control Point	25 "
Leveling Point	approx. 100 "
Field Identification (including Land use)	1,500 km <sup>2</sup> (823 km <sup>2</sup> )
Aerial Triangulation	120 models
Stereo Plotting	1,500 km <sup>2</sup>

(2) F.Y. 1986 (Second Year) (Tentative)

Compilation (Contoured Map)	1,500 km <sup>2</sup>
Field Completion ( " )	1,500 km <sup>2</sup>
Drafting ( " )	1,500 "
Printing (Topographic Map)	57 sheets x 1,000 copies
" (Planimetric Map)	57 " x 1,000 "
Field Identification (Land Condition Map)	484 km <sup>2</sup>
Leveling (3rd order)	100 km

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(3) F.Y. 1987 (Third Year) (Tentative)

Compilation (Land Use, Land Condition) 1,307 km<sup>2</sup>  
 Field Completion ( " , " ) 1,307 "



(4) F.Y. 1988 (Fourth Year) (Tentative)

Drafting (Land Use, Land Condition) 1,307 km<sup>2</sup>  
 Printing ( " , " ) 49 sheets x 1,000 copies

(5) Work Schedule (Tentative)

Item of work	Year Month	F. Y. 1987												F. Y. 1988											
		4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
Preparation in Japan				▬																					
Ground Control Point Survey						▬	▬	▬																	
Field Identification						▬	▬	▬																	
Aerial Triangulation										▬	▬														
Stereo Plotting																									
Compilation																									
Field Completion																									
Drafting & Printing																									
Field Identification (Land Condition)																									

Item of work	Year Month	F. Y. 1987												F. Y. 1988											
		4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
Compilation (Land Use)																									
" (Land Condition)																									
Field Completion (Land Use)																									
" (Land Condition)																									
Drafting & Printing (Land use)																									
" (Land Condition)																									

Field work   
 In-door work in Japan 

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3. Shares of Work to be carried out by the both Sides,  
Japan and the Philippines

Items of Work	Japan	the Philippines	Remarks
Observation of new ground control points	10 points	2 points	JICA SPEC. 3rd order
Monumentation of new ground control points	-	12 "	
Pricking Triangulation points	25 points	--	
Leveling points	100 "	--	
Leveling		about 250 km	JICA SPEC. 4th order
Field Identification	1,500 km <sup>2</sup>	*	
" (Land Use)	823 "	*	

\* Data related to administrative boundaries, geographical names, annotation, abbreviation, etc. shall be provided by the Philippines.

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

Name	Assignment	July	August	September	October
<b>(Headquarters)</b>					
Masayoshi TAKASAKI	Leader	7/18	7/28		10/9
Kenzo NOTOJIMA	Deputy Leader				10/19
Hiroshi KIMURA	Coordination				
<b>(Field Identification)</b>					
Isao FURUKAWA	Chief Surveyor				10/12
Takeshi YOKOI	Surveyor	7/25			
Tokushichi KANNO	"				
Naomi IKINO	"				
Yasuo FURUKAWA	"				
Tatsujiro KIBO	"				
Nisuo HASEGAWA	"				
Atsushi OKUIZUMI	"				
Shozo SHIMODA	"				
Hiroshi SATO	"				
Hasanobu ISHII	"				
Hasatoka NIYAZAKI	"				
Sadao ISHIGURO	"				
<b>(Ground Control Point Survey)</b>					
Hasaji KOYAMA	Chief Surveyor		8/13		10/12
Kazuyoshi IBA	Surveyor		8/21		
Kuzo TOYODA	"				
Fukuo IZUMIKAWA	"				
Hideo HATTORI	"				
Yoshihiko NOCHIZUKI	"				
Shingo NIJIMA	"				

5. Counterparts to be provided by BCGS

(1) For the First Year Field Work

	Number of counterparts	Period	Remarks
Chief Counterpart	1	July 18-Oct. 18 '85	for Headquarters
Counterparts specialized in topography	6	July 26-Oct. 18 '85	for Field Identification
Counterparts specialized in geodesy	3	Aug. 22-Oct. 11 '85	for Ground Control Point Survey

(2) For the First Year In-door Work in Japan

	Number of Counterparts	Period
For Aerial Triangulation	1	Oct. 15 - Dec. 22 '85
For Stereo Plotting	1 1	Nov. 23 - Feb. 28 '86 Jan. 10 - March 23 '86

6. Group Formation of the Field Survey Team

	Number of Chief Surveyor	Field Party		
		Number of party	Member of a Party	Total
Field Identification party	1	6	2 Japanese Surveyors 1 BCGS Counterparts	12 Japanese Surveyors 6 BCGS Counterparts
Ground Control Point Survey Party	1	3	2 Japanese Surveyors 1 BCGS Counterparts	6 Japanese Surveyors 3 BCGS Counterparts



7. Measures to be taken by BCGS

In accordance with the Implementing Arrangement agreed between IICA AND BCGS , BCGS shall take necessary measures to provide the Japanese Survey Team with the following to facilitate smooth implementation of the First Year field work:

(1) Vehicles (4-wheel drive)

Type of Vehicles	Number of Vehicles	Period	Remarks
Station Wagon	1	about 90 days from July 19 '85	for Headquarters
"	6	about 80 days from July 26 '85	" Field Identifi- cation
"	3	about 50 days from Aug. 22 '85	" Ground Control Point Survey

(2) Laborers

Type of Laborers	Number of Laborers	Period	Remarks
Assistant *	6	about 70 days from Aug. 1 '85	for Field Identifi- cation
"	6	about 40 days from Aug. 25 '85	Ground Control Point Survey

\* Young male (20 - 25 years old) with good antecedents.

(3) Office and Work Rooms

Type	Number of Rooms	Space	Period	remarks
Office *	1	6m x 4m	about 90 days from July 19 '85	with 4 desks
Work room *	2	6m x 6m or more	about 80 days from July 26 '85	with large size work table

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

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(4) Tax Exemption and Custom Clearance

Tax exemption and smooth custom clearance shall be arranged for the equipment, instruments, materials and others brought into the Philippines by the Japanese Survey Team including the following:

1) Theodolite .....	3 sets
2) Tellurometer .....	3 "
3) Auto Level.....	2 "
4) Plane Table .....	2 "
5) Camera .....	8 "
6) Binocular .....	8 "
7) reflecting Prism .....	36 "
8) Staff.....	4 "
9) Signal Lamp .....	5 "
10) Heliotrope .....	5 "
11) Tripod .....	7 "
12) Slidax .....	1 set
13) Typewriter .....	1 "
14) Electronic Caluculator(small).	2 sets
15) Generator.....	2 "
16) Transceiver .....	4 " (8 pieces)

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## 8. Technical Aspects

- (1) Aerial photos: 1/32,000 photos of BCGS
- (2) Map symbols: 1/10,000 map symbols of BCGS
- (3) Criteria of surveying

- Reference ellipsoid: Clarke 1866
- Projection: U.T.M.
- Sheet line: 3' x 3'
- Scale: 1/10,000
- Specifications: JICA Specifications for Overseas Surveying
- Contour line: Flat area 2m  
Mountainous area 4m

### (4) Accuracy

- Map accuracy
  - Horizontal 1 mm on map
  - Spot Height  $\Delta h/3$  ( $\Delta h = 2m$ )
  - Contour  $\Delta h/2$  ( " )
- Ground control point:
  - 3rd order 1/25,000
- Leveling point: 4th order 20 mm  $\sqrt{s}$  (s = distance)

### (5) Changes after the aerial photography

Photos at the time of the aerial photography shall primarily be regarded as the standard to depend on. Correction due to changes after the aerial photography shall be limited only to the main changes.

### (6) Results of leveling points

Other than results of new leveling points, those of the existing leveling points already established by BCGS shall also be used for the First Year survey.

(7) Contour line of the flat area and the mountainous area

<u>Area</u>	<u>Contour Line</u>
Flat area	2 m
Mountainous area	4 m

(8) Ground control point survey

The ground control point survey shall also include checking on accuracy of the existing ground control points. If any difference more than observation error found among them, the both sides shall take necessary measures for solution.

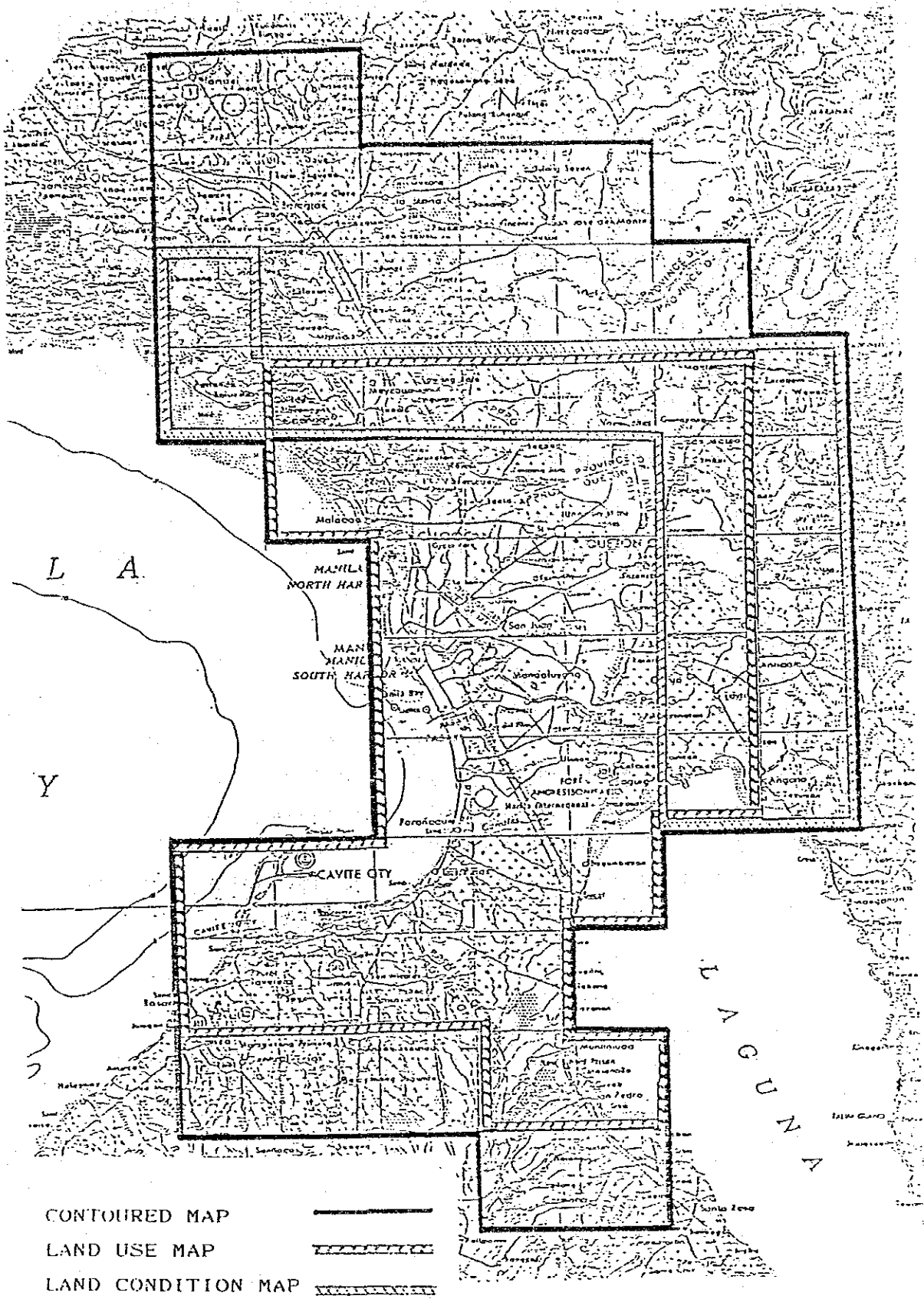
(9) Expression of topographic map

Expression of the topographic map shall be based upon the BCGS Specifications for map symbols and the Implementing Arrangement.

(10) Map symbol, color separation design, etc. of contoured map and planimetric map

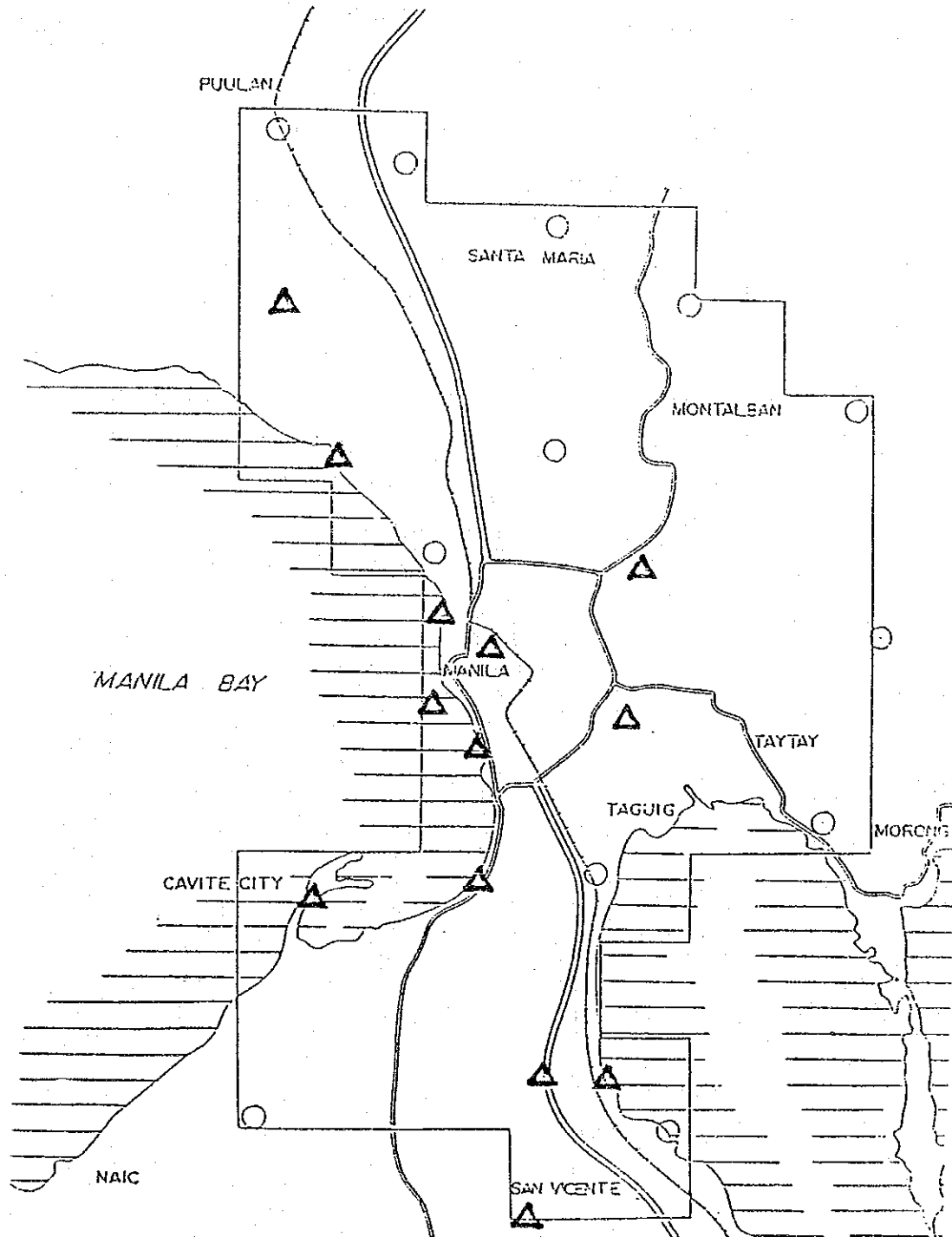
Map symbols and application rules as well as color separation design shall be principally based on the Implementing Arrangement and the Minutes of Meeting agreed between JICA and BCGS, and their detailed applications proposed by the Japanese team shall be discussed between the both sides for finalization.

