

ESTABLISHMENT OF A GRAPHIC INFORMATION BASE FOR THE NATIONAL CAPITAL REGION

A. Importance and Objectives

The National Capital Region (Metro Manila) comprising of four (4) cities and thirteen (13) municipalities, is the economic and social center of the Philippines. The growth of human population in this region is so explosive that the natural quality of the environment has been disturbed or even destroyed. These environmental impacts include not only population growth but also high density urbanization, industrial expansion, undesirable land-use patterns, threat to health resource exploitation, air, water and noise pollution and other consequences to the environment. These problems does not only affect the whole area of the region but now also includes the outgoing municipalities.

To eliminate or reduce these environmental problems, every development project must require indepth analysis and assessment, which must be performed by a multi-disciplinary group of agencies. As a first step to attain these objective, there is a need to prepare/produce detailed and standardized plans of all natural and physical facilities in the region. These are envisioned to be graphically presented in the form of Land Condition and Land Use Plans.

The Land Condition Plan is intended to depict the type of soil, grade or slopes, surface descriptions, water sphere and drainage and others. This plan will be of tremendous help in flood control planning, design constructions, urban planning and maintenance, rehabilitation work and other activities.

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 plan will be important and necessary in planning for urban zoning, traffic routing, sanitation (including garbage collection and disposal) public utility, and others.

B. Area Coverage

	Area (sq. km.)	No. of Sheets	Remarks
1. Planimetric Map	1500	57	Annex 1
2. Land Use Plan	823	33	Annex 2
3. Land Condition Plan	1500	57	Annex 1
4. Topographic Maps	1500	57	Annex 1

C. FINAL DELIVERY ITEMS

	Scale
1. Planimetric Map	1:10,000
2. Land Use Plan	1:10,000
3. Land Condition Plan	1:10,000
4. Topographic Map	1:10,000

D. GEODETIC CONTROLS

1. Photo Controls

1.1 JICA shall be responsible for establishing the necessary controls required for photo-controls and aerial triangulation.

1.2 JICA shall be responsible for supplementing the primary level lines to satisfy the requirements for aerial triangulation.

E. PLOTTING REQUIREMENTS

1. Plotting scale for the required final results shall be made at scale 1:10,000.

2. Contour lines shall be at intervals of two (2) meters and supplementary of one (1) meter on flat areas.

3. Definitions

3.1 *Planimetric Maps* - Base maps that show the horizontal representation of features. This usually show roads, water limits, drainage, and natural features except contours and elevations. These are used as base for preparing land use and land condition plans.

3.2 *Topographic Maps* - Maps showing the positions of natural and artificial features and their elevations above a certain datum.

3.3 *Overprinting* - The process wherein additional information will be added to existing maps.

The proposed idea of overprinting is that when the maps are already printed additional informations like new roads, powerlines, public utilities and others can be superimposed on the existing maps. This process will be done by BCGS after receiving the final delivery items.

4. Detail Plotting Classification shall be as follows:

4.1 Planimetric map

a) Red - roads

b) Blue - coast line, lake coastal lines, rivers, water ways.

Topographic map

a) Red - roads

b) Blue - coast line, lake coastal lines, rivers, water ways.

c) Black - buildings, index contours, man made features, symbols and elevation points.

d) Green - vegetation delineation

e) Orange red - contour lines

5. Symbols

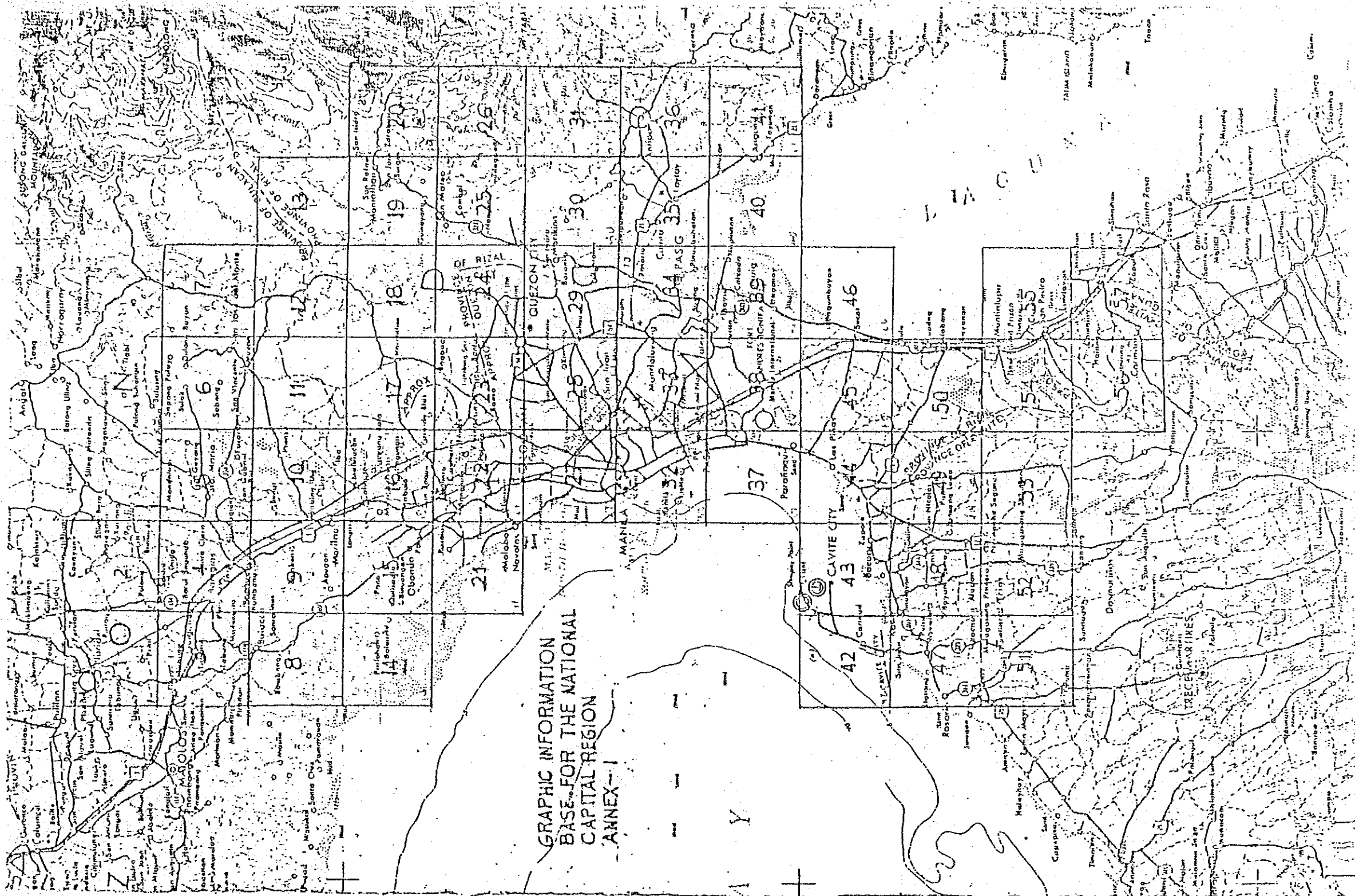
The symbols to be used for the required maps can use the existing symbols for the 1:10,000 maps of BCGS. These symbols were adopted from the symbols

used on the 1:25,000 Cagayan Valley topographic maps prepared by JICA. Symbols of features not found on existing specifications can be designed for use of the NCR and other urban areas.

