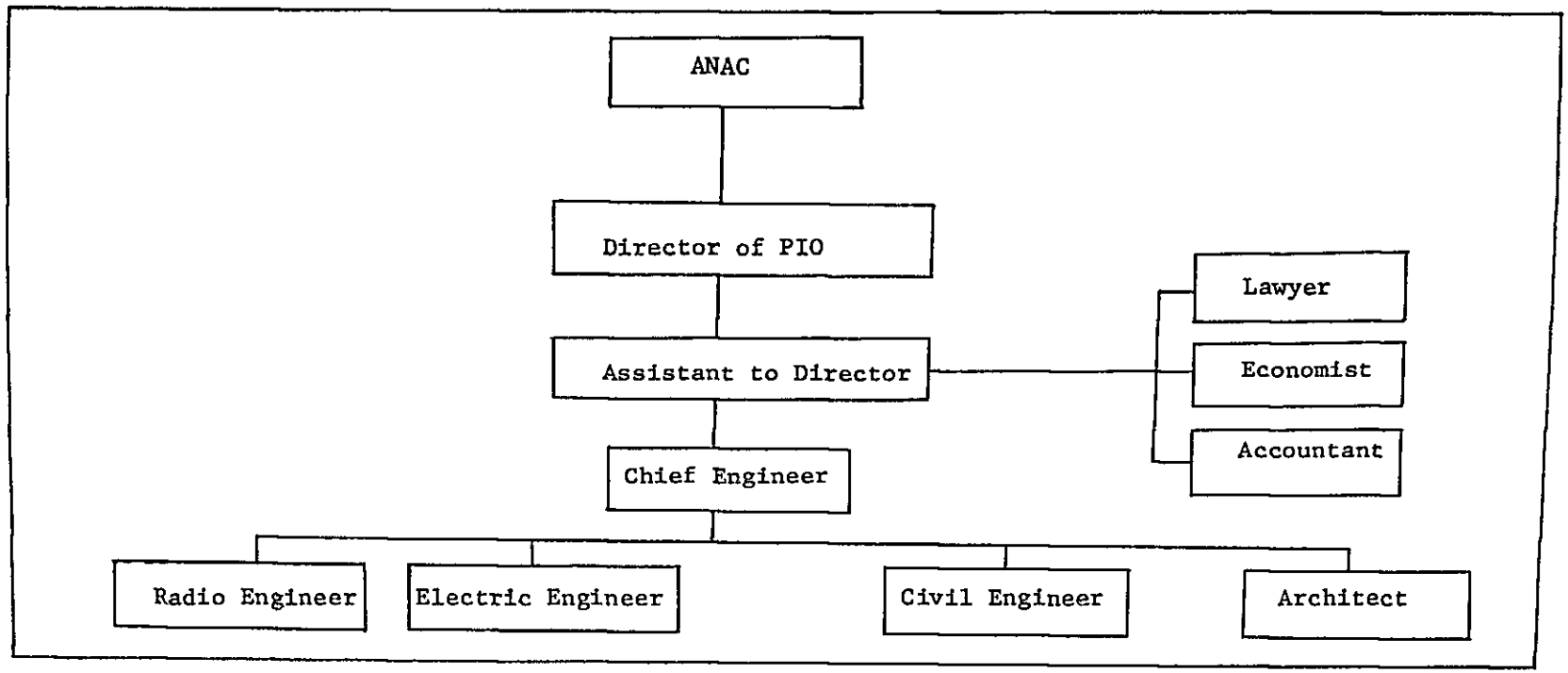
CHAPTER 10

CHAPTER 10 PROJECT IMPLEMENTATION ORGANIZATION AND NEW CPS AIRPORT ADMINISTRATION

10.1 Project Implementation Organization

In order to ensure efficient implementation of the Project it is recommended that an ad hoc team to be exclusively in charge of the Project implementation be established within ANAC. It is also recommended that ANAC conclude either a single or separate contract(s) with some consultants suitably qualified and experienced in airport engineering for the design and for the supervision of construction of the new airport. The Project Implementation Office of ANAC, hereinafter called PIO, should also recruit and train the operation and maintenance personnel to be employed by the new airport administration to be established in time for the opening to traffic of the new airport. Fig. 10.1 shows the outline of the recommended organization of the PIO. Outlined below are the major tasks to be carried out either directly by the PIO or through the consultant under appropriate consulting contract.

Fig. 10.1 PROPOSED PROJECT IMPLEMENTATION OFFICE



1) Preparations for design tender

The first thing to be done at this stage is to prepare the "Terms of Reference" for the design of the new airport, describing the background and the scope of work of the Project. To optimize the project management in terms of cost, schedule and quality control, it is desirable for the PIO to conduct the necessary land survey and geological exploration at this stage, and supply the information to the consultants, since, as mentioned in Chapter 7, the earthwork planning of this Project demands special care and attention. For the same reason it is also recommended that an experimental banking be made at this stage.

2) Selection of consultants

When the design tenders are received the Project Implementation Office shall evaluate them, negotiate with the top ranking consultant(s) and enter into contracts with the consultants of its choice. It is recommendable to include in the consultancy service scope not only the design and cost calculation of the Project but also tender assistance services including preparation of construction tender documents, evaluation of tenders, and, if so desired, assistance in contract negotiation as well.

3) Design

For the sake of satisfactory and on-schedule implementation of the Project, the PIO shall be required to comment on and approve the consultants' works at different design stages.

4) Selection of contractor

The PIO shall,with the assistance of consultants, invite and evaluate construction tenders, negotiate with top-ranking bidder(s) and conclude a construction contract.

5) Construction supervision

By the time the construction contract is concluded, a contract for the construction supervision should be concluded preferably with the consultants who design the new airport.

6) Preparations for opening of the new airport

(1) Flight check

Flight check should be made immediately after the completion of the construction in order to examine the functional coherence of the facilities and to ensure the operational safety, and notify the competent authorities of the results of such examination.

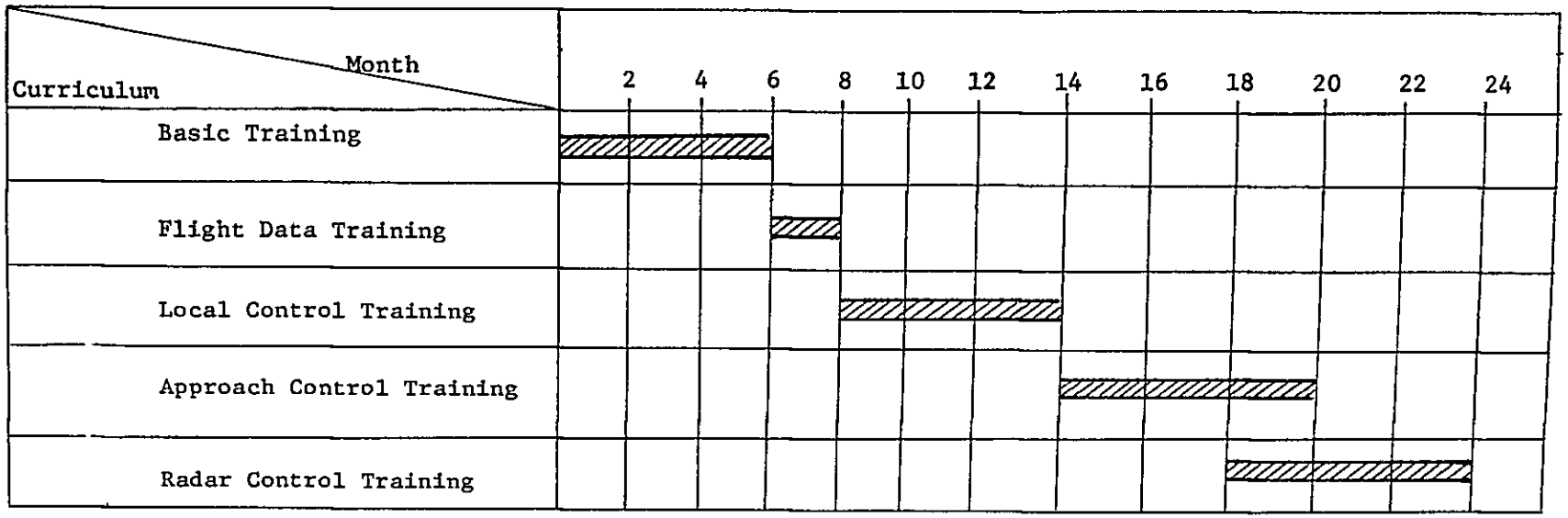
(2) Training of personnel

The personnel required for the administration, operation and maintenance of the new airport must be recruited and trained parallel to the construction of the airport. For such facilities as navigational aids and aeronautical telecommunications, etc., it is recommendable to include in the scope of services of the construction contract the training of the personnel, preparation of maintenance manual and the initial maintenance services for a certain period. The standard period of time required for the training of personnel for maintenance and

operation of the different facilities are as follows:

a.	Air traffic control	2 years (Fig. 10.2)
b.	Radio navigational aids	4 months
c.	Aeronautical telecommunications	2 months
d.	Meteorological service facilities	3 months
e.	Airfield lighting	3 months
f.	Power supply system	3 months
g.	Other facilities related to the buildings	2 months

Fig. 10.2 AIR TRAFFIC CONTROLLER TRAINING PROGRAM



10.2 New CPS Airport Administration Organization

It is considered absolutely necessary to establish an independent administration organization for the new airport for the sake of its effective management and operation. The new airport's administrative organization is envisaged to be composed of Operations Division, Maintenance Division and Administration Division each of which to be under the control of the airport director. The responsibility of the new airport administration organization will sum up to the following.

1) Operations Division

The Operations Division will be responsible for the effective and efficient operation of the new airport, and be composed of the air traffic control section, the flight operations section, the meteorological services section and the fire-fighting and rescue services section.

(1) Air traffic control section

This section will be in charge of the control of the aircraft landing and taking off at the new airport. The number of controllers required in the initial year of operation will be one chief of the section and 25 air traffic controllers grouped in 5 teams of 5 persons each, working on a 6-hour shift a day. Increase in the ATC personnel is not expected to be necessary throughout the project life.

(2) Flight operations section

This section will be in charge of approving flight plans, and providing aeronautical information and telecommunications services. The number of persons required in the first year will be one chief of the section and 8 operators grouped into

4 teams of 2 persons each working on a 8-hour shift a day. It will be necessary to increase the number of the staff at the rate of 3% a year to cope with the future traffic increase.

(3) Meteorological services section

The section will be in charge of meteorological observation and weather forecast, and the staff will comprise one chief of the section and 8 operators, 2 each working on an 8-hour shift a day. No increase in the staff is anticipated throughout the project life.

(4) Fire-fighting and rescue services section

The section will comprise 1 section chief and 30 firemen grouped into 3 teams of 10 persons, each team working on a 12-hour shift a day, with no increase in the staff being anticipated during the project life.

Each of the above-mentioned sections of this division is expected to be self-sufficient in manpower as regards the maintenance of the facilities belonging to each. Should the Government so desire, however, a separate section specializing in the maintenance of the equipment and installations of the operations division could be established within the framework of the total manning envisaged for the division in the present recommendation.

2) Maintenance Division

The maintenance division will be responsible for the maintenance of airport facilities, and will be composed of the airfield maintenance section, the terminal maintenance section, the electrical and mechanical maintenance section and the technical procurement section.

(1) Airfield maintenance section

The section will be in charge of day-to-day maintenance including upkeep of the runway, taxiway, apron and drainage, etc. The section will require 1 chief of the section, 1 civil engineer and 11 workers, and no particular increase is envisaged throughout the period of the project life. Major repaire works and upkeep of turfing should be made under separate contracts.

(2) Terminal maintenance section

The section will be in charge of maintenance of the passenger terminal buildings, including the normal upkeep and security services. The international cargo building will be operated and maintained by the Customs, and the domestic cargo building by the airlines. The staff of this section required initially will comprise a section chief an architect, 2 carpenters, 2 painters, 10 janitors and 14 guardsmen, and this will need to be increased by about 3% each year in order to cope with the expected increase in the activities of the airport.

(3) Electrical and mechanical maintenance section

The section will be responsible for the maintenance of the airfield lighting facilities and of the electrical and mechanical facilities of the terminal buildings. The section will require a staff of 13 engineers including a section chief, 6 each electromechanics for the buildings and for the lighting facilities, with one each mechanic working in 4 shifts plus 2 on normal day duty in both cases. No increase in the staff requirements of this section is anticipated during the project life.

(4) Technical procurement section

The section will be in charge of procurement and inventory of the materials and equipment needed for the maintenance of the entire airport facilities. It will initially comprise a staff of 2 clerks reporting to a section chief, which will be increased by about 3% a year to cope with the increasing work load in the future.

3) Administration Division

This division will be composed of the accounting section, the personnel section and statistics section, each of which is expected to require staff increase of about 3% per annum through the project life over what will be required at the initial stage as mentioned below.

(1) Accounting section

The section will be responsible for the control of budgets and expenditures as well as collection of airport revenues. The initial staff will comprise a section chief and 3 clerks.

(2) Personnel section

This section will be in charge of the personnel management and general affairs, and will initially require a section chief and 2 clerks.

(3) Statistics section

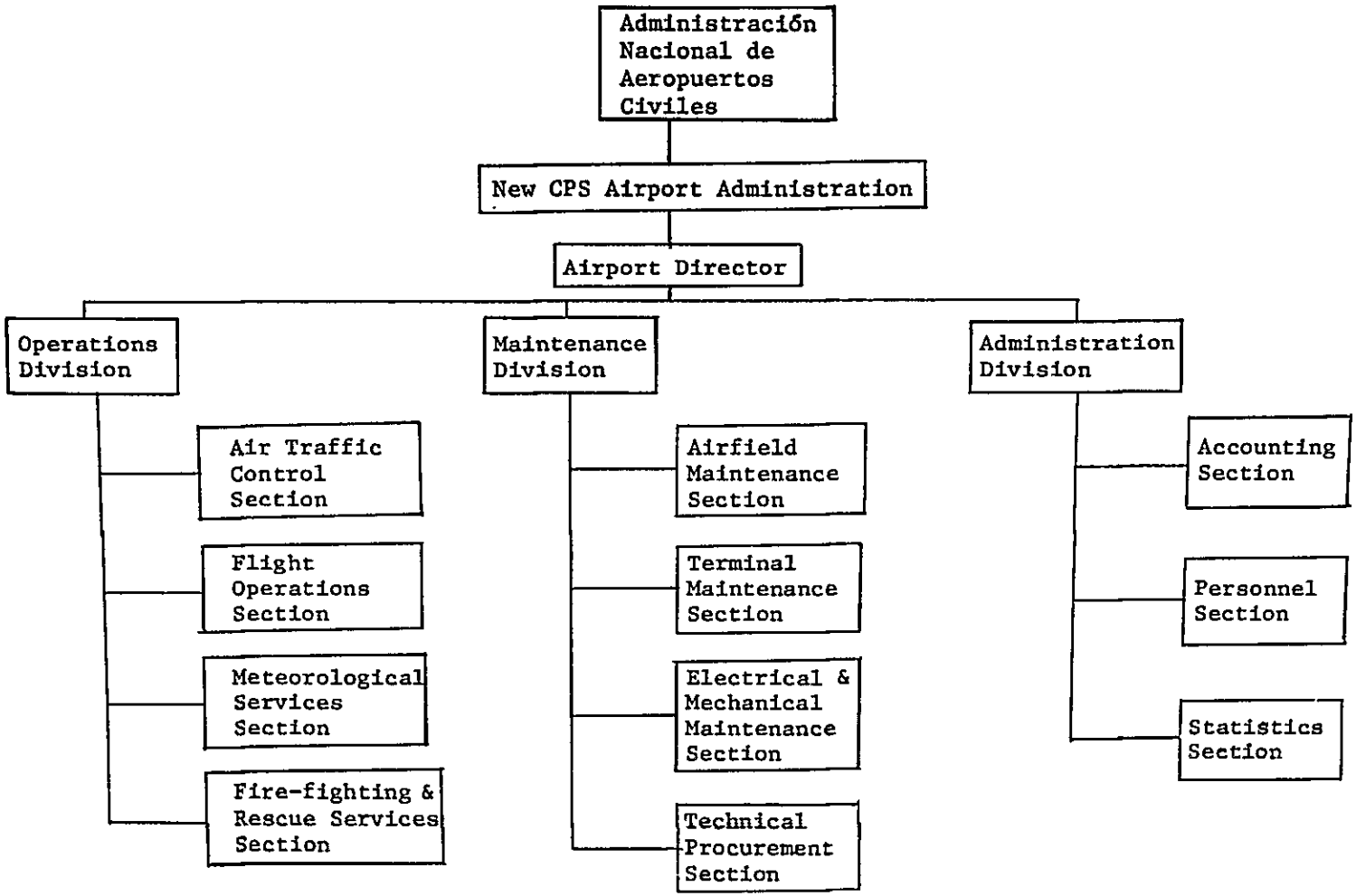
The statistics section comprising a section chief and one statistician will be in charge of collection and analysis of the statistical data relating to air traffic and administration of the airport.

The manning program of the new airport administration during the project life is summarized in Table 10.1 and the proposed administration organization is presented in Fig. 10.3.

Table 10.1 RECOMMENDED MANNING PROGRAM OF NEW CPS
AIRPORT ADMINISTRATION

Job Classification	1985	1989	1994	1999	2004
Airport Director	1	1	1	1	1
Secretary	1	1	1	1	1
Operations Division					
Division Chief	1	1	1	1	1
Secretary	1	1	1	1	1
Air Traffic Control Section	26	26	26	26	26
Flight Operations Section	13	15	17	20	24
Meteorological Services Section	9	9	9	9	9
Fire-fighting & Rescue Section	31	31	31	31	31
Maintenance Division					
Division Chief	1	1	1	1	1
Secretary	1	1	1	1	1
Airfield Maintenance Section	13	13	13	13	13
Terminal Maintenance Section	30	33	38	44	52
Electrical & Mechanical Maintenance Section	13	13	13	13	13
Technical Procurement Section	4	5	6	7	8
Administration Division					
Division Chief	1	1	1	1	1
Secretary	1	1	1	1	1
Accounting Section	4	5	6	7	8
Personnel Section	3	4	5	6	7
Statistics Section	2	3	4	5	6
Total	156	165	176	186	205

Fig. 10.3 PROPOSED ORGANIZATION CHART OF NEW CPS AIRPORT ADMINISTRATION



SUPPLEMENTARY CONSIDERATION

ON

AIR TRAFFIC FORECAST

SUPPLEMENTARY CONSIDERATION ON AIR TRAFFIC FORECAST

In the present feasibility study the air traffic forecast as presented in Chapter 3 was made by means of regression analysis with the gross domestic product (GDP) of Paraguay, of which the annual growth rate in real terms was assumed to be 7.0% for the 16-year period of 1979 - 1995, and 6.0% for the rest of the forecast period in anticipation of a duller growth tendency.

According to a recent World Bank publication, however, the annual growth rate of the Paraguayan GDP is projected as high as 9.7% for the period of 1979 - 1983. Applying this figure which was not available before the submission of the Draft Final Report of the present study for the period through 1983 and a lower growth rate of 7.0% for the rest of the forecast period to be on a conservative side, another traffic demand forecast was made with the results as shown in the following table.

AIR TRAFFIC DEMAND FORECAST BASED ON WORLD BANK PROJECTION OF PARAGUAYAN GDP GROWTH

In thousand persons
In tons

			1994	2004
International Traffic	Passenger	Entire Paraguay	1,747.0	4,793.9
		CPS	515.4	1,409.4
	Cargo	Entire Paraguay	11,207.9	23,336.4
		CPS	3,473.0	7,290.3
Domestic Traffic	Passenger	CPS	296.0	768.5
	Cargo	CPS	2,318.6	4,726.4

On the other hand, the Itaipu Dam which is now under construction and scheduled to start operating in 1983 is expected to contribute considerably to the growth of GDP of the Republic from the following year, and also to stimulate the future growth of the air traffic in Paraguay. Yet another demand forecast, if it was to be made with full consideration for the possible effect of the Itaipu Dam Project, would obviously result in still higher future traffic.

Taking all these into consideration, the above tabulated air traffic demand forecast based on the said World Bank estimate may be considered a moderate value, against a low of the demand forecast in the present study and a possible high of the said new forecast yet to be made.

A review was made then to examine if the airport facilities planned in the present feasibility study could accommodate the traffic demand shown in the above table, and the following conclusion was reached.

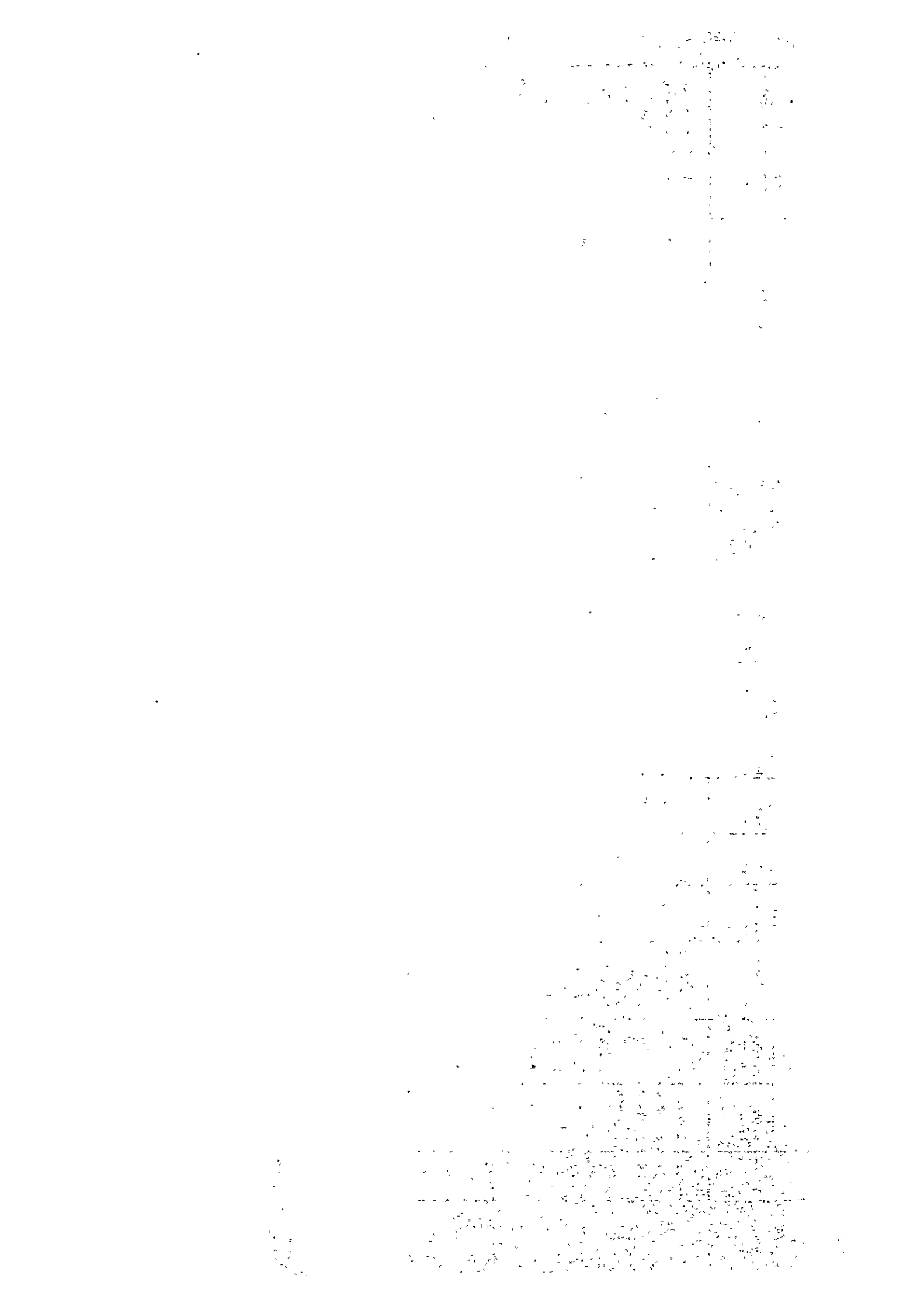
- The reserve aircraft parking position planned in the study will have to be switched for regular use.
- The congestion in the terminal building will cause a slight drop in the service level.
- Nevertheless, the airport facilities planned in the present study can generally accommodate the above-tabulated traffic demand without requiring any additional investment.