BASE OF THE NATIONAL CAPITAL REGION (METRO MANILA)



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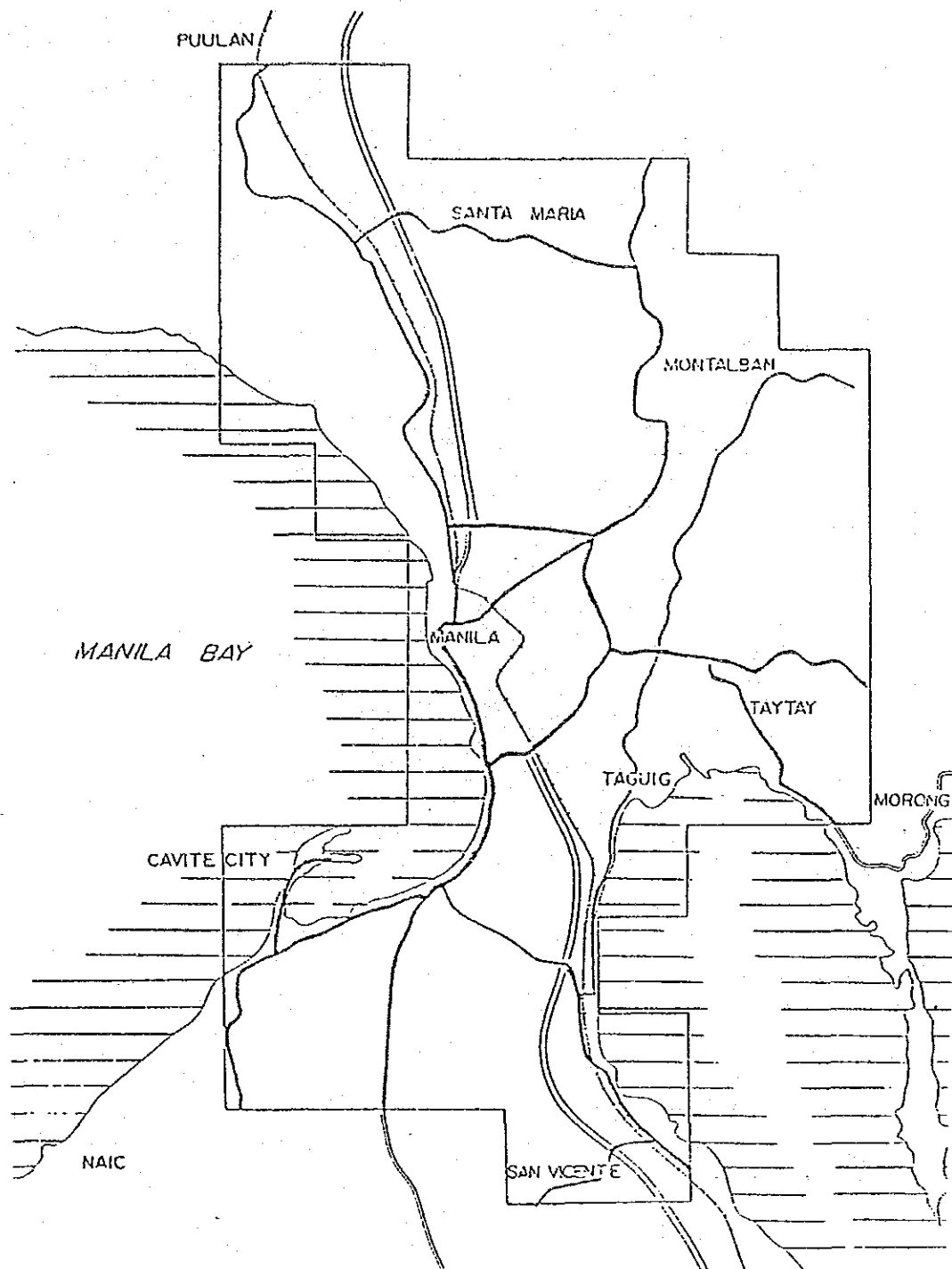
DISTRIBUTION PLAN OF GROUND CONTROL POINTS



- ▲ Existing Points
- New Points
- ▨ Pricking

*M. J.*

PLAN OF LEVELING ROUTES



— Leveling Routes



Coverage of Field Identification

*M.*



REPUBLIC OF THE PHILIPPINES  
 Bureau of Coast and Geodetic Survey  
 421 BARRACA ST., SAN NICOLAS, MANILA

APPENDIX 2

24 July 1985

Mr. Masayoshi Takasaki  
 Team Leader  
 JICA, Field Survey Team  
 for National Capital Region Project  
 Manila

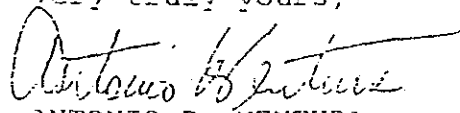
Sir :

In connection with the RP-Japan Project for "The Establishment of Graphic Information Base for the National Capital Region" we would like to request some changes on the Implementing Arrangement for this project.

One of the change we would like to request is the transfer of the proposed area for land condition maps. We would like to change the proposed map sheets covering mountainous areas and substitute these with flat and low lying areas. The map sheets that we would like to be changed are 20, 26, 31, 36 and 41. The new map sheets proposed are 21, 22, 24, 29 and 34. The reason for this request is to give priority to the areas covered by the new map sheets which are flooded and eroded during the rainy season. In other words the original area requested are less prone to disaster than the area now proposed. This proposal we think will not change the authorized area covered by land condition maps, nor will it create changes in costing and time schedules.

The next change we would like to request is the addition of symbol to Barangays. We feel that administrative control, management and development of this smallest political subdivision will be very effective if their boundaries can be shown on maps. BCGS will be responsible for supplying the information on how to delineate these boundaries.

Hoping for your consideration of these request.

Very truly yours,  
  
 ANTONIO P. VENTURA  
 Commodore, BCGS (Ret.)  
 Director

BSF/eqc

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## LIST OF ATTENDANTS

BUREAU OF COAST AND GEODETIC SURVEY

1. Commodore Antonio P. Ventura  
Director
2. Commander Renato B. Feir  
Chief  
Planning Division
3. Commander Jose Galo P. Isada  
Chief  
Operations Division
4. Mr. Ponciano C. Ciceron  
Chief  
Coastal Mapping and Special  
Projects Division
5. Mr. Gavino C. Angeles, Jr.  
Chief  
Chart and Map Production Division
6. Mr. Conrado Santos  
Chief  
Physical Science Division

JICA ADVISORY COMMITTEE

1. Mr. Tadao Dohi  
Technical Advisor
2. Mr. Yoshikazu Yamada  
Advisor

JICA MANILA OFFICE

1. Mr. Yuji Okasaki

JICA SURVEY TEAM

1. Mr. Masayoshi Takasaki  
Leader
2. Mr. Kenzo Motojima  
Deputy Leader
3. Mr. Hiroshi Kimura  
Coordinator
4. Mr. Isao Furukawa  
Chief Surveyor
5. Mr. Atsushi Okuizumi  
Surveyor

- (2) Minutes at the completion of the field work (October 1985)
- 1) Minutes for change of site of land condition map (approval by JICA)

SUMMARY OF DISCUSSION  
ON ADMINISTRATIVE ISSUES ON THE  
ESTABLISHMENT OF GRAPHIC INFORMATION  
BASE PROJECT OF THE NATIONAL CAPITAL  
REGION IN THE REPUBLIC OF THE PHILIPPINES

October 11, 1985

*Antonio Ventura*

Commodore ANTONIO P. VENTURA  
Director  
BCGS

*山田好一*

Mr. YOSHIKAZU YAMADA  
Japan International  
Cooperation Agency

*Tadao Dohi*

Mr. TADAO DOHI  
Member  
Advisory Committee for  
Mapping Project

In response to the request made by the Philippine side on July 26, 1985 that the land condition maps covering sheets No. 20, 26, 31, 36 and 41 be changed to map sheets No. 21, 22, 24, 29, and 34. Mr. Yoshikazu Yamada on behalf of JICA recognized the request as acceptable in the survey result and hereby gave the approval about the change of site of land condition map to the Philippine side.

*[Handwritten signature]*  
JICA

LIST OF ATTENDANTS

BUREAU OF COAST & GEODETIC SURVEY

---

1. Commodore Antonio P. Ventura  
Director
2. Captain Renato B. Feir  
Chief  
Operations Division
3. Mr. Ponciano C. Ciceron  
Chief  
Coastal Mapping & Special  
Projects Division
4. Mr. Gavino Angeles  
Chief  
Chart & Map Production Division
5. Mr. Conrado Santos  
Chief  
Physical Science Division

JICA ADVISORY COMMITTEE

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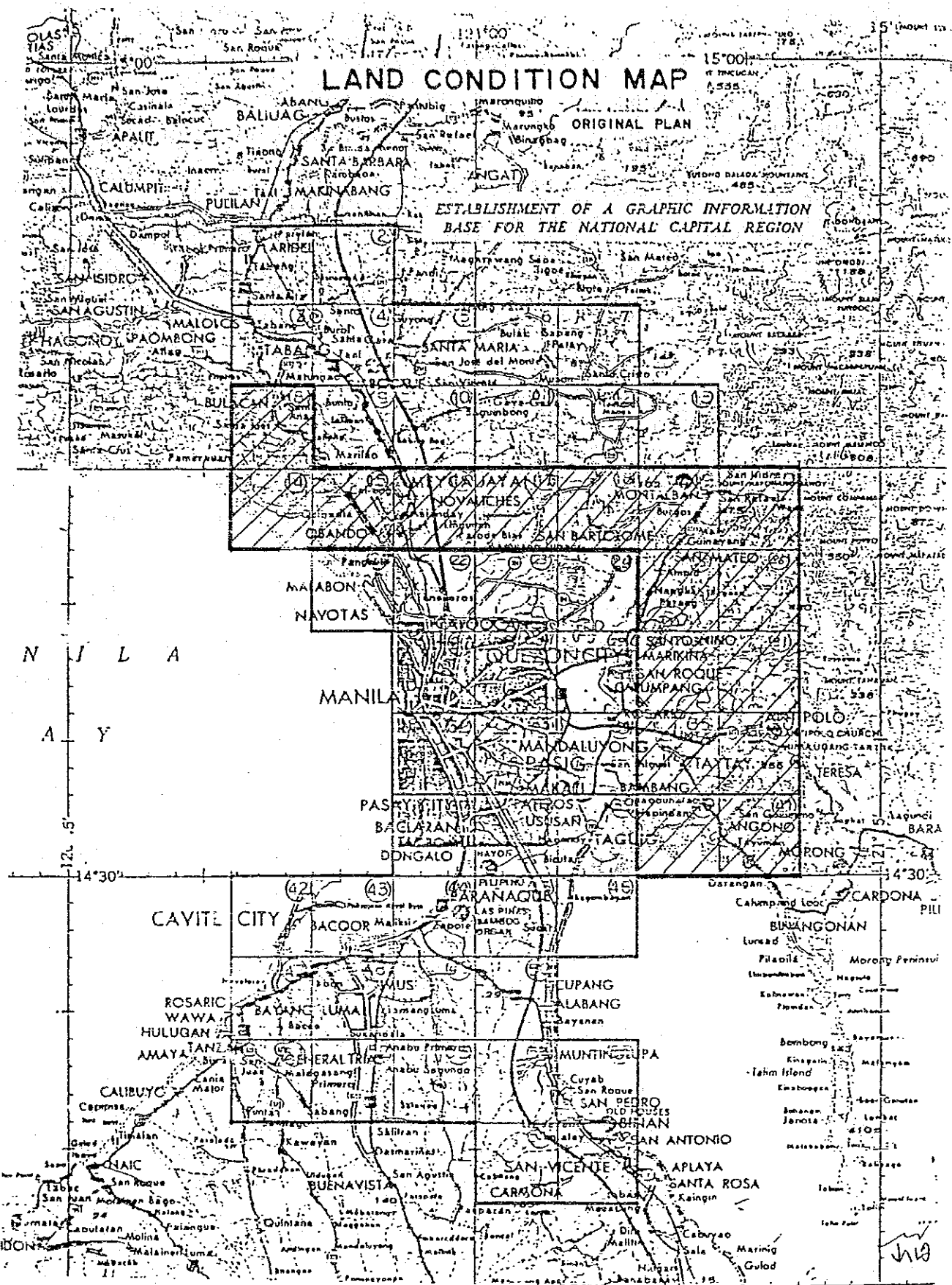
1. Mr. Tadao Dohi  
Technical Advisor
2. Mr. Yoshikazu Yamada  
Advisor