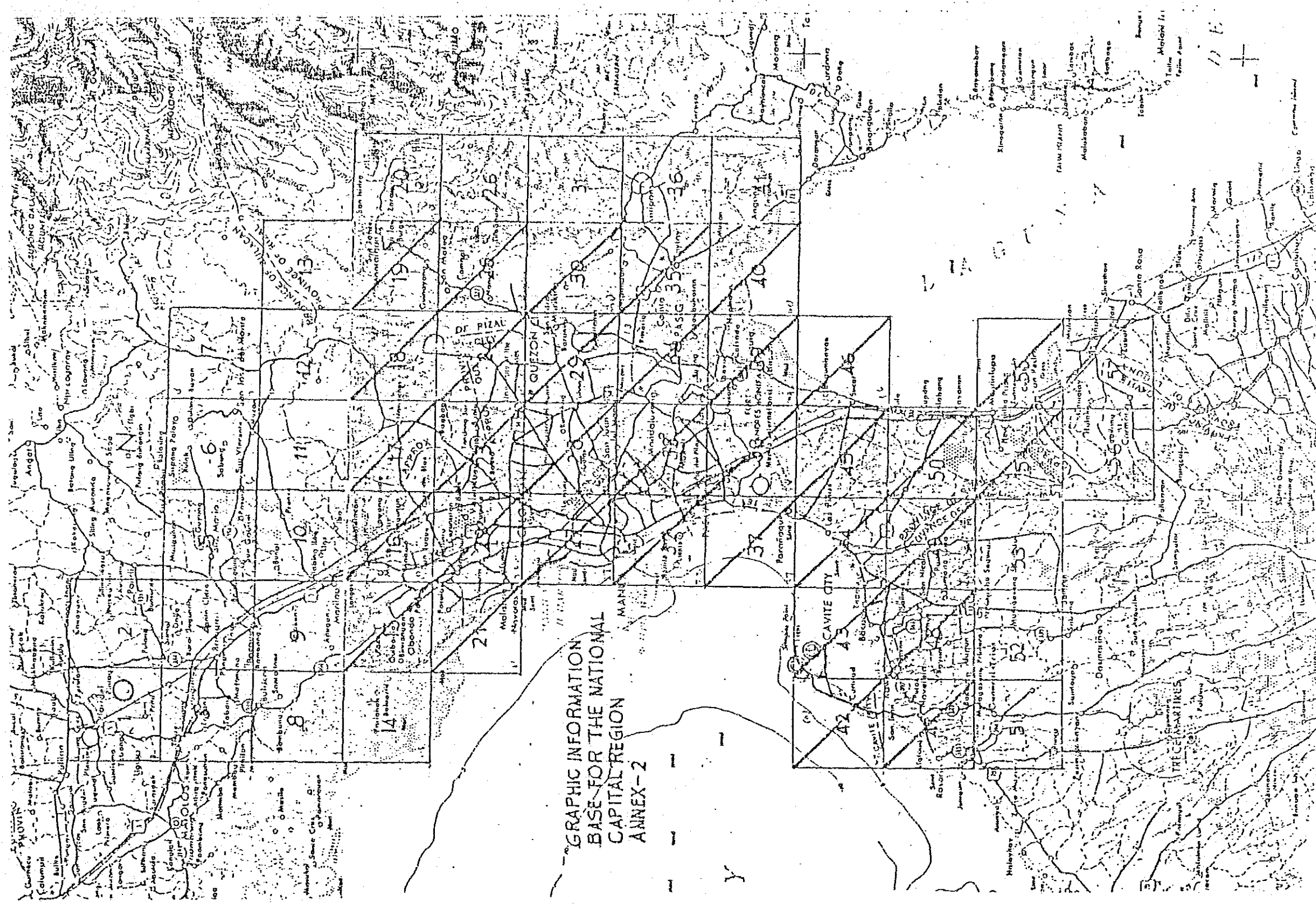
The symbols for the land use and land condition maps will be designed based on existing international standards.

F. SCHEDULE

	<i>First Year</i>	<i>Second Year</i>	<i>Third Year</i>
<i>Planimetric Map</i>			
<i>Topographic Map</i>			
<i>Land Use Survey</i>			
<i>Land Condition Survey</i>			



GRAPHIC INFORMATION
 BASE FOR THE NATIONAL
 CAPITAL REGION
 ANNEX-1



GRAPHIC INFORMATION
 BASE FOR THE NATIONAL
 CAPITAL REGION
 ANNEX-2

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

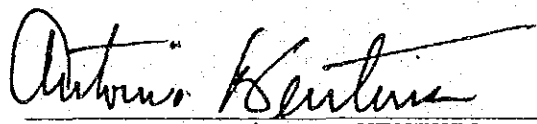
THE JAPAN INTERNATIONAL COOPERATION AGENCY

AND

THE BUREAU OF COAST AND GEODETIC SURVEY

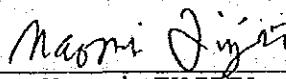
Dated: March 26, 1985
In Manila, Philippines

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

INPLEMENTING 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 km²; (see APPENDIX I-1)
- (2) To prepare Land Use plan (1/10,000) covering an area of approximately 823 km². (see Appendix I-2).

- (3) To prepare Land Condition Plan (1/10,000) covering an area of approximately 484 km² (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.