An economic internal rate of return calculated with the increased economic benefits to be brought about by the

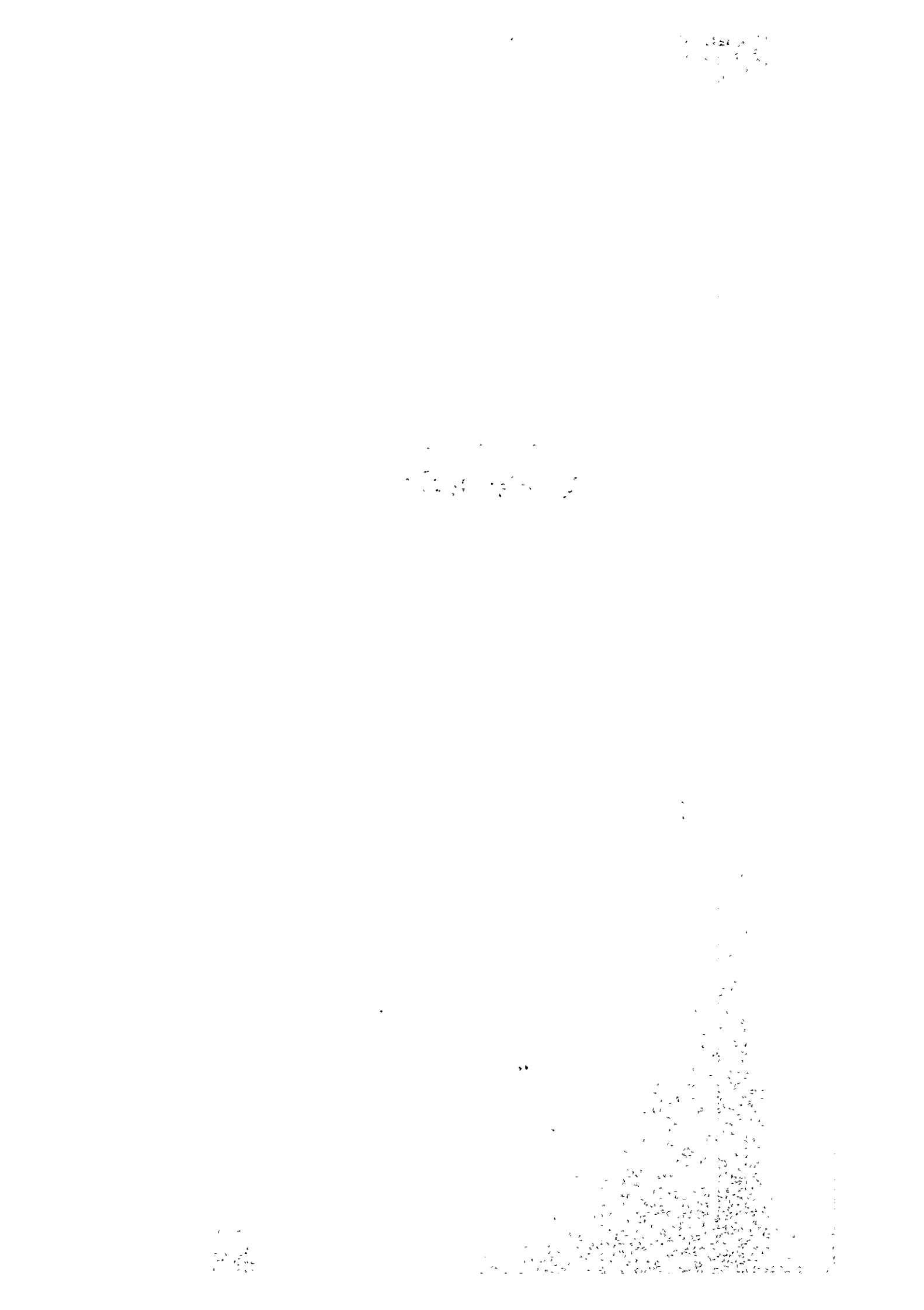
increased traffic as tabulated above will no doubt show a much higher figure than 10.8% as indicated in the present study.

The following table shows the result of a financial analysis made with similarly increased revenues expected for the new airport. It indicates that if the airport tariffs of ANAC other than the taxi surcharge were to be raised by 200% to a total of 300% over the present in 1985, the FIRR of 5.4% could be expected, and if an additional increase by 33.3% over the raised level of 1985 were to be made in 1994, the FIRR could be as high as 7.6%.

Year	Costs			Revenues													Operating Surplus	Cumulative Balance
	Construction	Maintenance & Operation	Total	Landing Charge	Parking Charge	Land Rental	Terminal Rental	Car Parking Charge	Airport Access Road Toll	Aviation Fuel Tax	Balcony Admission Fee	Passenger Service Charge	Cargo Handling Tax	Taxi-Surcharge	Charge on Airline Employees	Total		
1981	3,907.0	0	3,907.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-3,907.0
82	8,252.0	0	8,252.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-12,159.0
83	33,035.0	0	33,035.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-45,194.0
84	32,599.0	0	32,599.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-77,793.0
85	0	1,249.1	1,249.1	301.6	15.1	93.3	56.4	24.2	18.2	33.7	7.7	297.2	2.1	78.4	493.6	1,421.5	172.4	-77,620.0
86	0	1,254.2	1,254.2	333.3	16.0	93.3	56.4	26.2	19.8	38.1	8.5	330.0	2.3	85.5	528.8	1,538.2	284.0	-77,336.6
87	0	1,259.5	1,259.5	368.4	17.0	93.3	56.4	28.3	21.6	43.0	9.5	366.4	2.5	93.3	566.4	1,666.1	406.6	-76,930.0
88	0	1,264.7	1,264.7	407.2	18.0	93.3	56.4	30.5	23.5	48.5	10.5	406.9	2.7	101.8	606.8	1,806.1	541.4	-76,388.6
89	0	1,270.1	1,270.1	450.0	19.1	93.3	56.4	33.0	25.6	54.8	11.7	451.8	3.0	111.1	650.0	1,959.8	689.7	-75,698.9
1990	0	1,275.0	1,275.0	483.7	20.4	93.3	56.4	35.7	28.0	58.9	13.0	503.0	3.3	121.3	696.8	2,113.8	838.8	-74,860.1
91	0	1,280.1	1,280.1	520.0	21.7	93.3	56.4	38.7	30.7	63.2	14.5	560.0	3.6	132.5	746.9	2,281.5	1,001.4	-73,858.7
92	0	1,285.1	1,285.1	559.0	23.2	93.3	56.4	41.9	33.6	67.9	16.1	623.5	3.9	144.7	800.6	2,464.1	1,179.0	-73,679.7
93	501.0	1,290.3	1,791.3	600.9	24.7	93.3	56.4	45.3	36.8	73.0	18.0	694.1	4.2	158.0	858.2	2,662.9	1,372.6	-71,808.1
94	10,514.0	1,295.4	11,809.4	646.0	26.4	93.3	56.4	49.1	40.3	78.4	20.0	772.8	4.6	172.6	920.0	2,879.9	1,584.5	-80,737.6
95	0	1,436.4	1,436.4	718.5	27.5	109.2	124.3	53.1	44.0	88.1	22.3	858.5	5.0	188.1	981.4	3,220.0	1,783.6	-78,954.0
96	0	1,444.4	1,444.4	789.1	28.5	109.2	124.3	57.4	48.1	97.3	24.8	953.7	5.3	204.9	1,046.9	3,489.5	2,045.1	-76,908.9
97	0	1,452.5	1,452.5	866.6	29.7	109.2	124.3	62.1	52.6	107.4	27.7	1,059.4	5.8	223.3	1,116.8	3,784.9	2,332.4	-74,576.5
98	0	1,460.8	1,460.8	951.7	30.9	109.2	124.3	67.2	57.5	118.7	30.9	1,177.0	6.2	243.3	1,191.4	4,108.3	2,647.5	-71,929.0
99	0	1,469.2	1,469.2	1,045.2	32.1	109.2	124.3	72.7	62.8	131.0	34.4	1,307.5	6.7	265.1	1,270.9	4,461.9	2,992.7	-68,936.3
2000	0	1,477.1	1,477.1	1,159.5	35.6	109.2	124.3	78.5	68.3	144.0	37.9	1,438.4	7.2	287.8	1,356.4	4,847.1	3,370.0	-65,566.3
01	0	1,485.3	1,485.3	1,286.3	39.6	109.2	124.3	84.7	74.3	158.1	41.7	1,582.5	7.7	312.4	1,447.7	5,268.5	3,783.2	-61,783.1
02	0	1,493.6	1,493.6	1,426.9	43.9	109.2	124.3	91.4	80.8	173.8	46.0	1,741.0	8.3	339.2	1,545.1	5,729.9	4,236.3	-57,546.8
03	0	1,502.1	1,502.1	1,583.0	48.7	109.2	124.3	98.7	87.9	190.9	50.7	1,915.4	8.9	368.2	1,649.0	6,234.9	4,732.8	-52,814.0
04	0	1,510.7	1,510.7	1,756.2	54.1	109.2	124.3	106.5	95.6	209.8	55.8	2,107.2	9.6	399.7	1,760.0	6,788.0	5,277.3	-47,536.7
Total	88,808.0	27,455.6	116,263.6	16,253.1	572.2	2,025.0	1,807.0	1,125.2	950.0	1,978.6	501.7	19,146.3	102.9	4,031.2	20,233.7	68,726.9	41,271.3	-47,536.7



APPENDIX



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APPENDIX 1

SCOPE OF WORK

ON

THE FEASIBILITY STUDY

THE NEW AIRPORT CONSTRUCTION PROJECT

IN

CIUDAD PRESIDENTE STROESSNER, PARAGUAY

1. INTRODUCTION

In response to a request of the Government of the Republic of Paraguay, the Government of Japan has decided to conduct a feasibility study for the New Airport in Ciudad Presidente Stroessner in accordance with laws and regulations in force in Japan, and the Japan International Cooperation Agency (hereinafter referred to as JICA), the official agency responsible for the implementation of technical cooperation programs of the Government of Japan, will carry out the study.

The present document sets forth the scope of work in regard to the above-mentioned study which is to be carried out in close cooperation with the Government of the Republic of Paraguay and the authorities concerned.

2. OBJECTIVE OF THE STUDY

The objective of this study is to examine the technical and economic feasibility of the New Airport construction project in Ciudad Presidente Stroessner so as to contribute to optimum planning of the project.

3. OUTLINE OF THE STUDY

This feasibility study will consist of the followings:

1) Air transport demand forecasts
2) Facility requirement analysis
3) Site selection
4) Airport layout plan
5) Facility planning
6) Air navigation planning
7) Construction schedule and cost estimate

8) Economic analysis

9) Financial analysis

4. REPORTS

JICA will prepare and submit the following reports in the course of the study. All documents are written in English and with metric system

1)	Inception Report	20 copies
2)	Progress Report	20 copies
3)	Interim Report	20 copies
4)	Draft Final Report	20 copies
5)	Final Report	50 copies

5. UNDERTAKING OF THE GOVERNMENT OF THE REPUBLIC OF PARAGUAY

1) To provide the study team with all available data and information necessary for the study, including soil boring information, topographical maps and aerial photographs, and to give the study team free access to such sources of information as may be necessary for the proper execution of the study.

2) To ensure that such documents are smoothly taken out of the country.

3) To exempt the taxes and duties on the materials and personal effects which the study team will bring into the Republic of Paraguay.

4) To assign the counterpart officials for the study team.

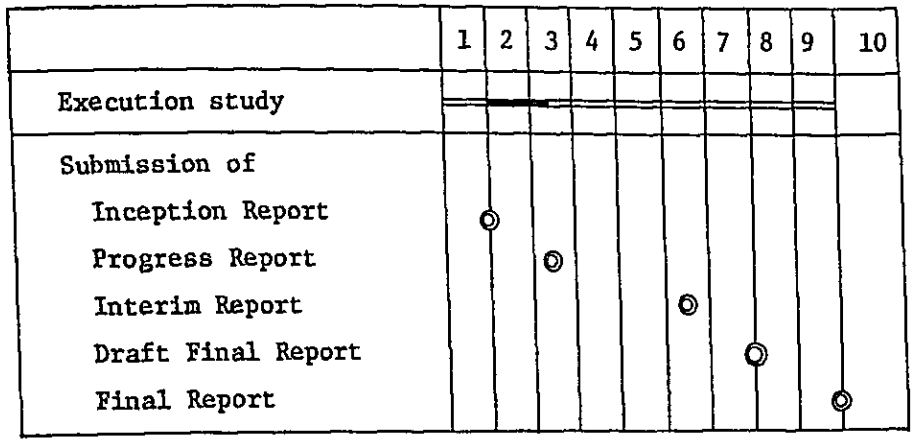
5) To provide suitable office spaces for the team.

6) To provide the study team with the necessary means and equipments for their activities in the country, such as vechicles, airplane (if necessary), etc.

6. TIME SCHEDULE

JICA will conduct the study on the following schedule.

This time schedule, however, is subject to change according to circumstances.

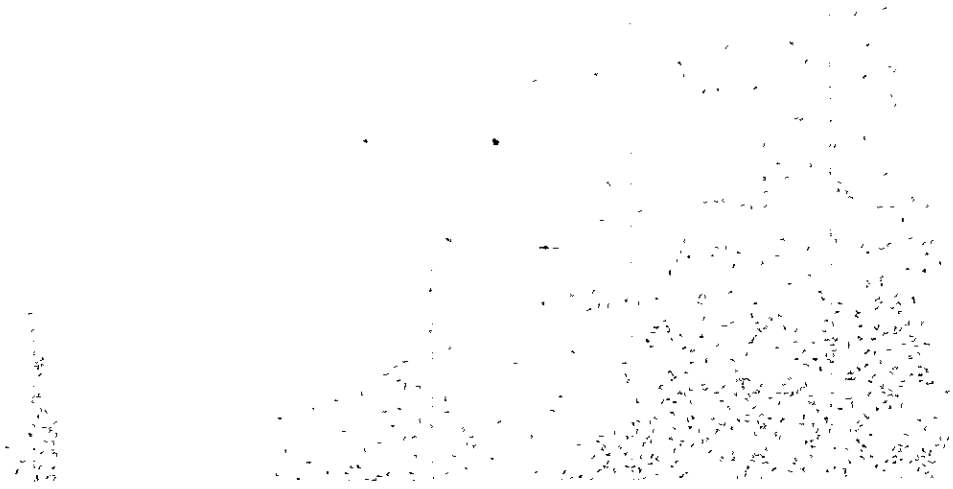


Notes: ═══ indicates Home work in Japan

▬▬▬ indicates Field work in Paraguay

◎ indicates the submission of Report

APPENDIX 2



GROSS DOMESTIC PRODUCT, POPULATION AND
PER CAPITA GDP IN PARAGUAY

Year	GDP (Million Guaranies in 1972 price)	Population (Persons)	Per Capita GDP (Guaranies in 1972 price)
1962	63,413	1,866,809	33,968
1963	65,146	1,915,160	34,016
1964	67,979	1,964,939	34,596
1965	71,849	2,016,255	35,635
1966	72,664	2,069,238	35,116
1967	77,274	2,124,044	36,381
1968	80,031	2,180,839	36,697
1969	83,137	2,239,796	37,118
1970	88,291	2,301,081	38,369
1971	92,160	2,364,846	38,971
1972	96,899	2,431,222	39,856
1973	104,499	2,500,312	41,794
1974	113,151	2,572,185	43,990
1975	118,840	2,646,877	44,898
1976	127,772	2,724,391	46,899
1977	142,858	2,804,703	50,935
1978	157,563	-	-

Source: Banco Central del Paraguay

PRINCIPAL EXPORTS OF PARAGUAY

(Million US$)

Product	1974	1975	1976	1977	1978
Cotton	16.5	20.1	34.6	80.4	100.0
Seeds	20.4	19.1	34.1	58.8	41.6
Processed Beef	35.2	32.2	21.0	22.1	24.0
Tobacco	11.4	12.0	14.7	13.7	9.2
Lumber	24.7	27.9	12.1	19.9	20.3
Essential Oil	8.3	9.8	11.6	12.3	8.5
Tung Oil	6.5	4.7	10.6	22.0	9.2
Other Industrial Products	9.1	10.4	8.3	7.7	7.6
Coffee	4.0	8.7	7.8	10.1	0.2
Torta and Expeller	5.0	4.4	6.6	8.4	8.3
Quebracho Extract	0.9	2.5	3.7	5.2	5.2
Cowhide	4.5	2.0	2.7	5.5	7.8
Fruit and Vegetable	2.6	5.7	1.7	1.8	2.6
Coconut oil	5.5	4.4	1.5	5.5	4.8
Sugar	10.0	6.7	1.0	-	-
Miscellaneous	4.9	5.6	4.2	5.5	7.6
Total	169.8	176.2	18.2	278.9	256.9

Source: Boletin Estadistico-Banco Central del Paraguay

PRINCIPAL IMPORTS OF PARAGUAY

(Million US$)

Product	1974	1975	1976	1977	1978
Fuel and Lubricant	41.9	31.3	37.9	37.3	59.6
Machinery, Apparatus and Motors	27.9	36.6	34.6	56.9	53.8
Transport Apparatus and Accessories	22.6	11.9	23.1	40.7	60.9
Beverages and Tobaccos	11.2	18.2	14.9	19.6	28.9
Foodstuffs	14.4	8.8	14.1	12.6	14.4
Iron and Iron Products	12.5	14.1	12.4	15.2	14.6
Chemical Products	10.1	9.5	8.9	12.5	16.3
Cardboard and Paper Products	5.0	5.3	4.8	7.1	7.1
Agricultural Implements and Accessories	5.8	4.8	4.1	9.8	10.5
Textile and Textile Products	4.3	3.7	3.7	6.2	6.7
Metal and Metal Products	1.6	2.0	3.1	3.6	5.2
Miscellaneous	17.9	21.4	18.3	28.6	17.6
Total	171.4	178.4	180.2	250.4	295.6

Source: Boletin Estadistico-Banco Central del Paraguay

FOREIGN EXCHANGE EARNINGS IN TOURISM INDUSTRY

Year	Number of Visitors	Value Consumed per Visitor (US$)	Total Income Tourism Industry (Thousand US$)
1966	30,052	119.1	3,579
1967	41,464	119.0	4,936
1968	67,795	119.1	8,071
1969	111,643	119.1	13,291
1970	119,230	119.3	14,227
1971	123,676	119.0	14,722
1972	93,023	119.1	11,074
1973	95,086	134.3	12,770
1974	79,124	132.6	12,078
1975	93,113	123.5	11,501
1976	111,902	125.3	14,023
1977	153,528	230.4	35,372

Source: Direccion General de Turismo
Boletin Estadistico

VISITORS TO PARAGUAY BY NATIONALITY

Nationality	1975		1976		1977		1978	
Argentine	36,428	(39.1%)	36,577	(32.7%)	58,164	(37.9%)	81,091	(44.4%)
Brazil	33,871	(36.3%)	40,164	(35.9%)	60,293	(39.3%)	64,219	(35.1%)
Uruguay	3,189	(3.4%)	4,650	(4.2%)	3,790	(2.5%)	4,236	(2.3%)
Chile	2,246	(2.4%)	2,557	(2.3%)	1,810	(1.2%)	2,061	(1.1%)
U. S. A.	2,945	(3.1%)	4,571	(4.1%)	2,763	(1.8%)	4,139	(2.3%)
W. Germany	780	(0.8%)	708	(0.6%)	1,155	(0.8%)	1,167	(0.6%)
Spain	404	(0.4%)	565	(0.5%)	749	(0.5%)	615	(0.3%)
Italy	306	(0.3%)	466	(0.4%)	641	(0.4%)	489	(0.3%)
Japan	1,161	(1.2%)	2,805	(2.5%)	3,357	(2.2%)	3,820	(2.1%)
Others	11,783	(13.0%)	18,839	(16.8%)	20,806	(13.6%)	20,925	(11.4%)
TOTAL	93,113	(100.0%)	111,902	(100.0%)	153,528	(100.0%)	182,762	(100.0%)

Source: Direccion General de Turismo

DISTRIBUTION OF HOTEL ACCOMMODATIONS IN PARAGUAY

City	Number of Hotels	Number of Rooms
Asuncion	63 (68%)	1,742 (76%)
CPS	7 (8%)	223 (10%)
San Bernardino	4 (4%)	49 (2%)
Encarnacion	5 (5%)	94 (4%)
P.J.C.	3 (3%)	50 (2%)
Concepcion	1 (1%)	32 (2%)
Villa Florida	4 (4%)	36 (2%)
Chololo	1 (1%)	5 (-%)
Villarica	4 (4%)	38 (2%)
San Ignacio	1 (1%)	10 (-%)
Total	93 (100%)	2,279 (100%)

Source: Direccion General de Turismo, 1977

ROADS IN PARAGUAY

(Km)

Year	Surface			Total
	Earth	Gravel	Asphalt	
1963	2,358.2	795.6	347.3	3,501.1
1964	2,865.8	898.2	434.8	4,198.8
1965	3,234.3	963.5	470.0	4,667.8
1966	3,934.5	997.1	525.0	5,455.6
1967	4,371.5	834.1	577.3	5,782.9
1968	4,756.9	724.1	687.3	6,168.3
1969	4,898.5	601.4	810.0	6,309.9
1970	4,918.5	594.4	817.0	6,329.9
1971	4,972.3	574.7	841.7	6,388.7
1972	5,053.4	558.7	860.2	6,472.3
1973	5,243.4	554.9	870.9	6,669.2
1974	5,255.4	541.7	884.1	6,681.2
1975	5,990.0	582.0	905.0	7,477.0
1976	6,441	566	991	7,998
1977	7,166	540	1,109	8,815

Source: Ministerio de Obras Publicas y Comunicaciones

NUMBER OF REGISTERED CARS IN PARAGUAY

Year	1969	1970	1971	1972	1973	1974	1975
Automobile	7,441	7,917	8,438	8,919	9,652	10,566	11,067
Taxi	361	471	591	706	835	912	992
Jeep	1,047	1,165	1,261	1,359	1,464	1,620	1,641
Micro Bus	1,379	2,346	3,066	3,138	3,386	5,052	5,080
Bus	590	694	725	844	878	1,305	1,446
Pickup	4,493	4,938	5,877	6,874	8,415	9,212	10,184
Truck	3,213	3,475	3,744	3,929	4,479	6,668	6,973
Sub-total	18,524	21,006	23,702	25,769	29,109	35,335	37,383
Autobicycle	7,182	8,088	9,202	10,192	11,583	13,076	14,688
Total	25,706	29,094	32,904	35,961	40,691	48,411	52,071

Source: PLAN NACIONAL DE DESARROLLO
ECONOMICO Y SOCIAL
1977-1981

PASSENGERS TRAFFIC BY RAIL IN PARAGUAY

(persons)

Year	Domestic	International	Total
1964	527.379	23.894	551.273
1965	389.464	25.096	414.560
1966	152.018	23.904	175.922
1967	108.489	18.151	126.640
1968	197.955	21.506	219.461
1969	205.263	22.532	227.795
1970	174.694	20.746	195.440
1971	175.550	16.812	192.362
1972	185.611	15.814	201.425
1973	203.037	14.603	217.640
1974	191.112	16.507	207.619
1975	170.878	15.692	186.570

Source: PLAN NACIONAL DE DESARROLLO ECONOMICO Y SOCIAL 1977-1981

CARGO TRAFFIC BY RAIL IN PARAGUAY

(ton)

Year	Domestic	International	Total
1964	87.242	25.566	112.808
1965	64.991	29.044	94.035
1966	47.435	30.695	78.130
1967	43.648	30.455	74.103
1968	52.548	42.933	95.481
1969	57.727	55.877	113.604
1970	63.248	63.618	126.866
1971	62.221	58.700	120.931
1972	63.225	97.713	160.938
1973	54.598	78.427	132.925
1974	48.313	96.054	144.367
1975	30.899	65.629	96.528

Source: PLAN NACIONAL DE DESARROLLO ECONOMICO Y SOCIAL 1977-1981

INTERNATIONAL EMBARKING & DISEMBARKING PASSENGERS BY ORIGIN/DESTINATION AT ASUNCION AIRPORT

(persons)

O-D	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
BUE	51,901	49,443	50,528	52,186	60,843	60,957	74,087	93,064	102,128	76,684	85,749	89,160
MVD	10,417	13,409	14,874	14,548	12,070	9,454	10,535	14,005	14,947	17,068	19,084	18,715
FOZ	1,514	5,143	8,450	7,717	11,752	15,475	19,670	19,860	19,686	17,243	12,396	12,056
SAO	5,114	4,992	5,497	6,321	8,276	11,068	20,776	19,765	21,345	25,725	28,704	37,379
RIO	2,787	3,132	4,440	3,316	4,984	3,246	3,737	7,055	9,298	13,332	19,763	25,804
SRZ	-	-	-	245	1,650	2,714	2,647	5,135	5,824	4,926	5,241	7,941
LPB	94	-	1,312	2,164	2,910	5,275	4,873	6,079	6,316	8,102	8,360	5,995
SCL	172	-	2,388	2,712	2,635	2,554	3,144	1,769	2,905	4,027	3,964	6,438
LIM	4,020	4,456	2,324	2,874	4,087	6,781	6,428	14,637	17,879	14,322	13,217	12,566
PTY	486	676	1,062	1,107	502	565	668	901	1,146	1,851	1,999	1,533
MIA	2,975	3,637	3,873	3,349	3,876	4,182	4,230	5,603	6,715	7,446	9,077	10,069
FRK	979	1,230	845	1,468	1,876	1,626	1,888	1,931	2,601	2,845	3,513	3,721
MAD	235	808	1,130	1,099	1,293	1,217	1,579	1,724	2,062	2,230	2,281	2,887
Total	80,694	86,926	97,332	99,106	116,754	125,114	154,262	191,528	212,852	195,801	213,348	234,264

