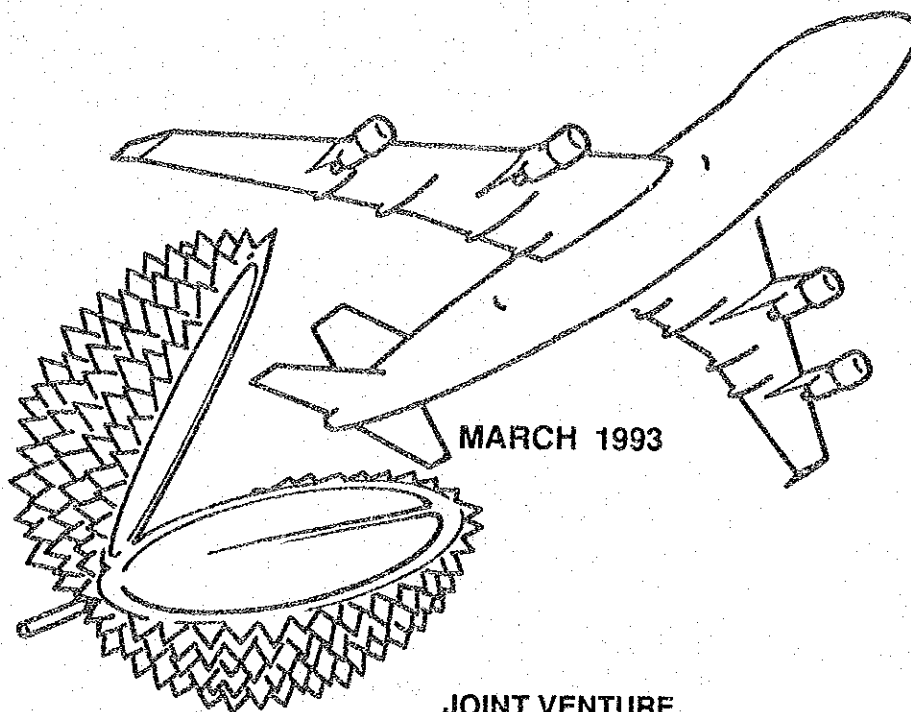


JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
DEPARTMENT OF TRANSPORTATION AND COMMUNICATIONS
REPUBLIC OF THE PHILIPPINES

THE STUDY ON THE DEVELOPMENT PLAN
OF
DAVAO INTERNATIONAL AIRPORT
IN
REPUBLIC OF THE PHILIPPINES

FINAL REPORT

VOLUME 3 APPENDICES



JOINT VENTURE
OF
PACIFIC CONSULTANTS INTERNATIONAL
AND
AERO ASAHI CORPORATION

Tokyo, Japan

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JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
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**THE STUDY ON THE DEVELOPMENT PLAN
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FINAL REPORT

VOLUME 3 APPENDICES

MARCH 1993

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AND
AERO ASAHI CORPORATION
Tokyo, Japan**

国際協力事業団

24612

LIST OF APPENDICES

APPENDIX TO CHAPTER 1

Appendix - 1.3.1	Implementing Arrangement of the Technical Cooperation.....	A1 - 1
Appendix - 1.5.1	Minutes of Meeting on Inception Report.....	A1 - 10
Appendix - 1.5.2	Minutes of Meeting on Progress Report.....	A1 - 14
Appendix - 1.5.3	List of Data and Information Collected.....	A1 - 19
Appendix - 1.5.4	Minutes of Meeting on Interim Report.....	A1 - 23
Appendix - 1.5.5	Memorandum on the Study on the Development Plan of Davao International Airport Dated October 1, 1992	A1 - 28
Appendix - 1.5.6	Memorandum on the Study on the Development Plan of Davao International Airport Dated October 2, 1992	A1 - 32
Appendix - 1.5.7	Minutes of Meeting on Draft Fianl Report.....	A1 - 35

APPENDIX TO CHAPTER 2

Appendix - 2.3.1	Population, Population Density and Annual Rate of Population Increase by Province in Mindanao.....	A2 - 1
Appendix - 2.3.2	Philippine Exports by Major Commodity Groups.....	A2 - 3
Appendix - 2.3.3	Direction of Trade	A2 - 4
Appendix - 2.5.1	Visitor Arrivals to the Philippines by Country of Residence	A2 - 5
Appendix - 2.6.1	Airport Classification.....	A2 - 7
Appendix - 2.7.1	Passenger Traffic by Major Seaport in Mindanao	A2 - 8

APPENDIX TO CHAPTER 3

Appendix - 3.4.1	Interview Survey for Air Passengers.....	A3 - 1
Appendix - 3.4.2	Passenger Processing Time Survey	A3 - 3
Appendix - 3.4.3	Present Flight Schedule at Davao International Airport.....	A3 - 5
Appendix - 3.4.4	Result of Traffic Survey.....	A3 - 6
Appendix - 3.5.1	Calculation of Rainfall Intensity	A3 - 9
Appendix - 3.6.1	Location Map of Aerial Photography.....	A3 - 11
Appendix - 3.6.2	Location Map of Surveying for Aerial Signalization.....	A3 - 12

Appendix - 3.6.3	Location Map of Longitudinal Profiling and Cross Sectioning	A3 - 13
Appendix - 3.8.1	Location Map of Soil Investigation.....	A3 - 14
Appendix - 3.8.2	Items of Soil Investigation at Each Location	A3 - 15
Appendix - 3.8.3	Result of Auger Boring and Mechanical Boring	A3 - 16
Appendix - 3.8.4	Mechanical Boring Log.....	A3 - 20
Appendix - 3.8.5	Result of Unconfined Compression Test	A3 - 25
Appendix - 3.9.1	Condition of Existing Runway Pavement Surface.....	A3 - 26
Appendix - 3.9.2	Condition of Existing Apron and Taxiway Pavement Surface.....	A3 - 27
Appendix - 3.9.3	Condition of Existing Car Parking Pavement Surface	A3 - 28

APPENDIX TO CHAPTER 4

Appendix - 4.2.1	Estimation of GRDP in Future by Region and Main City	A4 - 1
Appendix - 4.2.2	Formulation of Total Demand Model by Regression Analysis.....	A4 - 2
Appendix - 4.2.3	Estimation of Passenger Traffic Volume based on Capacities.....	A4 - 3
Appendix - 4.2.4	Concept of MD Model	A4 - 4
Appendix - 4.2.5	Parameters of MD Model	A4 - 7
Appendix - 4.3.1	Economic Data for Model Formulation	A4 - 8
Appendix - 4.3.2	Passenger Traffic Data for Model Formulation	A4 - 9
Appendix - 4.4.1	Input Data for Formulation of Domestic Cargo Demand Model	A4 - 10
Appendix - 4.5.1	Input Data for Formulation of International Cargo Demand Model	A4 - 11

APPENDIX TO CHAPTER 5

Appendix - 5.2.1	Runway Length Requirement.....	A5 - 1
------------------	--------------------------------	--------

APPENDIX TO CHAPTER 6

Appendix - 6.2.1	Terminal Control Area, Control Zone and Aerodrome Traffic Zone at Davao International Airport	A6 - 1
Appendix - 6.2.2	Dimension of Davao Terminal Control Area, Control Zone and Aerodrome Traffic Zone.....	A6 - 2
Appendix - 6.2.3	Instrument Approach Procedure NDB RWY 05.....	A6 - 3

Appendix - 6.2.4	Instrument Approach Procedure VOR RWY 05	A6 - 4
Appendix - 6.2.5	Instrument Approach Procedure VOR/DME RWY 05	A6 - 5
Appendix - 6.2.6	Instrument Approach Procedure VOR/DME RWY 23	A6 - 6
Appendix - 6.2.7	Instrument Departure Chart.....	A6 - 7
Appendix - 6.2.8	Instrument Departure Route Description	A6 - 8
Appendix - 6.7.1	Capacity Analysis of Existing Passenger Terminal Building	A6 - 9
Appendix - 6.9.1	Floor Plan of Existing Administration Building	A6 - 17
Appendix - 6.9.2	Floor Plan of Existing Control Tower Building.....	A6 - 18
Appendix - 6.9.3	Floor Plan of Existing Fire Station	A6 - 19
Appendix - 6.18.1	Definition of WECPNL.....	A6 - 20
Appendix - 6.18.2	Conditions for Preparation of Aircraft Noise Contours.....	A6 - 21
Appendix - 6.18.3	Impact of Aircraft Noise	A6 - 22

APPENDIX TO CHAPTER 7

Appendix - 7.4.1	Land Acquisition Area	A7 - 1
Appendix - 7.4.2	Unit Prices for Cost Estimates	A7 - 5
Appendix - 7.4.3	Breakdown of Cost Estimates.....	A7 - 8

APPENDIX TO CHAPTER 9

Appendix - 9.4.1	Required Areas and Facilities for New Passenger Terminal Building.....	A9 - 1
------------------	---------------------------------------------------------------------------	--------

APPENDIX TO CHAPTER 10

Appendix - 10.2.1	Capacity of New Passenger Terminal Building.....	A10 - 1
Appendix - 10.3.1	Breakdown of Cost Estimates for Medium-Term Development Project.....	A10 - 4

APPENDIX TO CHAPTER 12

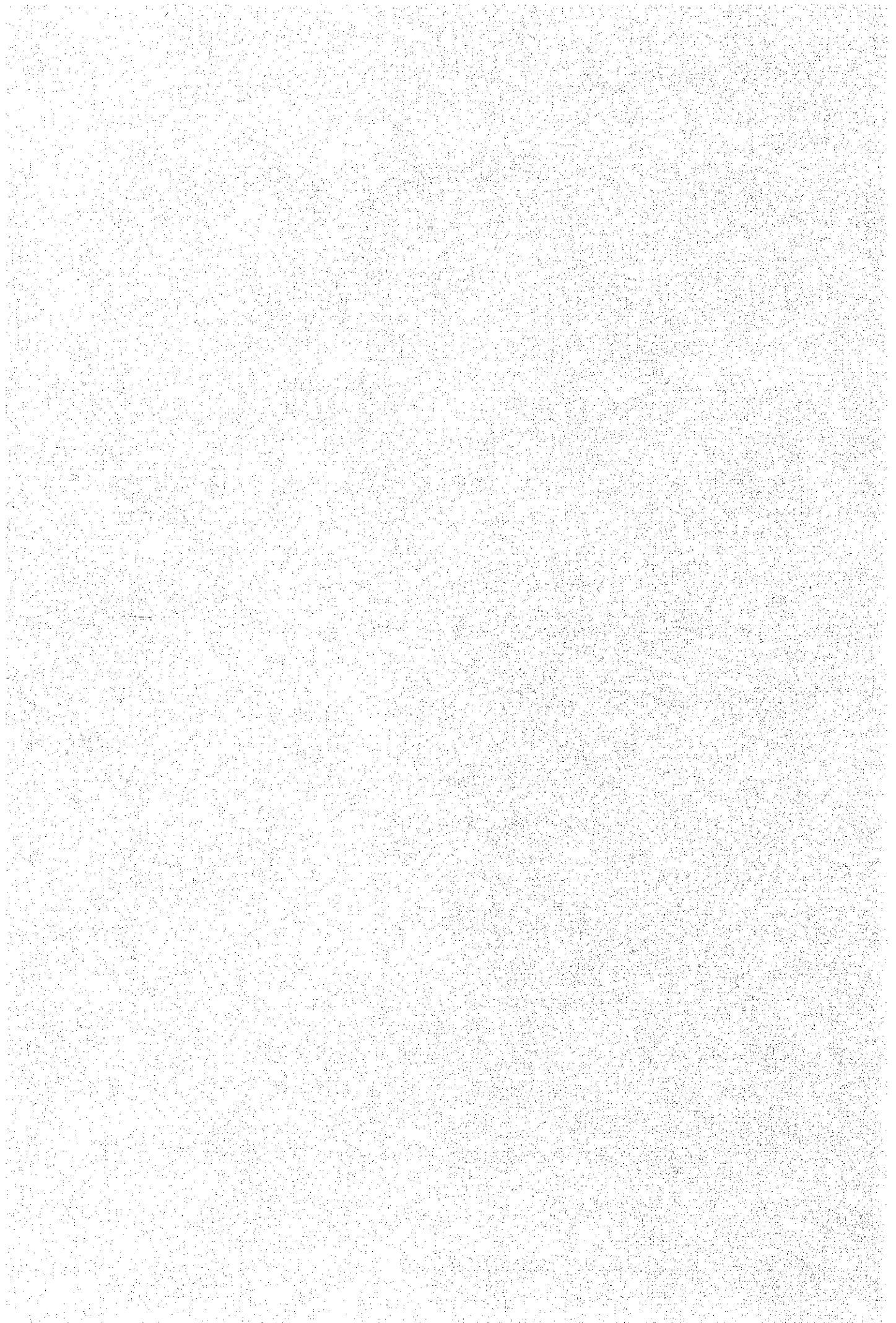
Appendix - 12.2.1	Inflation Rate and Interest Rate in the Philippines	A12 - 1
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Appendix - 12.2.2	Exchange Rate in Period Average	A12 - 3
Appendix - 12.2.3	Incremental Diverted Air Passengers by Mode and Route, and Induced Air Passengers by Route	A12 - 4
Appendix - 12.2.4	Estimation of Diverted Air Passengers of Filipino and Foreign Air Visitors to Davao	A12 - 8
Appendix - 12.2.5	Nationality by Day and Flight.....	A12 -10
Appendix - 12.2.6	Estimated Foreign Visitor Ratio in 1990.....	A12 -11
Appendix - 12.2.7	Passenger Fees, Landing Fees and Operational Charges in the Philippines	A12 -12
Appendix - 12.2.8	Income by Type for Davao International Airport	A12 -14
Appendix -12.2.9	Average Passenger-Kilometers and Average Operating Revenue.	A12 -15
Appendix -12.2.10	Average Revenue per Cargo Ton	A12 -17
Appendix -12.2.11	Average Operating Revenue per Cargo Ton Kilometer	A12 -18
Appendix -12.2.12	Average Tourist Receipt	A12 -19
Appendix -12.2.13	Incremental Quantity of Aircraft Fuel Consumed at Davao Airport Accompanied by Phase - I Project Implementation.....	A12 -20
Appendix -12.2.14	Expenses for Davao International Airport	A12 -21

APPENDIX TO CHAPTER 13

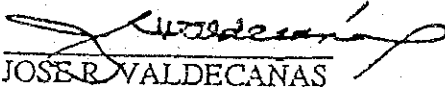
Appendix - 13.2.1	Aircraft Noise Contours at dB(A) of Taking off DC-10	A13 - 1
Appendix - 13.2.2	Aircraft Noise Contours at dB(A) of Landing DC-10.....	A13 - 2
Appendix - 13.2.3	Aircraft Noise Contours at dB(A) of Taking off B737.....	A13 - 3
Appendix - 13.2.4	Aircraft Noise Contours at dB(A) of Landing B737	A13 - 4
Appendix - 13.2.5	Typical Condition of Noise Level Indicated in dB(A).....	A13 - 5

APPENDIX TO CHAPTER 1

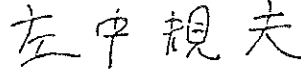


IMPLEMENTING ARRANGEMENT
OF THE TECHNICAL COOPERATION
BETWEEN
THE JAPAN INTERNATIONAL COOPERATION AGENCY
AND
THE DEPARTMENT OF TRANSPORTATION AND COMMUNICATIONS
FOR
THE STUDY ON THE DEVELOPMENT PLAN
OF
DAVAO INTERNATIONAL AIRPORT IN THE REPUBLIC OF THE PHILIPPINES

AGREED UPON BETWEEN
THE DEPARTMENT OF TRANSPORTATION AND COMMUNICATIONS
AND
THE JAPAN INTERNATIONAL COOPERATION AGENCY
MANILA, 13 DECEMBER 1991


JOSE R. VALDECANAS
Undersecretary

Department of Transportation and
Communications


NORIO SANAKA
Leader

Preparatory Study Team
Japan International
Cooperation Agency

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 Study on the Development Plan of Davao International Airport in the Republic of the Philippines (hereinafter referred to as "the Study"), and exchanged the Notes Verbales with GOP concerning the implementation of the Study.

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

On the part of GOP, the Department of Transportation and Communications (hereinafter referred to as "DOTC"), shall act as the 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 documents constitutes the implementing arrangement between JICA and DOTC under the above-mentioned Notes Verbales exchanged between two Governments.

II. OBJECTIVES OF THE STUDY

The objectives of the Study are as follows:

1. To formulate the Master Plan for Long-Term Development of

the Davao International Airport.

- 2 To evaluate technical, economic, and financial feasibility of the Medium-Term Development Plan to be formulated within the framework of the Master Plan.

III. THE STUDY AREA

The study area will cover the Davao International Airport.

