

NO. PASTILLA	W seco	Ws. s. s.	W sum.	VOLUMEN	GRAVEDAD ESPECIF.	ESTAB.	FACTOR CORREL.	ESTAB. CORREL.	FLUJO
6-1	1.092,9	1.101,3	606,1	495,2	2,207	937	1,09	1.021	20
6-2	1.110,6	1.115,8	611,2	504,6	2,183	1.005	1,04	1.045	27
6-3	1.115,7	922,9	505,7	417,2	2,195	763	1,47	1.122	15
7-1	1.086,8	1.088,8	586,8	502,0	2,162	1.037	1,04	1.079	18
7-2	1.099,8	1.103,9	604,9	499,0	2,204	756	1,04	786	24
7-3	1.117,8	1.119,6	612,4	507,2	2,204	1.444	1,04	1.502	19
8-1	1.065,2	1.071,2	567,6	503,6	2,115	372	1,04	387	17
8-2	1.058,8	1.062,4	557,0	505,4	2,095	376	1,04	391	21
8-3	1.028,5	1.039,3	537,4	501,9	2,049	181	1,04	188	17
9-1	1.070,0	1.079,4	586,1	493,3	2,169	794	1,09	763	12
9-2	1.075,7	1.086,7	589,9	496,8	2,165	748	1,04	778	25
9-3	1.106,9	1.112,0	613,5	498,5	2,220	913	1,04	950	24
10-1	1.075,8	1.080,0	578,5	501,5	2,145	336	1,04	349	18
10-2	1.068,5	1.071,3	569,4	501,9	2,129	345	1,04	359	18
10-3	1.046,0	1.048,8	540,7	508,1	2,059	890	1,00	890	10
OBSERVACIONES: AEROPUERTO JUAN SANTAMARIA									

NO. PASTILLA	W seco	Ws. s. s.	W sum.	VOLUMEN	GRAVEDAD ESPECIF.	ESTAB.	FACTOR CORREL.	ESTAB. CORREL.	FLUJO
11-1	1.105,3	1.110,6	601,5	509,1	2,171	372	1,00	372	16
11-2	1.105,0	1.111,0	604,7	506,3	2,183	308	1,04	320	15
11-3	1.102,4	1.105,5	598,9	506,6	2,176	777	1,04	808	21
12-1	1.078,5	1.084,1	575,9	508,2	2,122	612	1,00	612	14
12-2	1.086,3	1.090,9	582,8	508,1	2,138	816	1,00	816	16
12-3	1.80,0	1.082,9	510,8	510,8	2,114	665	1,00	665	10
OBSERVACIONES: AEROPUERTO JUAN SANTAMARIA									

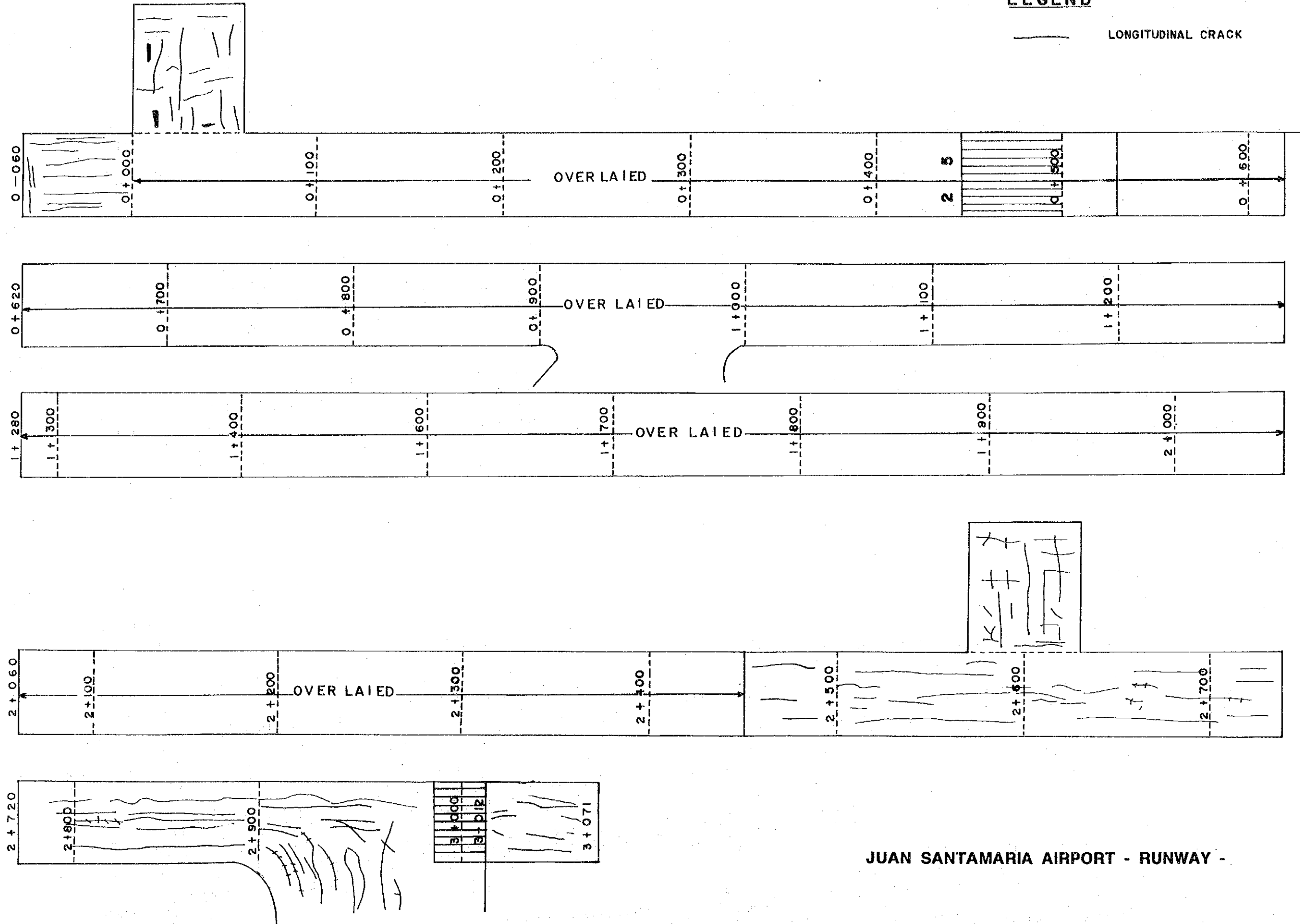
Marshall Stability Test

NO. PASTILLA	W seco	Ws. s. s.	W sum.	VOLUMEN	GRAVEDAD ESPECIF.	ESTAB.	FACTOR CORREL.	ESTAB. CORREL.	FLUJO
L 1-1	1.085,7	1.086,2	610,0	476,2	2,280	1.126	1,14	1.284	17
L 1-2	1.135,8	1.137,8	635,0	502,8	2,259	869	1,04	904	21
L 1-3	1.156,2	1.157,7	648,4	509,3	2,270	1.013	1,00	1.013	21
L 2-1	1.131,1	1.134,1	635,6	498,5	2,269	584	1,04	607	22
L 2-2	1.071,5	1.072,8	509,2	482,6	2,220	372	1,09	405	24
L 2-3	1.063,8	1.066,9	600,0	466,9	2,278	869	1,19	1.034	26
L 3-1	1.130,2	1.132,2	626,6	505,6	2,235	930	1,04	967	13
L 3-2	1.071,5	1.140,3	627,8	512,5	2,218	958	1,00	958	12
L 3-3	1.063,8	1.141,9	640,9	501,0	2,270	958	1,04	996	9
L 4-1	903,1	908,9	498,5	410,4	2,200	550	1,47	808	8
L 4-2	1.004,8	1.005,1	559,5	445,6	2,255	567	1,25	709	12
L 5-2	1.104,5	1.106,8	609,3	497,5	2,220	1.005	1,04	1.045	12
L 5-3	1.157,2	1.159,2	656,1	503,1	2,300	1.648	1,04	1.714	14
OBSERVACIONES: AEROPUERTO LIMON									

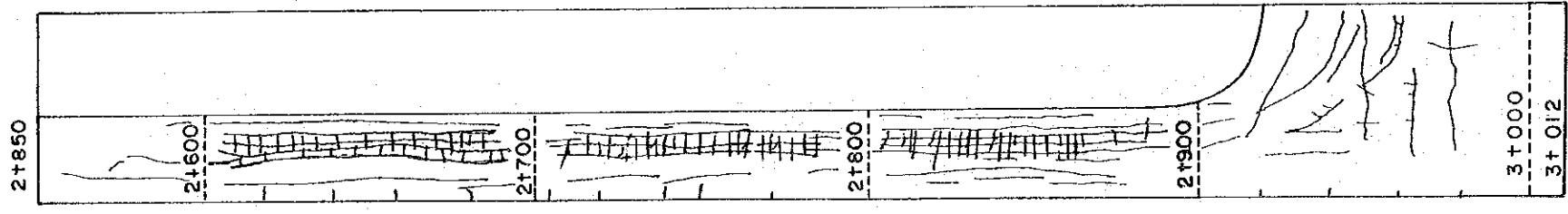
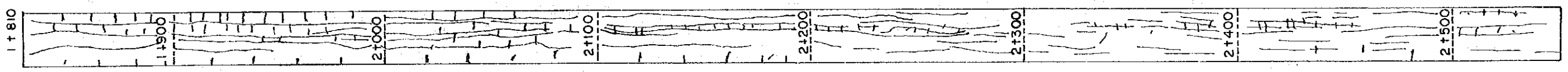
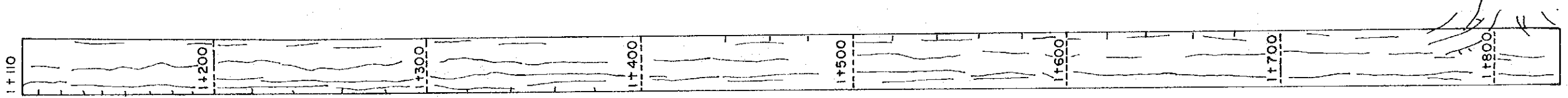
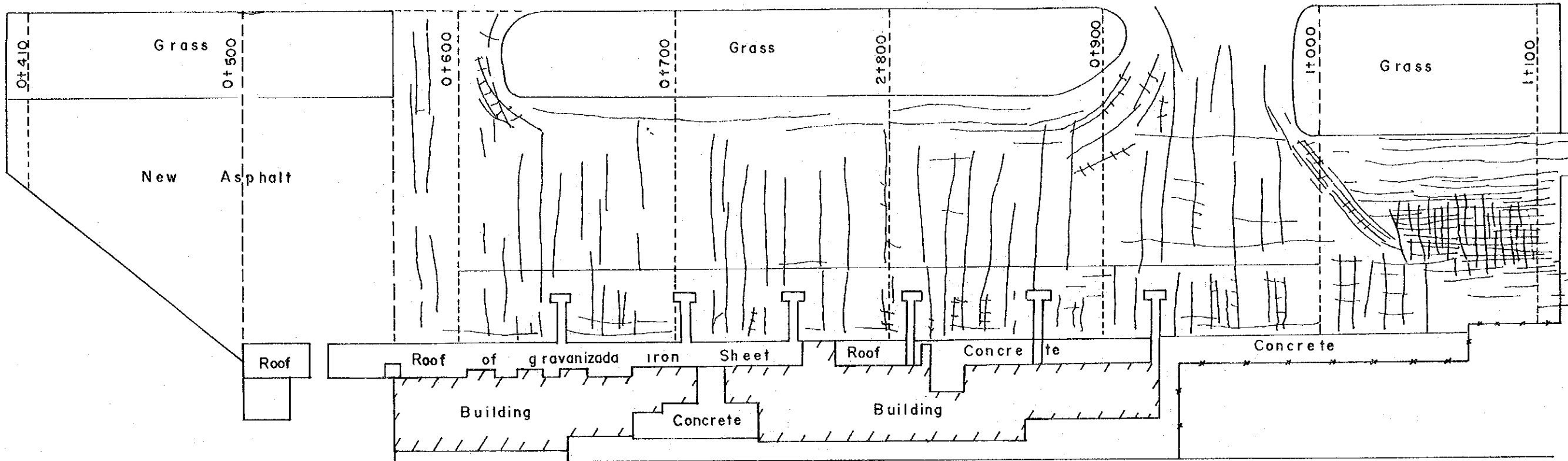
**APPENDIX-3.2.13 PAVEMENT VISUAL INVESTIGATION AT  
JUAN SANTAMARIA AND LIMON  
AIRPORTS**

LEGEND

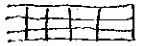
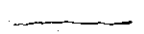
— LONGITUDINAL CRACK