Source: Direccion General de Aeronautica Civil

INTERNATIONAL LOADED & UNLOADED CARGO BY ORIGIN/DESTINATION AT ASUNCION AIRPORT

(kg)

O-D	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
BUE	545,625	501,988	755,313	881,892	541,379	448,069	635,605	590,909	561,822	503,215	680,675	804,810
MVD	16,498	33,250	151,814	174,138	115,814	88,697	113,671	133,637	57,984	64,809	109,251	164,000
FOZ	1	416	4	53	-	7	4,517	2,350	572	241	991	140
SAO	14,041	16,469	25,090	25,820	35,229	50,679	26,453	20,715	26,221	65,261	102,820	181,059
RIO	13,186	7,983	15,537	11,389	28,941	38,309	36,330	66,034	82,282	104,142	119,460	220,404
SRZ	-	-	-	60	2,649	13,025	1,747	7,960	8,295	22,862	41,765	34,130
LPB	1,820	1	8,110	6,341	6,238	5,252	1,999	14,095	5,061	35,668	44,736	48,253
SCL	464	-	78,102	193,327	119,703	55,464	60,384	154,338	96,729	122,662	112,559	228,595
LIM	224,853	82,137	26,881	34,860	48,170	28,836	36,653	74,571	59,246	55,576	106,726	127,711
PTY	28,391	58,827	35,638	45,586	34,322	51,777	44,834	37,089	26,184	41,561	44,314	34,600
MIA	337,848	392,550	162,348	142,781	196,158	138,483	146,652	136,999	85,771	135,732	196,341	212,766
FRK	8,521	24,129	54,906	44,526	59,059	110,572	94,205	147,462	219,127	190,891	287,549	322,063
MAD	501	19,607	21,975	35,602	30,393	41,054	39,281	86,422	70,184	132,448	171,868	228,472
Total	1,191,749	1,137,357	1,335,718	1,596,375	1,218,055	1,070,224	1,242,331	1,472,581	1,299,478	1,475,068	2,019,055	2,607,003

Source: Direccion General de Aeronautica Civil

DOMESTIC PASSENGER AND CARGO TRAFFIC CARRIED
BY TAM AT ASUNCION AIRPORT

Year	Passengers (persons)	Cargo (ton)
1966	37,022	NA
1967	40,728	NA
1968	42,332	378.1
1969	39,394	316.1
1970	44,485	331.0
1971	56,865	388.6
1972	63,456	410.5
1973	74,100	NA
1974	47,515	281.9
1975	43,818	234.8
1976	37,673	188.0
1977	45,071	195.0
1978	49,164	246.9

Source: TAM Statistical Department

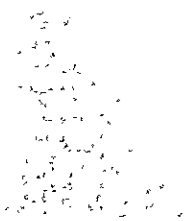
INTERNATIONAL CARGO TONNAGE BY TRANSPORT MODE - 1975

(ton)

		Ship	Road	Rail	Total
I	Asuncion	83,117.4	19,689.1	-	92,886.5
M	Concepcion	1,910.7	-	-	1,910.7
P	Stroessner	-	26,697.8	-	26,697.8
O	Villeta	277.0	-	-	277.0
R	Encarnacion	501.6	1,440.0	19,694.8	21,636.4
T	Others	288,438.6	6,372.1	1,705.9	296,516.6
S	Total	374,245.3	54,199.0	21,400.7	439,925.0
E	Asuncion	175,942.5	-	-	175,942.5
X	Concepcion	28,669.8	-	-	28,669.8
P	Stroessner	-	18,845.3	-	18,845.3
O	Villeta	47,050.7	80.7	-	47,131.4
R	Encarnacion	34,577.5	24,232,0	12,036.6	70,846.1
T	Others	30,892.6	10,580.1	4,887.5	46,360.2
S	Total	317,133.1	53,738.1	16,924.1	387,795.3

Source: Plan Nacional de Desarrollo Economico y Social 1977-81

APPENDIX 3

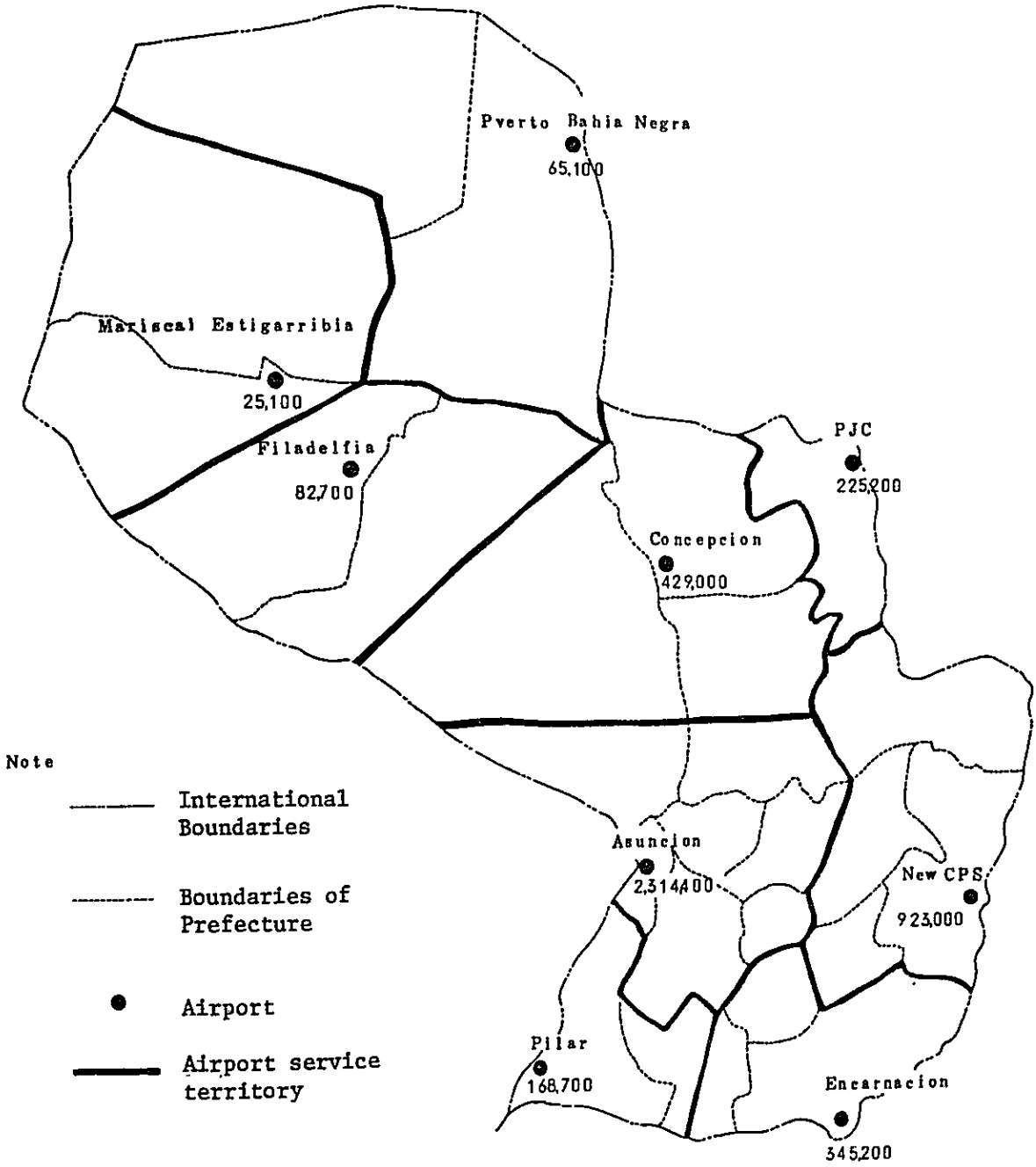


POPULATION OF PARAGUAY BY PREFECTURE

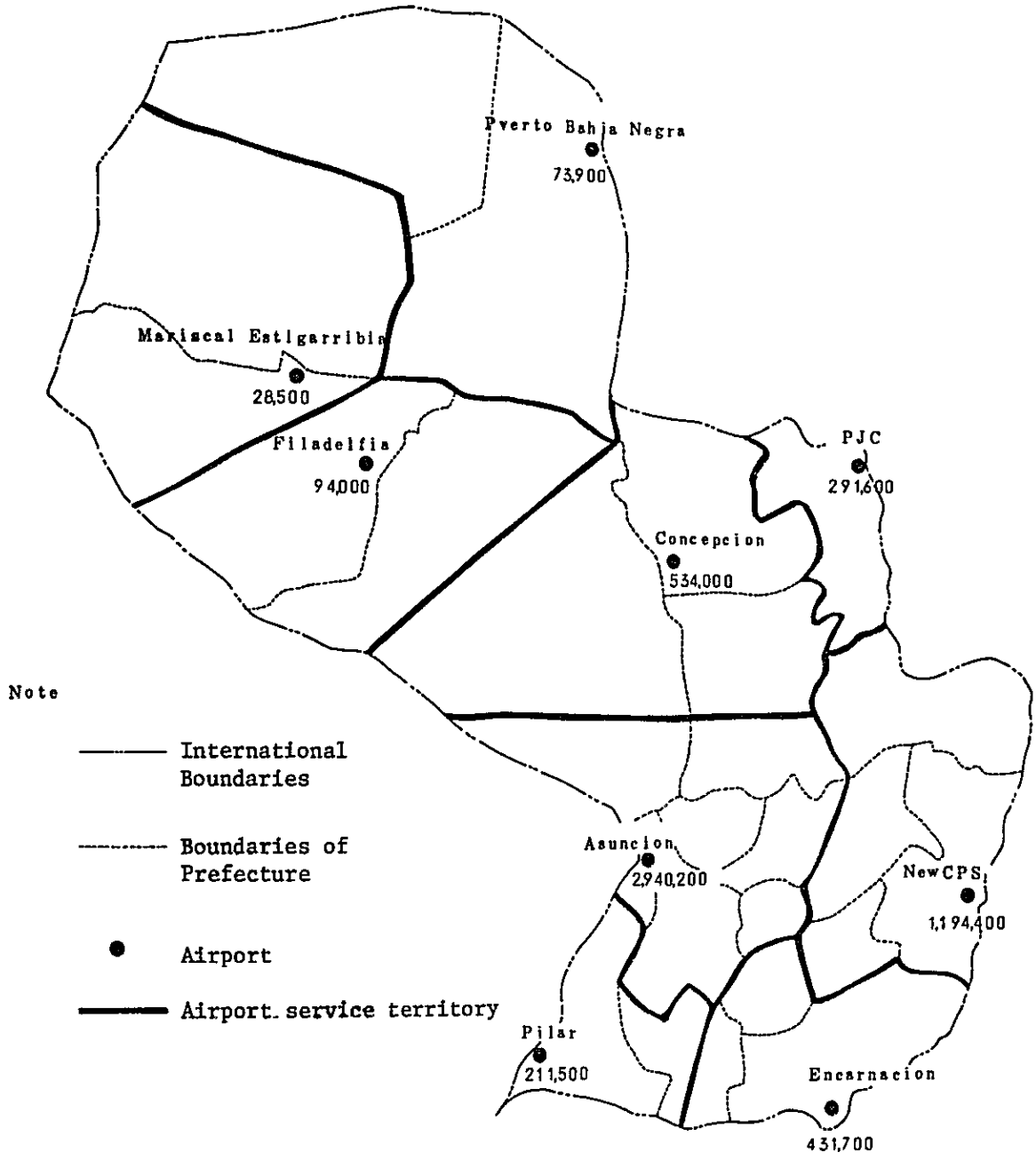
	Prefecture	Record[1]	Estimate[2]	
		1977	1980	1985
Eastern Region	Asuncion	453.8	491.3	572.3
	Central	363.7	387.2	445.6
	Concepcion	121.7	127.7	141.7
	San Pedro	170.4	185.2	220.0
	Cordillera	197.1	196.2	198.7
	Guaira	129.9	131.2	135.2
	Caaguazu	269.8	297.9	362.4
	Caazapa	108.9	108.9	112.8
	Itapua	242.6	225.0	195.6
	Misiones	75.0	75.4	80.4
	Paraguari	216.3	214.8	219.1
	Alto Parana	158.9	262.5	327.1
	Neembucu	82.3	87.4	98.9
	Amambay	95.9	106.4	139.1
	Canendiyu	38.7	60.1	76.7
Western Region		79.7	74.5	114.2
Total		2,804.7	3,061.8	3,539.8

Source: 1) Direccion General de Estadistica y Censos.

2) Secretaria Tecnica de Planificacion.



POPULATION DISTRIBUTION BY AIRPORT SERVICE TERRITORY IN YEAR 1994



POPULATION DISTRIBUTION BY AIRPORT SERVICE TERRITORY IN YEAR 2004

REGRESSION MODEL FOR FORECAST OF INTERNATIONAL EMBARKING & DISEMBARKING PASSENGERS BY O-D

In formulae 1.1 through 1.17:

Yt represents International Embarking & Disembarking Passengers on respective routes in year t ;

Xt represents Gross Domestic Product in Paraguay in year t

[Formula 1.1] BUENOS AIRES

$$Yt = 7{,}659 + 0.589\ Xt$$

$$(R = 0.8111)$$

[Formula 1.2] FOZ DO IGUACU

$$Yt = -14{,}523 + 0.283\ Xt - 15{,}708\ Z$$

$$Z = \text{Dummy}$$

$$(R = 0.8385)$$

[Formula 1.3] SAO PAULO

$$Yt = -28{,}048 + 0.414\ Xt$$

$$(R = 0.9808)$$

[Formula 1.4] RIO DE JANEIRO

$$Yt = -20{,}906 + 0.274\ Xt$$

$$(R = 0.9421)$$

[Formula 1.5] LIMA

$$Yt = -9{,}960 + 0.171\ Xt$$

$$(R = 0.7925)$$

[Formula 1.6] OTHER EUROPE

$$Yt = -298 + 0.010\ Xt$$

$$(R = 0.7852)$$

[Formula 1.7] ASIA

$$Yt = -442 + 0.005\ Xt$$

$$(R = 0.9130)$$

[Formula 1.8] SANTIAGO

$$Yt = -1{,}680 + 0.044\ Xt$$

$$(R = 0.8183)$$

[Formula 1.9] LA PAZ

$$Yt = -3{,}078 + 0.071\ Xt$$

$$(R = 0.7717)$$

[Formula 1.10] MIAMI

$$Yt = -5{,}663 + 0.075\ Xt$$

$$(R = 0.9672)$$

[Formula 1.11] PANAMA

$$Yt = -1{,}512 + 0.022\ Xt$$

$$(R = 0.8591)$$

[Formula 1.12] MADRID

$$Yt = -5{,}621 + 0.166\ Xt$$

$$(R = 0.9382)$$

[Formula 1.13] SANTA CRUZ

$$Yt = -4,239 + 0.074\ Xt$$

$$(R = 0.8696)$$

[Formula 1.14] CARACAS

$$Yt = -437 + 0.005\ Xt$$

$$(R = 0.9770)$$

[Formula 1.15] NEW YORK

$$Yt = -733 + 0.029\ Xt$$

$$(R = 0.8783)$$

[Formula 1.16] MONTEVIDEO

$$Yt = 4,282 + 0.092\ Xt$$

$$(R = 0.7521)$$

[Formula 1.17] FRANKFURT

$$Yt = -1,199 + 0.024\ Xt$$

$$(R = 0.9413)$$

REGRESSION MODEL FOR FORECAST OF INTERNATIONAL LOADED & UNLOADED AIR CARGO

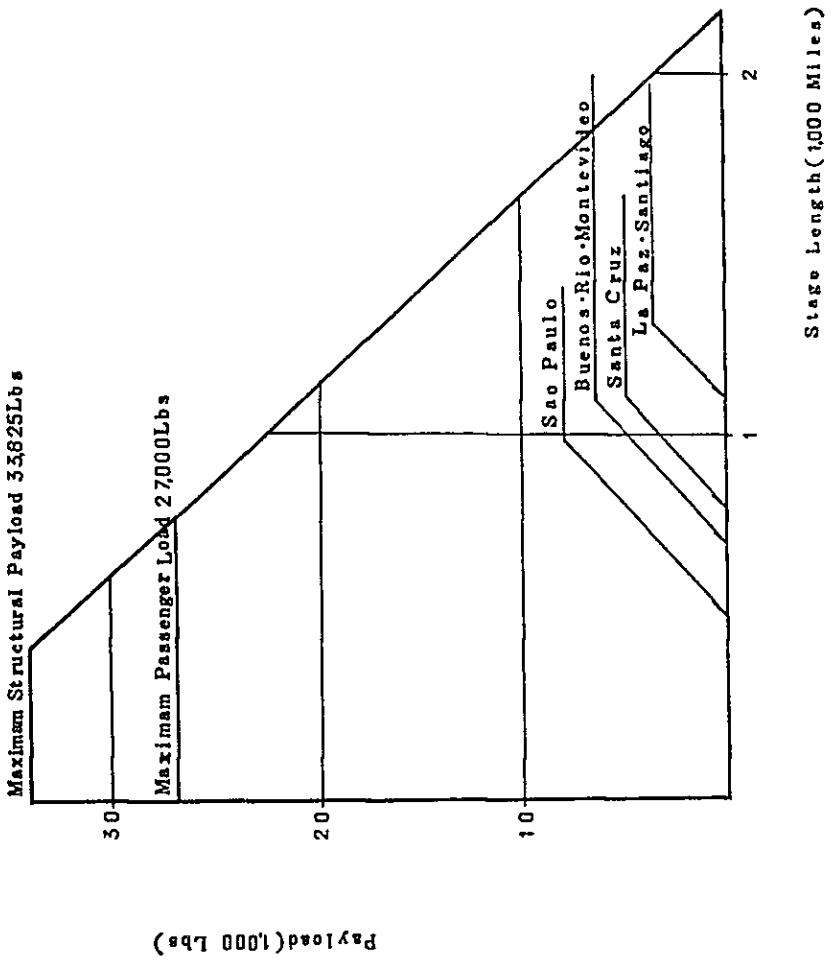
[Formula 2.1] $Yt = -1,332.3 + 23.8\ Xt$

where Yt = International Loaded & Unloaded Air Cargo at Asuncion Airport in year t

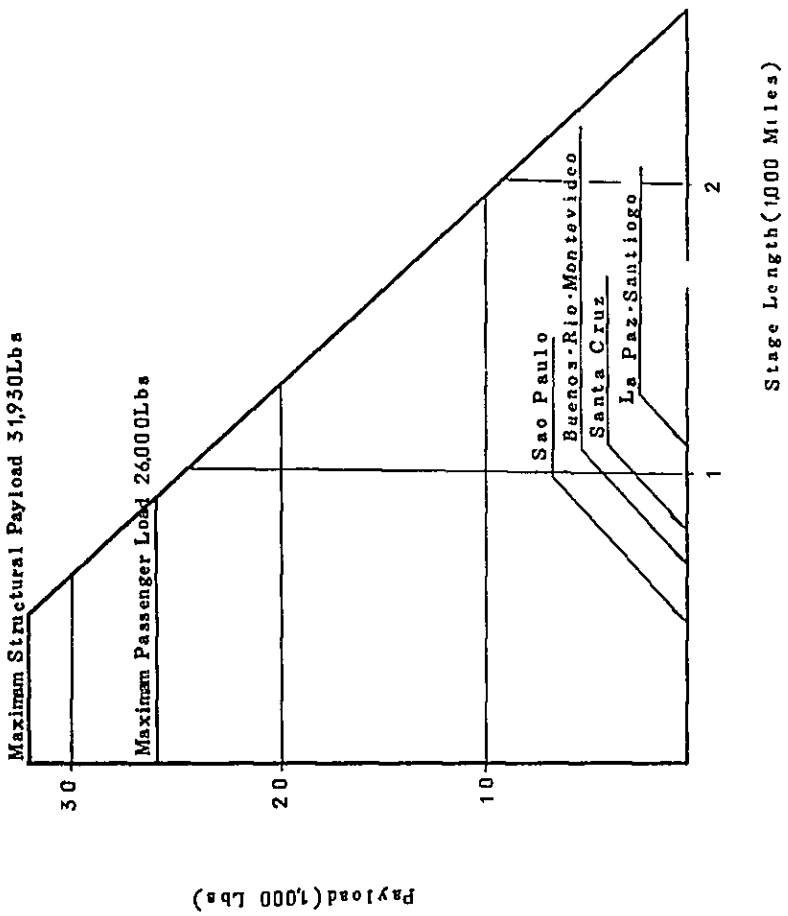
Xt = Gross Domestic Product in Paraguay in year t

(R = 0.9523)

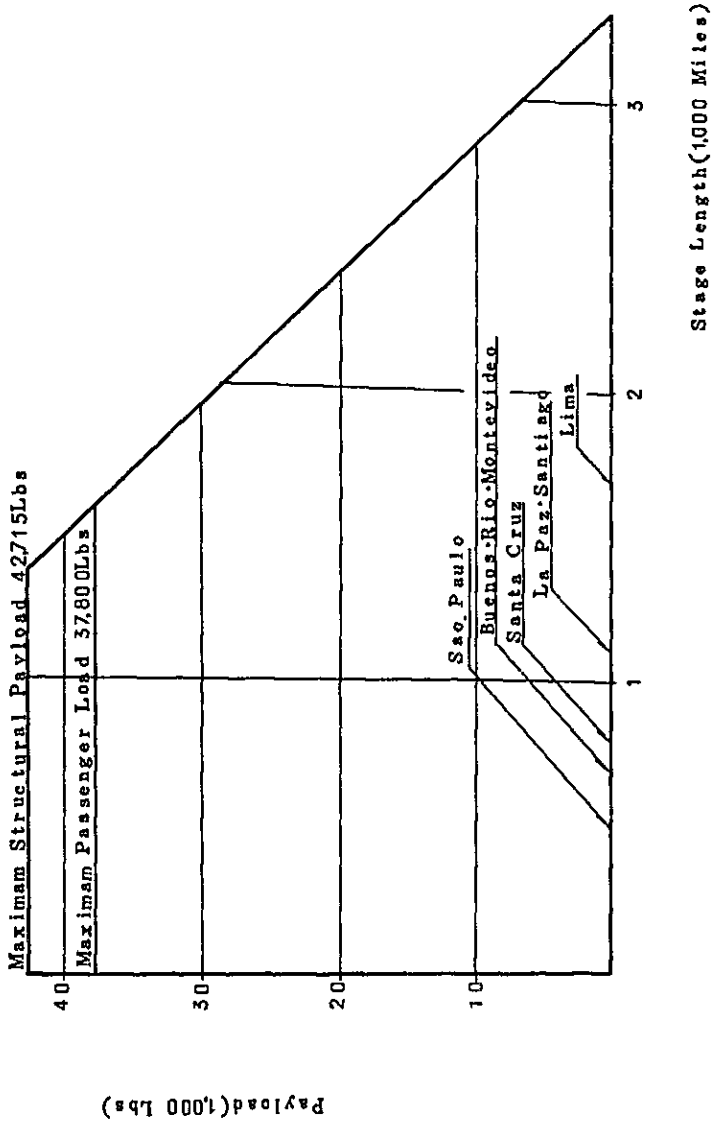
APPENDIX 4



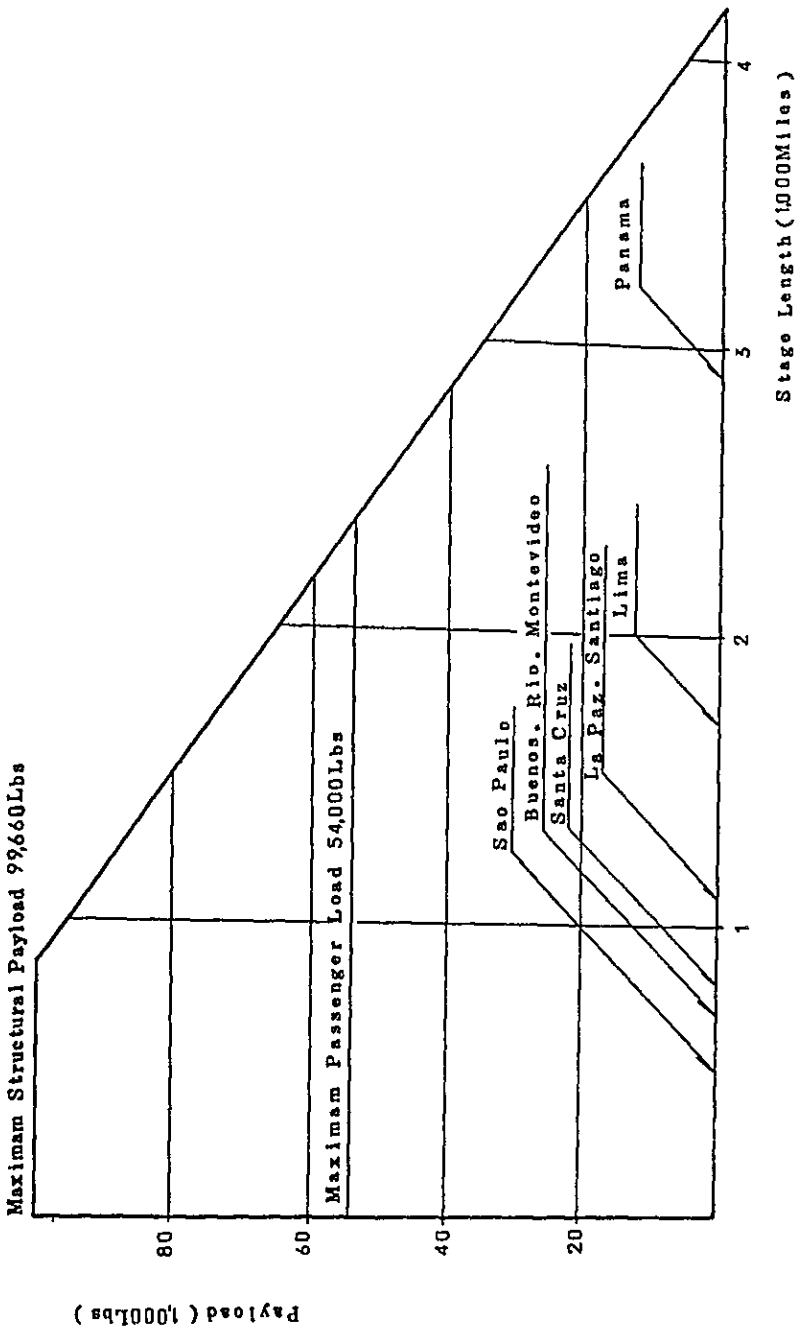
STAGE LENGTH - PAYLOAD RELATIONSHIP
ON PROPOSED RUNWAY LENGTH (DC-9-50)