IV. SCOPE OF THE STUDY

In order to achieve the objectives mentioned above, the Study shall cover the following items:

1. Evaluation of Existing Situation
 - (1) Review of available data and information relevant to the Study.
 - (2) Field Surveys for topographical and geotechnical conditions.
 - (3) Analysis of present air transport network and air transport demand, including the relations of other airports.
 - (4) Evaluation of existing facilities and utilization of the airport.
2. Formulation of Master Plan

An appropriate Master Plan shall be prepared for the target year of 2010.

- (1) Forecast of future air transport demand
- (2) Formulation of Long-Term Development Strategy of

the airport.

- (3) Analysis of facilities requirements
- (4) Airport facilities planning
- (5) preparation of preliminary cost estimates
- (6) Formulation of a master plan
- (7) Preparation of a staged implementation plan
- (8) Recommendation on management and operation systems for the airport.

3. Feasibility Study on Medium-Term Development Plan

Feasibility Study shall be conducted for a medium-term development plan to be formulated within the framework of Master Plan for the target year of 2000.

- (1) Formulation of the medium term development plan
- (2) Preliminary design
- (3) Cost estimates
- (4) Economic analysis
- (5) Financial analysis
- (6) Evaluation of the project
- (7) Implementation programmes for the project

V. STUDY SCHEDULE

The Study will be carried out in accordance with the attached tentative schedule as shown in the appendix.

VI. REPORTS

gsl JICA shall prepare and submit the following reports in

MS

English to GOP.

1. Inception Report (15 copies)

This report is to describe the overall approach and implementation programme of the Study and to be submitted at the commencement of work in the Philippines.

2. Progress Report (15 copies)

This report will be submitted within 3 months after commencement of the Study and will contain the preliminary outcome of the first field survey.

3. Interim Report (15 copies)

This report will be submitted within 6 months after commencement of the Study and will include the Master Plan.

4. Draft Final Report (15 copies)

This report will be submitted within 10 months after commencement of the Study and will contain a draft of all the results of the Study.

GOP will provide to JICA its comments written in English within one month after the receipt of the Draft Final Report.

5. Final Report (30 copies)

This report will be submitted within 2 months after receipt of the above mentioned comments on the Draft Final Report from GOP.

JW

MS

VII. UNDERTAKING OF GOP

In accordance with the Notes Verbales exchanged between GOJ and GOP, GOP shall accord privileges, immunities and other assistance to the Japanese study team and, through the authorities concerned, take necessary measures to facilitate the smooth conduct of the Study.

1. GOP shall be responsible for dealing with claims which may be brought by third parties against the members of the Japanese study team and shall hold them harmless in receipt of claims and 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. DOTC shall, at its own expense, provide the Japanese study team with the following, if necessary, in cooperation with other agencies concerned:
 - (1) Available data and information related to the Study,
 - (2) Counterpart personnel,
 - (3) Suitable office space with necessary equipment in Metro Manila and Davao City,
 - (4) Credentials or identification cards to the members of the Japanese study team,
3. DOTC shall make necessary arrangements with other governmental and non-governmental organizations concerned

SAW

MS

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 allowance 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 for 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 (including photographs) related to the Study out of the Philippines to Japan by the Japanese study team;

- (8) to provide medical services as needed and its expenses will be chargeable on members of the Japanese study team.

VIII. 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.

IX. CONSULTATION

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

A p p e n d i x

TENTATIVE STUDY SCHEDULE

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Work in Philippines														
Work in Japan														
Reports	▲ IC/R		▲ P/R			▲ IT/R				▲ DF/R				▲ F/R

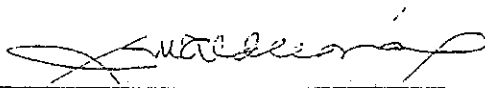
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P/R : Progress Report
IT/R : Interim Report
DF/R : Draft Final Report
F/R : Final Report

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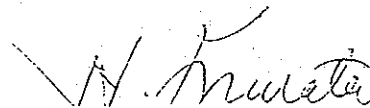
MINUTES OF MEETING
ON
INCEPTION REPORT
ON
THE STUDY ON THE DEVELOPMENT PLAN OF
DAVAO INTERNATIONAL AIRPORT
IN
THE REPUBLIC OF THE PHILIPPINES
AGREED UPON BETWEEN
THE
DEPARTMENT OF TRANSPORTATION AND COMMUNICATIONS
AND
JAPAN INTERNATIONAL COOPERATION AGENCY

APRIL 24, 1992
MANILA



JOSE R. VALDECAÑAS
Undersecretary

Department of Transportation
and Communications



HIDEKI MURATA
Team Leader

Study Team
Japan International
Cooperation Agency

MINUTES OF MEETING ON THE INCEPTION REPORT ON THE STUDY ON THE DEVELOPMENT PLAN OF DAVAO INTERNATIONAL AIRPORT

1. A team organized by Japan International Cooperation Agency (hereinafter referred to as "JICA") arrived in Manila, Philippines on April 20, 1992 for the Study on the Developmental Plan of Davao International Airport (hereinafter referred to as "the Study"). The JICA team consisted of the Study Team, headed by Mr. Hideki Murata, and the Advisory Committee, headed by Mr. Norio Sanaka.
2. A joint meeting between the JICA team and the Philippines side was held on April 21, 1992 for a presentation of the Inception Report of the Study. The Philippines side consisted of the Steering Committee headed by Mr. Gerardo C. Protacio, Assistant Secretary, Air Transportation Office (hereinafter referred to as "ATO") and the Technical Working Committee of the Department of Transportation and Communications (hereinafter referred to as "DOTC"). A list of attendants is indicated in Attachment - A.
3. After the presentation and the discussion, the Inception Report submitted by the JICA Study Team was generally accepted by the DOTC. A few additional points agreed upon or noted by both sides are as follows:
 - a) It was mentioned by the DOTC that coordination between the central and local authorities are increasingly important for smooth implementation of any public works project. To this end the DOTC requested the JICA Study Team to assist the DOTC in its consultation meetings on Davao International Airport Development Plan with the concerned governmental agencies, especially the Regional Development Council. Provided that the DOTC would be responsible for the final decision on the airport development plan, the JICA Study Team agreed to assist the DOTC in the presentation of the Interim and Draft Final Reports in Manila and Davao.
 - b) The DOTC requested the JICA Study Team to assist the DOTC in preparing an environmental impact assessment report for the project. The JICA Study Team agreed to assist the DOTC as much as possible in its preparation of the report.
 - c) The DOTC requested the JICA Team to provide more opportunity for technology transfer in Japan during the Study since the major tasks of the Study will be carried out in Japan.
4. On behalf of Philippine Government, the DOTC expressed its sincere appreciation for the JICA assistance to the Study.

LIST OF ATTENDANTS

1. Philippine Side

1.1 Steering Committee

1. MR. GERARDO C. PROTACIO Assistant Secretary, ATO
2. MR. BIENVENIDO O. MANGA Executive Director, ATO
3. MR. GEORGE D. ESGUERRA Director, Transportation Planning Service, DOTC

1.2 Technical Working Committee

1. MR. RAPHAEL S. LAVIDES Chief, Air Transportation Planning Division, DOTC
2. MRS. MA. FILIPINAS Z. CABANA Supervising Transport Development Officer, Air Transportation Planning Division, DOTC
3. MS. FILIPINA L. LARRACAS Supervising Transportation Development Officer, Air Transportation Planning Division, DOTC
4. MS. RUBY D. MANZO Transportation Development Officer II, DOTC
5. MR. FELICISIMO C. PANGILINAN, JR. Sr. Transportation Development Officer, Air Transportation Planning Division, DOTC
6. MR. MANUEL V. DE LEON Chief, Airport Maintenance Section, ATO
7. MR. FLORANTE MAGDAMO ATS Supervisor, ATO

1.3 JICA Expert

1. MR. YOSHINORI HASUMI ATO

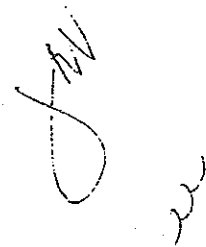
2. Japanese Side

2.1 JICA Advisory Committee

- | | |
|------------------------|----------------------------------------|
| 1. MR. NORIO SANAKA | Chairman of JICA
Advisory Committee |
| 2. MR. KOJI KITAMURA | Member of JICA
Advisory Committee |
| 3. MR. TOSHIO SUGIHARA | JICA, Headquarters |

2.2 JICA Study Team

- | | |
|---------------------------|------------------------------|
| 1. MR. HIDEKI MURATA | Leader of JICA Study
Team |
| 2. MR. KAZUO HAYASHI | Member of JICA Study
Team |
| 3. MR. MASASHI KABURAGI | Member of JICA Study
Team |
| 4. MR. RYUJIROU YAMAGISHI | Member of JICA Study
Team |




MINUTES OF MEETING
ON
PROGRESS REPORT
OF

THE STUDY ON THE DEVELOPMENT PLAN OF
DAVAO INTERNATIONAL AIRPORT
IN
THE REPUBLIC OF THE PHILIPPINES

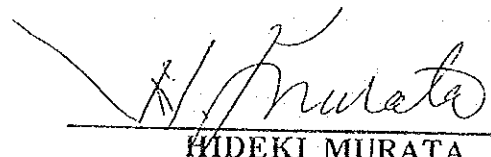
AGREED UPON BETWEEN
THE
DEPARTMENT OF TRANSPORTATION AND COMMUNICATIONS
AND
JAPAN INTERNATIONAL COOPERATION AGENCY

JUNE 11, 1992

MANILA, THE PHILIPPINES


GERARDO C. PROTACIO
Assistant Secretary

Air Transportation Office
Department of Transportation
and Communications


HIDEKI MURATA
Team Leader

Study Team
Japan International Cooperation Agency

MINUTES OF MEETING ON THE PROGRESS REPORT ON THE STUDY ON THE DEVELOPMENT PLAN OF DAVAO INTERNATIONAL AIRPORT

1. JICA Study Team submitted the Progress Report of the Study to Department of Transportation and Communications (DOTC) on June 8, 1992.
2. A joint meeting between the Philippine side and the JICA Study Team was held on June 10, 1992 for a presentation of the Progress Report of the Study. The Philippine side consisted of the Steering Committee headed by Mr. Gerardo C. Protacio, Assistant Secretary, Air Transportation Office, DOTC. A list of attendants is indicated in Attachment - A.
3. After the presentation and the discussions, the preliminary conclusions shown in Attachment - B were mutually acknowledged by the Philippine side and the JICA Study Team.
4. The Philippine side expressed their satisfaction with the progress of the study to-date and look forward to future discussions on the master plan to be recommended in the interim report for Davao International Airport.

LIST OF ATTENDANTS

1. Philippine Side
 - 1.1 Steering Committee
 1. MR. GERARDO C. PROTACIO Assistant Secretary, ATO
 2. MR. GEORGE D. ESGUERRA Director, Transportation Planning Service, DOTC
 - 1.2 Technical Working Committee
 1. MR. RAPHAEL S. LAVIDES Chief, Air Transportation Planning Division, DOTC
 2. MRS. MA. FILIPINA Z. CABANA Supervising Transport Development Officer, Air Transportation Planning Division, DOTC
 3. MS. RUBY D. MANZO Transport Development Officer II, DOTC
 4. MR. FELICISIMO C. PANGILINAN, JR. Sr. Transport Development Officer, Air Transportation Planning Division, DOTC
 5. MR. MANUEL V. DE LEON Chief, Airport Maintenance Section, ATO
 6. MR. FLORANTE MAGDAMO ATS Supervisor, ATO
 7. MS. ELSA D. PINEDA Transport Development Officer II, DOTC
 8. MR. R. L. CONCEPCION Sr. Transport Development Officer, DOTC
- 2 Japanese Side
 - 2.1 JICA Study Team
 1. MR. HIDEKI MURATA Leader of JICA Study Team
 2. MR. KAZUO HAYASHI Member of JICA Study Team
 3. MR. YOSHIYA NIINOMI Member of JICA Study Team

PRELIMINARY CONCLUSIONS OF FIELD SURVEY

As a result of the field survey, the following points are stated as preliminary conclusions at this stage as follows:

(1) Necessity of Development as Regular International Airport

First scheduled international flight was inaugurated on April 29, 1992 between Davao and Manado, Indonesia by Bouraq Indonesia Airlines. At present PAL and City of Davao intend to resume non-scheduled flights to Hong Kong and Singapore and wish to commence non-scheduled flights to/from Australia after completion of the airport development. Under these prevailing situation, it is strongly believed that Davao International Airport should be developed as a regular international airport as soon as possible.

(2) Major Problems of the Existing Davao International Airport.

Among various problems clarified through the field survey, it is considered that the following problems should be improved urgently in order to ensure the safety of the aircraft operations and to accommodate the present air traffic demands.

- a) Rough asphalt concrete pavement surface of the existing runway;
- b) Width shortage of the existing runway strip (some portion of the existing perimeter fence is located within 75m from the runway center line);
- c) Undulation of the existing runway strip;
- d) Inadequate baggage claim facility such as non-existence of belt conveyor and shortage of its floor area;
- e) Lack of CIQ facilities and the area itself for exclusive use by the international passengers; and
- f) Incomplete perimeter fence.

(3) Necessity of Establishing City Ordinance to Control Land Use in the Vicinity of the Airport

At present there seems no serious environmental problems such as aircraft noise pollution affecting the airport surrounding area. However, it was observed that quite extensive construction of residential sub-divisions were under going at the airport adjacent area. Progress of the urbanization toward the airport was also more rapid than envisaged before the site survey. It is considered that these urbanization will limit the expandability and the viability of the existing airport in the future. Accordingly, it is strongly believed that the City of Davao should introduce stringent City Ordinance to control land use of the airport vicinity, thereby ensure compatibility of the airport with its surrounding community and Davao City.

(4) Compatibility with the Proposed New General Santos Airport

Toward the end of the field survey, it was learned that a new airport for General Santos may be built by US Aid within three to four years. As the proposed new General Santos Airport would be some 150 km away from Davao City, compatibility with Davao International Airport should be studied closely and fairly in the next step of the Study.

List of Data and Information Collected

1. Davao Airport Development Plan

Data and Information	Source
1.1 Future Layout Plan of Davao Airport (Conceptual Plan)	Department of Transportation and Communications(DOTC)
1.2 Floor Plans and Elevations of Planned Passenger Terminal Building at Davao Airport	Philippine Airlines (PAL)

2. Other Airports Development Plan

Data and Information	Source
2.8 Feasibility Study to Upgrade Air Services to General Santos City, Aug. 1991	USAID
2.7 Feasibility Study and Master Planning, Cagayan de Oro-Iligan Corridor Airport, Nov. 1991 Volume I : Feasibility Study Volume II : Master Plan Volume III : Geotechnical Report	USAID
2.3 National Air Navigation Facilities Modernization Project Phase II -Executive Report -Air Traffic Study Report for Consulting Services - Part III, Dec. 1987	ATO DOTC
2.7 Inception Report FS and Master Planning Cagayan de Oro-Iligan Airport Project	
2.5 Mactan (Cebu) International Airport Development Project, Review of Airport Master Plan, Nov. 1989	ATO
2.4 Master Plan Review of Ninoy Aquino International Airport Final Report, Part 1 Feb. 1990	DOTC
2.6 Zamboanga International Airport Master Planning Project -Draft Final Report Vol. 1, May 1992 -Draft Final Report Vol. 2, May 1992 -Airport Operations Manual, April 1992	DOTC
2.9 Cagayan de Oro-Iligan Corridor Airport -Vol. I : Feasibility Study, Nov. 1991 -Vol. II : Master Plan, Nov. 1991 A1-19	DOTC
2.1 Civil Aviation Master Plan (Draft Final Report) Volume I : Civil Aviation Policy Volume II : Master Plan Report	DOTC
2.2 National Airport Five Year Development Plan	DOTC

3. National Development Plan

Data and Information	Source
3.1 Medium-Term Philippines Development (MTPDP) 1987-1992	NEDA
3.2 Updates on the Medium-Term Philippine Development Plan 1990-1992	NEDA
3.3 Medium-Term Public Investment Program (MTPDP) 1988-1992	NEDA

4. Regional Development Plan

Data and Information	Source
4.2 1990 South Mindanao Development Report	National Economic and Development Authority(NEDA) Region XI City Government of Davao
4.5 Davao City Development Framework	
F-3 1990 Southern Mindanao Development Statistics	NEDA Region XI
4.1 Regional Development Framework and Priority Project	Regional Development Council/NEDA Regions LX-XIII
4.6 Davao City Development Profile	City Government of Davao
4.8 Feasibility Study of the Davao City Regional Industrial Center -Executive Summary -Main Report -Appendices	Department of Trade and Industry
4.4 Southern Mindanao Regional Physical Framework Plan(RPFP)1990-2020	Regional Development Council/NEDA Region XI
4.7 Davao City Comprehensive Development Plan Year 1979-2000,Jan 1984	Davao City
4.3 Updated Regional Development Plan of Southern Mindanao 1990-1992	Regional Development Council XI, NEDA