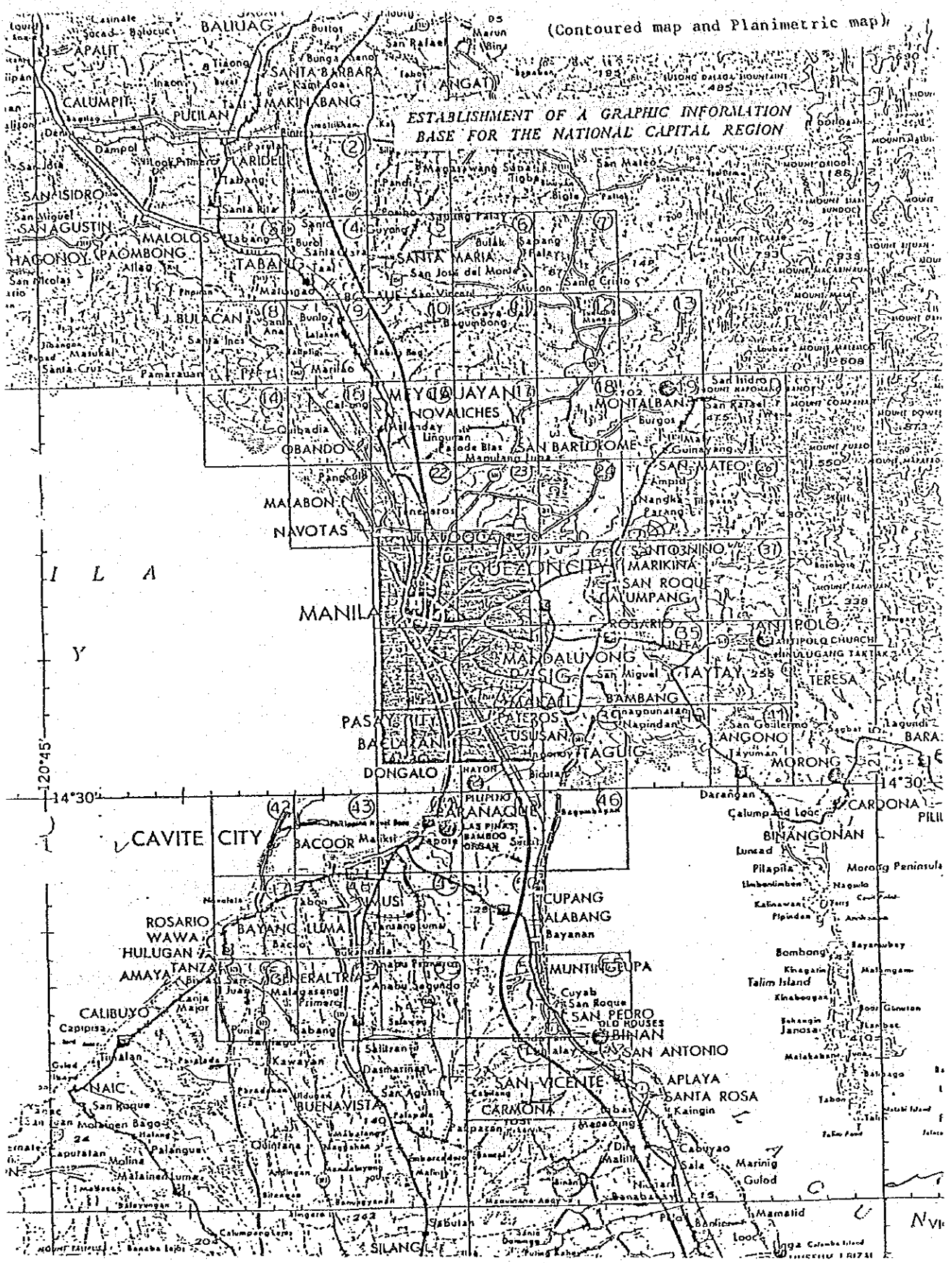
2. To pursue technology transfer to the Philippine counterpart personnel in the course of the Study.
3. To provide the following equipment and machinery for the implementation of the Study as listed in APPENDIX IV, which will remain in the property of JICA unless otherwise agreed.

V. CONSULTATION

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

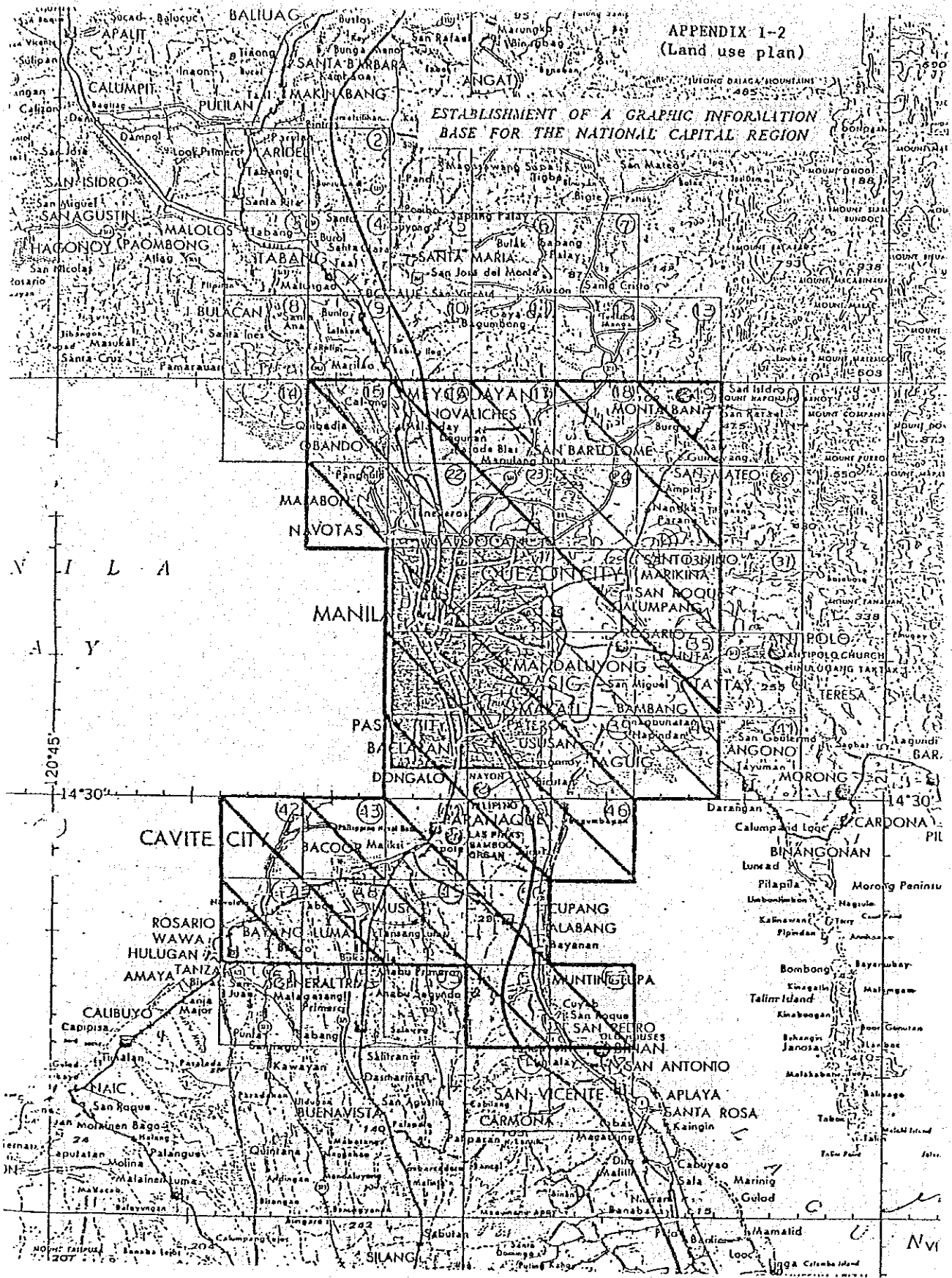
(Contoured map and Planimetric map)