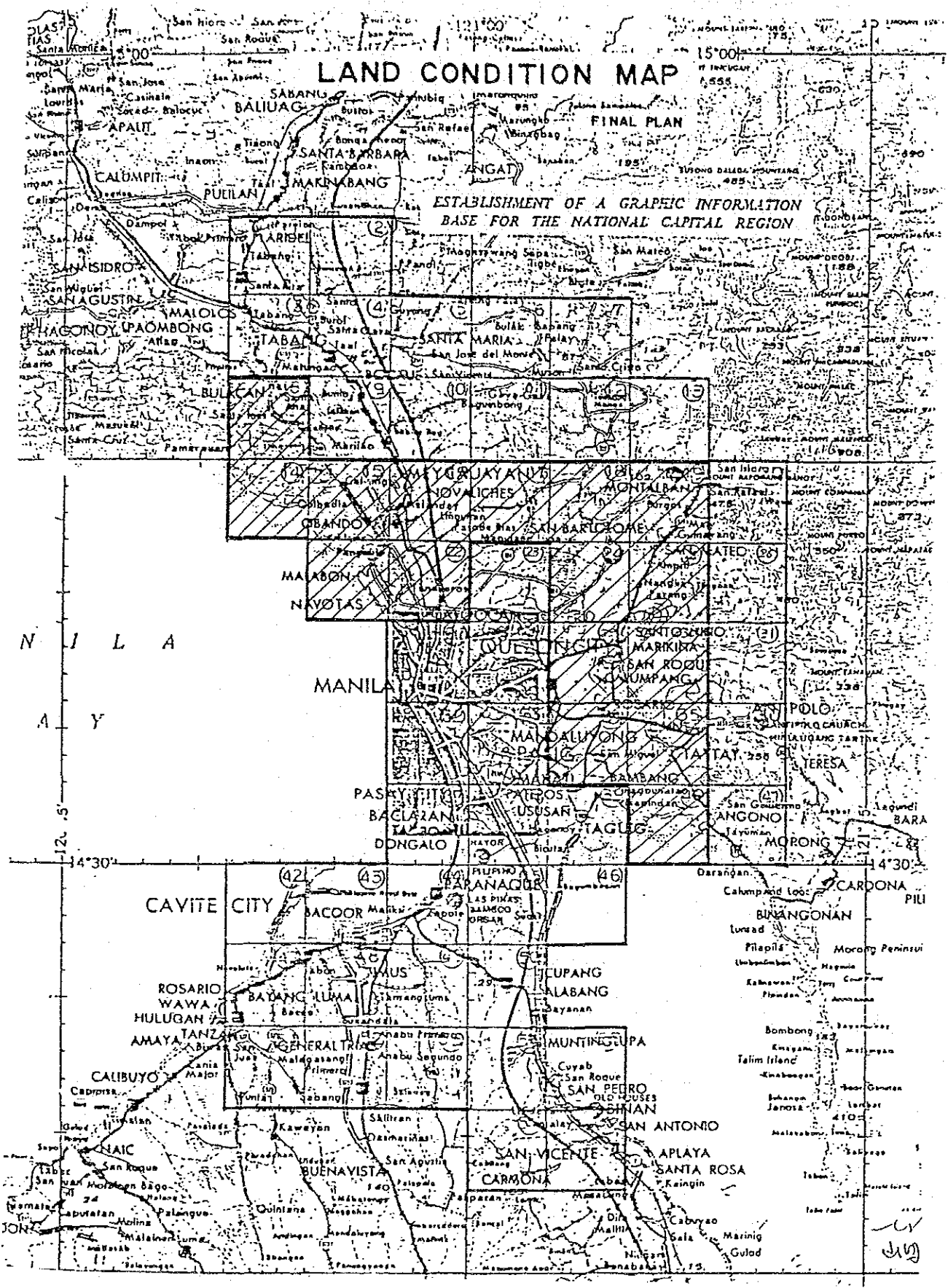
JICA SURVEY TEAM

---

1. Mr. Masayoshi Takasaki  
Leader
2. Mr. Kenzo Motojima  
Deputy Leader
3. Mr. Hiroshi Kimura  
Coordinator

*Handwritten signature*  
JICA





2) Minutes for the field work and following work

MINUTES OF DISCUSSIONS  
ON  
THE ESTABLISHMENT OF A GRAPHIC INFORMATION BASE PROJECT  
FOR THE NATIONAL CAPITAL REGION  
BETWEEN  
THE JAPAN INTERNATIONAL COOPERATION AGENCY  
AND  
THE BUREAU OF COAST & GEODETIC SURVEY

Dated: October 11th 1985

in Manila, Philippines

FOR THE BUREAU OF COAST  
AND GEODETIC SURVEY

*Antonio Ventura*

Commodore ANTONIO P. VENTURA  
Director of BCGS

FOR THE JAPAN INTERNATIONAL  
COOPERATION AGENCY

*M. Takasaki*

Mr. MASAYOSHI TAKASAKI  
Leader of JICA Survey Team

Upon completion of the 1st Year Field Survey, which has been carried out in close cooperation of BCGS for about 3 months since July 19, 1985, Mr. Masayoshi Takasaki, JICA Team Leader, reported progress of the survey work and expressed gratitude to BCGS for its cooperation.

Both sides discussed and agreed on the following items:

I. Outline & results of the 1st Year Field Work

1. Organization of the Survey Team

	JICA Team	BCGS Counterparts
Headquarters	2	
Field Identification	13 (6 parties)	6
Ground Control Point Survey	7 (3 parties)	3

2. Survey Period

Headquarters	July 19-Oct.18/85
Field Identification	July 25-Oct. 11/85
Ground Control Point Survey	August 14-Oct.11/85

3. Survey Results (see Appendix 1)

By JICA Team

3-1 Field Identification:	57 sheets.... 1,500 Sq. Km. (Contoured Map)
	33 sheets.... 823 Sq.Km.(Land Use Map)
	BM Pricking - 122 points
3-2 Ground Control Point Survey:	Establishment of new ground control points 10 points
	Picture points 3 points
	Checking of ground control points 2 points



Pricking of ground control  
points 25 points

By BCGS Team

- 1) Establishment of new ground control points 2 points
- 2) Monumentation of ground control points 12 points
- 3) Leveling (re-survey) approx. 200 Km.
- 4) Field Identification (contoured map) 27 features  
57 sheets
- 5) Sheet Name & Number Index (See Appendix 2) 1,500 Sq.Km.

BCGS expressed its cooperation, at initial stage of the 1st year field survey, to participate in the field identification work which has been carried out in joint work of BCGS & JICA teams with the following list showing responsibility of BCGS.

Features for Field Identification  
Carried Out by BCGS

- 1) Health Centers
- 2) Hotels/Motels
- 3) Antiquity
- 4) Windpump
- 5) Forts
- 6) Well
- 7) Main Changes
- 8) Underpasses/Overpasses  
of pedestrian (CL measured)
- 9) Street Names
- 10) Gasoline Stations
- 11) Railway Stations
- 12) Permanent Buildings
- 13) Government Buildings
- 14) Power Plants/Sub-stations
- 15) Waterfalls
- 16) Names of Waterways
- 17) Theaters
- 18) MWSS
- 19) Prominent Banks
- 20) Temporary Housing Areas/  
Congested (Slum) Areas
- 21) Bridges (Names)
- 22) Subdivisions/Villages (Names)
- 23) Light Houses
- 24) Ferry/Ford
- 25) Rock Awash
- 26) Wreck
- 27) Reef/Coral

## II Outline of succeeding work in the 1st year survey

### A. BY JICA

1. Adjustment of the ground control point network
2. Aerial triangulation - approx. 120 models
3. Stereo-plotting (57 sheets, 1,500 Sq. Km.)

### B. By BCGS

1. Aerial photos used by BCGS & JICA teams for the field identification shall be delivered by the BCGS counterparts to Japan for the stereo-plotting work. (See Appendix 3)
2. Following data shall be prepared by BCGS by May 1986:
  - 2-1 Following overhead clearances shall be filled by BCGS on plotting sheets \*(positive), as indicated by JICA team with mark:
    - Clearance between elevated railway & road.
    - Clearance between pedestrian, overpass & road.
    - Clearance between bridge & water surface.
    - Clearance between railway/road & bridge.
  - 2-2 Administrative names & boundaries shall be delineated on plotting sheets (positive)
  - 2-3 Names of roads, railways, stations, rivers and bridges shall be annotated on plotting sheets (positive)
  - 2-4 Data on wreck, sewerage outfall, reef, lighthouse, etc. shall be delineated on plotting sheets (Positive)
  - 2-5 Depth curve shall be delineated on plotting sheets (positive) based on the existing data.
  - 2-6 If names, symbols, annotations, abbreviations, function symbols, etc. intermingle on the contoured maps ( on positives of plotting & annotation sheets), BCGS shall edit these information.

\* sheet derived after editing.

27 sheets will be brought to BCGS on Feb. 28, 1986  
30 sheets will be brought to BCGS on March 23, 1986

- 2-7 All defense facilities shall be included in stereo-plotting by JICA. BCGS shall edit these areas for selection of information to be included in the editing sheets.

### III Technical Discussions

#### 1. Ground Control Point Survey

In respect to the ground control point survey, the observations were done by closed traversing method to form the geodetic control net composed of 5 loops. Free-net solution was applied to net adjustment. In case any existing coordinates are proven to have discrepancy more than allowable error, it was agreed by both sides that those shall be replaced with the newly computed results.

#### 2. Contoured Map

2-1 Application of the contoured map symbols was discussed and agreed as shown on Appendix 4.

#### 2-2 Road Classification

BCGS requested that road surface shall be categorized as concrete, asphalt and earth/gravel. They shall be differentiated by the thickness of road edge lines, furthermore roads with 8 meters and more in width shall be distinguished by changing the color density of the road surface due to the following reasons:

1. International Cartographic Standards classify road according to surface conditions.
2. Development planners must have information on road surface conditions to be able to have priority program for maintenance and development.
3. Motorist and bulk carriers must know road condition to have a good orientation as to accessibility and capacity of these roads.

JICA team replied that the request would be considered in Japan provided that BCGS conducts survey on the road surface conditions at its own expenses until the middle of August 1986.

#### 2-3 Plantation

BCGS requested that major plantations should be symbolized according to the following reason:

The Philippines is a tropical country, that there are varied crops. For crop assessment/inventory and taxation purposes vital for the government there is a necessity to symbolize major plantations. Five major kinds of plantations were identified and shall be symbolized individually. Other types of plantation shall be grouped as the sixth symbol. Boundaries for these plantations shall be grouped as the sixth symbol.

JICA team replied that the request should be considered, provided that BCGS conduct survey on the classification of plantations at its own expenses until the middle of August 1986

#### 2-4 Map Color

BCGS request to change the proposed colors and adopt the colours specified in 1:10,000 topo-map of TOKYO area according to the following reason:

This project can be considered as the first cartographically prepared map at the scale of 1:10,000 that will be prepared for a fully urbanized area. The color scheme originally proposed was patterned after the 1:25,000 topographic map of the Cagayan Valley made under the RP-Japan Technical Cooperation Scheme.

Therefore, new map color scheme is considered necessary to conform with such urbanized area as the Metro Manila region. Sample maps were secured from different countries including Japan. It was found out that the Geographical Survey Institute (GSI) of Japan had already made researches and came out with what was considered the best color scheme for this particular scale.

It is then requested to change the proposed colors and adopt the GSI color specifications, in order for these resulting maps to be shown and accepted internationally.

JICA team replied that further consideration for the above request would be made in Japan.

#### 2-5 Following items were discussed and agreed by both parties

- 5-1 Multi-tenants public building shall be symbolized according to the offices found in the building.
- 5-2 Multi-tenants building shall be annotated with name of the building. Names of the tenants (bank, cinema, etc.) shall not be shown.
- 5-3 Features found to extend outside of neatline shall be expressed. Their expression shall be discussed by BCGS and JICA, after preparation of plotting sheet.

5-4 Coastline/shoreline shall be stereo-plotted based on what appears on the aerial photographs.

5-5 Expression of administrative boundary and name shall be made according to the following:

	Boundary		Name	
	Diagram	Inside of Neatline	Diagram	Inside of Neatline
Region	drawn	drawn	annotate	no
Province	drawn	drawn	annotate	no
City	no	drawn	no	annotate
Municipality	no	drawn	no	annotate

5-6 All "Road" and "Street" more than 15 m in width and 300m in length shall be annotated.

### 3. Land Use Map

Definition, application and applicable landmarks for land use map were discussed by the both sides.

Results of the discussion is attached as Appendix 5. This draft will be discussed in August 1986 for finalization.

### IV. Tentative 2nd year work schedule (April 1986 - March 1987)

- May 1986 - Oct. 1987 - Compilation of the contoured map including the field completion and editing.
- Nov. 1986 - Jan. 1987 - Drafting, color proofing & checking of contoured map and planimetric map.
- Jan. 1987 - March 1987 - Printing of the contoured map & planimetric map.
- Jan. 1987 - Feb. 1987 - Field identification of the land condition map.

LIST OF ATTENDANTS

BUREAU OF COAST & GEODETIC SURVEY

---

1. Commodore Antonio P. Ventura  
Director
2. Captain Renato B. Feir  
Chief  
Operations Division
3. Mr. Ponciano Ciceron  
Chief  
Coastal Mapping and Special  
Projects Division
4. Mr. Gavino C. Angeles, Jr.  
Chief  
Chart & Map Production Division
5. Mr. Conrado Santos  
Chief  
Physical Science Division

JICA ADVISORY COMMITTEE

---

1. Mr. Tadao Dohi  
Technical Advisor
2. Mr. Yoshikazu Yamada  
Advisor

JICA SURVEY TEAM

---

1. Mr. Masayoshi Takasaki  
Leader
2. Mr. Kenzo Motojima  
Deputy Leader
3. Mr. Hiroshi Kimura  
Coordinator
4. Mr. Isao Furukawa  
Chief Surveyor
5. Mr. Masaji Koyama  
Chief Surveyor
6. Mr. Atsushi Okuizumi  
Surveyor

(3) References

1) Application of the contoured map symbols

APPLICATION OF THE CONTOURED MAP SYMBOLS

CONTROL POINTS

Horizontal Control Station:

2nd order or higher grade triangulation points except points confirmed lost and newly established control points monumented in this survey shall be symbolized.

Vertical Control Station:

2nd order or higher grade levelling points pricked in this survey shall be symbolized.

Spot Height:

Elevation points measured by stereoplotter shall be symbolized.

Direct Levelling Point:

Elevation of points measured by 3rd or lower order levelling survey shall be symbolized.

BOUNDARIES

Provincial Boundary:

Provincial boundary shall be shown within the neatline without annotation. A boundary diagram will be drawn at the margin where the provincial boundary coincides with regional boundary symbol shall be that of the latter.