5. Tourism Development Plan

Data and Information	Source
5.1 Comprehensive Tourism Master Plan -Vol.I.-Long Range Plan -Vol.II.-Medium Term Development Program -Vol.III.-Destination Area Plans	Philippine Tourism Master Plan Project Office
5.2 Tourism Infrastructure Development in Priority Tourism Clusters,Preliminary study, March 1992	Department of Tourism(DOT)
5.3 Tourism Development Plan-Samal Island,Davao	DOT
5.4 Regional Tourism Situation Report,1991	DOT Region XI
5.5 Statistical Report on Travel & Tourism 1991	DOT

6. Geography and Geology

Data and Information	Source
6.1 1:250,000 Geographic Maps (Davao City, Rajar Buayan City,Butuan City, Buluan, Digos,Jogos,Jose Abad Santos,6 Sheets covering Mindanao)	National Mapping and Resource Information Authority
6.2 1:50,000 Geographic Maps (Calinan, Tubok, Sirawan, Buawan, Davao City, Kaputian, Bungadon,Pantukan, Pose, 9 Sheets around Davao City)	Ditto
6.3 1:1,000,000 Aeronautical Charts (4 Sheets covering the Philippines)	Mapping House (Tokyo)
6.4 1:1,500,000 Aeronautical Charts (9 Sheets covering the Philippines)	Ditto

7. Meteorology and Climatology

Data and Information	Source
7.1 Meteorological Observation Data at Davao 1989-1991 (3 years) -Wind direction and velocity. -Visibility and cloud height.	PAGASA
7.2 1991 Predicted Tide and Current Tables	National Mapping and Resource Information Authority

8. Demography

Data and Information	Source
8.1 1991 Philippine Statistical Yearbook	

14. Environment

Data and Information	Source
14.1 Environmental Assessment, Cagayan de Oro-Iligan Corridor Airport (Draft Final Report)	USAID
14.2 General Santos City Air Service Improvement Feasibility Study Environmental Assessment	DOTC

9. Air Transportation

Data and Information	Source
9.2 PAL Flight Schedule	PAL
9.1 Airport Traffic Records 1980-1990	Air Transportation Office (ATO)
9.3 Historical Record of Passenger/Cargo Traffic from /to Davao	PAL
9.5 Long Range Plan for Davao	PAL
9.4 PAL Domestic Fleet	PAL

10. Other Transportation

Data and Information	Source
10.2 Number and Gross Tonnage of Registered Philippine Vessels: 1982 to 1990	Vessel Safety and Maritime Transportation Office
10.3 Number of Sea Passengers and Sea Cargo by Major Port in Mindanao	PPA(Philippine Port Authority)
10.1 Bus Route System and No. of Bus Operation by Route	LTFRB(Land Transport Franchise Board)
10.4 Profile of Philippine Ports 1989	Philippine Ports Authority(PPA)

11. Existing Airport Facilities

Data and Information	Source
11.1 Layout Plan and Runway Profile of Davao Airport	ATO
11.2 Floor Plans of Passenger Terminal Building	ATO
11.3 Davao Airport Profile	PAL
11.4 Davao International Airport Layout Plan 1:4,000	DOTC
11.5 Proposed Asphaltic Concrete Overlay and Widening of Davao Airport	ATO

12. Airspace Use and Aircraft Operations

Data and Information	Source
12.1 Aeronautical Information Publication (AIP)- Philippines	ATO
12.2 PAL Aircraft Operations Manual -B-747 -A300 -B737-300	PAL

13. Engineering

Data and Information	Source
13.1 The National Building Code 1992 Edition	Philippine Law Gazette
13.2 The Fire Code of the Philippines and Regulations P.D.No 1185 Revised Edition	Safety Organization of the Philippines
13.3 Philippines Electrical Code 1988 Part 2	Institute of Integrated Electrical Engineer of the PHILS.
13.4 Construction Planning, Equipment Method Fourth Edition	National Book Store.
13.5 Architectural Graphic Standards, Eighth Edition	The American Institute of Architects

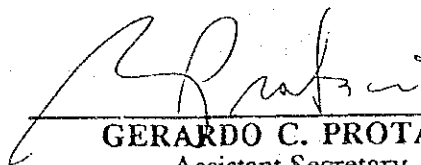
MINUTES OF MEETING
ON
INTERIM REPORT
OF

THE STUDY ON THE DEVELOPMENT PLAN OF
DAVAO INTERNATIONAL AIRPORT
IN
THE REPUBLIC OF THE PHILIPPINES


AGREED UPON BETWEEN
THE
DEPARTMENT OF TRANSPORTATION AND COMMUNICATIONS
AND
JAPAN INTERNATIONAL COOPERATION AGENCY

SEPTEMBER 11, 1992

MANILA, THE PHILIPPINES


GERARDO C. PROTACIO
Assistant Secretary

Air Transportation Office
Department of Transportation
and Communications



HIDEKI MURATA
Team Leader

Study Team
Japan International Cooperation Agency

MINUTES OF MEETING ON THE INTERIM REPORT OF THE STUDY ON THE DEVELOPMENT PLAN OF DAVAO INTERNATIONAL AIRPORT

1. JICA Study Team submitted the Interim Report of the Study to the Department of Transportation and Communications (DOTC) on September 7, 1992. Joint meetings between the Philippine side and the Japanese side were held from September 8, 1992 to September 11, 1992 for the presentation and discussions of the Interim Report.
 - (1) The Philippine side is composed of the Steering Committee and Technical Working Committee headed by Mr. Gerardo C. Protacio, Assistant Secretary, Air Transportation Office, DOTC. The Japanese side is composed of the JICA Advisory Committee headed by Mr. Norio Sanaka, Director, Tokyo Civil Aviation Bureau, Ministry of Transport and the JICA Study Team headed by Mr. Hideki Murata. A list of attendance is indicated in the Attachment.
 - (2) A presentation of the Interim Report to the concerned government agencies as well as the private sectors was held at DOTC head office in Manila on September 8, 1992 in order to obtain inputs from them on the proposed airport master plan.
 - (3) Another presentation of the same to the Regional Development Council XI, Davao City, other local government agencies and private sectors was also held on September 9, 1992 at Davao Airport for the same purpose.
 - (4) The above-mentioned meetings, both chaired by DOTC and assisted by the JICA Advisory Committee and the JICA Study Team, noted the strong desire of both government agencies and private sectors to promote the development of the Davao International Airport as the southern air gateway of the Philippines.
 - (5) A supplemental field survey and hearings were conducted by the DOTC, the JICA Advisory Committee and the JICA Study Team on September 9 and 10, 1992. As a result of the survey, it was found out that the housing development on the northern side of Runway 05 has come much closer to the airport as compared to the previous field survey conducted in the beginning of May 1992. This housing development has been approved by the Housing and Land Use Regulatory Board as a low cost housing project.
2. After the presentations, the supplemental field survey and hearings mentioned above, the following points were mutually confirmed by the Philippine side and the Japanese side:
 - (1) The Alternative - BN airport master plan is the most optimum plan among the four alternative plans from the aspects of a future expansibility, ease of construction while maintaining regular airport operations, ease of construction quality control, improved runway profile, and accessibility to the proposed Davao Regional Industrial Center.
 - (2) The Philippine side confirmed that the concern by the Japanese side on the relatively large initial investments required for Alternative - BN would not be of a problem, since the large-scale air transport projects currently undertaken by DOTC are scheduled to be completed by 1995.

- (3) With regard to the concern expressed by the Japanese side on the estimated aircraft noise level at the airport surroundings, the Philippine side made an assurance that this will not be a major problem in the future as well.
- (4) The Philippine side confirmed that specific measures would be taken by the Philippine side to ensure the availability of the land required for the implementation of the airport master plan .
- (5) In the next stage of the study, Alternative - BN will be modified to avoid conflicts with the recent housing developments recognized during the field survey mentioned above. The feasibility study should be based on the modified Alternative - BN.



LIST OF ATTENDANCE

1. Philippine Side
 - 1.1 DOTC
 1. MR. CESAR T. VALBUENA Assistant Secretary, DOTC
 2. MR. PRUDENCIO REYES, JR. Executive Assistant, DOTC
 - 1.2 Steering Committee
 1. MR. GERARDO C. PROTACIO Assistant Secretary, ATO
 2. MR. BIENVENIDO O. MANGA Executive Director, ATO
 3. MR. GEORGE D. ESGUERRA Director, Transportation Planning Service, DOTC
 - 1.2 Technical Working Committee
 1. MR. RAPHAEL S. LAVIDES Chief, Air Transportation Planning Division, DOTC
 2. MR. MANUEL V. DE LEON Chief, Airport Maintenance Section, ATO
 3. MS. MA. FILIPINAS Z. CABANA Supervising Transport Development Officer, Air Transportation Planning Division, DOTC
 4. MS. FILIPINA L. LARRACAS Supervising Transport Development Officer, Air Transportation Planning Division, DOTC
 5. MS. ELMIRA M. DOMINGO Sr. Transport Development Officer, DOTC
 6. MS. RUBY D. MANZO Transport Development Officer II, DOTC
 7. MS. ELSA D. PINEDA Transport Development Officer II, DOTC
 8. MR. FLORANTE MAGDAMO ATS Supervisor, ATO
 9. MR. MARIO GARCIA ANS Supervisor, ATO
 - 1.3 JICA Expert
 1. MR. YOSHINORI HASUMI ATO

2. Japanese Side

2.1 JICA Advisory Committee

- | | | |
|----|-------------------|-------------------------------------|
| 1. | MR. NORIO SANAKA | Chairman of JICA Advisory Committee |
| 2. | MR. HIROTAKA SATO | Member of JICA Advisory Committee |

2.2 JICA Coordinator

- | | | |
|----|--------------------|-----------------|
| 1. | MR. MUTSUMI NARAWA | Project Officer |
|----|--------------------|-----------------|

2.3 JICA Study Team

- | | | |
|----|------------------------|---------------------------|
| 1. | MR. HIDEKI MURATA | Leader of JICA Study Team |
| 2. | MR. RYUJIROU YAMAGISHI | Member of JICA Study Team |
| 3. | MR. TADAMITSU ITOH | Member of JICA Study Team |
| 4. | MR. KAZUO HAYASHI | Member of JICA Study Team |
| 5. | MR. MASASHI KABURAGI | Member of JICA Study Team |
| 6. | MR. YOSHIYA NIINOMI | Member of JICA Study Team |

MEMORANDUM
ON
THE STUDY ON THE DEVELOPMENT PLAN
OF
DAVAO INTERNATIONAL AIRPORT

October 1, 1992

For: Mr. Norio Sanaka, Chairman of JICA Advisory Committee
and Mr. Hideki Murata, Team Leader of JICA Study Team

Through: Mr. George D. Esguerra, Director, Transportation Planning Service,
Department of Transportation and Communications (DOTC) and
Mr. Kazuo Hayashi, Deputy Team Leader of JICA Study Team

Submitted herewith is the report about the meetings which were held on September 24, 1992 in Manila and September 28, 1992 in Davao. The main agenda was how to cope with the conflicts arising from the newly constructed houses at La Verna Hills with Alternative Airport Master Plan - BN and necessary land use controls to eliminate similar occurrence.

1. On September 24, 1992, a meeting was held in Air Transportation Office (ATO). List of attendance is shown in Attachment - 1.

The following major concerns were noted in the said meeting:

- 1.1 The JICA Study Team presented three (3) alternatives for the modification of the Alternative - BN as follows:

Alternative - M1: New runway is not parallel with the existing runway. Separation between the runways is 110m to 180m.

Alternative - M2: Not parallel and the separation is 50m to 180m.

Alternative - M3: Parallel and the separation is 110m.

- 1.2 Based on the comparative evaluation among Alternatives - M1, M2, M3 and AN, the DOTC/ATO counterpart committee and the JICA Study Team have reached a consensus that the Alternative - M3 is the most optimum as a modified plan of the Alternative - BN. It is because that Alternative - M3 requires the least house relocation among the four (4) alternatives and the least total project cost.

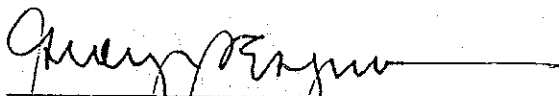
2. On September 28, 1992, another meeting was held in Davao International Airport to consult with regional and local officials in Davao City. List of attendance is shown in Attachment-2.

- 2.1 The JICA Study Team presented the Alternative - M3 and comparative evaluation between Alternative - BN and Alternative - M3.

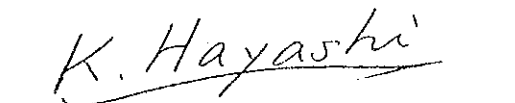



- 2.2 JICA Study Team said that Phase II development of La Verna Hills currently being undertaken at Bo. Cabantian interferes with the reserved area for the airport development in Davao City. The Team also said that it was assured by the City Planning and Development Office during its site survey on May 1992 of the following:
- The reserved area for the airport development is 500m in width and 5,000m in length as depicted in the land use plan of the city government.
 - No development is allowed within the reserved area unless the city approves it.
- 2.3 The Team said that it was aware of the city's approval for the Phase I development of La Verna Hills but there was no information regarding Phase II development as of May 1992. It further said that Phase II development which commenced on July 1992 did not obtain the approval of the city government.
- 2.4 Based on the above, DOTC inquired on the possibility of withdrawing the approval of the concerned housing development. In response to the inquiry, the Regional Director of the Housing and Land Use Regulatory Board (HLURB) stated that the approval can not be recalled. He further said that relocation of the La Verna Hills houses must be regarded as the same as other houses already being occupied around the airport since those houses were already sold and owned by each individuals.
- 2.5 Based on the above situation and the comparative evaluation between the Alternative - BN and Alternative - M3, the DOTC/ATO, other government agencies concerned and the JICA Study Team mutually agreed to adopt the Alternative - M3 as the most optimum airport master plan. Because Alternative - M3 is more advantageous than Alternative - BN in terms of house relocation and project cost.
- 2.6 The DOTC and local government agencies confirmed that specific measures and efforts would be taken by the Philippine side to ensure the availability of the land required for the implementation of the airport master plan. These are as follows:
- 1) For the implementation of Phase - I development project of Davao International Airport, DOTC, Davao Municipal Government, HLURB-XI, RDC-XI, NEDA-XI and Department of Interior and Local Government-XI (DILG) would closely coordinate with each other.
 - 2) For the long-term airport development, land use at the area surrounding the airport will be controlled by revising the existing zoning map. A revised zoning plan, based on land requirements of the Alternative to be agreed upon by DOTC/JICA meeting scheduled later of this week, is expected to be adopted through a city ordinance by the end of 1992.

For your information and perusal.



 GEORGE D. ESCUERRA
 Director
 Transportation Planning Service
 Department of Transportation and
 Communications



 KAZUO HAYASHI
 Deputy Team Leader
 JICA Study Team

LIST OF ATTENDANCE

Date: September 24, 1992 10:00 a.m. - 12:00 a.m.
 Place: Conference Room in Air Transportation Office

1. Philippine Side
 - 1.1 Steering Committee
 1. MR. GERARDO C. PROTACIO Assistant Secretary, ATO
 - 1.2 Technical Working Committee
 1. MR. RAPHAEL S. LAVIDES Chief, Air Transportation Planning Division, DOTC
 2. MS. MA. FILIPINA Z. CABANA Supervising Transport Development Officer, Air Transportation Planning Division, DOTC
 3. MS. ELMIRA M. DOMINGO Airport Engineer, DOTC
 4. MS. RUBY D. MANZO Transport Development Officer II, DOTC
 5. MS. ELSA D. PINEDA Transport Development Officer II, DOTC
 6. MR. FLORANTE MAGDAMO ATS Supervisor, ATO
2. Japanese Side
 - 2.1 JICA Study Team
 1. MR. KAZUO HAYASHI Deputy Team Leader, JICA Study Team

LIST OF ATTENDANCE

Date: September 28, 1992 10:00 a.m. - 12:00 a.m.
Place: VIP Room in Davao Airport

1. Philippine Side1.1 Department of Transportation and Communications (DOTC)

- | | |
|----------------------------|----------------------------------------------------------------------------|
| 1. MR. GEORGE D. ESGUERRA | Director, Transportation
Planning Service |
| 2. MR. ANTONIO V.A. LLAMAS | Regional Director, LTO &
Chairman, Regional
Management Council (RMC) |
| 3. MS. VIVIAN BARRIOS | RMC, DOTC XI |

1.2 Air Transportation Office (ATO)

- | | |
|-------------------------|-----------------------------------------|
| 1. MR. ANGEL S. RONGCAL | Manager,
Davao International Airport |
| 2. MR. MICHAEL V. LAHER | |

1.3 Other Government Agencies

- | | |
|----------------------------|--------------------------------------------------------------------------------------------------|
| 1. MR. ROY T. LOPEZ | Regional Director
HLRB - XI |
| 2. MR. GENARO T. BATINGAL | Asst. Regional Director
Dept. of Interior and
Local Government -XI (DILG) |
| 3. MR. GIL CELIS | Chief Economic
Development Specialist
National Economic
Development Authority-XI (NEDA) |
| 4. MS. ORVILLE B. DIPALING | NEDA - XI |
| 5. MR. JESS RELLER | NEDA - XI |
| 6. MS. CARLITA A. BALIO | Asst. Regional Director
Department of Trade
and Industry (DTI) |
| 7. MR. FRANK M. VILLARAIZ | Department of Tourism |

2. Japanese Side2.1 JICA Study Team

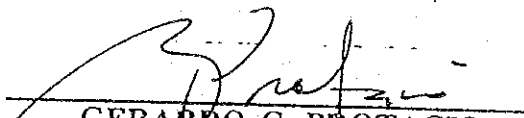
- | | |
|----------------------|----------------------------------------|
| 1. MR. KAZUO HAYASHI | Deputy Team Leader,
JICA Study Team |
|----------------------|----------------------------------------|

K.H.