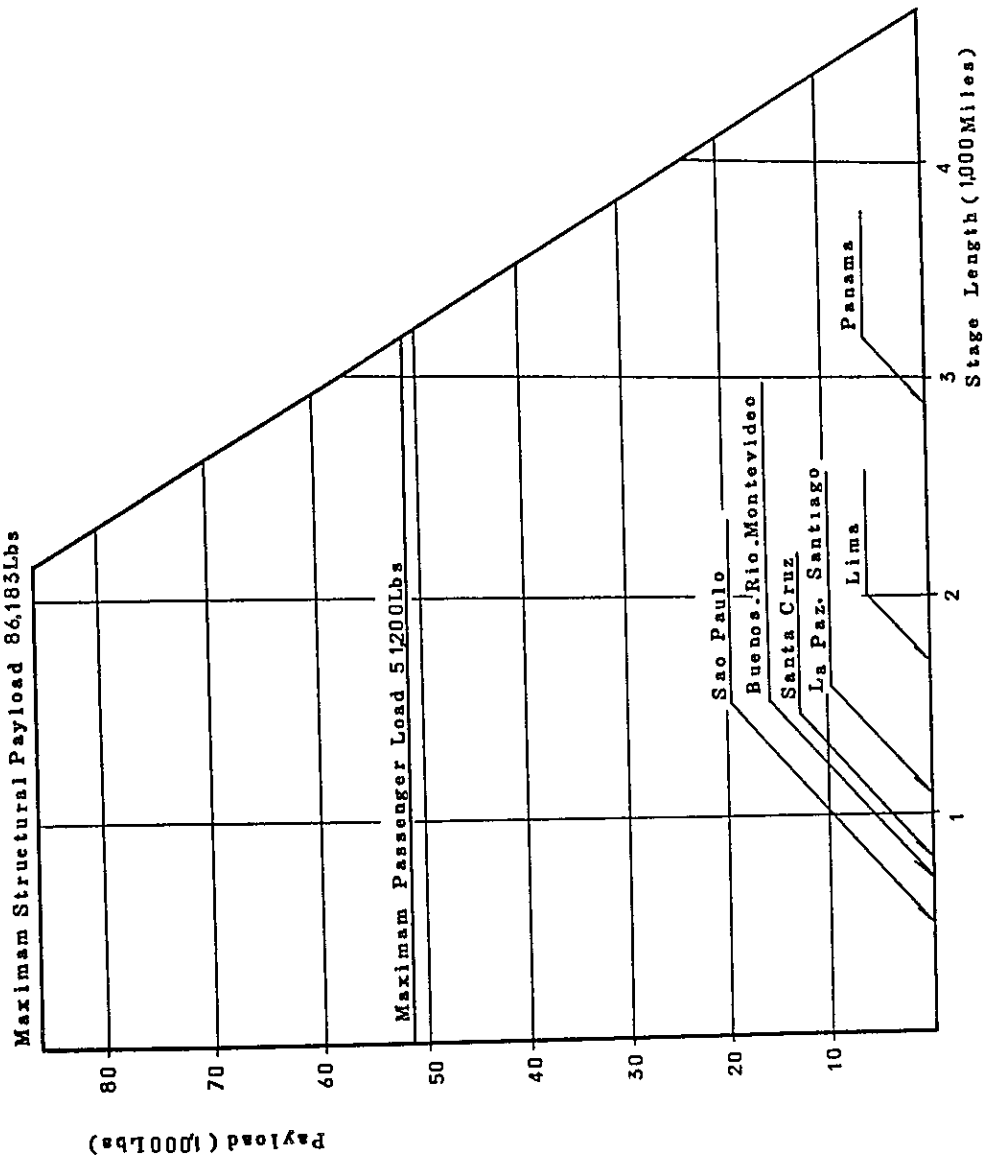
STAGE LENGTH - PAYLOAD RELATIONSHIP
ON PROPOSED RUNWAY LENGTH (B-737-200C)



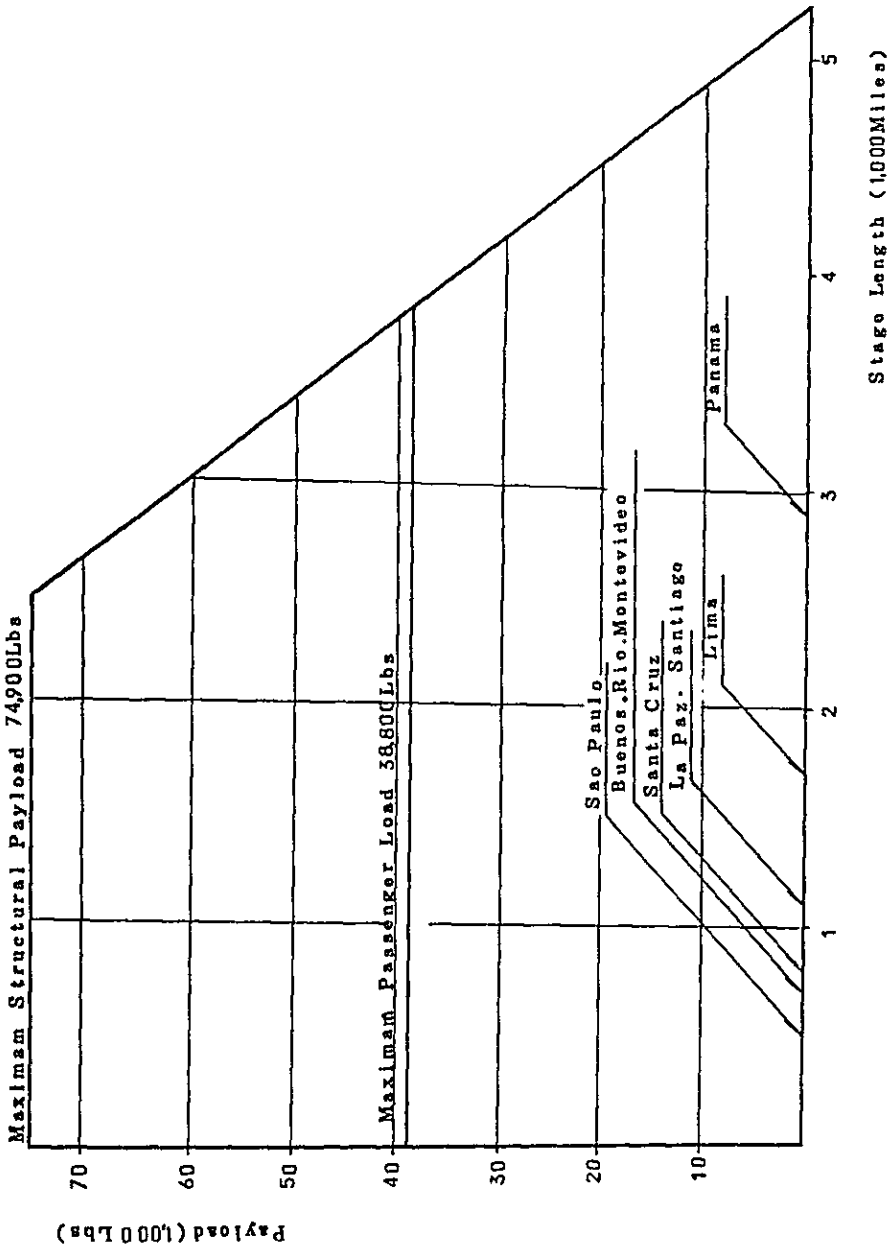
STAGE LENGTH - PAYLOAD RELATIONSHIP
ON PROPOSED RUNWAY LENGTH (B-727-200)



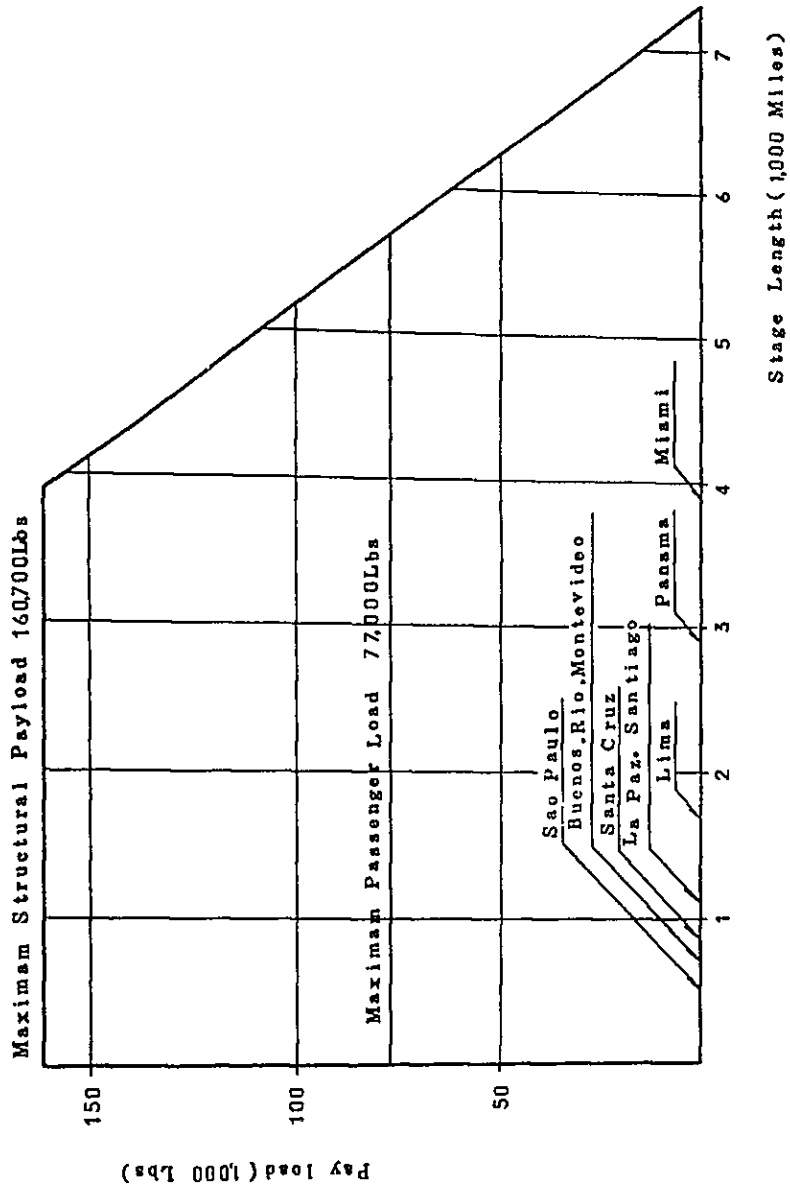
STAGE LENGTH - PAYLOAD RELATIONSHIP
ON PROPOSED RUNWAY LENGTH (DC-10-10)



STAGE LENGTH - PAYLOAD RELATIONSHIP
ON PROPOSED RUNWAY LENGTH (L-1011-385-1)

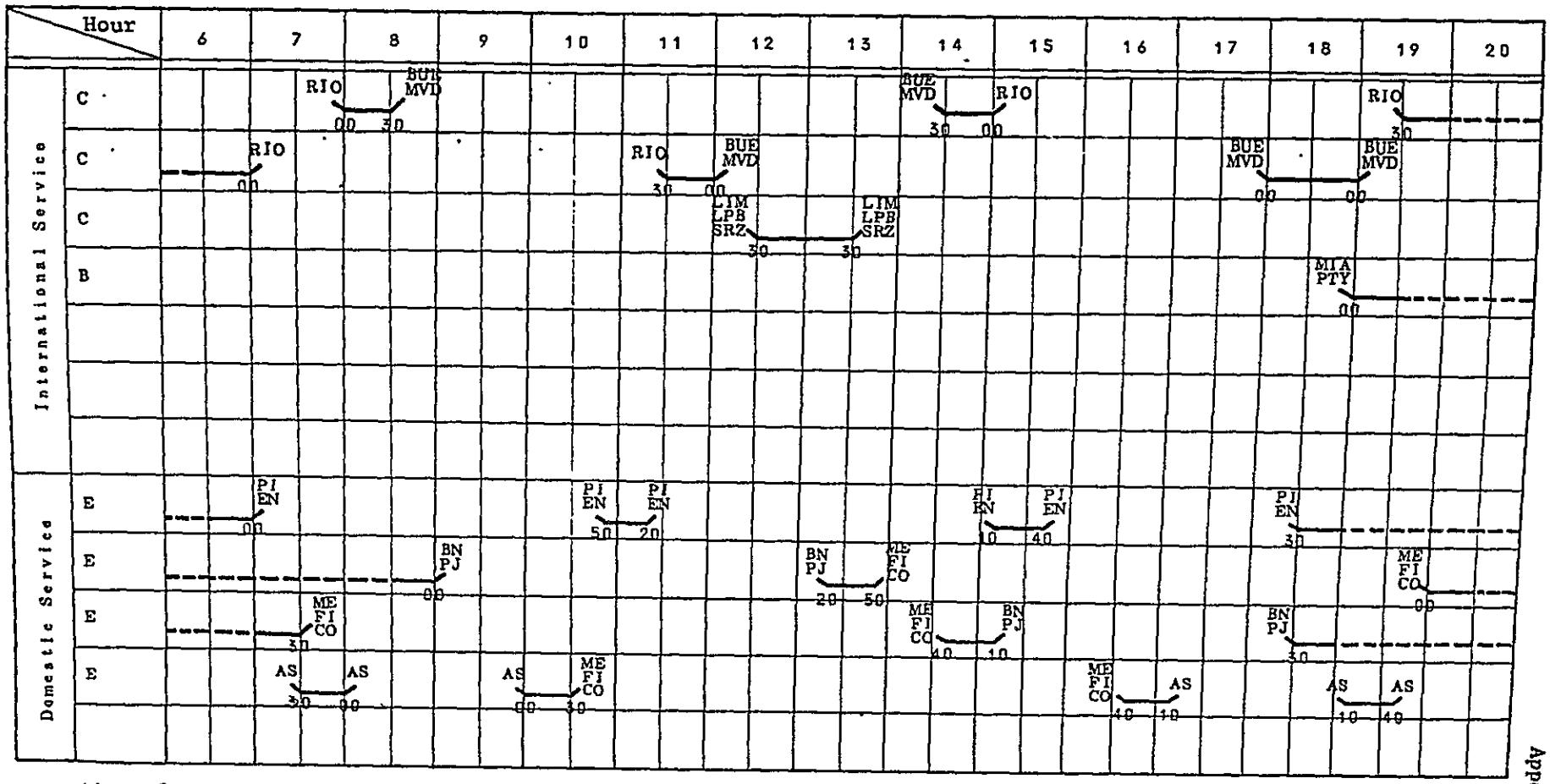


STAGE LENGTH - PAYLOAD RELATIONSHIP
ON PROPOSED RUNWAY LENGTH (B-707-300C)



STAGE LENGTH - PAYLOAD RELATIONSHIP
ON PROPOSED RUNWAY LENGTH (B-747-200B)

PROJECTED FLIGHT SCHEDULE IN YEAR 1994



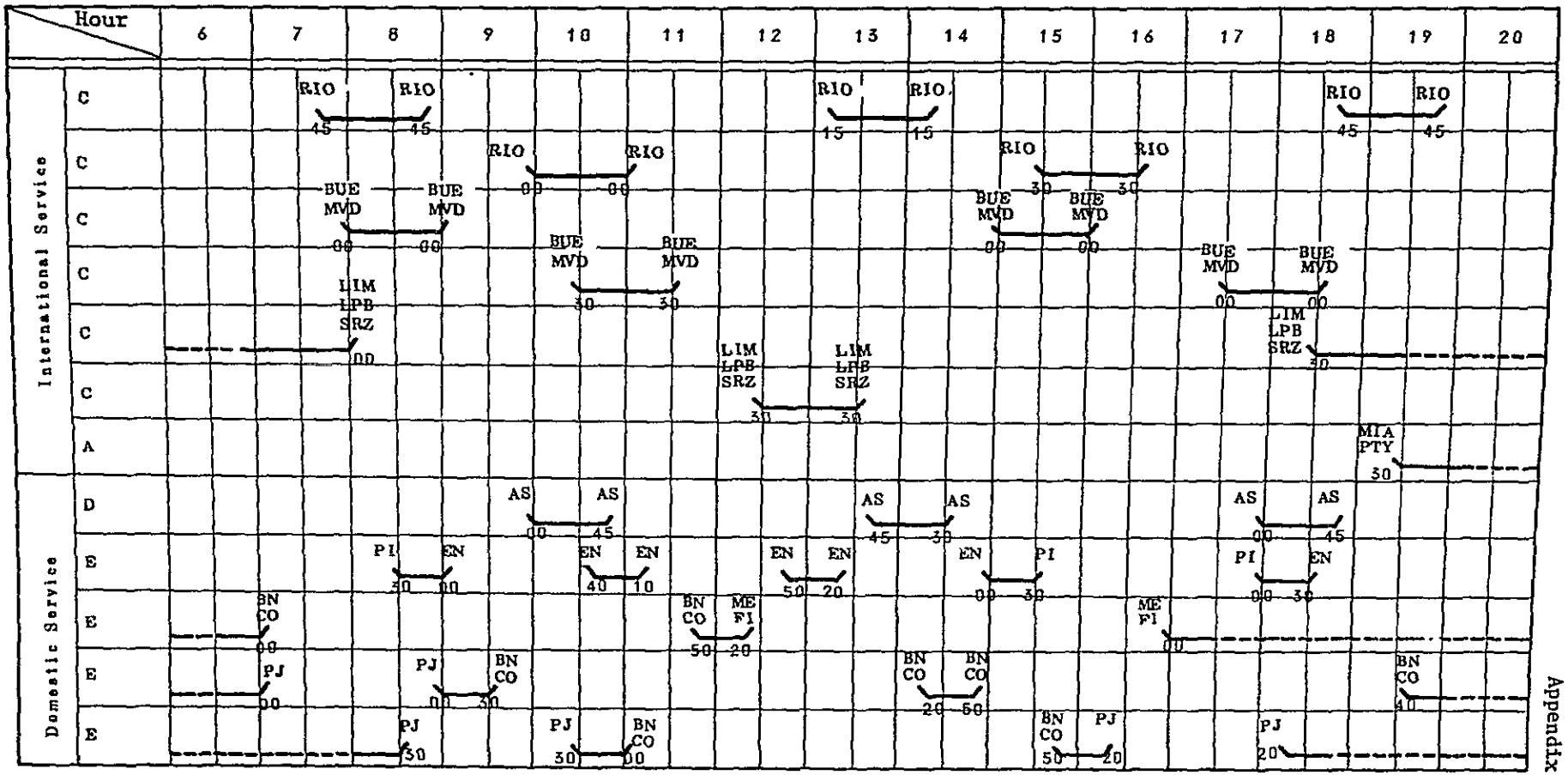
Aircraft Category
A ... 250 seater jet
B ... 180 "
C ... 150 "
D ... 120 "
E ... 55 non-jet

Notes.