City or Municipal Boundary:

City or Municipal boundary shall be shown within the neatline without annotation. The annotation will be indicated at the boundary diagram.

Regional Boundary:

Regional boundary shall be shown within the neatline without annotation. Annotation will be indicated at the boundary diagram.

ROADS

Divided Highway/Expressway:

Highway or expressway will express those with separate zone. Separate zone of 3 m or more in width shall be shown in proportion to the actual dimension. If the width is less than 3 m the separate zone shall be shown as a single line.

**National Highway:**

National Highway will express the route number. If the national highway crosses the map neatline, the route number will be shown close to the neatline and the highway lines must not be cut to accommodate the route symbol.

**Provincial Road:**

Provincial road will show the route number. If the provincial road crosses the map neatline, the route number will be shown close to the neatline and the road lines must not be cut to accommodate the route symbol.

**City/Municipal Road:**

- 1) City/Municipal road of 4 m or more in width shall be shown on the map. Expression of roads whose length are less than 5 mm on the map shall be deleted.
- 2) City/Municipal road whose width is between 2-4 m shall be shown in 0.4 mm double line on map.
- 3) City/Municipality road whose width is between 1-2 m shall be shown in single line on map.

**TRAIL/ALLEY**

Trails/Alley whose width are less than 1 m and which crosses residential areas & fields be expressed on map if necessary.

**Road Under Construction:**

Road under construction whose width is more than 4 m and shape is already clear shall be symbolized.

**Sidewalk:**

Sidewalk for pedestrians or bicycles whose width is 3 m or more shall be expressed. Sidewalks located under over hang of buildings shall be symbolized.



#### Grade Separation:

Roads with grade separation will be shown. Road, Canal, etc., under overhead shall not be shown.

#### Crossing:

The symbol specification at the left portion shows overpass and that at the right level crossing.

#### Pedestrian Overpass:

Overpasses through which pedestrians, bicycles etc., cross road or railway shall be shown to scale. In case of the width is less than 3 m, the overpass shall be symbolized with 3 mm width on map. Clearance shall be indicated.

#### Pedestrian Underpass:

Underpass through which pedestrians crosses the road or railway shall be shown. Section which is underground shall not be shown.

#### Toll Gate:

Gate collecting toll shall be symbolized.

### RAILWAY FEATURES

#### National Railway:

Government owned railway shall be symbolized. The left side of the symbols shows a single track and the right shows double tracks. Abandoned railway shall be annotated.

#### Private Railway:

Railways owned by private enterprise shall be symbolized.

#### Under Construction:

Railway under construction shall be shown. Railway expected to be completed shall be symbolized as completed railways.

**Level Crossing:**

Crossing where railway passes over road or railway on level shall be shown.

**Overpass:**

Crossing where railway passes over road or railway shall be shown.

**Underpass:**

Crossing where railway passes under road (under ground) shall be shown.

**Light Rail Transit:**

Elevated railway of the Light Rail Transit shall be shown together with the stations. Railway clearance above main road intersection shall be shown.

**Turnplate:**

Revolving circular platform used for turning locomotive etc., around shall be symbolized.

**Railway Station:**

Railway station for passengers and freight car including platform, overbridge etc., shall be shown.

**BUILDINGS**

**Prominent Buildings:**

Important and/or at least 4 storey buildings, shall be symbolized.

**Independent Buildings & Houses:**

Independent Buildings whose short side is more than 1.0 mm on the map (including warehouses) are to be symbolized.

**Congested Housing Area/Slum:**

Congested housing and slum area surrounded by street whose real coverage of buildings is more than 70% of the area shall

be shown. If there is any prominent building in the area, this shall be symbolized. Congested area not surrounded by street shall be shown with actual outline.

**Ruins:**

Delapidated buildings, ruins of historical buildings, houses etc., whose short side is more than 2mm on map shall be shown.

**Temporary Housing Areas:**

Congested areas with temporary houses mostly one storey including those on water and canal shall be shown.

**Building Minimum:**

Where short side of the building is less than 0.5 mm on the map.

**PUBLIC BUILDINGS (SYMBOL)**

**Government Building:**

Photo & Field identifiable main offices, branch office of National/City/Municipal administrative organization shall in principle be shown with annotation or abbreviation.

**Police Station:**

Photo & Field identifiable main and branch offices shall be shown and annotated if space permits.

**Fire Station:**

Photo & Field identifiable Fire Stations shall be symbolized. Annotation shall made if space permits.

**Post Office:**

Photo & Field identifiable main and branch offices shall be symbolized and annotated if space permits.

**Water Supply & Sewage:**

Water treatment plant and pumping stations shall be shown with annotation.

School:

University, College/Institution, Vocational/ trade, High School  
Elementary and Preparatory school buildings shall be shown.  
Universities down to the High School shall be shown with annotation  
or abbreviation depending on the space. Elementary and preparatory  
school shall be symbolized.

Hospital:

Hospital, Large clinics and medical center shall be shown.

Church/Mission:

Church, Mission and Chapel, shall be shown. Annotation shall  
be made if necessary.

Mosque:

Mosques shall be symbolized if space permits.

Embassy:

Indicated point of embassy shall be annotated.

Health Center:

Health centers shall be shown with annotation, if space permits.

Temple:

Photo & Field identifiable temples shall be shown.

Power plant & Sub-Station:

Power plants & Sub-Stations shall be shown. Annotation shall  
be made if space permits.

Banks:

credit  
Large banks and unions that have their own separate build-  
ings shall be shown and annotated.

Hotel:

Hotel with three(3) or more stars shall be shown with annotation.

less with  
Hotels/Motel with two (2) stars and  $\wedge$  ground area of  
1 cm x 1 cm on the map shall be symbolized with "H" if space  
permits.

**Market & Prominent Store:**

Public market with building, large supermarket & department  
stores shall be symbolized and annotated if space permits.

**Factory and Works:**

Factory and small scale industries shall be shown with annotation  
if space permits.

**Helipad:**

Helipad which are photo and field identifiable and are permanent  
shall be symbolized.

**Theater & Cinema:**

Large & prominent theater, cinema and amusement/recreational  
places shall be shown with annotation if space permits.

**Prominent Gas Station:**

Prominent gasoline stations used as transport terminal, special-  
ly those situated at crossing shall be symbolized.

**Sports Center:**

Centers like gymnasiums, stadiums, etc., shall be annotated  
if space permits and if not they shall be symbolized.

**Ferry/Ford:**

In case of a regular service, ferry shall be annotated as "Ferry"  
in italic and symbolized. The landing places on both banks of  
the rivers will be linked with broken line. In case of fording,  
it will be annotated as "Ford" in italic.

MISCELLANEOUS LANDMARK FEATURES

**Storage Tanks:**

Oil tanks that can not be drawn to scale shall be symbolized and

of  
annotated at right side symbol. In case of those with dimension of more than 1 mm on the map will drawn to scale and annotated.

**Tower, Radio/TV Tower, Stack/Flagpole:**

"Tower", "Radio/TV Tower", "Stack/Chimney", "Flagpole" etc., shall be shown and annotated if these can be used as landmarks. Abbreviations can be adopted if space does not permit.

**Airport:**

All airports and Airfields shall be drawn to scale and annotated. Airport facilities shall be drawn as independent building.

**Power Transmission Line:**

Power transmission lines with high towers shall be expressed. Those that have base dimensions of more than 1mm on the map shall be shown at the actual scale. Those with less than 1 mm on the map will be symbolized. The part of the lines crossing roads & railways shall be cut 0.2 mm from the features.

**Lighthouse:**

The symbol will be applied for fixed lighthouse.

**Cave:**

The symbol will be applied for caves formed naturally.

**Mine:**

Symbol will be applied for mine. The site and kind of mine shall be annotated.

**Water Tank/Standpipe:**

The symbol shall be applied for water tanks and standpipes which are large and prominent. Large water tanks more than 1 mm on the map shall be drawn to scale.

**Monument:**

Monuments which are big and used as landmarks on the map shall be shown.

Wall/Fence:

The symbol shall be applied for walls which are photo & Field identifiable and made of stone, bricks, concrete and steel mesh.

Antiquity:

The coverage shall be delineated with annotation.

Parks:

The coverage shall be delineated with annotation.

Revetment:

Revetment which are made of concrete or piled-up solid stones that have a height of more than 2 m and length of 100 meters shall be symbolized.

Windpump:

The symbol shall be applied for facilities which pumps up ground water by means of wind force.

Memorial Park, Cemetery:

On the symbol specifications the left side represent memorial park and right side cemetery. Limits of memorial park will be symbolized and annotated. Cemeteries shall be symbolized if photo and field identifiable.

Fort:

Distinguished historic spots, noted places, etc., shall be annotated if space permits. Line width shall be 0.4 & 0.2 mm on the map for the inside and outside lines respectively.

WATER AND ASSOCIATED FEATURES

Pier-Jetty:

Pier or jetty made of iron, concrete, wood, including floating bridge shall be shown to scale or symbolized.

Breakwater:

Breakwater, causeways etc., shall be drawn to scale.

Wharf:

Photo & Field identifiable wharf which has mooring facilities shall be symbolized.

RIVER/STREAM

(Single Line)

Stream which is more than 100 m in length and less than 4 m in width shall be expressed as single line.

(Double Line)

River which is more than 100 m in length and more than 4 m in width shall be shown as double line. Shoreline of river/creeks/canals in congested areas shall be shown as much as possible.

(Intermittent)

Rivers in which no water flow at the time of an ordinary water level for other rivers shall be symbolized.

(Indefinite)

Waterway whose water flow stops for sometime shall be symbolized.

Flow Arrow:

The symbol shall be applied where the flow is certain and for wide and double line rivers.

Falls:

(Double line stream)

Waterfalls whose relative height is more than 3 m shall be symbolized.

(Single line Stream)

Waterfalls whose relative height is less than 3 m shall be symbolized.



Well:

Well which is large and prominent shall be symbolized.

Spring/Hot Spring:

Spring or Hot spring shall be symbolized and annotated if space permits.

Channel/Canal:

Channel or canal (esteros), which is more than 10 m in width and 100 m in length shall be shown.

Flood Gate:

Artificial structure for control of water volume for the prevention of adverse flow shall be symbolized, and annotated if space permits.

Dam:

Dams which are photo and field identifiable shall be drawn to scale, and annotated if space permits.

Weir:

Artificial structure to control water flow shall be symbolized. Those with length of more than 10 m shall be shown in proportion to the actual size.

Lake/Pond:

Lake or Pond whose approximate dimensions are more than 20 m x 20 m shall be shown and annotated if space permits.

Ditch:

Ditch whose dimensions are more than 10 m in width and 100 m in length shall be shown. Those with smaller dimensions shall be shown if necessary.

Swamp/Marsh:

Marshy area which is always wet and store water during rainy season with area of more than 50 m x 50 m shall be symbolized.

Tidal Flat:

Water areas where sand or earth is exposed at low water and covers at high water with area of more than 50 m x 50 m shall be symbolized.

Reef/Coral:

Coral reef which uncovers at sounding datum with size of 50m x 50m or more shall be symbolized with annotation.

Mud:

Tidal flat covered by muddy soil, whose dimensions are more than 50 mm x 50 mm on the map shall be symbolized.

Pipeline/Water pipeline:

Pipeline used for transporting water, oil, gas, etc., which are photo and field identifiable shall be symbolized. Underground section shall not be expressed.

Siphon:

Siphon which is photo and field identifiable shall be symbolized and annotated "siphon".

Rock Awash:

Rock awash which are dangerous to surface navigation shall be symbolized.

Wreck:

Wrecks showing any portion of hull or always partially submerged shall be symbolized.

Sewerage Outfall:

Sewerage outfall shall be symbolized and annotated in italic.

Marine Pond:

Photo & Field identifiable pond for raising fish will be drawn to scale and annotated if space permits.

Fishpen:

Drift-net for fishing which is located at sea, lake or river shall be drawn to scale if photo and field identifiable.

Salt Bed:

Salt beds shall be drawn to scale.

VEGETATION

Broadleaf:

Areas where broadleaf tree grows more than 3 m high and with more than 5 m x 5 m on the map by symbolized.

Bush/Scrub:

Area where trees of less than 3 m high and with less than 5 m x 5 m on map shall be symbolized.

Mixed Scrub & Broadleaf:

Areas of mixed scrub and broadleaf trees shall be symbolized.

Rice Field:

Areas for rice cultivation whose dimension is more than 50 m x 50 m shall be symbolized.

Cropland:

Cultivated areas for upland rice, vegetable, pineapple, sugar cane, whose dimension are more than 50 m x 50 m shall be symbolized.

Plantation/Orchard:

Cultivated areas for bananas, Coconut, Mango, Pineapple, Sugarcane and other fruit trees, whose dimension are more than 50 m x 50 m shall be symbolized and annotated if space permits.

Mangroves:

Mangroves which grow densely around river mouth and coastal areas and whose dimensions are more than 50m x 50m shall be shown.

Nipa:

Nipa which grows in water edge and whose dimensions are more than 50 m x 50 m shall be symbolized.

Tropical Grass:

Areas where tropical grass grow densely and whose dimensions are more than 50 m x 50 m shall be symbolized.

Bamboo:

Areas where bamboo tree grows densely of not less than 50 m x 50 m on map shall be symbolized.

RELIEF & ASSOCIATED FEATURES:

Cutting:

Man-made cutting whose dimensions are more than 2 m in height and 100 m in length and if photo and field identifiable will be symbolized.

Embankment:

Man-made embankment whose dimensions are more than 2 m in height and 100 m in length which are photo field identifiable shall be symbolized.

Slopes:

Slopes made by land slide whose dimensions are more than 2 m in height and 30 m in length which are photo and field identifiable will be symbolized.

Quarry:

Quarry for construction materials which is extensive shall be drawn to scale and small ones will be symbolized.

Depression:

Areas where the ground is depressed partly shall be symbolized.

Cliff:

Steep hilly areas where rock surface are exposed and whose dimensions are more than 2 m height and 50 m in length shall be symbolized.

Rockoutcrop Area:

Areas whose surface are rocky, or areas where huge rocks are scattered and which are photo and field identifiable shall be symbolized.

Sand/Dunes:

Natural sand areas with little or no vegetation, which are photo and field identifiable, shall be symbolized.

Golf Course:

Areas for golf courses shall be shown with annotation.

CONTOURS

Index Contour:

Index contour interval in flat areas shall be 10 m and mountainous areas 20 m.