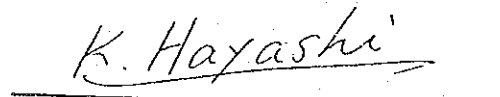
MEMORANDUM
ON
THE STUDY ON THE DEVELOPMENT PLAN OF
DAVAO INTERNATIONAL AIRPORT
IN THE REPUBLIC OF THE PHILIPPINES

OCTOBER 2, 1992

MANILA, PHILIPPINES


GERARDO C. PROTACIO
Assistant Secretary

Air Transportation Office
Department of Transportation
and Communications


KAZUO HAYASHI
Deputy Team Leader

Study Team
Japan International Cooperation Agency

MEMORANDUM ON THE STUDY ON THE DEVELOPMENT PLAN OF DAVAO INTERNATIONAL AIRPORT

The Department of Transportation and Communications (DOTC) and JICA Study Team have confirmed the following points:

1. Alternative - BN has been modified to minimize conflicts with the communities as much as practical. In Alternative-M3 that is modified from the Alternative-BN, the new runway center line is 110m from and in parallel with the existing runway center line.
2. The Alternative - M3 is the most optimum airport master plan for Davao International Airport.
3. The Philippine side would take measures to ensure the availability of the land required for the implementation of the airport master plan.
4. Feasibility Study should be based on the Alternative - M3.
5. Scope of Phase - I Development Project is as shown in the Attachment.
6. The Philippine side has requested for future consultation meetings with local authorities in Davao City to present the findings and recommendations contained in the Draft Final Report to be submitted by February 1993. This presentation will be done in the form of a one-day workshop to formulate project implementation strategies based on the agreements with concerned government agencies and the private sector.



SCOPE OF PHASE - I DEVELOPMENT PROJECT
OF
DAVAO INTERNATIONAL AIRPORT

1. Site preparation for the new runway and new terminal area
2. Construction of new runway with 2,500m length and 45m width
3. Construction of two connecting taxiways with 23m width
4. Construction of new apron to accommodate one (1) DC - 10 class, two (2) A300 class one (1) F50 class aircraft
5. Construction of new connecting taxiway for general aviation
6. Construction of new passenger terminal building with about 11,000 sq.m. floor area including airlines office area
7. Construction of new cargo terminal building with about 3,500 sq. m. floor area
8. Construction of new administration building with about 1,800 sq. m. floor area and new control tower
9. Construction of new fire station with about 550 sq. m. floor area
10. Construction of new car park to accommodate about 310 vehicles
11. Construction of new airport access road
12. Relocation of Instrument Landing System (ILS)
13. Installation of new air traffic control system
14. Installation of new aeronautical telecommunication system
15. Installation of new meteorological observation system
16. Installation of new airfield lighting system
17. Provision of new power supply system
18. Provision of new telephone system
19. Provision of new water supply system
20. Provision of new sewerage system
21. Installation of an incinerator
22. Procurement of one (1) ambulance
23. Installation of fuel hydrant system at the new apron

Note - 1: Area for the aircraft maintenance hangar to accommodate one A300 aircraft is allocated in the airport master plan. Design and construction of the aircraft maintenance hangar will be made by airlines.

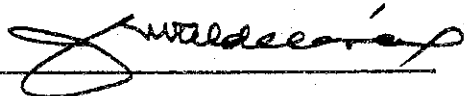
Note - 2: Area for the fuel tank farm is allocated in the airport master plan. Design and construction of the fuel tank farm will be made by airlines or other private sector.

MINUTES OF MEETING
ON
DRAFT FINAL REPORT
OF
THE STUDY ON THE DEVELOPMENT PLAN OF
DAVAO INTERNATIONAL AIRPORT
IN
THE REPUBLIC OF THE PHILIPPINES

AGREED UPON BETWEEN
THE
DEPARTMENT OF TRANSPORTATION AND COMMUNICATIONS
AND
JAPAN INTERNATIONAL COOPERATION AGENCY

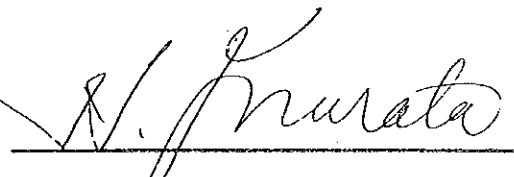
FEBRUARY 2, 1993

MANILA, PHILIPPINES



JOSE R. VALDECAÑAS
Undersecretary

Department of Transportation
and Communications



HIDEKI MURATA
Team Leader

Study Team
Japan International Cooperation Agency

MINUTES OF MEETING ON THE DRAFT FINAL REPORT OF THE STUDY ON THE DEVELOPMENT PLAN OF DAVAO INTERNATIONAL AIRPORT

1. The JICA Study Team submitted the Draft Final Report of the Study to the Department of Transportation and Communications (DOTC) on January 21, 1993. Joint meetings between the Philippine side and the Japanese side were held from January 22, 1993 to February 2, 1993 for the presentation and discussion on the Draft Final Report.
 - (1) The Philippine side was composed of the Steering Committee and Technical Working Committee headed by Mr. Gerardo C. Protacio, Assistant Secretary, Air Transportation Office, DOTC. The Japanese side was composed of the JICA Advisory Committee headed by Mr. Hirotaka Sato, Deputy Chairman of the Committee and the JICA Study Team headed by Mr. Hideki Murata, Team Leader. List of attendance is shown in Attachment - 1.
 - (2) After the presentation and discussion, the Draft Final Report was generally accepted by the DOTC.
 - (3) It was mutually confirmed that the DOTC shall send their additional written comments, if any, on the Draft Final Report to the JICA Study Team by February 22, 1993.
2. The DOTC appreciated the efforts exerted by JICA Study Team for the following works:
 - (1) Upon the request by the DOTC, the JICA Study Team prepared additional drawings of aircraft noise contours indicated in dB (A) so that the Philippine officials could easily understand the noise levels.
 - (2) The JICA Study Team conducted a seminar/workshop on airport planning and development on February 1, 1993 at the Davao Insular Hotel, upon the request by the DOTC. During the seminar, the JICA Study Team presented the conclusions and recommendations of the Study to the local officials and industry groups who were satisfied with the results of the Study.
3. In recognition of the valuable contribution of the Government of Japan in conducting the Study and seminar in Davao, the DOTC awarded plaques of appreciation to JICA, Ministry of Transport, and PCI.

LIST OF ATTENDANCE

1. Philippine Side1.1 DOTC/ATO

- | | | |
|----|------------------------------|------------------------------------------------------|
| 1. | MR. CESAR T. VALBUENA | Assistant Secretary, DOTC |
| 2. | MR. ARLEIGH JAY C. SITOY | Executive Assistant
Office of the Secretary, DOTC |
| 3. | MR. LUIS E. GUANZON, JR. | Director, Air Traffic Service, ATO |
| 4. | MR. CRISOSTOMO O. BALUCATING | Director, Airways Navigation
Service, ATO |

1.2 Steering Committee

- | | | |
|----|-------------------------|----------------------------------------------------|
| 1. | MR. GERARDO C. PROTACIO | Assistant Secretary, ATO |
| 2. | MR. BIENVENIDO O. MANGA | Executive Director, ATO |
| 3. | MR. GEORGE D. ESGUERRA | Director, Transportation
Planning Service, DOTC |

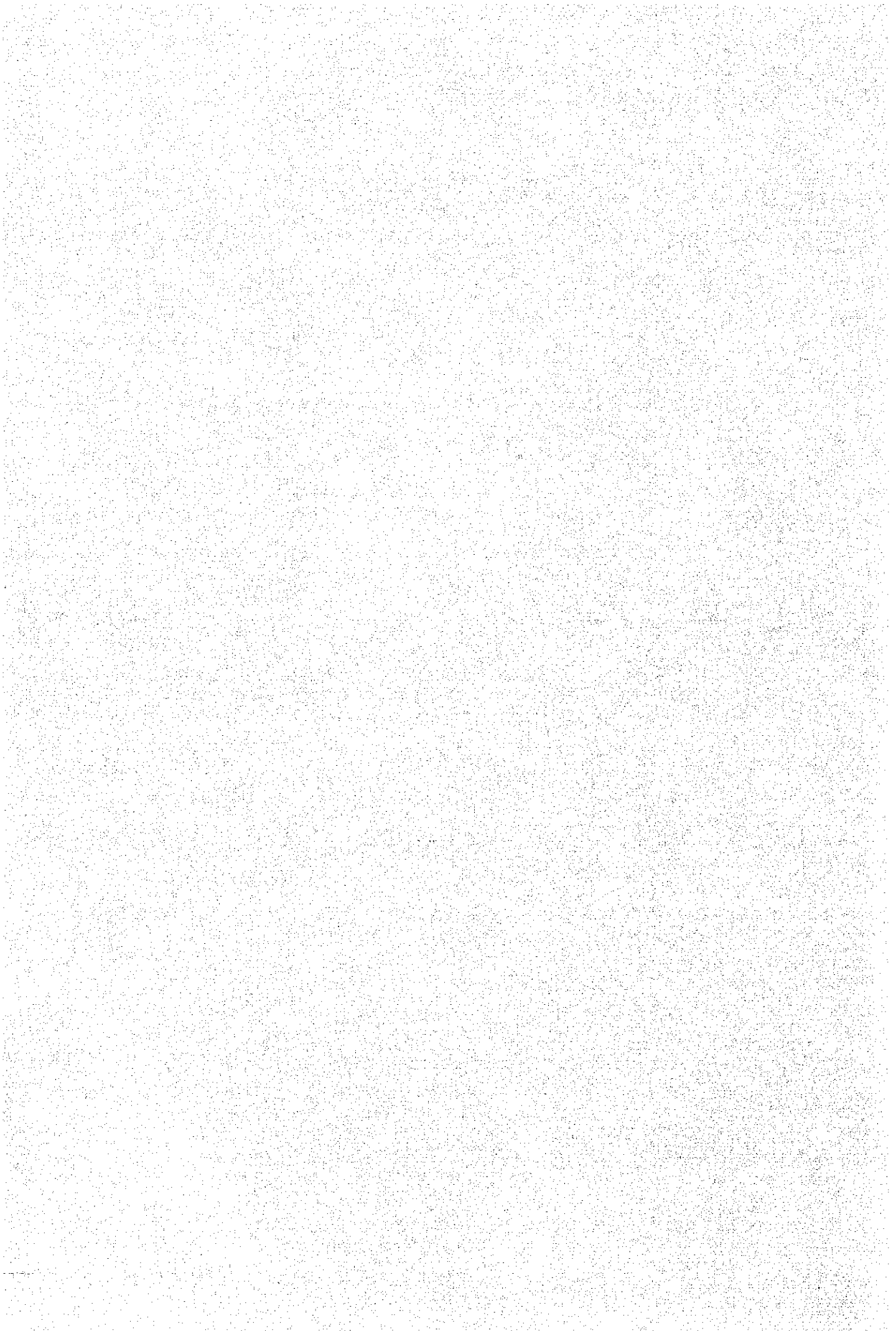
1.3 Technical Working Committee

- | | | |
|-----|-----------------------------------|------------------------------------------------------------------------------------------------|
| 1. | MR. RAPHAEL S. LAVIDES | Chief, Air Transportation
Planning Division, DOTC |
| 2. | MR. MANUEL V. DE LEON | Chief, Airport Maintenance
Section, ATO |
| 3. | MS. MA. FILIPINA Z. CABANA | Supervising Transport
Development Officer,
Air Transportation Planning
Division, DOTC |
| 4. | MS. FILIPINAS L. LARRACAS | Supervising Transport
Development Officer,
Air Transportation Planning
Division, DOTC |
| 5. | MS. ELMIRA M. DOMINGO | Sr. Transport Development
Officer, DOTC |
| 6. | MS. RUBY D. MANZO | Transport Development
Officer II, DOTC |
| 7. | MS. ELSA D. PINEDA | Transport Development
Officer II, DOTC |
| 8. | MR. FELICISIMO C. PANGILINAN, JR. | Sr. Transport Development Officer
DOTC |
| 9. | MR. FLORANTE R. MAGDAMO | ATS Supervisor, ATO |
| 10. | MR. MARIO B. GARCIA | ANS Supervisor, ATO |

(Continued)

2. Japanese Side
- 2.1 JICA Advisory Committee
1. MR. HIROTAKA SATO Deputy Chairman
 2. MR. KENRO OHTSUKA Committee Member
- 2.2 JICA Coordinator
1. MR. MUTSUMI NARAWA Project Officer
- 2.3 JICA Study Team
1. MR. HIDEKI MURATA Team Leader
 2. MR. KAZUO HAYASHI Team Member
 3. MR. MASASHI KABURAGI Team Member
- 2.4 JICA Expert
1. MR. YOSHINORI HASUMI ATO

APPENDIX TO CHAPTER 2



**Population, Population Density and Annual Rate of Population Increase by
Province in Mindanao**

Province and City	Land Area (sq. km)	1939 (Jan 1)	1948 (Oct 1)	1960 (Feb 15)	1970 (May 6)	1975 (May 1)	1980 (May 1)	1990 (May 1)
(1) Population in Mindanao by Province								
Region 9								
Zamboanga del Norte	6,618.1	139	168	281	409	491	588	674
Zamboanga del Sur	8,052.0	160	244	587	890	1,003	1,184	1,544
Region 10								
Agsan del Norte	2,590.3	64	89	177	278	301	365	465
Augsan del Sur	8,965.5	35	38	94	175	213	265	421
Bukidnon	8,293.8	58	63	194	415	533	632	844
Camiguin	229.8	41	70	45	54	53	57	64
Misamis Occidental	1,939.3	210	208	248	320	356	386	424
Misamis Oriental	3,570.1	173	300	344	473	560	690	865
Surigao del Norte	2739	126	155	195	239	298	363	426
Region 11								
Davao del Norte	8,129.8	60	91	263	443	590	725	1,055
Davao del Sur	6,377.6	172	205	498	785	936	1,134	1,483
Davao Oriental	5,164.5	61	68	133	248	299	340	395
South Cotabato	7,468.8	58	103	295	466	587	770	1,073
Surigao del Sur	4,552.2	100	110	165	259	302	378	452
Region 12								
Lanao del Norte	3,092.0	99	132	271	350	381	461	614
Lanao del Sur	3,872.9	144	212	378	456	500	405	600
Lanao del Maguindanao	5,077.6	137	245	377	421	478	537	758
North Cotabato	6,565.9	50	87	279	468	472	565	764
Sultan Kudarat	4714.8	54	5	78	247	239	304	436

(2) Population Density by Province in Mindanao

Region 9								
Zamboanga del Norte	6,618.1	21.0	25.4	42.5	61.8	74.2	88.8	101.8
Zamboanga del Sur	8,052.0	19.9	30.3	72.9	110.5	124.6	147.0	191.8
Region 10								
Agsan del Norte	2,590.3	24.7	34.4	68.3	107.3	116.2	140.9	179.5
Augsan del Sur	8,965.5	3.9	4.2	10.5	19.5	23.8	29.6	47.0
Bukidnon	8,293.8	7.0	7.6	23.4	50.0	64.3	76.2	101.8
Camiguin	229.8	178.4	304.6	195.8	235.0	230.6	248.0	278.5
Misamis Occidental	1,939.3	108.3	107.3	127.9	165.0	183.6	199.0	218.6

Source: 1991 Philippine Statistical Yearbook
Note : Davao City belongs to Davao del Sur

(To be continued)

Population, Population Density and Annual Rate of Population Increase by Province in Mindanao (Con't)

