SOCIALIST REPUBLIC

OF

THE UNION OF BURMA

RANGOON INTERNATIONAL AIRPORT DEVELOPMENT

FEASIBILITY STUDY REPORT

APPENDIX

MARCH 1980

JAPAN INTERNATIONAL COOPERATION AGENCY

SOCIALIST REPUBLIC
OF
THE UNION OF BURMA

RANGOON INTERNATIONAL AIRPORT DEVELOPMENT FEASIBILITY STUDY REPORT

APPENDIX

MARCH 1980

JAPAN INTERNATIONAL COOPERATION AGENCY

LIST OF APPENDICES

APPENDIX 1A

SCOPE OF WORK

SCOPE OF WORK
ON
THE FEASIBILITY STUDY OF
THE RANGOON INTERNATIONAL AIRPORT DEVELOPMENT PROJECT
IN
THE SOCIALIST REPUBLIC OF THE UNION OF BURMA

AGREED

BETWEEN

JAPAN INTERNATIONAL COOPERATION AGENCY

AND

MINISTRY OF TRANSPORT AND COMMUNICATION

I. INTRODUCTION

In response to the request of the Government of the Socialist Republic of the Union of Burma, the Government of Japan in accordance with its laws and Regulations has decided to conduct a feasibility study of the Rangoon International Airport Development Project. The Japan International Cooperation Agency (hereinafter referred to as JICA) is the official agency responsible for the implementation of technical cooperation programs of the Government of Japan. It will carry out the study in close cooperation with the authorities concerned of the Government of the Socialist Republic of the Union of Burma.

II. OBJECTIVE OF THE STUDY

The objective of this study is to examine the technical and economic feasibility of the Rangoon International Airport Development Project in Rangoon so as to contribute to optimum planning of the Project.

III. OUTLINE OF THE STUDY

This feasibility study will consist of the following:

1) Collection of relevant data
2) Study and evaluation on the existing facilities
3) Air transport demand forecasts
4) Facility requirement analysis
5) Airport layout plan
6) Facility planning
7) Air navigation aids planning
8) Construction schedule and cost estimate
9) Economic analysis
10) Financial analysis
11) Social and other aspects

IV. REPORTS

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

1)	Inception Report	20 copies
2)	Progress Report	20 copies
3)	Draft Final Report	30 copies
4)	Final Report	50 copies

V. UNDERTAKING OF THE GOVERNMENT OF THE SOCIALIST REPUBLIC OF THE UNION OF BURMA

1) To provide the study team with all available data and information necessary for the proper execution of the study,
2) To ensure that such documents are allowed to be taken out of the country.
3) To exempt from the taxes and duties on the meterials, equipments and personal effects of the study team on entry into and departure out of Burma.
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 available equipments for their activities in the country, such as vehicles etc.

VI. TIME SCHEDULE

JICA will conduct the study on the following time schedule. This time schedule is subject to change according to circumstances.

	'79 SEPT	OCT	NOV	DEC	'80 JAN	FEB	MAR
Execution Study							
Submission of							
Inception Report		◎					
Progress Report			◎				
Draft Final Report					◎		
Final Report							◎

Notes: ——— indicates Home work in Japan

═══ indicates Field work in Burma

◎ indicates the submission of Report

APPENDIX 2A

ECONOMIC AND TRANSPORT DATA

Table 2A-1 ESTIMATES ON POPULATION GROWTH (1960/61 to 1978/79)

Year	Total Population (Thousand) Mid Fiscal Year (past)	Mid Fiscal Year (current)	Annual Growth Rate
1960/61	22200		
1961/62	22688		2.20
1962/63	23187		2.20
1963/64	23697		2.20
1964/65	24218		2.20
1965/66	24751		2.20
1966/67	25303		2.23
1967/68	25867		2.23
1968/69	26444		2.23
1969/70	27034		2.23
1970/71	27637		2.23
1971/72	28262		2.26
1972/73	28886		2.21
1973/74	29521		2.20
1974/75	30170	29846	2.20
1975/76	30834	30502	2.20
1976/77	31512	31173	2.20
1977/78	32206	31859	2.20
1978/79		32573	2.24

Source: Report to the Pyithu Hluttaw, 1979/80

Note : Past fiscal year --- October to end of September
Current fiscal year --- April to end of March

Table 2A-2 COMPOSITION OF ESTIMATED ACTIVE LABOUR FORCE OF WORKERS AND PEASANTS ENGAGED IN THE VARIOUS SECTORS DURING 1978/79

(In thousand)

Sector	State Sector	Co-operative and Private Sectors	Total
Agriculture	66	8294	8360
Livestock and Fishery	9	162	171
Forestry	85	81	166
Mining	66	2	68
Processing and Manufacturing	169	799	968
Power	15		15
Construction	127	62	189
Transport and Communications	107	323	430
Social Services	188	74	262
Administration	474	24	498
Trade	57	1182	1239
Workers n.e.s.		569	569
Total	1363	11572	12935

Source: ditto

Table 2A-3 GROSS DOMESTIC PRODUCT (AT 1969/70 CONSTANT PRODUCER'S PRICES)

Year	Gross Domestic Product (in lakhs Kyat)
1961/62	77976
1967/68	91999
1968/69	95028
1969/70	99757
1970/71	103881
1971/72	106407
1972/73	105377
1973/74	108117
1974/75	111011
1975/76	115617
1976/77	122653
1977/78	129995
1978/79	138701

Source: ditto

Table 2A-4 INTERNAL AND EXTERNAL TRANSPORTATION OF PASSENGERS AND FREIGHT BY MEANS OF STATE-OWNED CONVEYANCES

Year	Rail		Road		Inland Water		Overseas Coastal		Internal Flight		External Flight		Total	
	Passenger	Freight	Passenger	Freight	Passenger	Freight	Passenger	Freight	Passenger	Freight	Passenger	Freight	Passenger	Freight
1961/62	43078	2938	-	-	5260	1283	13	527	133	2.9	34	0.3	48518	4751.2
1967/68	55174	2790	164084	2292	10979	1848	21	331	277	6.2	20	0.3	232529	7267.5
1968/69	54555	2940	201613	2245	10324	1802	26	638	313	6.5	23	0.3	271160	7631.8
1969/70	52266	2685	241044	2116	10594	1762	15	721	334	6.7	45	0.5	308961	7291.2
1970/71	53586	2819	226501	2000	10716	2016	18	906	368	7.2	40	0.8	296407	7749.0
1971/72	53389	2925	302291	1844	9834	2162	29	834	399	6.5	50	0.9	374513	7772.4
1972/73	55060	2486	207892	1568	9650	1888	27	671	409	5.9	55	1.0	284293	6619.9
1973/74	48570	1494	173869	1204	9140	1679	23	434	404	3.7	54	1.1	242527	4815.8
1974/75	51036	1560	146682	1088	9402	1698	26	533	371	3.5	51	1.0	217828	4883.5
1975/76	49055	1620	150959	1124	11153	1746	22	469	399	3.9	43	0.6	224644	4963.5
1976/77	32053	1675	180721	1042	11961	912	24	516	409	4.4	43	0.5	236310	4149.9
1977/78	34469	1831	199003	1006	11691	1037	22	555	536	5.0	46	0.4	256867	4434.4
1978/79	44455	1973	173312	1006	12393	1061	23	631	685	7.1	43	1.2	241711	4679.3
(%) 1978/79	18.39	42.16	71.70	21.50	5.13	22.67	0.01	13.48	0.28	0.15	0.2	0.13	100.0	100.0

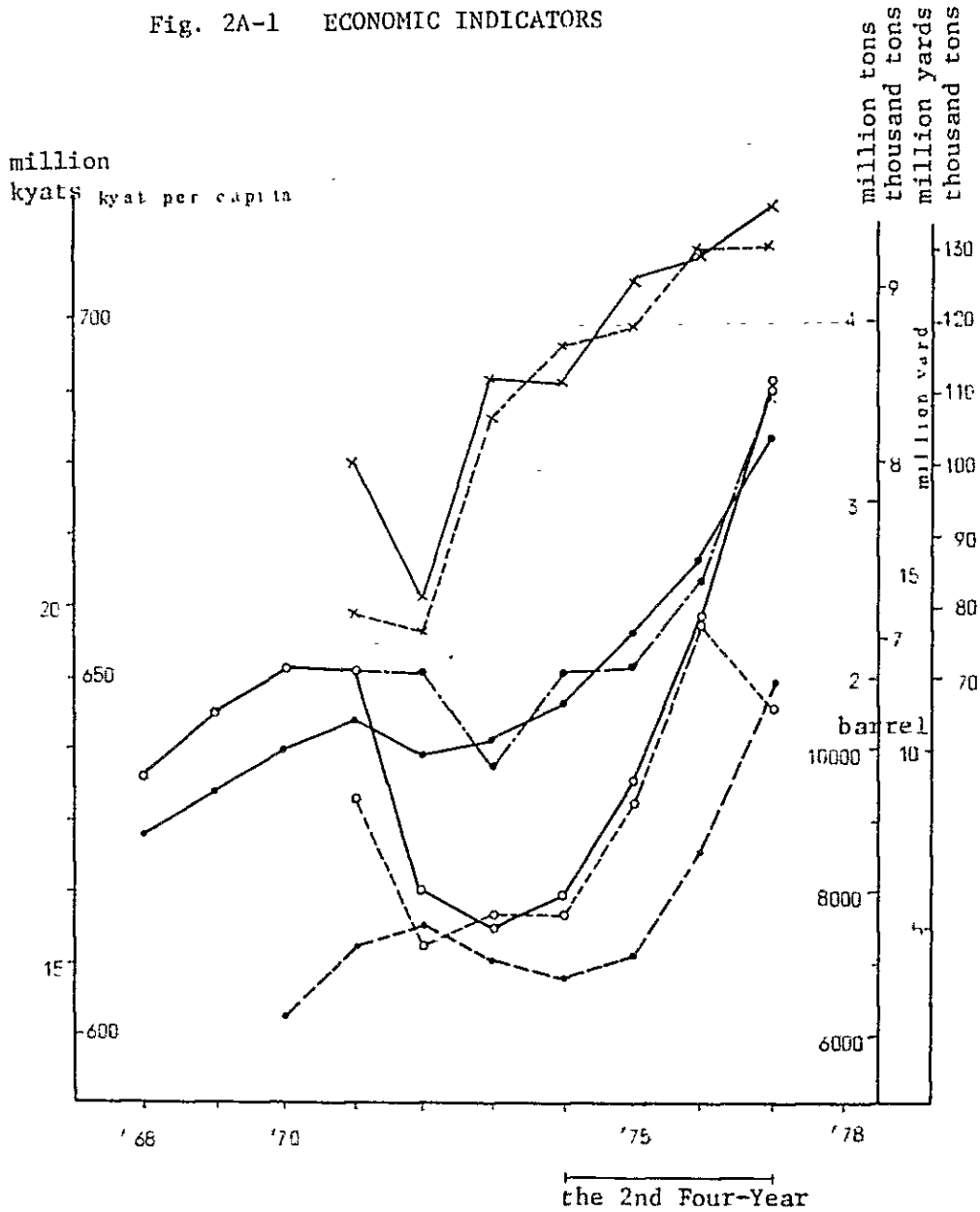
Source: Report to the Pyithu Hluttaw, 1979/80

Table 2A-5 CHANGES IN STATE CURRENT EXPENDITURE

Sector	1962/63	1976/77	1977/78	1978/79
	%	%	%	%
Agriculture	2.3	4.3	4.5	4.8
Livestock & Fishery	-	0.6	0.9	1.2
Forestry	6.5	3.2	3.7	3.9
Mining	4.1	3.1	3.2	3.3
Processing and Manufacturing	7.0	30.0	30.5	31.1
Power	2.0	0.7	0.7	0.8
Construction	1.2	3.4	3.8	3.9
Transport & Communications	7.3	5.6	5.0	5.8
Trade	44.6	26.6	26.3	23.5
Social Services	6.2	6.8	5.9	6.2
Financial Institutions	0.9	2.2	2.2	2.6
Administrative Organizations	17.9	12.8	12.1	12.1
Others	-	0.7	1.2	0.8
Total	100.0	100.0	100.0	100.0
Million Kyat	(34.1)	(127.8)	(161.8)	(176.0)

Source: Report to the Pyithu Hluttaw, 1979/80

Fig. 2A-1 ECONOMIC INDICATORS



GDP

GDP per capita

Rice (unhalted)

Crud Oil

Cotton Fabrics

Cement

Chemical Fertiliger

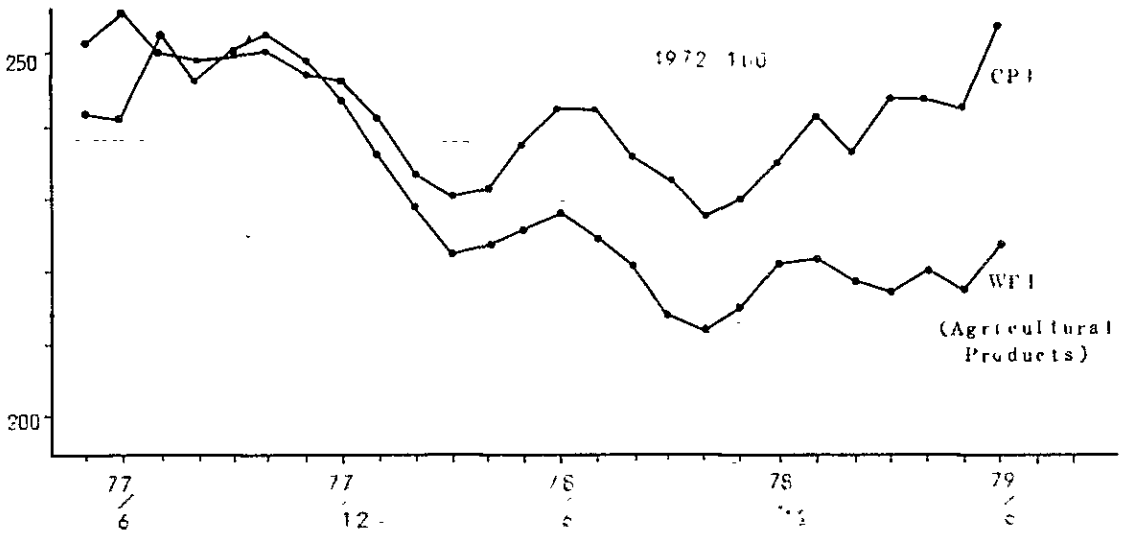
GDP Terget/Accemplishment

'74	6.3%	2.7%
'75	6.4	4.1
'76	6.9	5.9
'77	6.6	6.4

(The 3rd Four-Year Plan, Target 6.6%)

Source : Report to the Pyithu Hluttaw, 1979/80

Fig. 2A-2 PRICE



Source: SELECTED MONTHLY ECONOMIC INDICATORS MAY, JUNE 1979.

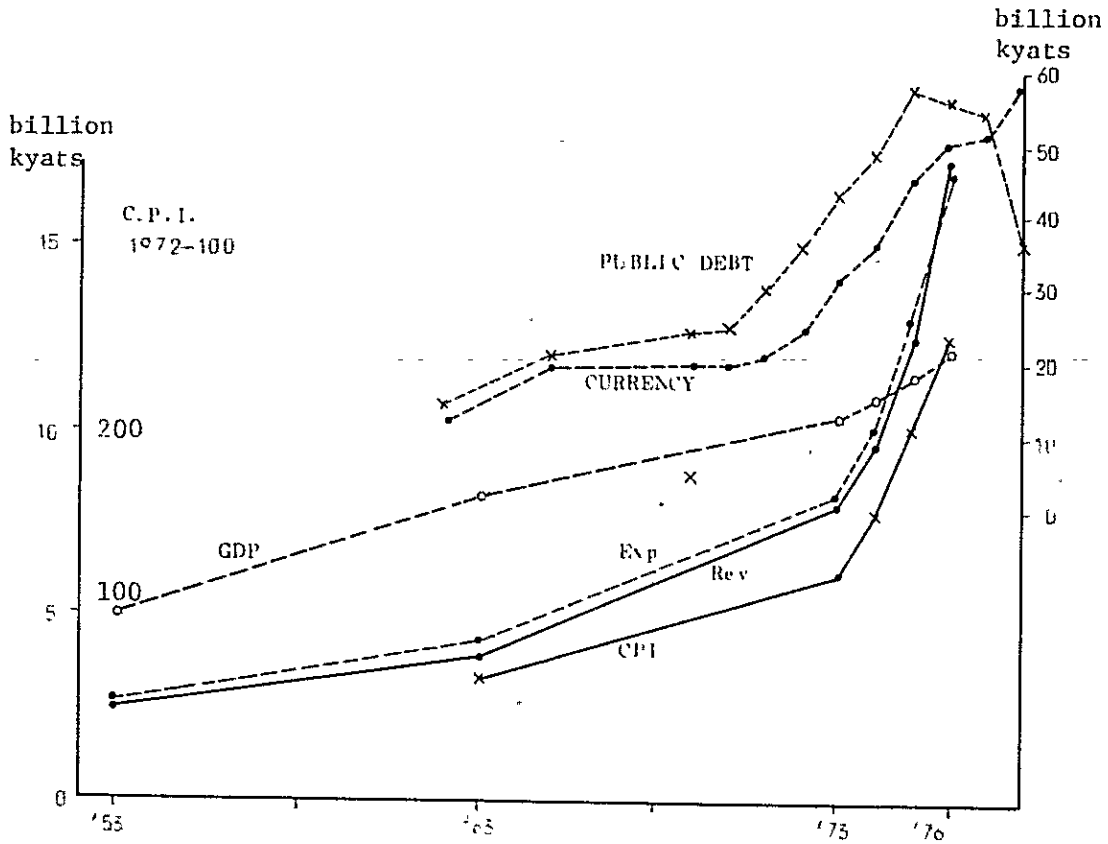
Note Purchase Price of Paddy (Ngasein Group, Ordinary) $\frac{1974/79}{1972/73} = \frac{900}{425} = 2.118$

As of June '79:-

	K/viss	K/Kg.
Fresh fish (Ngamyin)	40.70 (35.28)	24.97
" (Pazunkyaint)	16.50 (9.54)	10.12
Chicken	24.20 (23.73	14.85
Duck Egg	6.60 (5.33)	4.05
Sesamum Oil	24.21 (15.13)	14.85
Chillies (short)	43.21 (10.76)	26.51
Potatoes (big)	3.30 (3.02)	2.02
Tomatoes	5.00 (1.89)	3.07
Banana	2.80 (1.50)	1.72
Fresh Milk	6.00 (5.62)	3.68

Figures in ( ) present the lowest price during '77/May - '79/June.

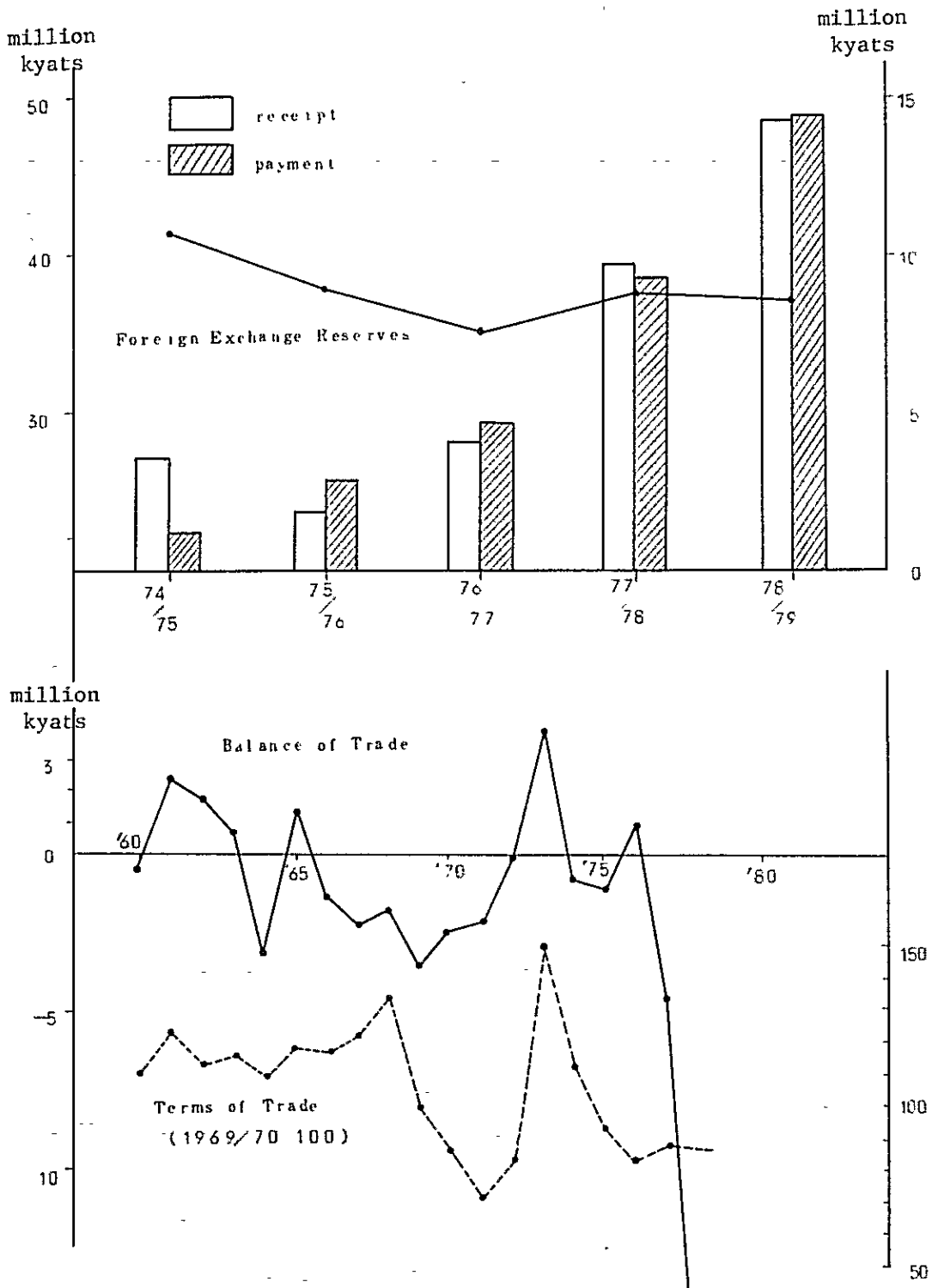
Fig. 2A-3 BUDGET AND FINANCE



GDP, at 1969/70 price, Internal Public Debt, Currency in Circuration } 30th/Sept.

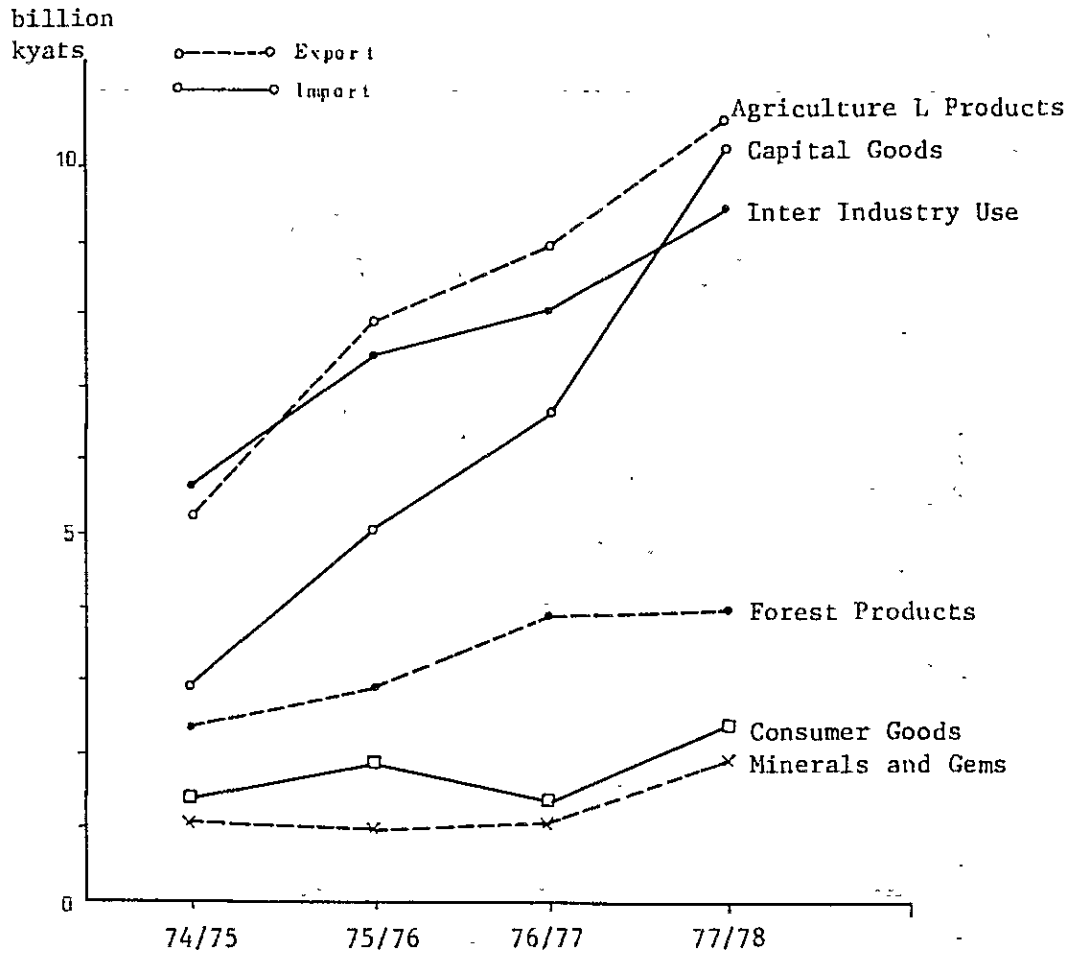
Source: Statiscal Abstract (1976)

Fig. 2A-4 BALANCE PAYMENT



Source : Report to the Pyithu Hluttaw, 1979/80.