Intermediate Contour:

Contour interval in flat mountainous areas shall be 4 m.

Auxiliary Contour:

Two (2) meter contour line shall be drawn on flat areas and on mountainous areas, it shall be shown if necessary to depict Land condition.

DEPTH CURVES

Depth Curve interval shall be 0-1-5-10-20-50-100 m.

2) Definition, application and applicable landmarks of symbols for land use map (draft)

Definition, Application and Applicable Landmarks  
of Symbols for Land Use Map

Applicable Landmarks

Definition & Application

Urban & Inhabited Area

Residential District

1) Multi-storey Housing:

Four (4) or more storey housing in a compound that have more than 50% of area occupied by these buildings and their facilities shall be classified under multi-storey housing.

2) Residential:

One (1) to three (3) storey housing in a more than 50% area occupied by these houses and their facilities.

3) Temporal Housing Area:

Temporal housing area includes congested housing and those fixed on water or along creeks and rivers.

Rest house for groups of various organizations, lodging for public servants shall be classified as residential. In suburb (outside EDSA) subdivisions/villages that have already existing road system but have sparse houses of less than 3 mm x 3 mm shall be classified as residential.

Areas where temporary housing exist such as congested, slum or squatter.

281

4) Business:

Areas where enterprise conduct their business and Office work.

Private offices, banks, hotel, TV.  
Radio, Telephone stations, etc.

5) Commercial:

Area which is considered as a general shopping district including those for shops, stores, etc.

Retail store, restaurant, wholesale store, department store, market, and auto repair/sale shops, etc.

6) Mixed Commercial - Residential area:  
tenanted buildings which have shops or stores on the first floor and upper floors are for residential.

In Mixed Commercial and residential area, buildings which face the streets and are less than 15 mm in width shall be expressed in 1.5 mm strip on the map.

7) Mixed Business - Commercial:

Mixed Business/Commercial buildings in a common block/area shall be categorized accordingly, if they are more than 3 mm x 3 mm on the map and are multi-storey; if smaller, the category for the area shall be generalized as a 1.5 mm strip on the map.

INDUSTRIAL DISTRICT

8) Large Scale Industry:

Large scale industry, are those occupying an area of at least 5 mm x 5 mm on the map.

Textile industry, chemical factory, shipyard, bottling company, quarry with selecting facilities, etc.

9) Small Scale Industry:

Industrial areas where small factories occupying an area of less than 5 mm x 5 mm on the map.

10) Mixed Industrial - Residential:

Areas where industrial and residential are mixed and their classification cannot be made properly.

A 1.5 mm strip shall represent mixed industrial-residential areas, if those buildings facing the streets are less than 1.5 mm x 1.5 mm on the map.

PUBLIC & OFFICIAL DISTRICT

11) Governmental/Quasi-Public Business:

Areas where buildings of National, Regional, Local government organizations or corporations, etc., mainly exist for carrying on their business.

National or public buildings, police stations, fire station, embassy or legation, consulate, trade/cooperative union buildings, quasi-public buildings etc.

150



12) Education - Culture:

Areas where school, research institute, museum, historical buildings, educational institute, etc., mainly exist.

School, laboratories, public hall, library, exhibition hall, museum, research institute, astronomical observatory and historical buildings.

13) Health & Welfare:

Areas where health and welfare facilities mainly exist.

Hospital, sanitarium, medical health center, Large clinics, photo-identifiable health centers.

14) Park & Recreational:

Areas where public and recreational facilities mainly exist.

Park, garden, zoological and botanical gardens, picnic ground, theater, billiard halls, bowling, etc., Cock-pit, casino, Resort & Beaches.

15) Religious & Cemetery:

Areas where religious facilities and cemetery exist.

Church, temple, mosque, memorial park, cemetery, seminary, monastery, photo-identifiable Grotto, etc.

FACILITIES

16) Transportation:

Areas where transportation and distribution facilities exist.

Railway terminal, car shed, marshalling yard, warehouse, airport, bus terminal, parking lot, pier, cargo shed and port facilities. Fuel oil LPG terminal, gas stations, etc.

17) Utility:

Areas where supply and treatment facilities for City & Municipal management exist.

Power Station & Sub-station, water treatment & filtering plant, sewerage, crematory, dumping area.

18) Sports & Athletic:

Area where sports facilities exist.

Sports plaza, stadium, shooting range, gymnasium, golf courses, etc.

19) Defense:

Area where defense facilities exist.

Perimeter fence/wall and road system shall be delineated.

20) Rice Field:

Area where irrigated paddies exist.

Rice Paddy

21) Crop Land:

Areas where crops are cultivated.

Corn, Upland rice, Vegetables, etc.

22) Plantation:

Areas where plantation exist. Different plantations shall be shown in color but differentiated by different pattern of stiple.

Bananas, coconut, mango, sugarcane, pineapple and other fruit bearing trees.

23) Agro-Industrial:

Areas where agricultural related industrial facilities exist.

Rice mill, warehouse for agricultural products, tractor shed, processing factory, sugar factory and animal food factory.

24) Forest:

Areas covered by trees.

Broadleaf, bushes/scrub, mixed scrub, broadleaf and bamboo shall be shown but differentiated by symbol, if area is more than 50 m x 50 m. On smaller areas they shall only be symbolized.

- 25) Grass Land:  
Areas covered by grasses.  
Pasture, ranch, and other areas where tropical grass densely.
- 26) Bared Land:  
Area where little or no vegetation grow.  
Rock-outcropped area, barren area, sand gravel area, etc.

OTHERS

WATER SPHERE

- 27) Natural bodies of water.  
Shoreline of Sea, Lake, Creeks/Stream and bay, tidal flat, mud.
- 28) Marine Pond:  
Fish Pond, Oyster pond and cultivating breeding area.
- 29) Water Related Vegetation:  
Vegetation that grows on water.  
Nipa, mangrove, marsh/swamp shall be shown in one color but differentiated by symbol.
- 30) Salt Bed:  
Field where salt is collected.  
Salt Bed.

RB

UNDER-CONSTRUCTION

32) Open Space:

Areas where artificial land development is in progress.

Large reclaimed and idle area not yet utilized, including quarry, and open pit mine.

*ed.*

### 3) Specifications of planimetric map (draft)

#### Specifications of Planimetric Maps

##### 1. Basic Concept

1. Planimetric Maps, shall for its production, used contoured maps as base map.
2. Planimetric Maps shall be printed only by combination of colour separation plates which are produced in the process of colour separation drafting of the contoured maps.

##### II Definition

Planimetric maps shall be base maps that show the horizontal representation of all features on the contoured map, except contours, spot heights and relief features.

##### III Detailed Specifications

1. The color for roads and water limits shall be the same as that of the contoured maps.
2. Roads whose dimensions are more than 4 m in width and 200 m in length shall be annotated.
3. Grid shall be expressed in meters because planimetric map is used as a representation of horizontal distances between features, and location of these features can easily be observed. Grid shall follow the UTM Projection used on the contoured map with longitude of central meridian at  $123^{\circ} 00' 00''$ . Grid interval shall be 1 km. apart. Grid spaces shall be lettered along the parallel lines and numbered along meridian lines. Letters and numbers of the grid shall start from the intersection of the lines at long.  $120^{\circ} 51' 00''$  and lat.  $14^{\circ} 18' 00''$ .

4. I/A and related Minutes of Meetings



4. I/A and related Minutes of Meetings

MINUTES OF DISCUSSIONS

ON

Initial Joint Meeting between the Japan International Cooperation Agency Preliminary Study Team and the Bureau of Coast and Geodetic Survey regarding the establishment of a graphic information base for the National Capital Region

Between

The Japan International Cooperation Agency

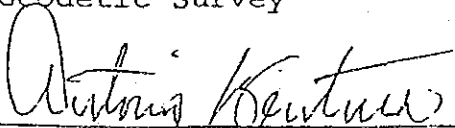
And

The Bureau of Coast and Geodetic Survey

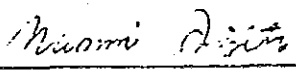
Dated: January 23, 1985

In Manila, Philippines

For the Bureau of Coast and  
Geodetic Survey

  
Commodore ANTONIO P. VENTURA  
Director, BCGS

For the Japan International  
Cooperation Agency

  
Dr. NAOMI FUJITA  
Leader of Japanese  
Preliminary Study Team



The Japanese Preliminary Study Team (the team) organized by J.I.C.A., headed by Dr. N. Fujita, visited the Republic of the Philippines from 16th to 25th January 1985, to carry out the preliminary survey for the captioned project.

During the team's stay in the Philippines, the team exchanged views and had discussions with BCGS and National Economic and Development Authority.

The main items understood by the both sides are as follows:

1. Final result of the study is to produce contoured map (1/10,000) and planimetric map (1/10,000) covering an area of approximately 1,500 KM<sup>2</sup> and land use map (1/10,000) covering an area of approximately 823 KM<sup>2</sup>, as shown in Appendix I and II.
2. As for aerial photographs, existing aerial photographs (1/32,000) possessed by BCGS to be utilized.
3. The main topographic information not appearing on the existing photos due to changes after aerial photography will be considered during the field identification work.
4. Intervals of contour lines for contoured map are as follows:
  - a. Flat Area : 2 m contour intervals
  - b. Other Area : 4 m contour intervals

*n.d.*

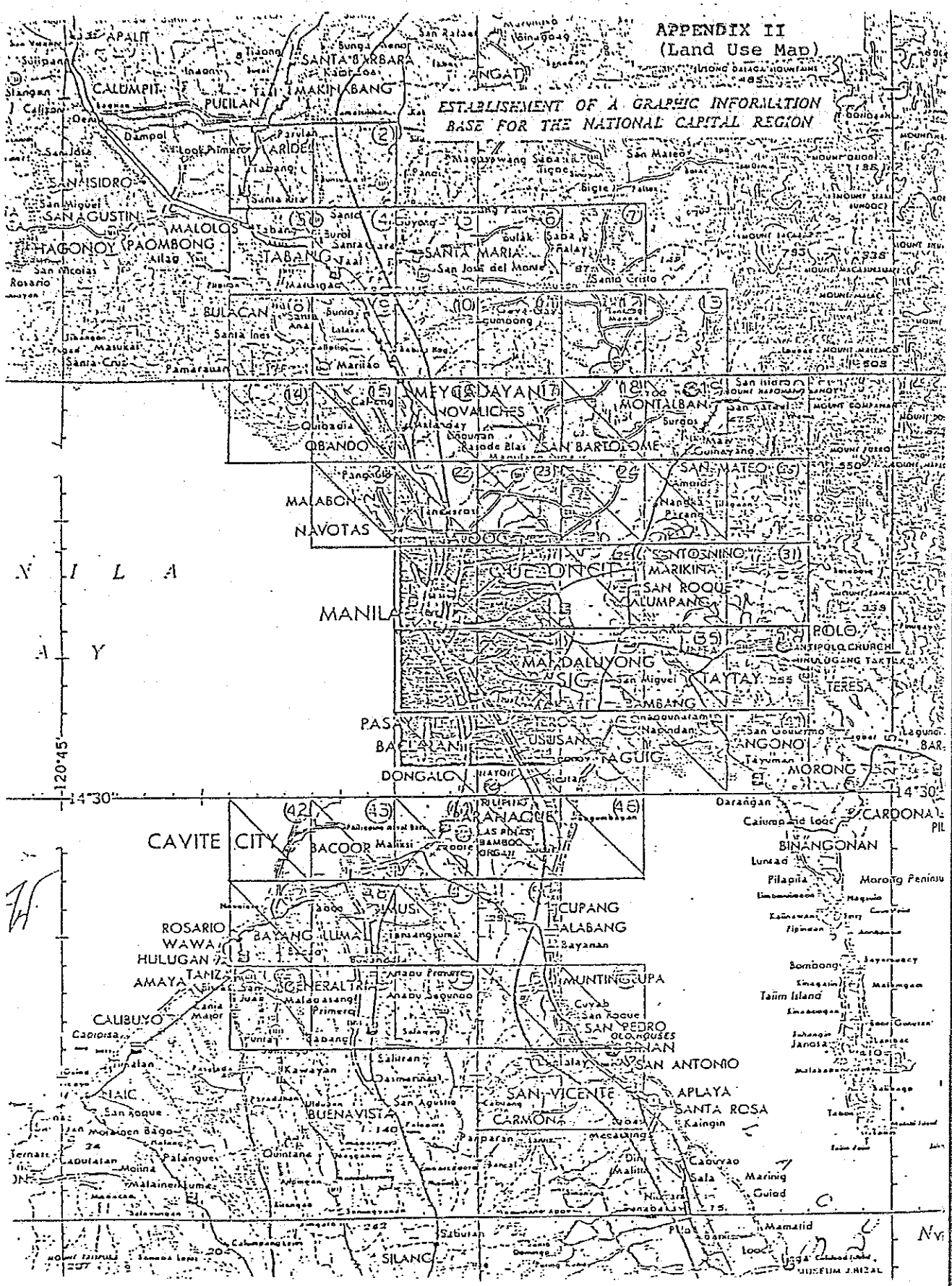
5. The team explained the budgetary difficulties to produce land condition map, BCGS still requested to include an area of approximately 484 KM<sup>2</sup> as the final result of the study.
6. As for the symbols of contoured map, the team handed over the draft of the symbols to BCGS and requested to have the comments of BCGS by the time of next mission's arrival.
7. Draft of undertaking of both sides were agreed as shown in Appendix III.
8. The Study Team requested BCGS to carry out leveling survey of an area of land subsidence with length of about 50 KM by the end of February.
9. Draft of Implementing Arrangement (I/A) was agreed by both sides except the matter of land condition map.