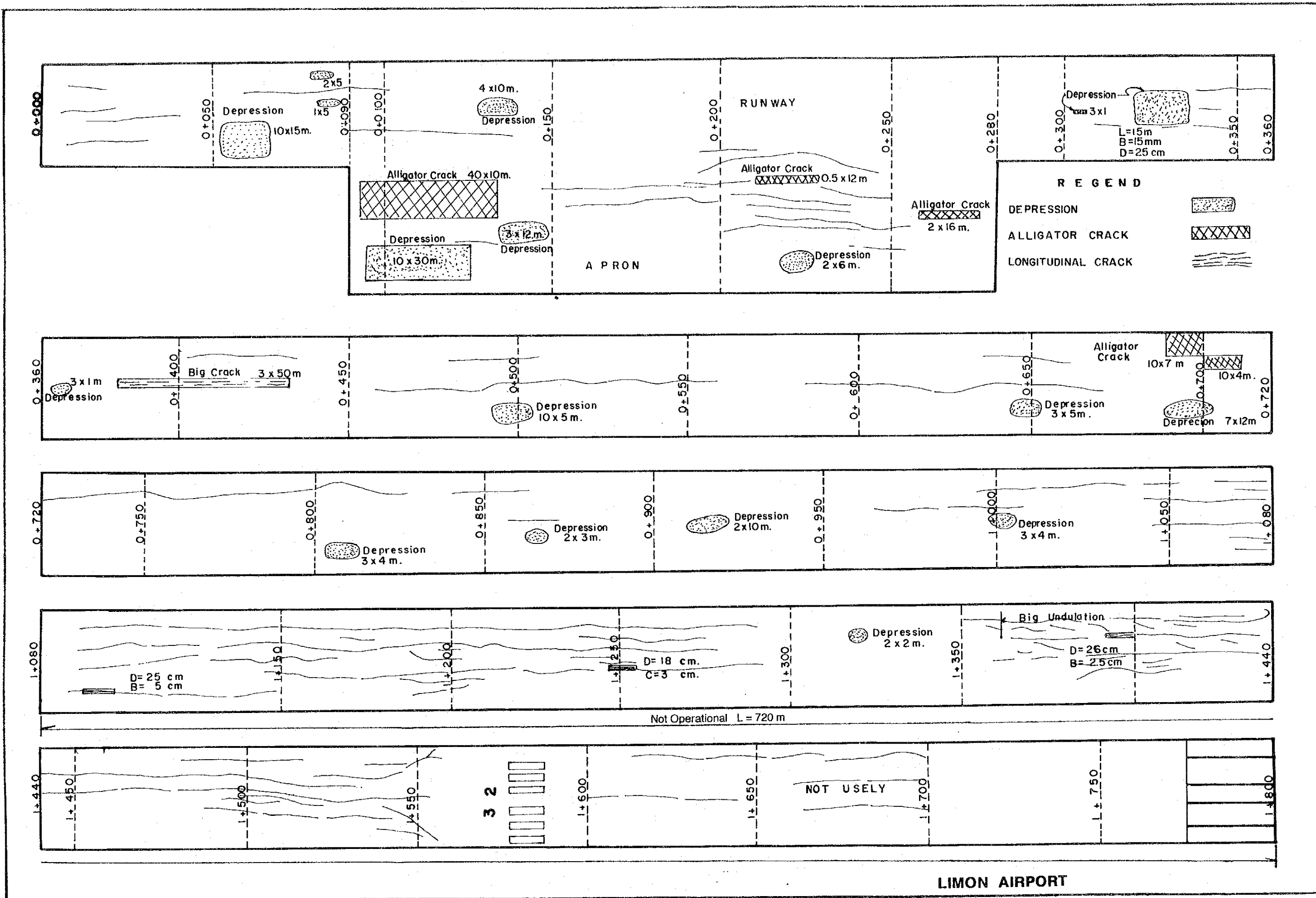
JUAN SANTAMARIA AIRPORT - RUNWAY -



**LEGEND**

-  Alligator Crack
-  LONGITUDINAL Crack

**JUAN SANTAMARIA AIRPORT - TAXIWAYS AND APRONS -**



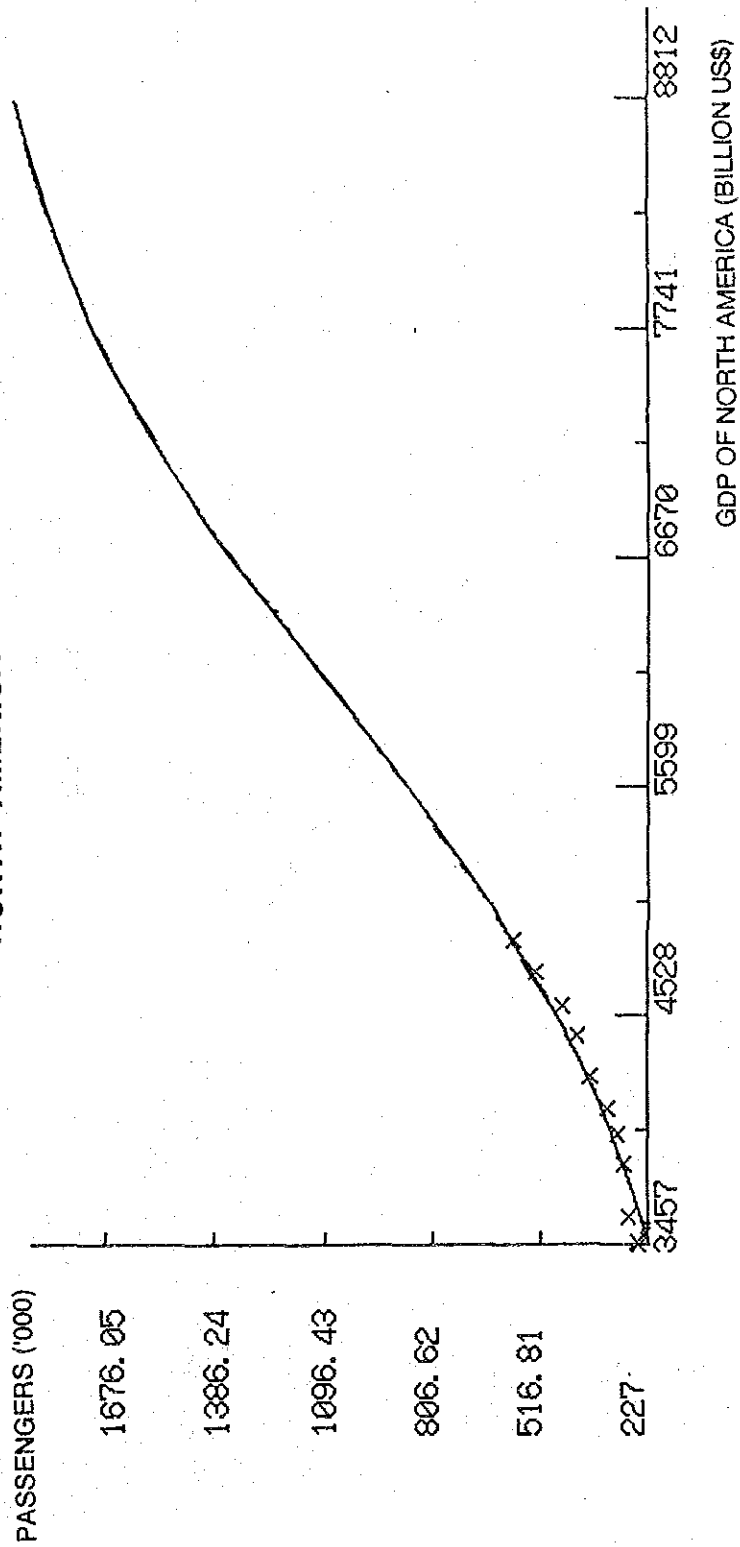
## **APPENDIX TO CHAPTER 4**

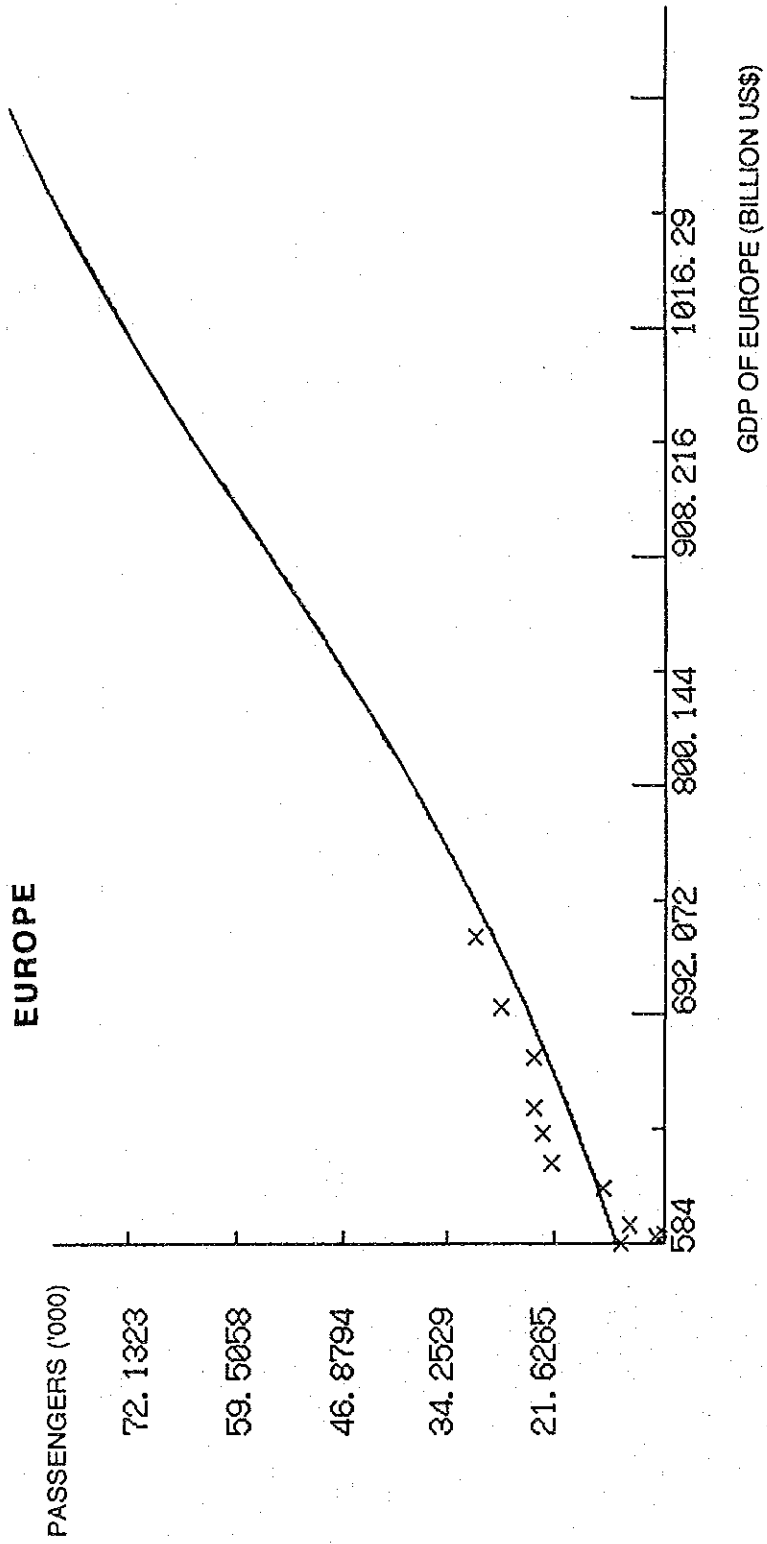




**APPENDIX-4.3.1 REGRESSION ANALYSIS FOR  
INTERNATIONAL PASSENGER  
FORECAST**

# NORTH AMERICA





**APPENDIX-4.3.2 DISTRIBUTION OF FOREIGN  
INTERNATIONAL PASSENGERS**

Year	NTQ	NDQ	TDQ	HDQ
1991	253	190	63	126
1992	272	204	68	136
1993	293	219	73	146
1994	315	236	79	157
1995	338	254	85	169
1996	363	272	91	182
1997	389	292	97	195
1998	417	313	104	208
1999	445	334	111	222
2000	474	355	118	237
2001	503	377	126	251
2002	532	399	133	266
2003	560	420	140	280
2004	500	375	125	250
2005	615	461	154	307
2006	640	480	160	320
2007	666	499	166	333
2008	693	520	173	346
2009	720	540	180	360
2010	749	562	187	375

Note, NTQ: Passenger on other purposes (than tourism)

NDQ: Passenger on tourism purpose not visiting Liberia

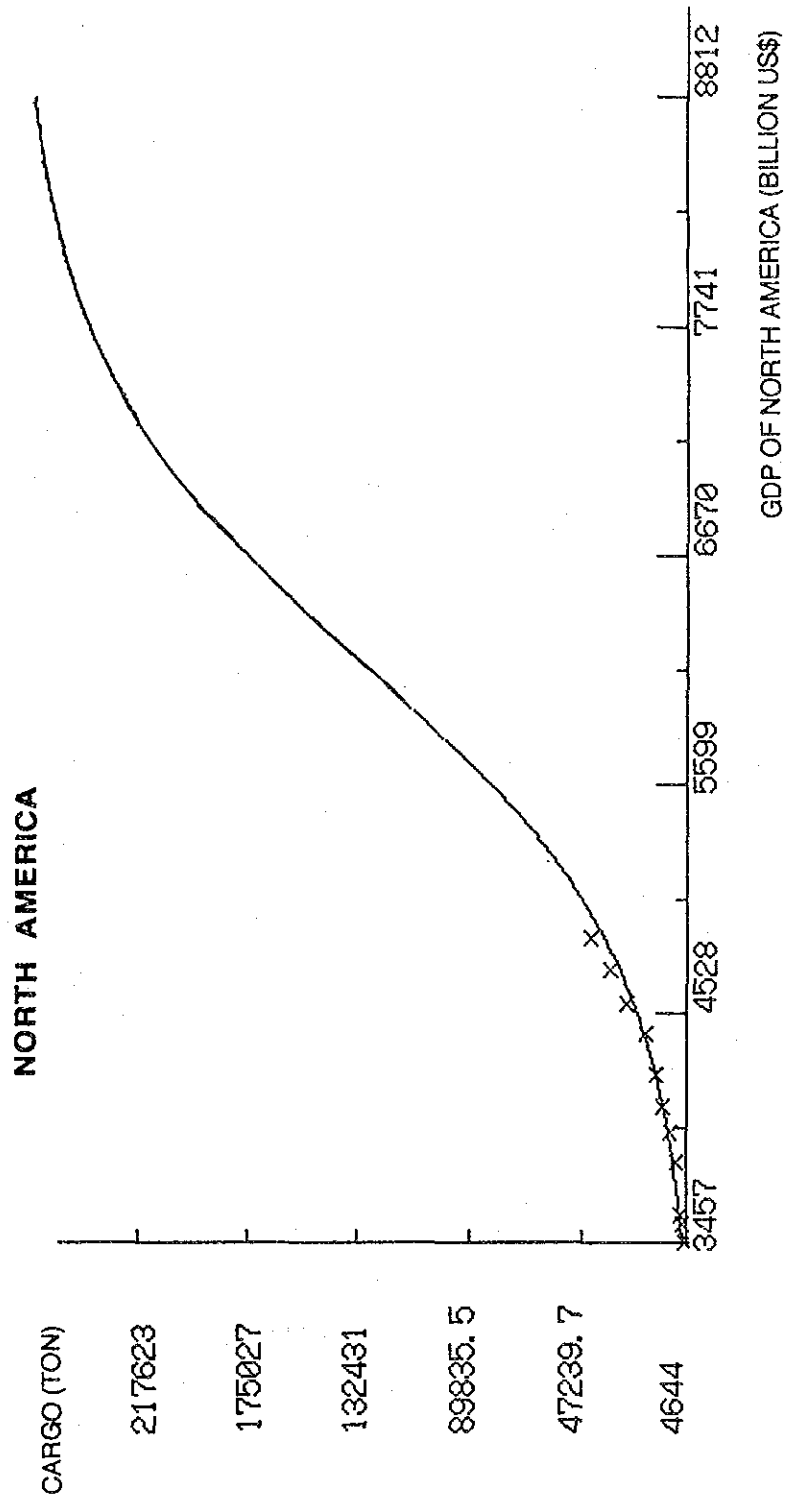
TDQ: Passenger on tourism purpose using only Liberia  
for ports of entry/exit

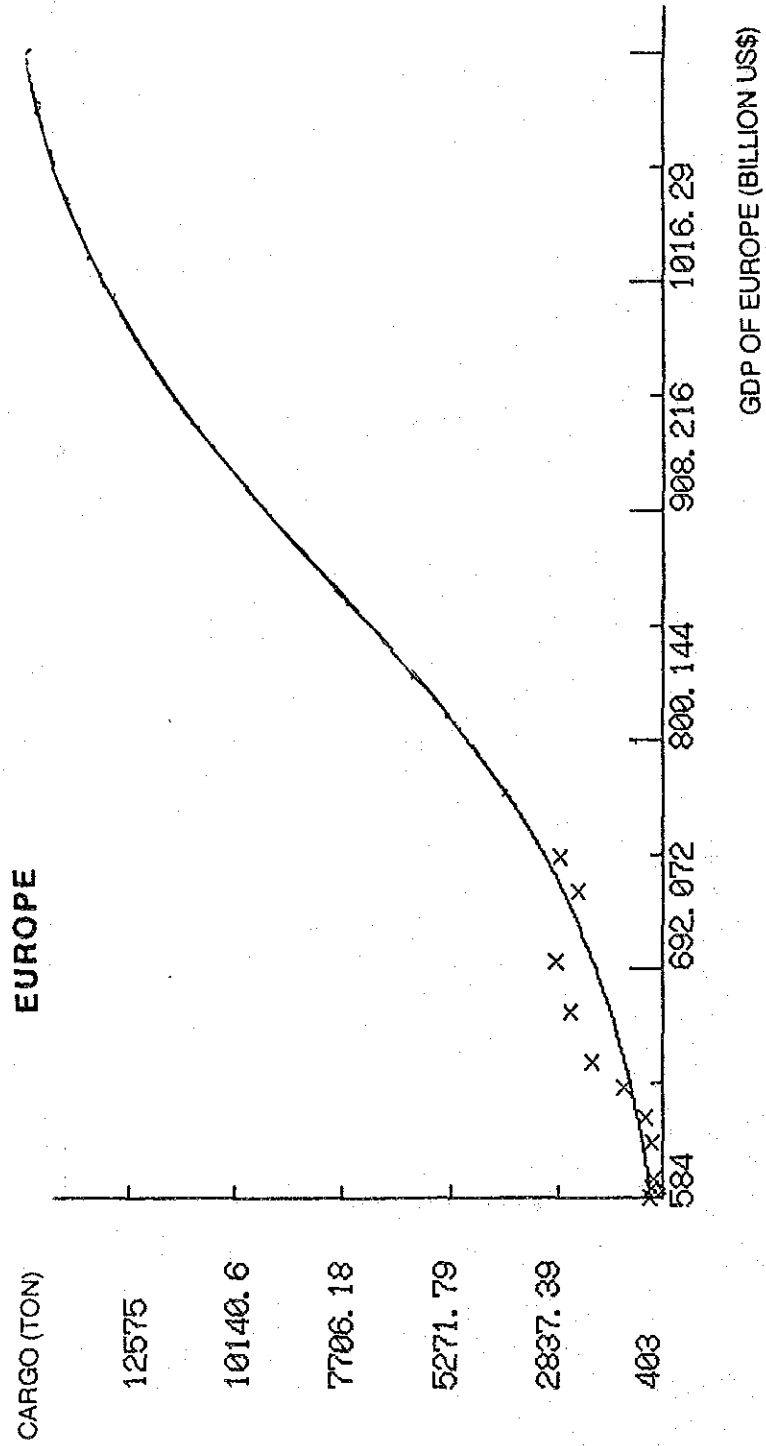
HDQ: Passenger on tourism purpose using both San Jose  
and Liberia for ports of entry/exit