Fig. 2A-5 FOREIGN TRADE



Source : Report to the Pyithu Hluttaw, (1979/80)

APPENDIX 3A

AIR TRAFFIC FORECAST DATA

Table 3A-1 PROJECTED INTERNATIONAL AIRCRAFT MOVEMENTS BY ROUTE AT RIA IN THE YEAR 1985 (CASE 1)

Route	Number of Passengers [1000]	Aircraft Movements														
		360-Seater Jet			250-Seater Jet			170-Seater Jet			120-Seater Jet			60-Seater Jet		
		Annual	Monthly	Weekly	Annual	Monthly	Weekly	Annual	Monthly	Weekly	Annual	Monthly	Weekly	Annual	Monthly	Weekly
RANGOON-ROME																
" -ATHENS																
" -BAGDAHD																
" -TEHRAN																
" -KARACHI	20	50	5	2	48	5	2									
" -DACCA	4													110	11	3
" -BOMBAY	18	47	5	2	45	5	2									
" -CALCUTTA	13							113	11	3						
" -DELHI	21	54	6	2	52	6	2									
" -BANGKOK	14							129	13	4						
" -SINGAPORE	25	63	7	2	61	7	2									
" -KUALA LUMPUR																
" -JAKARTA																
" -KUNMING	8										103	10	3			
" -VIENTIANE	8										99	10	3			
" -HONG KONG	24	63	7	2	60	6	2									
" -MANILA	8										107	11	3			
" -TOKYO	20	86	9	3												
Sub Total	183	363	39	13	266	29	10	242	24	7	309	31	9	110	11	3
Non-Scheduled	10				32	5	2	31	5	2						
TOTAL	193	363	39	13	298	34	12	273	29	9	309	31	9	110	11	3

Table 3A-2 PROJECTED INTERNATIONAL AIRCRAFT MOVEMENTS BY ROUTE AT RIA IN THE YEAR 1990 (CASE 1)

Route	Number of Passengers [1000]	Aircraft Movements														
		360-Seater Jet			250-Seater Jet			170-Seater Jet			120-Seater Jet			60-Seater Jet		
		Annual	Monthly	Weekly	Annual	Monthly	Weekly	Annual	Monthly	Weekly	Annual	Monthly	Weekly	Annual	Monthly	Weekly
RANGOON-ROME																
" -ATHENS																
" -BAGDAHD																
" -TEHRAN																
" -KARACHI	41	107	11	3	103	11	3									
" -DACCA	9													216	22	6
" -BOMBAY	39	100	10	3	96	10	3									
" -CALCUTTA	27							245	25	7						
" -DELHI	45	116	12	3	112	12	3									
" -BANGKOK	30				112	12	3	110	11	3						
" -SINGAPORE	61	169	17	5	131	14	4									
" -KUALA LUMPUR																
" -JAKALTA																
" -KUNMING	13										164	17	5			
" -VIENTIANE	12										149	15	4			
" -HONG KONG	58	162	17	5	125	13	4									
" -MINILA	19							104	11	3	98	10	3			
" -TOKYO	40	169	17	5												
Sub Total	394	823	84	24	679	72	20	459	47	13	411	42	12	216	22	6
Non-Scheduled	19				66	7	2	65	7	2						
TOTAL	413	823	84	24	745	79	22	524	54	15	411	42	12	216	22	6

Table 3A-3 PROJECTED INTERNATIONAL AIRCRAFT MOVEMENTS BY ROUTE AT RIA IN THE YEAR 1995 (CASE 1)

Route	Number of Passengers [1000]	Aircraft Movements														
		360-Seater Jet			250-Seater Jet			170-Seater Jet			120-Seater Jet			60-Seater Jet		
		Annual	Monthly	Weekly	Annual	Monthly	Weekly	Annual	Monthly	Weekly	Annual	Monthly	Weekly	Annual	Monthly	Weekly
RANGOON-ROME																
" -ATHENS																
" -BAGDAHD																
" -TEHRAN	39	167	17	5												
" -KARACHI	58	161	17	5	125	13	4									
" -DACCA	16							85	9	3	80	8	2			
" -BOMBAY	53	147	15	4	114	12	3									
" -CALCUTTA	36				135	14	4	132	14	4						
" -DELHI	63	176	18	5	137	14	4									
" -BANGKOK	54	150	15	4	117	12	3									
" -SINGAPORE	110	305	31	8	237	24	6									
" -KUALA LUMPUR	15							82	9	3	78	8	2			
" -JAKARTA																
" -KUNMING	21							112	12	3	106	11	3			
" -VIENTIANE	17							94	10	3	89	9	3			
" -HONG KONG	105	293	30	8	227	23	6									
" -MANILA	35				131	14	4	128	13	4						
" -TOKYO	69	295	30	8												
Sub Total	691	1694	113	47	1223	126	34	633	67	20	353	36	10			
Non-Scheduled	36	80	12	3	77	11	3									
TOTAL	727	1774	185	50	1300	137	37	633	67	20	353	36	10			

Table 3A-4 PROJECTED INTERNATIONAL AIRCRAFT MOVEMENTS BY ROUTE AT RIA IN THE YEAR 2000 (CASE 1)

Route	Number of Passengers [1000]	Aircraft Movements														
		360-Seater Jet			250-Seater Jet			170-Seater Jet			120-Seater Jet			60-Seater Jet		
		Annual	Monthly	Weekly	Annual	Monthly	Weekly	Annual	Monthly	Weekly	Annual	Monthly	Weekly	Annual	Monthly	Weekly
RANGOON-ROME																
" -ATHENS																
" -BAGDAHD	35	150	15	4												
" -TEHRAN	44	189	19	5												
" -KARACHI	87	242	25	7	188	19	5									
" -DACCA	25							136	14	4	128	13	4			
" -BOMBAY	79	220	22	6	170	17	5									
" -CALCUTTA	59	152	16	4	145	15	4									
" -DELHI	92	257	26	7	200	20	5									
" -BANGKOK	88	244	25	7	190	19	5									
" -SINGAPORE	167	465	47	12	361	37	10									
" -KUALA LUMPUR	23							122	13	4	101	11	3			
" -JAKARTA	13							67	7	2	64	7	2			
" -KUNMING	33				131	14	4	104	11	3						
" -VIENTIANE	26							235	24	6	133	14	4			
" -HONG KONG	166	460	46	12	357	36	9									
" -MANILA	56	156	16	4	121	13	4									
" -TOKYO	116	495	50	13												
Sub Total	1109	3030	271	81	1863	190	51	664	69	19	426	45	13			
Non-Scheduled	59	133	14	4	127	13	4									
TOTAL	1168	3163	291	85	1990	203	55	664	69	19	426	45	13			

Table 3A-5 PROJECTED INTERNATIONAL AIRCRAFT MOVEMENTS BY ROUTE AT RIA IN THE YEAR 2005 (CASE 1)

Route	Number of Passengers [1000]	Aircraft Movements														
		360-Seater Jet			250-Seater Jet			170-Seater Jet			120-Seater Jet			60-Seater Jet		
		Annual	Monthly	Weekly	Annual	Monthly	Weekly	Annual	Monthly	Weekly	Annual	Monthly	Weekly	Annual	Monthly	Weekly
RANGOON-ROME																
" -ATHENS																
" -BAGDAHD	51	218	22	6												
" -TEHRAN	61	261	27	7												
" -KARACHI	129	360	36	9	279	28	7									
" -DACCA	37				139	14	4	136	14	4						
" -BOMBAY	117	326	33	9	253	26	7									
" -CALCUTTA	89	249	25	7	193	20	5									
" -DELHI	145	404	41	11	313	32	8									
" -BANGKOK	132	367	37	10	285	29	8									
" -SINGAPORE	261	725	73	19	563	57	15									
" -KUALA LUMPUR	30							161	17	5	152	16	4			
" -JAKARTA	19							101	11	3	96	10	3			
" -KUNMING	52	146	15	4	113	12	3									
" -VIENTIANE	39				144	15	4	142	15	4						
" -HONG KONG	251	697	70	18	541	55	19									
" -MANILA	87	241	25	7	187	19	5									
" -TOKYO	175	746	75	19												
Sub Total	1675	4740	419	126	3010	307	85	540	57	16	248	26	7			
Non-Scheduled	89	199	29	8	191	28	7									
TOTAL	1764	4939	508	134	3201	335	92	540	57	16	248	26	7			

Table 3A-6 PROJECTED INTERNATIONAL AIRCRAFT MOVEMENTS BY ROUTE AT RIA IN THE YEAR 1985 (CASE 2)

Route	Number of Passengers [1000]	Aircraft Movements														
		360-Seater Jet			250-Seater Jet			170-Seater Jet			120-Seater Jet			60-Seater Jet		
		Annual	Monthly	Weekly	Annual	Monthly	Weekly	Annual	Monthly	Weekly	Annual	Monthly	Weekly	Annual	Monthly	Weekly
RANGOON-ROME																
" -ATHENS																
" -BAGDAHD																
" -TEHRAN																
" -KARACHI	20	50	5	2	48	5	2									
" -DACCA	4													110	11	3
" -BOMBAY	18	47	5	2	45	5	2									
" -CALCUTTA	13							113	11	3						
" -DELHI	21	54	6	2	52	6	2									
" -BANGKOK	14							129	13	4						
" -SINGAPORE	25	63	7	2	61	7	2									
" -KUALA LUMPUR																
" -JAKARTA																
" -KUNNING	8										103	10	3			
" -VIENTIANE	8										99	10	3			
" -HONG KONG	24	63	7	2	60	6	2									
" -MANILA	8										107	11	3			
" -TOKYO	20	86	9	3												
Sub Total	183	363	39	13	266	29	10	242	24	7	309	31	9	110	11	3
Non-Scheduled	10				32	5	2	31	5	2						
TOTAL	193	363	39	13	298	34	12	273	29	9	309	31	9	110	11	3

Table 3A-7 PROJECTED INTERNATIONAL AIRCRAFT MOVEMENTS BY ROUTE AT RIA IN THE YEAR 1990 (CASE 2)

Route	Number of Passengers (1000)	Aircraft Movements														
		360-Seater Jet			250-Seater Jet			170-Seater Jet			120-Seater Jet			60-Seater Jet		
		Annual	Monthly	Weekly	Annual	Monthly	Weekly	Annual	Monthly	Weekly	Annual	Monthly	Weekly	Annual	Monthly	Weekly
RANGOON-ROME																
" -ATHENS																
" -BAGDAHD																
" -TEHRAN																
" -KARACHI	41	107	11	3	103	11	3									
" -DACCA	9													216	22	6
" -BOMBAY	39	100	10	3	96	10	3									
" -CALCUTTA	27							245	25	7						
" -DELHI	45	116	12	3	112	12	3									
" -BANGKOK	30				112	12	3	110	11	3						
" -SINGAPORE	61	169	17	5	131	14	4									
" -KUALA LUMPUR																
" -JAKARTA																
" -KUNMING	13										164	17	5			
" -VIENTIANE	12										149	15	4			
" -HONG KONG	58	162	17	5	125	13	4									
" -MANILA	19							104	11	3	98	10	3			
" -TOKYO	40	169	17	5												
Sub Total	394	823	84	24	679	72	20	459	47	13	411	42	12	216	22	6
Non-Scheduled	19				66	7	2	65	7	2						
TOTAL	413	823	84	24	745	79	22	524	54	15	411	42	12	216	22	6

Table 3A-8 PROJECTED INTERNATIONAL AIRCRAFT MOVEMENTS BY ROUTE AT RIA IN THE YEAR 1995 (CASE 2)

Route	Number of Passengers [1000]	Aircraft Movements														
		360-Seater Jet			250-Seater Jet			170-Seater Jet			120-Seater Jet			60-Seater Jet		
		Annual	Monthly	Weekly	Annual	Monthly	Weekly	Annual	Monthly	Weekly	Annual	Monthly	Weekly	Annual	Monthly	Weekly
RANGOON-ROME																
" -ATHENS	22	95	10	3												
" -BAGDAHD																
" -TEHRAN	28	120	12	3												
" -KARACHI	58	161	17	5	125	13	4									
" -DACCA	16							85	9	3	80	8	2			
" -BOMBAY	53	147	15	4	114	12	3									
" -CALCUTTA	36				135	14	4	132	14	4						
" -DELHI	63	176	18	5	137	14	4									
" -BANGKOK	54	150	15	4	117	12	3									
" -SINGAPORE	110	305	31	8	237	24	6									
" -KUALA LUMPUR	15							82	9	3	78	8	2			
" -JAKARTA																
" -KUNMING	21							112	12	3	106	11	3			
" -VIENTIANE	17							94	10	3	89	9	3			
" -HONG KONG	105	293	30	8	227	23	6									
" -MANILA	35				131	14	4	128	13	4						
" -TOKYO	69	295	30	8												
Sub Total	702	1742	178	48	1223	126	34	633	67	20	353	36	10			
Non-Scheduled	36	80	12	3	77	11	3									
TOTAL	738	1822	190	51	1300	137	37	633	67	20	353	36	10			

Table 3A-9 PROJECTED INTERNATIONAL AIRCRAFT MOVEMENTS BY ROUTE AT RIA IN THE YEAR 2000 (CASE 2)

Route	Number of Passengers [1000]	Aircraft Movements														
		360-Seater Jet			250-Seater Jet			170-Seater Jet			120-Seater Jet			60-Seater Jet		
		Annual	Monthly	Weekly	Annual	Monthly	Weekly	Annual	Monthly	Weekly	Annual	Monthly	Weekly	Annual	Monthly	Weekly
RANGOON-ROME	23	97	10	3												
" -ATHENS	25	109	11	3												
" -BAGDAHD	23	99	10	3												
" -TEHRAN	32	136	14	4												
" -KARACHI	87	242	25	7	188	19	5									
" -DACCA	25							136	14	4	128	13	4			
" -BOMBAY	79	220	22	6	170	17	5									
" -CALCUTTA	59	152	16	4	145	15	4									
" -DELHI	92	257	26	7	200	20	5									
" -BANGKOK	88	244	25	7	190	19	5									
" -SINGAPORE	167	465	47	12	361	37	10									
" -KUALA LUMPUR	23							122	13	4	101	11	3			
" -JAKARTA	13							67	7	2	64	7	2			
" -KUNMING	33				131	14	4	104	11	3						
" -VIENTIANE	26							235	24	6	133	14	4			
" -HONG KONG	166	460	46	12	357	36	9									
" -MANILA	56	156	16	4	121	13	4									
" -TOKYO	116	495	50	13												
Sub Total	1133	3132	318	85	1863	190	51	664	69	19	426	45	13			
Non-Scheduled	59	133	14	4	127	13	4									
TOTAL	1192	3265	332	89	1990	203	55	664	69	19	426	45	13			

Table 3A-10 PROJECTED INTERNATIONAL AIRCRAFT MOVEMENTS BY ROUTE AT RIA IN THE YEAR 2005 (CASE 2)

Route	Number of Passengers [1000]	Aircraft Movements														
		360-Seater Jet			250-Seater Jet			170-Seater Jet			120-Seater Jet			60-Seater Jet		
		Annual	Monthly	Weekly	Annual	Monthly	Weekly	Annual	Monthly	Weekly	Annual	Monthly	Weekly	Annual	Monthly	Weekly
RANGOON-ROME	43	183	19	5												
" -ATHENS	42	182	19	5												
" -BAGDAHD	31	134	14	4												
" -TEHRAN	41	174	18	5												
" -KARACHI	129	360	36	9	279	28	7									
" -DACCA	37				139	14	4	136	14	4						
" -BOMBAY	117	326	33	9	253	26	7									
" -CALCUTTA	89	249	25	7	193	20	5									
" -DELHI	145	404	41	11	313	32	8									
" -BANGKOK	132	367	37	10	285	29	8									
" -SINGAPORE	261	725	73	19	563	57	15									
" -KUALA LUMPUR	30							161	17	5	152	16	4			
" -JAKARTA	19							101	11	3	96	10	3			
" -KUNMING	52	146	15	4	113	12	3									
" -VIENTIANE	39				144	15	4	142	15	4						
" -HONG KONG	251	697	70	18	541	55	19									
" -MANILA	87	241	25	7	187	19	5									
" -TOKYO	175	746	75	19												
Sub Total	1720	4934	500	132	3010	307	85	540	57	16	248	26	7			
Non-Scheduled	89	199	29	8	191	28	7									
TOTAL	1809	5133	529	140	3201	335	92	540	57	16	248	26	7			

Table 3A-11 PROJECTED DOMESTIC AIRCRAFT MOVEMENTS BY ROUTE AT RIA IN THE YEAR 1985

Route	Number of Passengers [1000]	Aircraft Movements											
		120-Seater Jet			60-Seater Jet			40-Seater Non-Jet			20-Seater Non-Jet		
		Annual	Monthly	Daily	Annual	Monthly	Daily	Annual	Monthly	Daily	Annual	Monthly	Daily
300	64				1524	139	5						
400	78				1858	169	6						
500	12										858	78	3
600	87				2072	189	7						
700	94				2239	204	7						
800	62				1477	135	5						
Sub Total	396				9170	836	30				858	78	3
Non-Scheduled	31							1550	155	6			
TOTAL	427				9170	836	30	1550	155	6	858	78	3

Table 3A-12 PROJECTED DOMESTIC AIRCRAFT MOVEMENTS BY ROUTE AT RIA IN THE YEAR 1990

Route	Number of Passengers [1000]	Aircraft Movements											
		120-Seater Jet			60-Seater Jet			40-Seater Non-Jet			20-Seater Non-Jet		
		Annual	Monthly	Daily	Annual	Monthly	Daily	Annual	Monthly	Daily	Annual	Monthly	Daily
300	91				2167	197	7						
400	109				2595	236	8						
500	16										1143	104	4
600	122	1453	133	5									
700	131	1560	142	5									
800	87				2072	189	7						
Sub Total	556	3031	275	10	6834	622	22				1143	104	4
Non-Scheduled	44							2175	218	8			
TOTAL	600	3031	275	10	6834	622	22	2175	218	8	1143	104	4

Table 3A-13 PROJECTED DOMESTIC AIRCRAFT MOVEMENTS BY ROUTE AT RIA IN THE YEAR 1995

Route	Number of Passengers [1000]	Aircraft Movements											
		120-Seater Jet			60-Seater Jet			40-Seater Non-Jet			20-Seater Non-Jet		
		Annual	Monthly	Daily	Annual	Monthly	Daily	Annual	Monthly	Daily	Annual	Monthly	Daily
300	121	1441	131	5									
400	146	1739	159	6									
500	22							786	72	3			
600	163	1941	177	6									
700	176	2096	191	7									
800	116	1381	126	5									
Sub Total	743	8598	784	29				786	72	3			
Non-Scheduled	59				1639	164	6						
TOTAL	802	8598	784	29	1639	164	6	786	72	3			

Table 3A-14 PROJECTED DOMESTIC AIRCRAFT MOVEMENTS BY ROUTE AT RIA IN THE YEAR 2000

Route	Number of Passengers [1000]	Aircraft Movements											
		120-Seater Jet			60-Seater Jet			40-Seater Non-Jet			20-Seater Non-Jet		
		Annual	Monthly	Daily	Annual	Monthly	Daily	Annual	Monthly	Daily	Annual	Monthly	Daily
300	155	1845	168	6									
400	186	2214	202	7									
500	28							1000	91	4			
600	208	2476	226	8									
700	224	2667	243	9									
800	148	1761	161	6									
Sub Total	949	10963	1000	36				1000	91	4			
Non-Scheduled	75				2063	207	7						
TOTAL	1024	10963	1000	36	2063	207	7	1000	91	4			

Table 3A-15 PROJECTED DOMESTIC AIRCRAFT MOVEMENTS BY ROUTE AT RIA IN THE YEAR 2005

Route	Number of Passengers [1000]	Aircraft Movements											
		120-Seater Jet			60-Seater Jet			40-Seater Non-Jet			20-Seater Non-Jet		
		Annual	Monthly	Daily	Annual	Monthly	Daily	Annual	Monthly	Daily	Annual	Monthly	Daily
300	188	2239	204	7									
400	227	2703	246	9									
500	34							1215	111	4			
600	253	3012	274	10									
700	273	3251	296	10									
800	181	2155	196	7									
Sub Total	1155	13360	1216	43				1215	111	4			
Non-Scheduled	91				2167	217	8						
TOTAL	1246	13360	1216	43	2167	217	8	1215	111	4			

Fig. 3A-1 GRAPHIC PRESENTATION OF THE REGRESSION MODEL OF THE NORMAL INTERNATIONAL PASSENGERS

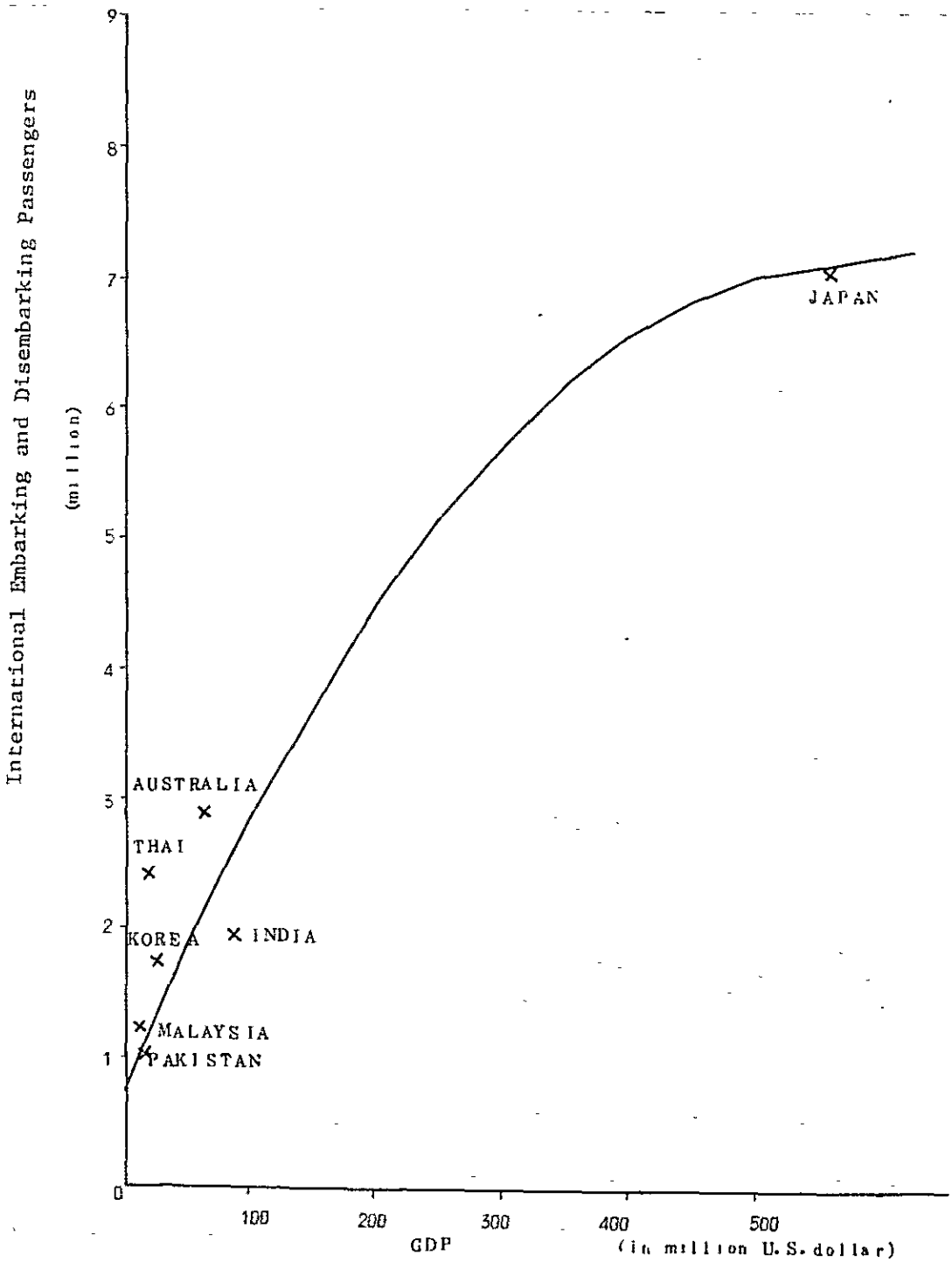


Fig. 3A-2 SHARE OF TRANSIT PASSENGERS IN INTERNATIONAL AIR PASSENGERS

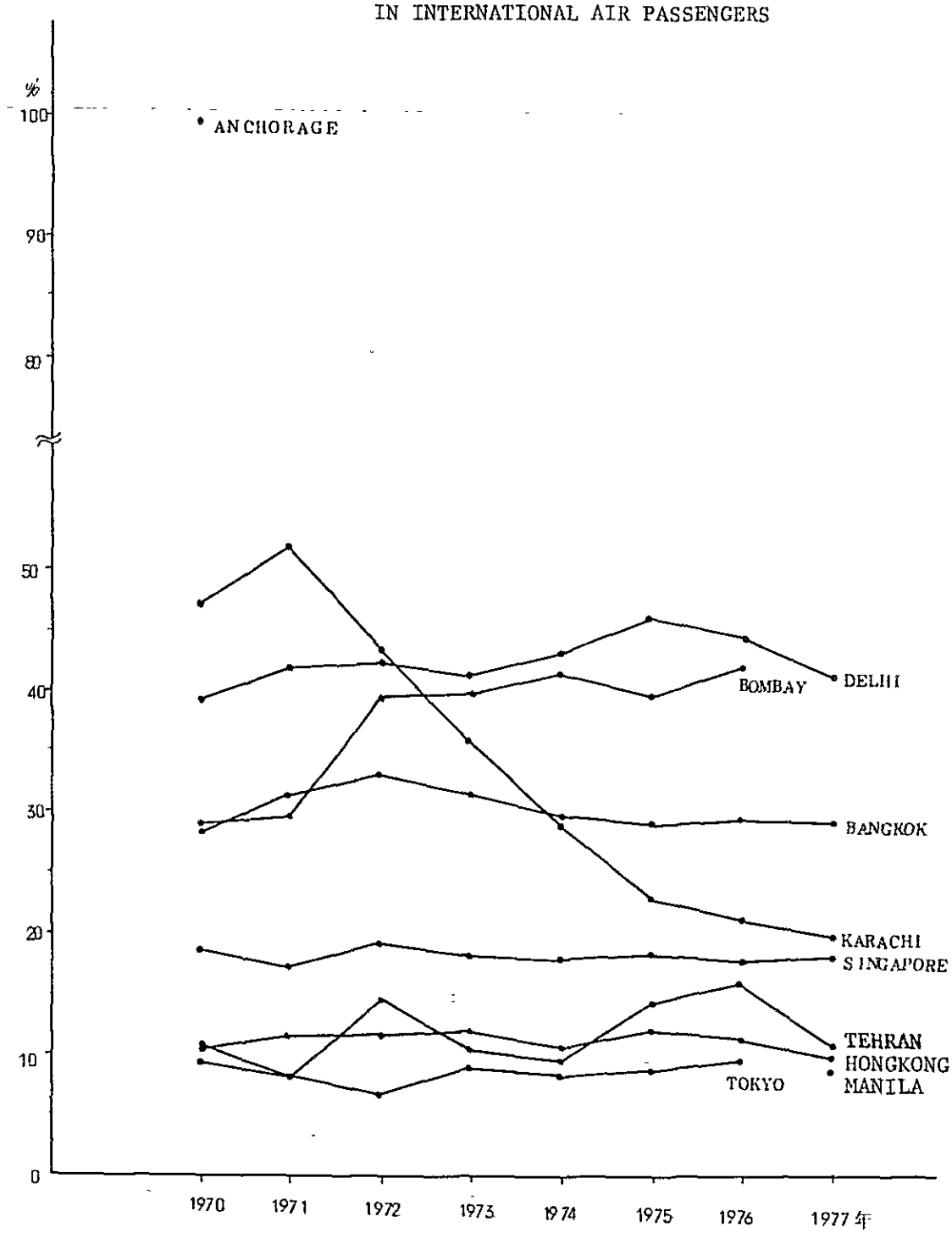
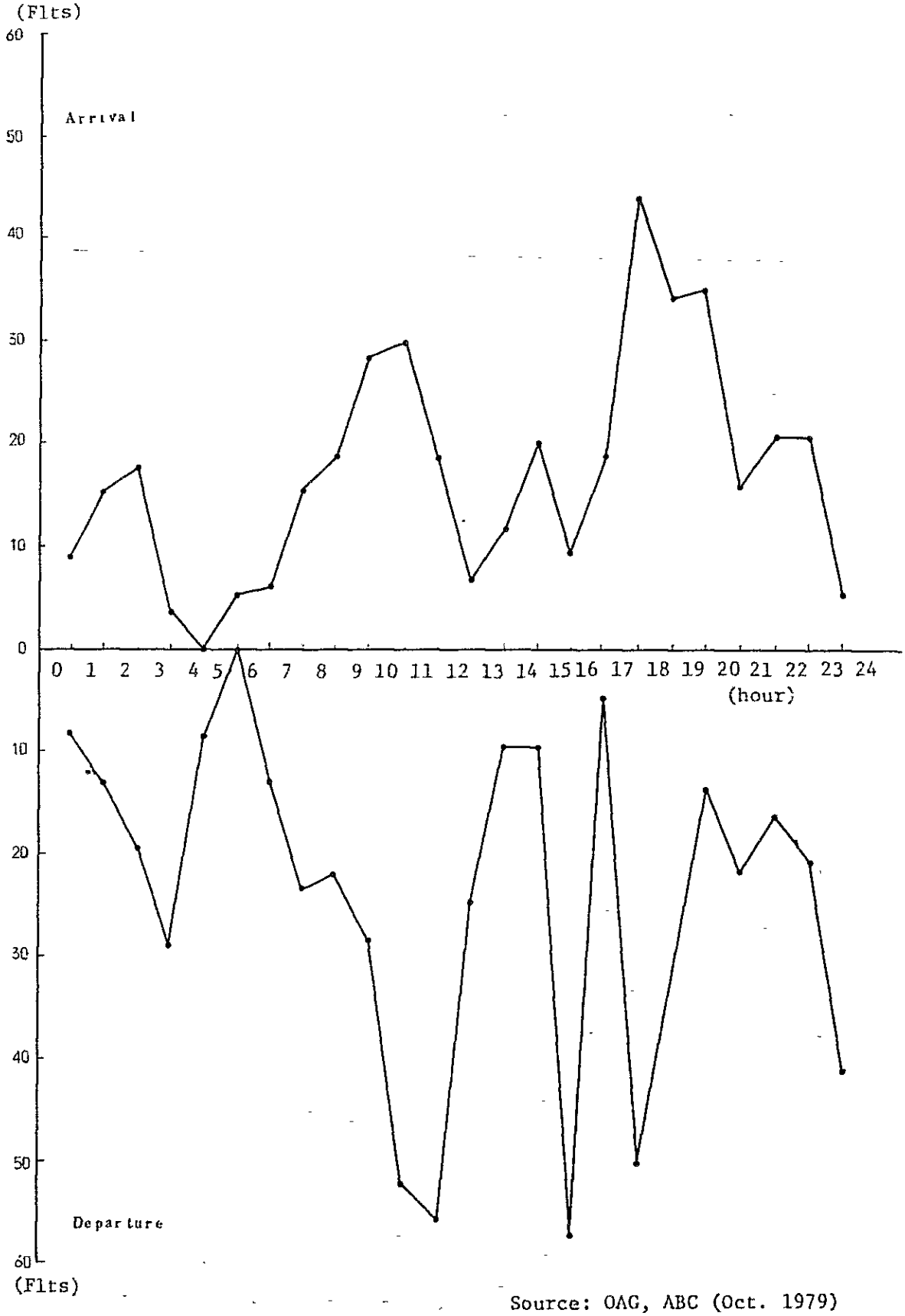


Fig 3A-3 LANDING & TAKE-OFF AT BANGKOK INTERNATIONAL AIRPORT



Source: OAG, ABC (Oct. 1979)