Misamis Oriental	3,570.1	48.5	84.0	96.4	132.5	156.9	193.3	242.3
Surigao del Norte	2739	46.0	56.6	71.2	87.3	108.8	132.5	155.5
Region 11 Davao del Norte	8,129.8	7.4	11.2	32.4	54.5	72.6	89.2	129.8
Davao del Sur	6,377.6	27.0	32.1	78.1	123.1	146.8	177.8	232.5
Davao Oriental	5,164.5	11.8	13.2	25.8	48.0	57.9	65.8	76.5
South Cotabato	7,468.8	7.8	13.8	39.5	62.4	78.6	103.1	143.7
Surigao del Sur	4,552.2	22.0	24.2	36.2	56.9	66.3	83.0	99.3
Region 12 Lanao del Norte	3,092.0	32.0	42.7	87.6	113.2	123.2	149.1	198.6
Lanao del Sur	3,872.9	37.2	54.7	97.6	117.7	129.1	104.6	154.9
Lanao del Maguindanao	5,077.6	27.0	48.3	74.2	82.9	94.1	105.8	149.3
North Cotabato	6,565.9	7.6	13.3	42.5	71.3	71.9	86.1	116.4
Sultan Kudarat	4714.8	11.5	1.1	16.5	52.4	50.7	64.5	92.5

(3) Rate of Annual Increase (%)							
	1939 (Jan 1)	1948 (Oct 1)	1960 (Feb 15)	1970 (May 6)	1975 (May 1)	1980 (May 1)	1990 (May 1)
		9.75	11.38	10.22	4.99	5.00	10.00
Region 9 Zamboanga del Norte		1.96	4.63	3.74	3.73	3.67	1.37
Zamboanga del Sur		4.42	8.02	4.16	2.43	3.37	2.69
Region 10 Agsan del Norte		3.44	6.23	4.52	1.51	3.93	2.45
Agsan del Sur		0.85	8.29	6.27	4.02	4.47	4.74
Bukidnon		0.85	10.39	7.73	5.15	3.47	2.93
Camiguin		5.64	-3.81	1.80	-0.37	1.47	1.17
Misamis Occidental		-0.10	1.56	2.53	2.16	1.63	0.94
Misamis Oriental		5.81	1.21	3.17	3.44	4.26	2.29
Surigao del Norte		2.15	2.04	2.01	4.52	4.03	1.61
Region 11 Davao del Norte		4.37	9.78	5.24	5.92	4.21	3.82
Davao del Sur		1.82	8.11	4.55	3.59	3.91	2.72
Davao Oriental		1.12	6.07	6.29	3.82	2.80	1.51
South Cotabato		6.07	9.69	4.58	4.74	5.58	3.37
Surigao del Sur		0.98	3.63	4.51	3.13	4.59	1.80
Region 12 Lanao del Norte		2.99	6.53	2.54	1.72	3.89	2.91
Lanao del Sur		4.05	5.21	1.85	1.86	-4.13	4.01
Lanao del Maguindanao		6.14	3.86	1.09	2.58	2.36	3.51
North Cotabato		5.85	10.79	5.19	0.17	3.66	3.06
Sultan Kudarat		-21.66	27.31	11.94	-0.66	4.93	3.67

Note: Population and land area are based on the "1991 Philippine Statistical Yearbook". Population annual growth rate are estimated based on the abovementioned data.

Philippine Exports by Major Commodity Groups : 1981 to 1990

(F.O.B. value in million U.S. dollars)

Major commodity group	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Totals	5,720	5,021	5,005	5,391	4,629	4,842	5,735	7,074	7,821	8,267
(%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Coconut products	750	590	680	727	459	470	560	577	532	496
(%)	13.1	11.8	13.6	13.5	9.9	9.7	9.8	8.2	6.8	6.0
Sugar&sugar products	609	445	321	327	189	108	78	83	103	134
(%)	10.6	8.9	6.4	6.1	4.1	2.2	1.4	1.2	1.3	1.6
Forest Product	469	362	331	323	246	251	304	339	284	95
(%)	8.2	7.2	6.6	6.0	5.3	5.2	5.3	4.8	3.6	1.1
Mineral products	758	532	440	266	243	267	224	383	424	442
(%)	13.3	10.6	8.8	4.9	5.2	5.5	3.9	5.4	5.4	5.3
Fruits&vegetables	378	374	327	392	354	346	382	418	180	269
(%)	6.6	7.4	6.5	7.3	7.6	7.1	6.7	5.9	2.3	3.3
Abaca products	25	26	25	37	31	35	47	41	26	21
(%)	0.4	0.5	0.5	0.7	0.7	0.7	0.8	0.6	0.3	0.3
Tacco products	50	49	35	31	28	26	23	26	28	48
(%)	0.9	1.0	0.7	0.6	0.6	0.5	0.4	0.4	0.4	0.6
Mineral fuel&lubricants	42	33	115	87	42	66	97	153	118	155
(%)	0.7	0.7	2.3	1.6	0.9	1.4	1.7	2.2	1.5	1.9
Chemicals	107	96	87	104	151	243	245	256	279	261
(%)	1.9	1.9	1.7	1.9	3.3	5.0	4.3	3.6	3.6	3.2
Textiles	69	56	25	38	39	44	68	71	88	93
(%)	1.2	1.1	0.5	0.7	0.8	0.9	1.2	1.0	1.1	1.1
Misc.manufactures	2,453	2,449	2,586	2,934	2,807	2,874	3,558	4,647	5,689	6,158
(%)	42.9	48.8	51.7	54.4	60.6	59.4	62.0	65.7	72.7	74.5
Re-exports	10	9	33	125	40	112	149	80	70	95
(%)	0.2	0.2	0.7	2.3	0.9	2.3	2.6	1.1	0.9	1.1

Direction of Trade 1981 - 1990

(F.O.B. value in million U.S. Dollars)

Country/Region		United States	Japan	European Economic Community	Middle East Countries	Asean Countries	Others	Total
Year								
1981	I	1,784	1,494	819	1,694	538	1,616	7,945
	E	1,740	1,250	924	99	412	1,295	5,720
1982	I	1,702	1,532	813	1,454	509	1,656	7,666
	E	1,576	1,145	726	90	358	1,125	5,020
1983	I	1,739	1,266	879	1,451	671	1,480	7,486
	E	1,799	1,015	816	78	352	945	5,005
1984	I	1,629	814	674	977	783	1,192	6,069
	E	2,002	1,042	682	66	516	1,082	5,390
1985	I	1,273	734	424	634	754	1,291	5,110
	E	1,618	874	630	71	530	905	4,628
1986	I	1,252	868	568	501	440	1,414	5,043
	E	1,651	851	913	96	351	979	4,841
1987	I	1,485	1,121	781	833	687	1,829	6,736
	E	1,976	981	1,089	99	507	1,068	5,720
1988	I	1,715	1,421	1,039	793	754	2,437	8,159
	E	2,432	1,420	1,248	101	491	1,382	7,074
1989	I	1,978	2,043	1,171	1,009	930	3,287	10,418
	E	2,796	1,585	1,326	123	531	1,460	7,821
1990	I	2,365	2,232	1,365	1,409	1,187	3,648	12,206
	E	3,094	1,615	1,448	126	584	1,319	8,186

Note: I - Imports
E - Exports

Source: National Statistics Office, Yearbook Table 7.2

Visitor Arrivals to the Philippines by Country of Residence, 1980 to 1990

Country of Residence	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
EUROPE	102,755	105,074	98,742	96,882	85,556	79,096	80,251	80,865	100,339	100,339	122,798
Austria //											3,317
Belgium //											2,709
Denmark	2,257	2,489	2,366	2,390	2,334	2,081	2,294	2,572	3,320	3,320	2,043
Finland	988	1,041	884	885	836	726	669	573	1,103	1,103	1,032
France	10,511	10,030	9,760	8,415	7,783	7,714	7,980	6,808	9,543	9,543	10,204
Germany, West	32,047	31,501	27,612	27,892	23,738	22,110	23,210	22,784	30,045	30,045	26,915
Greece //											754
Ireland //											921
Italy	8,729	8,976	8,701	8,287	7,020	5,463	5,379	5,956	8,869	8,869	0,516
Luxembourg //											86
Netherlands	5,671	5,430	5,171	5,503	4,781	4,355	4,325	4,810	6,543	6,543	6,487
Norway	1,899	1,774	1,844	1,688	1,769	1,622	1,999	1,912	2,726	2,726	3,023
Poland //											226
Portugal //											1,185
Spain	5,617	6,301	4,926	3,820	2,134	1,851	1,415	1,770	2,970	2,970	2,827
Sweden	4,051	4,403	4,102	3,904	3,844	3,984	4,838	5,557	6,759	6,759	6,389
Switzerland	11,557	11,561	10,751	11,100	10,095	9,512	8,826	8,248	10,853	10,853	10,382
United Kingdom	19,428	21,408	22,625	22,990	21,222	19,679	19,316	19,867	26,600	26,600	33,465
USSR //											1,003
Yugoslavia //											514
MIDDLE EAST	10,583	15,254	16,374	14,209	17,809	13,539	19,976	20,396	15,052	15,052	20,742
Bahrain											1,134
Iran //											703
Israel //											2961
Jordan //											605
Kuwait //											884
Saudi Arabia	10,583	15,254	16,374	14,209	17,809	13,539	19,976	20,396	15,052	15,052	13,112
United Arab Emirates											1343
AFRICA //											795
Egypt											305
Nigeria											285
South Africa											205
OTHERS AND UNSPECIFIED	96,558	92,372	92,744	82,077	71,061	74,366	71,718	70,833	86,823	86,823	29,457
TOTAL	947,543	881,155	824,521	795,537	747,459	706,532	711,582	721,950	1,076,103	1,076,103	893,763
OVERSEAS FILIPINOS	60,616	57,798	66,206	65,013	69,253	66,542	69,935	72,750	113,616	113,616	130,757

(to be continued)

Source: Tourism Research and Statistics Division, Department of Tourism

Visitor Arrivals to the Philippines by Country of Residence, 1980 to 1990
(Con't.)

Country of Residence	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Grand Total	1,008,159	1,038,953	1,090,807	1,060,550	1,018,712	773,074	781,517	794,700	1,043,114	1,189,719	1,024,590
ASEAN											
Brunei	80,595	88,508	80,171	64,641	57,100	49,454	46,844	46,520	59,671	64,806	47,758
Indonesia	0	0	0	0	2,024	2,140	2,031	1,690	2,302	2,455	1,660
Malaysia	10,342	11,771	10,806	7,711	6,175	5,916	6,222	5,664	7,250	7,994	5,190
Singapore	28,684	29,470	25,939	18,107	14,459	14,525	12,700	11,941	16,336	17,201	11,009
Thailand	31,828	34,913	33,792	27,210	22,147	17,271	17,556	17,705	23,794	26,402	19,331
Thailand	8,741	12,346	10,104	11,604	12,985	9,602	8,255	9,248	9,909	10,753	8,768
EAST ASIA											
Japan	405,782	335,875	295,226	304,610	275,358	251,759	255,872	257,375	307,662	472,713	369,954
Hongkong	260,252	192,902	159,652	178,527	160,542	152,771	133,536	126,127	181,741	215,634	4,066
Korea	84,067	92,281	75,625	70,043	62,939	52,407	75,344	80,886	133,331	130,346	201,982
Taiwan	10,651	12,298	13,698	19,258	11,802	10,873	12,623	14,463	16,125	36,587	70,629
Taiwan	40,812	38,394	46,251	42,782	40,276	35,700	34,369	35,899	56,465	90,146	36,533
SOUTH ASIA											
Bangladesh II	10,629	10,309	10,831	11,162	11,555	9,957	6,908	6,344	5,701	6,348	14,923
India	10,629	10,309	10,831	11,162	11,555	9,957	6,908	6,344	5,701	6,348	1,046
Nepal II											6,474
Pakistan II											530
Sri Lanka II											5,368
NORTH AMERICA											1,405
USA	168,264	165,083	153,554	165,217	178,030	177,525	182,903	193,694	231,232	267,679	224,510
Canada	151,251	147,730	148,783	151,241	160,638	162,320	166,382	175,729	211,502	246,586	203,941
Canada	17,013	18,353	14,781	13,976	15,392	15,205	15,521	17,965	19,730	21,093	20,569
CENTRAL AMERICA II											
Mexico											401
SOUTH AMERICA II											401
Argentina II											1,237
Brazil II											264
Colombia I/											537
Peru II											170
Venezuela I/											136
OCEANIA											130
Australia	72,377	67,679	65,879	66,739	52,900	50,836	47,110	45,915	48,698	54,143	61,188
Guam II	67,942	63,342	62,969	53,238	40,670	40,176	44,571	43,126	45,349	50,529	47,351
Nauru II											8,784
New Zealand	4,435	4,337	3,910	3,501	3,230	2,660	2,539	2,789	3,349	3,614	129
Papua New Guinea II											3,627
Papua New Guinea II											1,297

Source: Tourism Research and Statistics Division, Department of Tourism

Airport Classification

As of June 1992

Airport	Number
I. REGULAR INTERNATIONAL 1. Manila 2. Mactan	2
II. ALTERNATIVE INTERNATIONAL 1. Davao 2. Laoag 3. Zamboanga	3
III. TRUNKLINE 1. Bacolod 5. Dumaguete 9. Pto. Princesa 2. Baguio 6. General Santos 10. Roxas 3. Cagayan de Oro 7. Iloilo 11. San Jose 4. Cotabato 8. Legaspi 12. Tacloban	12
IV. SECONDARY 1. Allah Valley 14. Jolo 27. Plaridel 2. Antique 15. Kalibo 28. Romblon 3. Bagabag 16. Lahug 29. San Fernando 4. Basco 17. Lubang 30. Sanga-Sanga 5. Bislig 18. Malabang 31. Sorsogon 6. Butuan 19. Mamburao 32. Surigao 7. Calapan 20. Marinduque 33. Tagbilaran 8. Calbayog 21. Masbate 34. Tandag 9. Catarman 22. Mati 35. Tuguegarao 10. Cauayan 23. Naga 36. Vigan 11. Daet 24. Ormoc 37. Virac 12. Dipolog 25. Osamis 13. Iligan 26. Pagadian	37
V. FEEDER 1. Alabat 12. Corregidor 23. Lucena 2. Baler 13. Cuyo 24. Maasin 3. Barobo 14. Dolores (closed) 25. Malaybalay 4. Biliran 15. Guiuan 26. Palanan 5. Bulan 16. Hilongos 27. Rosales 6. Busuanga 17. Iba 28. Siargao 7. Cagayan de Oro 18. Ipil 29. Siocon 8. Camiguin 19. Itbayat 30. Siquijor 9. Castillejos 20. Jomalig 31. Ubay 10. Catbalogan 21. Liloy 32. Wasig 11. Caticlan 22. Lingayen	32
Total	86

Source: Department of Transportation and Communications

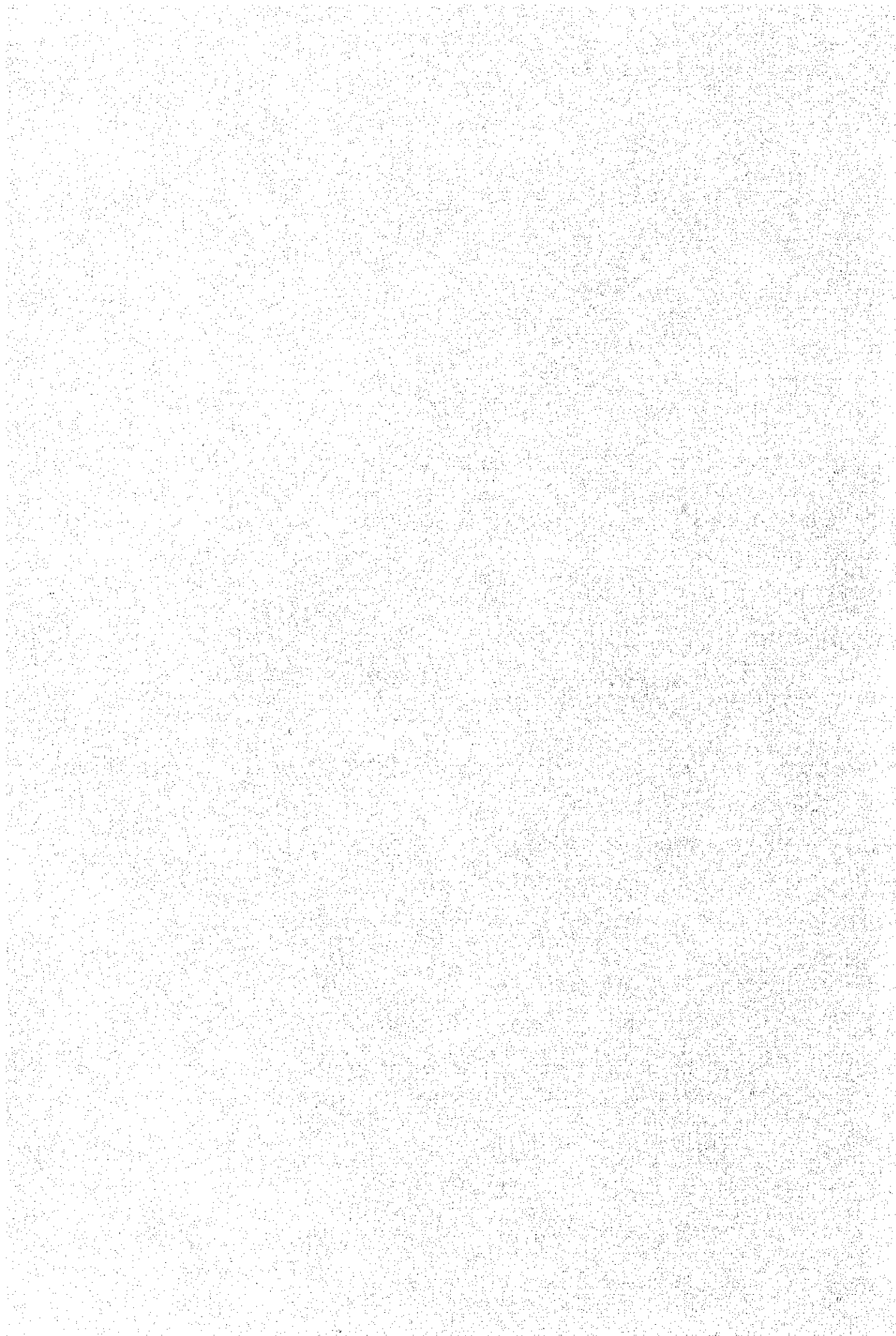
Passenger Traffic by Major Seaport in Mindanao