*W*

*n.2.*

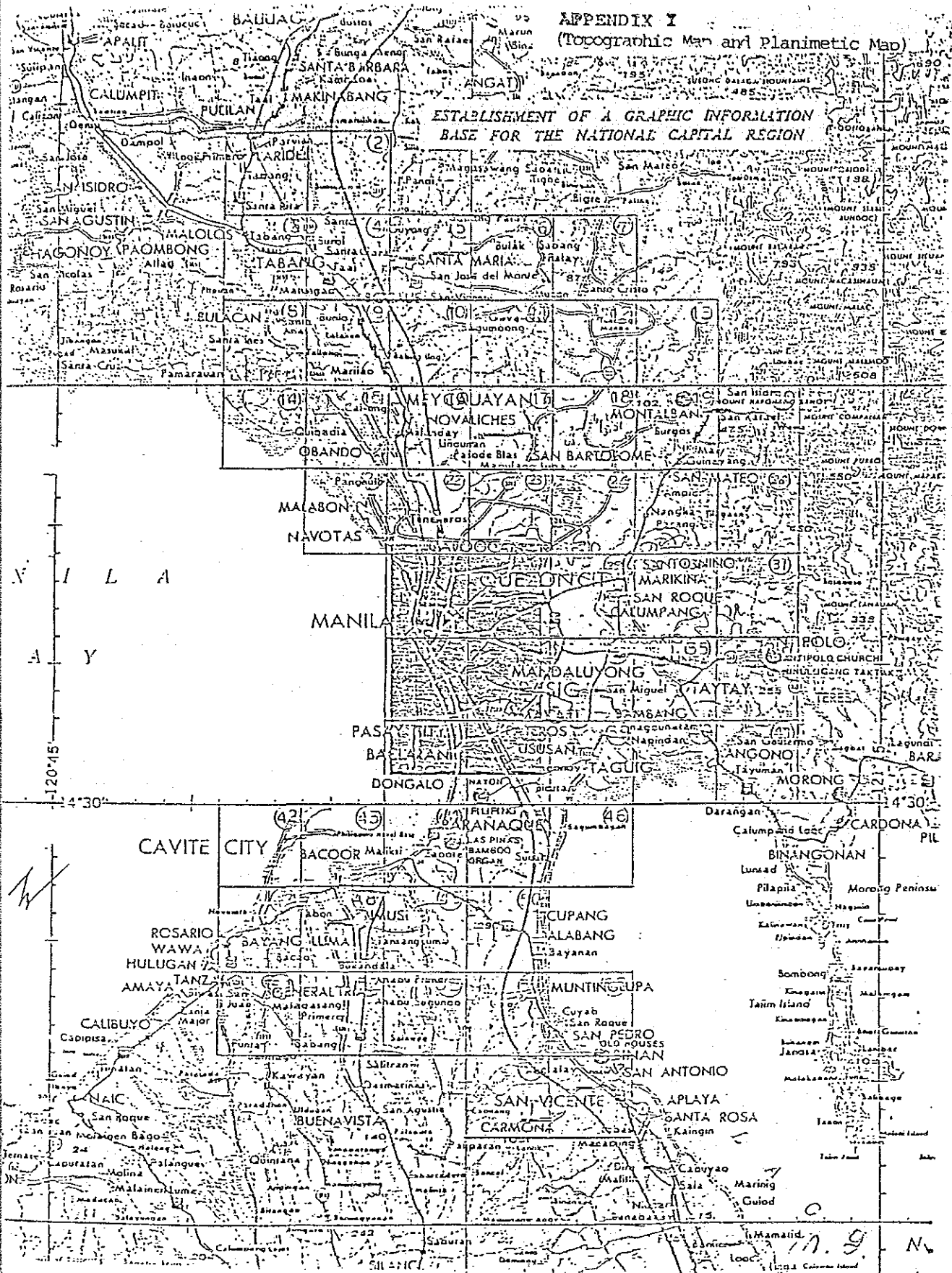
APPENDIX II  
(Land Use Map)

ESTABLISHMENT OF A GRAPHIC INFORMATION  
BASE FOR THE NATIONAL CAPITAL REGION



APPENDIX Y  
(Topographic Map and Planimetric Map)

ESTABLISHMENT OF A GRAPHIC INFORMATION  
BASE FOR THE NATIONAL CAPITAL REGION



APPENDIX III

I. UNDERTAKING OF THE GOVERNMENT OF THE PHILIPPINES

In accordance with the Notes Verbales exchanged between Government of Japan (hereinafter referred to as "GOJ") and Government of the Philippines (hereinafter referred to as "GOP"), GOP shall accord privileges, immunities and other benefits to the Japanese Study Team and, through the authorities concerned, measures to facilitate smooth conduct of the Study.

1. GOP shall be responsible for dealing with claims which may be brought by the third parties against the members of the Japanese Study Team and shall hold them harmless in respect of claims or liabilities arising in the course of or otherwise connected with the discharge of their duties in the implementation of the Study, except when such claims and liabilities arise from the gross negligence or willful misconduct of the above-mentioned members.
2. The BCGS shall, at its own expense, provide the Japanese Study Team with the following in cooperation with other agencies concerned.
  - a. Available data and information related to the Study

- b. Counterpart personnel
  - c. Administrative and technical support staff
  - d. Suitable office space with necessary office equipment, furniture, and telephone in Manila
  - e. Credentials or identification cards to the members of the Study Team
  - f. Appropriate number of vehicles with drivers
  - g. The monuments for the new control points, if necessary
  - h. Necessary facilities for processing the aerial photographs
  - i. Information of the necessary administrative boundary and geographical names on the maps, at its full responsibility
3. The BCGS shall make necessary arrangements with the government and non-governmental organizations for the following:
- a. to secure the safety of the Japanese Study Team;
  - b. to permit the members of the Japanese Study Team to enter, leave and sojourn in the Philippines for the duration of their assignment therein;
  - c. to exempt the members of the Japanese Study Team from taxes, duties, fees and other charges on equipment, machinery and other materials brought into the Philippines for the conduct of the Study;

- d. to exempt the members of the Japanese Study Team from income tax and charges of any kind imposed on or in connection with any emolument or allowance paid to the members of the Japanese Study Team for their services in connection with the implementation of the Study;
- e. to provide necessary facilities to the Japanese Study Team for remittance as well as utilization of the funds introduced into the Philippines from Japan in connection with the implementation of the Study;
- f. to secure permission for entry into private properties or restricted areas for the conduct of the Study;
- g. to secure permission to take all data and documents related to the Study out of the Philippines to Japan by the Study Team when real photographs are needed, BCGS trainees will bring them to Japan;
- h. to provide medical services as needed and its expenses will be chargeable on members of the Japanese Study Team.

II. UNDERTAKING OF GOJ

In accordance with the Notes Verbales exchanged between GOJ and GOP, GOJ, through JICA, shall take the following measures for the implementation of the Study:

1. to dispatch, at its own expense, study teams to the Philippines;
2. to pursue technology transfer to the Philippine counterpart personnel in the course of the Study;
3. to provide the following equipment and machinery for the implementation of the Study as listed in attached paper which will remain in the property of JICA unless otherwise agreed.

III. CONSULTATION

JICA and BCGS shall consult with each other in respect of any matter that may arise from or in connection with the Study.



ATTACHED PAPER

LIST OF EQUIPMENTS TO BE USED FOR FIELD SURVEY  
BY THE JAPANESE SURVEY TEAM

1. Theodolites
2. Electro magnetic distance measuring equipments
3. Short wave transmitter receivers
4. Transceivers
5. Levels with staves
6. Electronic calculators
7. Camping materials including food stuff
8. Generators
9. Small instruments, office equipments and consumables

Note: Above mentioned equipments are subject to alteration.

LIST OF ATTENDANTS

BUREAU OF COAST AND GEODETIC SURVEY

1. Commodore Antonio P. Ventura  
Director
2. Captain Ananias A. Batilaran, Jr.  
Chief  
Operations Division
3. Commander Renato B. Feir  
Chief  
Planning Division
4. Mr. Ponciano C. Ciceron  
Chief  
Coastal Mapping and Special  
Projects Division
5. Mr. Gavino C. Angeles, Jr.  
Chief  
Chart and Map Production Division
6. Mr. Conrado Santos  
Chief  
Physical Science Division

NATIONAL ECONOMIC AND DEVELOPMENT  
AUTHORITY

1. Mrs. Ma. Resurrecion Suarez
2. Mr. Alfred Feliciano

EMBASSY OF JAPAN

1. Mr. Yoshitaka Motoda  
First Secretary

JICA MANILA OFFICE

1. Mr. Yuji Okazaki

JICA STUDY TEAM

1. Dr. Naomi Fujita  
Leader
2. Mr. Kenji Chujo  
Member
3. Mr. Toshio Hida  
Member
4. Mr. Seizo Kakishita  
Member

IMPLEMENTING ARRANGEMENT ON THE TECHNICAL COOPERATION  
BETWEEN  
THE JAPAN INTERNATIONAL COOPERATION AGENCY  
AND  
THE BUREAU OF COAST AND GEODETIC SURVEY  
FOR THE ESTABLISHMENT OF GRAPHIC INFORMATION BASE PROJECT  
OF THE NATIONAL CAPITAL REGION IN THE REPUBLIC OF THE PHILIPPINES

AGREED BETWEEN

THE JAPAN INTERNATIONAL COOPERATION AGENCY

AND

THE BUREAU OF COAST AND GEODETIC SURVEY

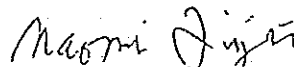
Dated: March 26, 1985  
In Manila, Philippines

FOR THE BUREAU OF COAST AND  
GEODETIC SURVEY



Commo. Antonio P. VENTURA  
Director of BCGS (Ret.)

FOR THE JAPAN INTERNATIONAL  
COOPERATION AGENCY



Dr. Naomi FUJITA  
Leader of Japanese Prelimi-  
nary Study Mission

IMPLEMENTING ARRANGEMENT ON THE TECHNICAL COOPERATION  
BETWEEN  
THE JAPAN INTERNATIONAL COOPERATION AGENCY  
AND  
THE BUREAU OF COAST & GEODETIC SURVEY  
FOR THE ESTABLISHMENT OF GRAPHIC INFORMATION BASE PROJECT  
OF THE NATIONAL CAPITAL REGION IN THE REPUBLIC OF THE PHILIPPINES

I. INTRODUCTION

In response to the request of the Government of the Republic of the Philippines (hereinafter referred to as "GOP"), the Government of Japan (hereinafter referred to as "GOJ") has decided to conduct the Establishment of Graphic Information Base Project of the National Capital Region (hereinafter referred to as "the Study") and exchanged the Notes Verbales with GOP concerning the implementation of the Study.

The Japan International Cooperation Agency (hereinafter referred to as "JICA"); the official agency responsible for the implementation of technical cooperation programmes of GOJ, will undertake the Study, in accordance with the relevant laws and regulations in force in Japan.

On the part of GOP, the Bureau of Coast & Geodetic Survey (hereinafter referred to as "BCGS") shall act as counterpart agency to the Japanese study team and also as coordinating body in relation with other governmental and non-governmental organizations concerned for the smooth implementation of the Study.

The present document constitutes the implementing arrangements between JICA and BCGS under the above-mentioned Notes Verbales exchanged between the two governments.

II. OBJECTIVES OF THE STUDY

The objectives of the Study are as follows:

- (1) To prepare Contoured Map (1/10,000), and Planimetric Map (1/10,000) covering an area of approximately 1,500 km<sup>2</sup>; (see APPENDIX I-1)
- (2) To prepare Land Use plan (1/10,000) covering an area of approximately 823 km<sup>2</sup>. (see Appendix I-2).

- (3) To prepare Land Condition Plan (1/10,000) covering an area of approximately 484 km<sup>2</sup> (see Appendix I-3).

Maps mentioned above are produced by using aerial photographs (1/32,000) possessed by GOP.

### III. SCOPE OF THE STUDY

In order to achieve the above mentioned objectives, the Study will cover the following items. (The technical details are as shown in APPENDIX V.)

#### 1. Ground Control Point Survey

##### 1.1 Triangulation and Traversing

Minor horizontal control points, necessary for aerial triangulation and mapping work, shall be established by triangulation or traverse.

##### 1.2 Leveling

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

Monumentation of new control points shall be done if necessary

#### 2. Pricking

Pricking of control points on the aerial photographs shall be done in the field for aerial triangulation.

#### 3. Field Identification

The topographic information related to land use, vegetations, etc. shall be verified in the field using the aerial photographs. Geographical names to be expressed on the maps shall also be identified in the field and the gazetteer.

The Land Use Plan is envisioned to present the existing zoning districts (like residential, commercial and industrial), vegetations, institutional facilities (like hospital, churches and government building), roads and others.

The Land Condition Plan is to portray the landform classification.

Main topographic information not appearing on the existing photos due to changes after aerial photography will be considered during the field identification work.

4. Aerial Triangulation  
Aerial triangulation shall be carried out by analytical method. Adjustment shall be carried out by block adjustment method.
5. Stereo Plotting  
Stereo plotting shall be carried out using stereo plotting instruments at scale of 1/10,000.
6. Field Completion  
Topographic features, vegetation, etc. which cannot be properly identified or stereo plotted shall be verified in the field and plotted on the compilation sheet. Administrative boundaries and geographical names shall be verified and indicated on the paper copy of the compilation sheet by BCGS.
7. Drafting  
Based on the compiled sheet, scribing shall be carried out on the stable polyester base for each of the six colour separation plates. Map style and symbols shall be those adopted by BCGS.
8. Printing  
Plate making shall be carried out using 1/10,000 scribed negatives, and printing shall be carried out by the off-set method.

#### IV. STUDY SCHEDULE

The whole work will be conducted in accordance with the time schedule (see Appendix II).

#### V. REPORTS AND FINAL RESULTS

A report shall be presented to GOP by JICA every fiscal year (from April to March).

The materials mentioned in Appendix III will be submitted to the GOP by GOJ after having completed the whole work, and

they shall belong to GOP.

All maps produced under this project shall bear at the lower margin the following:

This map was produced under a cooperative undertaking between the Government of the Republic of the Philippines and the Government of Japan.

## VI. UNDERTAKING OF GOP

In accordance with the Note Verbale exchanged between GOJ and GOP, GOP shall accord privileges, immunities and other benefits to the Japanese Study Team and, through the authorities concerned take necessary measures to facilitate smooth conduct of the Study.