Fig. 3A-4 FORECASTS OF AIR PASSENGER AT RANGOON INTERNATIONAL AIRPORT

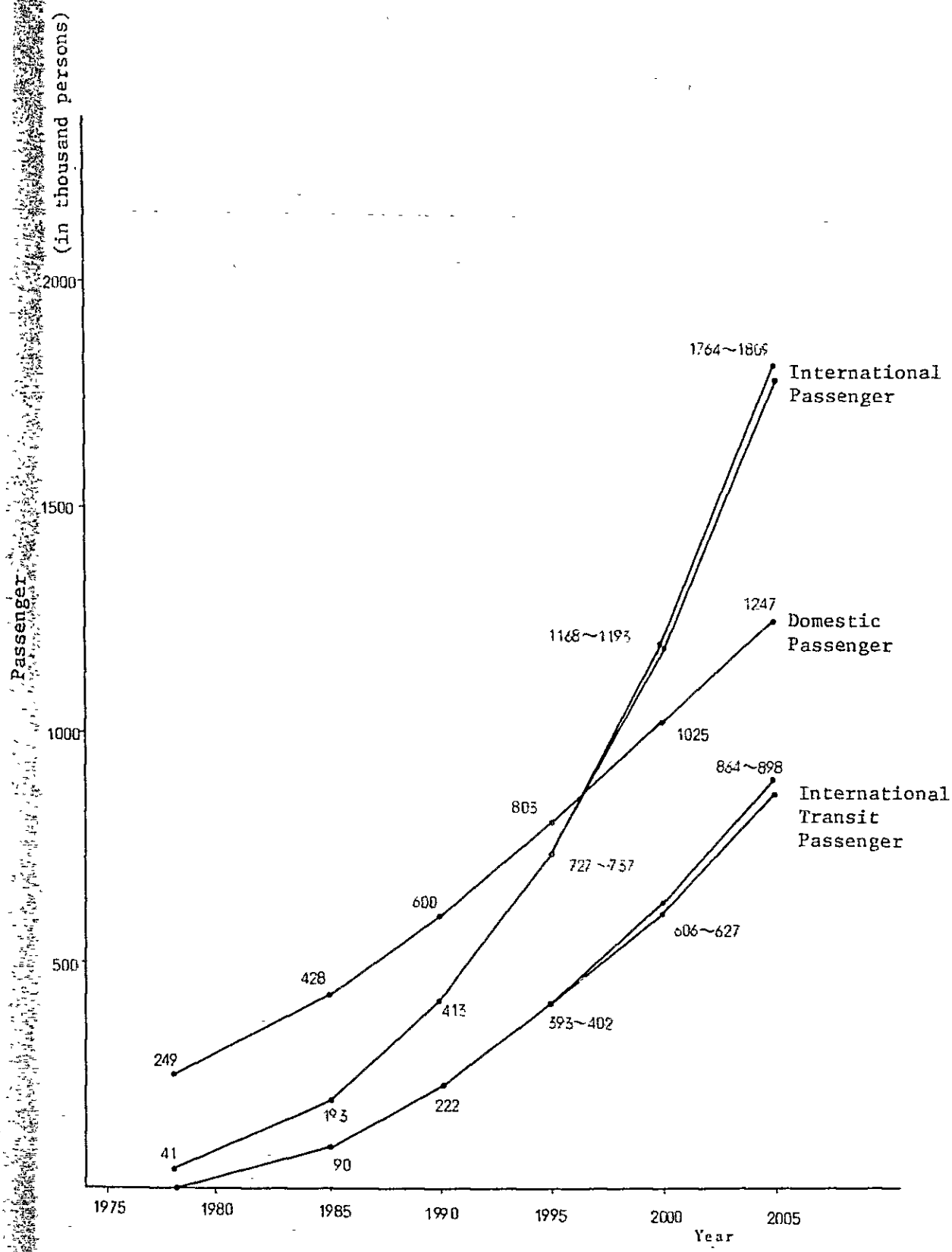


Table 3A-16 FORECASTS OF INTERNATIONAL NON-SCHEDULED CARGO FLIGHT MOVEMENT AT RIA

Year	Cargo (tons)	Aircraft Movements (170 Seater-Jet)		
		Annual	Monthly	Weekly
1985	18	1	1	1
1990	38	3	1	1
1995	76	5	1	1
2000	146	9	1	1
2005	270	15	2	1

International Non-Scheduled Cargo (tons)

= 0.02 x Total International Cargo

(2% of Total International Cargo)

Table 3A-17 FORECASTS OF DOMESTIC NON-SCHEDULED CARGO FLIGHT MOVEMENTS AT RIA

Year	Cargo (in tons)	Aircraft Movements					
		40-Seater Non-Jet			20-Seater Non-Jet		
		Annual	Monthly	Daily	Annual	Monthly	Daily
1985	1510	607	61	3	303	31	2
1990	1980	795	80	4	398	40	2
1995	2550	1063	107	5			
2000	3080	1284	129	6			
2005	3564	1268	128	6			

Table 3A-18 FORECASTS OF AIR TRAFFIC AT THE MINGALADON AIRPORT AND ANNUAL GROWTH RATE

(in 1000 passenger or 1000 ton)

Case No.	Item	1978	1985	1990	1995	2000	2005
I	International Emb./Disemb. Passenger	41	110 (15%)	212 (14%)	390 (13%)	687 (12%)	1157 (11%)
	International Transit Passenger	-	90 (-)	222 (20%)	402 (13%)	627 (9%)	898 (7%)
	Domestic Passenger	250	456 (9%)	670 (8%)	940 (7%)	1258 (6%)	1606 (5%)
	International Cargo	0.3	1.0 (18%)	2.1 (17%)	4.4 (16%)	8.9 (15%)	17.0 (14%)
	Domestic Cargo	2.1	3.6 (8%)	5.0 (7%)	6.8 (6%)	8.6 (5%)	10.5 (4%)
II	International Emb./Disemb. Passenger	41	103 (14%)	190 (13%)	336 (12%)	565 (11%)	911 (10%)
	International Transit Passenger	-	90 (-)	222 (20%)	402 (13%)	627 (9%)	898 (7%)
	Domestic Passenger	250	428 (8%)	600 (7%)	803 (6%)	1025 (5%)	1247 (4%)
	International Cargo	0.3	0.9 (17%)	1.9 (16%)	3.8 (15%)	7.3 (14%)	13.5 (13%)
	Domestic Cargo	2.1	3.4 (7%)	4.5 (6%)	5.8 (5%)	7.0 (4%)	8.1 (3%)
III	International Emb./Disemb. Passenger	41	117 (16%)	225 (14%)	396 (12%)	638 (10%)	937 (8%)
	International Transit Passenger	-	90 (-)	222 (20%)	402 (13%)	627 (9%)	898 (7%)
	Domestic Passenger	250	486 (10%)	715 (8%)	956 (6%)	1164 (4%)	1285 (2%)
	International Cargo	0.3	1.0 (19%)	2.2 (17%)	4.5 (15%)	8.2 (13%)	13.9 (11%)
	Domestic Cargo	2.1	3.8 (9%)	5.4 (7%)	6.9 (5%)	8.0 (3%)	8.4 (1%)

Air Traffic Forecast of Asia Area by ICAO (1978-1986)

International Passenger	16%
Domestic Passenger	10%
International Cargo	19%
Domestic Cargo	9%

Table 3A-19 TRAFFIC OF PRINCIPAL INTERNATIONAL AIRPORTS OF ICAO STATES (IN 1976)

State	Passenger (in 1000 persons)		Cargo (in 1000 tons)		GDP (in million dollars)	Area (in 1000 km^2)
	International	Domestic	International	Domestic		
Bangladesh	125	334	3.2	3.3	6838	144
Hong Kong	4415	-	163.2	-	29322	1
India	1921	-	87.6	-	86918	3280
Indonesia	965	1955	15.8	20.0	37270	1904
Japan	7091	23773	366.2	192.6	555063	372
Malaysia	1243	870	15.6	-	11060	330
Pakistan	1087	2052	31.3	25.6	14510	804
Republic of Korea	1733	573	92.8	3.4	25369	98
Singapore	3799	-	78.2	-	5915	0.6
Sri Lanka	204	14	0.5	-	3131	66
Thailand	2487	232	59.1	1.0	16283	514
Australia	2897	12118	75.9	152.6	64022	7687
Denmark	6471	1582	139.7	4.8	38527	43
France	17232	9824	419.8	44.0	346731	547
West Germany	20028	13878	500.9	153.3	445909	248
Ireland	2606	359	52.0	8.3	7971	70
Netherland	8056	160	266.4	0.1	89523	41
United Kingdom	28432	5092	500.8	29.6	220155	244
Austria	2276	3	28.5	0	40620	84

(Continued)

State	Passenger (in 1000 persons)		Cargo (in 1000 tons)		GDP (in million dollars)	Area (in 1000 km^2)
	International	Domestic	International	Domestic		
Finland	1698	1143	16.5	4.3	28145	337
Iceland	256	248	4.7	4.8	1455	103
Norway	2086	2772	17.5	13.7	31301	324
Sweden	4077	1593	45.2	4.1	74214	450
Switzerland	8694	1190	144.9	17.8	56284	41
Greece	3967	2412	33.1	11.8	22245	132
Spain	15391	14966	108.6	149.0	104620	505
Kenya	786	149	34.7	0.4	3405	583
South Africa	1506	2952	61.8	38.5	33472	1221
Canada	9724	13414	141.9	175.2	194606	9976
U.S.A.	25585	136898	1194.9	2286.3	1702023	9363
Brazil	2156	6040	91.1	84.7	144615	8512
Chile	427	212	22.6	6.8	8088	757
Hondulas	172	83	10.0	1.3	1201	1.2
Mexico	3549	8780	-	-	79139	1973
Nicaragua	203	30	15.9	3.1	1835	130
Panama	723	83	40.8	1.3	2028	76
Peru	1289	1135	15.0	12.0	9872	1285

(Continued)

State	Passenger (in 1000 persons)		Cargo (in 1000 tons)		GDP (in million dollars)	Area (in 1000 km^2)
	International	Domestic	International	Domestic		
Uruguay	591	70	10.5	0	3693	178
Venezuela	1414	3036	82.9	12.7	31019	912
Iran	1454	1840	96.2	12.0	66777	1648
Saudi Arabia	1933	1328	11.2	5.2	43924	2150

Table 3A-20 INTERNATIONAL AIR PASSENGERS AT PRINCIPAL AIRPORT IN ASIA

(in 1000 persons)

Airport		1970	1971	1972	1973	1974	1975	1976	1977	Average Annual Growth Rate for 1972 - 77 (in percent)
TEHRAN	Embark & Disembark	410	506	501	582	764	1079	1269	1471	24
	Transit	50	40	82	67	76	182	228	164	15
	Total	460	546	583	649	840	1261	1497	1635	23
KARACHI	Embark & Disembark	276	232	256	386	534	711	954	1222	37
	Transit	244	248	174	223	211	214	265	305	12
	Total	520	480	430	609	745	925	1219	1527	29
DELHI	Embark & Disembark	311	298	416	499	479	535	418	712	11
	Transit	201	211	307	358	356	451	329	500	10
	Total	512	509	723	857	835	986	747	1212	11
BOMBAY	Embark & Disembark	492	522	614	662	701	889	792	-	7
	Transit	194	217	386	422	489	585	560	-	10
	Total	686	739	1000	1084	1190	1474	1352	-	8
BANGKOK	Embark & Disembark	1250	1236	1553	1967	2116	2370	2487	2719	12
	Transit	490	574	741	896	901	934	981	1072	8
	Total	1740	1810	2294	2863	3017	3304	3468	3791	11

(Continued)

(in 1000 persons)

Airport		1970	1971	1972	1973	1974	1975	1976	1977	Average Annual Growth Rate for 1972 - 77 (in percent)
SINGAPORE	Embark & Disembark	1379	1669	1476	2123	2997	3324	3740	4224	23
	Transit	309	346	340	464	636	708	787	906	22
	Total	1688	2015	1816	2587	3633	4032	4527	5130	23
HONG KONG	Embark & Disembark	1105	2371	2880	3543	3693	3865	4415	4899	11
	Transit	134	299	375	482	452	525	553	543	8
	Total	1239	2670	3255	4025	4145	4390	4968	5442	11
TOKYO	Embark & Disembark	2357	-	3199	4350	4485	5013	5686	-	15*
	Transit	257	-	250	405	407	460	564	-	23*
	Total	2614	-	3449	4755	4892	5473	6250	-	16*

Source: ICAO Airport Statistics

* 1972-1976

Table 3A-21 ESTIMATED FUTURE GDP OF BURMA

Year	Gross Domestic Product (Million of Constant 1978 U.S. dollars)
1980	3,896
1985	5,820
1990	7,751
1995	10,324
2000	13,751
2005	18,315

Table 3A-22 LOAD FACTORS USED IN PROJECT PLANNING

		International	Domestic
Passenger	Scheduled	65%	70%
	Non-Scheduled	75%	50% (in 1985) 60% (in 1995) 70% (in 2005)
Cargo	Scheduled	60%	70%
	Non-Scheduled	60%	50% (in 1985) 60% (in 1995) 70% (in 2005)

APPENDIX 3B

LISTS OF PROJECTION FORMURA

Table 3B-1 THE REGRESSION MODEL USED IN FORECAST

Formula 1. Normal International Passengers at Mingaladon Airport

$$Y = 781.5 + 0.02230\ (GDP) - 0.00000001971\ (GDP)^2$$

$$r = 0.927$$

GDP: 1976 year constant price (in million dollar)
Y: International passenger (in thousand persons)

Formula 2. International Passenger between East Asia and Europe

$$Y = 105003.8 + 159250.1t$$

$$r = 0.984$$

t: Trend (t=1, 1967 year)
Y: International passenger between East Asia and Europe (in person)

Formula 3. International Passenger between South East Asia and Europe

$$Y = 3937.8 + 65158.0t$$

$$r = 0.966$$

t: Trend (t=1, 1967 year)
Y: International passenger between South East Asia and Europe (in person)

Formula 4. International Passenger between Australia, New Zealand and Europe

$$Y = -8263.8 + 135783.3t$$

$$r = 0.933$$

t: Trend (t=1, 1967 year)
Y: International passenger between Australia, New Zealand and Europe (in person)

(continued)

Formula 5. International Passenger between South Asia and USA, Canada

$Y = 45410.7 + 12324.0t$

$r = 0.950$

t: Trend (t=1, 1967 year)
Y: International passenger between South Asia and USA, Canada (in person)

Formula 6. Normal Domestic Passenger at Mingaladon Airport

$Y = 710.76 + 0.3513\ (GDP) + 0.37118\ (S)$

$r = 0.876$

GDP: 1976 year constant price (in million dollar)
S: National area (in thousand km^2)
Y: Domestic passenger (in thousand persons)

Formula 7. Normal International Cargo at Mingaladon Airport

$Y = 15.424 + 0.0009467\ (GDP)$

$r = 0.946$

GDP: 1976 year constant price (in million dollar)
Y: International cargo (in thousand tons)

Formula 8. Normal Domestic Cargo at Mingaladon Airport

$Y = -1.04835 + 0.00030\ (GDP) + 0.00859\ (S)$

$r = 0.849$

GDP: 1976 year constant price (in million dollar)
S: National area (in thousand km^2)
Y: Domestic cargo (in thousand tons)

APPENDIX 4A

RUNWAY DIMENSION OF INTERNATIONAL AIRPORTS IN THE MAJOR CITIES OF SOUTH EAST ASIA

Table 4A-1 RUNWAY DIMENSION OF INTERNATIONAL AIRPORTS IN THE MAJOR CITIES OF SOUTH EAST ASIA

Name of Airport		RUNWAY		REMARKS
		LENGTH	WIDTH	
BURMA	/ RANGOON Int'l	2469m (8100')	60m (200')	
BANGLADESH	/ DACCA	2740m (8990')		
INDIA	CALCATTA	3630m (11909')		
	/ DELHI	3810m (12500')		
	BOMBAY	3350m (10991') 2730m (8957')		
SLI LANKA	/ COLOMBO Int'l	3370m (11056')	46m (151')	
NEPAL	/ KATHMANDU Int'l	3000m (9843') 1200m (3937')	45m (148')	
PAKISTAN	/ KARACHI Int'l	3200m (10499')		
AFGHANISTAN	/ KABUL	2800m (9186') 3700m (12139')		FUTURE PLANNING
THAILAND	/ BANGKOK Int'l	3550m (11647') 3000m (9843')	60m (200') 45m (148')	
LAO	/VIENTIANE	3000m (9843') 3000m (9843')		FUTURE PLANNING
VIET-NAM	/ HANOI	2000m (6562') 2810m (9219')		FUTURE PLANNING
MALAYSIA	/ KUALA LUMPUR Int'l	3474m (11398')	45m (148')	
SINGAPORE	/ SINGAPORE Int'l	4023m (13199')	61m (200')	
	CHANGI NEW Int'l	4000m (13123') 3355m (11007')	60m (197') 60m (197')	UNDER CONSTUCTION FUTUEE PLANNING
INDONESIA	/ JAKALTA Int'l	3000m (9843')		
HONG KONG	/ HONG KONG Int'l	3400m (11155')	60m (197')	
PHILIPPINES	/ MANILA Int'l	3354m (11004') 2425m (7956')	61m (200') 31m (102')	
CHINA	TAIPEI Int'l /	2605m (8547') 3660m (12008')	60m (197') 60m (197')	
	TAOYUAN Int'l	3200m (10499') 3140m (10302')	60m (197') 45m (148')	FUTURE PLANNING FUTURE PLANNING

APPENDIX 5A

FINNANCIAL ANALYSIS DATA

(Chapter 8, Appendix 1)

Table 5A-1 GROSS REVENUE BY THE PROJECT

(CASE 1)

(In 1979 thousand US$)

Year	Landing Charge	Housing Charge	Air Navigation Facilities Charge	Passenger Charge	Terminal Rental	Car Parking Charge	Fuel Service Charge	Total
1985	108	36	327	103	79	93	380	1,126
6	299	36	358	117	289	102	437	1,638
7	364	36	385	132	289	111	494	1,811
8	475	51	385	149	289	122	551	2,022
9	581	61	378	168	289	131	608	2,216
1990	648	68	403	190	289	143	665	2,406
1	798	98	400	213	289	154	749	2,701
2	887	98	427	239	289	166	829	2,935
3	985	98	454	268	289	180	910	3,184
4	1,140	88	419	300	289	195	992	3,423
1995	1,236	101	382	334	289	210	1,074	3,626
6	1,345	101	405	372	529	227	1,186	4,165
7	1,474	107	433	412	529	243	1,299	4,497
8	1,604	111	457	457	529	261	1,411	4,830
9	1,715	111	480	507	529	281	1,524	5,147
2000	1,857	119	509	562	527	303	1,636	5,515
1	2,026	119	538	620	529	323	1,773	5,928
2	2,166	130	559	680	529	346	1,991	6,401
3	2,332	133	585	747	529	369	2,048	6,743
4	2,497	133	612	819	529	396	2,186	7,172
2005	2,630	139	636	900	529	423	2,323	7,580
TOTAL	27,167	1,974	9,532	8,289	8,259	4,779	25,066	85,066

(Chapter 8, Appendix 2)

Table 5A-2 GROSS REVENUE BY THE PROJECT

(CASE 2)

(In 1979 thousand US$)

Year	Landing Charge	Housing Charge	Air Navigation Facilities Charge	Passenger Charge	Terminal Rental	Car Parking Charge	Fuel Service Charge	Total
1985	108	36	327	103	79	93	380	1,126
6	299	36	358	117	289	102	437	1,638
7	364	36	385	132	289	111	494	1,811
8	475	51	385	149	289	122	551	2,022
9	581	61	378	168	289	131	608	2,216
1990	648	68	403	190	289	143	665	2,406
1	798	98	400	213	289	154	749	2,701
2	887	98	427	239	289	166	829	2,935
3	985	98	454	268	289	180	910	3,184
4	1,140	88	419	300	289	195	992	3,423
1995	1,247	101	383	336	289	211	1,126	3,693
6	1,361	101	407	373	529	227	1,251	4,249
7	1,496	107	435	414	529	244	1,376	4,601
8	1,628	111	460	459	529	262	1,500	4,949
9	1,728	111	481	510	529	282	1,625	5,266
2000	1,881	119	511	565	529	304	1,750	5,659
1	2,055	119	541	622	529	324	1,907	6,097
2	2,199	130	562	684	529	347	2,064	6,515
3	2,369	133	589	753	529	371	2,220	6,964
4	2,539	133	616	828	529	398	2,377	7,420
2005	2,676	139	641	911	529	426	2,534	7,856
TOTAL	27,464	1,974	9,562	8,334	8,259	4,793	26,345	86,731

Table 5A-3 CASH FLOW OF FINANCIAL COSTS AND REVENUE OF RIA WITH ASSUMPTION OF 2.5 TIMES AS CURRENT CHARGE

CASE 1

Year	Costs		Revenue	Operation Surplus	Cumulative Balance
	Construction Cost	Maintenance Cost	Total Revenue		
1980	13,667				-13,667
1	13,667				-27,334
2	13,667				-41,001
3	13,667				-54,668
4	13,667				-68,335
1985	13,667		151	151	-81,851
6	13,667	1,640	1,431	-209	-95,727
7		1,913	1,864	-49	-95,777
8		1,913	2,391	478	-95,298
9	6,450	1,913	2,876	963	-100,785
1990	6,450	1,913	3,351	1,438	-105,797
1	6,450	1,913	4,089	2,176	-110,071
2	6,450	1,913	4,674	2,761	-113,760
3	6,450	1,913	5,296	3,383	-116,827
4	6,450	1,913	5,894	3,981	-119,296
1995	6,450	1,913	7,104	5,191	-120,555
6		2,816	7,852	5,036	-115,519
7		2,816	8,682	5,866	-109,653
8		2,816	9,514	6,698	-102,955
9		2,816	10,307	7,491	-95,464
2000		2,816	11,227	8,411	-87,053
1		2,816	12,259	9,443	-77,610
2		2,816	13,242	10,426	-67,184
3		2,816	14,297	11,481	-55,703
4		2,816	15,369	12,553	-43,104
5		2,816	16,389	13,573	-29,577
TOTAL	140,819	47,017	158,259	111,340	-29,577

Residual Value = 22,575
Net Loss = -7,002

Table 5A-4 CASH FLOW OF FINANCIAL COSTS AND REVENUE OF RIA WITH ASSUMPTION OF 2.5 TIMES AS CURRENT CHARGE

CASE 2

Year	Costs		Revenue	Operation Surplus	Cumulative Balance
	Construction Cost	Maintenance Cost	Total Revenue		
1980	13,641				-13,641
1	13,641				-27,282
2	13,641				-40,923
3	13,641				-54,564
4	13,641				-68,205
1985	13,641		151	151	-81,695
6	13,641	1,637	1,431	-206	-95,542
7		1,910	1,864	-46	-95,588
8		1,910	2,391	481	-95,107
9	7,781	1,910	2,876	966	-101,922
1990	7,781	1,910	3,351	1,441	-108,262
1	7,781	1,910	4,089	2,179	-113,864
2	7,781	1,910	4,674	2,764	-118,881
3	7,781	1,910	5,296	3,386	-123,276
4	7,781	1,910	5,894	3,984	-127,073
1995	7,781	1,910	7,272	5,362	-129,492
6		2,999	8,062	5,063	-124,429
7		2,999	8,942	5,943	-118,486
8		2,999	9,812	6,813	-111,673
9		2,999	10,604	7,605	-104,068
2000		2,999	11,587	8,588	-95,480
1		2,999	12,682	9,683	-85,797
2		2,999	13,727	10,728	-75,069
3		2,999	14,849	11,850	-63,219
4		2,999	15,989	12,990	-50,229
2005		2,999	17,079	14,080	-36,149
TOTAL	149,954	48,817	162,622	113,805	-36,149

Residual Value = 27,234
Net Loss = -8,915

APPENDIX 6A

ECONOMIC ANALYSIS DATA

Table 6A-1 FORECASTS OF TOURISM INCOME, AIRPORT REVENUE AND FUEL REVENUE

(1,000 US$)

Year	Case 1			Case 2		
	Tourism Income	Airport Revenue	Fuel Revenue	Tourism Income	Airport Revenue	Fuel Revenue
1985	5,927	142	1,668	5,927	142	1,668
1986	6,697	171	2,003	6,697	171	2,003
1987	7,574	198	2,338	7,574	198	2,338
1988	8,560	227	2,672	8,560	227	2,672
1989	9,667	255	3,007	9,667	255	3,007
1990	10,922	269	3,341	10,922	269	3,341
1991	12,232	330	3,877	12,232	330	3,877
1992	13,703	391	4,412	13,703	391	4,412
1993	15,350	453	4,948	15,350	453	4,948
1994	17,200	486	5,481	17,200	486	5,481
1995	19,130	546	6,266	19,265	534	6,017
1996	21,236	597	7,136	21,371	588	6,939
1997	23,599	646	8,005	23,734	639	7,860
1998	26,069	697	8,875	26,339	692	8,782
1999	28,972	742	10,003	29,242	729	9,704
2000	32,171	788	10,308	32,441	786	10,624
2001	35,411	928	11,811	35,681	927	12,228
2002	38,853	1,051	13,346	39,258	1,053	13,833
2003	42,634	1,176	14,859	43,174	1,177	15,436
2004	46,819	1,313	16,380	47,494	1,316	17,040
2005	51,571	1,429	17,096	52,246	1,454	18,644

Table 6A-2 VISITOR EXPENDITURES IN US$ 1978

	Total	Per Diem Expenditures	Average Amount Spent per Visit
South Asia			
Sri Lanka	55,800,000	$27	$289
Southeast Asia			
Indonesia	230,000,000	70	491
*Philippines	624,781,000	79	727
Singapore	443,180,000	60	217
Thailand	400,000,000	57	275
Burma	4,547,000	43	208
East Asia			
Republic of China	608,000,000	71	478
Hong Kong	996,520,000	124	485
*Japan	1,230,652,000	106	197
Macau	90,273,000	104	167
Australia/New Zealand			
New Zealand	165,700,000	n.a.	407
South & Central Pacific			
Cook Islands	4,500,000	31	262
Guam	110,000,000	124	472
*Micronesia	2,400,000	35	104
New Hebrides	11,000,000	43	403
Papua New Guinea	20,534,582	n.a.	523
*Tahiti	59,650,000	87	635
Hawaii	2,188,000,000	63	596

* Philippines, Figures derived from a limited visitor survey.
* Japan, These expenditure figures based on surveys not bank figures
* Micronesia. Visitor expenditures in Northern Marianas not included.
* Tahiti. Total visitor expenditures derived by applying average amount per visit to the total number of visitor arrivals.

Source: PATA Annual Tourism Survey of National Tourist Offices. (except Burma)

Table 6A-3 AVERAGE LENGTH OF STAY (DAYS), 1978

	Average
South Asia	
Sri Lanka	10.8
Southeast Asia	
Indonesia	7.0
Philippines	9.2
Singapore	3.6
Thailand	4.84
Burma	4.8
East Asia	
Republic of China	6.75
Hong Kong	3.9
Japan	11.3
Macau	1.6
South & Central Pacific	
Cook Islands	8.4
Guam	3.8
Micronesia	3.0
New Caledonia	5.8
New Hebrides	9.3
Tahiti	7.3
Hawaii	9.5

Source: PATA Annual Tourism Survey of National Tourists Offices (except Burma)

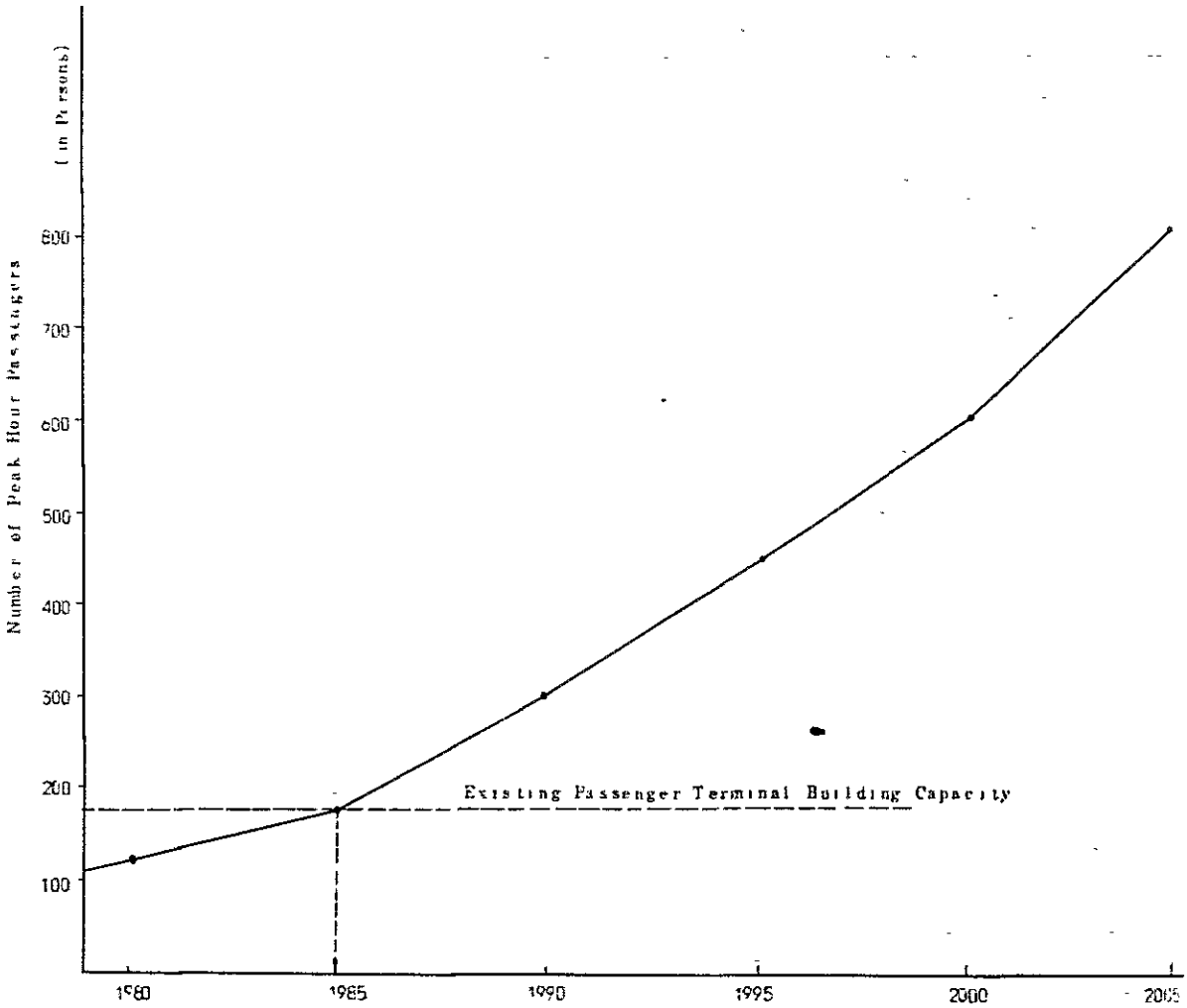


Fig 6A-1 THE FORECAST OF NUMBER OF PEAK HOUR PASSENGERS AT RANGOON INTERNATIONAL AIRPORT

Table 6A-4 HOURLY PROCESSING CAPACITY OF THE EXISTING PASSENGER TERMINAL BUILDING

	Area (Ft^2)	Hourly Processing Capacity (Person/Hour)
International	50,680	186
Domestic	24,700	154

Table 6A-5 (CASE 1)

FORECASTS OF THE BASE CASE DEMAND AND OVERFLOWING PASSENGER TRAFFIC ACCOMMODATED AT RANGOON INTERNATIONAL AIRPORT

(In thousand persons)