Arriving Flight

Departing Flight

PROJECTED FLIGHT SCHEDULE IN YEAR 2004



HALF-HOURLY DISTRIBUTION OF PASSENGERS AT NEW CPS AIRPORT IN YEAR 1994

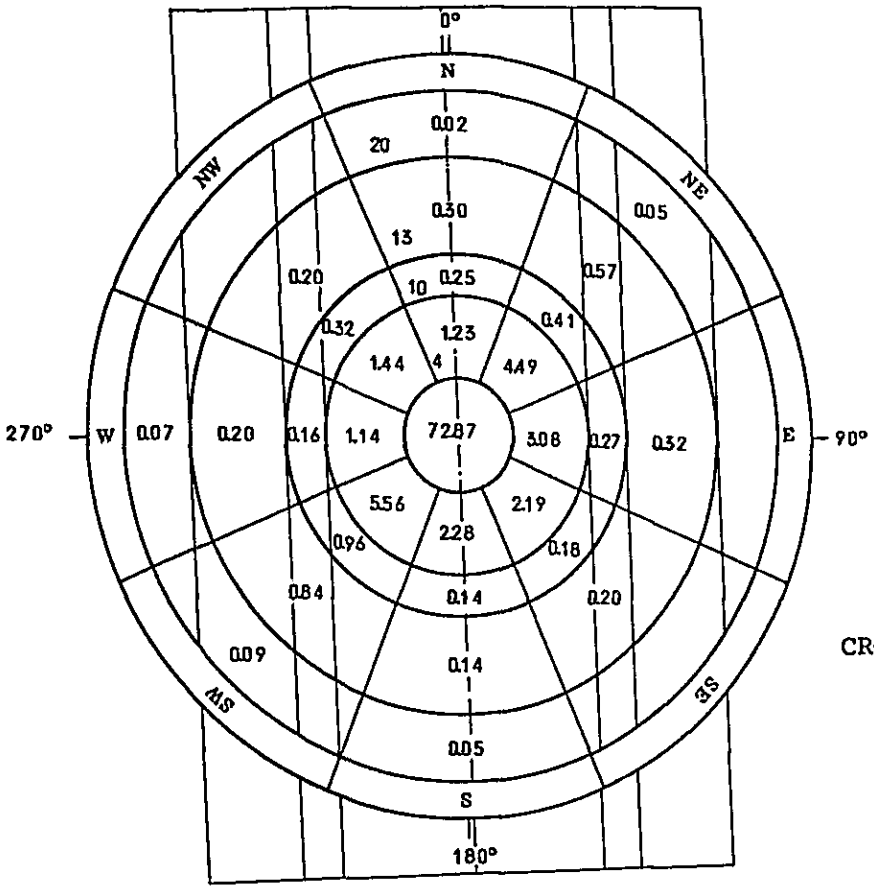
Time	International			Domestic	
	ARR	DEP	THRU	ARR	DEP
5:00 - 5:30	0	0	0	0	0
5:30 - 6:00	0	0	0	0	0
6:00 - 6:30	90	90	0	0	0
6:30 - 7:00	90	90	0	0	38
7:00 - 7:30	0	0	0	0	38
7:30 - 8:00	81	81	0	38	38
8:00 - 8:30	162	81	9	0	0
8:30 - 9:00	0	0	0	0	38
9:00 - 9:30	0	0	0	0	0
9:30 - 10:00	0	0	0	0	0
10:00 - 10:30	0	0	0	38	38
10:30 - 11:00	0	0	0	38	38
11:00 - 11:30	81	81	0	38	38
11:30 - 12:00	162	81	9	0	0
12:00 - 12:30	0	0	0	0	0
12:30 - 13:00	162	81	9	0	0
13:00 - 13:30	81	81	9	38	38
13:30 - 14:00	0	0	0	38	38
14:00 - 14:30	81	81	0	0	0
14:30 - 15:00	162	81	9	38	38
15:00 - 15:30	0	0	0	38	76
15:30 - 16:00	0	0	0	0	38
16:00 - 16:30	0	0	0	0	0
16:30 - 17:00	0	0	0	38	38
17:00 - 17:30	0	0	0	0	38
17:30 - 18:00	180	0	0	0	0
18:00 - 18:30	90	90	0	0	0
18:30 - 19:00	108	90	0	76	0
19:00 - 19:30	90	0	0	38	38
19:30 - 20:00	0	0	0	0	38
20:00 - 20:30	0	0	0	38	0
20:30 - 21:00	0	0	0	0	0
21:00 - 21:30	0	0	0	0	0

HALF-HOURLY DISTRIBUTION OF PASSENGERS AT NEW CPS AIRPORT IN YEAR 2004

Time	International			Domestic	
	ARR	DEP	THRU	ARR	DEP
5:00 - 5:30	0	0	0	0	0
5:30 - 6:00	0	0	0	0	0
6:00 - 6:30	0	0	0	0	0
6:30 - 7:00	0	0	0	0	76
7:00 - 7:30	0	90	0	0	0
7:30 - 8:00	81	180	9	0	0
8:00 - 8:30	162	171	18	0	38
8:30 - 9:00	0	171	18	38	38
9:00 - 9:30	0	0	9	38	38
9:30 - 10:00	0	0	9	0	0
10:00 - 10:30	81	81	18	84	84
10:30 - 11:00	81	162	27	76	160
11:00 - 11:30	0	81	18	0	38
11:30 - 12:00	0	0	9	38	38
12:00 - 12:30	0	0	9	38	38
12:30 - 13:00	81	81	18	38	38
13:00 - 13:30	81	162	27	38	38
13:30 - 14:00	81	81	18	84	0
14:00 - 14:30	0	81	18	38	122
14:30 - 15:00	0	0	9	38	38
15:00 - 15:30	81	81	18	38	38
15:30 - 16:00	81	162	18	38	38
16:00 - 16:30	0	81	18	0	38
16:30 - 17:00	0	0	18	38	0
17:00 - 17:30	0	0	9	0	0
17:30 - 18:00	81	81	18	160	0
18:00 - 18:30	0	81	18	38	122
18:30 - 19:00	180	81	9	0	84
19:00 - 19:30	90	81	9	38	0
19:30 - 20:00	150	81	9	0	0
20:00 - 20:30	0	0	0	0	0
20:30 - 21:00	0	0	0	0	0
21:00 - 21:30	0	0	0	0	0

APPENDIX 5

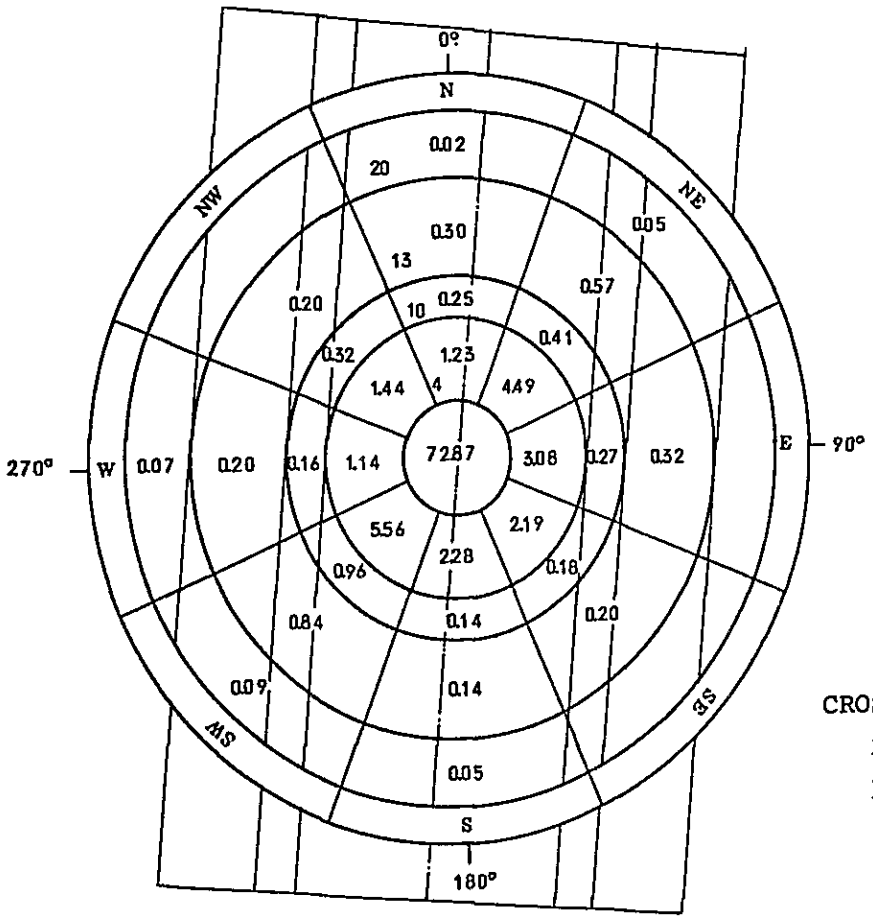
SITE I



CROSSWIND COMPONENT;

20knot	99.9%
13knot	98.8%
10knot	97.3%

SITE II



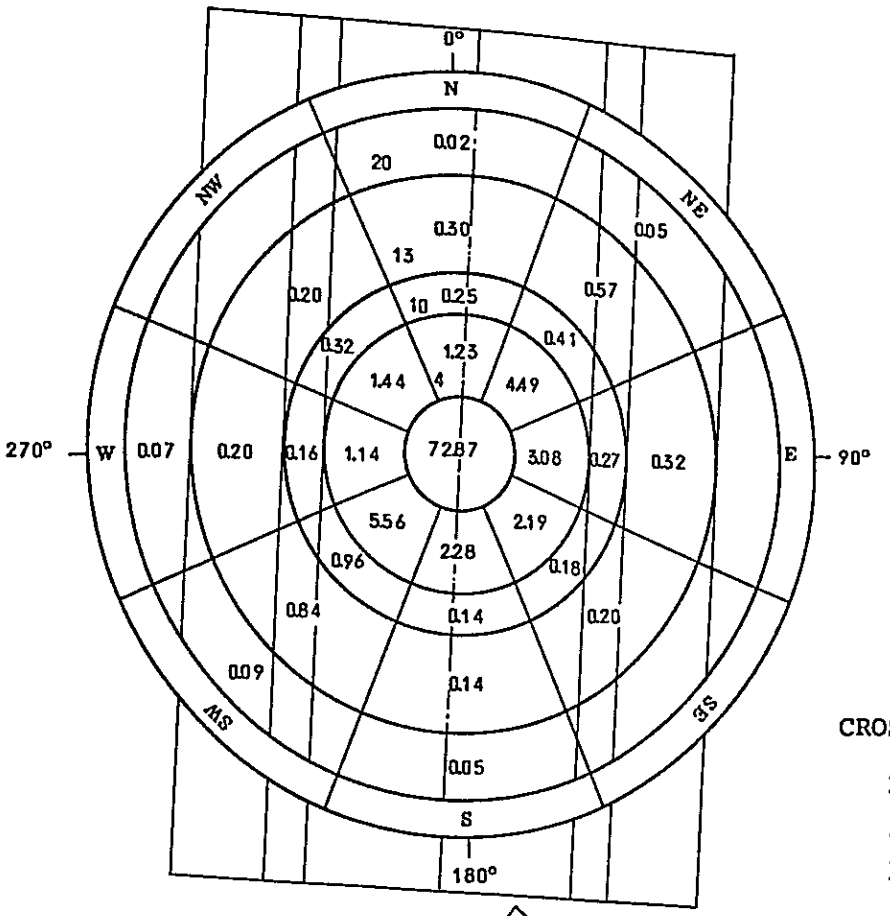
CROSSWIND COMPONENT;

20knot	99.9%
13knot	98.8%
10knot	97.3%

WIND ROSE (SITE I, SITE II)

Appendix 5-2

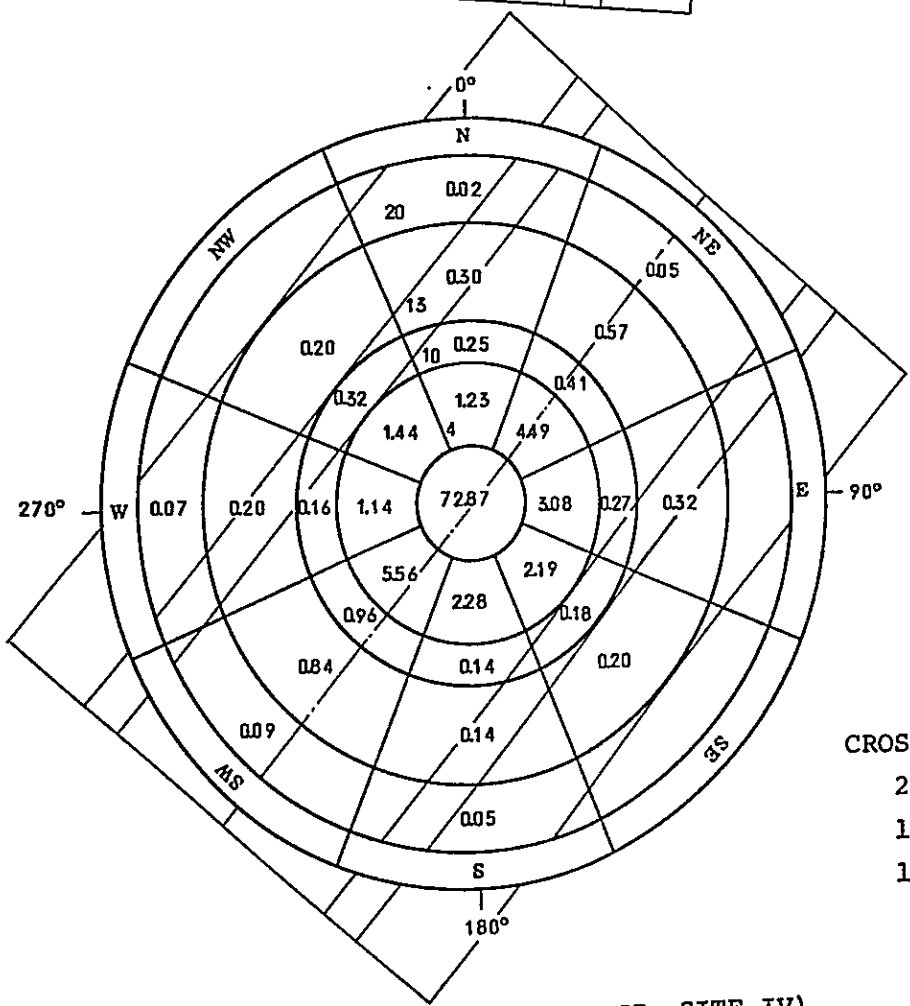
SITE III



CROSSWIND COMPONENT;

20knot	99.9%
13knot	98.8%
10knot	97.3%

SITE IV

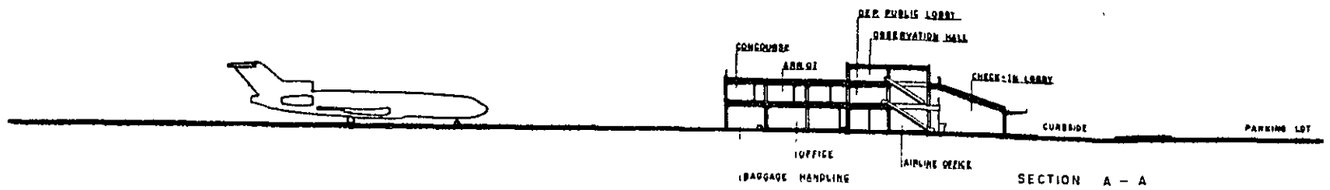


CROSSWIND COMPONENT;

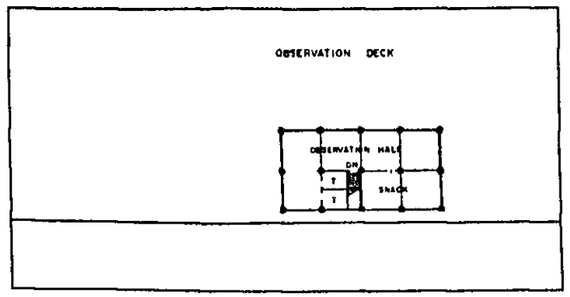
20knot	99.9%
13knot	99.2%
10knot	98.2%

WIND ROSE (SITE III, SITE IV)

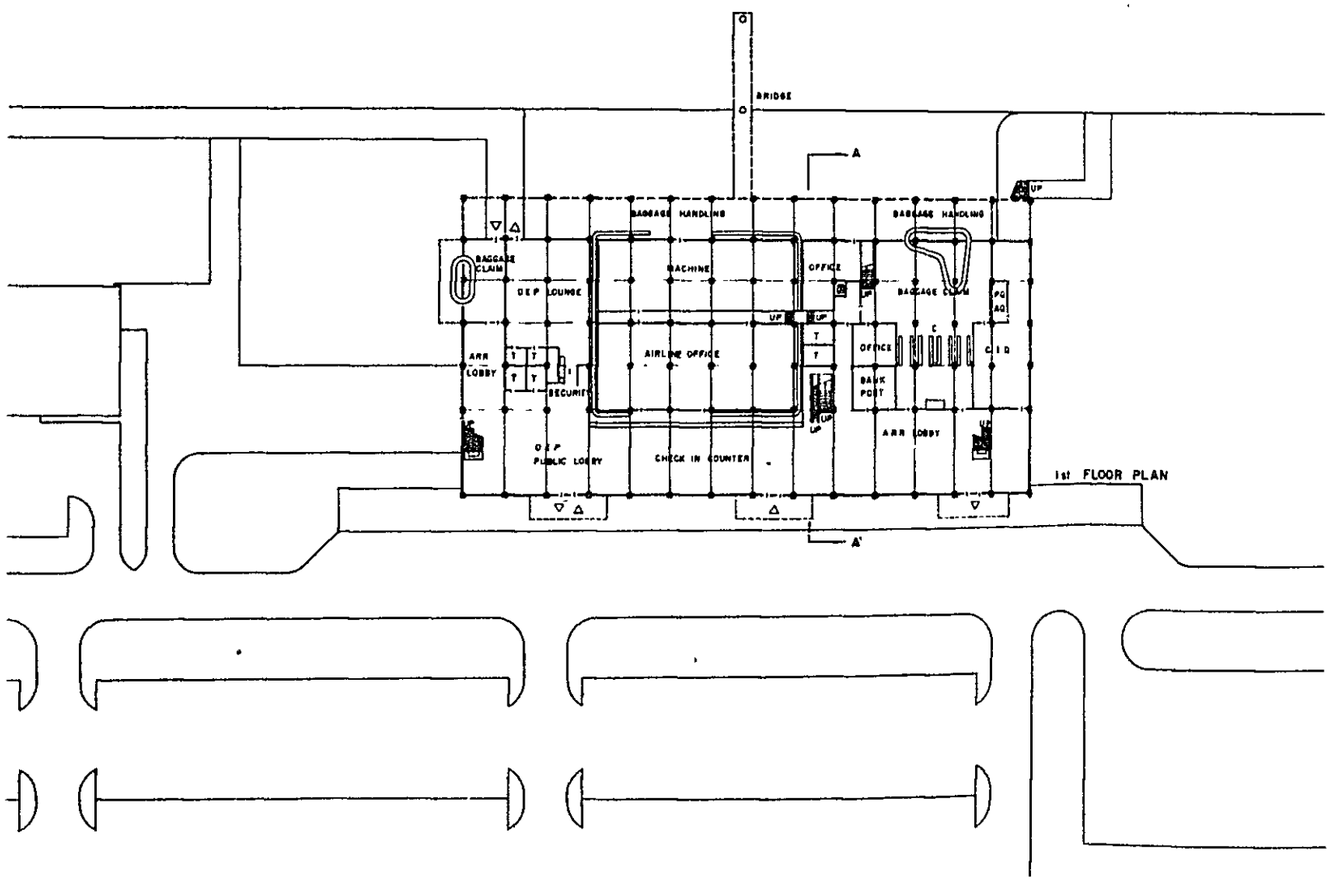
APPENDIX 6



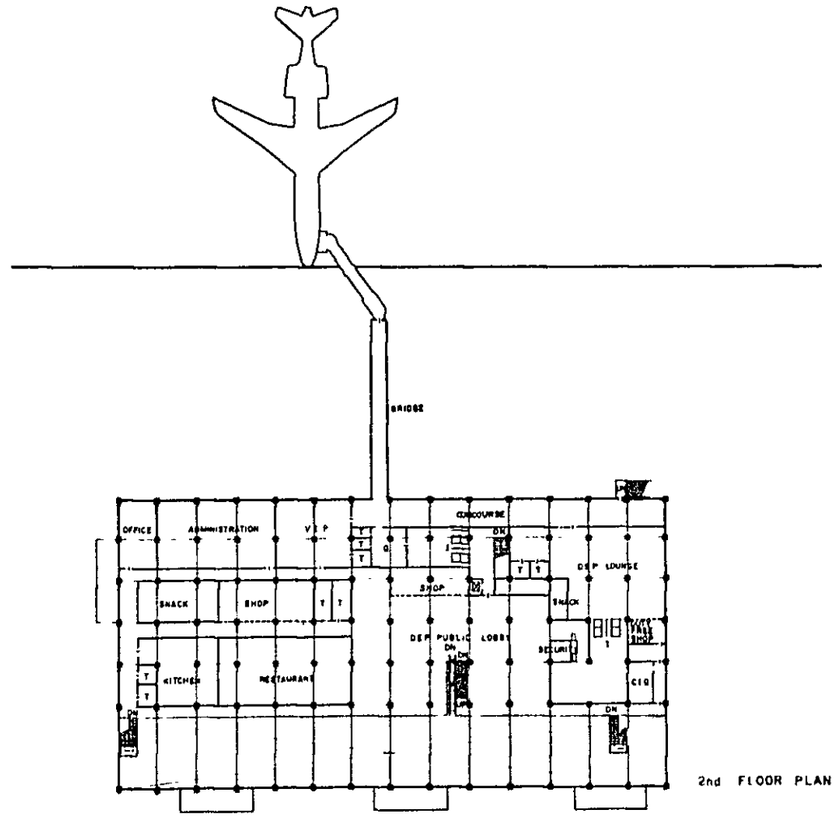
SECTION A - A



3rd FLOOR PLAN

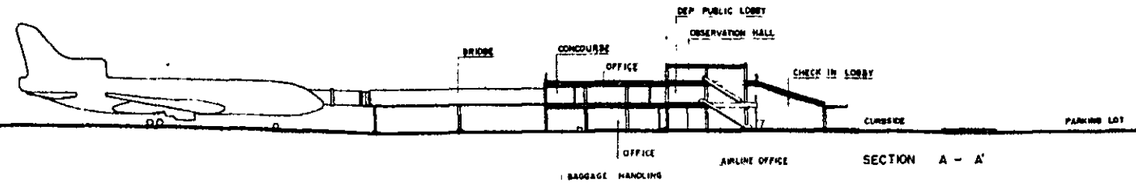


1st FLOOR PLAN

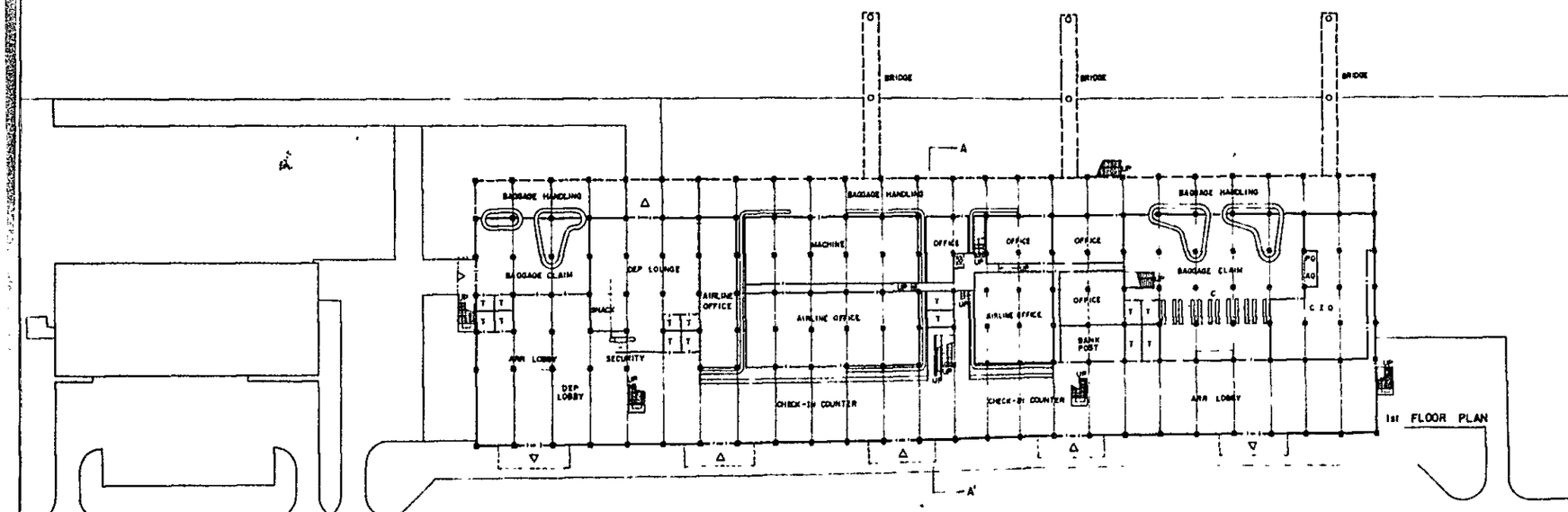


2nd FLOOR PLAN

REPUBLICA DEL PARAGUAY ADMINISTRACION NACIONAL DE AEROPUERTOS CIVILES	
NEW CPS AIRPORT DEVELOPMENT	
PASSENGER TERMINAL BUILDING - STAGE I	FEB 1980 13
JAPAN INTERNATIONAL COOPERATION AGENCY	



SECTION A - A'