**APPENDIX-4.5.1 REGRESSION ANALYSIS OF  
INTERNATIONAL EXPORTED CARGO  
FORECAST**



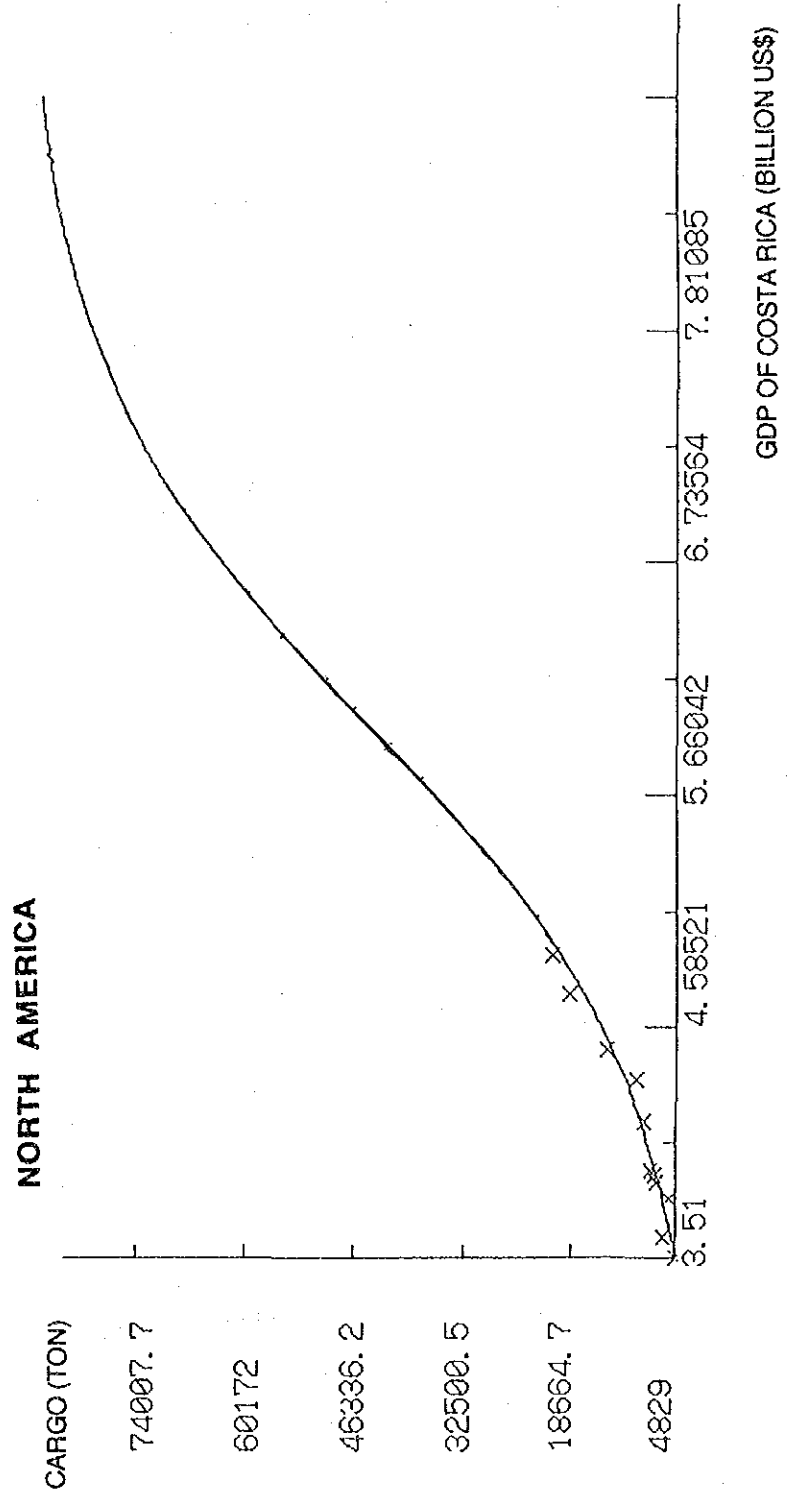


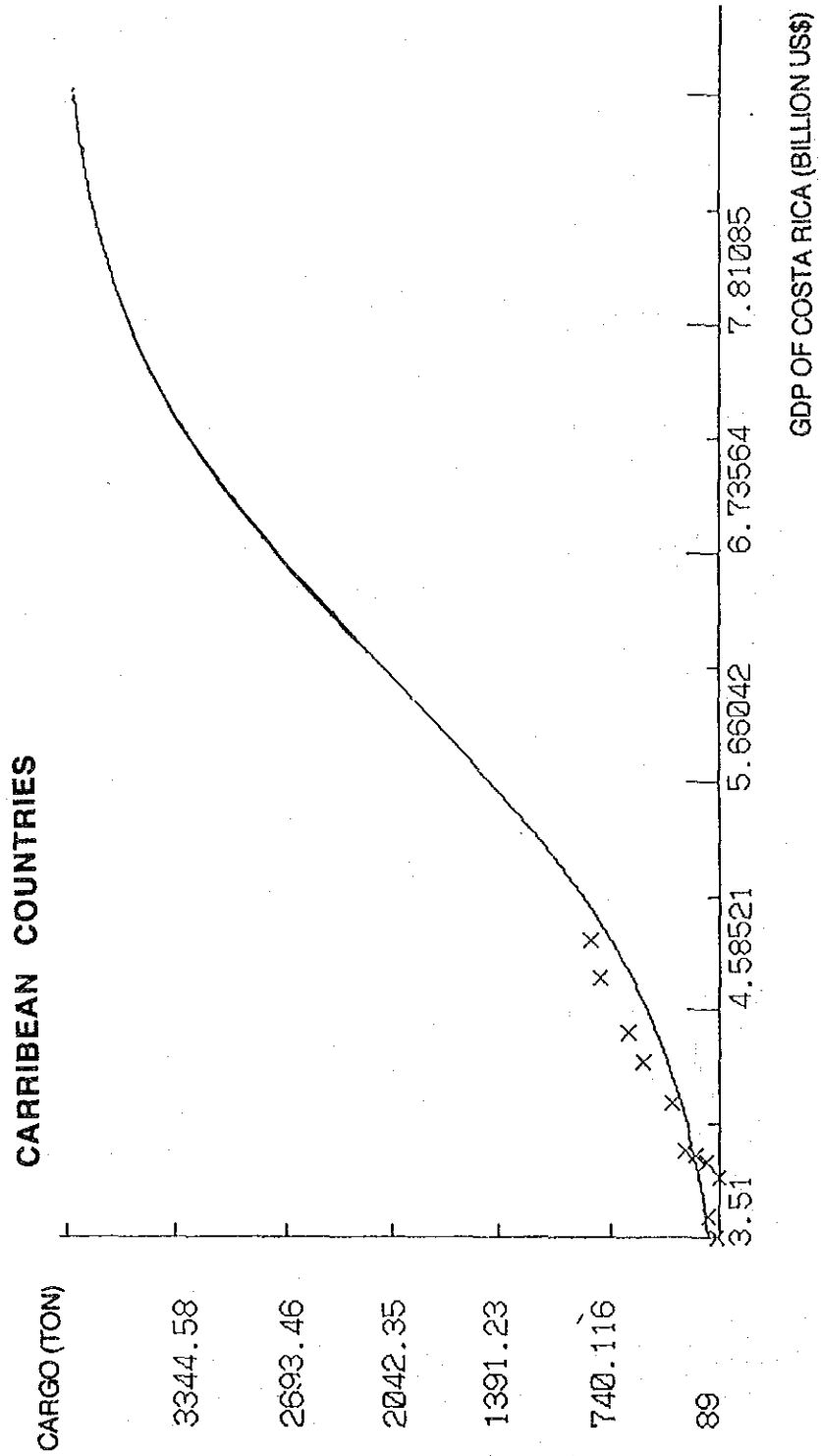




**APPENDIX-4.5.2 REGRESSION ANALYSIS OF  
INTERNATIONAL IMPORTED CARGO  
FORECAST**







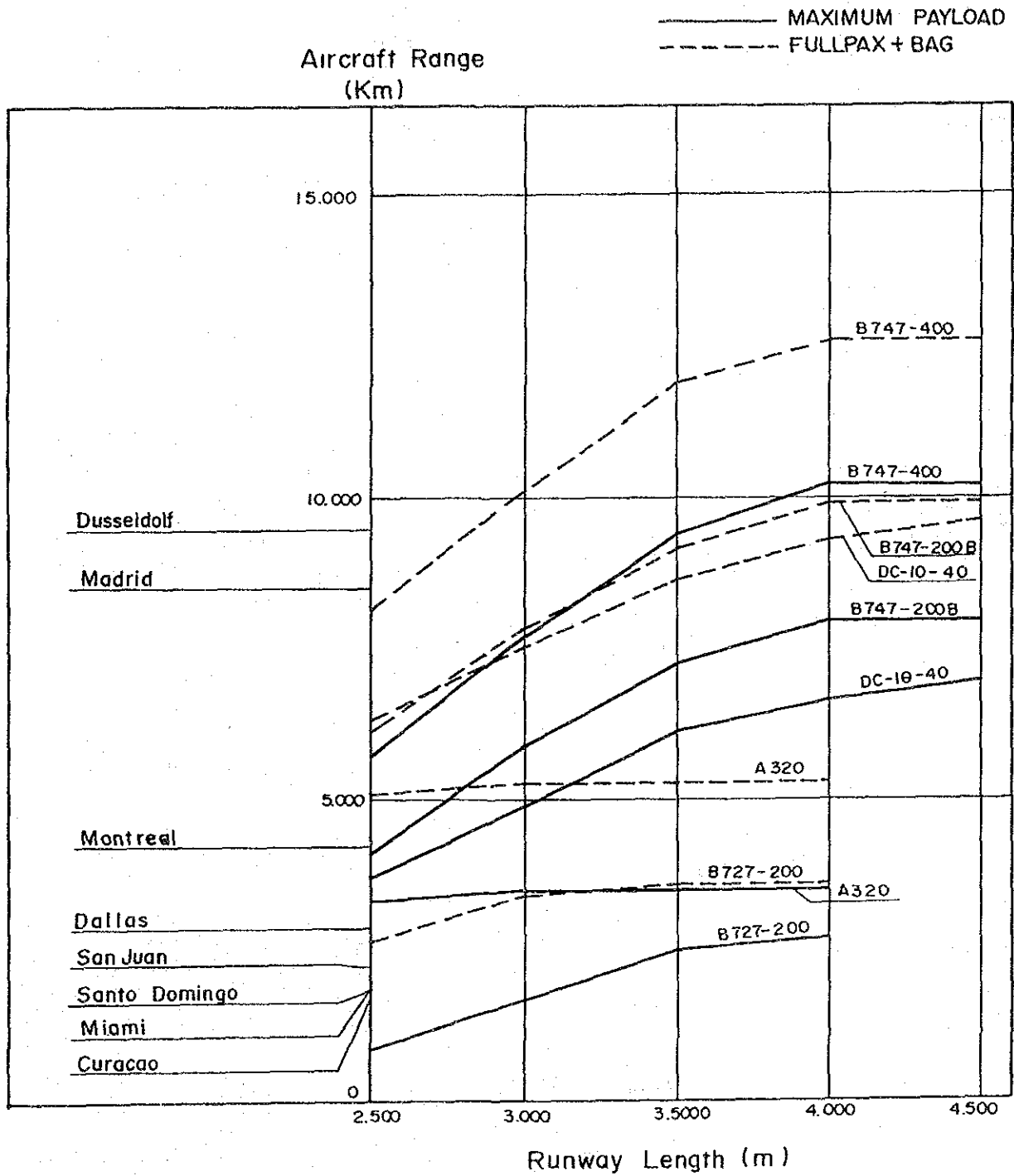


## **APPENDIX TO CHAPTER 5**





**APPENDIX-5.1.1 TAKE-OFF RUNWAY LENGTH  
REQUIREMENTS**



Conditions: International reserve, 3000ft altitude, 30°C, no wind, no runway gradient

**APPENDIX-5.1.2 PASSENGER TRAFFIC SURVEY AT JUAN  
SANTAMARIA AIRPORT**

**PASSENGER TRAFFIC SURVEY  
FOR  
JUAN SANTAMARIA INTERNATIONAL AIRPORT**

1. Summary

In order to grasp the traffic characteristics of the passengers at the Juan Santamaria International Airport, the traffic surveys were carried out by the Study Team and Aviacion Civil, during the period from September 22 to September 26, 1991, due to the busiest time on arrival or departure based on the current schedule.

The surveys were divided into following three categories:

a) Interview Survey

Interviews were made to passengers on 20 items as shown in attached form of questionnaire, at the departure lounges from 5:00 am to 2:00 p.m., on Monday September 23, 1991, and in the morning of September 26. The total number of samples was 383, covering the passengers of 24 different flights. The results were sorted out as shown in Table a-8.1

b) Passenger Processing Time Survey

In order to obtain the average processing time at each checking point such as the check-in counters, departure immigration, security check, arrival immigration, baggage claim and customs, the actual measurements were made at each checking point.

The measurements for arrivals were made from 3:00 p.m. to 9:00p.m. on September 24, 1991, while the measurements for the departures were made from 5:00 am to 11:00 am on Thursday September 26, 1991. The numbers of samples and average figures calculated based on the obtained data are as shown in table a-8.2

c) Car Traffic Survey

In order to obtain the characteristics of the car movements at the land side, the traffic survey was made at five control points of access road, entrance and exit of car park area in front of the terminal by the Aviacion Civil. The results are as shown in Table a-8.3. The characteristics of the utilized conditions of car parking were identified based on the review of the recent car parking slips on the same days of the survey for passenger movement. The results are shown in Table a-8.4

THE RESULTS OF THE INTERVIEW SURVEY  
OF  
PASSENGERS FOR JUAN SANTAMARIA AIRPORT

1. TOTAL NUMBERS OF SAMPLES: 383

2. DATE: SEPTEMBER 24 and 26, 1991    3. NUMBER OF FLIGHTS: 28

4. WHAT IS YOUR NATIONALITY ?

1. <u>COSTA RICA</u> 118	2. <u>NICARAGUA</u> 23	3. <u>PANAMA</u> 13	4. <u>MEXICO</u> 8	5. <u>GUATEMALA</u> 12
6. <u>EL SALVADOR</u> 14	7. <u>CARIBBEAN</u> 9	8. <u>U.S.A</u> 102	9. <u>CANADA</u> 9	10. <u>SOUTH AMERICA</u> 13
11. <u>SPAIN</u> 3	12. <u>HOLLAND</u> 9	13. <u>GERMAN</u> 4	14. <u>OTHERS</u> 46	

5. SEX : 1. MALE : 245            2. FEMALE: 126            3. NO ANSWER: 12

6. WHAT IS YOUR AGE ? :

1. <u>UNDER 20 YEARS</u> 5	2. <u>20 - 29 YEARS</u> 88	3. <u>30 - 39 YEARS</u> 109	4. <u>40 - 49 YEARS</u> 86
5. <u>50 - 59 YEARS</u> 37	6. <u>60 YEARS OR MORE</u> 30	7. <u>NO ANSWER</u> 28	

7. WHAT IS YOUR OCCUPATION ? :

1. <u>PROFESSIONAL</u> 164	2. <u>MANUFACTURING</u> 15	3. <u>SERVICE/SALES</u> 49	4. <u>GOVERNMENT</u> 15
5. <u>AGRICULTURE</u> 7	6. <u>EDUCATION</u> 21	7. <u>OTHERS</u> 112	

8. WHAT IS THE PURPOSE OF YOUR TRAVEL ? :

1. <u>BUSINESS</u>	2. <u>TOURISM</u>	3. <u>PRIVATE</u>	4. <u>OTHERS</u>	5. <u>NO ANSWER</u>
131	207	15	27	3

9. WHAT IS YOUR ACCOMMODATION IN COSTA RICA ? :

1. <u>PRIVATE RESIDENCE</u>	2. <u>HOTEL</u>	3. <u>PLACE OF BUSINESS</u>	4. <u>OTHERS</u>
140	151	1	9

5. <u>TRANSIT</u>	6. <u>NO ANSWER</u>
12	70

10. TRANSPORTATION MADE TO THIS AIRPORT ? :

1. <u>TRANSIT PASSENGER (FLT NO. xxxx)</u>	2. <u>TRANSFER PASSENGER (FLT NO. xxxx)</u>
43	

3. <u>PRIVATE CAR</u>	4. <u>RENTAL CAR</u>	5. <u>COMPANY</u>	6. <u>TAXI</u>	7. <u>BUS</u>
159	19	7	117	18

8. <u>HOTEL CAR</u>	9. <u>OTHERS</u>	10. <u>NO ANSWER</u>
11	5	5

11. WHAT PLACES DID YOU STAY IN COSTA RICA ( VISITOR'S ONLY ) ? :

1. <u>SAN JOSE</u>	2. <u>CARTAGO</u>	3. <u>HEREDIA</u>	4. <u>ALAJUELA</u>
165	44	23	30

5. <u>GUANACASTE</u>	6. <u>PUNTARENAS</u>	7. <u>LIMON</u>
43	82	29

12. TIME ARRIVAL AT THE AIRPORT BEFORE DEPARTURE TIME :

1. <u>1 :00</u>	2. <u>1:15</u>	3. <u>1:30</u>	4. <u>1:45</u>	5. <u>2:00</u>
138	9	48	9	95

6. <u>2:15</u>	7. <u>2:30</u>	8. <u>NO ANSWER</u>
1	28	55

13. STATUS OF TRAVEL :	1. <u>INDIVIDUAL</u>	2. <u>GROUP</u>	3. <u>NO ANSWER</u>
	203	173	7

14. NUMBER OF ACCOMPANIED PERSONS:

1. No person: 103    2. 1 person: 30    3. 2 persons: 14    4. 3 persons: 26

15. NUMBER OF WELL-WISHERS :

1. 1 person: 93    2. 2 persons: 26    3. 3 persons:10    4. 4 persons: 19

16. NUMBER OF ARTICLES OF BAGGAGE CHECKED IN :

1. piece: 150    2. pieces: 108    3. pieces: 47    4. pieces: 32

17. EXPENDITURE AT TERMINAL SHOP :

1. less than \$25    2. \$25 - \$50    3. \$50 - \$75    4. \$75 - \$100  
55                    23                    7                    6

5. More than \$100    6. NO ANSWER  
8                                    284

18. EXPENDITURE IN COSTA RICA :  
(VISITOR'S ONLY)

1. less than \$250    2. \$250 - \$500    3. \$500 - \$750  
49                                    49                                    32

4. \$750 - \$1000    5. more than \$1000  
20                                    43

19. SUGGESTIONS FOR AIRPORT IMPROVEMENT IF ANY :

1) Check-in lobby    2) Duty free shop    3) Coffee shop and restaurant  
14                                    21                                    50

4) Immigration (Departure and arrival)    5) Security check  
25    10

6) Baggage claim and customs (ARRIVAL)  
25

7) Others

(1) Duty free shops are expensive and the handled articles are few.