(Thousand)

Name of Seaport	1980										1981	1982	1983	1984	1985	1986	1987	1988	1989		
	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out
Rutuan										13.2	70.8	125.2	203.4	265.3	285.9	327.5	451.9	556.0			
										6.7	32.2	54.8	92.1	132.8	139.5	161.4	226.3	302.0			
										6.5	38.6	70.4	111.3	132.5	146.4	166.0	225.6	254.0			
Cagayan de Oro										461.9	625.3	778.6	600.0	510.2	579.5	585.0	652.1	814.4			
										220.0	291.1	356.4	299.8	238.3	266.0	272.9	337.9	411.2			
										241.9	334.2	422.2	300.3	272.0	313.5	312.2	314.2	403.2			
Davao, Sta. Ana										273.2	137.4	132.6	68.1	41.7	34.9	290.4	270.0	181.8			
										129.8	64.1	53.8	31.9	15.8	16.1	163.3	157.3	103.1			
										143.3	73.2	78.0	36.1	25.9	18.8	127.1	112.6	78.7			
Davao, Sasa										3.3	68.0	54.4	83.5	39.4	32.2	67.1	99.4	107.7			
										2.6	31.2	35.8	39.6	23.4	17.7	41.2	55.6	53.1			
										0.7	36.8	28.6	43.9	16.0	14.5	25.9	43.7	54.6			
Davao, Total										273.2	205.4	197.0	151.5	81.1	67.1	357.4	369.3	289.5			
										129.8	95.3	89.7	71.5	39.2	33.0	204.5	213.0	156.2			
										143.3	110.0	107.4	80.0	41.9	33.3	153.0	156.4	133.3			
Gen. Santos										132.3	137.2	136.0	103.3	98.1	99.3	120.2	118.7	126.5			
										60.7	64.6	62.9	47.3	44.9	45.5	51.0	51.3	54.8			
										71.6	72.7	73.1	56.0	53.2	53.8	69.3	67.4	71.7			
Surigao										301.8	275.5	262.6	257.6	263.5	294.8	313.1	335.0	381.6			
										136.7	148.1	143.3	129.2	137.7	159.4	157.4	174.3	198.2			
										145.2	127.4	139.3	128.4	125.8	135.4	155.7	160.7	183.4			
Zamboanga										967.2	895.0	1,014.5	894.0	568.1	1,010.3	1,008.4	1,222.0	1,298.1			
										529.1	488.0	548.3	467.5	467.9	504.3	518.2	650.3	699.1			
										438.1	406.9	466.2	426.5	400.3	506.0	490.2	571.8	598.9			
Grand Total										2,149.5	2,209.1	2,533.9	2,209.9	2,085.4	2,336.9	2,711.7	3,149.1	3,466.1			
										1,102.9	1,119.3	1,255.4	1,107.4	1,060.7	1,148.5	1,365.3	1,653.1	1,821.6			
										1,046.6	1,009.8	1,278.5	1,102.5	1,025.7	1,188.3	1,346.3	1,496.0	1,644.5			

Source: Philippine Port Authority Region XI, 1991

APPENDIX TO CHAPTER 3



Interview Survey for Air Passenger

An interview survey was carried out according to domestic scheduled flights mentioned below:

Date	Flight No.	Destination	No. of Pax Interviewed
03 May 92 (Sun)	PR 122	Cagayan de Oro	42
	PR 812	Manila	116
	PR 171	Zamboanga	28
	PR 460	Cebu	70
	PR 814	Manila	110
04 May 92 (Mon)	PR 410	Cebu	71
	PR 812	Manila	111
	PR 171	Zamboanga	26
	PR 460	Cebu	60
	PR 814	Manila	105
05 May 92 (Tue)	PR 122	Cagayan de Oro	68
	PR 812	Manila	91
	PR 171	Zamboanga	49
	PR 460	Cebu	61
	PR 814	Manila	142
			1,150

Total number of passengers interviewed was 1,150. The interview surveys were held during the general election. Especially, the first day - May 3rd on Sunday, many candidates and their supporters were seen in the Passenger Terminal Building. It seemed to be an unusual situation, but anyhow the survey will be valuable for the planning of the airport. The preliminary result of the survey is explained as follows:

1. Nationality

	Responses	Percentage
1. Filipino	1,036	92%
2. Overseas Filipino	10	1%
3. American	22	2%
4. Japanese	20	2%
5. Hong Kong	1	0%
6. Others	31	3%
1,120		100%

2. Usual Place of Residence

	<u>Responses</u>	<u>Percentage</u>
1. Davao	348	42%
2. Manila	275	21%
3. Cebu	113	9%
4. Other - Philippines	194	15%
5. Other Country	164	13%
	<u>1,120</u>	<u>100%</u>

3. Trip Purposes

	<u>Responses</u>	<u>Percentage</u>
1. Holiday/Vacation	232	20%
2. Business	378	32%
3. Meeting/Conference	207	18%
4. Visiting Friends/Relatives	137	12%
5. Transit	26	2%
6. Others	202	16%
	<u>1,182</u>	<u>100%</u>

4. Origin

	<u>Responses</u>	<u>Percentage</u>
1. Davao	949	87%
2. General Santos	35	3%
3. Others	107	10%
	<u>1,091</u>	<u>100%</u>

5. Final Destination

	<u>Responses</u>	<u>Percentage</u>
1. Manila	682	63%
2. Cebu	168	16%
3. Other Place in Philippines	209	19%
4. Other Country	20	2%
	<u>1,079</u>	<u>100%</u>

In addition to the above, there is an international scheduled flight started from April 29, 1992 between Davao and Manado - Indonesia operated by Bouraq Airlines - Indonesian Airlines once a week. The flight schedule is as follows:

Wednesday	Arriving Davao	17:00
Thursday	Leaving Davao	7:00

The interview survey for international passengers was tried to perform on May 6 and 7- (Wednesday and Thursday). Finally, the survey had not been carried out due to an occasion of Filipino delegation-arrival and a few passenger-departure.

Passenger Processing Time Survey

1. International Passenger

As there are insufficient international facilities provided at Davao International Airport, the survey for international passengers was carried out at Ninoy Aquino International Airport-Manila for the study. The result of the survey is presented as follows:

(1) Customs Inspection - Departure

Date	No. of Pax Surveyed	Ave. No. of Baggage Inspected	Processing Time		Average
			Max.	Min.	
18 May 92	18	2.0	45"	5"	23"

(2) Check-in

Date	Flight No.	No. of Pax Surveyed	Ave. No. of Baggage Inspected	Processing Time		
				Max.	Min.	Ave.
18 May 92	MH703	21	0.86	7:45"	1:24"	1:50"

(3) Terminal Fee Counter

Date	No. of Pax Surveyed	Processing Time		Average
		Max.	Min.	
18 May 92	31	32"	11"	18"

(4) Passport Control - Departure

Date	No. of Pax Surveyed	Processing Time		Average
		Max.	Min.	
18 May 92	21	1:27"	26"	50"

(5) Security Check before Gate Lounges

Date	No. of Pax Surveyed	Processing Time		Average
		Max.	Min.	
18 May 92	29	25"	4"	9"

(6) Passport Control - Arrival

Date	No. of Pax Surveyed	Processing Time		Average
		Max.	Min.	
18 May 92	20	1:04"	6"	35"

(7) Customs Inspection - Arrival

Date	No. of Pax Surveyed	Ave. No. of Baggage Inspected	Processing Time		
			Max.	Min.	Average
18 May 92	38	1.4	2:59"	12"	1:03"

2. Domestic Passengers

The survey for domestic passengers was conducted at Davao International Airport. The result of the survey was also presented as follows:

(1) Security check before check-in "No Security Equipment"

Date	No. of Pax Surveyed	Ave. No. of Baggage Inspected	Processing Time		
			Max.	Min.	Average
04 May 92	18	1.1	2:27"	9"	32"

(2) Check-in

Date	Flight No.	No. of Pax Surveyed	Ave. No. of Baggage Inspected	Processing Time		
				Max.	Min.	Ave.
04 May 92	PR812	19	1.4	2:30"	45"	1:10"
04 May 92	PR814	21	1.7	2:33"	17"	1:12"

(3) Security check before Predeparture Lobby "Security Equipment Installed"

Date	No. of Pax Surveyed	Processing Time		
		Max.	Min.	Average
04 May 92	17	25"	10"	11"

Present Flight Schedule at Davao International Airport

Hrs.	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Domestic							CEB B737 550 650	CGY *1 CEB *2									MNL A300 605	MNL A300 725						
											ZAM ZAM F50 1010 1035						MNL A300 1705	MNL A300 1825						
International																		MDC *6 1700				HS748		

Note *1 : Tu-Th-Sa-Su *2 : Mo-We-Fr *3 : Mo-We-Th-Sa
 *4 : Tu-Fr-Su *5 : Th *6 : We

Result of Traffic Survey

Traffic survey was carried out to obtain the number of incoming and outgoing cars and parked cars generated by the air traffic from May 2, 1992 to May 5, 1992. The results of the survey are as follows:

1. Number of Air Passengers

Number of air passengers during the traffic survey is shown in table A.3.4.1.

Table A.3.4.1 Number of Arrival and Departure Passengers at Davao Airport

Date	Arrival				Departure			
	Flight No.	Origin	No. of Passengers	Time of Arrival	Flight No.	Destination	No. of Passengers	Time of Departure
5.3.92 (Sun.)	PR 409	CEB	101	5:50	PR 122	CGY	68	6:50
	PR 811	MNL	183	6:05	PR 812	MNL	242	7:25
	PR 172	ZAM	47	10:10	PR 171	ZAM	31	10:35
	PR 813	MNL	239	17:05	PR 814	MNL	224	18:25
	PR 459	CEB	131	17:50	PR 460	CEB	95	18:50
5.4.92 (Mon.)	PR 409	CEB	83	5:50	PR 410	CEB	100	6:50
	PR 811	MNL	199	6:05	PR 812	MNL	209	7:25
	PR 172	ZAM	20	10:10	PR 171	ZAM	32	10:35
	PR 813	MNL	172	17:05	PR 814	MNL	182	18:25
	PR 121	CGY	85	17:20	PR 460	CEB	74	18:50
5.5.92 (Tue.)	PR 409	CEB	58	5:50	PR 122	CGY	98	6:50
	PR 811	MNL	213	6:05	PR 812	MNL	211	7:25
	PR 172	ZAM	46	10:10	PR 171	ZAM	54	10:35
	PR 813	MNL	227	17:05	PR 814	MNL	198	18:25
	PR 459	CEB	142	17:50	PR 460	CEB	73	18:50

From Table A.3.4.1, peak hour passengers are indicated below:

Date	Time	Peak Hour Passengers
May 3	6:50 - 7:50	310
	17:05 - 18:05	310
May 4	6:50 - 7:50	309
	17:05 - 18:05	257
May 5	6:50 - 7:50	309
	17:05 - 18:05	369

2. Number of Incoming and Outgoing Cars during Peak Hour

Date	In/Out	Time	Private car	Taxi	Bus	Jeepney	Tricycle	Total
May 3	IN	5:30-6:30	199	62	2	13	32	308
	OUT	6:30-7:30	178	40	2	22	47	289
	IN	16:40-17:40	229	52	4	4	49	338
	OUT	17:10 - 18:10	304	51	3	8	51	417
May 4	IN	5:30 - 6:30	258	63	3	20	33	377
	OUT	6:00 - 7:00	214	53	2	18	47	334
	IN	16:20 - 17:20	290	62	4	7	51	414
	OUT	17:20 - 18:20	305	50	6	14	62	437
May 5	IN	5:30 - 6:30	252	65	2	2	35	378
	OUT	5:50 - 6:50	206	63	2	2	31	319
	IN	16:30 - 17:30	235	60	3	3	58	372
	OUT	17:10 - 18:10	266	57	4	4	65	409

Traffic generated by passengers are calculated as follows:

		Traffic A	Peak Hour Passenger B	A / B
May 3	morning	308	310	0.99
	evening	417	370	1.13
May 4	morning	377	309	1.22
	evening	437	257	1.70
May 5	morning	378	309	1.22
	evening	409	369	1.11
<u>Ave.</u>				1.23

As a result, the number of cars generated per peak hour passenger at each direction is estimated to be 1.2.

3. Number of Parked Cars

Maximum number of parked cars during survey period is shown in Table 3.4.1.

Date	Time	Private car	Taxi	Bus	Jeepney	Tricycle	Total
May 3	6:40	116	30	6	15	2	169
	17:30	159	32	3	9	2	205
May 4	6:20	106	19	2	14	1	142
	17:20	165	29	4	12	1	211
May 5	6:10	79	20	3	14	1	117
	17:20	129	33	3	18	2	185

Parked car generated by air passengers are calculated as follows:

		Number of Parked Car A	Peak Hour Passenger B	A / B
	morning	169	310	0.55
	evening	205	370	0.55
May 4	morning	142	309	0.46
	evening	211	257	0.82
May 5	morning	117	309	0.38
	evening	185	369	0.50
Ave.				0.54

As a result, the number of parked cars during peak hour is estimated to be 0.5.

Proportion of types of parked cars is calculated below.

		Private Car	Taxi/ Tricycle	Bus/JEEPNEY	Total
May 3	Morning	116	32	21	169
		69	19	12	100
	Evening	159	34	12	205
		78	16	6	100
May 4	Morning	106	20	16	142
		75	14	11	100
	Evening	165	30	16	211
		78	14	8	100
May 5	Morning	79	21	17	117
		67	18	15	100
	Evening	129	35	21	185
		70	19	11	100
Ave.		73	17	11	100

From the above table, the proportion is estimated to be 73 % for private car, 17 % for Taxi/Tricycle and 10 % for Bus/JEEPNEY.

Calculation of Rainfall Intensity

Typical rainfalls recorded at Davao airport since 1980 are listed in Table A.3.5.1.