Year	Base Case Passenger Traffic			Overflowing Passengers		
	International Passenger	Domestic Passenger	Total	International Passenger	Domestic Passenger	Total
1985	193	427	620	0	0	0
1986	193	427	620	40	35	75
1987	193	427	620	82	70	152
1988	193	427	620	125	104	229
1989	193	427	620	171	139	310
1990	193	427	620	220	173	393
1991	193	427	620	278	214	492
1992	193	427	620	340	254	594
1993	193	427	620	405	295	700
1994	193	427	620	473	337	810
1995	193	427	620	534	375	909
1996	193	427	620	612	420	1,032
1997	193	427	620	697	465	1,162
1998	193	427	620	783	509	1,292
1999	193	427	620	877	553	1,430
2000	193	427	620	975	597	1,572
2001	193	427	620	1,081	642	1,723
2002	193	427	620	1,193	687	1,880
2003	193	427	620	1,312	731	2,043
2004	193	427	620	1,437	775	2,212
2005	193	427	620	1,571	819	2,390

Table 6A-6 (CASE 2)
FORECASTS OF THE BASE CASE DEMAND AND OVERFLOWING PASSENGER TRAFFIC AT RANGOON INTERNATIONAL ARIPORT

(In thousand persons)

Year	Base Case Passenger Traffic			Overflowing Passengers		
	International Passenger	Domestic Passenger	Total	International Passenger	Domestic Passenger	Total
1985	193	427	620	0	0	0
1986	193	427	620	40	35	75
1987	193	427	620	82	70	152
1988	193	427	620	125	104	229
1989	193	427	620	171	139	310
1990	193	427	620	220	173	393
1991	193	427	620	278	214	492
1992	193	427	620	340	254	594
1993	193	427	620	405	295	700
1994	193	427	620	473	337	810
1995	193	427	620	545	375	920
1996	193	427	620	626	420	1,046
1997	193	427	620	713	465	1,178
1998	193	427	620	803	509	1,312
1999	193	427	620	899	553	1,452
2000	193	427	620	999	597	1,596
2001	193	427	620	1,110	642	1,752
2002	193	427	620	1,227	687	1,914
2003	193	427	620	1,349	731	2,080
2004	193	427	620	1,479	775	2,254
2005	193	427	620	1,616	819	2,435

Table 6A-7 ESTIMATED CONSTRUCTION COST IN ECONOMIC COST CALCULATION

CASE-1 Phase I

(In 1979 thousand US$)

Item	Foreign Portion			Local Portion				Grand Total
	Foreign Goods & Services	Skilled Labor	Total	Domestic Goods & Services	Labor		Total	
					Skilled	Unskilled		
Construction Cost	4,0454.7	3,535.4	43,990.1	19,262.3	2,724.5	1,183.7	23,170.5	67,160.6
Engineering			4,399.0				2,317.1	6,716.1
Contingency			4,399.0				2,317.0	6,716.0
Grand Total			52,788.1				27,804.6	80,592.7

Table 6A-8 ESTIMATED CONSTRUCTION COST IN ECONOMIC COST CALCULATION

CASE-1 Phase II

(In 1979 thousand US$)

Item	Foreign Portion			Local Portion				Grand Total
	Foreign Goods & Services	Skilled Labor	Total	Domestic Goods & Services	Labor		Total	
					Skilled	Unskilled		
Construction Cost	21,200.5	2,635.4	23,835.9	5,513.2	2,181.6	335.1	8,029.9	31,865.8
Engineering			2,383.6				803.0	3,186.6
Contingency			2,383.4				803.0	3,186.4
Grand Total			28,602.9				9,635.9	38,238.8

Table 6A-9 ESTIMATED CONSTRUCTION COST IN ECONOMIC COST CALCULATION

CASE-2 Phase I

(In 1979 thousand US$)

Item	Foreign Portion			Local Portion				Grand Total
	Foreign Goods & Services	Skilled Labor	Total	Domestic Goods & Services	Labor		Total	
					Skilled	Unskilled		
Construction Cost	40,072.7	3,535.4	43,608.1	19,533.9	2,708.6	1,157.6	23,400.1	67,008.2
Engineering			4,360.8				2,340.0	6,700.8
Contingency			4,360.8				2,340.0	6,700.8
Grand Total			52,329.7				28,080.1	80,409.8

Table 6A-10 ESTIMATED CONSTRUCTION COST IN ECONOMIC COST CALCULATION

CASE-2 Phase II

(In 1979 thousand US$)

Item	Foreign Portion			Local portion				Grand Total
	Foreign Goods & Services	Skilled Labor	Total	Domestic Goods & Services	Labor		Total	
					Skilled	Unskilled		
Construction Cost	24,937.9	2,711.2	27,649.1	7,817.8	2,308.3	731.4	10,857.5	38,506.6
Engineering			2,764.9				1,085.7	3,850.6
Contingency			2,765.0				1,085.6	3,850.6
Grand Total			33,179.0				13,028.8	46,207.8

Table 6A-11 ESTIMATE BENEFITS OF SATISFIED TRIP DEMAND OF OVERFLOWING PASSENGERS

(In 1979 thousand dollars)

Year	Benefits of overflowing passengers forced to give up their trips	Benefits of overflowing passengers who continue their trips by other traffics	Total
1985	0	0	0
1986	55	109	164
1987	130	260	390
1988	230	459	689
1989	358	717	1,075
1990	518	1,036	1,554
1995	1,705	3,410	5,115
2000	3,453	6,905	10,358
2005	4,869	9,738	14,607

Table 6A-12 ESTIMATE OF TIME VALUE OF RESIDENT AIR PASSENGER

Year	US$
1978	0.5
1985	0.7
1990	0.9
1995	1.3
2000	1.7
2005	2.2

Table 6A-13. (CASE 1)
FORECAST BENEFIT OF TIME SAVING
BY DIRECT FLIGHT

(In thousand U.S.$)

Year	Time Saving Increment by Direct Flight
1985	0
1986	3
1987	8
1988	12
1989	18
1990	25
1995	86
2000	213
2005	475

Table 6A-14 (CASE 2)
FORECAST BENEFIT OF TIME SAVING
BY DIRECT FLIGHT

(In thousand U.S.$)

Year	Time Saving Increment by Direct Flight
1985	0
1986	3
1987	8
1988	12
1989	18
1990	25
1995	86
2000	215
2005	

Table 6A-15 (CASE 1)
FORECAST OF NET INCREASE IN TOURISM INCOME

(In thousand persons, thousand US$)

Year	Number of Overflowing Visitor	Net Increase in Tourist Income
1985	0	0
1986	6	770
1987	12	1,647
1988	20	2,633
1989	28	3,740
1990	37	4,995
1995	98	13,203
2000	195	26,244
2005	338	45,644

Table 6A-16 (CASE 2)
FORECAST OF NET INCREASE IN TOURISM INCOME

(In thousand persons, thousand US$)

Year	Number of Overflowing Visitor	Net Increase in Tourist Income
1985	0	0
1986	6	770
1987	12	1,647
1988	20	2,633
1989	28	3,740
1990	37	4,995
1995	99	13,338
2000	197	26,514
2005	343	46,319

Table 6A-17 LANDING CHARGE BY TYPE OF AIRCRAFT AT RIA

(In U.S. Dollar)

Type of Aircraft		Landing Charge
360 Seater		473
250		473
170		473
120		189
60		32
40		32
20	non-jet	7

Table 6A-18 (CASE 1)
FORECAST OF AIRPORT REVENUE INCREMENT
BY FOREIGN AIRCRAFT

(In thousand U.S. Dollars)

Year	Airport Revenue Increment by Foreign Aircraft
1985	0
1986	29
1987	56
1988	85
1989	113
1990	127
1995	404
2000	646
2005	1,287

Table 6A-19 (CASE 2)
FORECAST OF AIRPORT REVENUE INCREMENT
BY FOREIGN AIRCRAFT

(In thousand U.S. Dollars)

Year	Airport Revenue Increment by Foreign Aircraft
1985	0
1986	29
1987	56
1988	85
1989	113
1990	127
1995	392
2000	644
2005	1,312

Table 6A-20 ESTIMATED FUEL CONSUMPTION BY TYPE OF AIRCRAFT BY ROUTE

(In 1,000 lbs.)

Route	360 Seater	250 Seater	170 Seater	120 Seater	60 Seater
RGN – ROME	358.7	244.0	214.2	145.2	72.9
– ATHENS	330.6	224.9	197.4	133.8	67.2
– BAGHDAD	239.1	162.7	142.8	96.8	48.6
– TEHRAN	196.9	134.0	117.6	79.7	40.0
– KARACHI	119.6	81.3	71.4	48.4	24.3
– DACCA	21.1	14.4	12.6	8.5	4.3
– BOMBAY	98.5	67.0	58.8	39.9	20.0
– CALCUTTA	21.1	14.4	12.6	8.5	4.3
– DELHI	84.4	57.4	50.4	34.2	17.2
– BANGKOK	14.1	9.6	8.4	5.7	2.9
– SINGAPORE	91.4	62.2	54.6	37.0	18.6
– KUALA LUMPUR	77.4	52.6	46.2	31.3	15.7
– JAKARTA	112.5	76.5	67.2	45.6	22.9
– KUNGMIN	49.2	33.5	29.4	19.9	10.0
– VIENTIANE	28.1	19.1	16.8	11.4	5.7
– HONG KONG	84.4	57.4	50.4	34.2	17.2
– MANILA	133.6	90.9	79.8	54.1	27.2
– TOKYO	246.2	167.4	147.0	99.7	50.1

Table 6A-21 (CASE 1)
FORECAST OF FUEL SUPPLY REVENUE INCREMENT BY FOREIGN AIRCRAFT

(In thousand US$)

Year	Fuel Supply Revenue Increment by Foreign Aircraft
1985	335
1986	670
1987	1,004
1988	1,339
1989	1,673
1990	2,209
1995	4,597
2000	8,640
2005	15,428

Table 6A-22 (CASE 2)
FORECAST OF FUEL SUPPLY REVENUE INCREMENT BY FOREIGN AIRCRAFT

(In thousand US$)

Year	Fuel Supply Revenue Increment by Foreign Aircraft
1985	0
1986	335
1987	670
1988	1,004
1989	1,339
1990	1,673
1995	4,349
2000	8,956
2005	16,976

Table 6A-23 ESTIMATED SAVED MAINTENANCE COST OF EXISTING FACILITIES

(In 1979 thousand US$)

	1985-1994	1995-2005
Equipment & Tools	3	3
Buildings	-	95
Road	8	16
Others	140	140
Total	151	254

Table 6A-24 (Case 1) CASH FLOW OF ECONOMIC COSTS AND BENEFITS OF RANGOON INTERNATIONAL AIRPORT DEVELOPMENT PROJECT

(In 1979 thousand US$)

Year	Costs			Benefits								Discounted Cash Flow at 10%	
	Construction Cost	Maintenance & Operation Cost	Total Costs	Benefits of Overflowing Passengers forced to give up Their Trip	Benefits of Overflowing Passengers who continue Their Trips by Other Traffics	Time Saving Increment by Direct	Net Increase in Tourism Income	Airport Reverse Increment by Foreign Aircraft	Fuel Supply Revenue Increment by Foreign Aircraft	Saved Maintenance Cost of Existing Facilities	Total Benefits	Total Costs	Total Benefits
1980	11,513	0	11,513	0	0	0	0	0	0	0	0	10,466	0
1981	11,513	0	11,513	0	0	0	0	0	0	0	0	9,515	0
1982	11,513	0	11,513	0	0	0	0	0	0	0	0	8,650	0
1983	11,513	0	11,513	0	0	0	0	0	0	0	0	7,864	0
1984	11,513	0	11,513	0	0	0	0	0	0	0	0	7,149	0
1985	11,513	0	11,513	0	0	0	0	0	0	151	151	6,499	85
1986	11,513	1,382	12,895	55	109	3	1,013	29	335	151	1,695	6,617	869
1987	0	1,612	1,612	130	260	8	2,254	56	670	151	3,529	752	1,646
1988	0	1,612	1,612	230	459	12	3,747	85	1,004	151	5,688	684	2,412
1989	5,463	1,612	7,075	358	717	18	5,536	113	1,339	151	8,232	2,728	3,173
1990	5,463	1,612	7,075	518	1,036	25	7,689	127	1,673	151	11,219	2,480	3,932
1991	5,463	1,612	7,075	689	1,378	34	10,094	188	2,209	151	14,743	2,254	4,697
1992	5,463	1,612	7,075	891	1,783	43	12,947	249	2,744	151	18,808	2,049	5,448
1993	5,463	1,612	7,075	1,126	2,253	55	16,317	311	3,280	151	23,493	1,863	6,186
1994	5,463	1,612	7,075	1,397	2,794	69	20,302	344	3,813	151	28,870	1,694	6,911
1995	5,463	1,612	7,075	1,705	3,410	86	24,728	404	4,597	254	35,184	1,540	7,657
1996	0	2,377	2,377	2,003	4,006	104	29,820	455	5,468	254	42,110	470	8,331
1997	0	2,377	2,377	2,329	4,657	126	35,800	504	6,337	254	50,007	428	8,994
1998	0	2,377	2,377	2,681	5,363	149	42,436	555	7,207	254	58,645	389	9,588
1999	0	2,377	2,377	3,056	6,111	178	50,494	600	8,335	254	69,028	353	10,260
2000	0	2,377	2,377	3,453	6,905	213	59,803	646	8,640	254	79,914	321	10,798
2001	0	2,377	2,377	3,779	7,559	251	69,874	786	10,143	254	92,646	292	11,381
2002	0	2,377	2,377	4,096	8,192	295	81,153	909	11,678	254	106,577	266	11,902
2003	0	2,377	2,377	4,393	8,787	348	94,091	1,034	13,191	254	122,098	241	12,396
2004	0	2,377	2,377	4,658	9,316	405	109,011	1,171	14,712	254	139,527	219	12,877
2005	0	2,377	2,377	4,869	9,738	475	126,546	1,287	15,428	254	158,597	199	13,307
Total	118,832	39,660	158,492	42,416	84,833	2,897	803,655	9,853	122,803	4,304	1,070,761	75,982	152,850

Economic Internal Rate of Return (EIRR) = 16.1%

Residual Value = 19,121, Net Present Value = 78,481
Profitability Index = 2.055, Pay Back Period = 20 (years)

Table 6A-25 (Case 2) CASH FLOW OF ECONOMIC COSTS AND BENEFITS OF RANGOON INTERNATIONAL AIRPORT DEVELOPMENT PROJECT

(In 1979 thousand US$)

Year	Costs			Benefits								Discounted Cash Flow at 10%	
	Construction Cost	Maintenance & Operation Cost	Total Costs	Benefits of Overflowing Passengers forced to give up Their Trip	Benefits of Overflowing Passengers who continue Their Trips by Other Traffics	Time Saving Increment by Direct	Net Increase in Tourism Income	Airport Reverse Increment by Foreign Aircraft	Fuel Supply Revenue Increment by Foreign Aircraft	Saved Maintenance Cost of Existing Facilities	Total Benefits	Total Costs	Total Benefits
1980	11,487	0	11,487	0	0	0	0	0	0	0	0	10,443	0
1981	11,487	0	11,487	0	0	0	0	0	0	0	0	9,493	0
1982	11,487	0	11,487	0	0	0	0	0	0	0	0	8,630	0
1983	11,487	0	11,487	0	0	0	0	0	0	0	0	7,846	0
1984	11,487	0	11,487	0	0	0	0	0	0	0	0	7,133	0
1985	11,487	0	11,487	0	0	0	0	0	0	151	151	6,484	85
1986	11,487	1,378	12,865	55	109	3	1,013	29	335	151	1,695	6,602	869
1987	0	1,608	1,608	130	260	8	2,254	56	670	151	3,529	750	1,646
1988	0	1,608	1,608	230	459	12	3,747	85	1,004	151	5,688	682	2,412
1989	6,601	1,608	8,209	358	717	18	5,536	113	1,339	151	8,232	3,165	3,173
1990	6,601	1,608	8,209	518	1,036	25	7,689	127	1,673	151	11,219	2,877	3,932
1991	6,601	1,608	8,209	689	1,378	34	10,094	188	2,209	151	14,743	2,616	4,697
1992	6,601	1,608	8,209	891	1,783	43	12,947	249	2,744	151	18,808	2,378	5,448
1993	6,601	1,608	8,209	1,126	2,253	55	16,317	311	3,280	151	23,493	2,162	6,186
1994	6,601	1,608	8,209	1,397	2,794	69	20,302	344	3,813	151	28,870	1,965	6,911
1995	6,601	1,608	8,209	1,705	3,410	86	24,981	392	4,349	254	35,177	1,787	7,655
1996	0	2,532	2,532	2,003	4,006	104	30,083	446	5,271	254	42,167	501	8,342
1997	0	2,532	2,532	2,329	4,657	126	36,073	497	6,192	254	50,128	455	9,015
1998	0	2,532	2,532	2,681	5,363	151	43,005	550	7,114	254	59,118	414	9,666
1999	0	2,532	2,532	3,056	6,111	180	51,086	587	8,036	254	69,310	376	10,302
2000	0	2,532	2,532	3,453	6,905	215	60,419	644	8,956	254	80,846	342	10,924
2001	0	2,532	2,532	3,779	7,559	254	70,514	785	10,560	254	93,705	311	11,511
2002	0	2,532	2,532	4,096	8,192	298	82,151	911	12,165	254	108,067	283	12,068
2003	0	2,532	2,532	4,393	8,787	351	95,475	1,035	13,768	254	124,063	257	12,595
2004	0	2,532	2,532	4,658	9,316	412	110,810	1,174	15,372	254	141,996	234	13,105
2005	0	2,532	2,532	4,869	9,738	482	128,418	1,312	16,976	254	162,049	212	13,596
Total	126,616	41,170	167,786	42,416	84,833	2,926	812,914	9,835	125,826	4,304	1,083,054	78,398	154,138

Economic Internal Rate of Return (EIRR) = 16.0% Residual Value = 23,104, Net Present Value = 77,689
Profitability Index = 2.016, Pay Back Period = 20 (years)

APPENDIX 7A

DRAWINGS OF AIRPORT FACILITY PLAN

SOCIALIST REPUBLIC

OF

THE UNION OF BURMA

RANGOON INTERNATONAL AIRPORT DEVELOPMENT

FEASIBILITY STUDY

FACILITY PLAN DRAWINGS

MARCH 1980

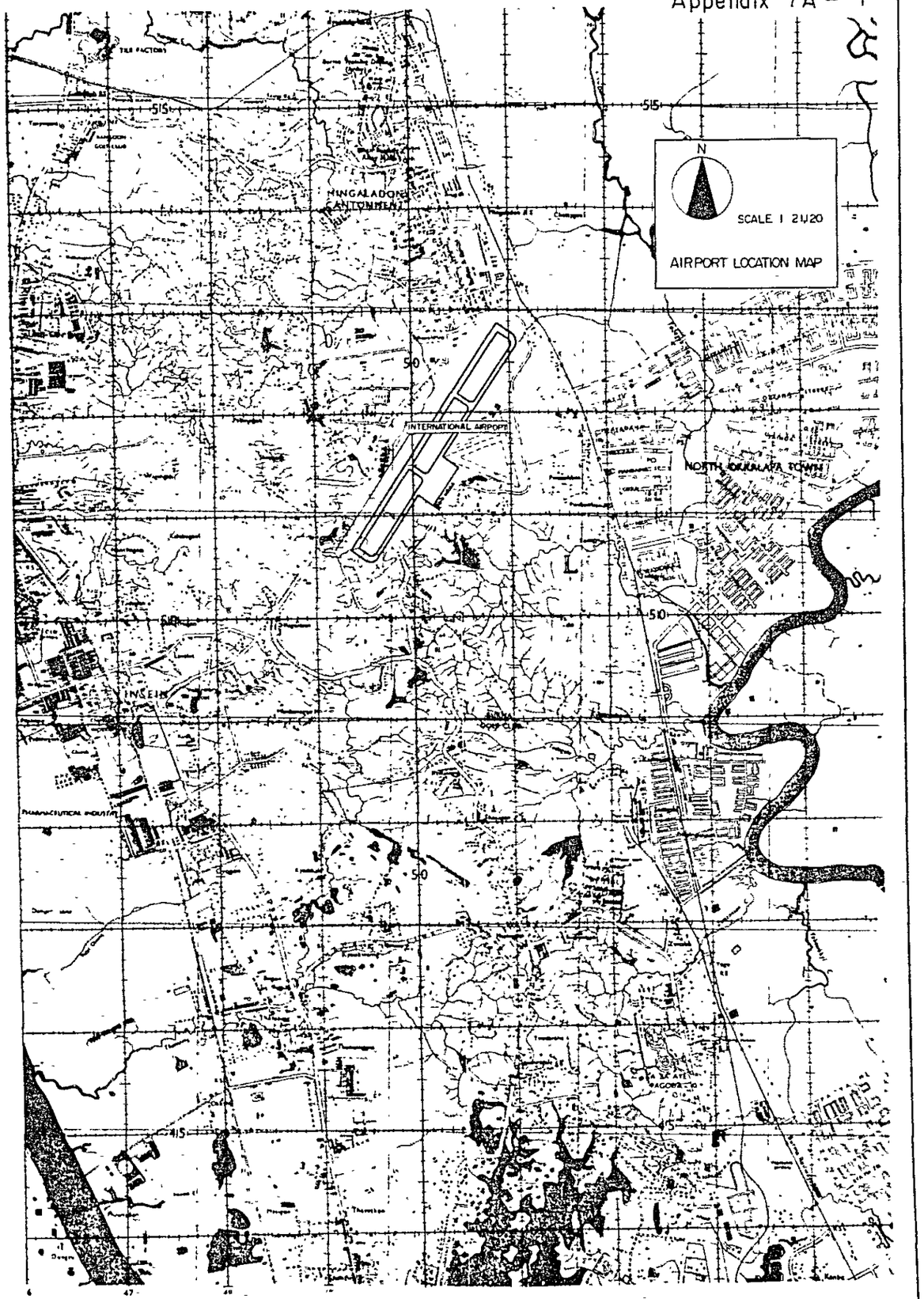
JAPAN INTERNATIONAL COOPERATION AGENCY

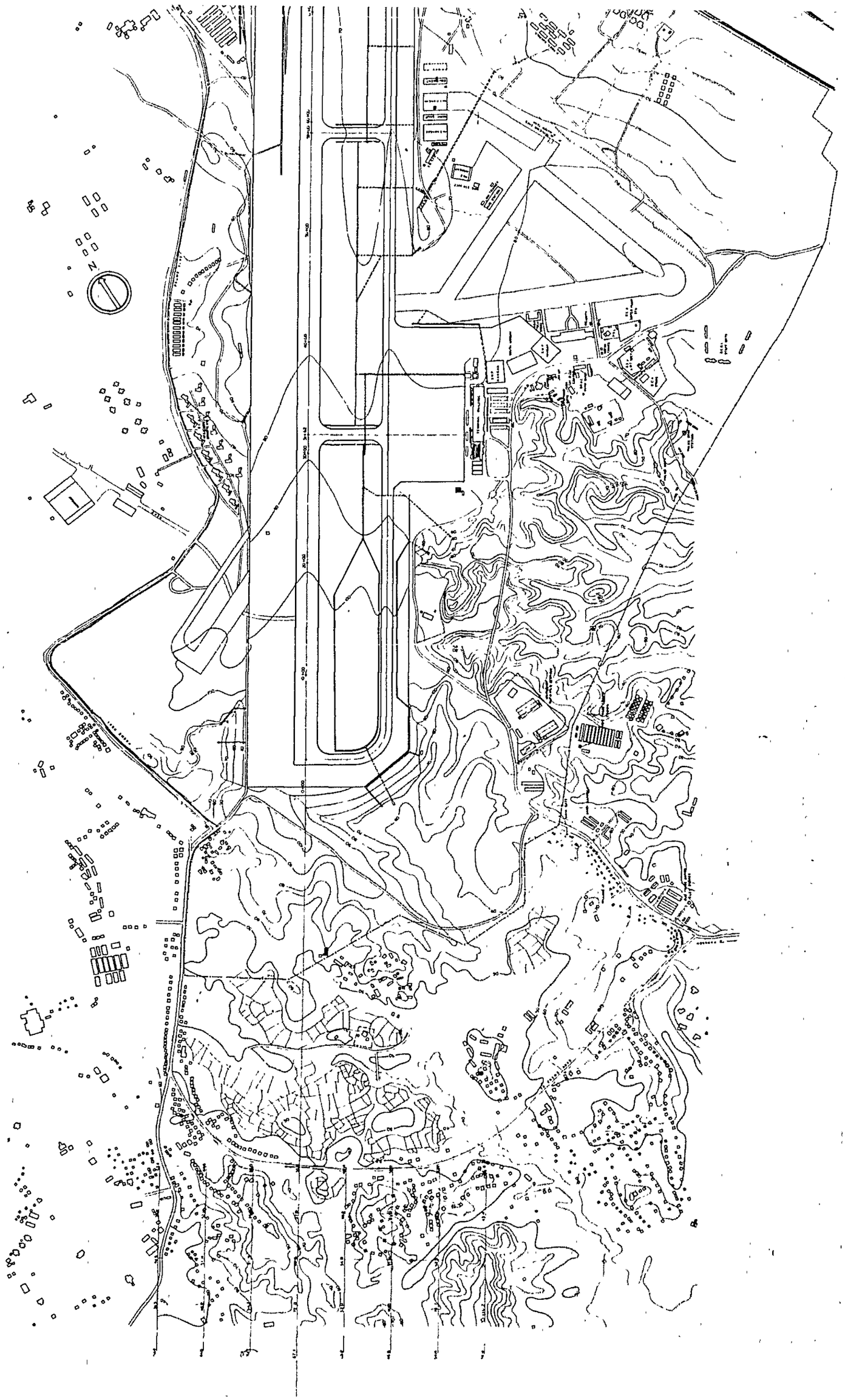
LISTS OF FACILITY PLAN DRAWINGS

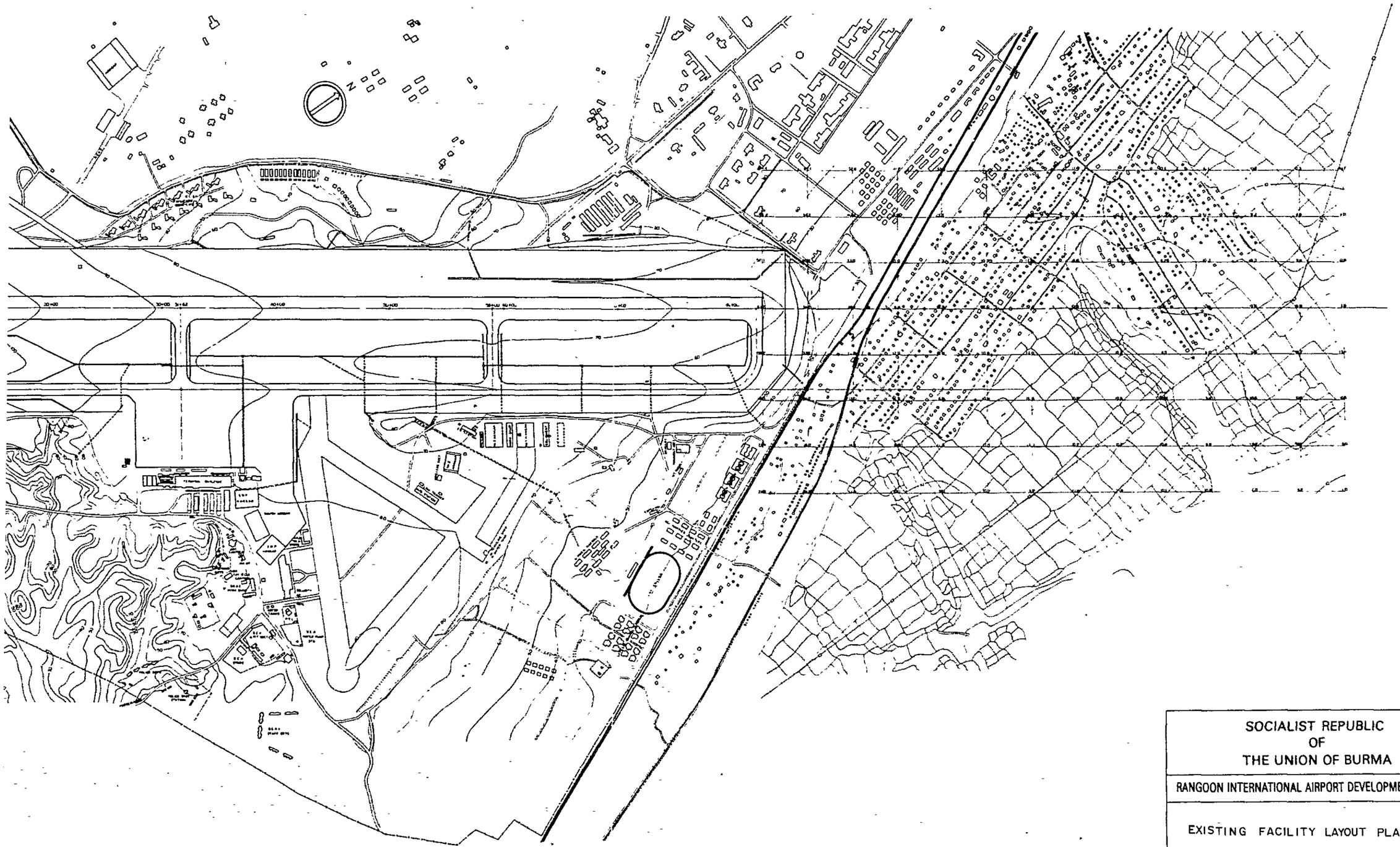
DRAWING NUMBER

1 EXISTING FACILITY LAYOUT PLAN
2 AIRPORT LAYOUT PLAN CASE - 1
3 AIRPORT LAYOUT PLAN CASE - 2
4 AIRPORT BASIC DIMENSIONS CASE - 1
5 AIRPORT BASIC DIMENSIONS CASE - 2
6 RUNWAY PLOFILE
7 TAXIWAY PLOFILE
8 TYPICAL CROSS SECTION
9 CROSS SECTION — 1
10 CROSS SECTION — 2
11 PAVEMENT (NEW CONSTRUCTION)
12 PAVEMENT (OVERLAYS)
13 TYPICAL CROSS SECTION OF RAILWAY & ROAD & CULVERT
14. TERMINAL AREA LAYOUT PLAN PHASE I
15 PASSENGER TERMINAL BUILDINGS ELEVATION SECTION PHASE I
16 PASSENGER TERMINAL BUILDINGS GROUND FLOOR PLAN PHASE I
17 PASSENGER TERMINAL BUILDINGS 1 ST FLOOR PLAN PHASE I
18 PASSENGER TERMINAL BUILDINGS 2 ND FLOOR PLAN PHASE I
19 PASSENGER & BAGGAGE TRAFFIC FLOW GROUND FLOOR PLAN PHASE I
20 PASSENGER & BAGGAGE TRAFFIC FLOW 1 ST FLOOR PLAN PHASE I
21 CONTROL TOWER & OPERATIONAL MAIN POWER SUBSTATION & FIRE FIGHTING & RESCUE STATION BUILDINGS
22 TERMINAL AREA LAYOUT PLAN PHASE II
23 PASSENGER TERMINAL BUILDINGS ELEVATION SECTION PHASE II
24 PASSENGER TERMINAL BUILDINGS GROUND FLOOR PLAN PHASE II
25 PASSENGER TERMINAL BUILDINGS 1 ST FLOOR PLAN PHASE II
26 PASSENGER TERMINAL BUILDINGS 2 ND FLOOR PLAN PHASE II
27 PASSENGER & BAGGAGE TRAFFIC FLOW GROUND FLOOR PLAN PHASE II
28 PASSENGER & BAGGAGE TRAFFIC FLOW 1 ST FLOOR PLAN PHASE II
29 INTERNATIONAL & DOMESTIC CARGO BUILDING, G S E & CATERING BUILDINGS
30 AIRFIELD LIGHTING LAYOUT CASE - 1
31 AIRFIELD LIGHTING LAYOUT CASE - 2
32 INSTALLATION CONCEPT - 1
33. INSTALLATION CONCEPT - 2
34. ELECTRIC POWER SUPPLY CONNECTION DIAGRAM
35 ELECTRIC POWER SUPPLY DISTRIBUTION SYSTEM
36 RADIO NAV-AIDS TELECOMMUNICATION & METEOROLOGICAL SYSTEMS