(2) Coffee shop should be open earlier in the morning.



(3) Passport is checked too many times.

(4) There are too many defects to be improved at the departure area such as: Lack of decoration, un-clean condition, bad air conditioning, more emergency exits, more information signs, long waiting time for departure.

(5) Money exchange shall be served at least 20 hours, and more counters preferable.

## 20. LIBERIA

If there were direct international flights to and from Liberia which is located near the North West resort area of Costa Rica, would you take the direct flight rather than using this airport?

1. YES: 185    2. NO: 110    3. OTHERS: 27    4. NO ANSWER: 61

### The Results of Passenger Processing Time Survey

#### (1) Arrivals

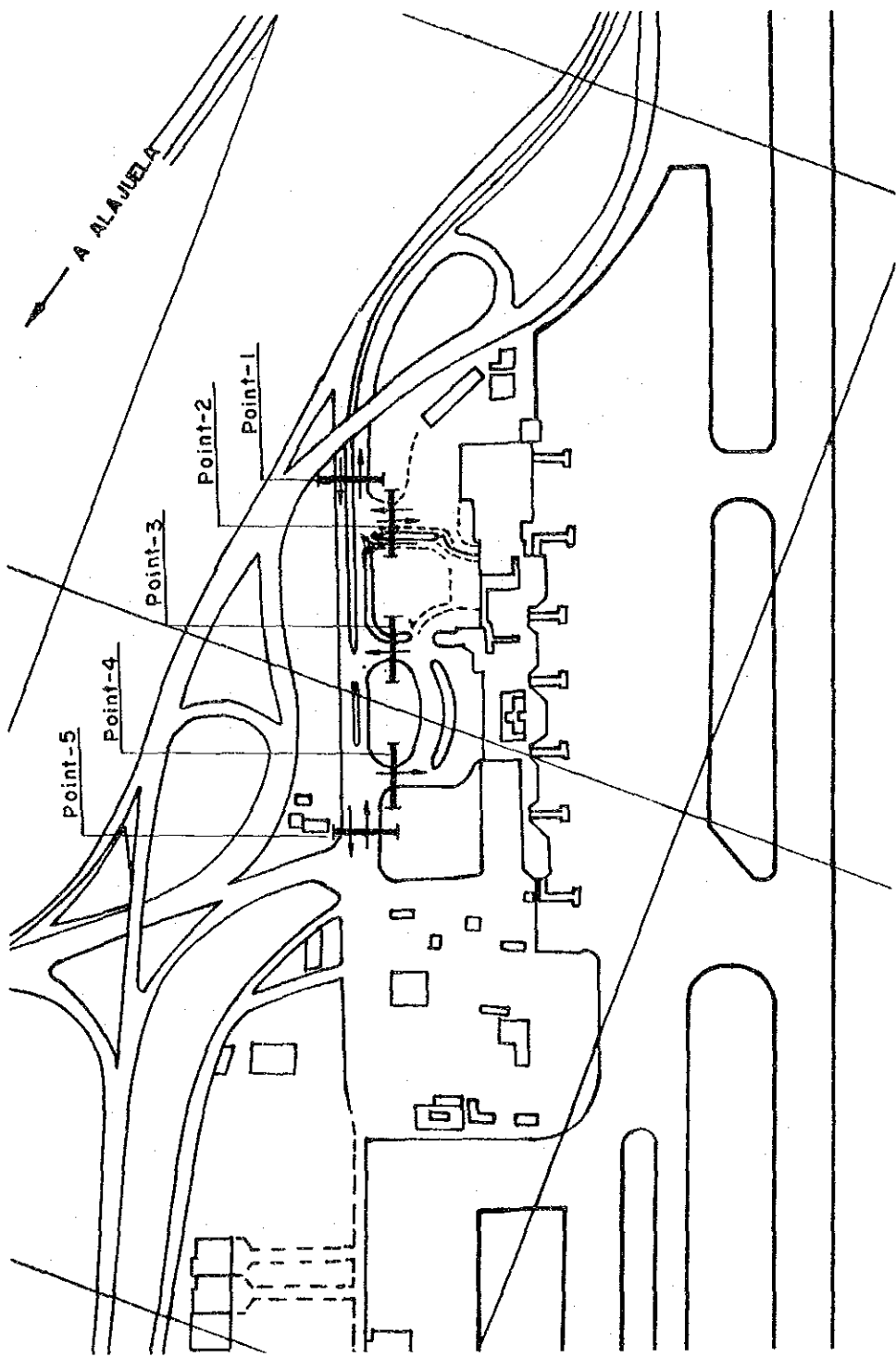
Check points	Number of samples	Average Processing Capacity
Baggage Claim	10 flights	13 min. 42 sec/flight
Immigration	248 passengers	52 sec/person
Customs	301 Passengers	1 min. 34 sec/person

#### (2) Departures

Check points	Number of samples	Average Processing Capacity
Check-in	378 passengers	3 min. 10 sec/person
Immigration	259 passengers	48 sec/person
Security	301 Passengers	16.3 sec/person (221 persons/hour)

**APPENDIX-5.1.3 VEHICLE TRAFFIC SURVEY AT JUAN  
SANTAMARIA AIRPORT**





LOCATION OF VEHICLE SURVEY POINTS

VEHICLE TRAFFIC SURVEY IN JUAN SANTAMARIA AIRPORT

(1)

Point: No. 1 Direction: Airport->San Jose Date: September 24,25

Time	Type of Car					Total
	Sedan	Bus	Microbus	Taxi	More than two axles	
5:00- 5:30	37	15	4	32	2	90
5:30- 6:00	40	27	10	45	5	127
6:00- 6:30	79	35	5	21	4	144
6:30- 7:00	82	48	9	24	23	186
7:00- 7:30	124	45	5	25	8	207
7:30- 8:00	83	34	4	8	5	134
8:00- 8:30	105	28	1	10	9	153
8:30- 9:00	95	33	5	9	13	155
9:00- 9:30	105	33	3	15	7	163
9:30-10:00	100	31	7	15	11	164
10:00-10:30	126	26	9	12	14	187
10:30-11:00	141	31	6	11	17	206
11:00-11:30	130	29	11	32	15	217
11:30-12:00	184	24	7	31	16	262
12:00-12:30	174	27	12	36	8	257
12:30-13:00	127	27	12	27	18	211
13:00-13:30	116	28	9	16	10	179
13:30-14:00	131	29	9	13	17	199
14:00-14:30	121	30	7	9	19	186
14:30-15:00	124	30	5	17	5	181
15:00-15:30	153	19	9	11	17	209
15:30-16:00	140	28	5	10	9	192
16:00-16:30	136	29	9	13	11	198
16:30-17:00	132	41	3	13	12	201
17:00-17:30	123	29	4	24	8	188
17:30-18:00	128	34	3	21	9	195
18:00-18:30	118	24	8	18	9	177
18:30-19:00	112	25	9	33	9	188
19:00-19:30	109	23	9	24	6	171
19:30-20:00	76	19	3	17	5	120
20:00-20:30	42	18	5	14	4	83
20:30-21:00	60	18	7	21	6	112
21:00-21:30	46	14	3	8	1	72
21:30-22:00	26	14	5	9	0	54
22:00-22:30	21	1	0	7	2	31
22:30-23:00	3	0	1	2	0	6
Total	3649	946	223	653	334	5805
%	62	17	4	11	6	100

VEHICLE TRAFFIC SURVEY IN JUAN SANTAMARIA AIRPORT

(2)

Point: No. 1 Direction: San Jose->Airport Date: September 24,25

Time	Type of Car					Total
	Sedan	Bus	Microbus	Taxi	More than two axiles	
5:00- 5:30	56	12	4	24	3	99
5:30- 6:00	66	16	5	38	3	128
6:00- 6:30	71	18	3	13	3	108
6:30- 7:00	89	30	3	15	3	140
7:00- 7:30	102	24	3	15	8	152
7:30- 8:00	108	20	1	11	5	145
8:00- 8:30	72	19	2	16	11	120
8:30- 9:00	99	16	4	8	3	130
9:00- 9:30	82	18	2	6	12	120
9:30-10:00	89	17	3	13	8	130
10:00-10:30	102	8	3	7	7	127
10:30-11:00	128	15	5	7	13	168
11:00-11:30	157	19	4	18	9	207
11:30-12:00	168	21	6	13	11	219
12:00-12:30	77	6	4	10	13	110
12:30-13:00	72	14	5	12	8	111
13:00-13:30	74	10	4	8	15	111
13:30-14:00	101	13	0	9	9	132
14:00-14:30	83	17	3	8	8	119
14:30-15:00	159	19	7	19	8	212
15:00-15:30	95	15	4	9	7	130
15:30-16:00	98	19	0	2	8	127
16:00-16:30	89	16	1	4	10	120
16:30-17:00	85	18	2	6	8	119
17:00-17:30	63	13	2	12	7	97
17:30-18:00	65	14	6	10	4	99
18:00-18:30	53	14	8	13	8	96
18:30-19:00	58	11	7	14	6	96
19:00-19:30	39	6	4	14	3	66
19:30-20:00	22	12	15	0	3	52
20:00-20:30	8	2	2	3	2	17
20:30-21:00	16	5	4	0	1	26
21:00-21:30	17	7	3	0	0	27
21:30-22:00	5	4	4	1	1	15
22:00-22:30	14	0	3	1	1	19
22:30-23:00	2	0	1	0	0	3
Total	2684	488	145	359	229	3905
%	69	13	3	9	6	100

VEHICLE TRAFFIC SURVEY IN JUAN SANTAMARIA AIRPORT

(3)

Point: No. 2 Direction: Both (Cargo & Taxi Exit) Date: September 24,25

Time	Type of Car					Total
	Sedan	Bus	Microbus	Taxi	More than two axiles	
5:00- 5:30	0	0	0	2	0	2
5:30- 6:00	4	0	0	5	0	9
6:00- 6:30	7	0	0	3	1	11
6:30- 7:00	13	0	0	2	1	16
7:00- 7:30	15	0	0	11	3	29
7:30- 8:00	39	0	0	7	5	51
8:00- 8:30	36	0	0	9	8	53
8:30- 9:00	39	0	0	5	5	49
9:00- 9:30	53	0	0	3	10	66
9:30-10:00	39	0	0	1	9	49
10:00-10:30	41	0	0	5	13	59
10:30-11:00	40	0	0	9	11	60
11:00-11:30	45	0	0	14	9	68
11:30-12:00	56	0	0	16	10	82
12:00-12:30	36	0	0	23	11	70
12:30-13:00	27	0	0	20	4	51
13:00-13:30	62	0	0	5	9	76
13:30-14:00	71	0	0	3	14	88
14:00-14:30	60	0	0	2	9	71
14:30-15:00	51	0	0	6	9	66
15:00-15:30	63	0	0	5	9	77
15:30-16:00	41	0	0	4	10	55
16:00-16:30	51	0	0	4	13	68
16:30-17:00	20	0	0	4	8	32
17:00-17:30	29	0	0	7	15	51
17:30-18:00	23	0	0	15	5	43
18:00-18:30	17	0	0	19	8	44
18:30-19:00	14	0	0	17	4	35
19:00-19:30	15	0	0	26	6	47
19:30-20:00	20	0	0	19	1	40
20:00-20:30	11	0	0	11	4	26
20:30-21:00	9	0	0	17	3	29
21:00-21:30	14	0	0	2	1	17
21:30-22:00	11	0	0	4	0	15
22:00-22:30	4	0	0	1	0	5
22:30-23:00	0	0	0	0	0	0
Total	1076	0	0	301	228	1605
%	67	0	0	19	14	100



VEHICLE TRAFFIC SURVEY IN JUAN SANTAMARIA AIRPORT (4)

Point: No.3 Direction: Both Date: September 24,25

Time	Type of Car					Total
	Sedan	Bus	Microbus	Taxi	More than two axiles	
5:00- 5:30	37	15	4	26	0	82
5:30- 6:00	34	20	8	41	0	103
6:00- 6:30	58	27	6	19	0	110
6:30- 7:00	40	28	5	12	3	88
7:00- 7:30	66	33	4	16	1	120
7:30- 8:00	41	34	3	7	3	88
8:00- 8:30	44	26	4	8	3	85
8:30- 9:00	31	27	2	6	3	69
9:00- 9:30	41	29	1	8	1	80
9:30-10:00	39	28	2	10	4	83
10:00-10:30	54	21	2	7	3	87
10:30-11:00	69	27	3	3	1	103
11:00-11:30	64	30	7	24	1	126
11:30-12:00	94	22	11	12	4	143
12:00-12:30	77	22	8	15	2	124
12:30-13:00	52	25	7	7	3	94
13:00-13:30	41	20	5	7	5	78
13:30-14:00	33	27	3	6	6	75
14:00-14:30	47	24	1	6	3	81
14:30-15:00	46	26	4	4	3	83
15:00-15:30	60	20	4	6	4	94
15:30-16:00	63	31	6	7	3	110
16:00-16:30	52	26	3	4	4	89
16:30-17:00	43	27	1	7	3	81
17:00-17:30	53	26	6	14	3	102
17:30-18:00	58	26	5	8	3	100
18:00-18:30	59	25	8	6	3	101
18:30-19:00	83	23	7	3	1	117
19:00-19:30	65	18	8	5	1	97
19:30-20:00	50	19	1	1	11	82
20:00-20:30	25	15	2	11	3	56
20:30-21:00	39	14	5	7	1	66
21:00-21:30	23	14	2	8	0	47
21:30-22:00	6	11	2	5	0	24
22:00-22:30	5	1	1	3	0	10
22:30-23:00	1	0	0	0	0	1
Total	1693	785	151	349	79	3079
%	56	26	5	11	3	100

VEHICLE TRAFFIC SURVEY IN JUAN SANTAMARIA AIRPORT (5)

Point: No.4 Direction: Both Date: September 24,25

Time	Type of Car					Total
	Sedan	Bus	Microbus	Taxi	More than two axiles	
5:00- 5:30	63	16	3	30	0	112
5:30- 6:00	63	21	7	51	0	142
6:00- 6:30	56	27	8	20	0	111
6:30- 7:00	41	31	5	13	1	91
7:00- 7:30	50	29	8	18	1	106
7:30- 8:00	44	30	2	8	1	85
8:00- 8:30	45	27	3	18	4	97
8:30- 9:00	28	25	1	10	2	66
9:00- 9:30	54	22	3	13	2	94
9:30-10:00	70	29	4	19	3	125
10:00-10:30	73	21	7	13	5	119
10:30-11:00	109	27	8	14	4	162
11:00-11:30	80	27	12	29	2	150
11:30-12:00	88	20	18	15	3	144
12:00-12:30	50	23	4	28	2	107
12:30-13:00	46	22	3	19	1	91
13:00-13:30	36	21	4	15	6	82
13:30-14:00	39	27	4	12	10	92
14:00-14:30	43	19	5	9	0	76
14:30-15:00	79	26	3	23	3	134
15:00-15:30	60	19	6	21	4	110
15:30-16:00	64	21	6	21	2	114
16:00-16:30	44	24	3	12	4	87
16:30-17:00	55	22	4	18	3	102
17:00-17:30	71	23	3	22	3	122
17:30-18:00	74	22	13	19	2	130
18:00-18:30	72	16	13	23	4	128
18:30-19:00	46	16	9	20	1	92
19:00-19:30	37	15	1	26	1	80
19:30-20:00	29	14	0	22	0	65
20:00-20:30	24	12	2	15	3	56
20:30-21:00	30	23	13	15	0	81
21:00-21:30	2	11	2	10	0	25
21:30-22:00	4	1	0	6	0	11
22:00-22:30	2	0	0	0	0	2
22:30-23:00	0	0	0	0	0	0
Total	1772	729	187	645	77	3391
%	62	22	5	19	2	100

VEHICLE TRAFFIC SURVEY IN JUAN SANTAMARIA AIRPORT

(6)

Point: No.5 Direction: Both Date: September 24,25

Time	Type of Car					Total
	Sedan	Bus	Microbus	Taxi	More than two axiles	
5:00- 5:30	38	7	1	8	5	59
5:30- 6:00	58	11	2	17	6	94
6:00- 6:30	72	20	3	7	9	111
6:30- 7:00	100	28	3	5	23	159
7:00- 7:30	117	20	3	6	14	160
7:30- 8:00	118	14	4	9	14	159
8:00- 8:30	113	13	2	11	10	149
8:30- 9:00	93	10	5	6	9	123
9:00- 9:30	102	15	6	9	12	144
9:30-10:00	109	12	5	13	14	153
10:00-10:30	117	11	4	5	16	153
10:30-11:00	123	13	4	4	17	161
11:00-11:30	116	9	3	13	15	156
11:30-12:00	118	8	2	9	14	151
12:00-12:30	86	11	1	7	12	117
12:30-13:00	69	7	2	4	16	98
13:00-13:30	133	15	4	7	20	179
13:30-14:00	103	10	5	11	16	145
14:00-14:30	97	13	3	3	21	137
14:30-15:00	86	15	3	12	4	120
15:00-15:30	111	15	0	2	8	136
15:30-16:00	125	14	1	2	12	154
16:00-16:30	129	18	1	3	10	161
16:30-17:00	128	26	1	7	10	172
17:00-17:30	113	17	3	4	9	146
17:30-18:00	113	19	1	6	6	145
18:00-18:30	87	10	3	3	7	110
18:30-19:00	66	11	2	2	11	92
19:00-19:30	61	12	2	8	1	84
19:30-20:00	23	6	0	9	2	40
20:00-20:30	31	6	4	5	7	53
20:30-21:00	30	8	3	5	2	48
21:00-21:30	22	6	2	5	0	35
21:30-22:00	24	6	2	7	0	39
22:00-22:30	23	1	1	4	2	31
22:30-23:00	0	0	0	0	0	0
Total	3056	437	81	242	254	4174
%	73	10	2	6	9	100

## **APPENDIX TO CHAPTER 6**



**APPENDIX-6.2.1 RUNWAY CAPACITY AT JUAN  
SANTAMARIA AIRPORT**

## Conditions for Calculation of Runway Capacity

### 1. Aircraft Mix

- Heavy (DC-10, B-747) : 10%
- Large (B-737, A320) : 52%
- Small (General Aviation): 38%

### 2. Percent Arrivals

- 50%

### 3. Aircraft Operations Procedure

- IFR
- Radar Control

### 4. Occupancy Time of Single Aircraft Operation

- Take-off Runway 07    Heavy : 3.0 min (1.0 min)  
                                  Large : 1.0 min  
                                  Medium: 1.0 min
  
- Take-off Runway 25    Heavy : 2.3 min (1.0 min)  
                                  Large : 2.3 min (1.0 min)  
                                  Medium: 1.0 min
  
- Landing Runway 07     Heavy : 2.2 min  
                                  Large : 2.2 min  
                                  Medium: 1.95 min
  
- Landing Runway 25     Heavy : 5.2 min (2.2 min)  
                                  Large : 2.2 min  
                                  Medium: 1.95 min

Note 1: ( ) indicates after improvement of taxiway system.