Table A.3.5.1 Typical Rainfall Precipitation

Date	Rainfall (mm)	Duration (Minute)	Rainfall Intensity (mm/hr)
June 17, 1980	117.0	68	103.2
July 10, 1989	24.2	10	145.2
June 25, 1989	90.1	68	79.5
March 5, 1989	28.0	10	168.0

Source : PAGASA

Based on the above data, 10 minutes and 60 minutes rainfall intensities are estimated as follows:

Table A.3.5.2 Rainfall Intensity

Duration (min)	10	60
10 Year Recurrence (mm/hr)	168.0	103.2
5 Year Recurrence (mm/hr)	145.2	79.5

Formulas of rainfall intensity are determined based on the Japanese standard for designing of drainage systems as follows:

$$i = \frac{a}{t + b}$$

$$b = \frac{60 - 10 \times b}{b - 1}$$

$$b = \frac{I_{10}}{R_{60}}$$

$$a = R_{60} \times (b + 60)$$

where, i : Rainfall intensity
 t : Time of concentration
 a, b : Constants
 b : Specific modules
 R_{60} : Rainfall precipitation for 60 minutes
 I_{60} : Rainfall precipitation for 10 minutes

Rainfall Intensity of 10 year recurrence

$$b = 168.0/103.2 = 1.63$$

$$b = \frac{60 - 10 \times 1.63}{1.63 - 1} = 69.37$$

$$a = 103.2 \times (69.37 + 60) = 13.351$$

$$i = \frac{13.351}{t + 69.37}$$

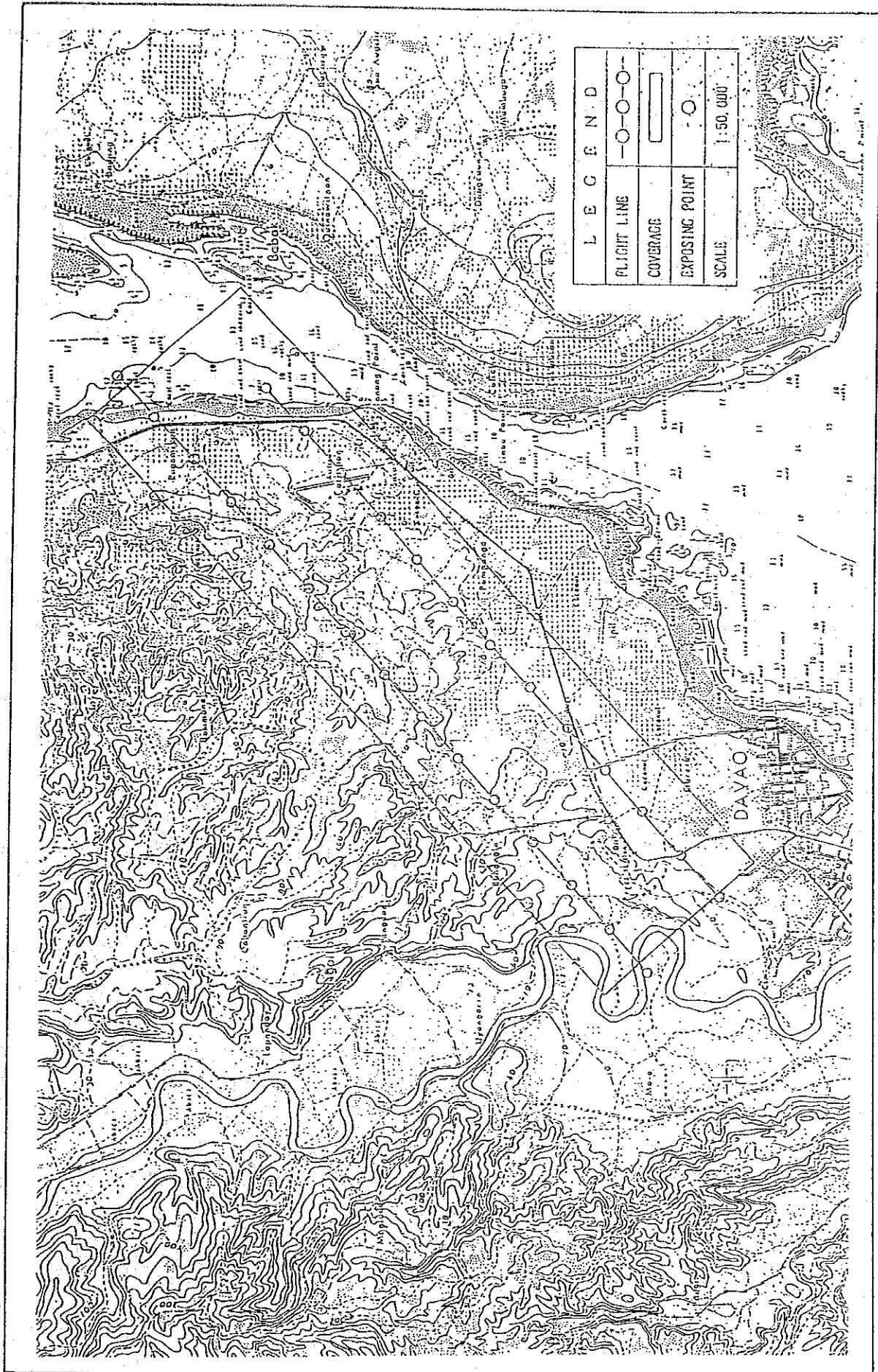
Rainfall Intensity of 5 year recurrence

$$b = 145.2/79.5 = 1.83$$

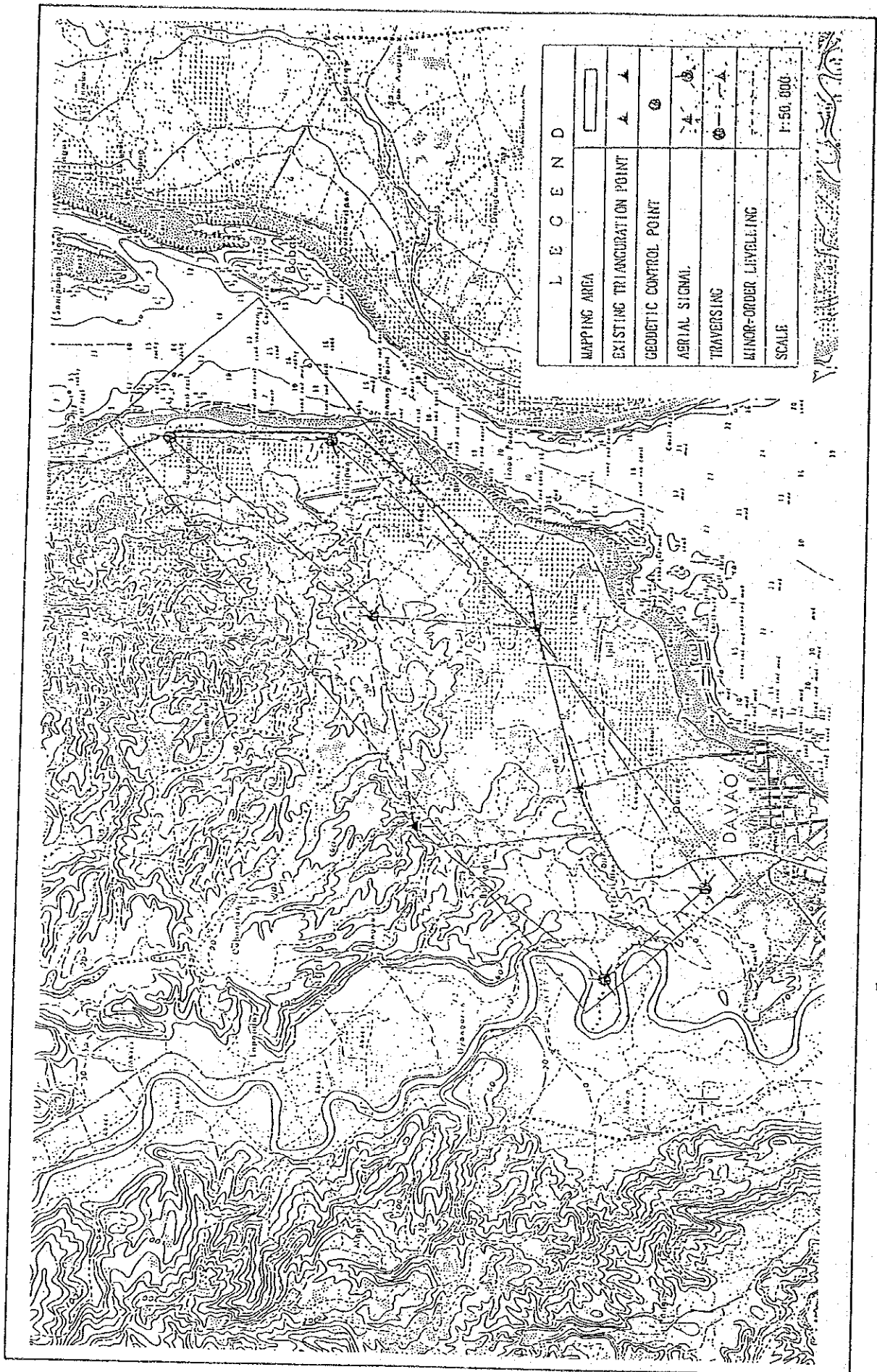
$$b = \frac{60 - 10 \times 1.83}{1.83 - 1} = 50.24$$