1. GOP shall be responsible for dealing with claims which may be brought by third parties against members of the Japanese Study Team and shall hold them harmless in respect of claims or liabilities arising in the course of or otherwise connected with the discharge of their duties in the implementation of the Study, except when such claims or liabilities arise from gross negligence or willful misconduct of the above-mentioned members.
2. The BCGS shall, at its own expense, provide the Japanese Study Team with the following in cooperation with other agencies concerned.
  - (1) Available data and information related to the Study
  - (2) Counterpart personnel
  - (3) Administrative and technical support
  - (4) Suitable office space with necessary office equipment, furniture, and telephones in Manila
  - (5) Credentials or identifications cards to the members of the Study Team
  - (6) Appropriate number of vehicles with drivers
  - (7) Monuments for the new control points, if necessary
  - (8) Levelling survey in the whole area of the project, necessary for photo-control
  - (9) Triangulation survey in the southern part of the project, necessary for aerial triangulation
  - (10) Necessary facilities for processing the aerial photographs
  - (11) Information of the necessary administrative boundary and geographical names on the maps, at its full responsibility

3. The BCGS shall make necessary arrangements with the government and non-governmental organizations for the following:

- (1) To secure the safety of the Japanese Study Team;
- (2) To permit the members of the Japanese Study Team to enter, leave and sojourn in the Philippines for the duration of their assignment therein;
- (3) To exempt the members of the Japanese Study Team from taxes, duties, fees and other charges on equipment, machinery, and other materials brought into the Philippines for the conduct of the Study;
- (4) To exempt the members of the Japanese Study Team from income tax and charges of any kind imposed on or in connection with any emolument or allowances paid to the members of the Japanese Study Team for their services in connection with the implementation of the Study;
- (5) To provide necessary facilities to the Japanese Study Team from remittance as well as utilization of the funds introduced into the Philippines from Japan in connection with the implementation of the Study;
- (6) To secure permission for entry into private properties or restricted areas for the conduct of the Study.
- (7) To secure permission to take all data and documents related to the Study out of the Philippines to Japan by the Study Team. When aerial photographs are needed, BCGS trainees will bring them to Japan.
- (8) To provide medical services as needed and its expenses will be chargeable on members of the Japanese Study Team.

#### VII. UNDERTAKING OF GOJ

In accordance with the Note Verbale exchanged between GOJ & GOP, GOJ through JICA, will take the following measures for the implementation of the Study.

1. To dispatch, at its own expense, Study team to the Philippines.

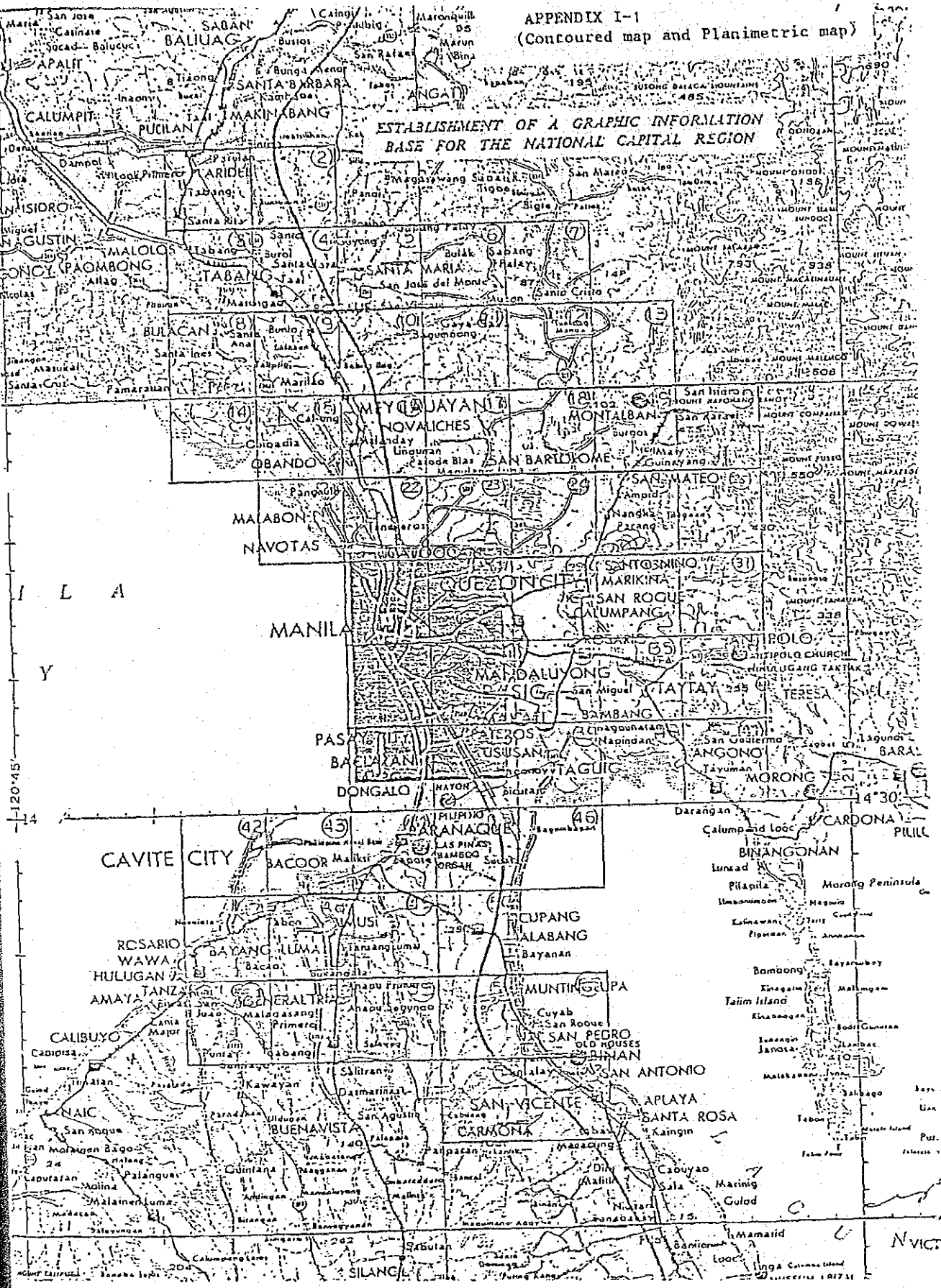


2. To pursue technology transfer to the Philippine counterpart personnel in the course of the Study.
3. To provide the following equipment and machinery for the implementation of the Study as listed in APPENDIX IV, which will remain in the property of JICA unless otherwise agreed.

#### V. CONSULTATION

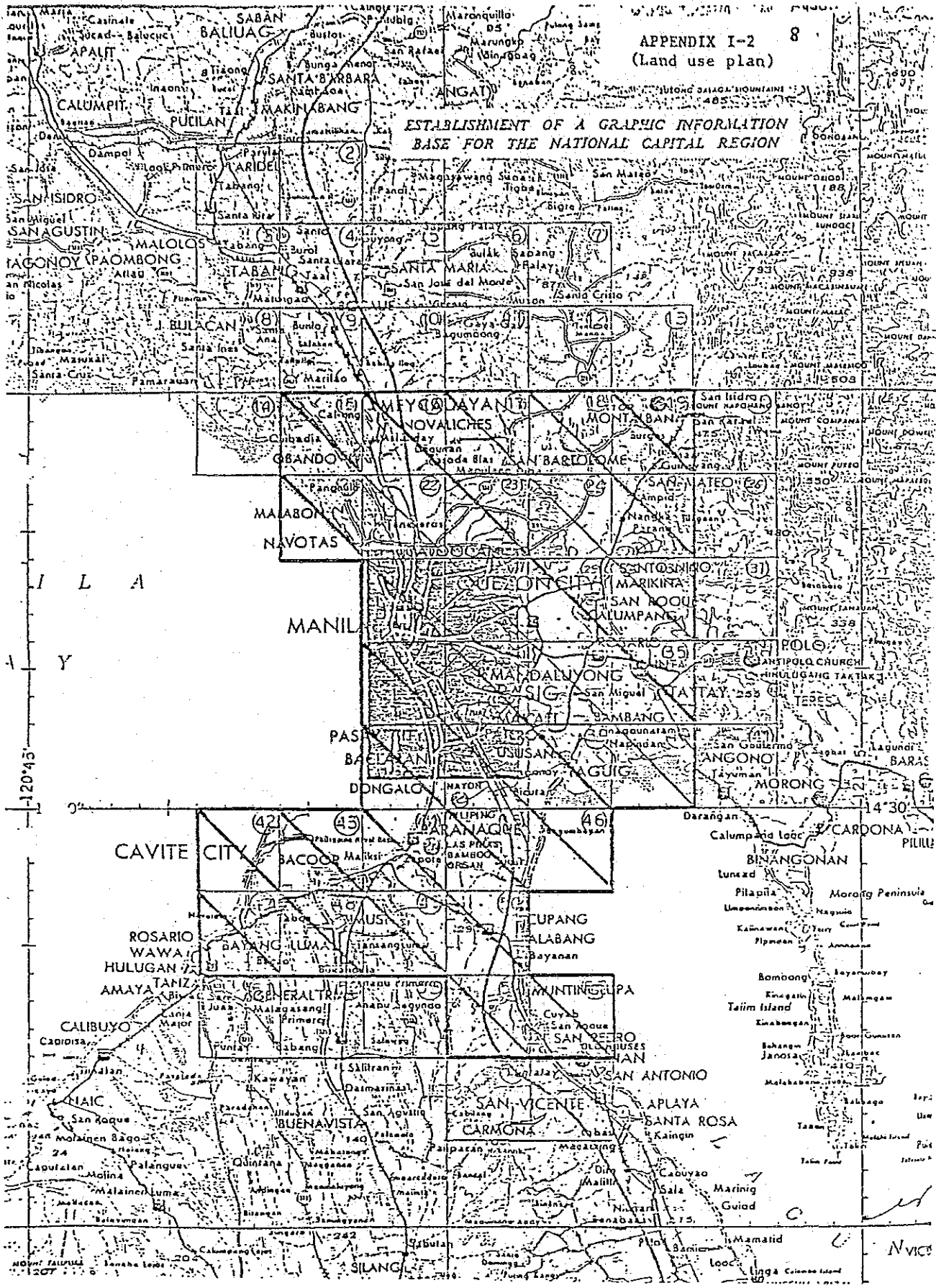
JICA and BCGS consult with each other in respect of any matter that may arise from or in connection with the Study.

APPENDIX I-1  
(Contoured map and Planimetric map)

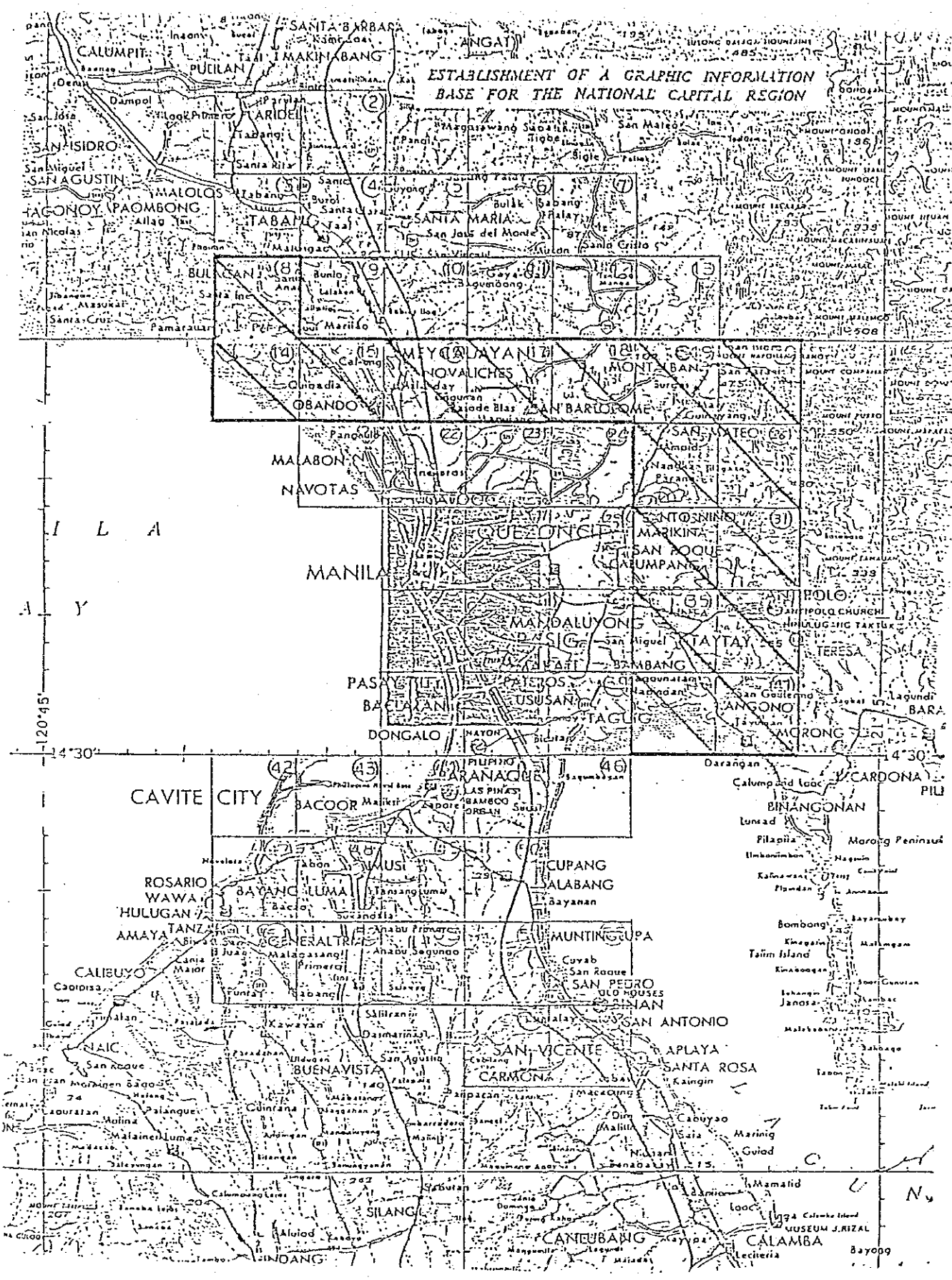


APPENDIX I-2 8  
(Land use plan)

ESTABLISHMENT OF A GRAPHIC INFORMATION  
BASE FOR THE NATIONAL CAPITAL REGION



ESTABLISHMENT OF A GRAPHIC INFORMATION  
BASE FOR THE NATIONAL CAPITAL REGION



APPENDIX II

TENTATIVE SCHEDULE

ITEM	1st year	2nd year	3rd year	4th year
	Apr. 1985 - Mar. 1986	Apr. 1986 - Mar. 1987	Apr. 1987 - Mar. 1988	Apr. 1988 - Mar. 1989
GROUND CONTROL POINT SURVEY	4 5 6 7 8 9 10 11 12 1 2 3	4 5 6 7 8 9 10 11 12 1 2 3	4 5 6 7 8 9 10 11 12 1 2 3	4 5 6 7 8 9 10 11 12 1 2 3
PRICKING				
FIELD IDENTIFICATION				
- DITTO - (LAND CONDITION)				
AERIAL TRIANGULATION				
STEREO PLOTTING (and EDITING)				
- DITTO - (LAND USE & CONDITION)				
FIELD COMPLETION				
- DITTO - (LAND USE & CONDITION)				
DRAFTING - PRINTING				
- DITTO - (LAND USE & CONDITION)				

NOTE: : Work in the Philippines  
 : Work in Japan

*ey*

APPENDIX III

FINAL RESULTS

- I. Ground Control Point Survey
  - 1. Horizontal control results
  - 2. Vertical control results
  - 3. Computation sheets
  - 4. Field Notes
  - 5. Description of points
  
- II. Contoured Mapping
  - 1. Aerial triangulation results
  - 2. Colour separation scribed sheets
  - 3. 1/10,000 Contoured maps (1,000 copies)
  - 4. Pricked photos
  - 5. Original manuscripts
  - 6. 1/10,000 Planimetric maps w/ 30" grid (1,000 copies)
  
- III. Land Use Plan
  - 1. Colour separation scribed sheets
  - 2. 1/10,000 Land use plans (1,000 copies)
  - 3. Original manuscripts
  
- IV. Land Condition Plan
  - 1. Colour separation scribed sheets
  - 2. 1/10,000 Land condition plans (1,000 copies)
  - 3. Original manuscripts

APPENDIX IV

LIST OF EQUIPMENTS TO BE USED FOR FIELD SURVEY  
BY THE JAPANESE SURVEY TEAM

1. Theodolites
2. Electro magnetic distance measuring equipments
3. Short waves transmitter receivers
4. Transceivers
5. Levels with staves
6. Electronic calculators
7. Camping materials including food staff
8. Generators
9. Small instruments, office equipments and consumables

Note: Above mentioned equipments are subject to alteration.