Note 2: Occupancy of landing includes flying time of 3NM plus actual landing operation

### 5. IFR Separation and Wake Turbulence Separation for Take-off after Take-off

- IFR Separation : 1.0 min
- Wake Turbulence Separation: 2.0 min (only after Heavy)

6. Wake Turbulence Separation for Landing after Landing

- Heavy after Heavy: 2.0 min
- Large after Heavy: 2.0 min
- Small after Heavy: 3.0 min
- Small after Large: 3.0 min

7. Wake Turbulence Separation for Take-off after Landing  
(Preferential use only)

- Heavy after Heavy: 2.0 min
- Large after Heavy: 2.0 min
- Small after Heavy: 3.0 min
- Small after Large: 3.0 min

8. Additional Separation for Landing after Take-off  
(Preferential use only)

- 1.2 min (flying time of 3NM of previous take-off aircraft)



**RUNWAY CAPACITY WITH EXISTING TAXIWAY SYSTEM**

Patterns	Unit: Minutes/Operation												
	Pattern-1	Pattern-2	Pattern-3	Average	Previous Aircraft	Pattern-1	Pattern-2	Pattern-3					
	07	25	25	07	Runway Occupancy	Runway Occupancy	Runway Occupancy	Runway Occupancy					
T/O	07	25	25	07	Heavy	3.00	2.00	2.00	2.00	2.30	2.30	2.30	2.00
L/D	07	25	25	07	Large	3.00	1.00	1.00	1.00	2.30	2.30	2.30	1.00
T/O after T/O					Small	3.00	1.00	1.00	1.00	2.30	2.30	2.30	1.00
Heavy	3.00	2.30	2.30	2.30	Average	3.00	1.10	1.10	1.10	2.30	2.30	2.30	1.10
Large	1.10	2.30	2.30	2.30									
Small	1.10	1.10	1.10	1.10									
Average	1.29	1.84	1.84	1.84									
T/O after L/D					Heavy	3.00	1.00	1.00	1.00	2.30	2.30	2.30	1.00
Heavy	3.00	2.30	2.30	2.30	Large	3.00	1.00	1.00	1.00	2.30	2.30	2.30	1.00
Large	1.00	2.30	2.30	2.30	Small	3.00	1.00	1.00	1.00	2.30	2.30	2.30	1.00
Small	1.00	1.00	1.00	1.00	Average	3.00	1.00	1.00	1.00	2.30	2.30	2.30	1.00
Average	1.20	1.81	1.81	1.81									
L/D after T/O					Heavy	2.20	2.20	1.95	1.95	5.20	2.20	2.20	1.95
Heavy	2.20	5.20	5.20	3.40	Large	2.20	2.20	1.95	1.95	5.20	2.20	2.20	1.95
Large	2.20	2.20	2.20	3.40	Small	2.20	2.20	1.95	1.95	5.20	2.20	2.20	1.95
Small	1.95	1.95	1.95	3.15	Average	2.20	2.20	1.95	1.95	5.20	2.20	2.20	1.95
Average	2.11	2.41	2.41	3.31									
L/D after L/D					Heavy	2.20	2.20	3.00	3.00	5.20	2.20	2.20	3.00
Heavy	2.20	5.20	5.20	2.20	Large	2.20	2.20	3.00	3.00	5.20	2.20	2.20	3.00
Large	2.20	2.20	2.20	2.20	Small	2.20	2.20	1.95	1.95	5.20	2.20	2.20	1.95
Small	2.60	2.60	2.60	2.60	Average	2.20	2.20	2.60	2.60	5.20	2.20	2.20	2.60
Average	2.35	2.65	2.65	2.35									
Average of T/O	1.25	1.83	1.83	2.06									
Average of L/D	2.23	2.53	2.53	2.83									
Average Occupancy	1.74	2.18	2.18	2.44									
Hourly Capacity	34.5	27.6	27.6	24.5									
Percentage Usage	67%	5%	5%	28%									100%

**RUNWAY CAPACITY WITH TAXIWAY IMPROVEMENT MEASURE 1  
- ADDITION OF TAXIWAY FOR RUNWAY 25 THRESHOLD**

Patterns	Unit: Minutes/Operation													
	Pattern-1			Pattern-2			Pattern-3			Pattern-3				
	Pattern-1	Pattern-2	Pattern-3	Average	Previous Aircraft	Runway Occupancy Heavy	Runway Occupancy Large	Runway Occupancy Small	Runway Occupancy Heavy	Runway Occupancy Large	Runway Occupancy Small	Runway Occupancy Heavy	Runway Occupancy Large	Runway Occupancy Small
T/O	07	25	25											
L/D	07	25	07											
T/O after T/O														
Heavy	3.00	1.10	1.10		Heavy	3.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Large	1.10	1.10	1.10		Large	3.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Small	1.10	1.10	1.10		Small	3.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Average	1.29	1.10	1.10		Average	3.00	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
T/O after L/D														
Heavy	3.00	1.00	1.10		Heavy	3.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	3.00
Large	1.00	1.00	1.10		Large	3.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	3.00
Small	1.00	1.00	2.24		Small	3.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Average	1.20	1.00	1.53		Average	3.00	1.00	1.00	1.00	1.00	1.00	1.10	1.10	2.24
L/D after T/O														
Heavy	2.20	5.20	3.40		Heavy	2.20	2.20	1.95	5.20	2.20	1.95	3.40	3.40	3.15
Large	2.20	2.20	3.40		Large	2.20	2.20	1.95	5.20	2.20	1.95	3.40	3.40	3.15
Small	1.95	1.95	3.15		Small	2.20	2.20	1.95	5.20	2.20	1.95	3.40	3.40	3.15
Average	2.11	2.41	3.31		Average	2.20	2.20	1.95	5.20	2.20	1.95	3.40	3.40	3.15
L/D after L/D														
Heavy	2.20	5.20	2.20		Heavy	2.20	2.20	3.00	5.20	2.20	3.00	2.20	2.20	3.00
Large	2.20	2.20	2.20		Large	2.20	2.20	3.00	5.20	2.20	3.00	2.20	2.20	3.00
Small	2.60	2.60	2.60		Small	2.20	2.20	1.95	5.20	2.20	1.95	2.20	2.20	1.95
Average	2.35	2.65	2.35		Average	2.20	2.20	2.60	5.20	2.20	2.60	2.20	2.20	2.60
Average of T/O	1.25	1.05	1.32											
Average of L/D	2.23	2.53	2.83											
Average Occupancy	1.74	1.79	2.07											
Hourly Capacity	34.5	33.5	28.9											
Percentage Usage	67%	5%	28%											100%

**RUNWAY CAPACITY WITH TAXIWAY IMPROVEMENT MEASURE 2  
- IMPROVEMENT OF EXISTING PARTIAL PARALLEL TAXIWAY FOR USE OF  
WIDE-BODY JET -**

Unit: Minutes/Operation

Patterns	Pattern-1		Pattern-2		Pattern-3		Average	Previous Aircraft	Pattern-1		Pattern-2		Pattern-3				
	07	25	25	07	25	07			Runway Occupancy Heavy	Runway Occupancy Large	Runway Occupancy Small	Runway Occupancy Heavy	Runway Occupancy Large	Runway Occupancy Small	Runway Occupancy Heavy	Runway Occupancy Large	Runway Occupancy Small
T/O	07	25	25	07	25	07		Aircraft	Heavy	2.00	2.00	2.00	2.00	2.00	2.30	2.30	2.00
L/D	07	25	25	07	25	07		Heavy	2.00	2.00	2.00	2.30	2.30	2.00	2.30	2.30	2.30
T/O after T/O	1.10	2.30	2.30	2.30	1.10	1.10		Large	1.00	1.00	1.00	2.30	2.30	1.00	2.30	2.30	1.00
Heavy	1.10	2.30	2.30	2.30	1.10	1.10		Small	1.00	1.00	1.00	2.30	2.30	1.00	2.30	2.30	1.00
Large	1.10	2.30	2.30	2.30	1.10	1.10		Average	1.10	1.10	1.10	2.30	2.30	1.10	2.30	2.30	1.10
Small	1.10	2.30	2.30	2.30	1.10	1.10		Heavy	1.00	1.00	1.00	2.30	2.30	1.00	2.30	2.30	1.00
Average	1.10	2.30	2.30	2.30	1.10	1.10		Large	1.00	1.00	1.00	2.30	2.30	1.00	2.30	2.30	1.00
T/O after L/D	1.00	2.30	2.30	2.30	1.00	1.00		Small	1.00	1.00	1.00	2.30	2.30	1.00	2.30	2.30	1.00
Heavy	1.00	2.30	2.30	2.30	1.00	1.00		Average	1.00	1.00	1.00	2.30	2.30	1.00	2.30	2.30	1.00
Large	1.00	2.30	2.30	2.30	1.00	1.00		Heavy	2.20	2.20	2.20	2.20	2.20	1.95	3.40	3.40	3.15
Small	1.00	2.30	2.30	2.30	1.00	1.00		Large	2.20	2.20	2.20	2.20	2.20	1.95	3.40	3.40	3.15
Average	1.00	2.30	2.30	2.30	1.00	1.00		Small	2.20	2.20	2.20	2.20	2.20	1.95	3.40	3.40	3.15
L/D after T/O	2.20	2.20	2.20	2.20	2.20	2.20		Average	2.20	2.20	2.20	2.20	2.20	1.95	3.40	3.40	3.15
Heavy	2.20	2.20	2.20	2.20	2.20	2.20		Heavy	2.20	2.20	2.20	2.20	2.20	3.00	2.20	2.20	3.00
Large	2.20	2.20	2.20	2.20	2.20	2.20		Large	2.20	2.20	2.20	2.20	2.20	3.00	2.20	2.20	3.00
Small	2.20	2.20	2.20	2.20	2.20	2.20		Small	2.20	2.20	2.20	2.20	2.20	1.95	2.20	2.20	1.95
Average	2.20	2.20	2.20	2.20	2.20	2.20		Average	2.20	2.20	2.20	2.20	2.20	2.60	2.20	2.20	2.60
L/D after L/D	2.20	2.20	2.20	2.20	2.20	2.20		Heavy	2.20	2.20	2.20	2.20	2.20	3.00	2.20	2.20	3.00
Heavy	2.20	2.20	2.20	2.20	2.20	2.20		Large	2.20	2.20	2.20	2.20	2.20	3.00	2.20	2.20	3.00
Large	2.20	2.20	2.20	2.20	2.20	2.20		Small	2.20	2.20	2.20	2.20	2.20	1.95	2.20	2.20	1.95
Small	2.20	2.20	2.20	2.20	2.20	2.20		Average	2.20	2.20	2.20	2.20	2.20	2.60	2.20	2.20	2.60
Average	2.20	2.20	2.20	2.20	2.20	2.20		Percentage Usage	67%	5%	28%	100%					
Average of T/O	1.05	1.83	2.06	1.37				Average of L/D	2.23	2.03	2.44	1.88					
Average of L/D	2.23	2.03	2.44	1.88				Hourly Capacity	36.6	29.6	24.5	31.8					

**RUNWAY CAPACITY WITH COMPLETE PARALLEL TAXIWAY**

Unit: Minutes/Operation

Patterns	Pattern-1		Pattern-2		Pattern-3		Average	Previous Aircraft	Pattern-1			Pattern-2			Pattern-3		
	07	25	25	07	25	07			Heavy	Large	Small	Heavy	Large	Small	Heavy	Large	Small
T/O																	
L/D																	
T/O after T/O																	
Heavy	1.10	1.10	1.10	1.10	1.10	1.10		Heavy	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Large	1.10	1.10	1.10	1.10	1.10	1.10		Large	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Small	1.10	1.10	1.10	1.10	1.10	1.10		Small	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Average	1.10	1.10	1.10	1.10	1.10	1.10		Average	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
T/O after L/D																	
Heavy	1.00	1.00	1.00	1.00	1.00	1.00		Heavy	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Large	1.00	1.00	1.00	1.00	1.00	1.00		Large	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Small	1.00	1.00	1.00	1.00	1.00	2.24		Small	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Average	1.00	1.00	1.00	1.00	1.53	1.53		Average	1.00	1.00	1.00	1.00	1.00	1.00	1.10	1.10	2.24
L/D after T/O																	
Heavy	2.20	2.20	2.20	3.40	3.40	3.40		Heavy	2.20	2.20	1.95	2.20	2.20	1.95	3.40	3.40	3.15
Large	2.20	2.20	2.20	3.40	3.40	3.40		Large	2.20	2.20	1.95	2.20	2.20	1.95	3.40	3.40	3.15
Small	1.95	1.95	1.95	3.15	3.15	3.15		Small	2.20	2.20	1.95	2.20	2.20	1.95	3.40	3.40	3.15
Average	2.11	2.11	2.11	3.31	3.31	3.31		Average	2.20	2.20	1.95	2.20	2.20	1.95	3.40	3.40	3.15
L/D after L/D																	
Heavy	2.20	2.20	2.20	2.20	2.20	2.20		Heavy	2.20	2.20	3.00	2.20	2.20	3.00	2.20	2.20	3.00
Large	2.20	2.20	2.20	2.20	2.20	2.20		Large	2.20	2.20	3.00	2.20	2.20	3.00	2.20	2.20	3.00
Small	2.60	2.60	2.60	2.60	2.60	2.60		Small	2.20	2.20	1.95	2.20	2.20	1.95	2.20	2.20	1.95
Average	2.35	2.35	2.35	2.35	2.35	2.35		Average	2.20	2.20	2.60	2.20	2.20	2.60	2.20	2.20	2.60
Average of T/O	1.05	1.05	1.05	1.32	1.32	1.12											
Average of L/D	2.23	2.23	2.23	2.83	2.83	2.40											
Average Occupancy	1.64	1.64	1.64	2.07	2.07	1.76											
Hourly Capacity	36.6	36.6	36.6	28.9	28.9	34.1											
Percentage Usage	67%	67%	5%	28%	28%	100%											

**APPENDIX-6.2.2 EVALUATION OF EXISTING PAVEMENT  
AT JUAN SANTAMARIA AIRPORT**

1. Evaluation of Subgrade

a) Runway

No.	1	2	3	4	5	6	7	8	9	10
CBR	6	2.3	4	12	12	11	10	10	8	7
No.	11	12	13	14	15	16	17	Average		
CBR	7	7	7	7	6	6	5	6.8		

$$\text{Design CBR} = 6.8 - \frac{12-2.3}{5.382} = 5\%$$

b) Taxiway and Apron

No.	1	2	3	4	5	6	7	Average	
CBR	7	5	4	3.5	3	3	2.5	4	

$$\text{Design CBR} = 4 - \frac{7-2.5}{4.059} = 3\%$$

2. Preliminary Study of PCN

- a) Design CBR = 5%
- b) Design Aircraft = DC-10-30
- c) Evaluated thickness = 102 cm (Runway)
- d) Estimated Gross Aircraft Mass = 209,000 Kg

PCN value is calculated based on the above conditions making reference to the ICAO Aerodrome Design Manual Part 3, Pavement. PCN value is around 62.