1st FLOOR PLAN

REPUBLICA DEL PARAGUAY
ADMINISTRACION NACIONAL DE AEROPUERTOS CIVILES

NEW CPS AIRPORT DEVELOPMENT

PASSENGER TERMINAL BUILDING - STAGE II - I

FEB 1980

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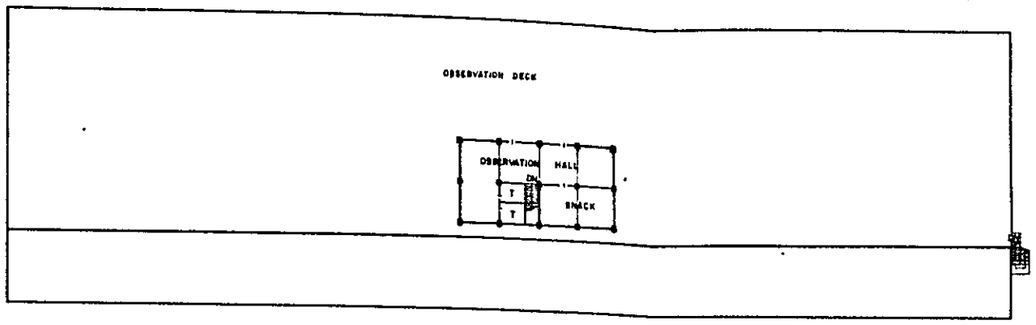
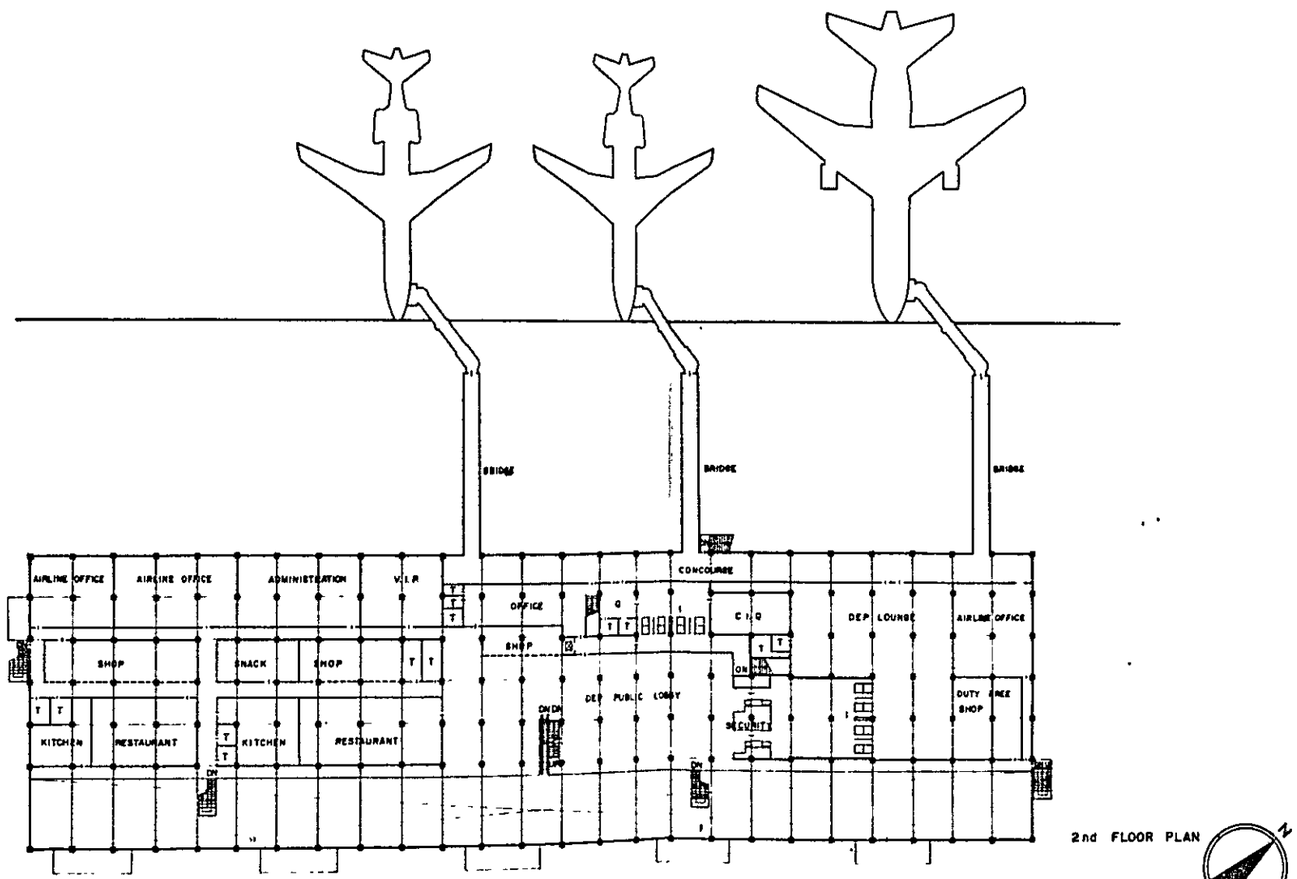
JAPAN INTERNATIONAL COOPERATION AGENCY



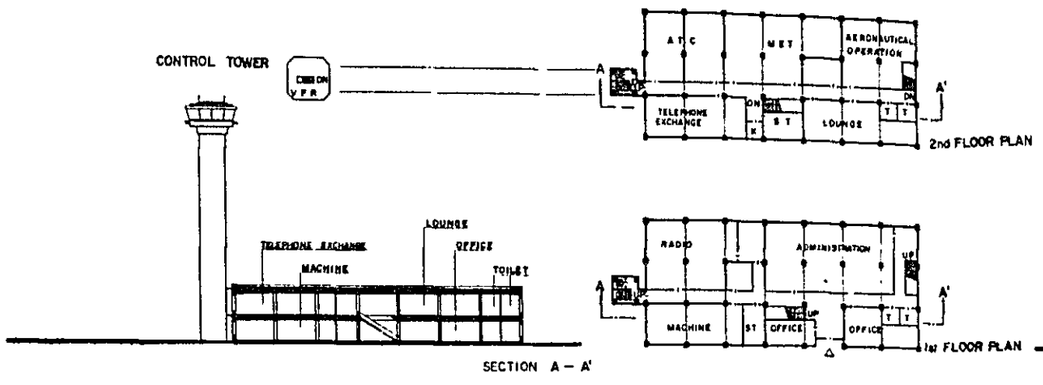
3rd FLOOR PLAN



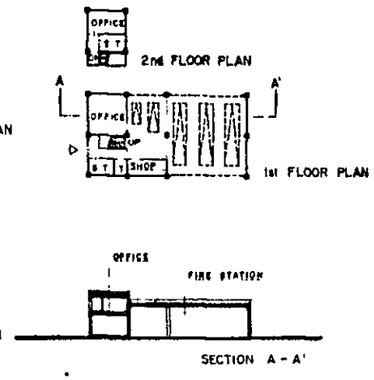
2nd FLOOR PLAN

0 10M 20M 30M 40M 50M

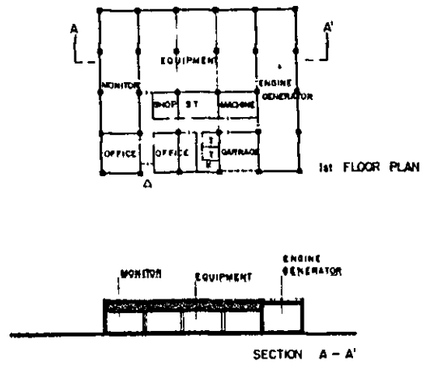
REPUBLICA DEL PARAGUAY ADMINISTRACION NACIONAL DE AEROPUERTOS CIVILES	
NEW CPS AIRPORT DEVELOPMENT	
PASSENGER TERMINAL BUILDING – STAGE II – 2	FEB 1980 15
JAPAN INTERNATIONAL COOPERATION AGENCY	



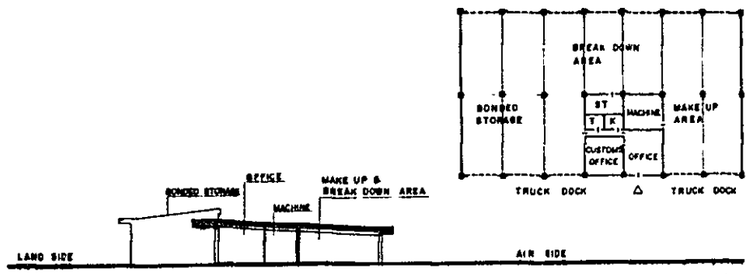
ADMINISTRATION BUILDING

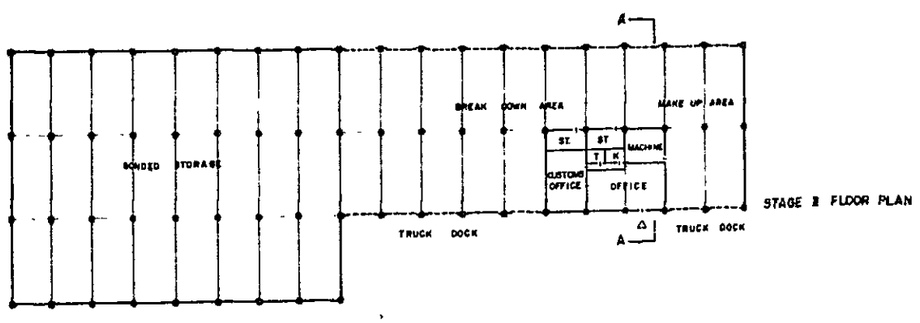


FIRE STATION

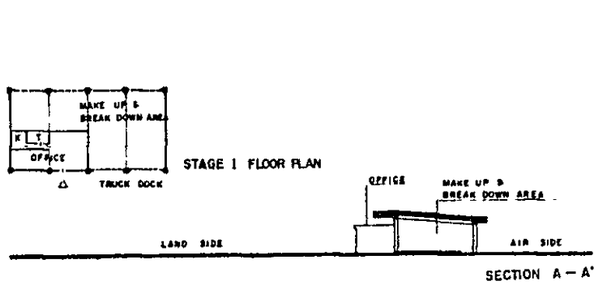


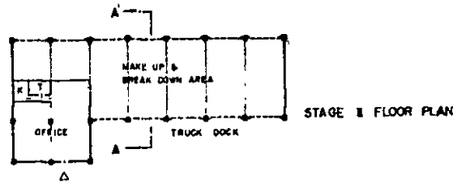
MAIN SUBSTATION





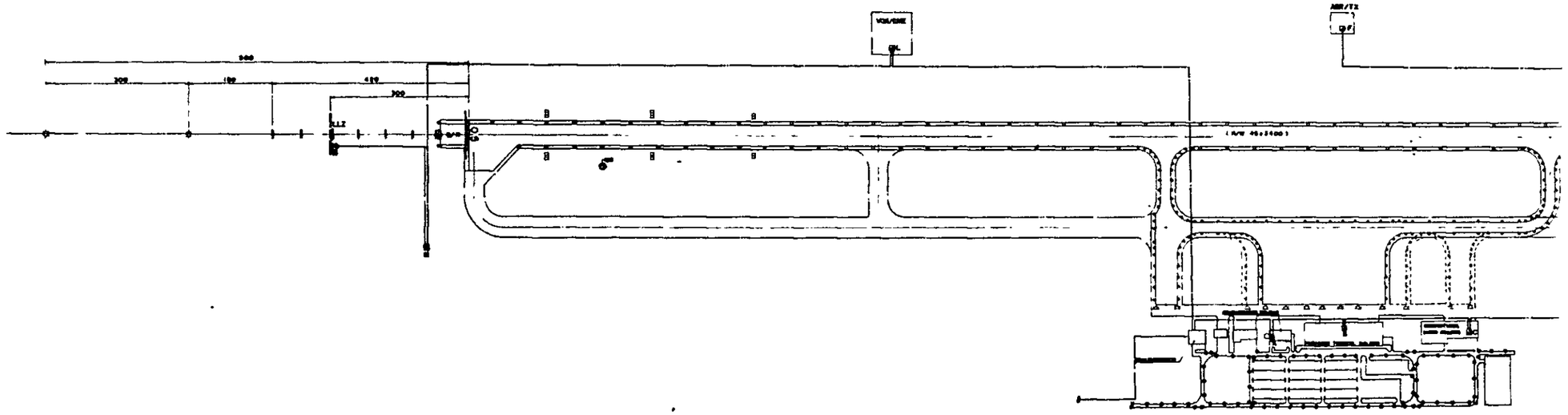
INTERNATIONAL CARGO BUILDING

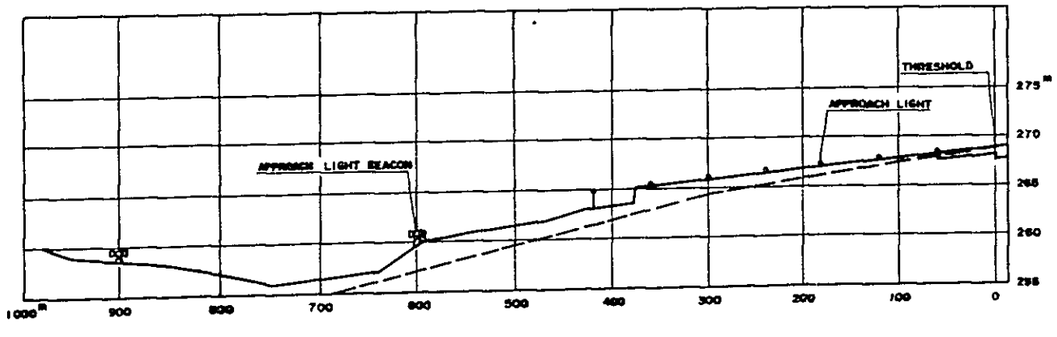




DOMESTIC CARGO BUILDING

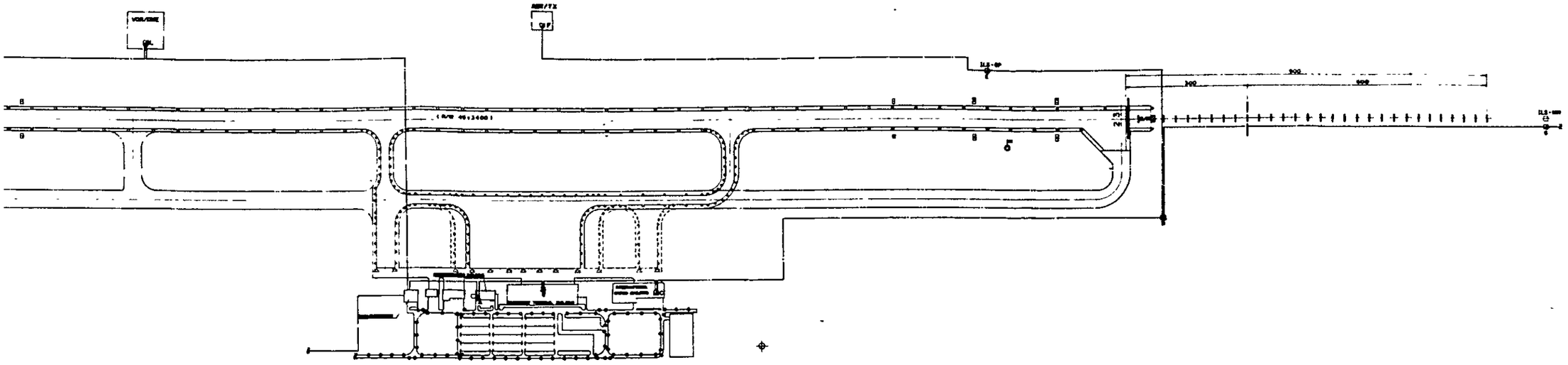
REPUBLICA DEL PARAGUAY ADMINISTRACION NACIONAL DE AEROPUERTOS CIVILES	
NEW CPS AIRPORT DEVELOPMENT	
ADMINISTRATION BUILDING / CARGO BUILDING / FIRE STATION / MAIN SUBSTATION	FEB 1980 16
JAPAN INTERNATIONAL COOPERATION AGENCY	



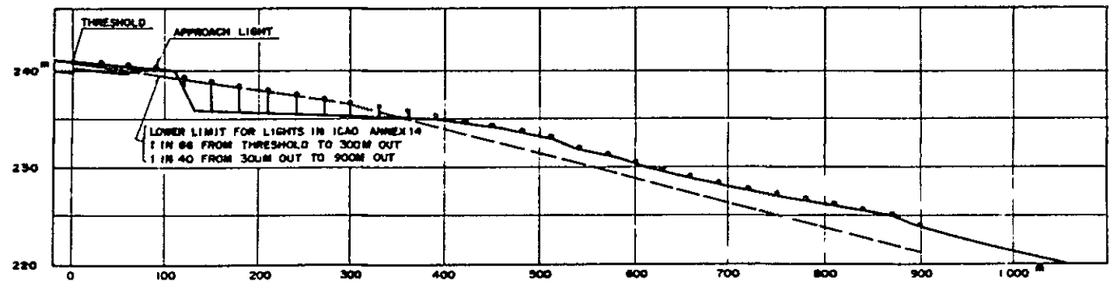


LONGITUDINAL CROSS SECTION OF APPROACH AREA

LEGEND	
APPROACH LIGHTS	○
APPROACH LIGHT BEACON	☼
VISUAL APPROACH SLOPE INDICATOR(VASI)	
RUNWAY EDGE LIGHTS	○ ●
OVER RUN LIGHTS	●
RUNWAY END LIGHTS RUNWAY THRESHOLD LIGHTS	▮
TAXIWAY EDGE LIGHTS (STAGE I)	○
TAXIWAY EDGE LIGHTS (STAGE II)	○
AERODROME BEACON	✦
WIND DIRECTIONAL INDICATOR	
APRON FLOOD LIGHTS (STAGE I)	
APRON FLOOD LIGHTS (STAGE II)	
SUBSTATION	
STREET LIGHTS	○
DISTRIBUTION LINE	——



LEGEND	
APPROACH LIGHTS	○
APPROACH LIGHT BEACON	☼
VISUAL APPROACH SLOPE INDICATOR(VASI)	
RUNWAY EDGE LIGHTS	○ ●
OVER RUN LIGHTS	●
RUNWAY END LIGHTS RUNWAY THRESHOLD LIGHTS	▮
TAXIWAY EDGE LIGHTS (STAGE I)	○
TAXIWAY EDGE LIGHTS (STAGE II)	○
AERODROME BEACON	✦
WIND DIRECTIONAL INDICATOR	
APRON FLOOD LIGHTS (STAGE I)	☼
APRON FLOOD LIGHTS (STAGE II)	☼
SUBSTATION	
STREET LIGHTS	○
DISTRIBUTION LINE	——



LONGITUDINAL CROSS SECTION OF APPROACH AREA

REPUBLICA DEL PARAGUAY
ADMINISTRACION NACIONAL DE AEROPUERTOS CIVILES

NEW CPS AIRPORT DEVELOPMENT

AIRFIELD LIGHTING LAYOUT

FEB.1980

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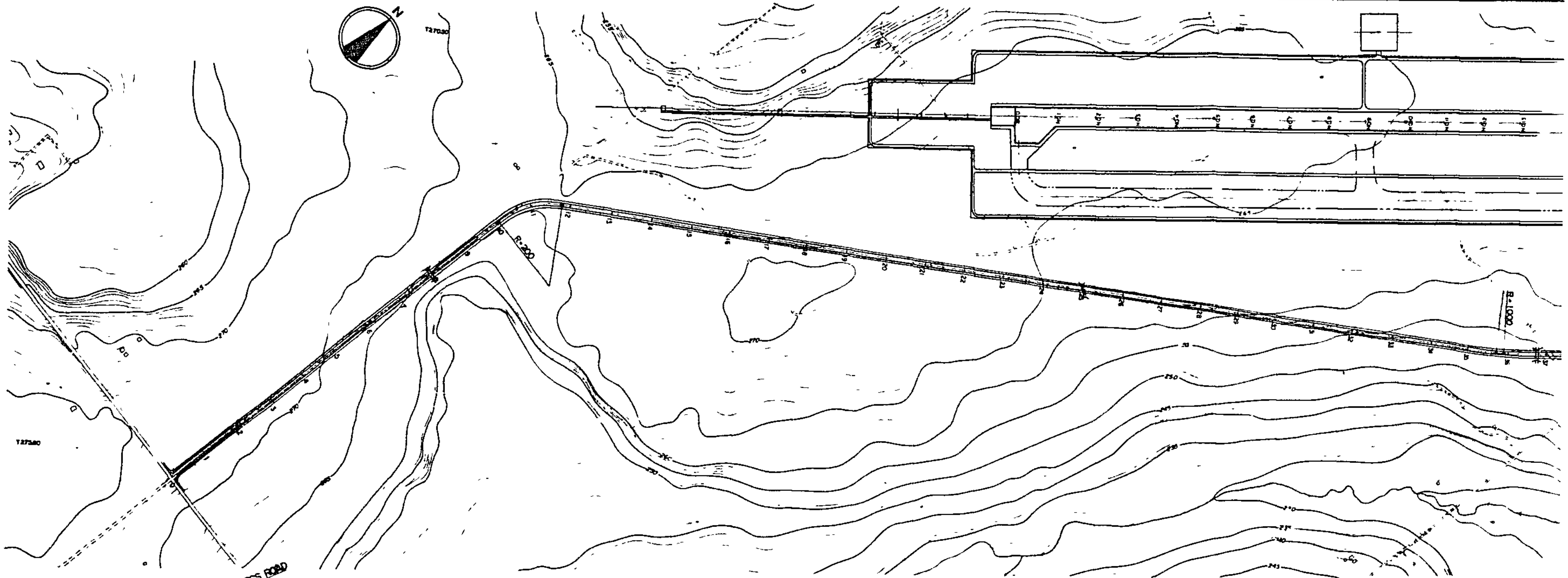
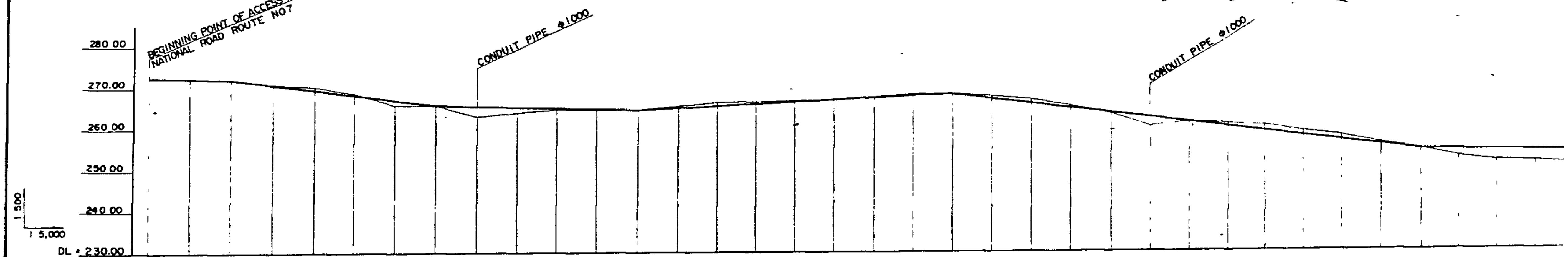
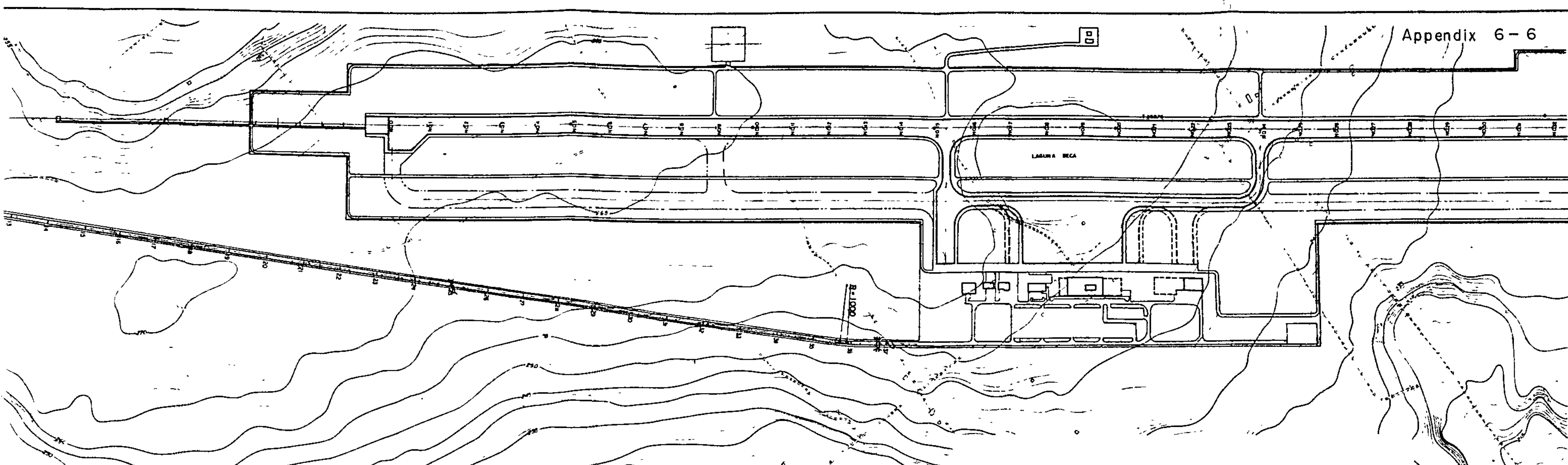
JAPAN INTERNATIONAL COOPERATION AGENCY