Appendix 7A - 1







SOCIALIST REPUBLIC
OF
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RANGOON INTERNATIONAL AIRPORT DEVELOPMENT PROJECT

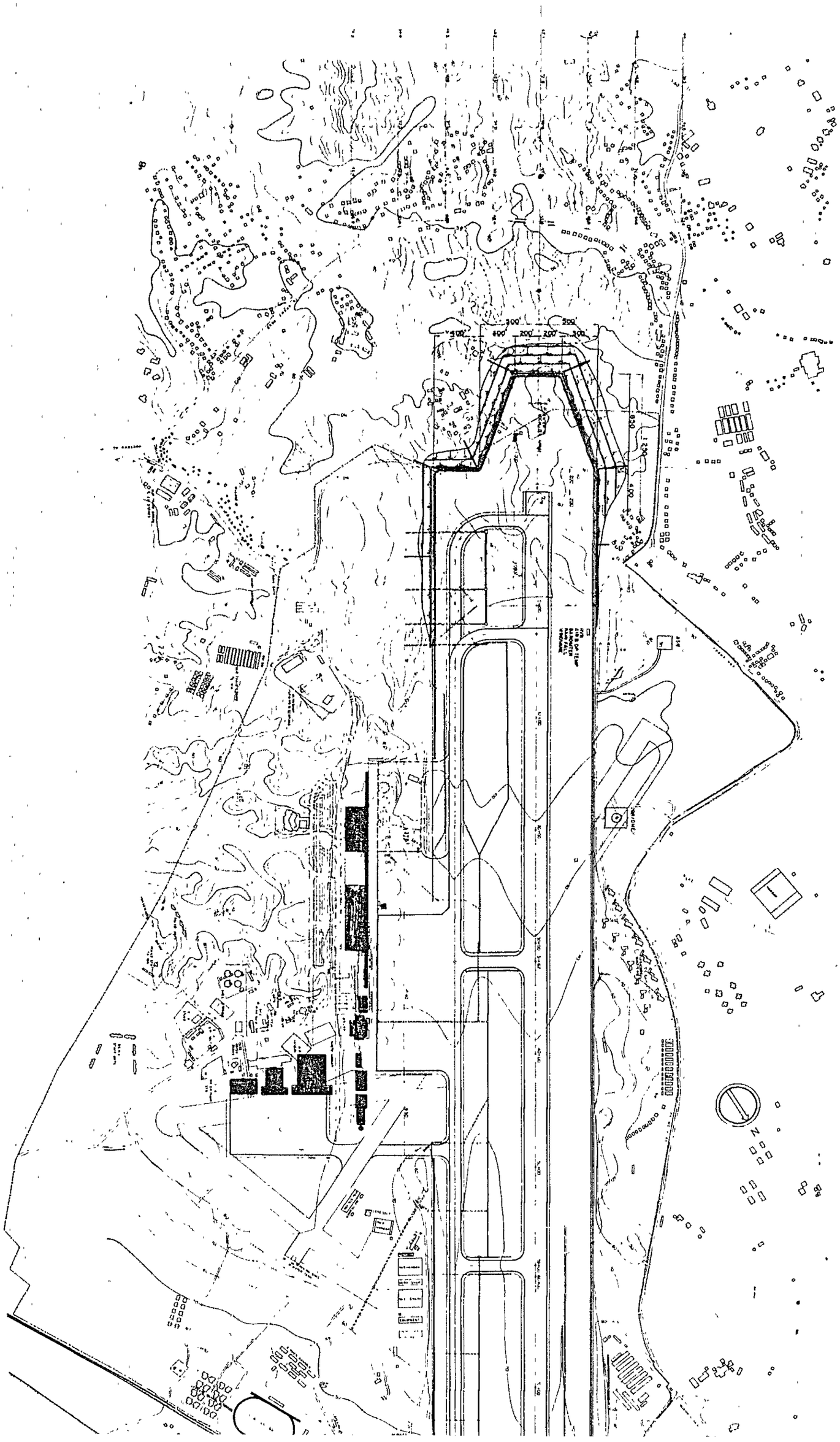
EXISTING FACILITY LAYOUT PLAN

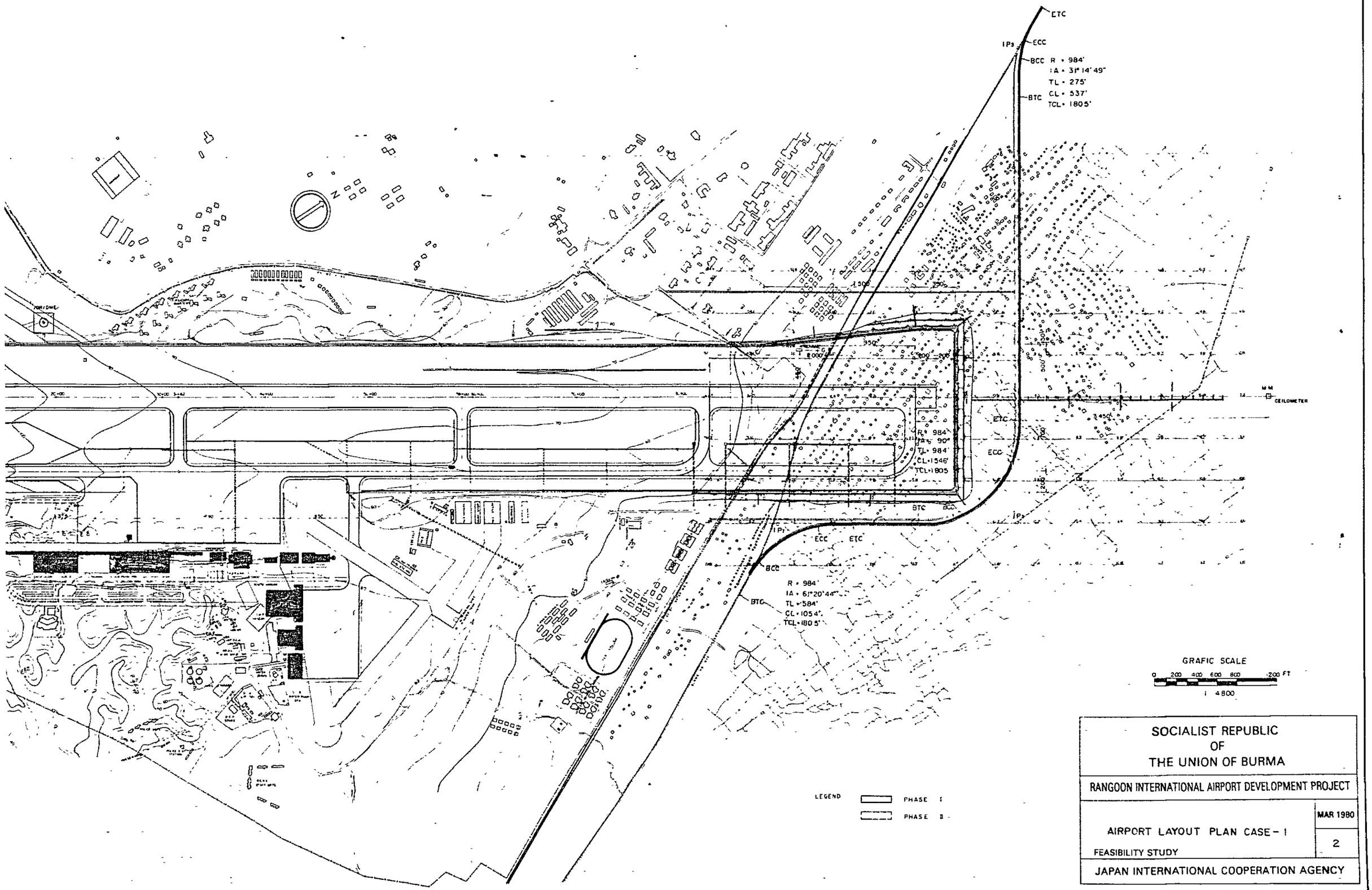
MAR 1980

FEASIBILITY STUDY

JAPAN INTERNATIONAL COOPERATION AGENCY

Fig 3 - 4


500
400
300
200
200
300
500
N



SOCIALIST REPUBLIC
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RANGOON INTERNATIONAL AIRPORT DEVELOPMENT PROJECT

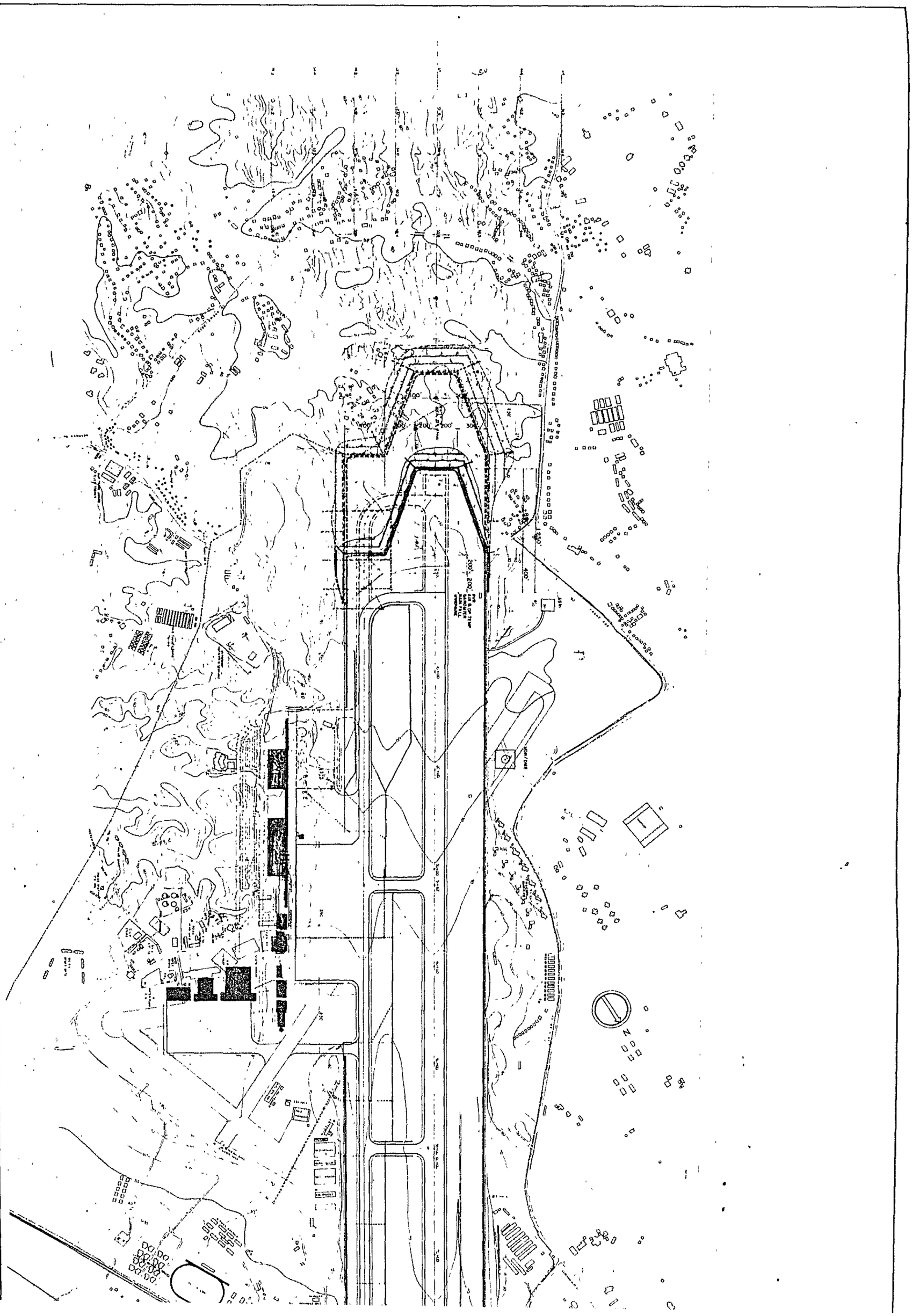
AIRPORT LAYOUT PLAN CASE - I

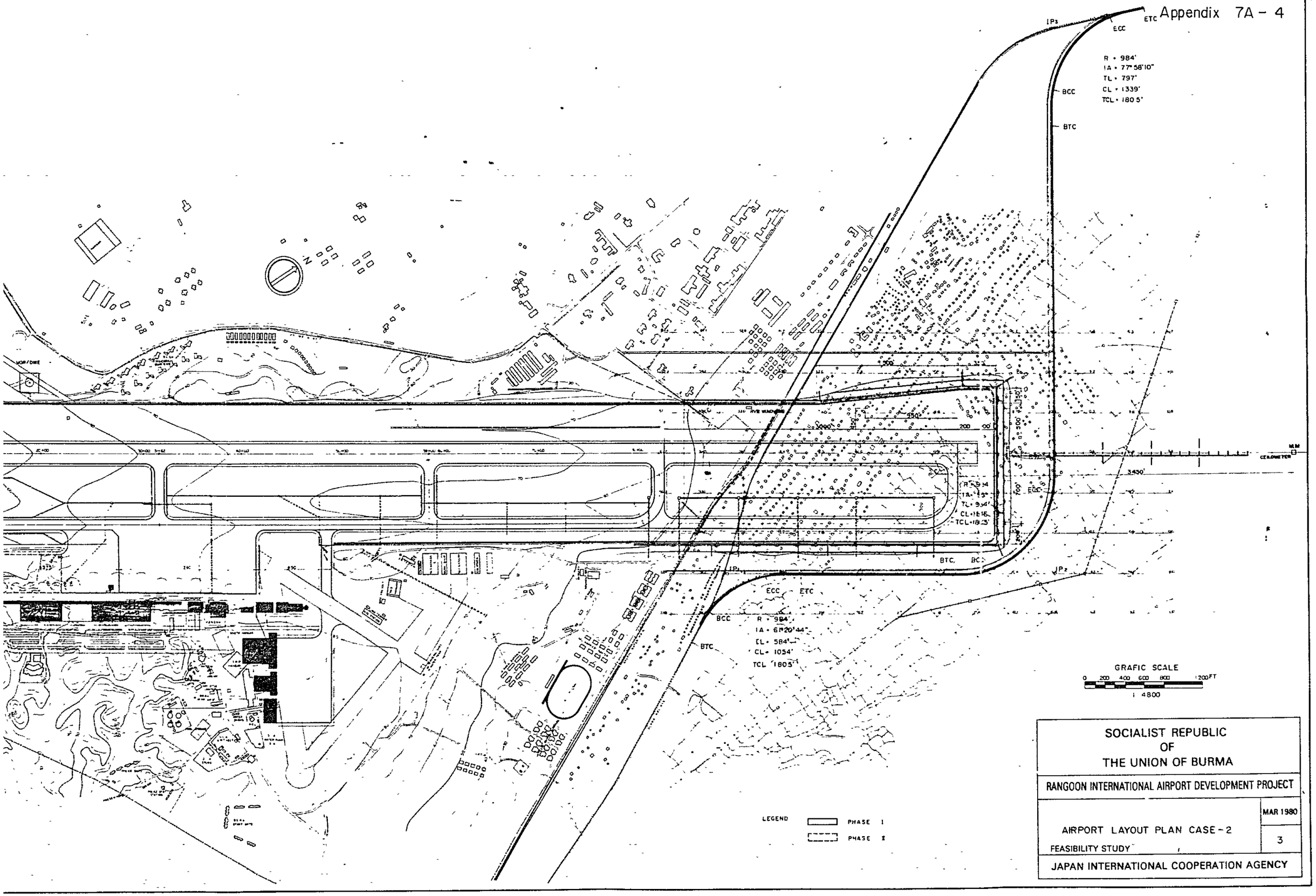
MAR 1980

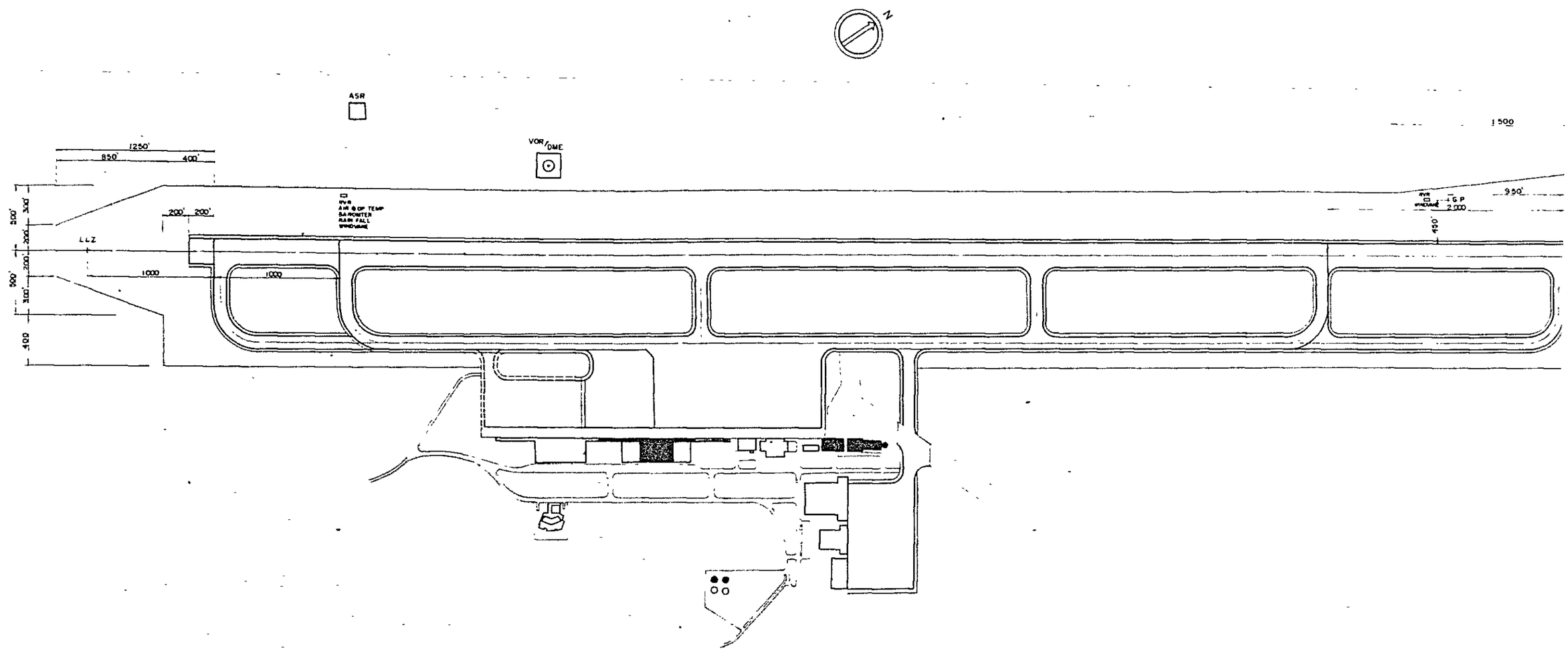
2

FEASIBILITY STUDY

JAPAN INTERNATIONAL COOPERATION AGENCY


200'
200'
200'
200'
300'
400'
N


IP3
ETC
ECC
R = 984'
IA = 77°58'10"
TL = 797'
CL = 1339'
TCL = 1805'
BCC
BTC
ECC
ETC
BCC
BTC
R = 984'
IA = 61°20'44"
TL = 584'
CL = 1054'
TCL 1805'
GRAFIC SCALE
0 200 400 600 800 1200FT
1 4800
LEGEND
PHASE I
PHASE II
SOCIALIST REPUBLIC
OF
THE UNION OF BURMA
RANGOON INTERNATIONAL AIRPORT DEVELOPMENT PROJECT
AIRPORT LAYOUT PLAN CASE-2
FEASIBILITY STUDY
MAR 1980
3
JAPAN INTERNATIONAL COOPERATION AGENCY

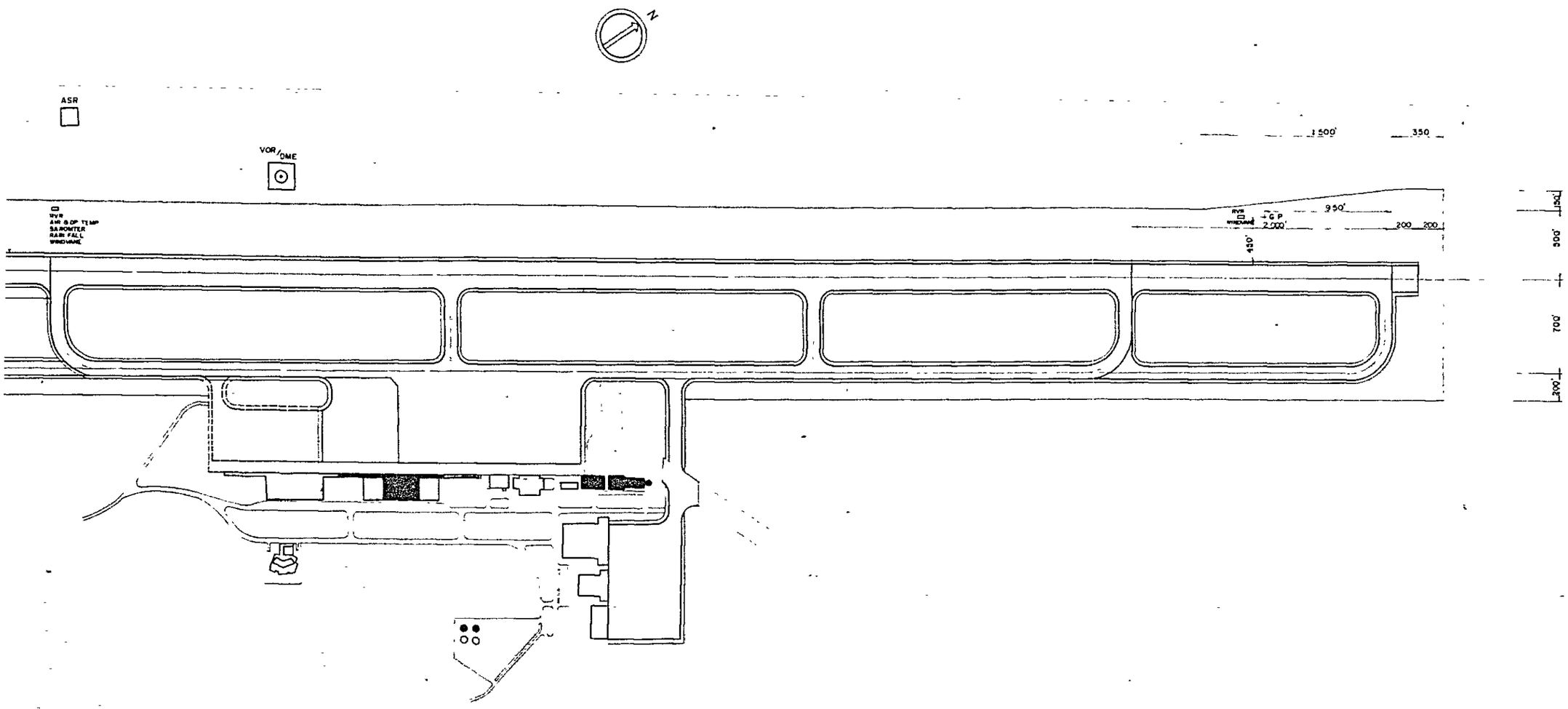


RUNWAY TAXIWAY APRON

LEGEND
PHASE I
PHASE II

TERMINAL AREA

LEGEND
PHASE I
PHASE II



RUNWAY TAXIWAY APRON

LEGEND
PHASE I
PHASE II

TERMINAL AREA

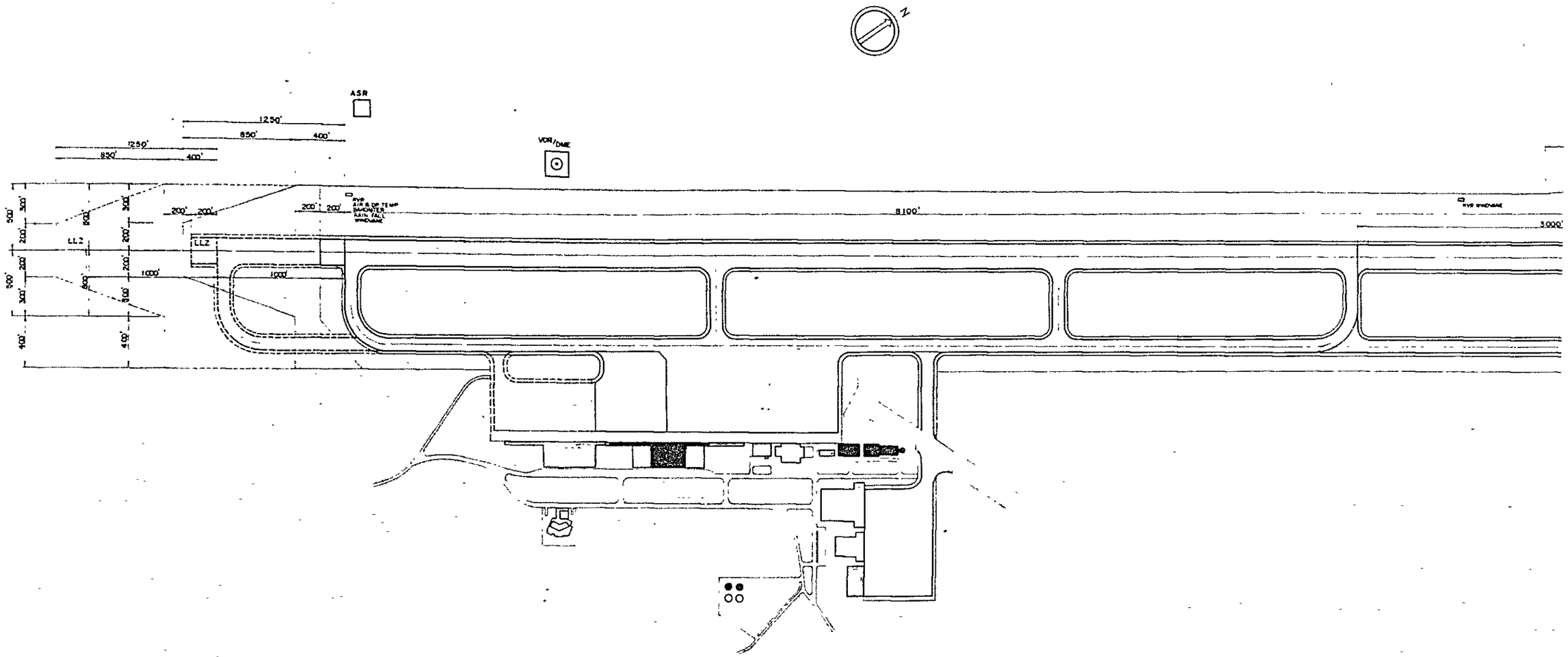
LEGEND
PHASE I
PHASE II

GRAFIC SCALE

0 200 400 600 800 1000 FT

1 4800

SOCIALIST REPUBLIC OF THE UNION OF BURMA	
RANGOON INTERNATIONAL AIRPORT DEVELOPMENT PROJECT	
AIRPORT BASIC DIMENSIONS CASE - I	MAR 1980
FEASIBILITY STUDY	4
JAPAN INTERNATIONAL COOPERATION AGENCY	