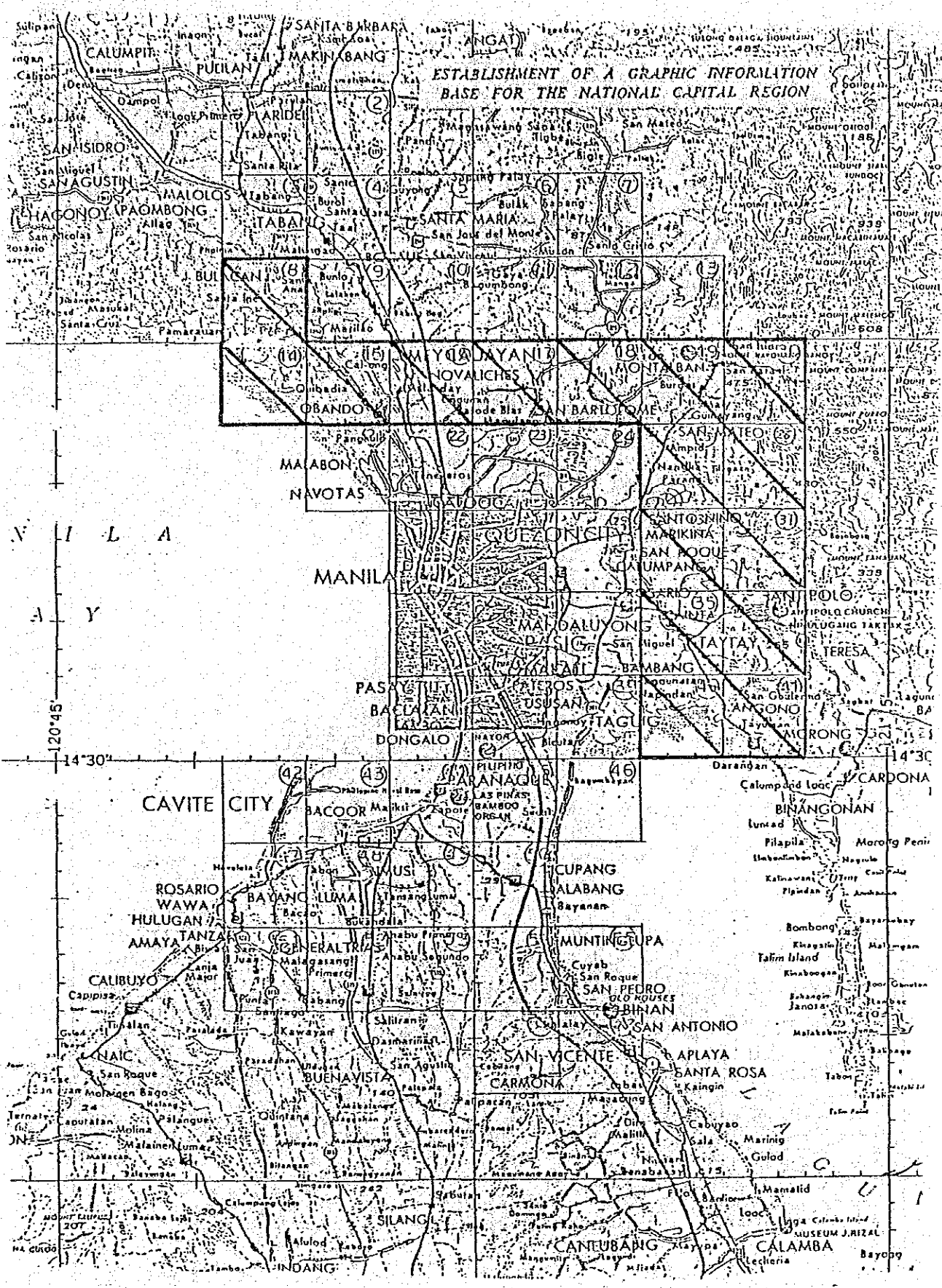
ESTABLISHMENT OF A GRAPHIC INFORMATION
BASE FOR THE NATIONAL CAPITAL REGION



APPENDIX 1-2
(Land use plan)

ESTABLISHMENT OF A GRAPHIC INFORMATION
BASE FOR THE NATIONAL CAPITAL REGION





TENTATIVE SCHEDULE

I T E M	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

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		± 1 mm on the map
Spot Height	$\frac{\Delta h}{3}$	Δh: main contour interval
Contour	$\frac{\Delta h}{2}$	

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		National Railway		Bank		Fish Pond	
Vertical Control Station (Identifiable)		Private Railway		Hotel (Three Stars)		Salt Bed	
Spot Height		Under Construction		Mosque & Prominent Stone		VEGETATION	
Direct Leveling Point		Level Crossing		Factory and Works			
BOUNDARIES		Overpass		Wharf		Standard Contour	
		Underpass		Shoal		Contour Values	
Provincial Boundary		Railway Station		Theatre and Cinema (Prominent)		DEPTH CURVES	
City or Municipal Boundary		Light Rail Transit Crossing		Bridge			
Regional Boundary		Turnpike		BRIDGES		Standard Depth Curve	
ROADS		BUILDINGS		MISCELLANEOUS LANDMARK FEATURES		LINE SIZES	
National Highway		Independent Buildings & Houses		Small Bridge / Culvert		0.25	
Provincial Road		Congested Housing Area		Ferry / Ford		0.3	
Barangay Road		Ruins		Wall		0.4	
		Temporary Squatter Areas		Spring / Hot Spring		0.6	
Trot		Building Minimum		Channel / Canal		RELIEF and ASSOCIATED FEATURES	
Road Under Construction		PUBLIC BUILDING Symbol		Flood Gate			
Side Walk		Government Building		Dam		Embankment	
Grade Separation		Police Station		Weir		Slopes	
Crossing		Fire Station		Lake / Pond		Quarry	
Pedestrian Overpass		Post Office		Ditch		Depression	
Pedestrian Underpass		Manila Water Supply & Sewage		Swamp / Marsh		Cleft	
Toll Gate		School		Tidal Flat		Rockoutcrop Area	
		Hospital		Reef / Coral		Sand / Dunes	
		Church / Mission		Mud			
		Mosque / Minaret		Pipeline / Water Pipeline			
		Embassy		Signon			
		Health Center		Rock Awash			
		Temple		Wreck			
				Sewerage Outlet			

MINUTES OF DISCUSSIONS

ON

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

BETWEEN

THE JAPAN INTERNATIONAL COOPERATION AGENCY

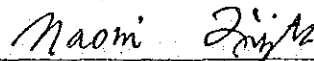
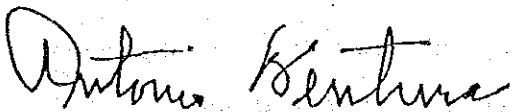
AND

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

GRAPHIC INFORMATION BASE FOR NATIONAL CAPITAL REGION

(LAND USE & LAND COVER)

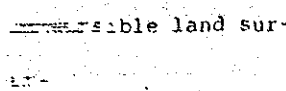
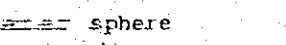
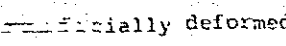
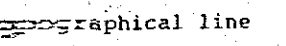
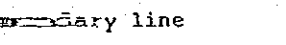
Category I	Category II	Category III
Urban & Inhabited Area	Residential District	Multistory Housing Residential Temporal Housing Inhabited
	Commercial Business District	Business Commercial Mixed Commercial Residential
	Industrial District	Large Scale Industry Small Scale Industry Mixed Industry-Residential
	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 Bed Agro-Industrial
	Forest	Forest Grass Land Bare land
Others	Water Sphere	Sea, Lake, River Fish Pond
	Under- Construction	Open Space