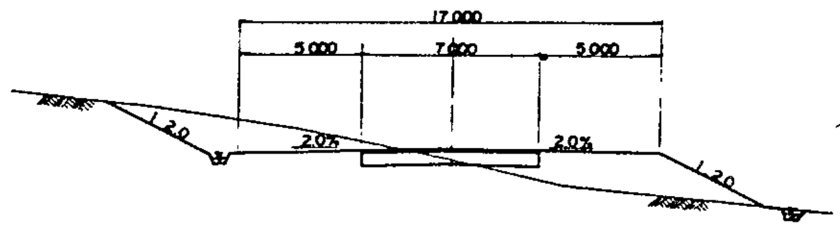




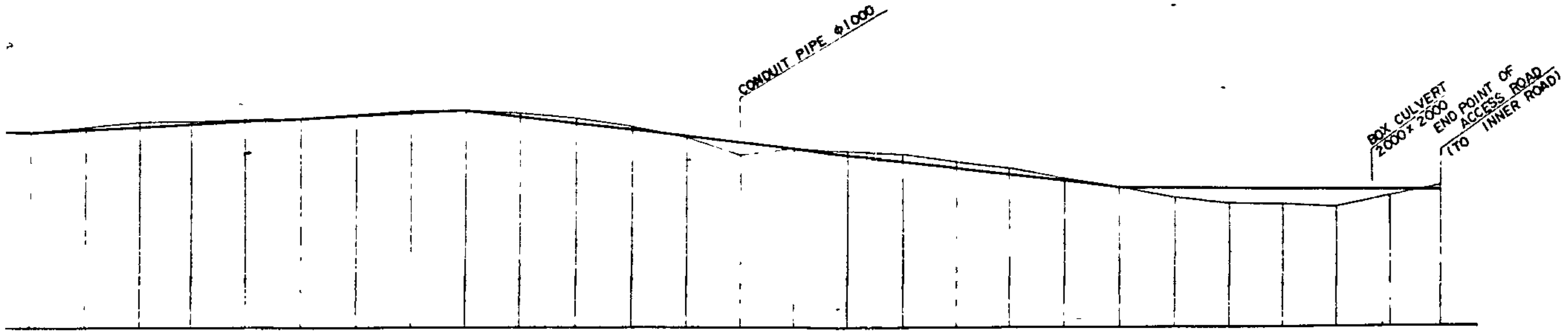
STATION	DISTANCE	ACCUMULATED DISTANCE	GROUND HEIGHT	FORMATION HEIGHT	CUT, FILL	GRADIENT
NO 0	0.000	0.000	272.80	272.80	±0.00	272.80
NO 1	100.000	100.000	272.40	272.45	-0.05	I=0.350% L=200.0
NO 2	100.000	200.000	272.10	272.10	±0.00	272.10
NO 3	100.000	300.000	271.20	270.90	+0.30	
NO 4	100.000	400.000	270.50	269.70	+0.80	I=1.200% L=500.0
NO 5	100.000	500.000	269.10	268.50	+0.60	
NO 6	100.000	600.000	268.20	267.30	-1.10	
NO 7	100.000	700.000	266.10	266.10	±0.00	266.10
NO 8	100.000	800.000	263.50	265.92	-2.42	
NO 9	100.000	900.000	264.50	265.74	-1.24	I=0.180% L=500.0
NO 10	100.000	1000.000	265.20	265.56	-0.36	
NO 11	100.000	1100.000	265.20	265.38	-0.18	
NO 12	100.000	1200.000	265.20	265.20	±0.00	265.20
NO 13	100.000	1300.000	266.30	265.76	+0.54	
NO 14	100.000	1400.000	267.20	266.33	+0.87	
NO 15	100.000	1500.000	267.30	266.89	+0.41	
NO 16	100.000	1600.000	267.80	267.45	+0.35	I=0.563% L=800.0
NO 17	100.000	1700.000	268.00	268.02	-0.02	
NO 18	100.000	1800.000	268.70	268.58	+0.12	
NO 19	100.000	1900.000	269.50	269.14	+0.36	
NO 20	100.000	2000.000	269.70	269.70	±0.00	269.70
NO 21	100.000	2100.000	269.20	268.56	+0.64	
NO 22	100.000	2200.000	268.30	267.42	+0.88	
NO 23	100.000	2300.000	266.90	266.28	+0.62	
NO 24	100.000	2400.000	265.00	265.14	-0.14	
NO 25	100.000	2500.000	261.80	263.99	-2.19	
NO 26	100.000	2600.000	262.80	262.85	-0.05	I=1.142% L=1200.0
NO 27	100.000	2700.000	262.30	261.71	+0.59	
NO 28	100.000	2800.000	262.00	260.57	+1.43	
NO 29	100.000	2900.000	260.50	259.43	+1.07	
NO 30	100.000	3000.000	259.50	258.28	+1.22	
NO 31	100.000	3100.000	257.50	257.14	+0.36	
NO 32	100.000	3200.000	256.00	256.00	±0.00	256.00
NO 33	100.000	3300.000	254.20	255.92	-1.72	
NO 34	100.000	3400.000	253.00	255.83	-2.83	I=0.085% L=590.0
NO 35	100.000	3500.000	252.90	255.75	-2.85	

Appendix 6-6





TYPICAL CROSS SECTION



265.20 — i=0.563% L=80.00 — 269.70 — i=1.142% L=120.00 — 256.00 — i=0.085% L=59.00 — 255.50

NO 12	100.000	1200.000	265.20	265.20	±0.00
NO 13	100.000	1300.000	266.30	265.76	+0.54
NO 14	100.000	1400.000	267.20	266.33	+0.87
NO 15	100.000	1500.000	267.30	266.89	+0.41
NO 16	100.000	1600.000	267.80	267.45	+0.35
NO 17	100.000	1700.000	268.00	268.02	-0.02
NO 18	100.000	1800.000	268.70	268.58	+0.12
NO 19	100.000	1900.000	269.50	269.14	+0.36
NO 20	100.000	2000.000	269.70	269.70	±0.00
NO 21	100.000	2100.000	269.20	268.56	+0.64
NO 22	100.000	2200.000	268.30	267.42	+0.88
NO 23	100.000	2300.000	266.90	266.28	+0.62
NO 24	100.000	2400.000	265.00	265.14	-0.14
NO 25	100.000	2500.000	261.80	263.99	-2.19
NO 26	100.000	2600.000	262.80	262.85	-0.05
NO 27	100.000	2700.000	262.30	261.71	+0.59
NO 28	100.000	2800.000	262.00	260.57	+1.43
NO 29	100.000	2900.000	260.50	259.43	+1.07
NO 30	100.000	3000.000	259.50	258.28	+1.22
NO 31	100.000	3100.000	257.50	257.14	+0.36
NO 32	100.000	3200.000	256.00	256.00	±0.00
NO 33	100.000	3300.000	254.20	255.92	-1.72
NO 34	100.000	3400.000	253.00	255.83	-2.83
NO 35	100.000	3500.000	252.90	255.75	-2.85
NO 36	100.000	3600.000	252.90	255.66	-2.76
NO 37	100.000	3700.000	254.50	255.58	-1.08
NO 37+90	90.000	3790.000	256.50	255.50	+1.00

STRUCTURAL PAVEMENT SECTION

GRAPHIC SCALE

0 100 200 300 400 500M

1:5,000

REPUBLICA DEL PARAGUAY

ADMINISTRACION NACIONAL DE AEROPUERTOS CIVILES

NEW CPS AIRPORT DEVELOPMENT

APPROACH ROAD

FEB 1980

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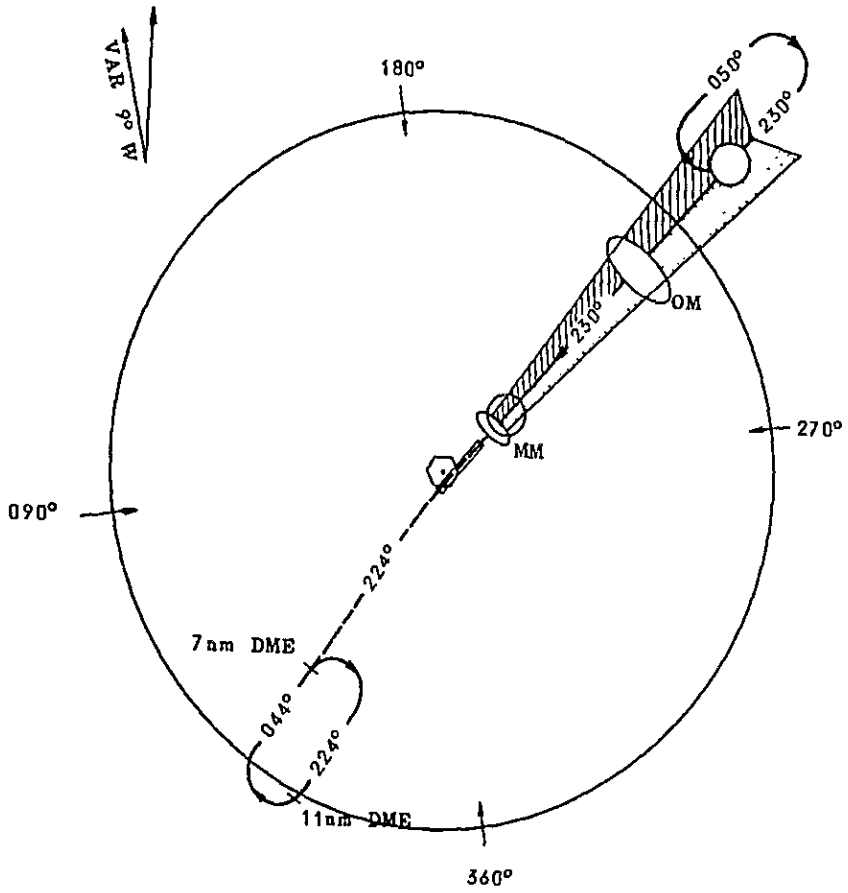
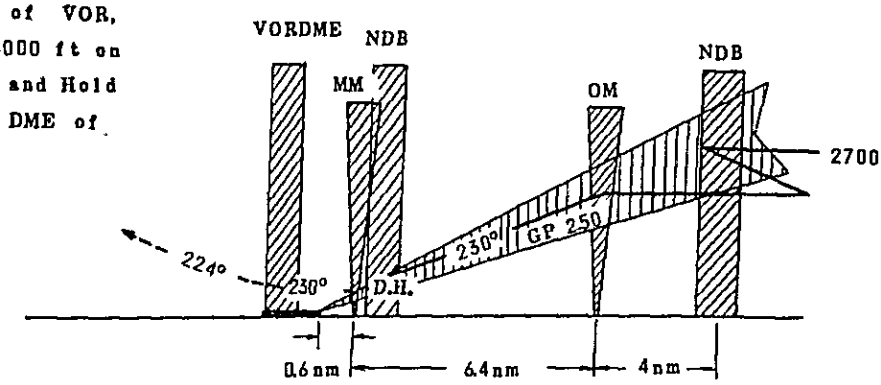
JAPAN INTERNATIONAL COOPERATION AGENCY



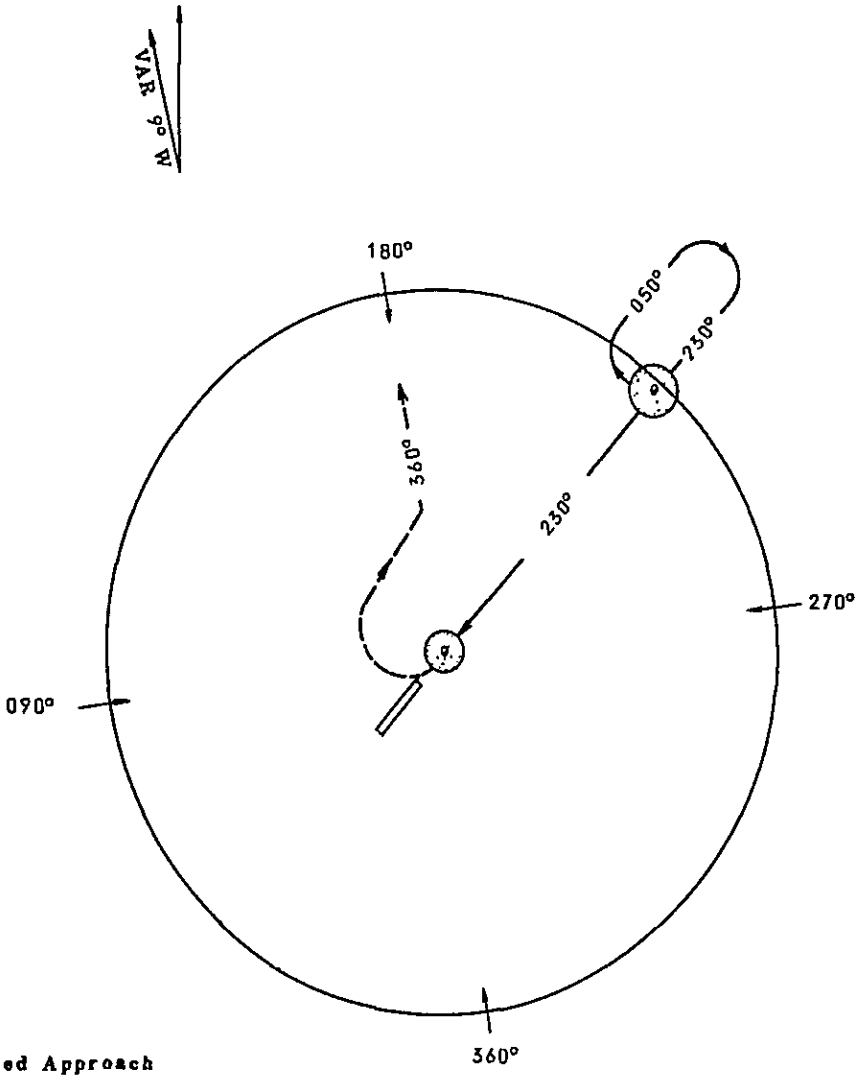
Missed Approach

Climb straight ahead until intercepting 224 radial of VOR, climb to 3000 ft on 224 radial and Hold SW of 7nm DME of VOR.



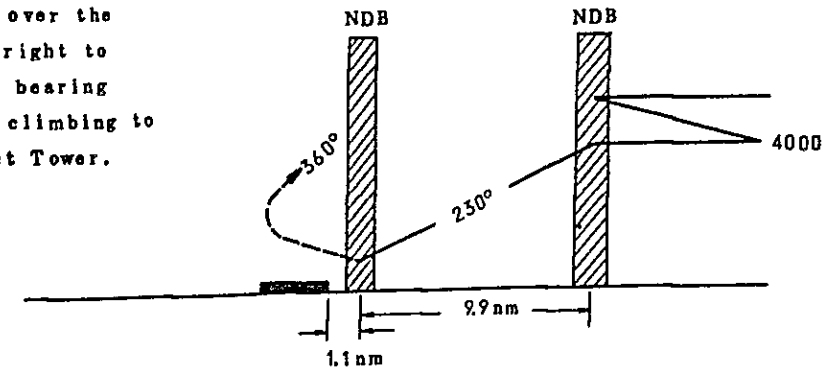
TDZ ELV–800ft(estimated)

INSTRUMENT APPROACH PROCEDURE (ILS RWY 23)



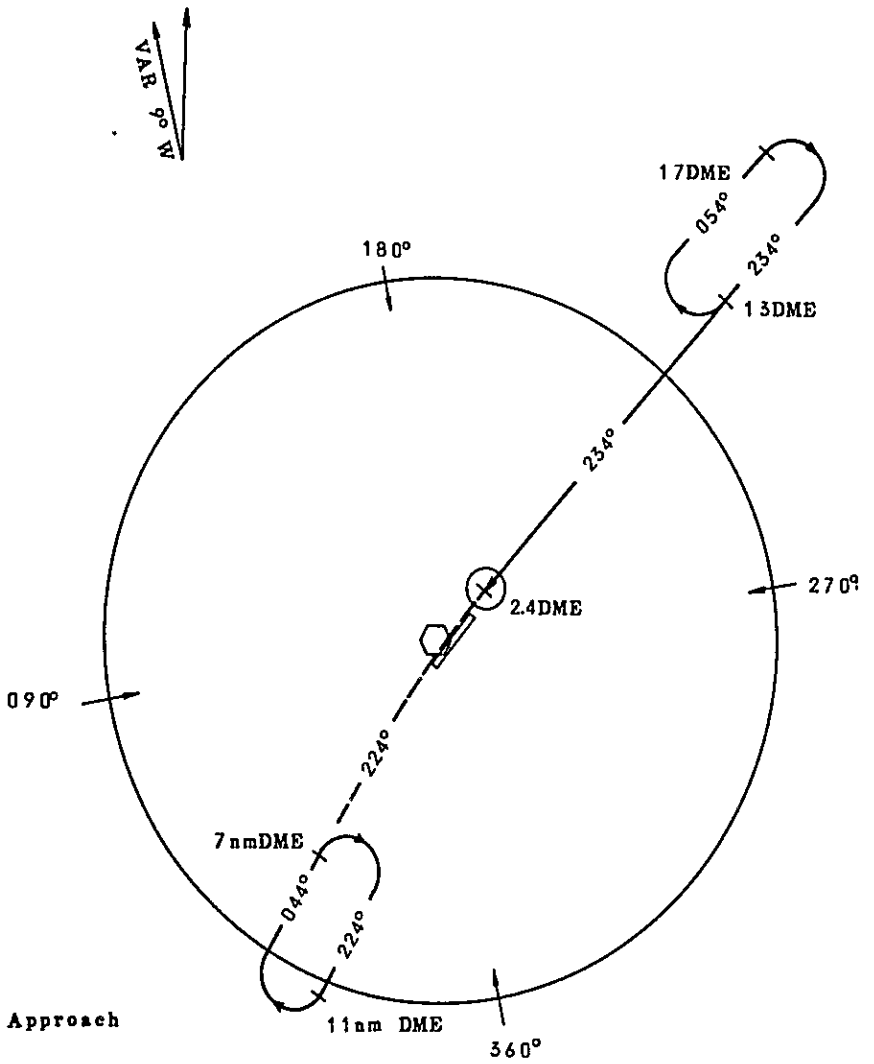
Missed Approach

If no contact over the NDB, turn right to intercept 360° bearing from NDB climbing to 3000 ft, contact Tower.



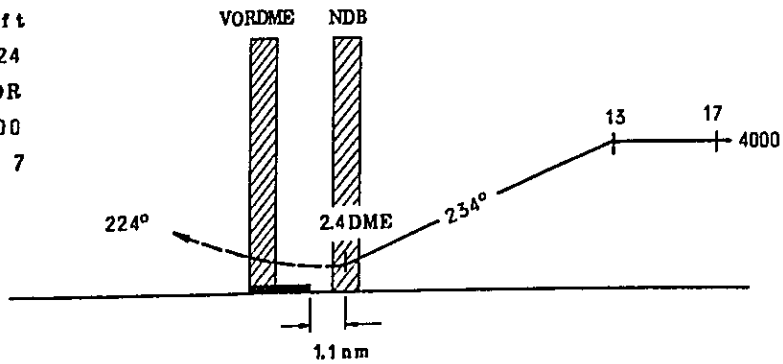
ELV—880ft (estimated)

INSTRUMENT APPROACH PROCEDURE (ADF)



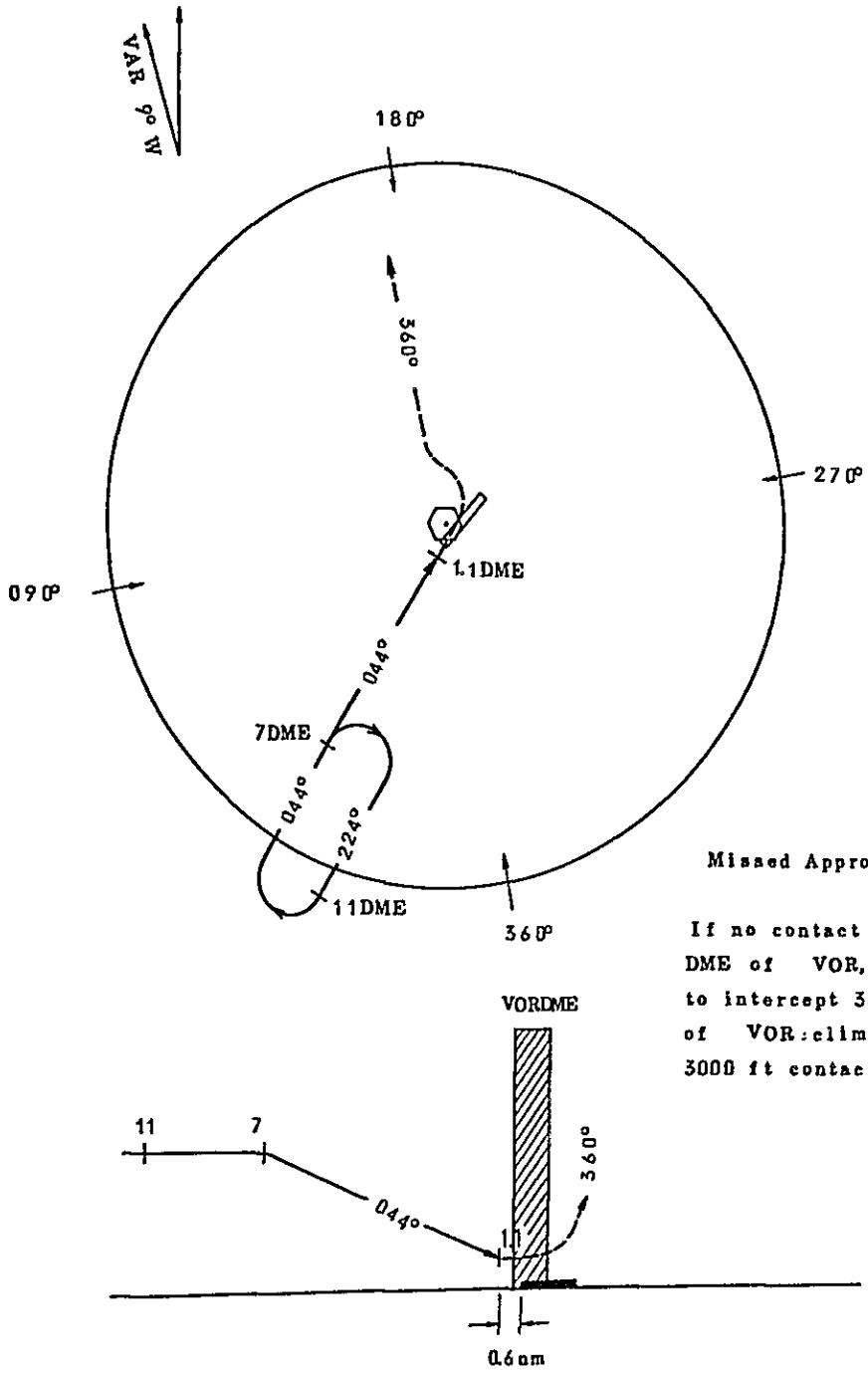
Missed Approach

If no contact at 24 DME, turn left and climb on 224 radial of VOR climbing to 3000 ft. Hold SW of 7 nm DME.



ELV—880 (estimated)

INSTRUMENT APPROACH PROCEDURE (VOR-1)

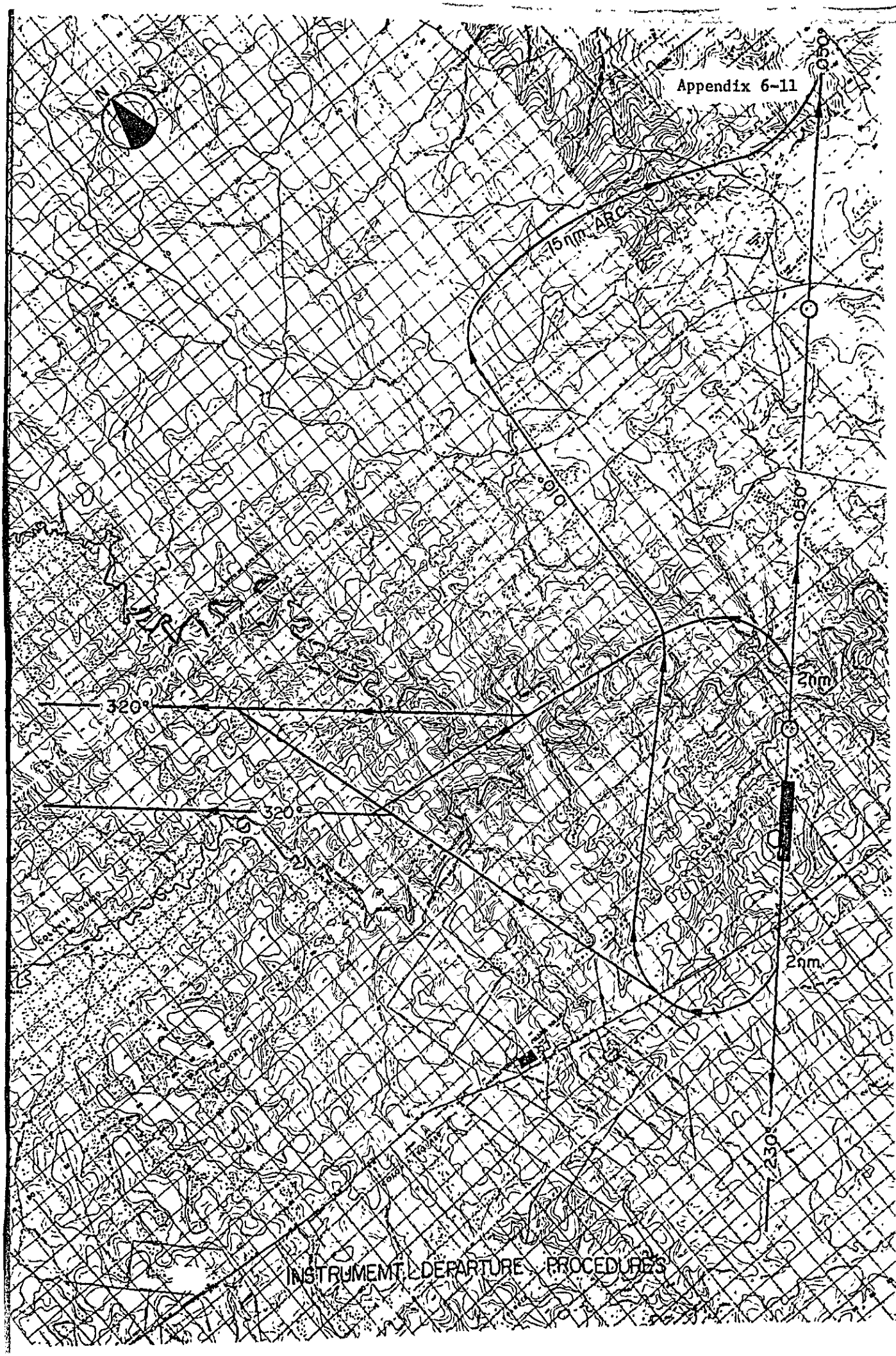


Missed Approach

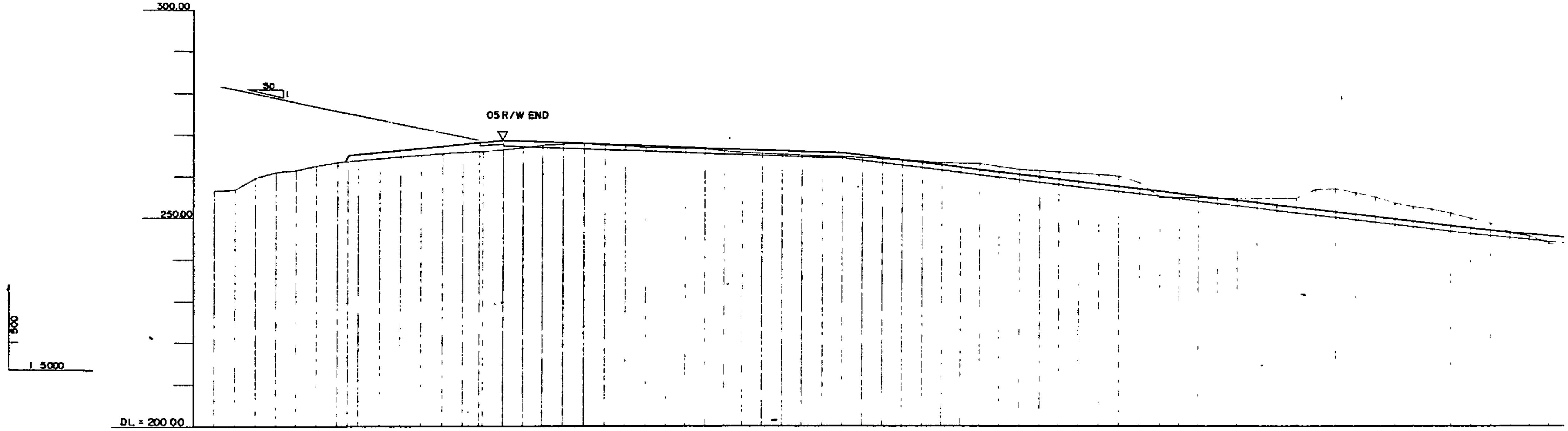
If no contact at 1.1 nm DME of VOR, turn left to intercept 360 radial of VOR: climbing to 3000 ft contact Tower.