$$a = 79.5 \times (50.24 + 60) = 8.764$$

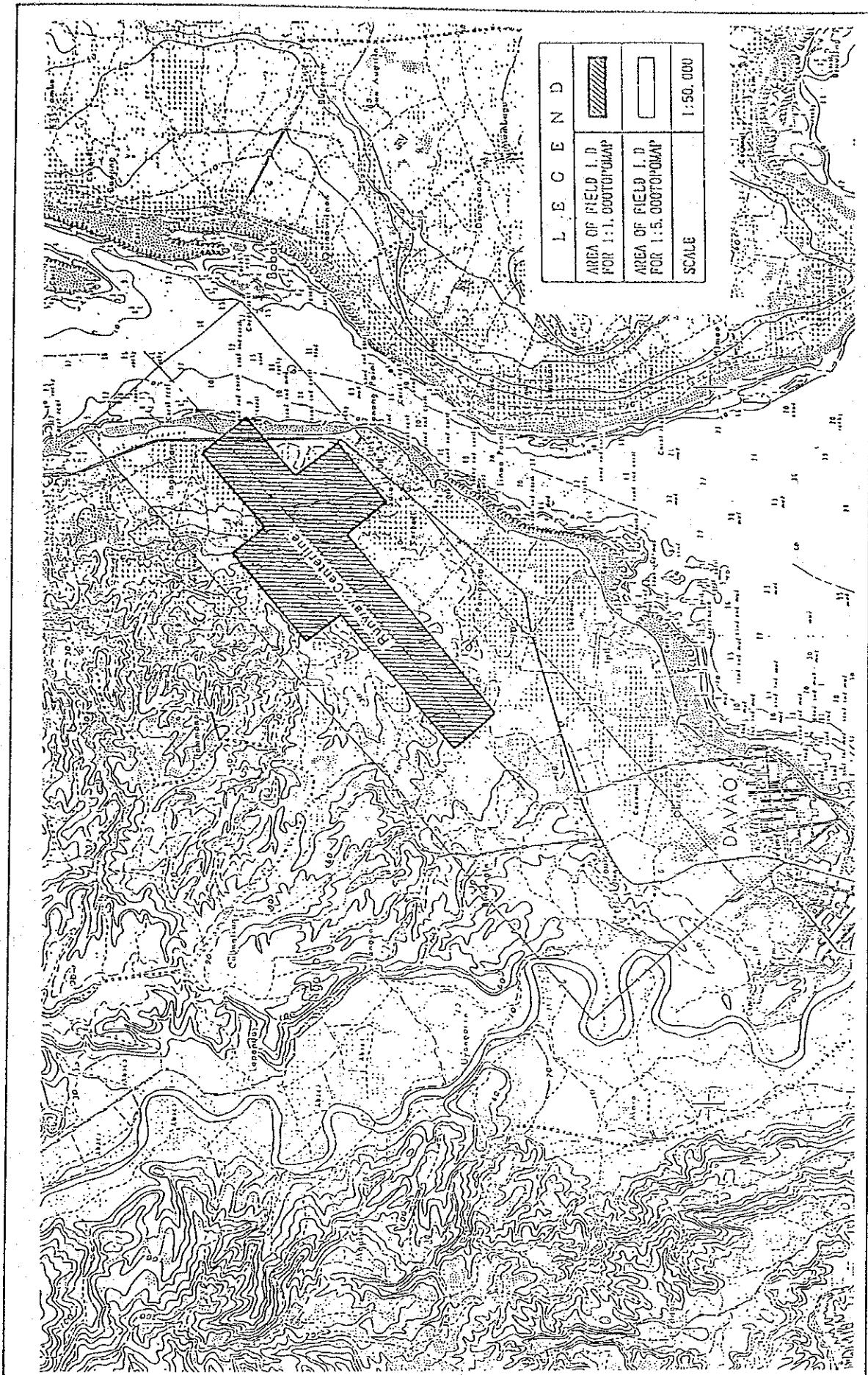
$$i = \frac{8.764}{t + 50.24}$$



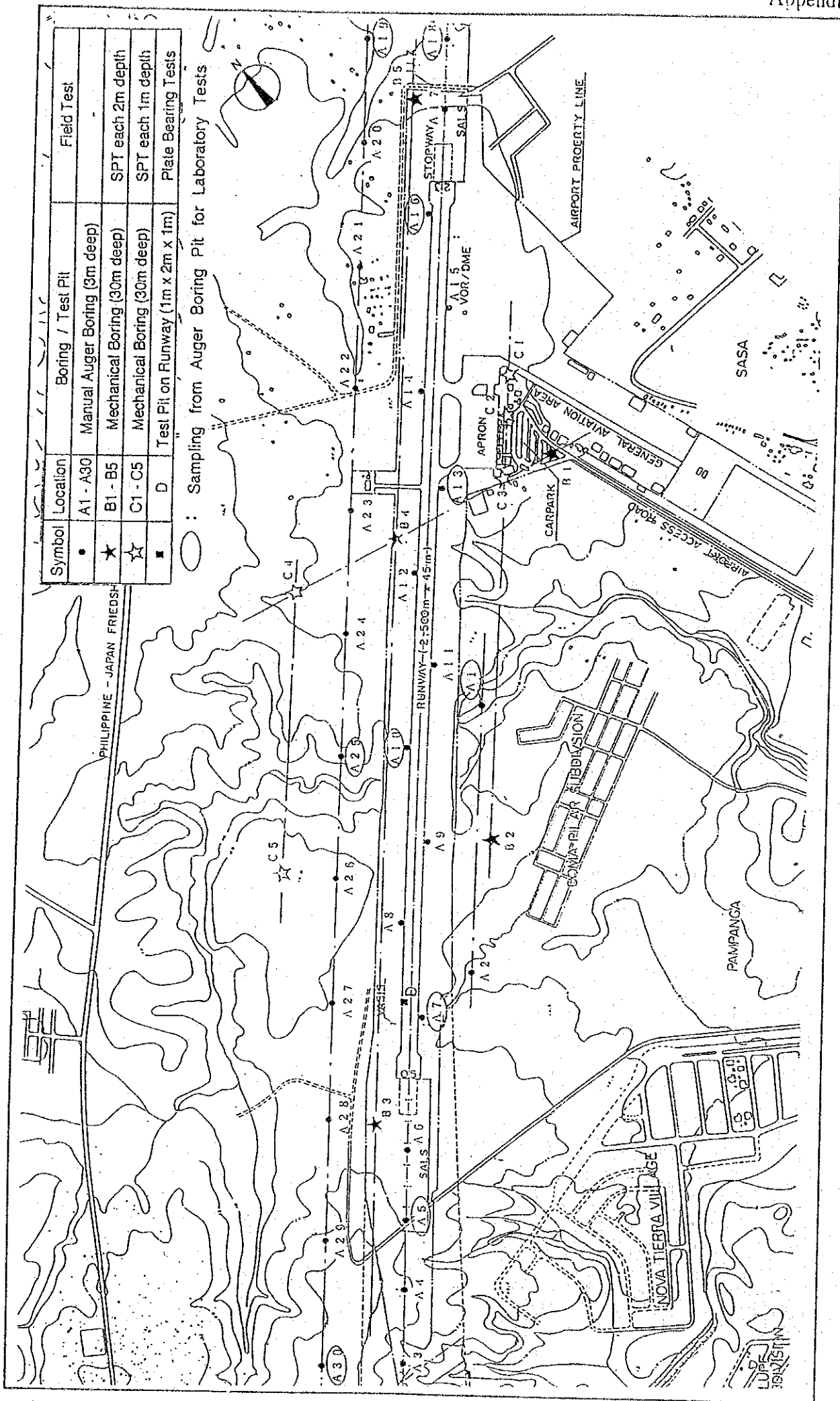
Location Map of Aerial Photography



Location Map of Surveying for Aerial Signalization



Location Map of Longitudinal Profiling and Cross Sectioning



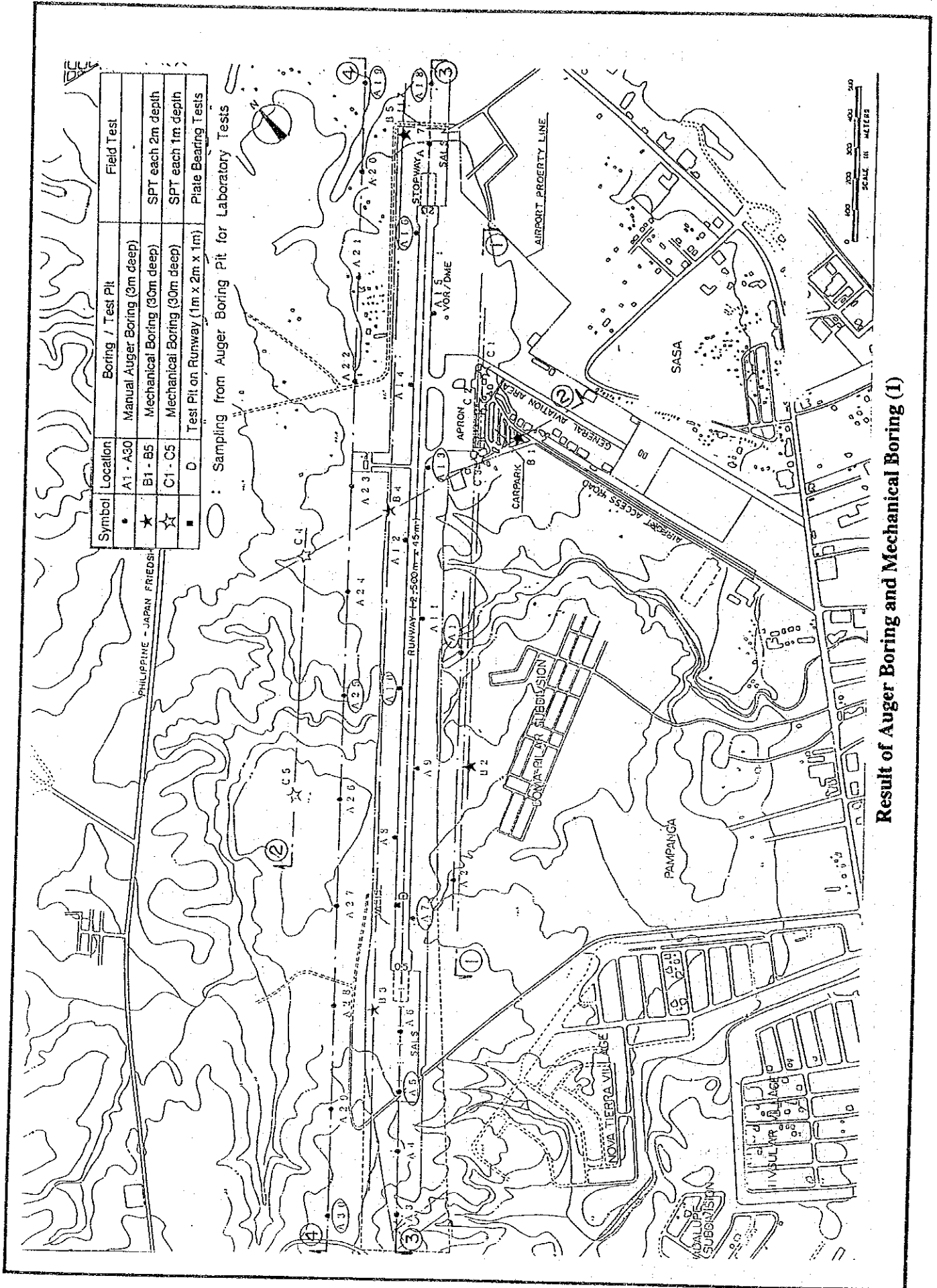
Location Map of Soil Investigation

Items of Soil Investigation at Each Location

Purpose	GENERAL SOUNDING															
	Items	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	A13	A14	A15
1) Manual Auger Boring	3m	3m	3m	3m	3m	3m	3m	3m	3m	3m	3m	3m	3m	3m	3m	3m
2) Soil Sampling (Number of Samples)	1				1		1				1			1		
3) Physical Property Tests																
- Sieve analysis	1				1		1				1			1		
- Specific gravity	1				1		1				1			1		
- Natural water content	1				1		1				1			1		
- Consistency	1				1		1				1			1		
4) Dynamic Tests																
- Moisture density	1				1		1				1			1		
- Laboratory CBR	1				1		1				1			1		
- Unconfined compression	1				1		1				1			1		

Purpose	GENERAL SOUNDING															
	Items	A16	A17	A18	A19	A20	A21	A22	A23	A24	A25	A26	A27	A28	A29	A30
1) Manual Auger Boring	3m	3m	3m	3m	3m	3m	3m	3m	3m	3m	3m	3m	3m	3m	3m	3m
2) Soil Sampling (Number of Samples)	1			1	1						1					
3) Physical Property Tests																
- Sieve analysis	1			1	1						1					
- Specific gravity	1			1	1						1					
- Natural water content	1			1	1						1					
- Consistency	1			1	1						1					
4) Dynamic Tests																
- Moisture density	1			1	1						1					
- Laboratory CBR	1			1	1						1					
- Unconfined compression	1			1	1						1					

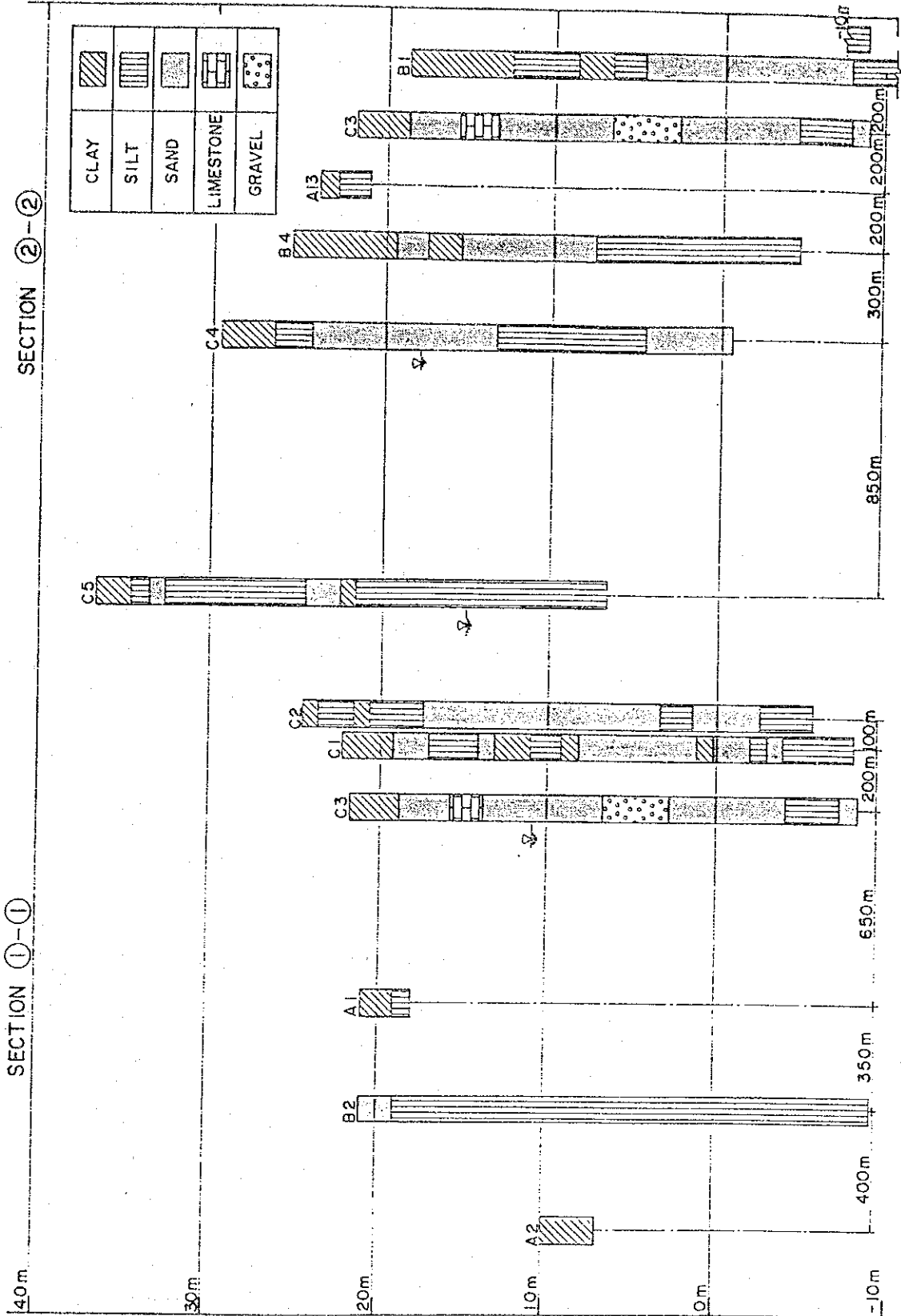
Purpose	Sounding for Civil Works Facilities					Sounding for Architectural Facilities					Pavement Investigation	
	Item	B1	B2	B3	B4	B5	C1	C2	C3	C4		C5
1) Mechanical Boring	30m	30m	30m	30m	30m	30m	30m	30m	30m	30m	30m	
2) Standard Penetration Test (Interval)	2m	2m	2m	2m	2m	2m	1m	1m	1m	1m	1m	
3) Soil Sampling (Number of Samples)							3	3	3	3	3	
4) Physical Property Tests												
- Sieve analysis							3	3	3	3	3	2
- Specific gravity							3	3	3	3	3	2
- Natural water content							3	3	3	3	3	2
- Consistency							3	3	3	3	3	2
5) Dynamic Tests												
- Moisture density												
- Laboratory CBR												2
- Unconfined compression							3	3	3	3	3	2
6) Core Sampling of PCC												3
7) Plate Bearing Test (Number of Tests)												2



Result of Auger Boring and Mechanical Boring (1)

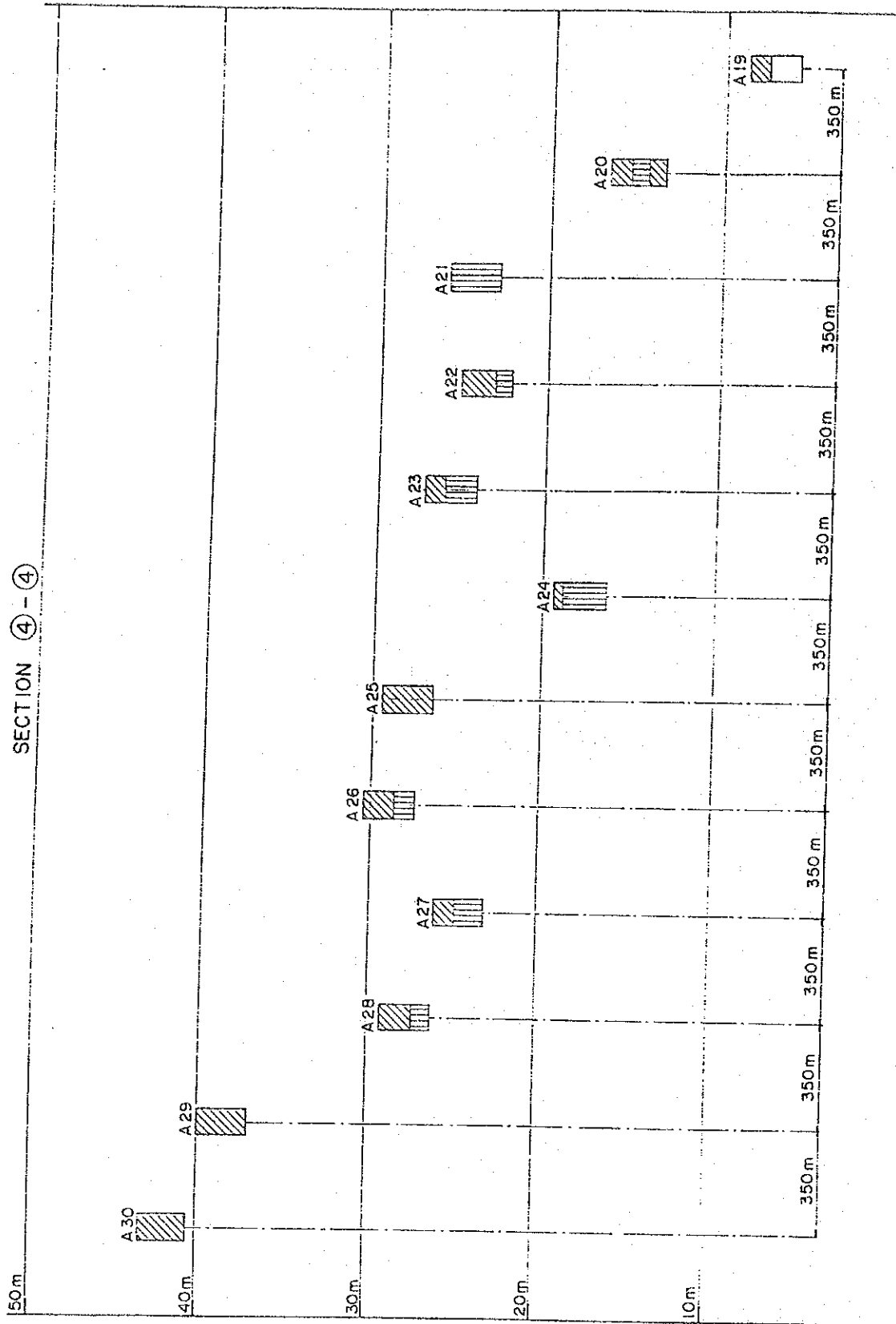
SECTION ①-①

SECTION ②-②



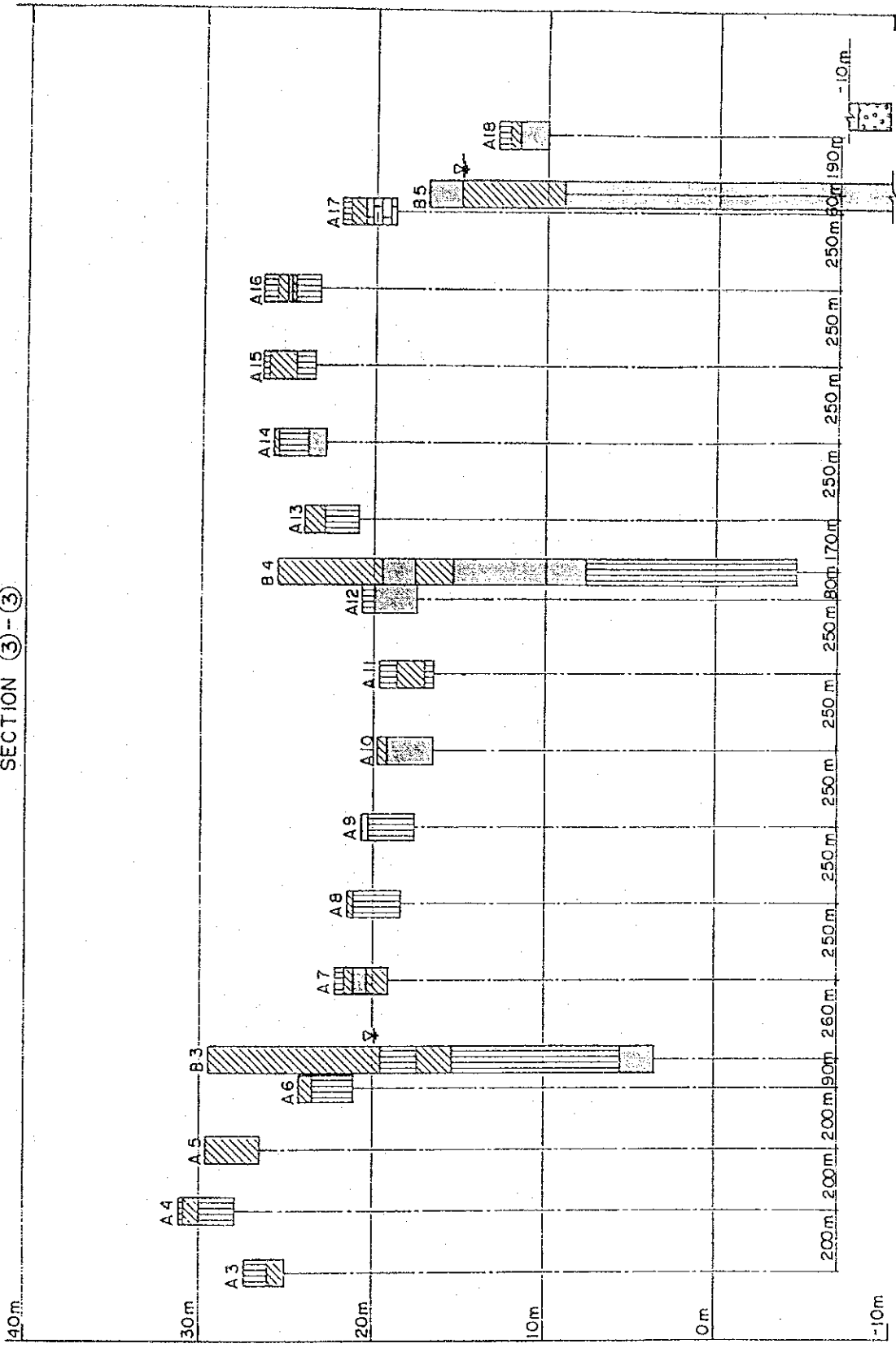
Result of Auger Boring and Mechanical Boring (2)

SECTION ④ - ④



Result of Auger Boring and Mechanical Boring (3)

SECTION ③ - ③



Result of Auger Boring and Mechanical Boring (4)

Mechanical Boring Logs (1)

B-1

B-2

PROJECT : PROPOSED DAVAO INTERNATIONAL AIRPORT
 LOCATION : Sala, Davao City
 BOREHOLE REFERENCE ELEVATION : 18.72 m. GROUND

PROJECT : PROPOSED DAVAO INTERNATIONAL AIRPORT
 LOCATION : Sala, Davao City
 BOREHOLE REFERENCE ELEVATION : 21.10 m. GROUND