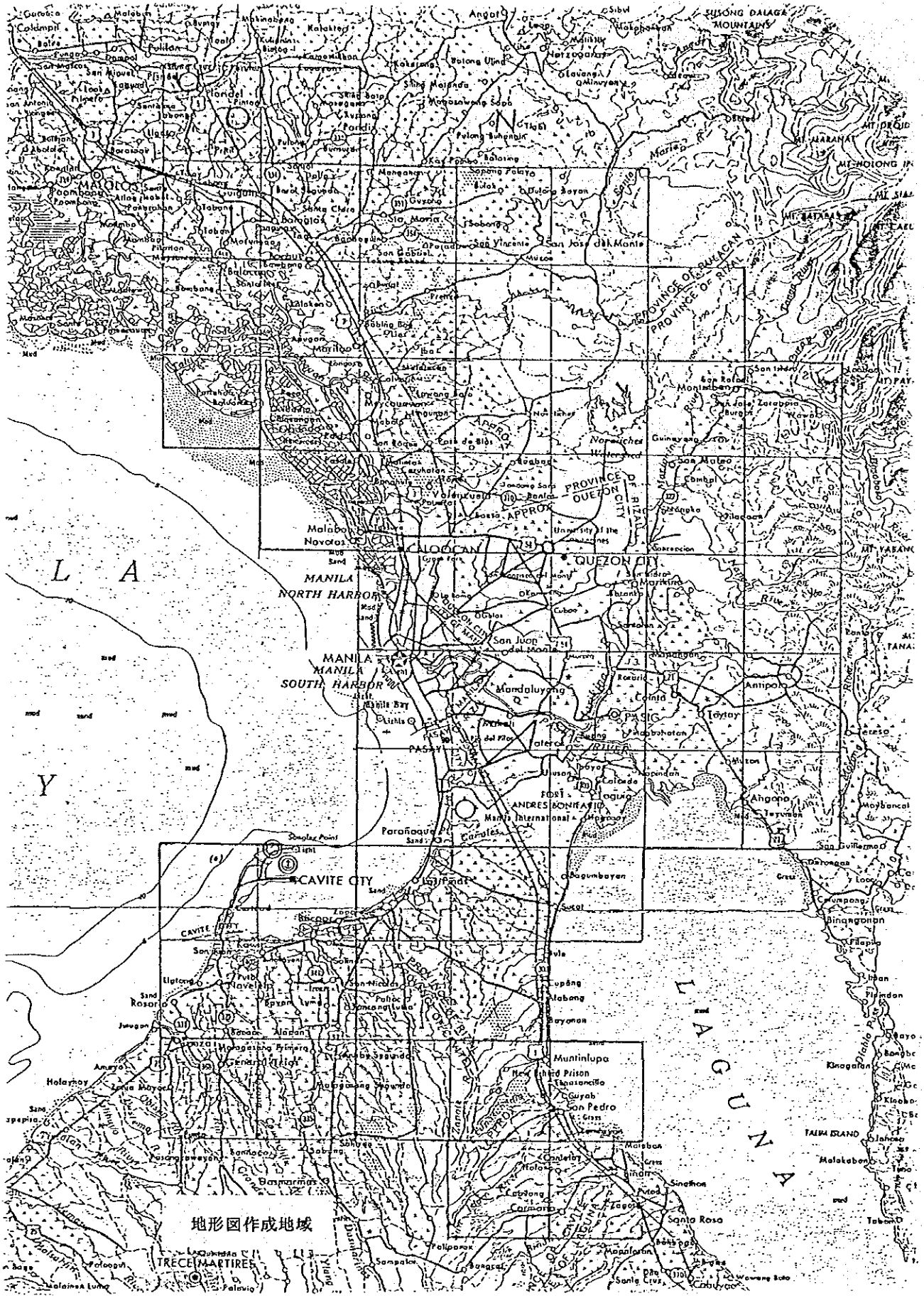
GRAPHIC INFORMATION BASE FOR NATIONAL CAPITAL REGION

LAND FORM CLASIFICATION)

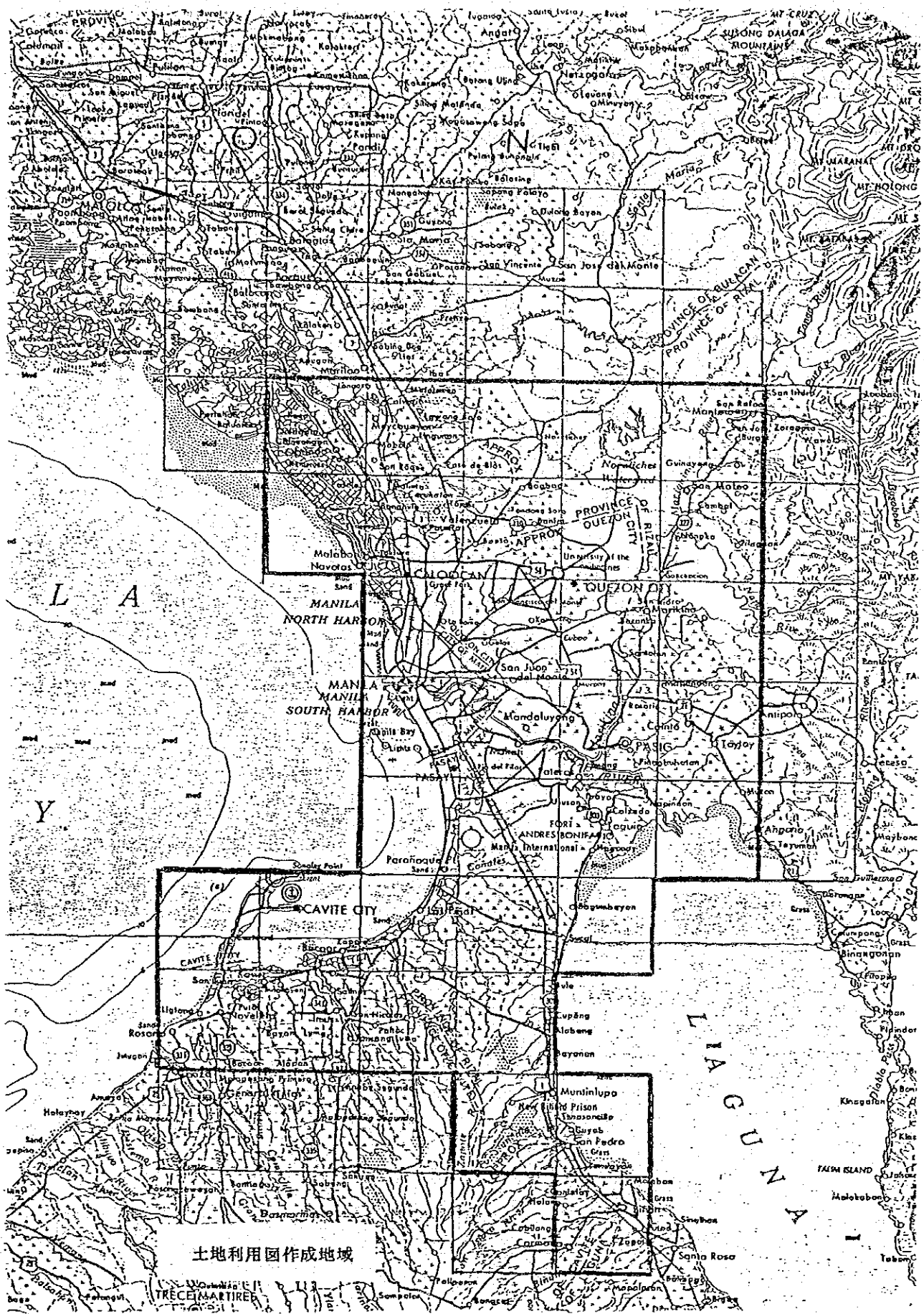
Category I	Category II	
Mountain Slope	Gentle Steep Very Steep	
Volcano Slope	Gentle Steep Very Steep	
Unstable Slope	Cliff Collapse Baldness & bare rock Land slide	
Terrace & Table land	High Low	
Piedmont aggraded	Debris avalanche	
Lowland, relatively higher & well drained	Alluvial fan Natural levee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