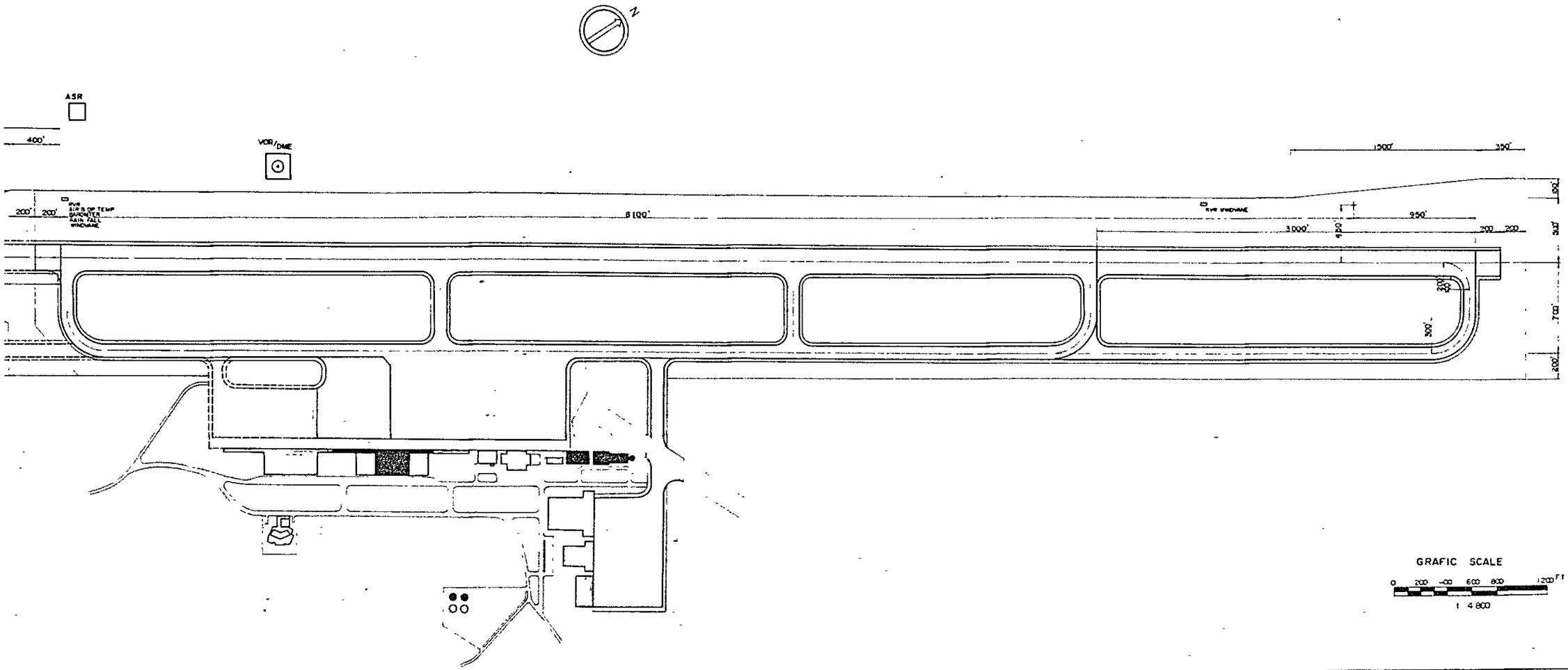


RUNWAY TAXIWAY APRON

LEGEND
PHASE I
PHASE II

TERMINAL AREA

LEGEND
PHASE I
PHASE II



GRAFIC SCALE

0 200 400 600 800 1200 FT

1 : 4 800

RUNWAY TAXIWAY APRON

LEGEND PHASE I

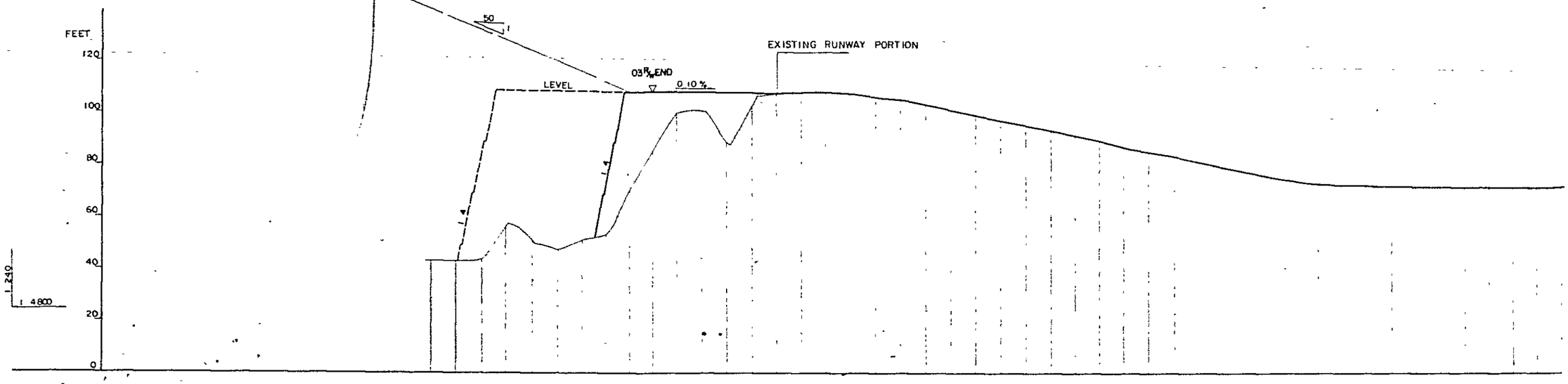
PHASE II

TERMINAL AREA

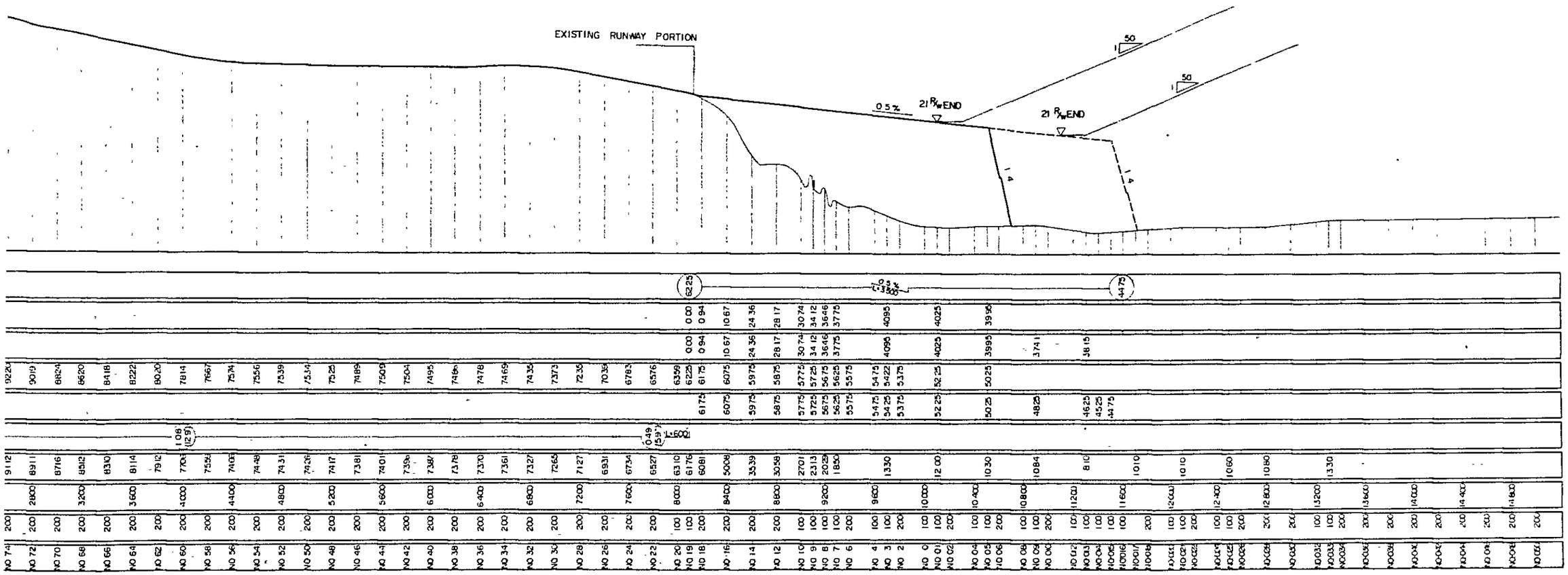
LEGEND PHASE I

PHASE II

SOCIALIST REPUBLIC OF THE UNION OF BURMA	
RANGOON INTERNATIONAL AIRPORT DEVELOPMENT PROJECT	
AIRPORT BASIC DIMENSIONS CASE – 2	MAR 1980
FEASIBILITY STUDY	5
JAPAN INTERNATIONAL COOPERATION AGENCY	



STATION	DISTANCE	ACCUMULATED DISTANCE	GROUND HIGHT	OVERLAY THICKNESS Feet (Inch)	FORMATION HIGHT CASE-2	FORMATION HIGHT CASE-1	FILL CASE-2	FILL CASE-1	GRADIENT
NO 154	200	5200							
NO 152	200								
NO 150	200	4800							
NO 148	200								
NO 146	200	4400							
NO 144	200								
NO 142	200	4000							
NO 140	200								
NO 138	200	3600							
NO 136	200								
NO 134	200	3200							
NO 132	200								
NO 130	200		4311						
NO 128	200	2800	4320						
NO 126	200		4260						
NO 124	200	2400	4410						
NO 122	200		5870			11054	5184	5184	
NO 120	200	2000	5051		11054	11054	6003	6003	
NO 118	200		4931		11054	11054	6123	6123	
NO 116	200	1600	5247		11054	11054	5807	5807	
NO 114	200		5467		11054	11054	5538	5538	
NO 112	200	1200	7273		11054	11054	3781	3781	
NO 110	200		8988		11054	11054	2066	2066	
NO 108	200	800	10254		11034	11034	784	784	
NO 106	200		10304		11014	11014	710	710	
NO 104	200	400	8897		10994	10994	2097	2097	
NO 102	200		10866		10974	10974	108	108	
NO 100	0	0	10905		10954	10954	000	000	LEVEL L=1250
NO 98	200		10927	0.49 (5.9")		10976			
NO 96	200	400	10931	L=600		10980			
NO 94	200		10905			10955			
NO 92	200	800	10870			10918			
NO 90	200		10719			10827			
NO 88	200	1200	10516			10624			
NO 86	200		10320			10428			
NO 84	200	1600	10119			10226			
NO 82	200		9914			10022			
NO 80	200	2000	9712			9820			
NO 78	200		9505			9617			
NO 76	200	2400	9304			9412			
NO 74	200		9112			9220			
NO 72	200	2800	8911			9019			
NO 70	200		8716			8824			
NO 68	200	3200	8512			8620			
NO 66	200		8310			8418			
NO 64	200	3600	8114			8222			
NO 62	200		7912			8020			
NO 60	200	4000	7705	1.08 (12.9")		7814			
NO 58	200		7556			7667			
NO 56	200	4400	7466			7574			
NO 54	200		7428			7556			
NO 52	200	4800	7431			7539			
NO 50	200		7426			7534			
NO 48	200	5200	7417			7525			
NO 46	200		7381			7489			
NO 44	200	5600	7401			7509			
NO 42	200		7356			7504			
NO 40	200	6000	7387			7495			
NO 38	200		7376			7493			



SOCIALIST REPUBLIC
OF
THE UNION OF BURMA

RANGOON INTERNATIONAL AIRPORT DEVELOPMENT PROJECT

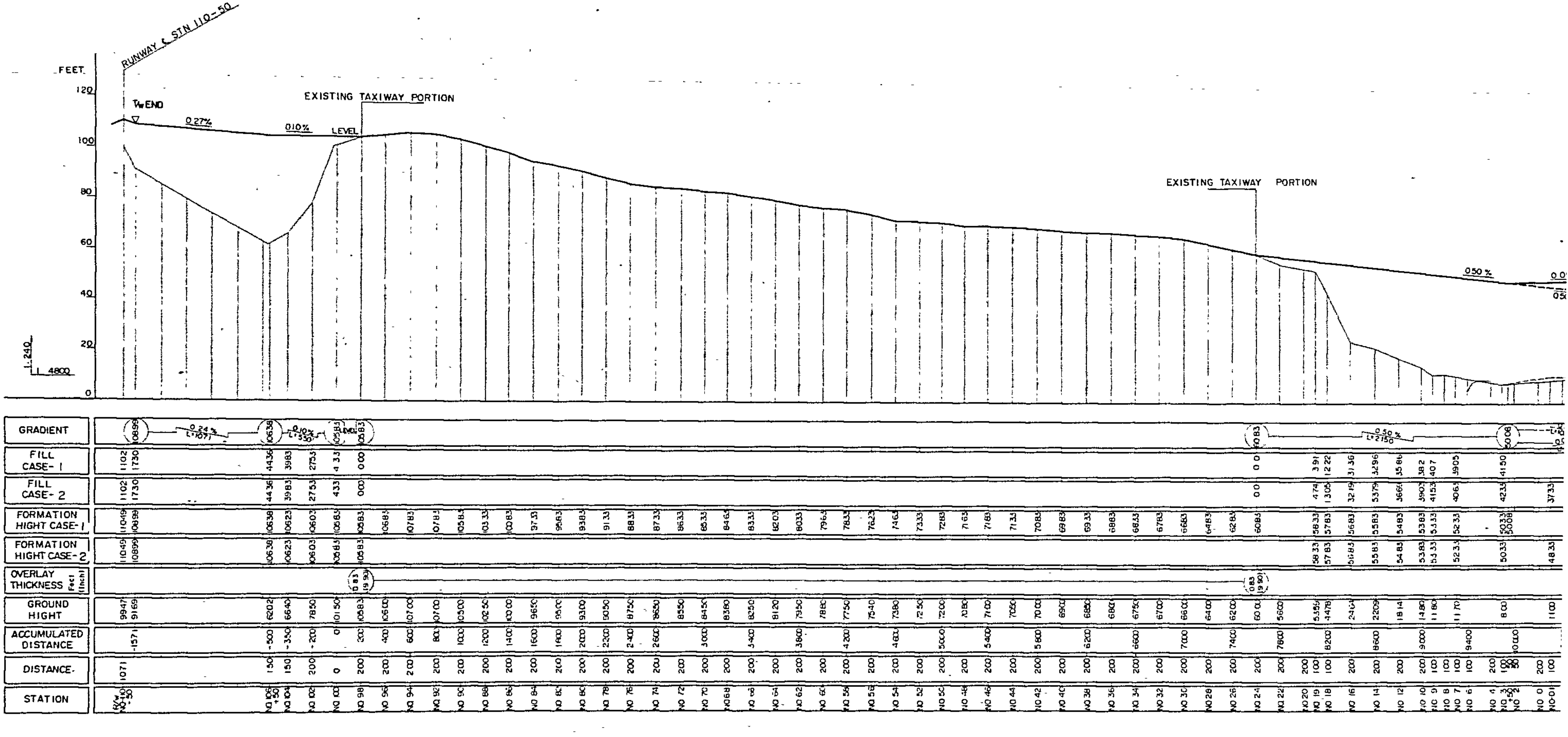
MAR 1980

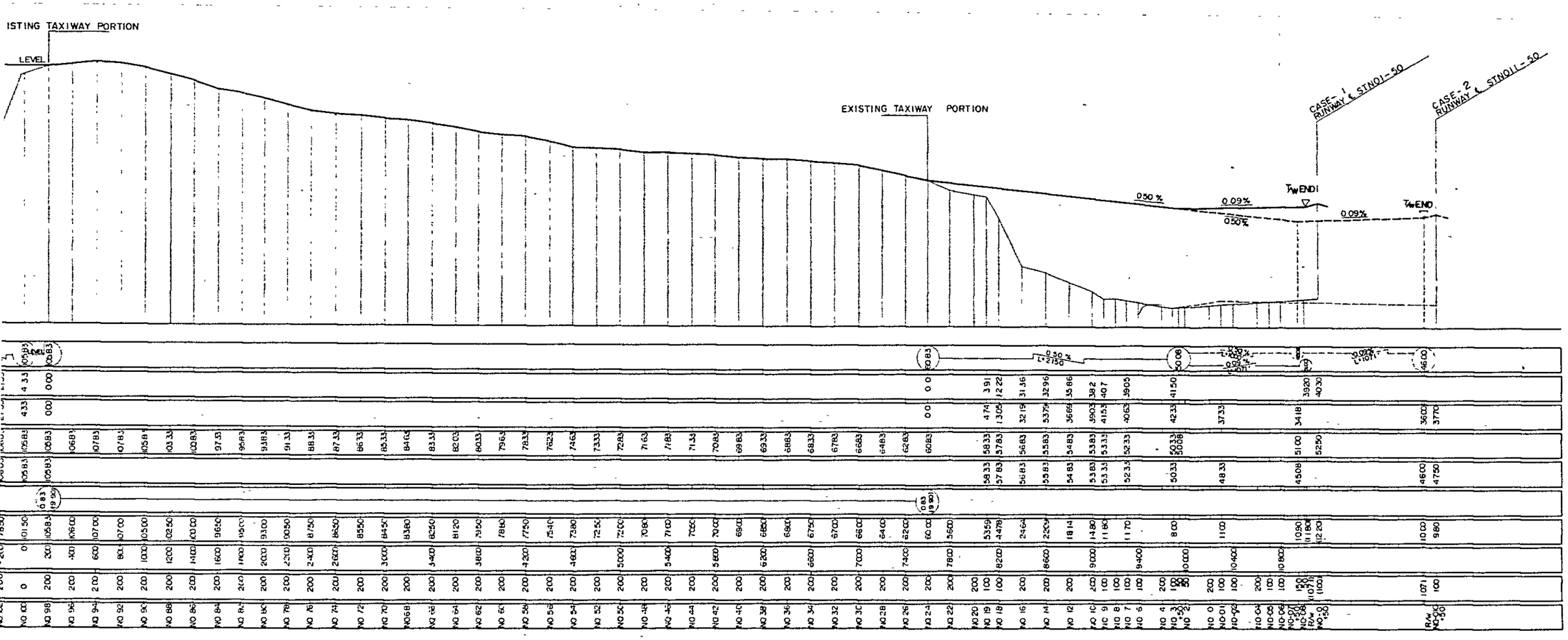
RUNWAY PLOFILE

FEASIBILITY STUDY

6

JAPAN INTERNATIONAL COOPERATION AGENCY


RUNWAY ℄ STN 110-50
FEET
120
100
80
60
40
20
0
1:240
1:4800
T/W END
0.27%
0.10%
LEVEL
EXISTING TAXIWAY PORTION
EXISTING TAXIWAY PORTION
0.50%
GRADIENT
FILL CASE- 1
FILL CASE- 2
FORMATION HIGHT CASE- 1
FORMATION HIGHT CASE- 2
OVERLAY THICKNESS Feet (Inch)
GROUND HIGHT
ACCUMULATED DISTANCE
DISTANCE
STATION

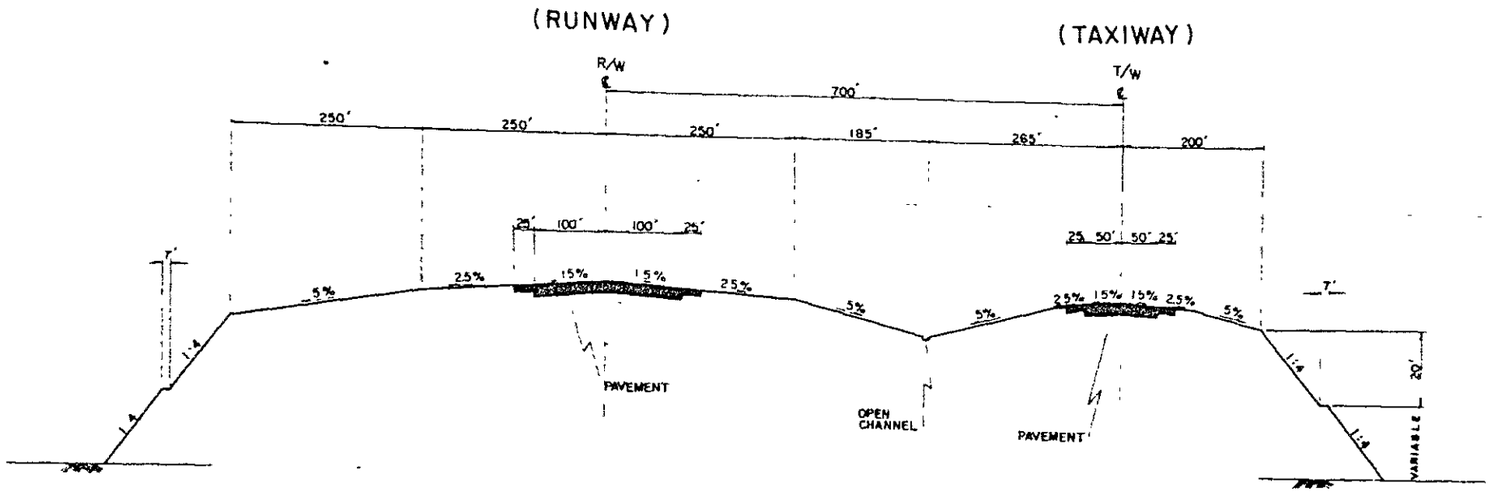


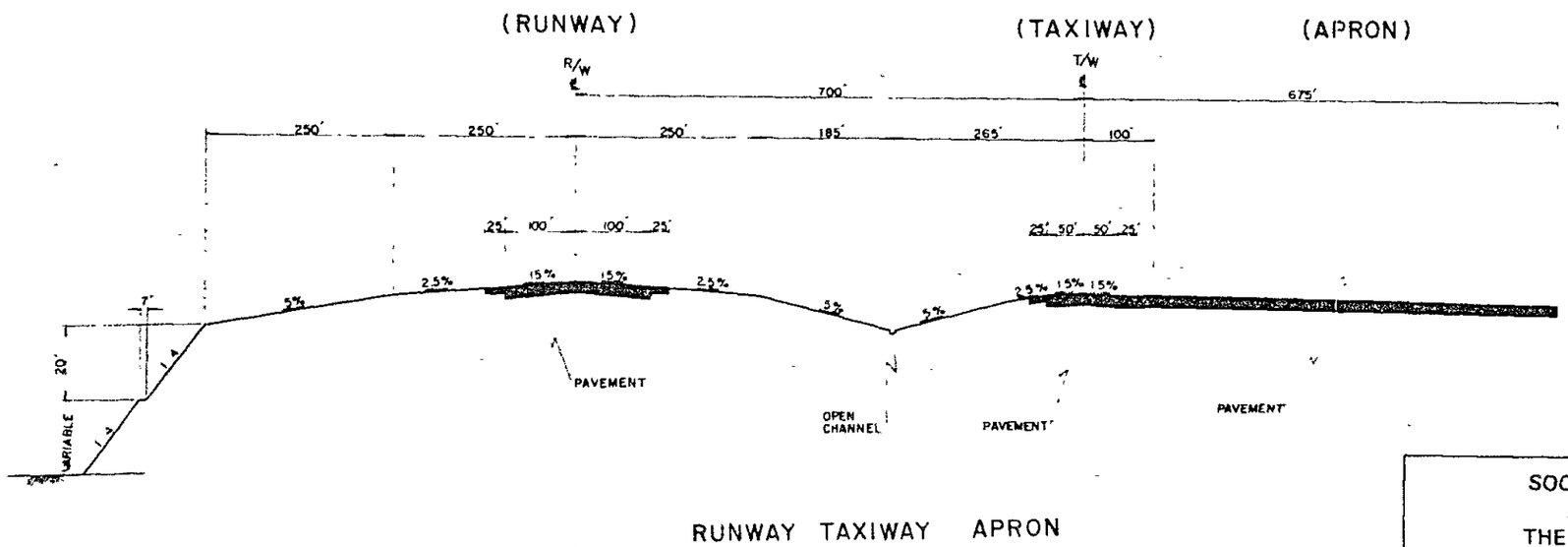
SOCIALIST REPUBLIC
OF
THE UNION OF BURMA

RANGOON INTERNATIONAL AIRPORT DEVELOPMENT PROJECT

TAXIWAY PLOFILE	MAR 1980
FEASIBILITY STUDY	7

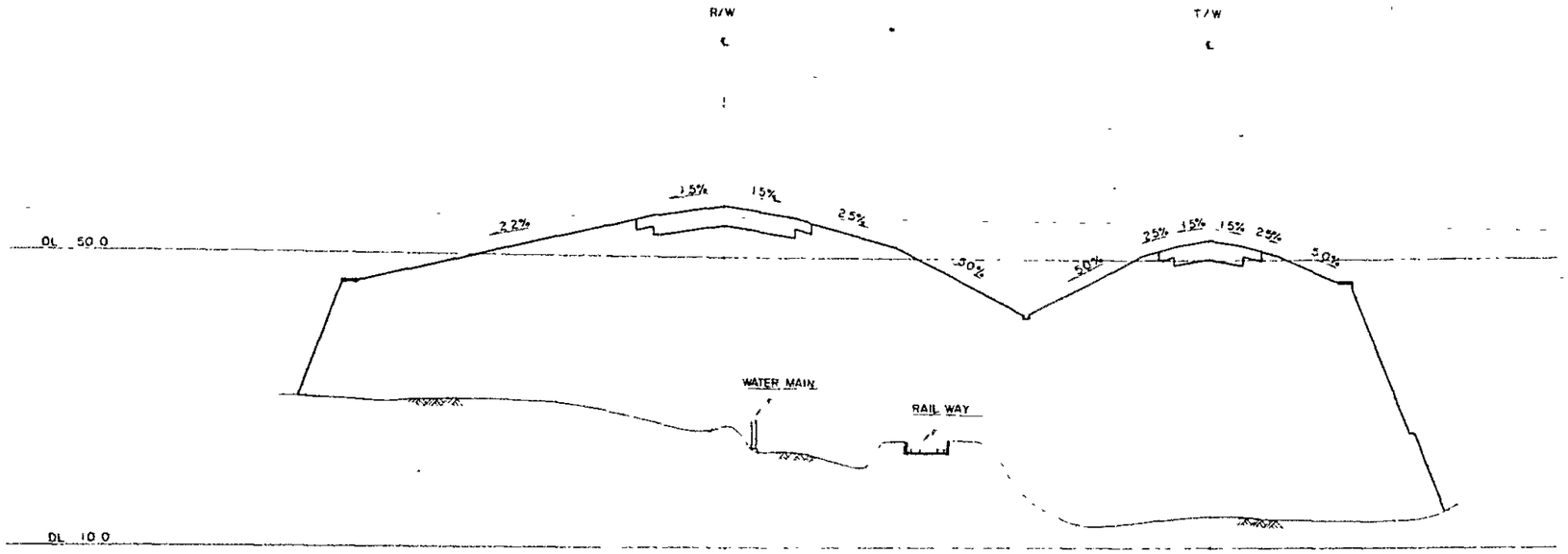
JAPAN INTERNATIONAL COOPERATION AGENCY



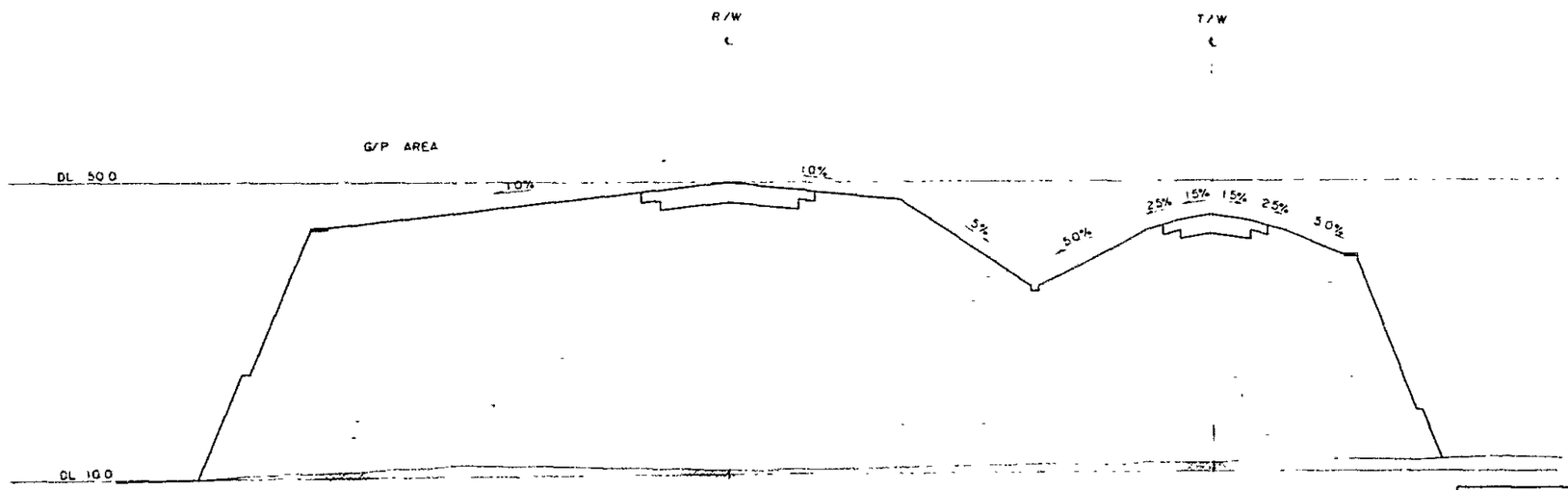


SOCIALIST REPUBLIC OF THE UNION OF BURMA	
RANGOON INTERNATIONAL AIRPORT DEVELOPMENT PROJECT	
TYPICAL CROSS SECTION	MAR 1980
FEASIBILITY STUDY	8
JAPAN INTERNATIONAL COOPERATION AGENCY	