ELV—880ft(estimated)

INSTRUMENT APPROACH PROCEDURES (VOR-2)


N
15 nm ARC
050°
090°
320°
320°
2nm
2nm
230°

APPENDIX 7



	1	2	3	4	5	6	7	8	9	10	11	12
GRADIENT								265 15				i=1.0% L=375.00
CUT, FILL									-1 40	-1 50	-1 50	-1 60
FORMATION HEIGHT								265 15	265 40	265 90	266 40	266 90
GROUND HEIGHT	256 5	256 8	259 6	261 0	261 4	262 6	263 5		264 0	264 4	264 9	265 3
ACCUMULATED DISTANCE					-500 00	-450 00	-400 00	-375 00	-350 00	-300 00	-250 00	-200 00
DISTANCE						-50 00	-25 00	-25 00	-50 00	-50 00	-50 00	-50 00
STATION					NO -5		NO. -4			NO -3		NO -2

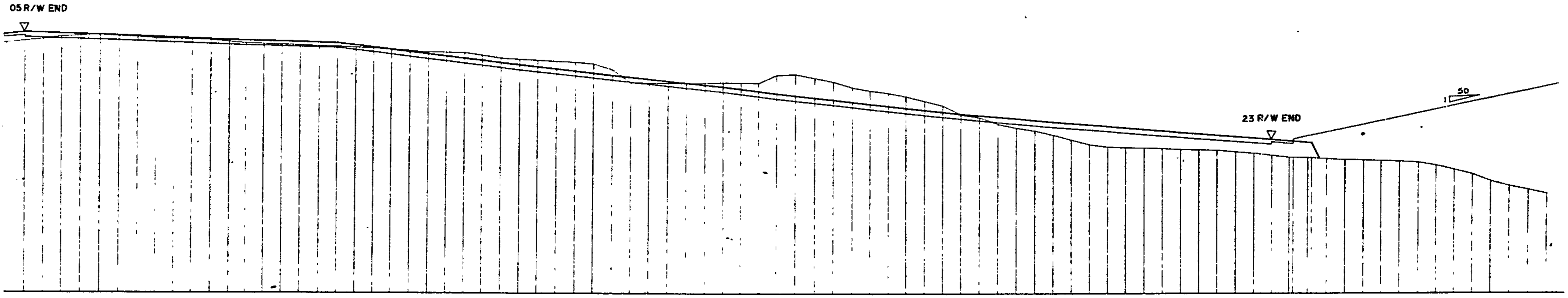
	13	14	15	16	17	18	19	20	21	22	23	24
GRADIENT				268 90								i=0.3% L=850.00
CUT, FILL	-1 60	-1 80	-2 10	-2 20	-1 55	-0 60	-0 25	+0 10	+0 05	±0 00	-0 35	-0 30
FORMATION HEIGHT	267 40	267 90	268 40	268 90	268 75	268 60	268 45	268 30	268 15	268 00	267 85	267 70
GROUND HEIGHT	265 8	266 1	266 3	266 7	267 2	268 0	268 2	268 4	268 2	268 0	267 5	267 4
ACCUMULATED DISTANCE	-150 00	-100 00	-60 00 / -50 00	0 00	50 00	100 00	150 00	200 00	250 00	300 00	350 00	400 00
DISTANCE	-50 00	-40 00	-10 00 / -50 00	0 00	50 00	50 00	50 00	50 00	50 00	50 00	50 00	50 00
STATION		NO -1		NO 0		NO 1		NO 2		NO 3		NO 4

	25	26	27	28	29	30	31	32	33	34	35	36
GRADIENT									266 35			
CUT, FILL	-0 15	-0 20	-0 45	-0 60	-0 65	-0 70	-0 75	-0 80	-0 85	-0 50	-0 15	+0 10
FORMATION HEIGHT	267 55	267 40	267 25	267 10	266 95	266 80	266 65	266 50	266 35	265 80	265 25	264 70
GROUND HEIGHT	267 4	267 2	266 8	266 5	266 3	266 1	265 9	265 7	265 5	265 3	265 1	264 8
ACCUMULATED DISTANCE	450 00	500 00	550 00	600 00	650 00	700 00	750 00	800 00	850 00	900 00	950 00	1000 00
DISTANCE	50 00	50 00	50 00	50 00	50 00	50 00	50 00	50 00	50 00	50 00	50 00	50 00
STATION		NO 5		NO 6		NO 7		NO 8		NO 9		NO 10

	37	38	39	40	41	42	43	44	45	46	47	48
GRADIENT												
CUT, FILL	+0 35	+0 40	+0 95	+1 40	+1 25	+1 30	+1 45	+1 80	+2 05	+2 40	+2 55	+1 40
FORMATION HEIGHT	264 15	263 60	263 05	262 50	261 95	261 40	260 85	260 30	259 75	259 20	258 65	258 10
GROUND HEIGHT	264 5	264 0	264 0	263 9	263 2	262 7	262 3	262 1	261 8	261 6	261 2	259 5
ACCUMULATED DISTANCE	1050 00	1100 00	1150 00	1200 00	1250 00	1300 00	1350 00	1400 00	1450 00	1500 00	1550 00	1600 00
DISTANCE	50 00	50 00	50 00	50 00	50 00	50 00	50 00	50 00	50 00	50 00	50 00	50 00
STATION		NO 11		NO 12		NO 13		NO 14		NO 15		NO 16

	49	50	51	52	53	54	55	56	57	58	59	60
GRADIENT		i=1.1% L=1700.00										
CUT, FILL	-1 55	-1 00	-0 45	+0 10	+0 65	+1 20	+1 75	+2 30	+4 95	+5 70	+5 35	+4 80
FORMATION HEIGHT	257 55	257 00	256 45	255 90	255 35	254 80	254 25	253 70	253 15	257 60	252 05	251 50
GROUND HEIGHT	256 0	256 0	256 0	256 0	256 0	256 0	256 0	256 0	258 1	258 3	257 4	256 3
ACCUMULATED DISTANCE	1650 00	1700 00	1750 00	1800 00	1850 00	1900 00	1950 00	2000 00	2050 00	2100 00	2150 00	2200 00
DISTANCE	50 00	50 00	50 00	50 00	50 00	50 00	50 00	50 00	50 00	50 00	50 00	50 00
STATION		NO 17		NO 18		NO 19		NO 20		NO 21		NO 22

	61	62	63	64	65	66	67	68	69
GRADIENT							247 65		
CUT, FILL	+3 95	+3 60	+3 45	+3 20	+2 35	+1 80	+0 85	-0 45	-1 85
FORMATION HEIGHT	250 95	250 40	249 85	249 30	248 75	248 20	247 65	247 25	246 85
GROUND HEIGHT	254 9	254 0	253 3	252 5	251 1	250 0	248 5	246 8	24[illegible] 0
ACCUMULATED DISTANCE	2250 00	2300 00	2350 00	2400 00	2450 00	2500 00	2550 00	2600 00	2650 00
DISTANCE	50 00	50 00	50 00	50 00	50 00	50 00	50 00	50 00	50 00
STATION		NO 23		NO 24		NO 25		NO 26	



	[illegible]	[illegible]	[illegible]	[illegible]	-50 00	-50 00
NO 0	268 90	-2 20	268 90	266 7	0 00	0 00
		-1 55	268 75	267 2	50 00	50 00
NO 1		-0 60	268 60	268 0	100 00	50 00
		-0 25	268 45	268 2	150 00	50 00
NO 2		+0 10	268 30	268 4	200 00	50 00
		+0 05	268 15	268 2	250 00	50 00
NO 3		±0 00	268 00	268 0	300 00	50 00
		-0 35	267 85	267 5	350 00	50 00
NO 4	i = 0 3 % L = 850 00	-0 30	267 70	267 4	400 00	50 00
		-0 15	267 55	267 4	450 00	50 00
NO 5		-0 20	267 40	267 2	500 00	50 00
		-0 45	267.25	266.8	550.00	50 00
NO 6		-0 60	267 10	266 5	600 00	50 00
		-0 65	266 95	266 3	650 00	50 00
NO 7		-0 70	266 80	266 1	700 00	50 00
		-0 75	266 65	265 9	750 00	50 00
NO 8		-0 80	266 50	265 7	800 00	50 00
	266 35	-0 85	266 35	265 5	850 00	50 00
NO 9		-0 50	265 80	265 3	900 00	50 00
		-0 15	265 25	265 1	950 00	50 00
NO 10		+0 10	264 70	264 8	1000 00	50 00
		+0 35	264 15	264 5	1050 00	50 00
NO 11		+0 40	263 60	264 0	1100 00	50 00
		+0 95	263 05	264 0	1150 00	50 00
NO 12		+1 40	262 50	263 9	1200 00	50 00
		+1 25	261 95	263 2	1250 00	50 00
NO 13		+1 30	261 40	262 7	1300 00	50 00
		+1 45	260 85	262 3	1350 00	50 00
NO 14		+1 80	260 30	262 1	1400 00	50 00
		+2 05	259 75	261 8	1450 00	50 00
NO 15		+2 40	259 20	261 6	1500 00	50 00
		+2 55	258 65	261 2	1550 00	50 00
NO 16		+1 40	258 10	259 5	1600 00	50 00
	i = 1 1 % L = 1700 00	-1 55	257 55	256 0	1650 00	50 00
NO 17		-1 00	257 00	256 0	1700 00	50 00
		-0 45	256 45	256 0	1750 00	50 00
NO 18		+0 10	255 90	256 0	1800 00	50 00
		+0 65	255.35	256 0	1850 00	50 00
NO 19		+1 20	254 80	256 0	1900 00	50.00
		+1 75	254 25	256 0	1950 00	50 00
NO 20		+2 30	253 70	256 0	2000 00	50 00
		+4 95	253 15	258 1	2050 00	50 00
NO 21		+5 70	252 60	258 3	2100 00	50 00
		+5 35	252 05	257 4	2150 00	50 00
NO 22		+4 80	251 50	256 3	2200 00	50 00
		+3 95	250 95	254 9	2250 00	50 00
NO 23		+3 60	250 40	254 0	2300 00	50 00
		+3 45	249 85	253 3	2350 00	50 00
NO 24		+3 20	249 30	252 5	2400 00	50 00
		+2 35	248 75	251 1	2450 00	50 00
NO 25		+1 80	248 20	250 0	2500 00	50 00
	247 65	+0 85	247 65	248 5	2550 00	50 00
NO 26		-0 45	247 25	246 8	2600 00	50 00
		-1 85	246 85	245 0	2650 00	50 00
NO 27		-2 35	246 45	244 1	2700 00	50 00
		-2 75	246 05	243 3	2750 00	50 00
NO 28		-3 55	245 65	242 1	2800 00	50 00
		-4 35	245 25	240 9	2850 00	50 00
NO 29		-5 35	244 85	239 5	2900 00	50 00
		-5 55	244 45	238 9	2950 00	50 00
NO 30	i = 0 8 % L = 850.00	-5 35	244 05	238 7	3000 00	50 00
		-5 05	243 65	238 6	3050 00	50 00
NO 31		-4 85	243 25	238 4	3100 00	50 00
		-4 65	242 85	238 2	3150 00	50 00
NO 32		-4 35	242 45	238 1	3200 00	50 00
		-4 15	242 05	237 9	3250 00	50 00
NO 33		-4 15	241 65	237 5	3300 00	50 00
		-4 15	241 25	237 1	3350 00	50.00
NO 34		-4 35	240 85	236 5	3400 00	50 00
		-4 45	240 45	236 0	3450 00 3460 00	50 00 10 00
NO 35	239 97	-4 15	240 05 239 97	235 9	3500 00 3510 00	40 00 10 00
				235 7	3550 00	40 00
NO 36				235 5	3600 00	50 00
				235 3	3650 00	50 00
NO 37				235 2	3700 00	50 00
				235 1	3750 00	50 00
NO 38				234 7	3800 00	50 00
				233 9	3850 00	50 00
NO 39				232 8	3900 00	50 00
				231 5	3950 00	50 00
NO 40				229 9	4000 00	50 00
				228 7	4050 00	50 00
NO 41				227 6	4100 00	50 00
				226 8	4150 00	50 00

REPUBLICA DEL PARAGUAY

ADMINISTRACION NACIONAL DE AEROPUERTOS CIVILES

NEW CPS AIRPORT DEVELOPMENT

RUNWAY PROFILE

FEB 1980

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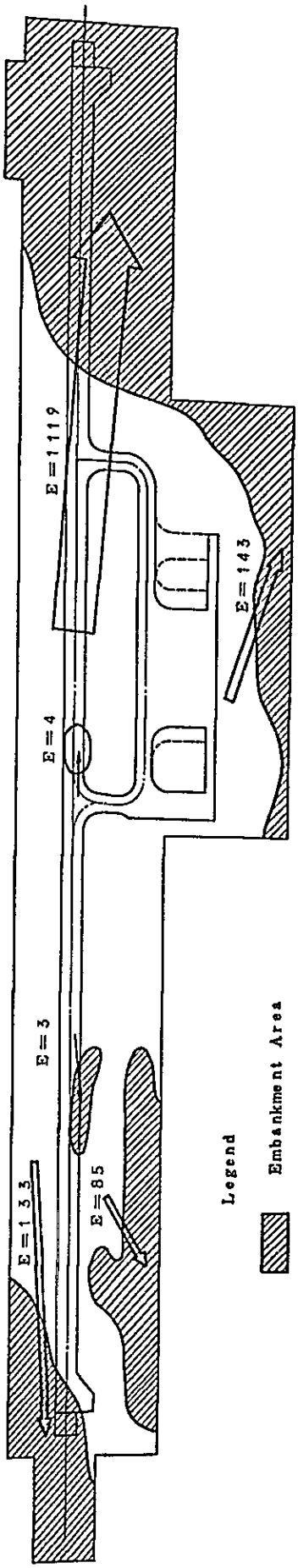
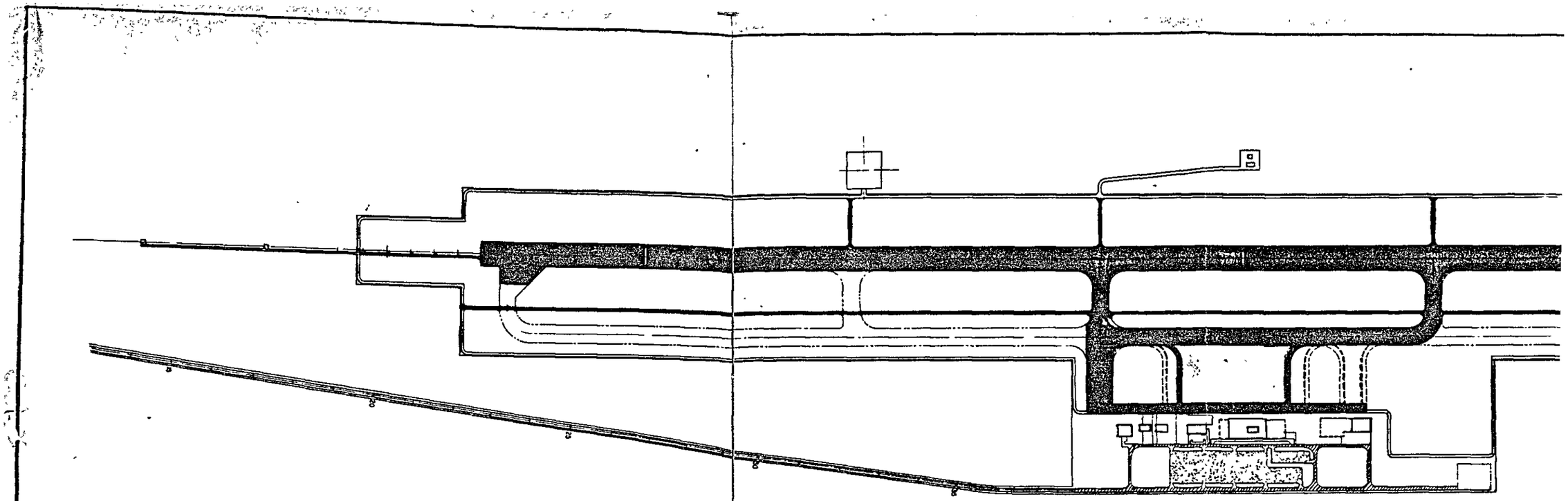
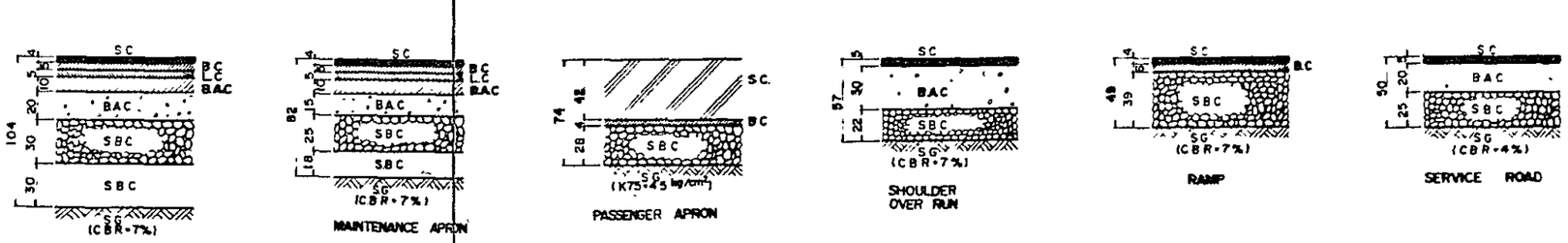
JAPAN INTERNATIONAL COOPERATION AGENCY



DISTRIBUTION DIAGRAM OF EARTHWORK

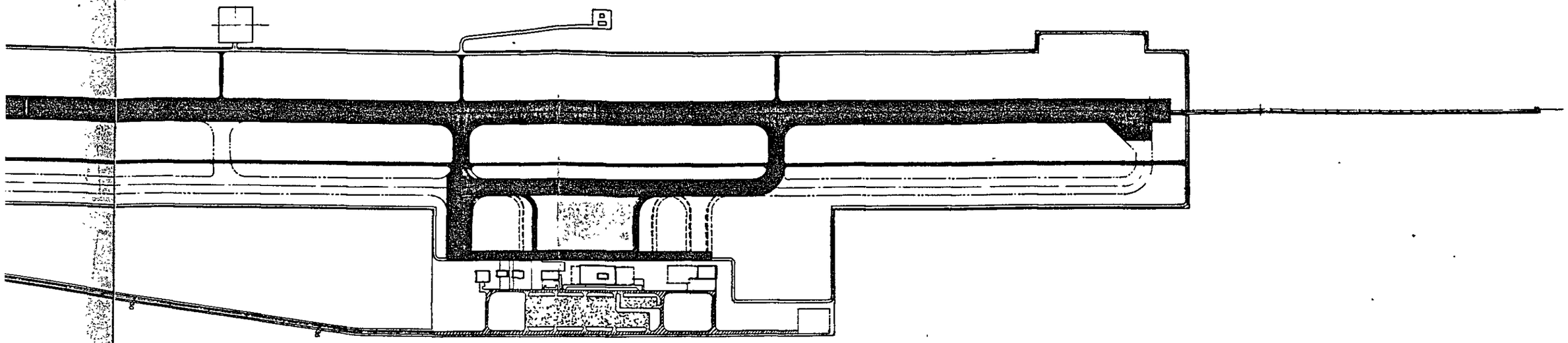


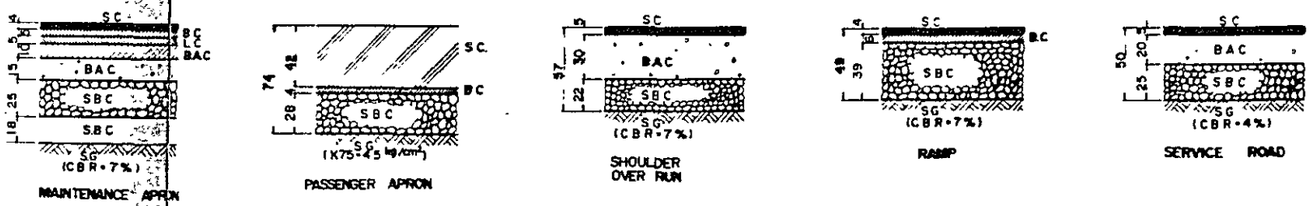


STRUCTURAL PAVEMENT SECTION

LEGEND

- SC SURFACE COURSE (ASPHALT CONCRETE)
- SC SURFACE COURSE (CEMENT CONCRETE)
- BC BINDER COUSE (ASPHALT CONCRETE)
- LC LEVELING COURSE (ASPHALT CONCRETE)
- BAC BASE COURSE (BITUMINOUS STABILIZATION)
- BAC BASE COURSE (CRUSHED STONE FOR MECHANICAL STABILIZATION)
- SBC SUBBASE COURSE (CRUSHER RUN)
- SBC SUBBASE COURSE (SAND)
- SG SUBGRADE





STRUCTURAL PAVEMENT SECTION

LEGEND

- SC SURFACE COURSE (ASPHALT CONCRETE)
- SC SURFACE COURSE (CEMENT CONCRETE)
- BC BINDER COUSE (ASPHALT CONCRETE)
- LC LEVELING COURSE (ASPHALT CONCRETE)
- BAC BASE COURSE (BITUMINOUS STABILIZATION)
- BAC BASE COURSE (CRUSHED STONE FOR MECHANICAL STABILIZATION)
- SBC SUBBASE COURSE (CRUSHER RUN)
- SBC SUBBASE COURSE (SAND)
- SG SUBGRADE

LEGEND

- AIRFIELD PAVEMENT (ASPHALT CONCRETE)
- " (CEMENT CONCRETE)
- PARKING LOT
- SERVICE ROAD (CEMENT CONCRETE)
- SERVICE ROAD (ASPHALT CONCRETE)
- INNER ROAD

GRAPHIC SCALE

0 100 200 300 400 500m

1 5 000

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PAVEMENTS	FEB 1980 8
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