 Variable land sur- face	High water bed Low water bed Tidal flat	
 Sphere	River & shore line	
 Artificially deformed	Cut & rolled surface Cutting Banked up Filled up Drainage Reclaimed land	
 Topographical line	Ridge line Valley line	
 Boundary line	Under construction Indistinct boundary Landform line	

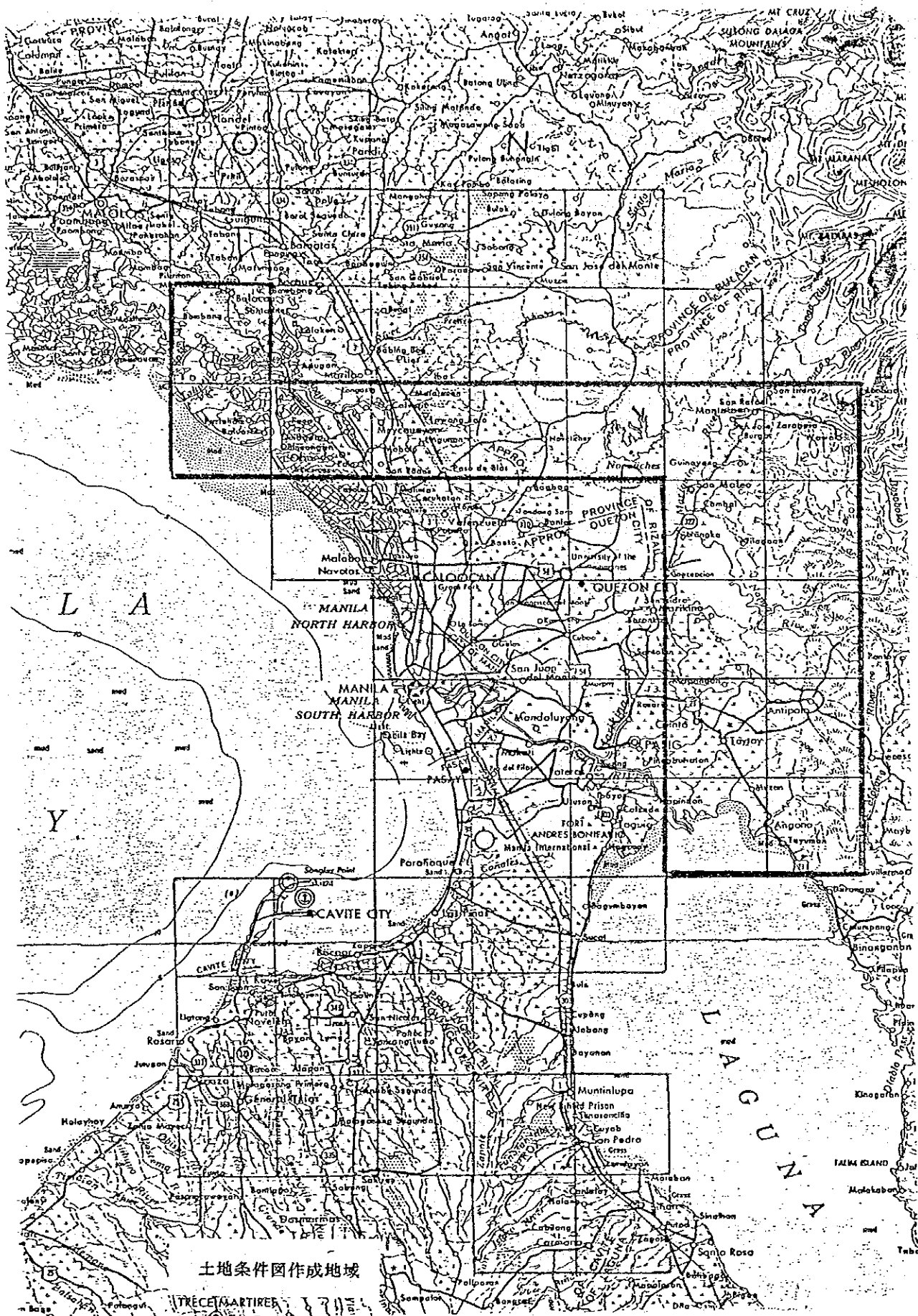
附 録 II



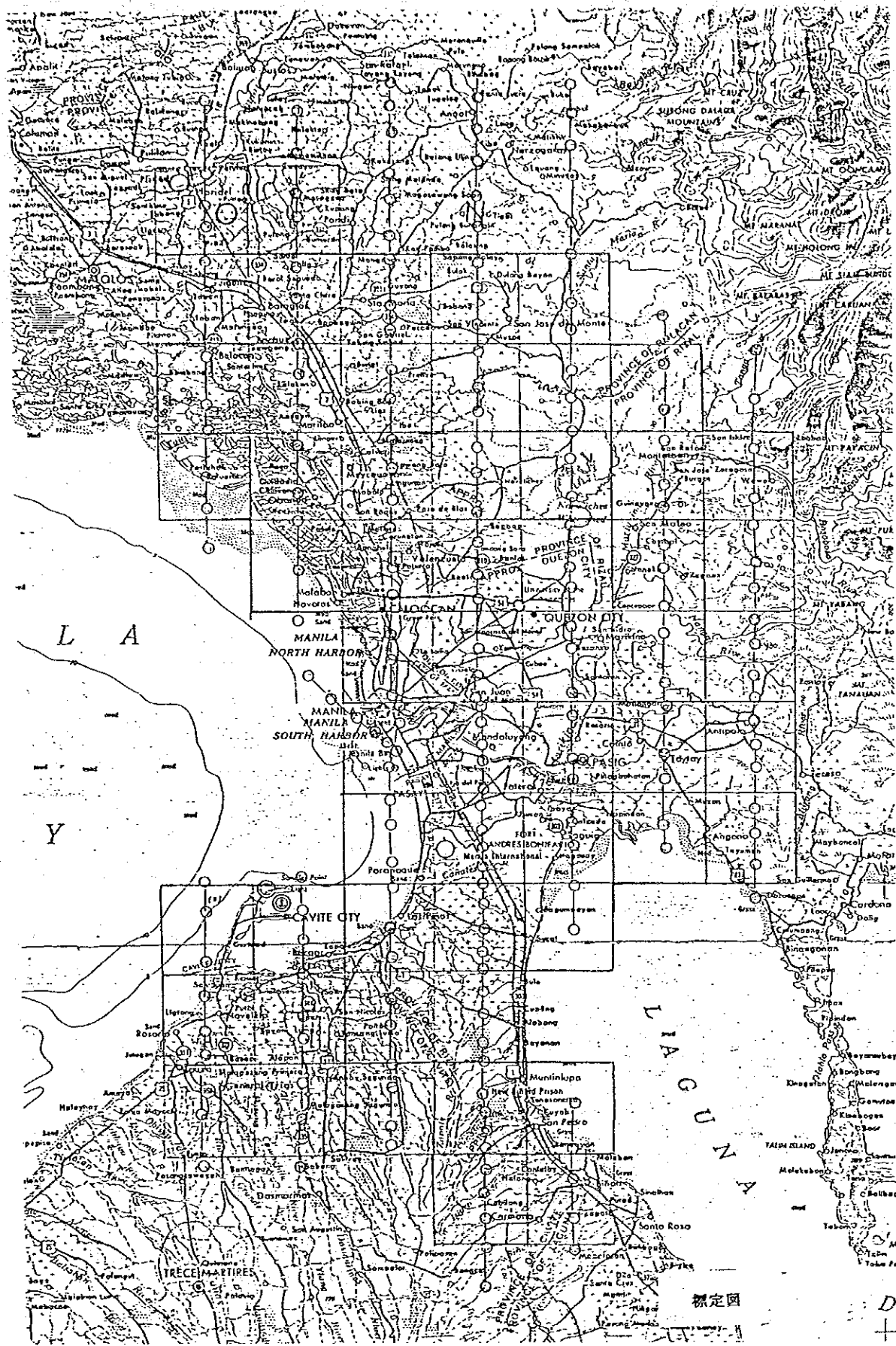
地形圖作成地域

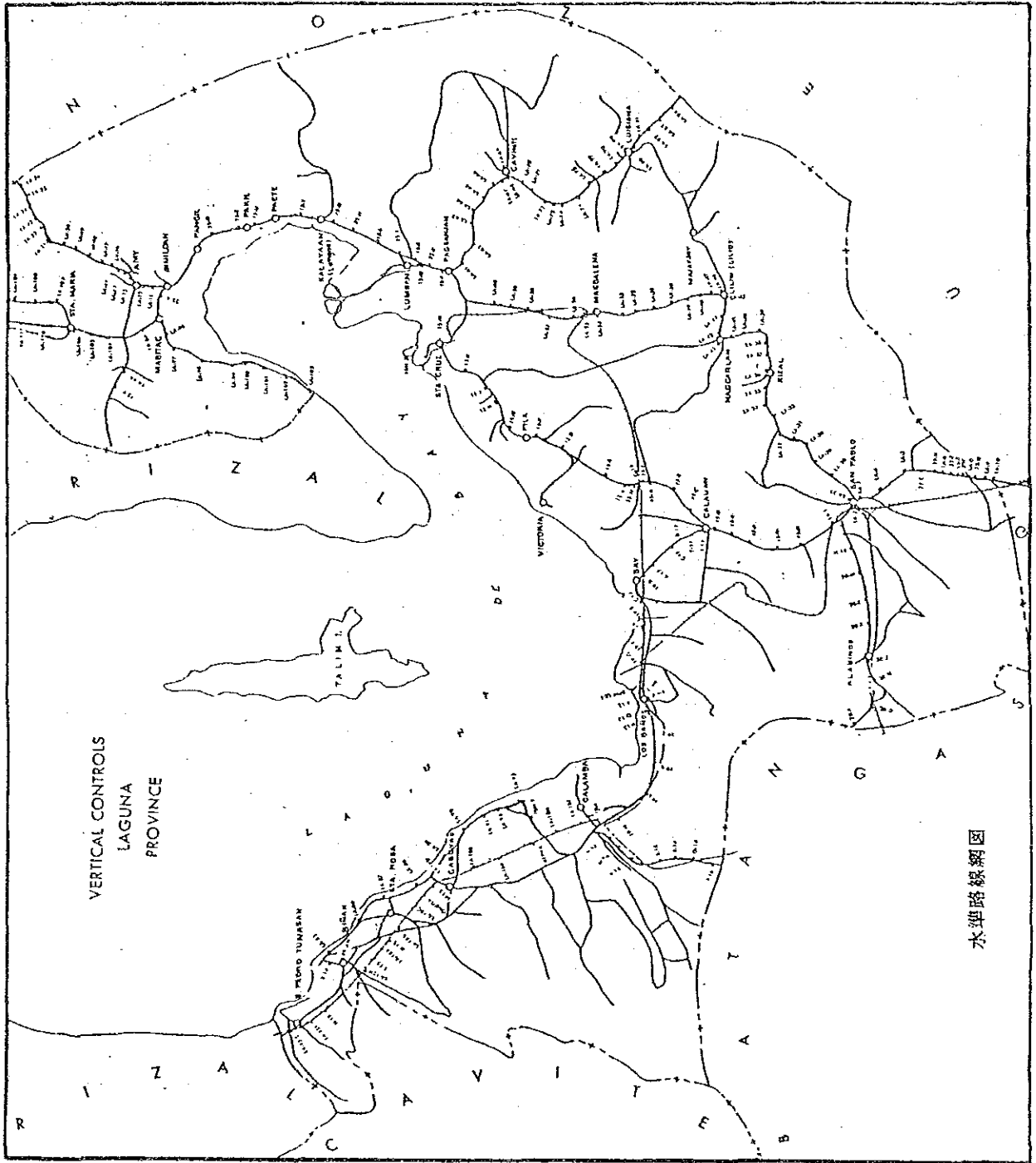