**APPENDIX-6.2.3 SPACE LIST OF INTERNATIONAL  
PASSENGER TERMINAL BUILDING AT  
JUAN SANTAMARIA AIRPORT**





## SPACE LIST OF TERMINAL BUILDING OF JUAN SANTAMARIA AIRPORT

(1)

FACILITIES	BASE MENT (m2)	FIRST FLOOR (m2)	SECOND FLOOR (m2)	THIRD FLOOR (m2)	FOURTH FLOOR (m2)	FIFTH FLOOR (m2)
<b>1. FUNCTIONAL AREAS</b>						
1.1 Documentation control Int'l arrival	411,8	-	-	-	-	-
1.2 Baggage claim area	231,4	-	-	-	-	-
1.3 Baggage inspection	314,9	-	-	-	-	-
1.4 Passenger reception (Departure)	-	677,6	-	-	-	-
1.5 Security inspection (Departure)	-	307,0	-	-	-	-
1.6 Baggage area	-	125,0	-	-	-	-
Sub-Total	958,1	1109,6	0,0	0,0	0,0	0,0
<b>2. PUBLIC OFFICES</b>						
2.1 Immigration	67,1	-	13,5	-	-	-
2.2 Customs	50,7	-	-	-	-	-
2.3 Security	46,3	-	11,7	-	-	-
2.4 Health	37,0	-	-	-	-	-
2.5 Tourism	82,2	-	-	-	-	-
2.6 I.R.S.	6,6	-	-	-	-	-
2.7 Agriculture	21,6	-	-	-	-	-
2.8 O.I.R.S.A.	-	-	-	-	-	-
2.9 I.M.A.S.	-	-	-	30,2	-	-
2.10 Meteorology (Mirenem)	90,6	-	-	382,5	124,2	28,6
2.11 Civil aviation Ministry of Transport	72,2	-	-	-	-	-

Continued Table

(2)

FACILITIES	BASE MENT (m2)	FIRST FLOOR (m2)	SECOND FLOOR (m2)	THIRD FLOOR (m2)	FOURTH FLOOR (m2)	FIFTH FLOOR (m2)
2.12 Ministry of exterior	78,2	-	-	-	-	-
2.13 Mail	17,5	-	-	-	-	-
2.14 Bank	-	25,3	-	-	-	-
2.15 Insurance	-	4,3	-	-	-	-
2.16 Information	-	15,0	-	-	-	-
Sub-total	570,0	44,6	25,2	412,7	124,2	28,6
<b>3. PRIVATE OFFICES</b>						
3.1 Lacsá	267,4	56,8	55,5	-	-	-
3.2 American airlines	52,0	-	-	-	-	-
3.3 Arrow	9,0	-	-	-	-	-
3.4 Other airlines	117,6	158,0	99,5	-	-	-
3.5 Other companies	-	-	-	92,5	-	-
3.6 Taxis	-	17,7	-	-	-	-
Sub-total	446,0	232,5	155,0	92,5	0,0	0,0
<b>4. SHOPS</b>						
Sub-total	0,0	316,0	36,4	0,0	0,0	0,0
<b>5. SUPPORT ELEMENTS</b>						
5.1 Electric	205,0	-	1,0	6,4	8,6	-
5.2 Elevator	15,1	11,0	1,5	4,5	4,0	-
5.3 Mechanical stairs	19,2	18,0	-	-	-	-

Continued Table

(3)

FACILITIES	BASE MENT (m2)	FIRST FLOOR (m2)	SECOND FLOOR (m2)	THIRD FLOOR (m2)	FOURTH FLOOR (m2)	FIFTH FLOOR (m2)
5.4 Telephones	25,7	20,3	-	-	-	-
5.5 Baggage conveyer	168,9	27,0	-	-	-	-
5.6 Ducts	8,6	4,4	6,0	5,7	-	-
5.7 Air conditioning	9,0	-	-	-	-	-
5.8 W.C	130,9	187,7	74,5	22,2	7,0	-
5.9 Mop room	7,5	-	1,8	2,1	-	-
5.10 Dinning room	105,0	72,0	-	-	8,0	-
5.11 Employees restaurant	120,0	-	-	-	-	-
5.12 Waiting room	-	2035,6	-	-	-	-
5.13 Water tank	-	-	-	-	40,0	-
5.14 Restaurant	-	-	278,0	-	-	-
cc5.15 Bar	-	76,0	142,2	-	-	-
5.16 Cafeteria	-	-	255,9	-	-	-
5.17 Chapel	-	-	73,2	-	-	-
5.18 Classroom	-	-	-	-	-	-
5.19 Dormitory	-	-	-	-	-	-
5.20 Refrigeration room	-	-	18,0	-	-	-
5.21 Kitchen	22,0	-	175,8	-	-	-
Sub-total	836,9	2452,0	1027,9	40,9	67,6	0,0

Continued Table

(4)

FACILITIES	BASE MENT (m2)	FIRST FLOOR (m2)	SECOND FLOOR (m2)	THIRD FLOOR (m2)	FOURTH FLOOR (m2)	FIFTH FLOOR (m2)
<b>6. STORE ROOM</b>						
6.1 Lacsá	27,5	-	-	-	-	-
6.2 K.L.M.	93,0	-	-	-	-	-
6.3 Other airlines	6,5	-	-	-	-	-
6.4 Others	265,6	50,4	47,0	-	2,5	-
Sub-total	392,6	50,4	47,0	0,0	2,5	0,0
<b>7. OTHER AREAS</b>						
7.1 Corridor	615,7	1048,0	66,6	92,3	18,8	-
7.2 Stairs	204,2	265,3	48,1	29,2	4,0	-
7.3 Passenger speedways	-	405,0	-	-	-	-
7.4 Others	2537,6	431,6	248,4	58,4	18,8	-
cSub-total	3357,50	2149,9	363,1	179,9	41,6	0,0
<b>8. VACANT SPACES</b>						
Sub-total	0,0	0,0	157,5	15,0	0,0	0,0
<b>Total</b>	<b>6561,1</b>	<b>6355,0</b>	<b>1812,1</b>	<b>741,0</b>	<b>235,9</b>	<b>28,6</b>

**APPENDIX-6.2.4    DETAILS OF AIR NAVIGATION SYSTEMS  
AT JUAN SANTAMARIA AIRPORT**



Item	Description	Remarks (Date of Installation)
<u>Radio Navalds</u>		
- Non-directional radio beacon (NDB)	260 KHz, 1KW	Aircom About 1975
- VHF omni-directional radio range (VOR) and co-located Distance Measuring Equipment (DME)	115.7 MHz. 100W 104x, 1KW	Wilcox
- Instrument Landing system (ILS)		1977
. Localizer	3MHz freq.	
. Glide Path	328 to 336 MHz Null Reference Gp=2.5 deg.	
<u>Air Traffic Control and Telecommunications</u>		
- Airport Surveillance (ASR) and Secondary Surveillance Radar (SSR)		Bendix Baltimore U.S.A. 1975
- Air-ground VHF communication system	Emergency (121.5MHz) SMC (121.3MHz) TWR (188.6MHz) TWR (121.9MHz) APP (119.6MHz) APP (120.5MHz)	About 1975
- Air-ground UHF communication system	Nil	
- Automated terminal information system (ATIS)	Under Repair	

Item	Description	Remarks
- Control consoles	.Aerodrome/Ground Control Console .APP consoles (2 pos)	
- UHF link	Between Poas and Pavas Station	COCESNA
- AFTN message exchange and teletypewriters	Dom circuits as AIS	About 1980 AFTN Service is done by COCESNA.
- Magnetic tape recorder	10 channel	About 1972
- ATC intercommunication	Provide	
- Time distribution system	Nil	
<u>Meteorological Equipment</u>		
- Runway surface sensors	Conventional type .Anemometers .Thermometers (Max-Min) .Precipitation Gauges .Barometer .Humidity .Evaporation grade .Rainfall .Sunshine	
- Runway visual range	Nil	
- Ceilometer	Nil	
- WX data processing and recorders	Provided by the computer system	
- HF receiver and WX facsimile	From Washington and to Washington and Central America	
- WX Teletypewriters	Provided	
- Radiosonde	Operated	About 1975



Item	Description	Remarks
- Weather Satellite Receiver	Provided	1975
- Weather radar	Nil	
<u>Aeronautical Ground Lights</u>		
- Aerodrome beacon	Provided	
- Precision approach category - I lighting system	RWY-07	
- Visual approach slope indicator system	A-VASIS for RWY-07	
- Runway threshold lights	Provided on RWY 07/25	
- Runway edge lights	Provided	
- Runway end lights	Provided	
- Runway centerline lights	Nil	
- Runway touchdown zone lights	Nil	
- Stopway lights	Provided	
- Taxiway centerline lights	Nil	
- Taxiway edge lights	Provided	
- Taxiway guidance system	Nil	
- Taxi-holding position lights	Nil	
- Apron floodlights	6 poles (Installed on building)	

Item	Description	Remarks
- Visual docking guidance system	Nil	
- Wind direction indicator lights	Not illuminated	
- Landing direction indicator	Illuminated	
- Obstruction lights	Provided	



## **APPENDIX TO CHAPTER 8**



**APPENDIX-8.2.1    OUTLINE OF PREVIOUS MASTER PLANS  
FOR JUAN SANTAMARIA AIRPORT**

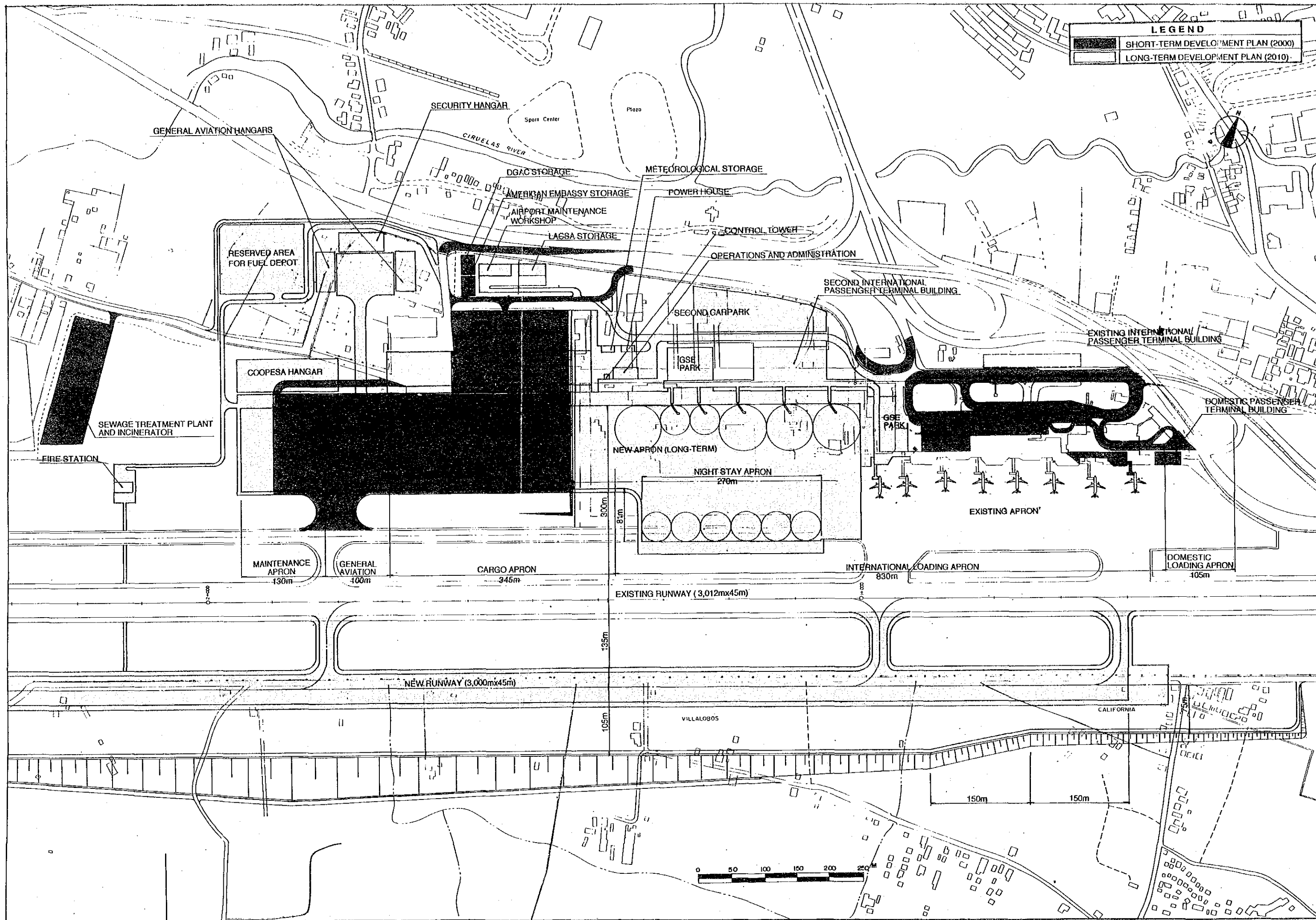
- Comparison of Previous Runway Study in Juan Santamaría Airport -

ALTERNATIVES	DIXON REPORT	JAC REPORT	BELL REPORT	REMARKS
1. Development at Existing Airport Site				
1.1 Improvement of existing runway	<ul style="list-style-type: none"> <li>1) New partial parallel taxiway at 180 m.</li> <li>2) West new terminal area</li> <li>3) Central new cargo terminal.</li> <li>4) South new maintenance area.</li> <li>5) South new partial parallel taxiway L=600m</li> </ul>	<p>RO 1) Relocation of existing highway.</p>		<ul style="list-style-type: none"> <li>1) Existing obstructions at terminal area to be removed</li> <li>2) Width of RWY strip at terminal area remains 75m.</li> <li>3) Precision approach runway not available</li> </ul>
1.2 Extension of existing runway		<p>RB 1) RWY extension 1,500 m to the west</p> <p>2) New partial parallel taxiway at 180 m</p>	<p>A-7 1) RWY extension 500 m to the west</p> <p>2) New partial parallel taxiway at 180 m</p>	<ul style="list-style-type: none"> <li>1) Existing obstruction at terminal area to be removed</li> <li>2) Width of RWY strip at terminal area remains 75m</li> </ul>
1.3 Construction of new angled runway		<p>RC 1) 7 degrees angled new runway</p> <p>2) New partial parallel taxiway</p> <p>3) Existing RWY changed to parallel taxiway</p> <p>4) Existing apron and terminal facilities utilized as it is</p>	<p>A-2 1) 7 degrees angled new runway</p> <p>2) New partial parallel taxiway</p> <p>3) Existing RWY changed to parallel taxiway</p> <p>4) Existing apron and terminal facilities utilized as it is</p>	<ul style="list-style-type: none"> <li>1) 150m width of RWY strip available</li> <li>2) Complete parallel TWY available at 180m from RWY center</li> <li>3) Broad terminal area available</li> <li>4) Wind coverage to be checked to angled RWY</li> </ul>
1.4 Construction of new parallel runway instead of existing runway.		<p>RA 1) RWY shifted 1,000m to the west</p> <p>2) Existing RWY changed to parallel taxiway</p>	<p>A-3 1) RWY shifted 1,000m to the west</p> <p>2) Existing RWY changed to parallel taxiway</p>	<ul style="list-style-type: none"> <li>1) 150m width of RWY strip available</li> <li>2) Complete parallel TWY available at 180m from RWY center</li> <li>3) Broad area available for new terminal area</li> </ul>
1.5 Improvement of existing runway and construction of new parallel runway so as to combine the function of Tobias Boranós.			<p>A-4 1) New partial parallel taxiway at 180 m</p> <p>2) Additional parallel RWY at the south (GR)</p> <p>3) Additional parallel TWY at the south (GR)</p>	<ul style="list-style-type: none"> <li>1) Existing obstruction at terminal area to be removed</li> <li>2) Width of RWY strip at terminal area remains 75m</li> <li>3) Airport capacity of Tobias Boranós to be checked</li> </ul>
2.1. New Airport Site			<p>Studied</p> <p>(Concluded as best site)</p>	<ul style="list-style-type: none"> <li>1) Out of this study</li> <li>2) New site to be only considered if improvement of existing airport is not feasible ( up to year 2010 )</li> </ul>
2.1 Tarcores site	Studied		Studied	
2.2 Cadera site	Studied		Studied	
2.3 Jardín site	Studied		Studied	
2.4 Pitahaya site	Studied		Studied	