APPENDIX V

TECHNICAL DETAILS

I. SPECIFICATIONS

Major specifications of this Project are:

1. Ground Control Point Survey  
Specifications for 3rd order control point survey in the Technical Manual of Overseas Surveying of JICA (hereinafter referred to as TM of JICA).
2. Leveling survey for minor height control point.  
Specifications for 4th order leveling survey in TM of JICA.
3. Monument  
Subject to the specification of BCGS.
4. Mapping  
B class mapping specifications for planimetry in TM of JICA  
A class mapping specifications for height in TM of JICA.
5. Reference Ellipsoid: Clarke Spheroid of 1866
6. Vertical Datum: Mean Sea Level (Manila Tidal Station)
7. Projection:  
Universal Transverse Mercator Projection
8. Contour Lines:  
2 meter contour intervals for flat area, and 4 meter contour intervals for others.
9. Format: 3' x 3' for Contoured Map,  
Planimetric Map, Land Use Plan, and Land Condition Plan



II. ACCURACY (Standard deviation)

Accuracy of above-mentioned surveys shall be:

- 1) Horizontal control survey

$$\frac{\sqrt{\Delta X^2 + \Delta Y^2}}{S} = \frac{1}{25,000}$$

- 2). Vertical control survey

20 mm  $\sqrt{S}$                       S: distance in Km.

- 3). Mapping

Planimetry                       $\pm$  1 mm on the map

Spot Height                       $\frac{\Delta h}{3}$                        $\Delta h$ : main contour interval

Contour                       $\frac{\Delta h}{2}$

MINUTES OF DISCUSSIONS

ON

"THE ESTABLISHMENT OF A GRAPHIC INFORMATION BASE  
FOR THE NATIONAL CAPITAL REGION"

BETWEEN

THE JAPAN INTERNATIONAL COOPERATION AGENCY

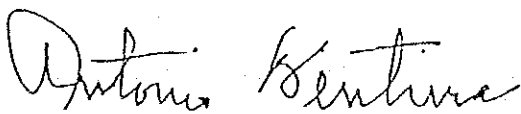
AND

THE BUREAU OF COAST AND GEODETIC SURVEY

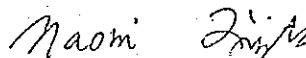
Dated: 28th March 1985  
in Manila, Philippines

FOR THE BUREAU OF COAST AND  
GEODETIC SURVEY

FOR THE JAPAN INTERNATIONAL  
COOPERATION AGENCY



Commodore Antonio P. VENTURA  
Director of BCGS



Dr. Naomi FUJITA  
Leader of Japanese Preliminary  
Study Team

The Japanese Preliminary Study Team organized by JICA and headed by Dr. Fujita, visited the Republic of the Philippines from 21st to 29th March, 1985 to exchange views and opinions with representatives of BCGS for formulating an Implementing Arrangement on the captioned Study.

After a series of joint meetings, the BCGS and the study team agreed on the following items:

- 1) The symbols of contoured map and the categories of land use and land condition plan are in principle as shown in Appendix I
- 2) In items 2. (8) and (9) of paragraph III in I/A BCGS shall provide the result of survey in the area before start of pricking work.
- 3) BCGS shall be responsible for drawing of bathymetric lines, rock awash, wrecks and sewerage outfalls on manuscript sheets.
- 4) BCGS shall provide information concerning the location and classification of theatre and cinema, schools, health centers, hotels and vertical clearances of overpasses.
- 5) Only identified benchmarks on aerial photographs shall be drawn on the map.
- 6) BCGS shall provide counterpart personnel to each Japanese field survey group in the course of the field survey.
- 7) Japanese side shall provide the technical guidance for proper use and efficient production of 1/10,000 contoured

map, land use plan and land condition plan.

- 8) Any amendment, addition or deletion that may come up later during the implementation of the Project shall be by mutual agreement of both parties.
- 9) Other matters
  - a. The BCGS and JICA Teams conducted reconnaissance survey in various parts of Metro Manila to make an appraisal of the bench marks previously established by the BCGS.
  - b. BCGS made arrangement and accompanied the Japanese team for visits to various surveying and mapping agencies of the government and the private sectors.

LIST OF ATTENDANTS

BUREAU OF COAST & GEODETIC SURVEY

JICA STUDY TEAM

- |   |                               |
|---|-------------------------------|
| 1. Commodore Antonio P. Ventura<br>Director   | 1. Dr. Naomi Fujita<br>Leader |
| 2. Capt. Ananias A. Batilaran, Jr.<br>Chief<br>Operations Division                      | 2. Mr. Toshio Hida<br>Member  |
| 3. Commander Renato B. Feir<br>Chief<br>Planning Division                               | 3. Mr. Mitsuo Iwase<br>Member |
| 4. Mr. Ponciano C. Ciceron<br>Chief<br>Coastal & Mapping & Special<br>Projects Division |                               |
| 5. Mr. Gavino C. Angeles, Jr.<br>Chief<br>Chart & Map Production Division               |                               |
| 6. Mr. Conrado Santos<br>Chief<br>Physical Science Division                             |                               |

GRAPHIC INFORMATION BASE FOR NATIONAL CAPITAL REGION

(LAND USE & LAND COVER)

Category I	Category II	Category III
Urban & Inhabited Area	Residential District	Multistory Housing Residential Temporal Housing Inhabited
	Commercial Business District	Business Commercial Mixed Commercial Residential
	Industrial District	Large Scale Industry  Small Scale Industry Mixed Industry-Residential
	Public & Official District	Governmental Business Education-Culture Health & Welfare Park & Recreational Religious/Cemetery
	Facilities	Transportation Utility Sport & Athletic Military

forest & Farm Area	Agricultural & Land Area	Rice Field Crop Land Plantation Salt Sed Agro-Industrial
	Forest	Forest Grass Land Bare land
Others	Water Sphere	Sea, Lake, River Fish Pond
	Under- Construction	Open Space

GRAPHIC INFORMATION BASE FOR NATIONAL CAPITAL REGION

LAND FORM CLASSIFICATION)

(Draft) 1.

Category I	Category II	
Mountain Slope	Gentle Steep Very Steep	
Volcano Slope	Gentle Steep Very Steep	
Unstable Slope	Cliff Collapse Baldness & bare rock Land slide	
Terrace & Table land	High Middle Low	
Piedmont aggraded	Debris avalanche	
Lowland, relatively higher & well drained	Alluvial fan Natural levee Sand dune Sand bank	
Lowland, general sur- face	Valley plain Coastal plain or Delta Former river bed	



Submersible land surface	High water river bed Low water river bed Tidal flat	
Water sphere	River & shore line	
Artificially deformed	Cut & rolled surface Cutting Banked up Filled up Drainage Reclamated land	
Topographical line	Ridge line Valley line	
Boundary line	Under construction Indistict boundary Landform line	



# SPECIFICATIONS AND SYMBOLS FOR METRO MANILA CONTOUR MAP 1:10,000

APPENDIX I

CONTROL POINTS		RAILWAY FEATURES		WATER and ASSOCIATED FEATURES		CONTOURS	
Horizontal Control Station 0.2	$\Delta 123.4$	National Railway 1.0	Black	Bank 0.5	Memorial Park, Cemetery 0.5	Fishpond 0.2	Blue
Vertical Control Station (Identifiable) 0.2	$\Delta 123.45$	Private Railway 1.0	Black	Hotel (Three Stars) 0.5	Alonzo South Cemetery 0.5	Fishpen 0.2	Blue
Spot Height 0.4	$\Delta 123.45$	Under Construction 1.0	Black	Market & Prominent Store 0.5		Silt Bed 0.2	Blue
Direct Levelling Point 0.4	$\Delta 123.45$	Level Crossing 1.0	Black	Factory and Works 0.5			Blue
		Overpass 1.0	Black	Helipad 0.5			Blue
		Underpass 1.0	Black	Theatre and Cinema (Prominent) 0.5			Blue
BOUNDARIES		BUILDINGS		BRIDGES		VEGETATION	
Provincial Boundary 0.3		Railway Station 0.25	Grey	Bridge 0.2	Black	Broadleaf 0.2	Green
City or Municipal Boundary 0.2		Independent Buildings & House 0.15	Grey	Small Bridge / Culvert 0.2	Black	Bushes/Scrub 0.2	Green
Regional Boundary 0.2		Congested Housing Area 0.15	Grey	Ferry / Ford 0.2	Black	Mixed Scrub & Brodiaea 0.2	Green
ROADS		BUILDINGS		BRIDGES		VEGETATION	
Divided Highway/Expressway 0.25-20%	Red	Prominent Building 0.25	Grey	Bridge 0.2	Black	Rice Fields 0.2	Blue
National Highway 0.2	Red	Independent Buildings & House 0.15	Grey	Small Bridge / Culvert 0.2	Black	Cropland Agricultural Land 0.2	Green
Provincial Road 0.2	Red	Congested Housing Area 0.15	Grey	Ferry / Ford 0.2	Black	Plantation / Orchard 0.2	Green
Barangay Road 0.1	Red	Ruins 0.1	Grey	Ferry / Ford 0.2	Black	Mangrove 0.2	Dot Screen
Barangay Road 0.1	Red	Temporary Squatter Areas 0.15	Grey	Ferry / Ford 0.2	Black	Nipa 0.2	Blue
Barangay Road 0.25	Red	Building Minimum 0.15	Grey	Ferry / Ford 0.2	Black	Tropical Grass 0.2	Green
ROADS		BUILDINGS		BRIDGES		VEGETATION	
Trod 0.25	Red	PUBLIC BUILDING (Symbol) 2.5	Red	Bridge 0.2	Black	Bamboo 0.2	Green
Road Under Construction 0.15	Red	Government Building 3.0	Red	Bridge 0.2	Black	Spring / Hot Spring 0.2	Amaretta
Side Walk 0.1	Red	Police Station 2.0	Red	Bridge 0.2	Black	Chonast/Canal 0.2	
Grade Separation 0.5	Red	Fire Station 2.0	Red	Bridge 0.2	Black	Flood Gate 0.2	
Crossing 0.5	Red	Post Office 2.0	Red	Bridge 0.2	Black	Dom 0.2	
Pedestrian Overpass 0.5	Red	Manila Water Supply & Sewage MWSS	Red	Bridge 0.2	Black	Well 0.2	
Pedestrian Underpass 0.5	Red	School 2.0	Red	Bridge 0.2	Black	Lake/Pond 0.2	
Toll Gate 0.5	Red	Hospital 2.0	Red	Bridge 0.2	Black	Ditch 0.2	
		Church/Mission 2.0	Red	Bridge 0.2	Black	Swamp/Marsh 0.2	
		Mosque/Minaret 2.0	Red	Bridge 0.2	Black	Tidal Flat 0.2	
		Embassy 2.0	Red	Bridge 0.2	Black	Reef / Coral 0.2	
		Health Center 2.0	Red	Bridge 0.2	Black	Mud 0.2	
		Temple 2.0	Red	Bridge 0.2	Black	Pipeline / Water Pipeline 0.2	
			Red	Bridge 0.2	Black	Siphon 0.2	
			Red	Bridge 0.2	Black	Rock Awash 0.2	
			Red	Bridge 0.2	Black	Wreck 0.2	
			Red	Bridge 0.2	Black	Sewerage Outfall 0.2	Blue
		PUBLIC BUILDING (Symbol)		MISCELLANEOUS LANDMARK FEATURES		RELIEF and ASSOCIATED FEATURES	
		Government Building 3.0	Red	Storage Tank 0.5	Red	Cutting 0.2	Brown
		Police Station 2.0	Red	Tower, Radio Tower, Stack / Flagpoles 0.5	Red	Embankment 0.2	Brown
		Fire Station 2.0	Red	Power Transmission Line 1.0	Red	Slopes 0.2	Brown
		Post Office 2.0	Red	Lighthouse 0.5	Red	Quarry 0.2	Brown
		Manila Water Supply & Sewage MWSS	Red	Cave 0.5	Red	Depression 0.2	Brown
		School 2.0	Red	Mine 0.5	Red	Cliff 0.2	Black
		Hospital 2.0	Red	Water Tank / Stand Pipe 0.5	Red	Rockoutcrop Area 0.2	Brown
		Church/Mission 2.0	Red	Monument 1.5	Red	Sand / Dunes 0.2	Brown
		Mosque/Minaret 2.0	Red	Wall / Fence 2.0	Red		
		Embassy 2.0	Red	Antiquity 2.0	Red		
		Health Center 2.0	Red	Parks 1.0	Red		
		Temple 2.0	Red	Revetment 2.0	Red		
			Red	Windmill 2.0	Red		

### LINE SIZES

0.1 mm	0.25
0.15	0.3
0.2	0.4
	0.6





JICA