STA No 10



STA No – 05



GRAPHIC SCALE

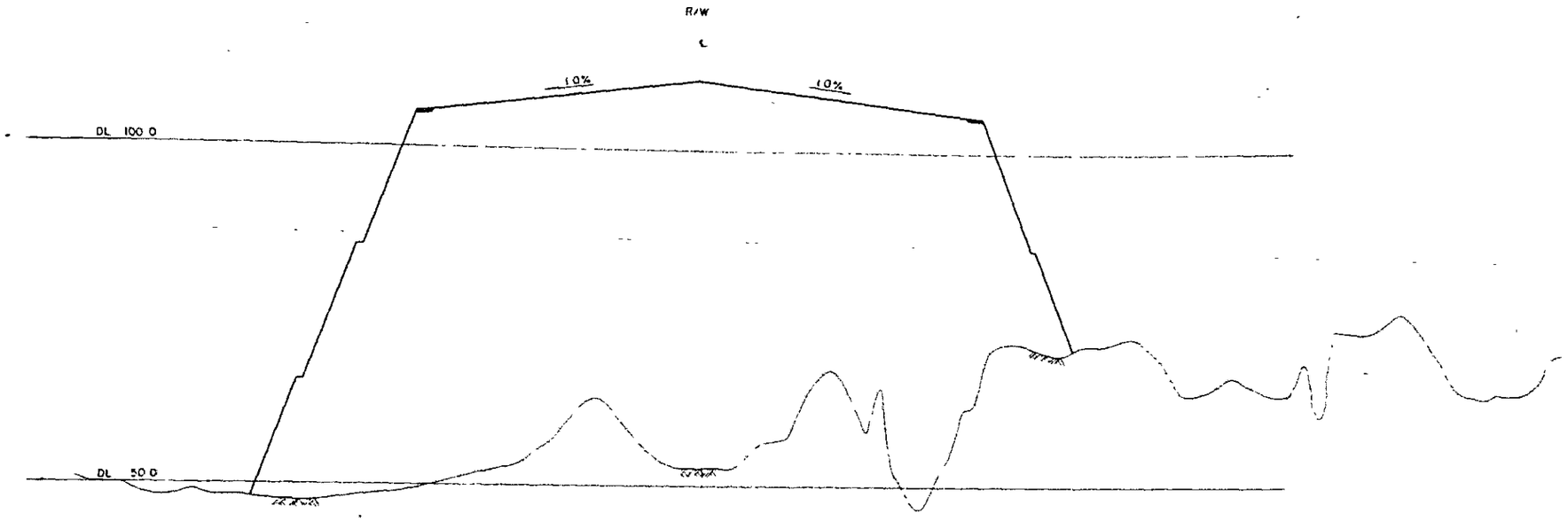
0 50 100 200
HORIZONTAL 1 1200

0 5 10 20
VERTICAL 1 120

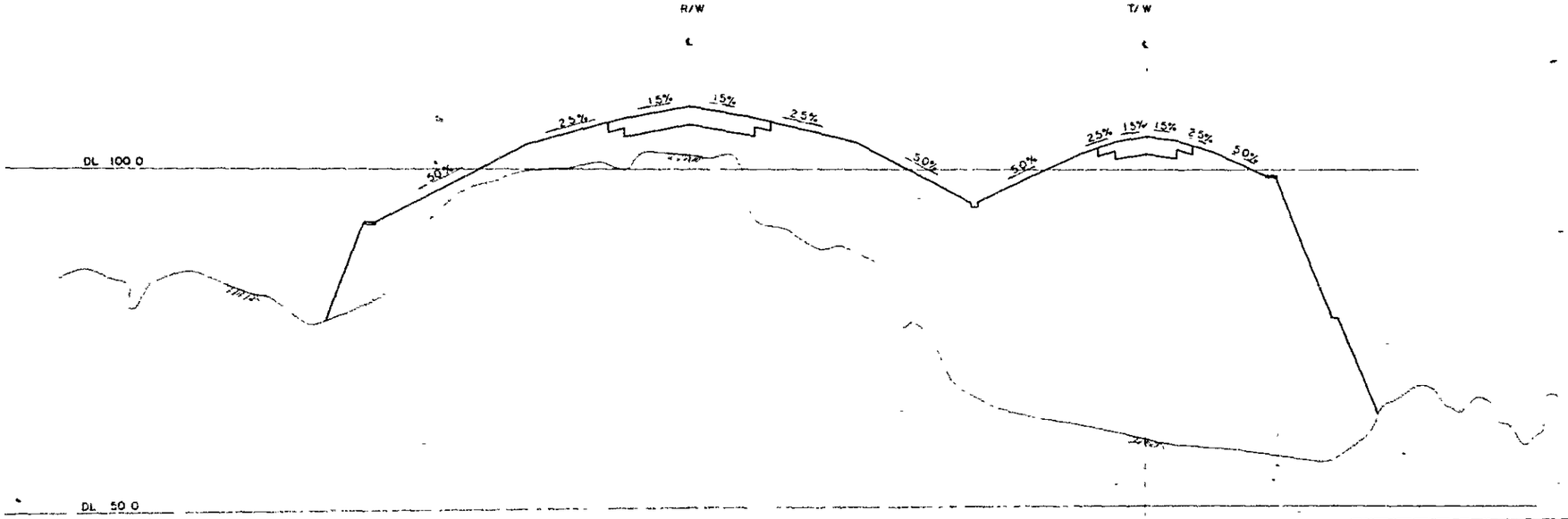
SOCIALIST REPUBLIC OF THE UNION OF BURMA	
RANGOON INTERNATIONAL AIRPORT DEVELOPMENT PROJECT	
CROSS SECTION – 1	MAR 1980
FEASIBILITY STUDY	9
JAPAN INTERNATIONAL COOPERATION AGENCY	

STA No 116

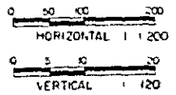
LOCALIZER AREA



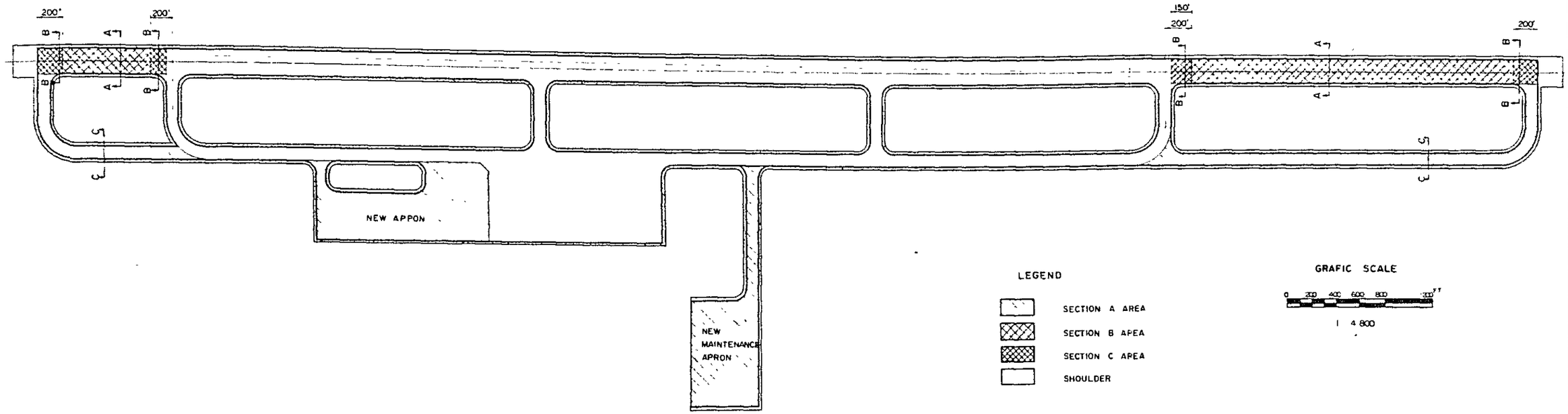
STA No 106

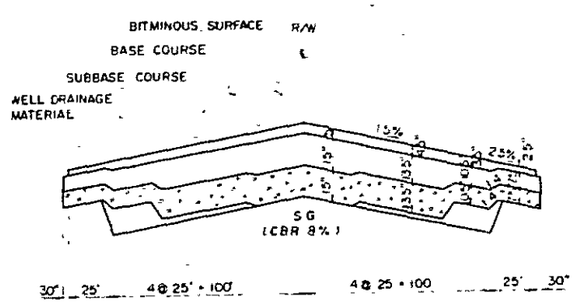


GRAPHIC SCALE

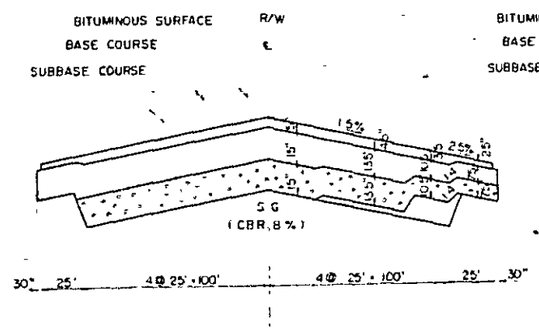


SOCIALIST REPUBLIC OF THE UNION OF BURMA	
RANGOON INTERNATIONAL AIRPORT DEVELOPMENT PROJECT	
CROSS SECTION - 2	MAR 1980
FEASIBILITY STUDY	10
JAPAN INTERNATIONAL COOPERATION AGENCY	

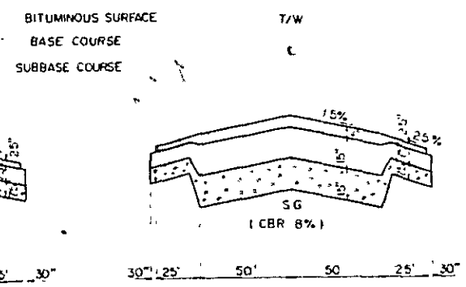




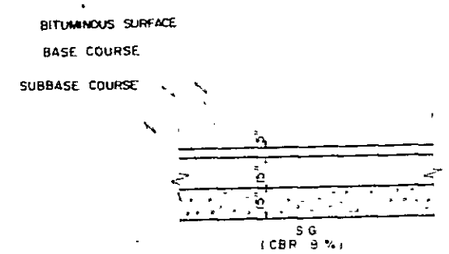
SECTION A – A



SECTION B – B

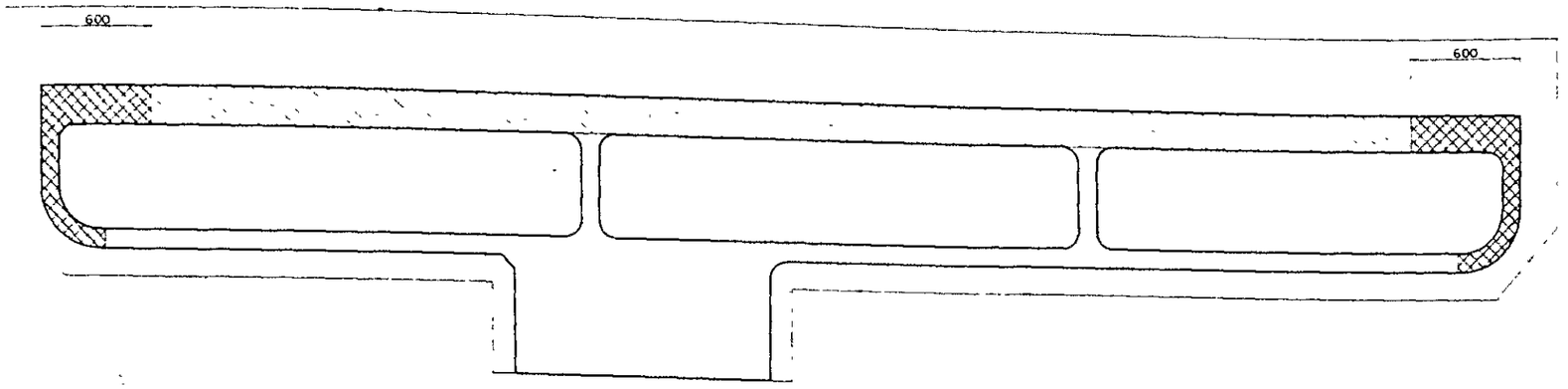


SECTION C – C



APRON

SOCIALIST REPUBLIC OF THE UNION OF BURMA	
RANGOON INTERNATIONAL AIRPORT DEVELOPMENT PROJECT	
PAVEMENT (NEW CONSTRUCTION)	MAR 1980
FEASIBILITY STUDY	11
JAPAN INTERNATIONAL COOPERATION AGENCY	



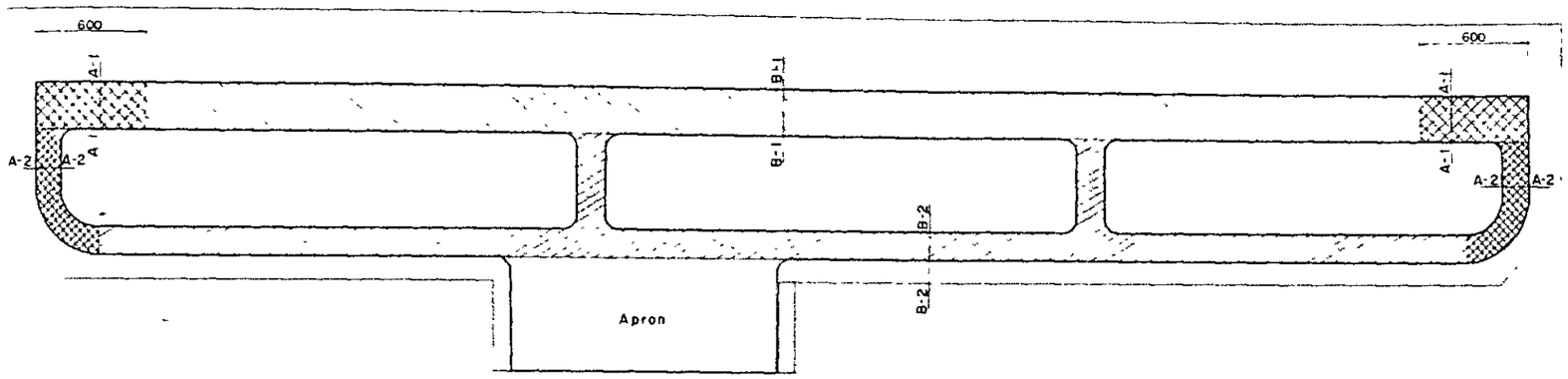
EXISTING PAVEMENT THICKNESS

LEGEND

16"

14"

12.5"



OVERLAY DESIGN THICKNESS

LEGEND

BITUMINOUS OVELAY

SEE SECTION A - 1

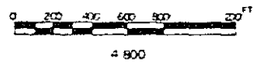
SEE SECTION A - 2

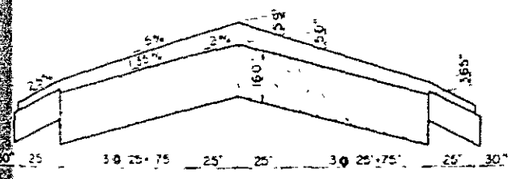
SEE SECTION B - 1

SEE SECTION B - 2

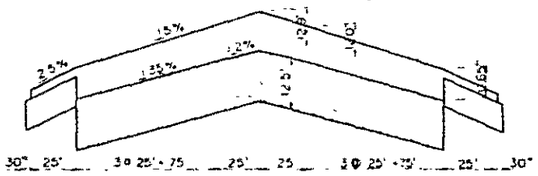
APRON AREA

GRAFIC SCALE

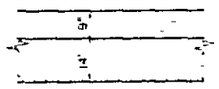




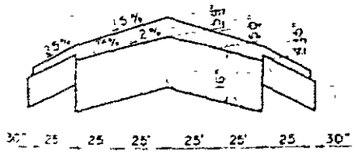
SECTION A - 1



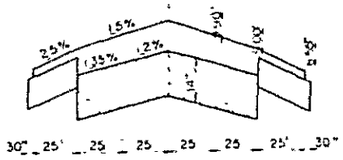
SECTION B - 1



APRON



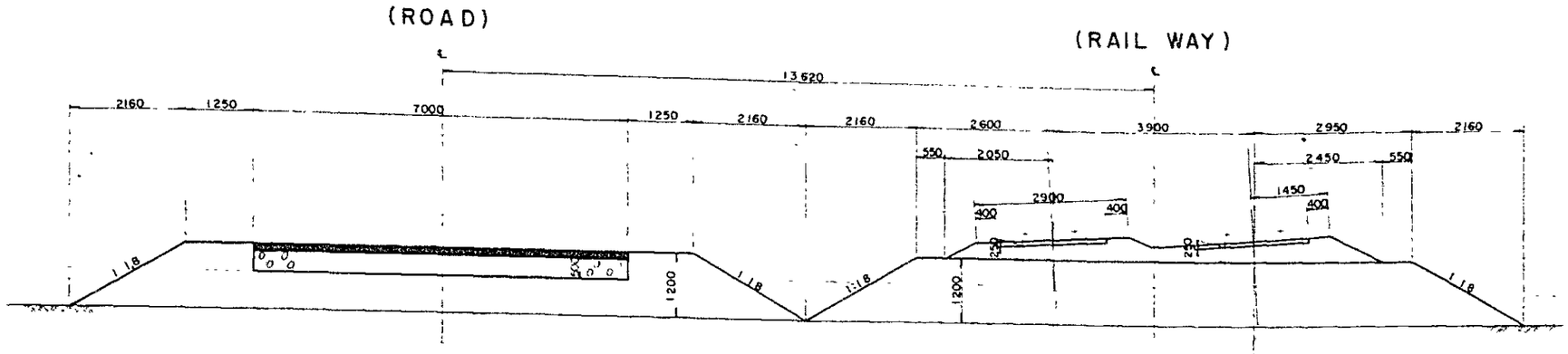
SECTION A - 2



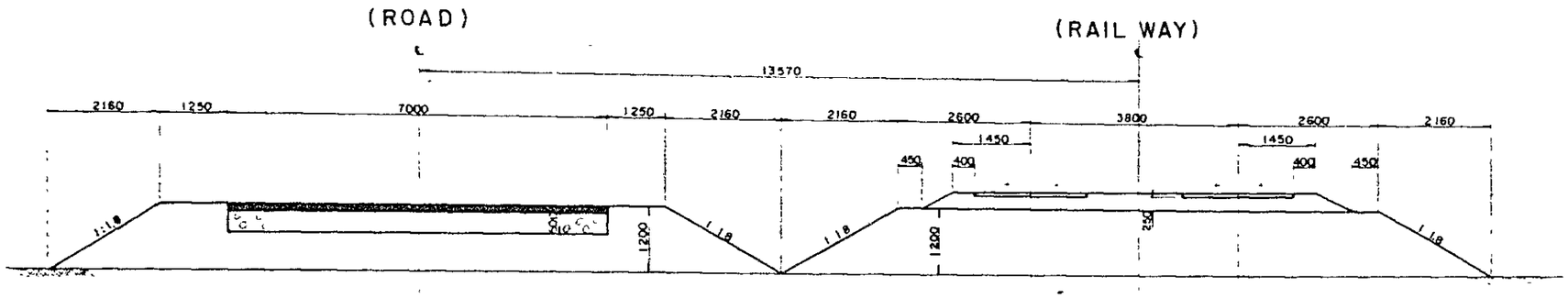
SECTION B - 2

H = 1 480
V = 1 24

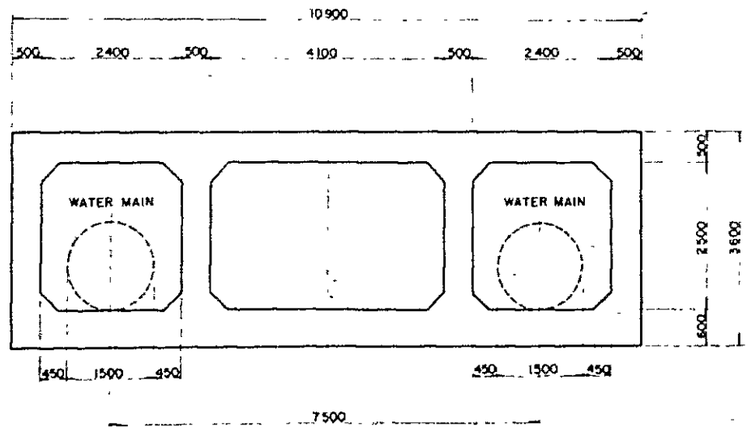
SOCIALIST REPUBLIC OF THE UNION OF BURMA	
RANGOON INTERNATIONAL AIRPORT DEVELOPMENT PROJECT	
PAVEMENT (OVERLAYS)	MAR 1980
FEASIBILITY STUDY	12
JAPAN INTERNATIONAL COOPERATION AGENCY	



SECTION In CURVE of ROAD & RAIL WAY Scale 1/50



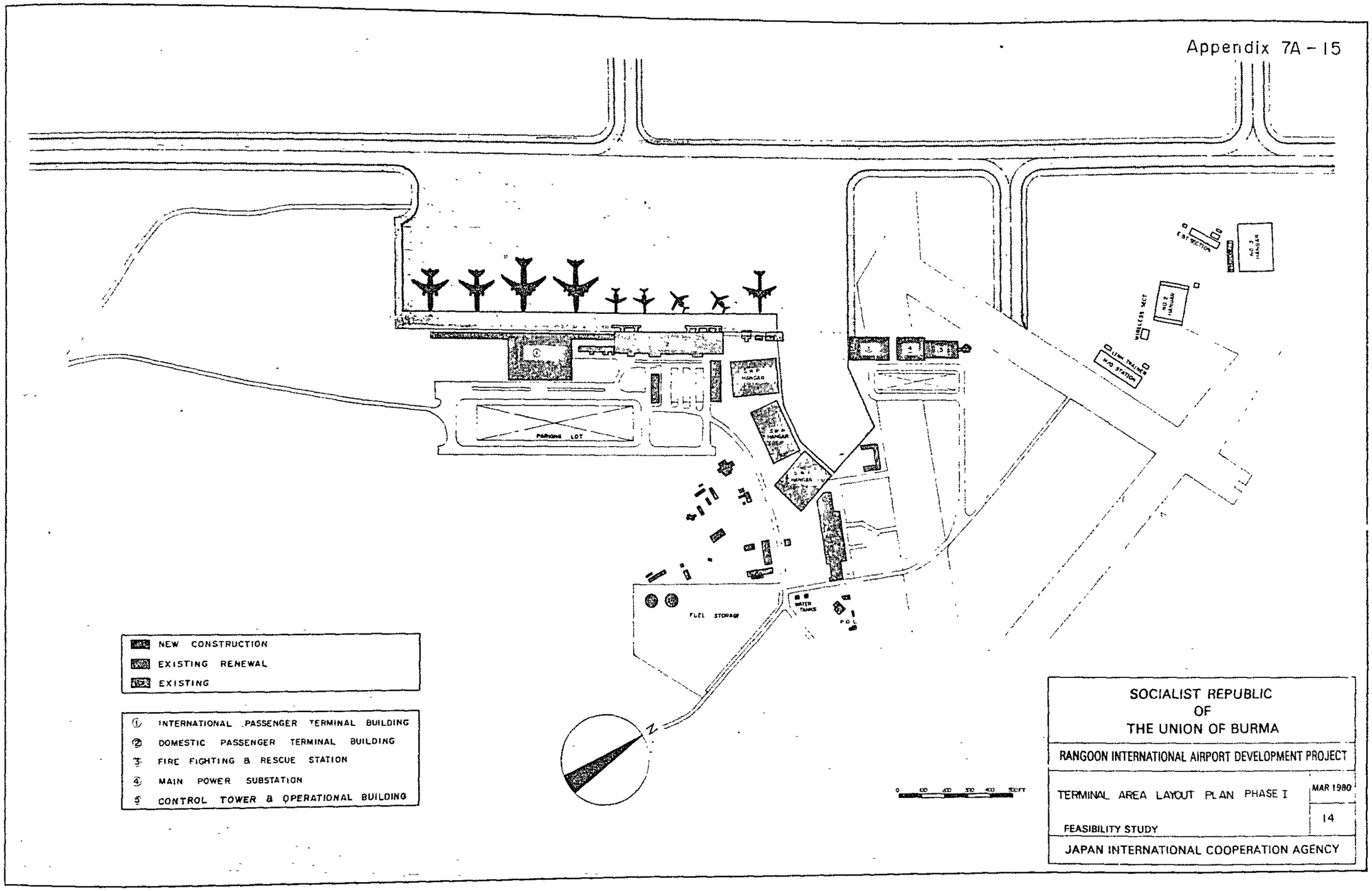
SECTION for STRAIGHT PORTION of ROAD & RAIL WAY Scale 1/50

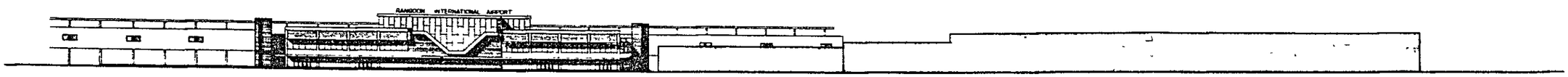


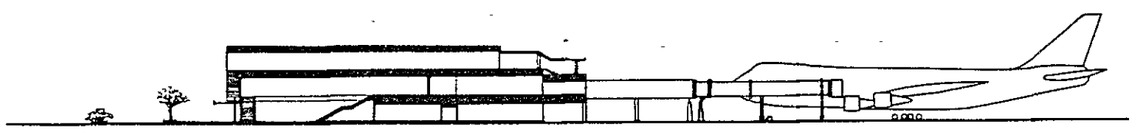
SECTION of CULVERT Scale 1/50
for
RGN WATER MAIN

DIMENSION mm

SOCIALIST REPUBLIC OF THE UNION OF BURMA	
RANGOON INTERNATIONAL AIRPORT DEVELOPMENT PROJECT	
TYPICAL CROSS SECTION OF RAILWAY & ROAD & CULVERT	MAR 1980
FEASIBILITY STUDY	13
JAPAN INTERNATIONAL COOPERATION AGENCY	


PARKING LOT
HANGAR
HANGAR
HANGAR
FUEL STORAGE
WATER TANKS
P.O.L
WIRELESS SECT
NO 2 HANGAR
NO 3 HANGAR
LINK TRAINER
R/O STATION
NEW CONSTRUCTION
EXISTING RENEWAL
EXISTING
① INTERNATIONAL PASSENGER TERMINAL BUILDING
② DOMESTIC PASSENGER TERMINAL BUILDING
③ FIRE FIGHTING & RESCUE STATION
④ MAIN POWER SUBSTATION
⑤ CONTROL TOWER & OPERATIONAL BUILDING
N
0 100 200 300 400 500FT
SOCIALIST REPUBLIC
OF
THE UNION OF BURMA
RANGOON INTERNATIONAL AIRPORT DEVELOPMENT PROJECT
TERMINAL AREA LAYOUT PLAN PHASE I
MAR 1980
14
FEASIBILITY STUDY
JAPAN INTERNATIONAL COOPERATION AGENCY

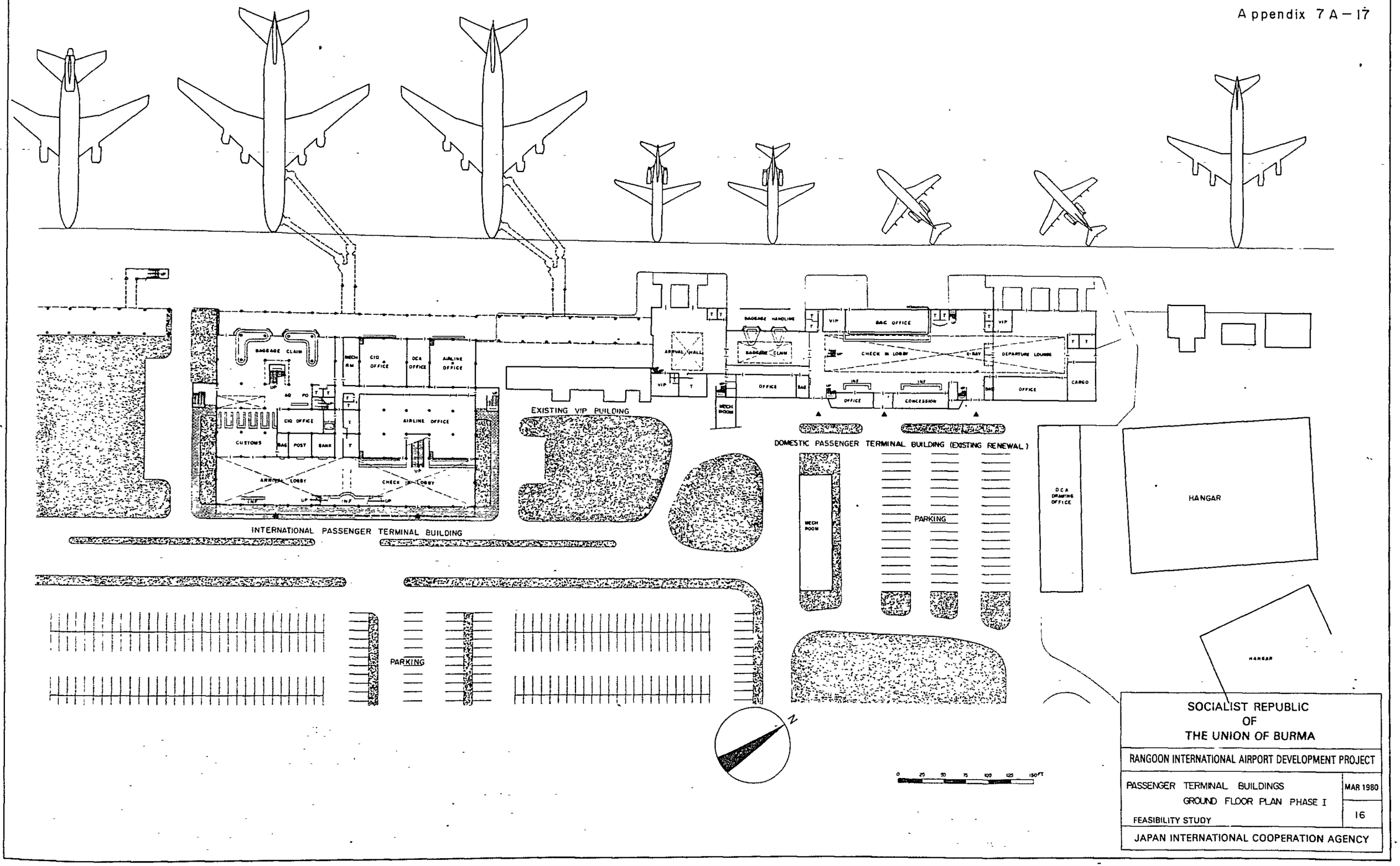




INTERNATIONAL PASSENGER TERMINAL BUILDING

DOMESTIC PASSENGER TERMINAL BUILDING (EXISTING RENEWAL)