土地利用図作成地域

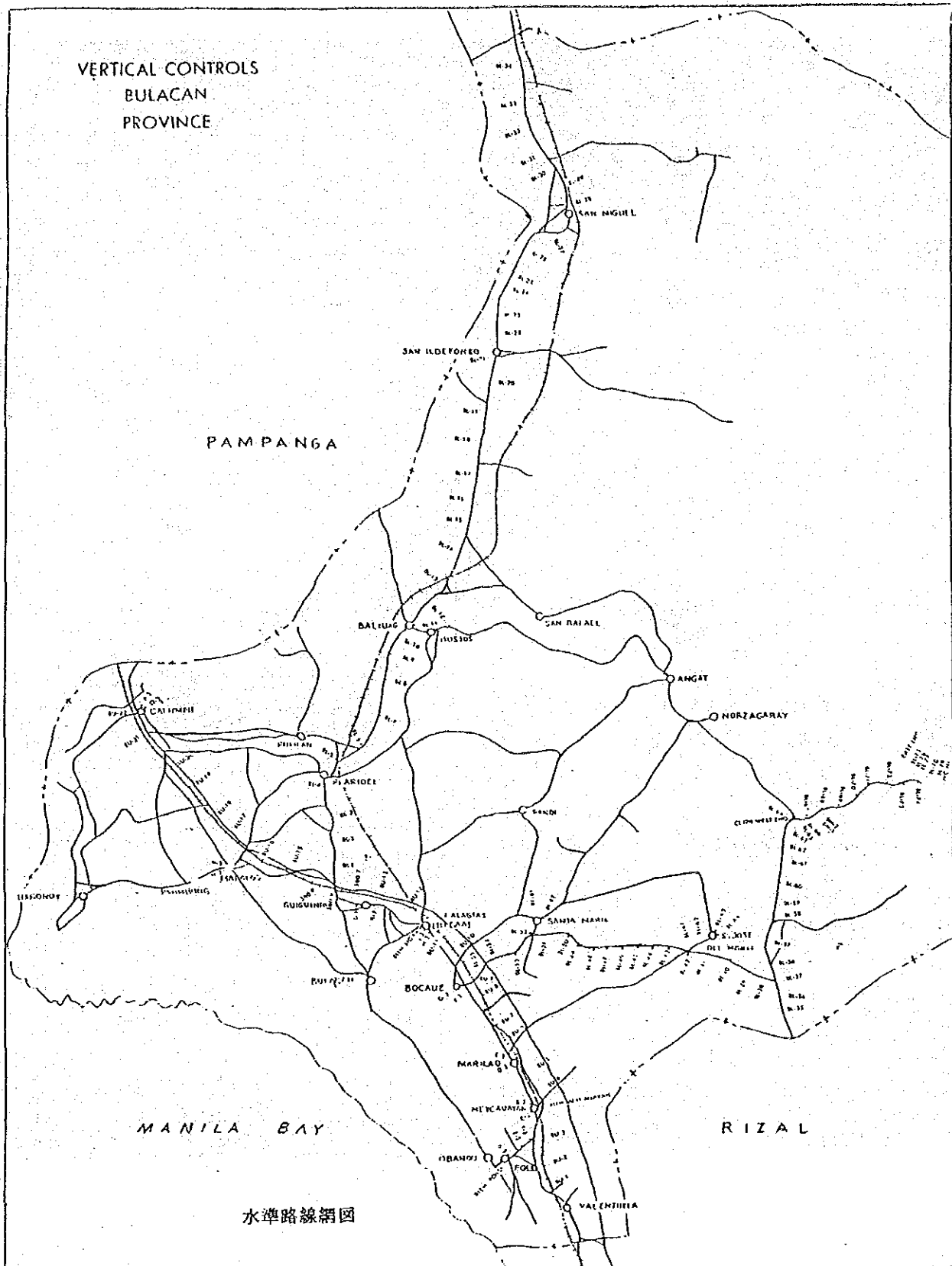


土地条件图作成地域









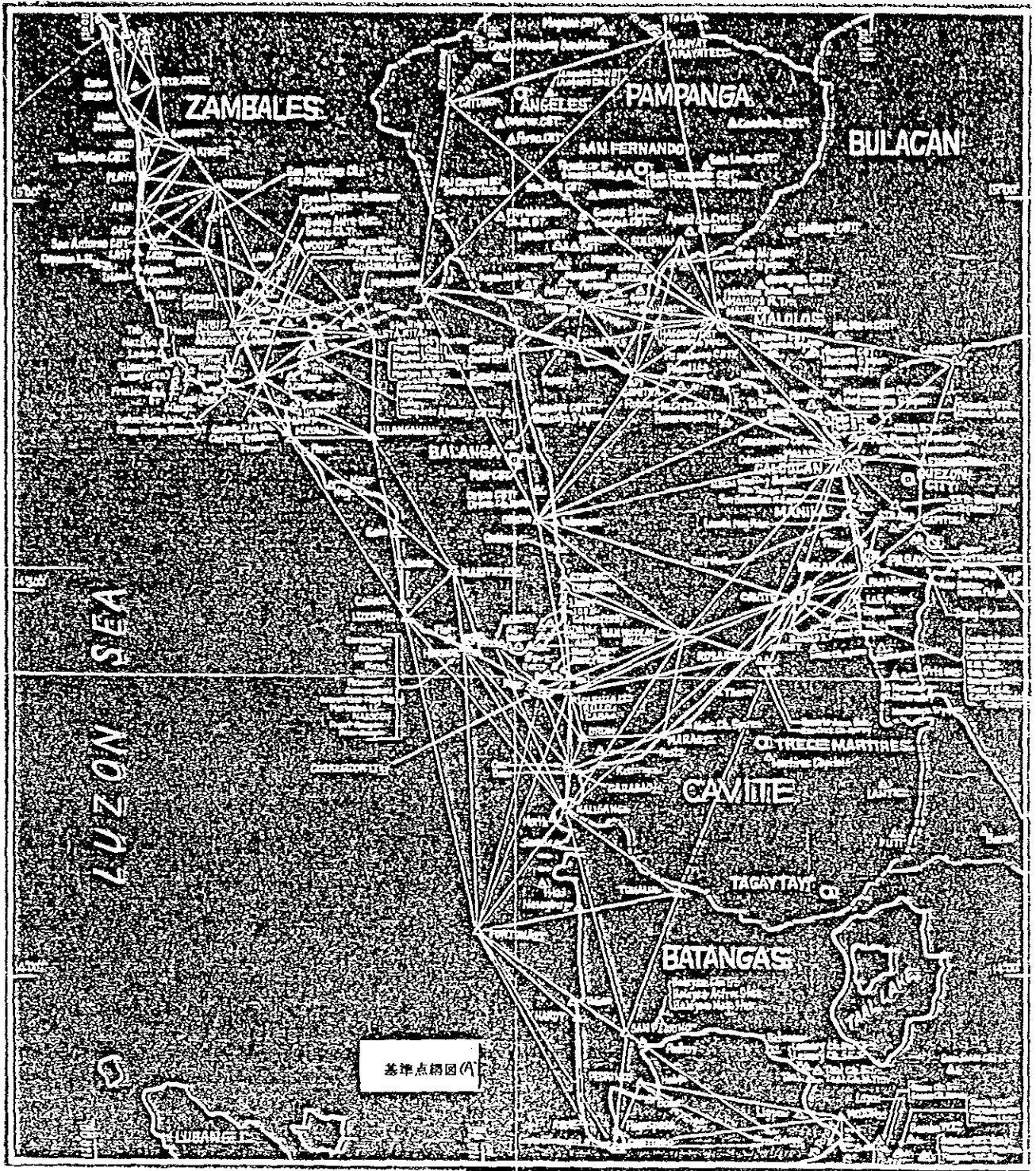
VERTICAL CONTROLS
BULACAN
PROVINCE

PAMPANGA

MANILA BAY

RIZAL

水準路線網圖



JICA