**APPENDIX-8.2.2 ALTERNATIVE TERMINAL AREA  
DEVELOPMENT PLAN OF JUAN  
SANTAMARIA AIRPORT FOR REFERENCE  
( ALT. T-D)**




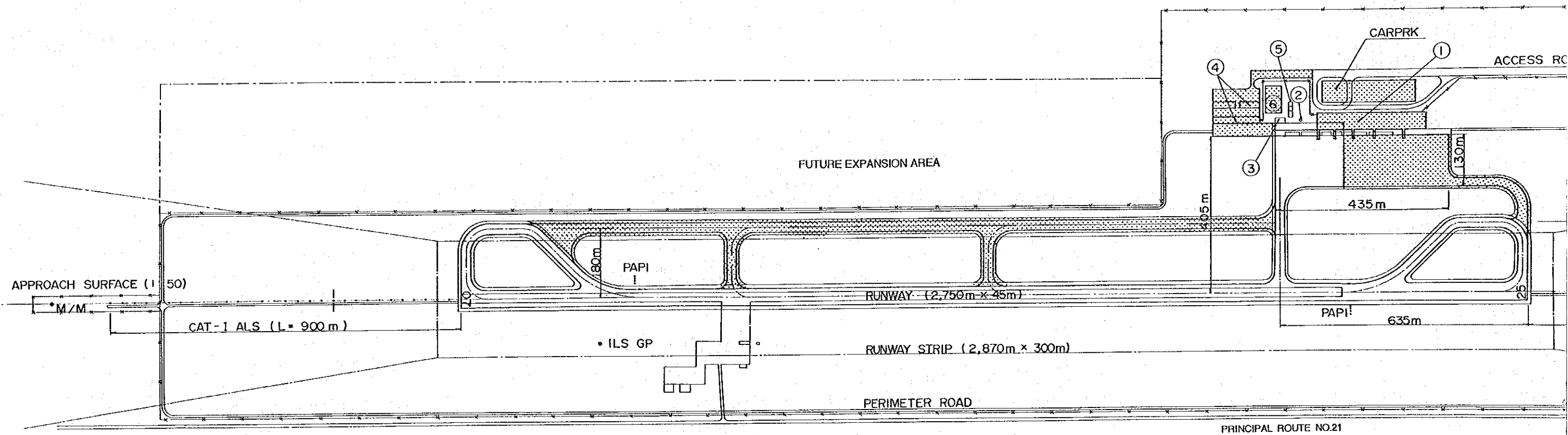




**APPENDIX-8.3.1 VERY LONG-TERM MASTER PLAN OF  
LIBERIA AIRPORT BEYOND 2010**

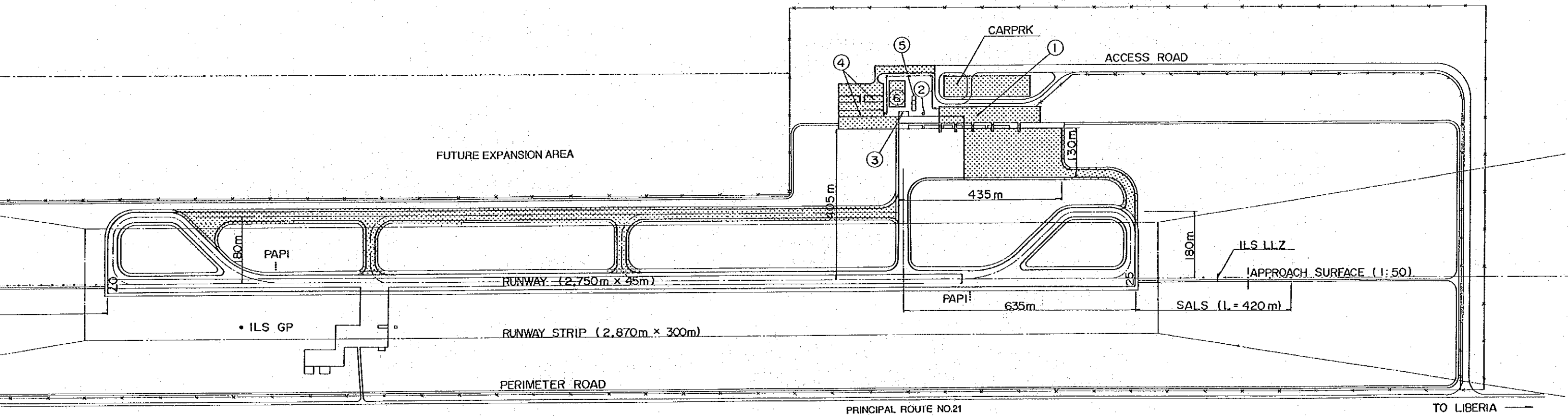


LEGEND	
	PROPOSED IMPROVEMENT PLAN
①	PASSEGER TERMINAL BUILDING EXPANSION
②	EXISTING CONTROL TOWER
③	EXISTING FIRE STATION
④	CARGO TERMINAL BUILDING
⑤	UTILITY COMPLEX (POWER HOUSE, MECHANICAL ROOM, WATER TANK)
⑥	FUEL DEPOT



PRINCIPAL ROUTE NO.21

ROOM, WATER TANK

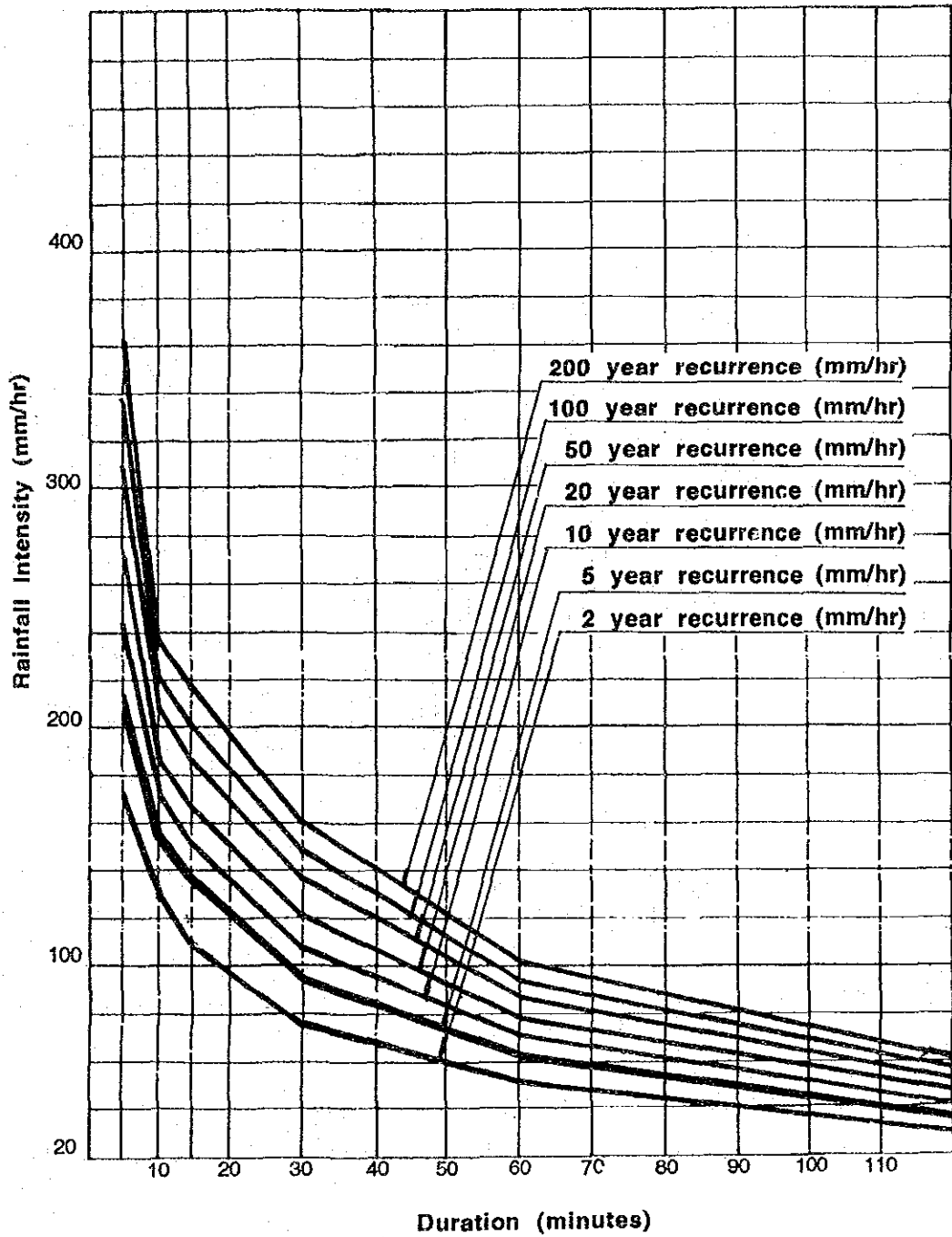


## **APPENDIX TO CHAPTER 10**





**APPENDIX-10.2.1 NOMOGRAM OF RAINFALL  
INTENSITY**



**APPENDIX-10.2.2 CALCULATION FOR PAVEMENT  
STRUCTURE**

## 1. Runway Overlay

### (1) Design Criteria

- Equivalent Annual Departures(1991-2000)
  - DC-10 :1,014times/year
  - A320 :10,534times/year
- Design CBR : 5%
- Gross Aircraft Weight (DC-10) : 500,000lbs

### (2) Equivalent Annual Departure by the Design Aircraft

- Conversion Factor : 0.6 (dual to dual tandem)
- Wheel Load of the Design Aircraft (DC-10) :35,625(lbs)  
(Wheel loads for wide body aircraft will be taken as the wheel load for a 300,000-pound(136,100kg) aircraft for equivalent annual departure calculations.)
- Wheel Load of A320 :34,692(lbs)

Aircraft	Dual Tandem Departures	Wheel Load (lbs)	Wheel Load of Design Aircraft	Equivalent Annual Departure
DC-10	1,014	35,625	35,625	1,014
A320	10,534*0.6 =6,320	34,692	35,625	5,631
Total				6,645

### (3) Total Required Thickness

The total required thickness of the runway is 122cm as shown in Figure A10.2.1 relating the required pavement thickness, weight of aircraft, frequency of annual departure and design CBR.

The required pavement structure is estimated as follows:

#### 1)Thickness of Subbase Course

Using Figure A10.2.1, the combined thickness of bituminous surface and base course needed over a 20 CBR subbase is estimated at 41cm(16inches). Thus thickness of the subbase course is determined by following calculation.

$$122\text{cm}-41\text{cm}=\underline{81\text{cm}}$$

#### 2)Thickness of Bituminous Surface

As indicated by the note in Figure A10.2.1, the thickness of bituminous surface for critical areas is 13cm(5inches).

#### 3)Thickness of Base Course

The thickness of base course can be computed by subtracting the thickness of bituminous surface from the combined thickness of surface and base determined in 1) above; in this case  $41-13=28\text{cm}$  of base course. However, the thickness of base course calculated should be compared with the minimum base course thickness required as shown in Figure A10.2.2. Using Figure A10.2.2, the minimum base course thickness requirements is 36cm(14inches). The extra thickness of base course by Figure A10.2.2 as opposed to the earlier calculation is taken out of the

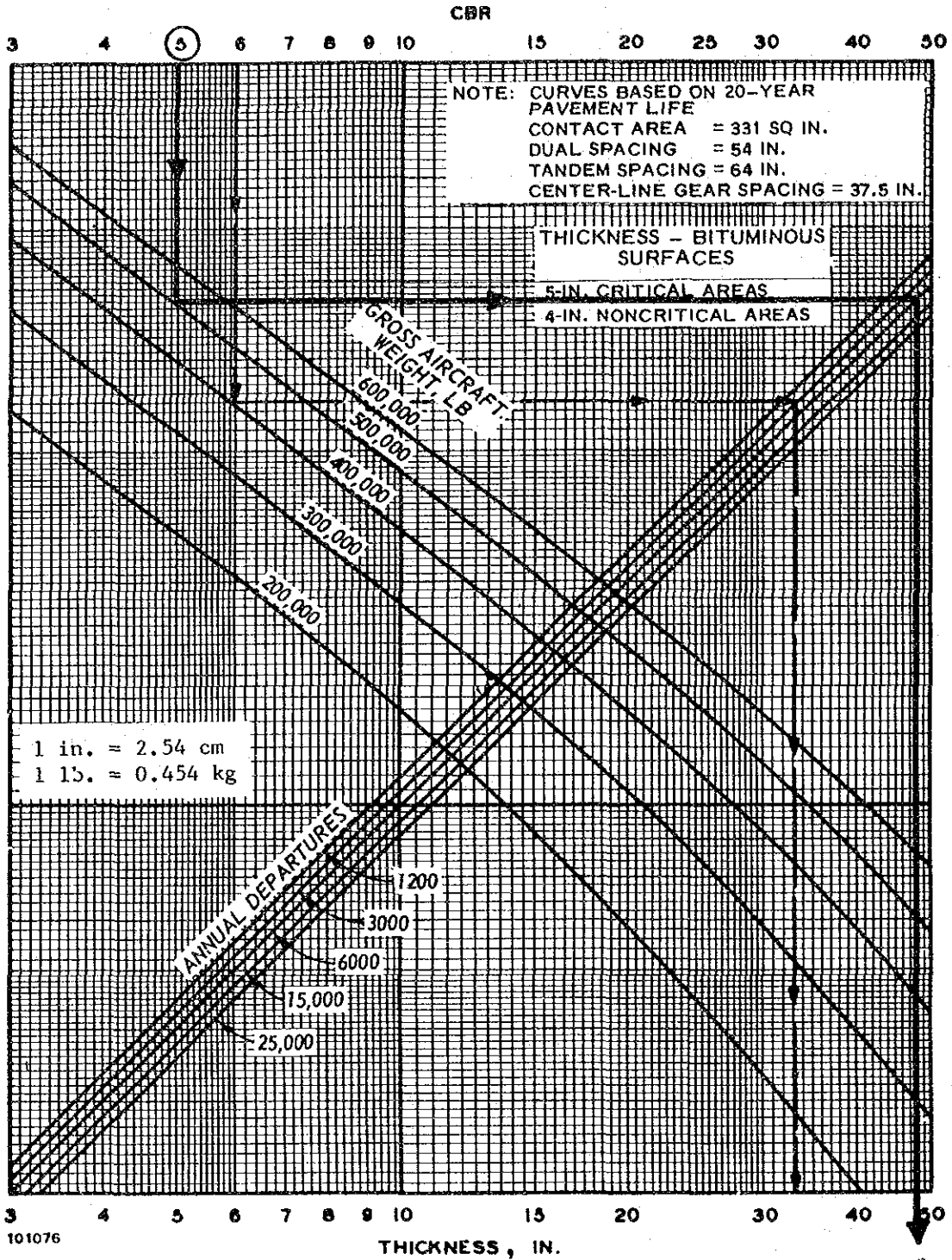


Figure A10.2.1 Flexible pavement Design Curves for Critical Areas

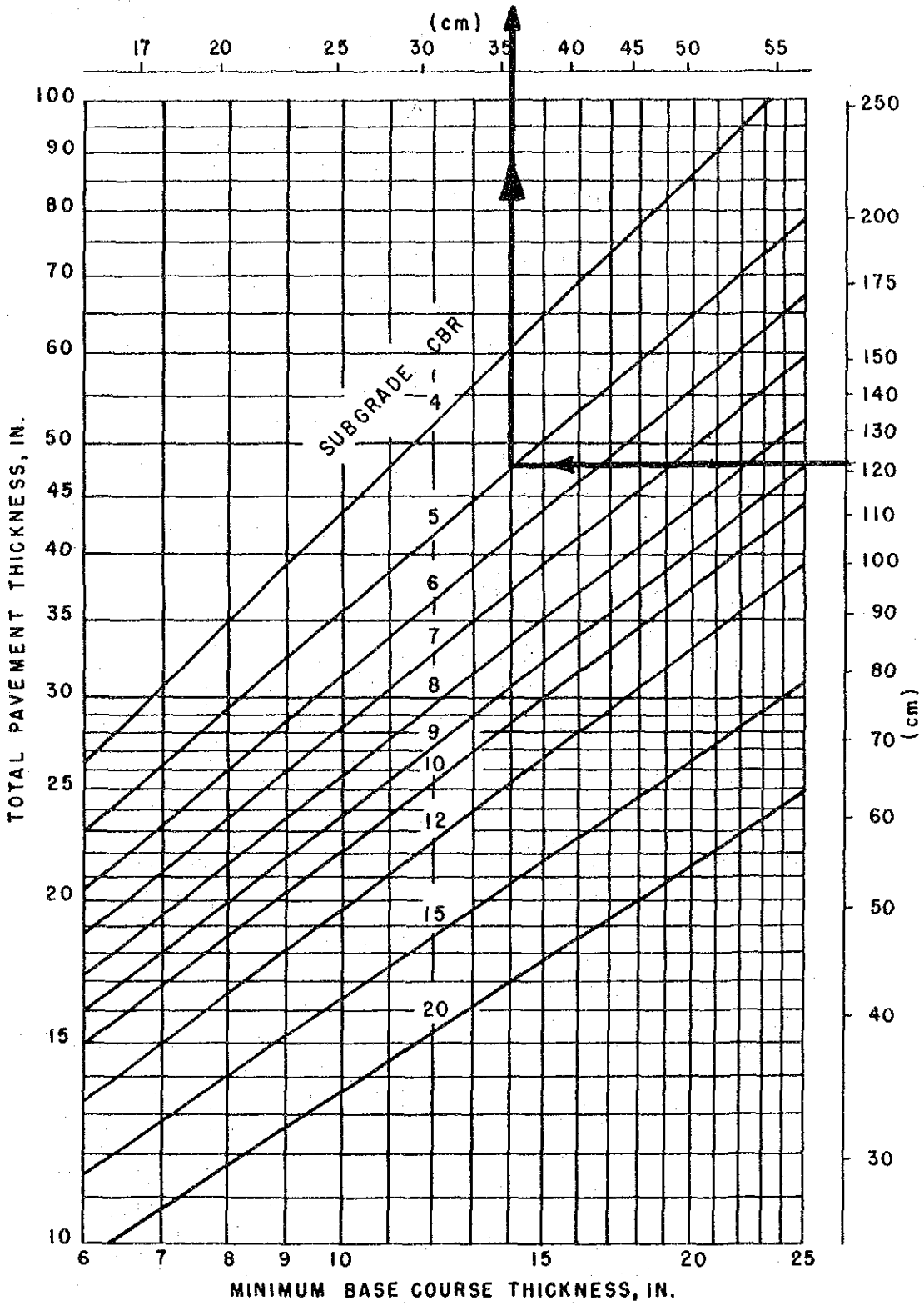


Figure A10.2.2 Minimum Base Course Thickness Requirements

subbase thickness not added to the total pavement thickness; in this case  $36-28=8\text{cm}$ .