SOCIALIST REPUBLIC OF THE UNION OF BURMA	
RANGOON INTERNATIONAL AIRPORT DEVELOPMENT PROJECT	
PASSENGER TERMINAL BUILDINGS ELEVATION SECTION PHASE I	MAR 1980
FEASIBILITY STUDY	15
JAPAN INTERNATIONAL COOPERATION AGENCY	



SOCIALIST REPUBLIC
OF
THE UNION OF BURMA

RANGOON INTERNATIONAL AIRPORT DEVELOPMENT PROJECT

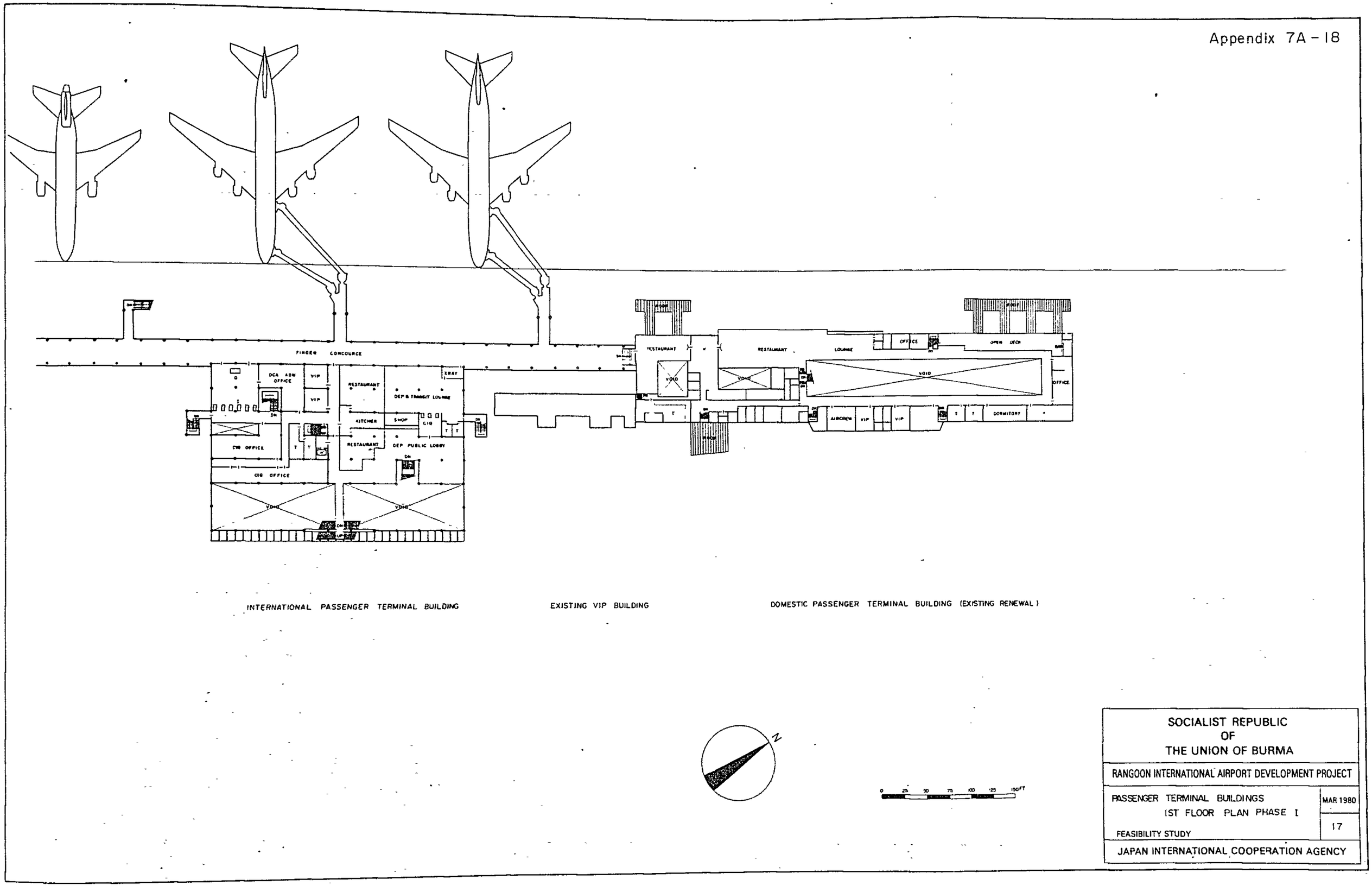
PASSENGER TERMINAL BUILDINGS
GROUND FLOOR PLAN PHASE I

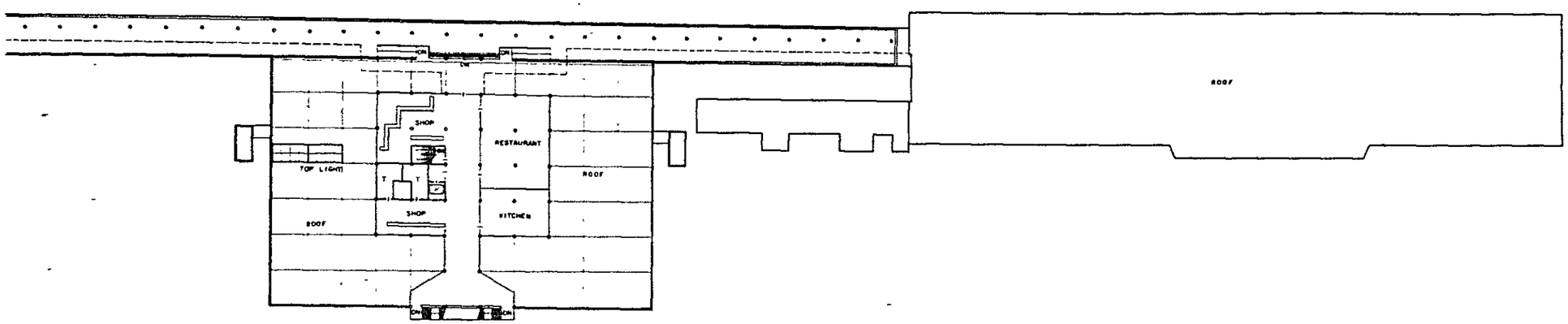
MAR 1980

FEASIBILITY STUDY

16

JAPAN INTERNATIONAL COOPERATION AGENCY

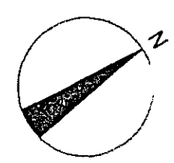

FINGER CONCOURCE
DCA ADM OFFICE
VIP
VIP
RESTAURANT
DEP & TRANSIT LOUNGE
XRAY
KITCHEN
SHOP
CIQ
CIQ OFFICE
RESTAURANT
DEP PUBLIC LOBBY
CIQ OFFICE
VOID
VOID
RESTAURANT
RESTAURANT
LOUNGE
OFFICE
OPEN DECK
VOID
VOID
VOID
OFFICE
AIRCREW
VIP
VIP
DORMITORY
INTERNATIONAL PASSENGER TERMINAL BUILDING
EXISTING VIP BUILDING
DOMESTIC PASSENGER TERMINAL BUILDING (EXISTING RENEWAL)
N
0 25 50 75 100 125 150FT
SOCIALIST REPUBLIC
OF
THE UNION OF BURMA
RANGOON INTERNATIONAL AIRPORT DEVELOPMENT PROJECT
PASSENGER TERMINAL BUILDINGS
1ST FLOOR PLAN PHASE I
MAR 1980
17
FEASIBILITY STUDY
JAPAN INTERNATIONAL COOPERATION AGENCY



INTERNATIONAL PASSENGER TERMINAL BUILDING

EXISTING VIP BUILDING

DOMESTIC PASSENGER TERMINAL BUILDING



SOCIALIST REPUBLIC
OF
THE UNION OF BURMA

RANGOON INTERNATIONAL AIRPORT DEVELOPMENT PROJECT

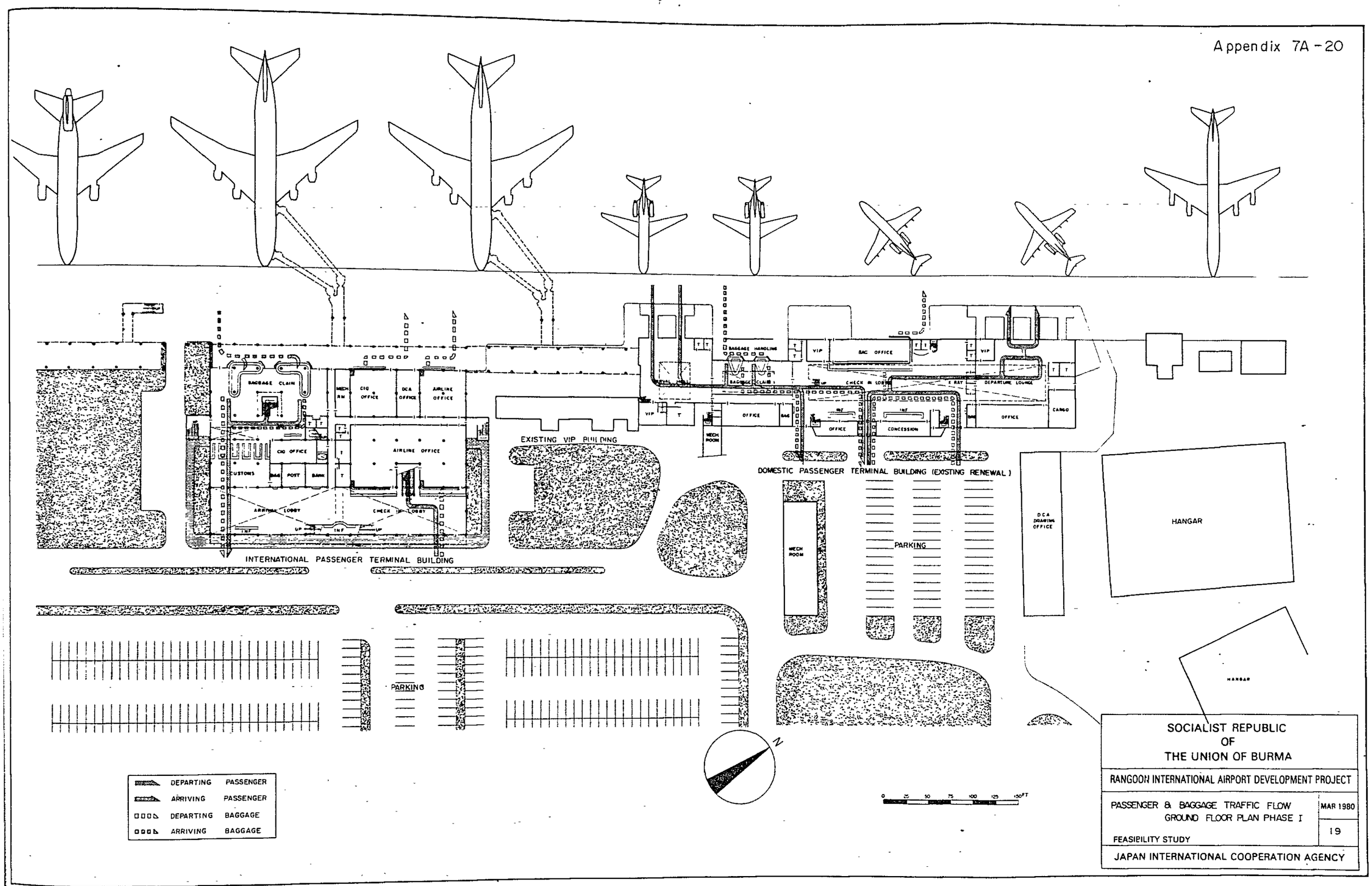
PASSENGER TERMINAL BUILDINGS
2 ND FLOOR PLAN PHASE I

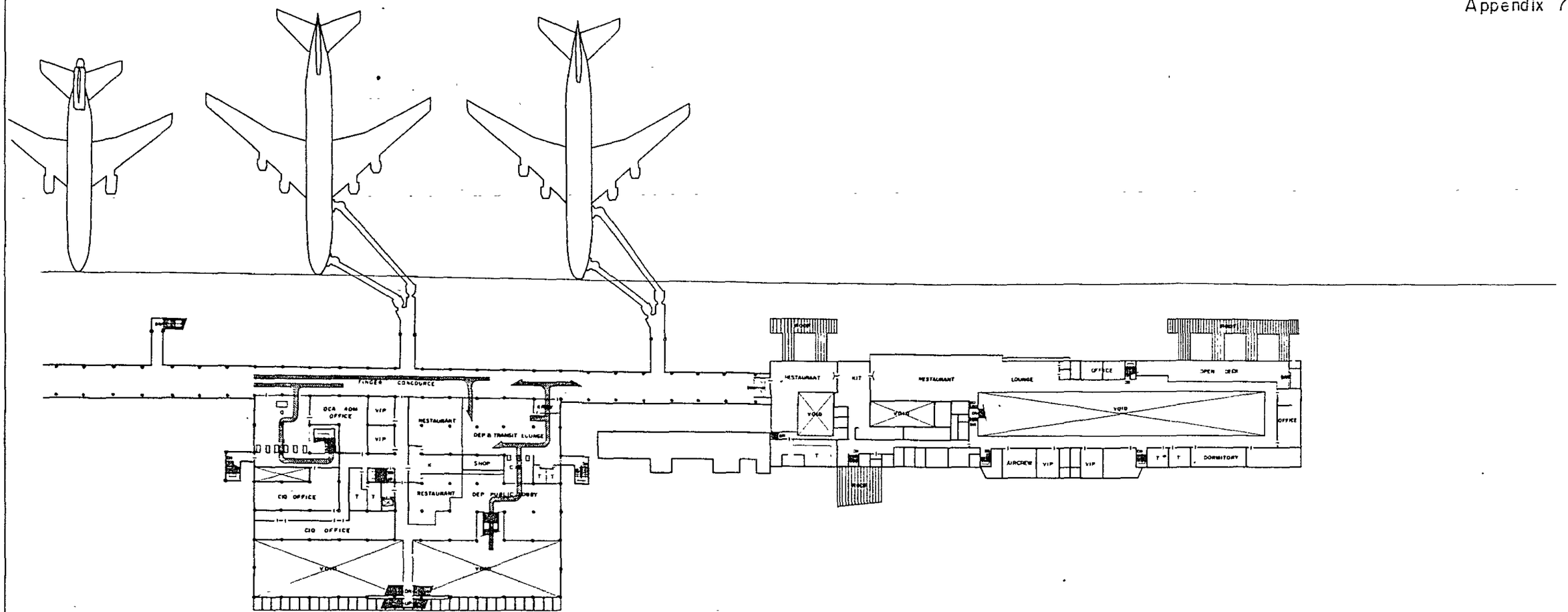
MAR 1980

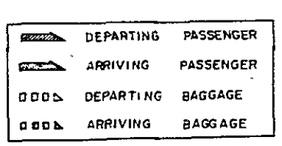
FEASIBILITY STUDY

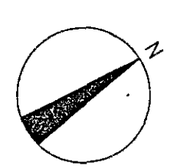
18

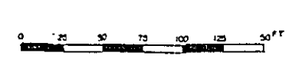
JAPAN INTERNATIONAL COOPERATION AGENCY


BAGGAGE CLAIM
MECH RM
CIQ OFFICE
DCA OFFICE
AIRLINE OFFICE
CIQ OFFICE
AIRLINE OFFICE
CUSTOMS
BAG
POST
BANK
ARRIVAL LOBBY
CHECK IN LOBBY
INF
UP
INTERNATIONAL PASSENGER TERMINAL BUILDING
EXISTING VIP BUILDING
VIP
MECH ROOM
BAGGAGE HANDLING
BAGGAGE CLAIM
OFFICE
BAG
CHECK IN LOBBY
VIP
BAG OFFICE
X RAY
DEPARTURE LOUNGE
OFFICE
CONCESSION
CARGO
DOMESTIC PASSENGER TERMINAL BUILDING (EXISTING RENEWAL)
MECH ROOM
PARKING
DCA DRAWING OFFICE
HANGAR
HANGAR
PARKING
N
0 25 50 75 100 125 150FT
DEPARTING PASSENGER
ARRIVING PASSENGER
DEPARTING BAGGAGE
ARRIVING BAGGAGE
SOCIALIST REPUBLIC
OF
THE UNION OF BURMA
RANGOON INTERNATIONAL AIRPORT DEVELOPMENT PROJECT
PASSENGER & BAGGAGE TRAFFIC FLOW
GROUND FLOOR PLAN PHASE I
MAR 1980
19
FEASIBILITY STUDY
JAPAN INTERNATIONAL COOPERATION AGENCY









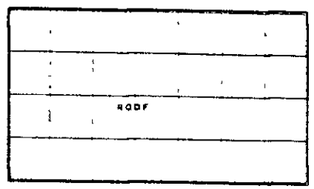
SOCIALIST REPUBLIC
OF
THE UNION OF BURMA

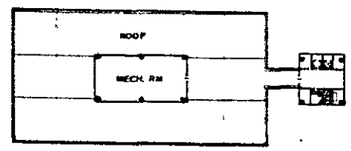
RANGOON INTERNATIONAL AIRPORT DEVELOPMENT PROJECT

PASSENGER & BAGGAGE TRAFFIC FLOW 1 ST FLOOR PLAN PHASE I	MAR 1980
FEASIBILITY STUDY	20

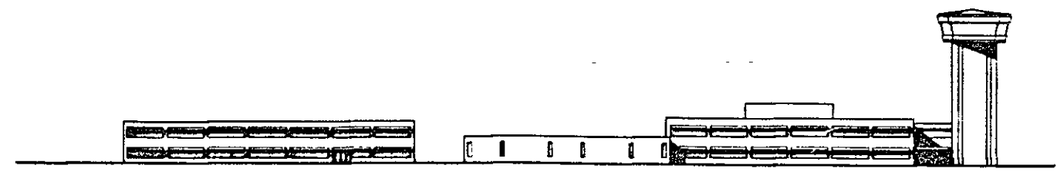
JAPAN INTERNATIONAL COOPERATION AGENCY

TOP FLOOR

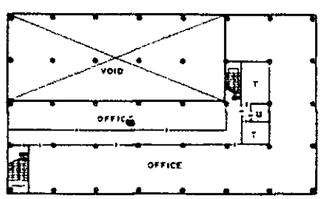


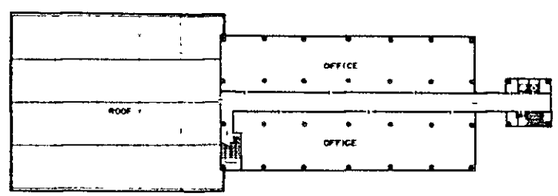


PLAN 2ND FLOOR

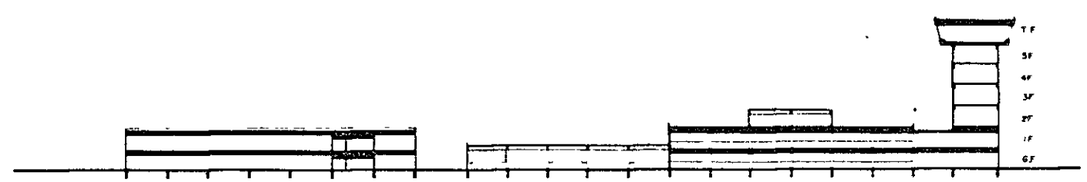


ELEVATION

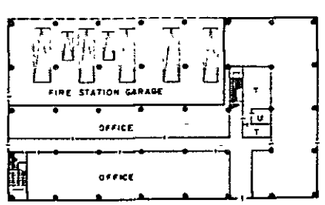


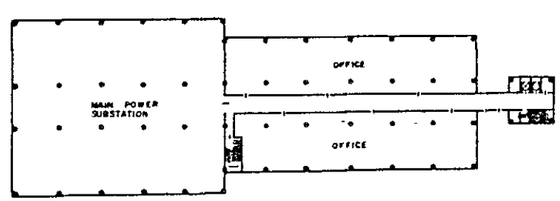


PLAN 1ST FLOOR



SECTION

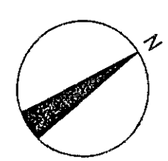




PLAN GROUND FLOOR

FIRE FIGHTING & RESCUE STATION MAIN POWER SUB-STATION ADMINISTRATION & OPERATIONAL BLDG CONTROL TOWER

FIRE FIGHTING & RESCUE STATION MAIN POWER SUB-STATION OPERATIONAL BLDG CONTROL TOWER

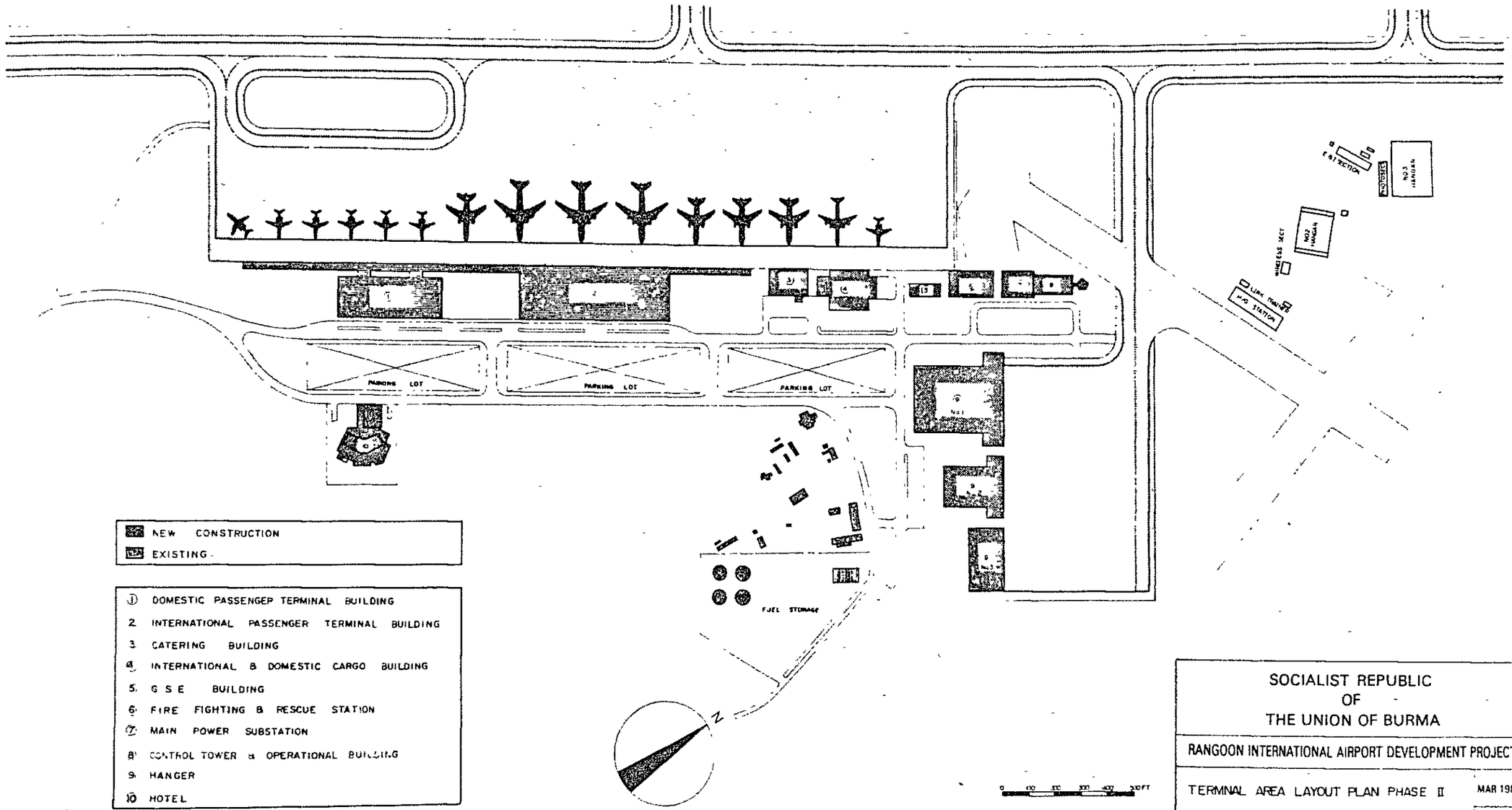


SOCIALIST REPUBLIC
OF
THE UNION OF BURMA

RANGOON INTERNATIONAL AIRPORT DEVELOPMENT PROJECT

CONTROL TOWER & OPERATIONAL MAIN POWER SUBSTATION & FIRE FIGHTING & RESCUE STATION BUILDINGS FEASIBILITY STUDY	MAR 1980 21

JAPAN INTERNATIONAL COOPERATION AGENCY



SOCIALIST REPUBLIC
OF
THE UNION OF BURMA

RANGOON INTERNATIONAL AIRPORT DEVELOPMENT PROJECT

TERMNAL AREA LAYOUT PLAN PHASE II

MAR 1980

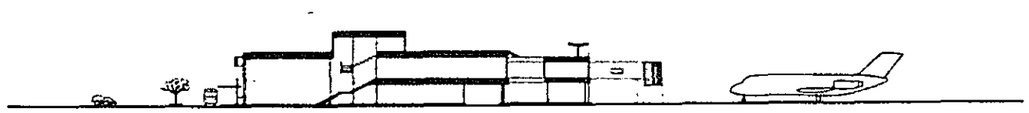
FEASIBILITY STUDY

22

JAPAN INTERNATIONAL COOPERATION AGENCY

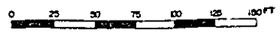
DOMESTIC PASSENGER TERMINAL BUILDING

INTERNATIONAL PASSENGER TERMINAL BUILDING



DOMESTIC PASSENGER TERMINAL BUILDING

INTERNATIONAL PASSENGER TERMINAL



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RANGOON INTERNATIONAL AIRPORT DEVELOPMENT PROJECT	
PASSENGER TERMINAL BUILDINGS ELEVATION SECTION PHASE II	MAR 1980
FEASIBILITY STUDY	23
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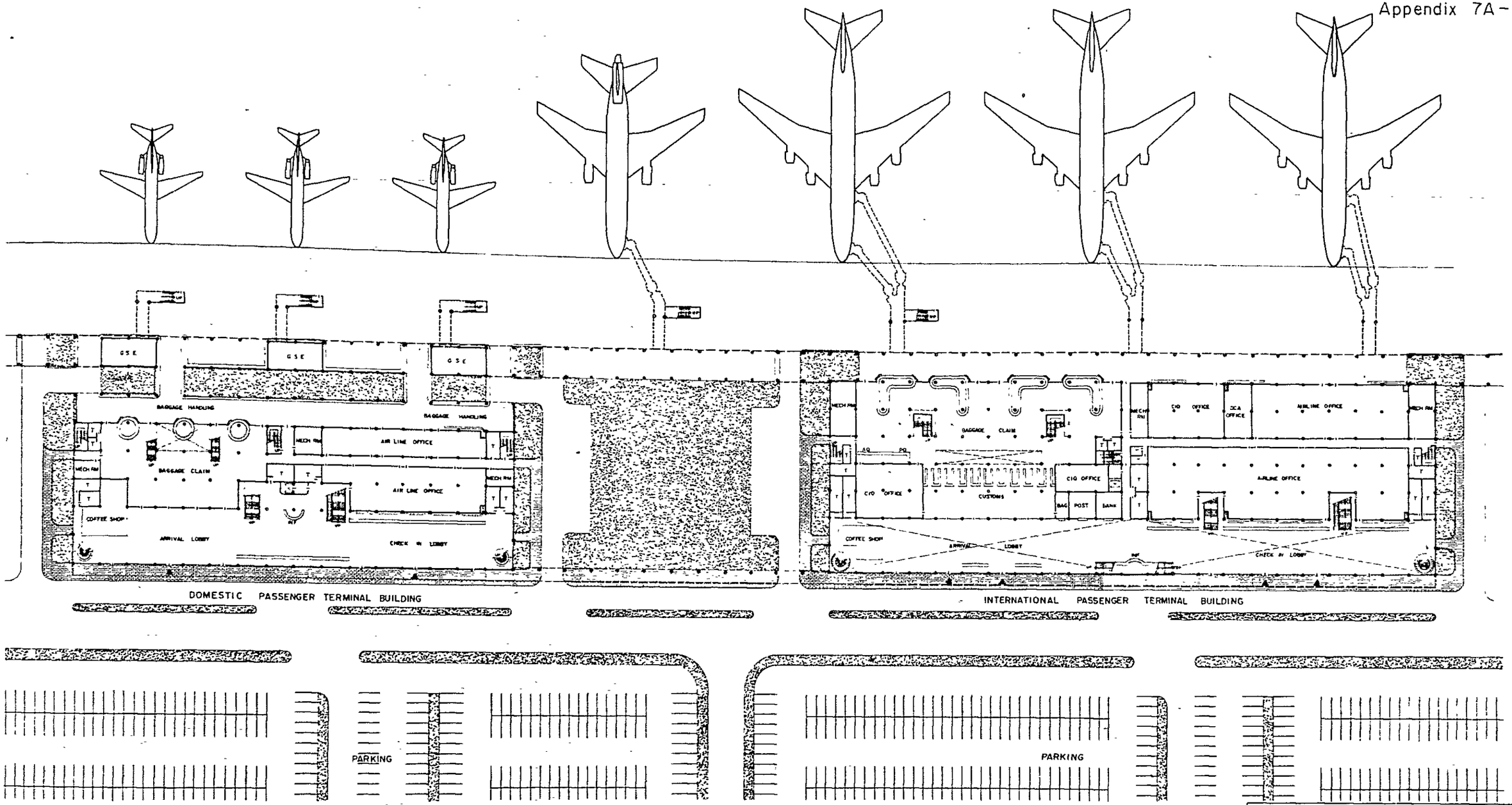

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