#### 4) Summary

Based on the calculation in the above paragraphs, the final design thickness for this example would be as follows:

	Thickness Requirements (cm)
Bituminous Surface	13
Base Course	36
Subbase Course	73

#### (4) Required Overlay Thickness

Required overlay thickness is calculated for three portions as described in Table 6.2.4.

##### 1) Stabilized Subbase and Base Equivalency Factors

Based on the standard of FAA (AIRPORT PAVEMENT DESIGN AND EVALUATION, AC 150/5320-6C), the equivalency factors are determined as follows;

- a. Equivalency Factor Stabilized Subbase
  - Bituminous Surface Course 1.7
  - Crushed Aggregate Base Course 1.4
  - Subbase Course 1.0
- b. Equivalency Factor Stabilized Base
  - Bituminous Surface Course 1.2
  - Crushed Aggregate Base Course 1.0

##### 2) Calculation

Based on the above conditions, the required overlay thickness of each portion is described and shown in Figure A10.2.3.

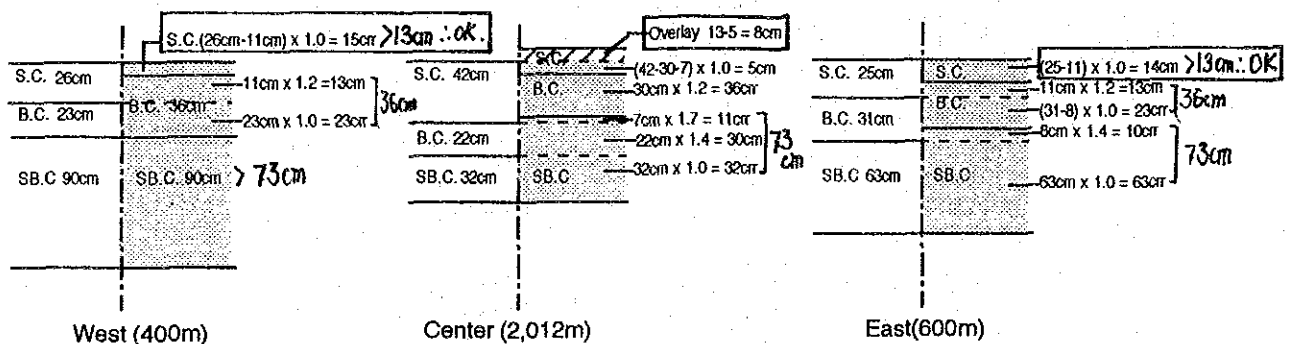


Figure A10.2.3 Calculation of Overlay Thickness

## 2. Apron

### (1) Design Criteria

- Design Aircraft : DC-10
- Repetition of Design Load : 6,000times
- Concrete Flexural Strength : 50kg/sq.cm (710 lb/sq.inch).
- Subgrade Modules     K75=3(kg/cu.cm)  
                                  (108 lb/cu.inch)
- Base Modules           K75=7(kg/cu.cm) (CBR=20%)  
                                  (253 lb/cu.inch)

### (2) Structure of Pavement

On the basis of the above criteria, the thickness of base course and concrete slab is estimated by using the diagram shown in Figures A10.2.4 and A10.2.5 respectively. The structure of the pavement for the apron is shown in Figure 10.2.6.

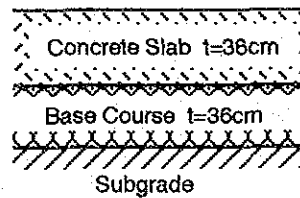


Figure A10.2.6 Structure of Rigid Pavement of the Apron

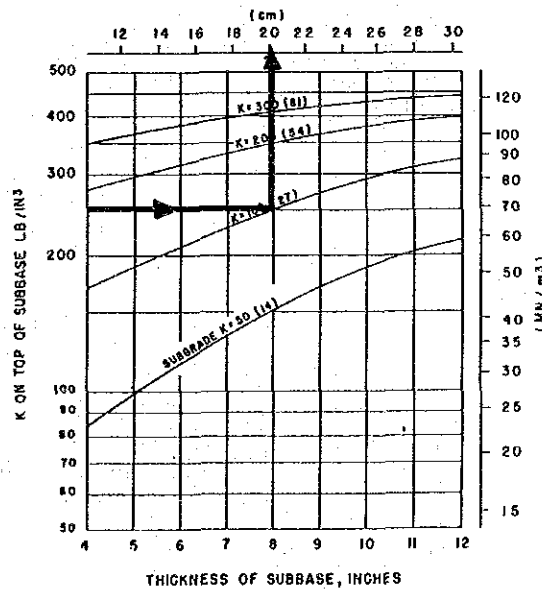
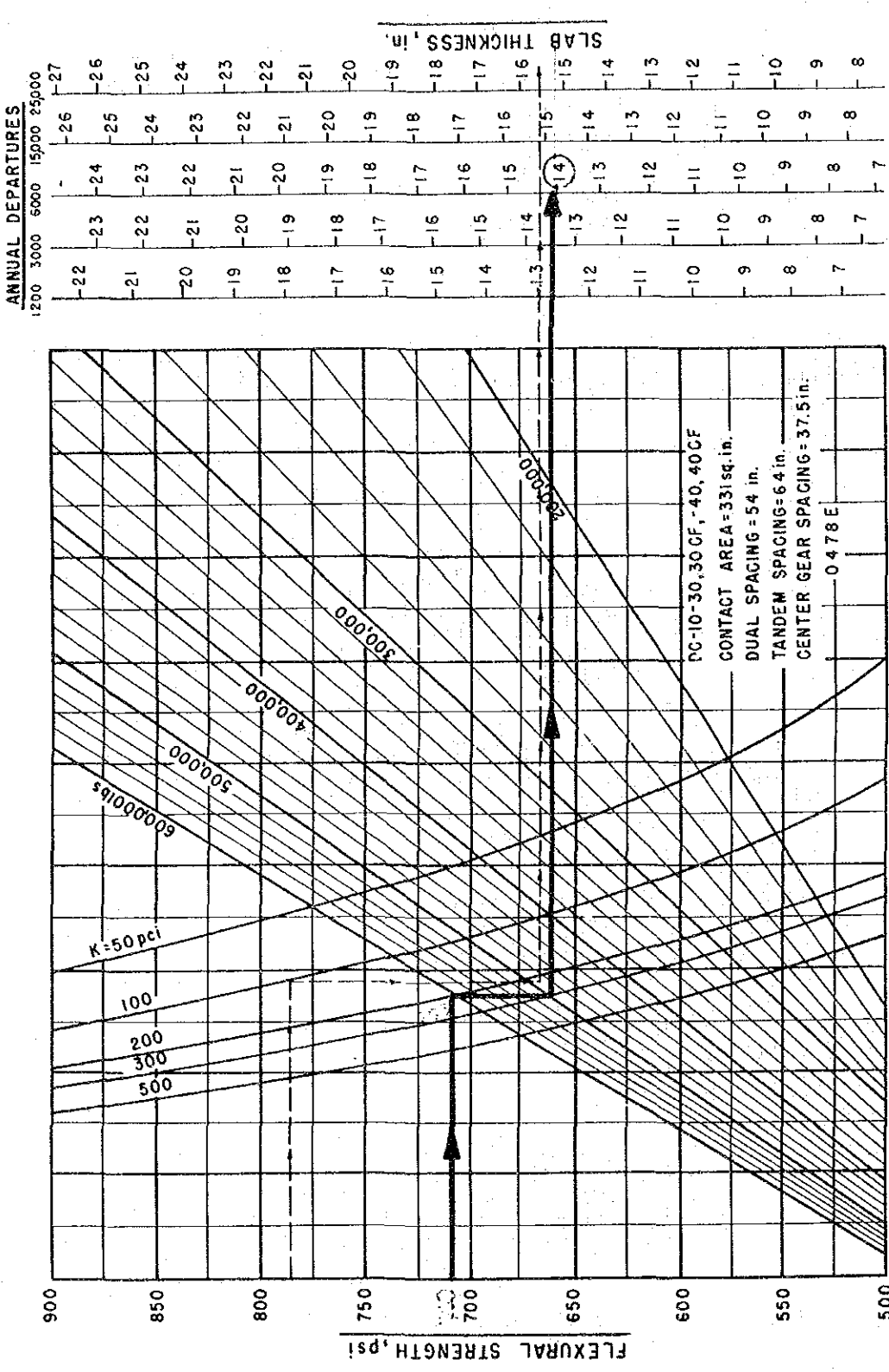


Figure A10.2.4 Effect of Stabilized Subbase on Subgrade Modules





NOTE:  
 1 inch = 2.54 cm | psi = 0.00069 MN/m<sup>2</sup>  
 1 lb = 0.454 kg | pci = 0.272 MN/m<sup>3</sup>

Figure A10.2.5 Rigid Pavement Design Curves - DC-10-30, 30CF, 40, and 40CF

### 3. Taxiway

#### (1) Improvement of Subgrade

The existing low bearing strength (3%) of the ground will be improved with the replacement of qualified sand and required thickness of qualified sand is calculated under the following conditions:

- a) Required CBR on subgrade is 5%.
- b) CBR of qualified sand is 10%.

A formula for the calculation is as follows:

$$((1.0-H+0.2) \times 3^{1/3} + (H-0.2) \times 10^{1/3}) / 1.0^3 = 4$$

Required thickness of replacement: H=0.60 (m)

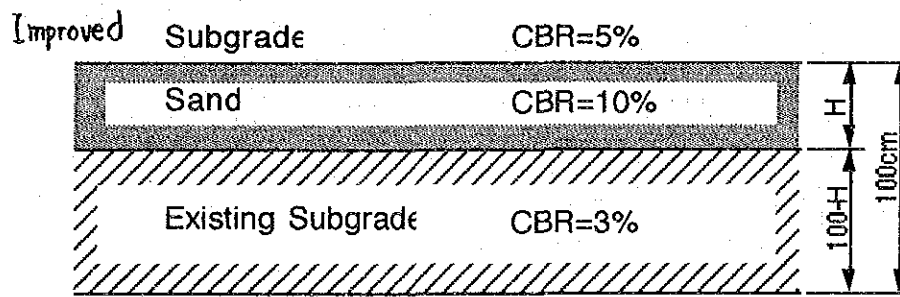


Figure A10.2.7 Replacement of the Existing Subgrade

#### (2) Pavement Structure

The improved subgrade CBR is 5% and it is same as that of the runway. Therefore, the pavement structure of the runway is applied for the taxiway and its thickness is shown in Figure A10.2.8.

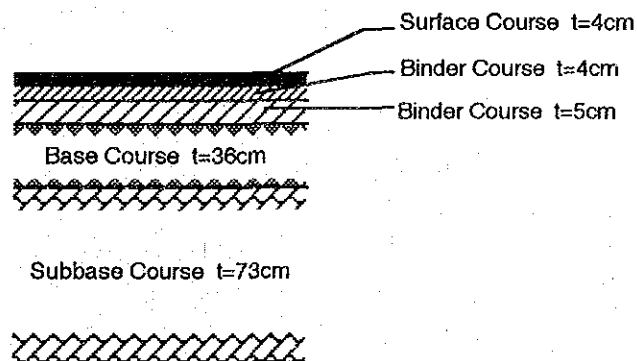


Figure A10.2.8 Pavement Structure of the Taxiway

#### 4. GSE Road and Park

The pavement structure of the GSE road is designed based on JCAB Airfield Asphalt Pavement Design Manual.

##### (1) Design Criteria

Load Classification : LT-1 (Wheel load of towing tractor for DC-10 class)  
Design CBR: 3%

##### (2) Total Required Thickness

The total required thickness is estimated at 77cm using the following table.

Total Required Thickness (Unit : cm)

Design Subgrade CBR(%)	Design Coverage (Class)		
	a	b	c
2	95	100	108
2.5	85	89	95
3	77	80	87
3.5	71	74	80

Source: JCAB Airfield Asphalt Pavement Design Manual (1990, JCAB)

a: 3,000times

b: 5,000times

c: 10,000times

##### (3) Pavement Structure

The required thickness of bituminous surface and base course is estimated 10cm and 25cm respectively based on the following tables:

Standard Thicknesses of Surface and Binder Course

Design Load (Class)	Design Coverage (Class)	Thickness (cm)		
		Surface Course	Binder Courses	
			Upper	Lower
LT-1	a	4	6	-
	b	4	6	-
	c	4	6	-

Source : JCAB Airfield Asphalt Pavement Design Manual

Standard Thickness of Base Course

Design Load (Class)	Design Subgrade CBR (cm)																
	2	2.5	3	3.5	4	4.5	5	6	7	8	9	10	12	14	16	18	20 or more
LA-1	40 (35)						35 (30)			30 (25)			25 (20)				
LT-1	25											20					

Note : Figures in ( ) shall be used for non-critical areas

Source : JCAB Airfield Asphalt Pavement Design Manual

From the above estimation, the pavement structure is determined as shown in Figure A10.2.9.

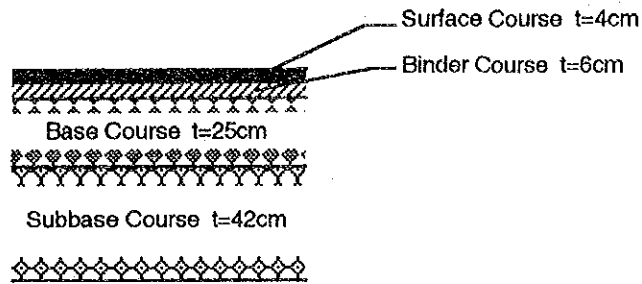


Figure A10.2.9 Pavement Structure of GSE Road and Park

## 5. Terminal Road and Car Park

### (1) Improvement of Subgrade

The existing soft ground will be improved with the same method as that of the taxiway. Since the bearing strength of the existing ground is 0.7% CBR, the required thickness of qualified sand is 1.0m so as to ensure the 5.0% CBR on subgrade.

### (2) Pavement Structure

The improved subgrade CBR is 5.0%. Therefore, the pavement structure of the terminal road and carpark is applied for the taxiway and its thickness is shown in Figure A10.2.10 in compliance with the Japanese standard for designing the road pavement.

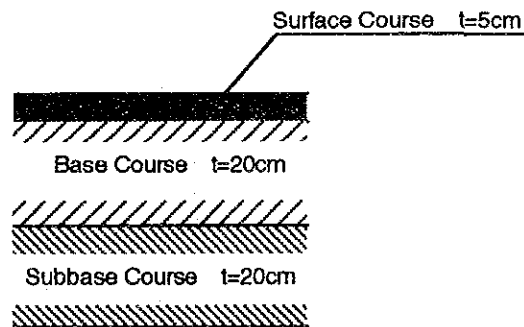


Figure A10.2.10 Pavement Structure of Terminal Road and Carpark

**APPENDIX-10.3.1 CALCULATION OF THE REQUIRED  
CAPACITY OF TERMINAL FACILITIES**

The Calculations of the required facilities have been made for each of the demands at present (Year 1990), Phase 1 (Year 2000) and Phase 2 (Year 2010). The actual numbers and floor areas of the existing facilities are also presented here.

**A. International**

**1. Average Occupancy Time and Required Floor Area per Passenger and/or Visitor**

The average occupancy time and required floor area per passenger and/or visitor are shown in Table 1. The following assumption have been taken into consideration:

- (1) Visitors are normally allowed to enter the check-in lobby.
- (2) A departing passenger is estimated to spend 30 minutes for the check-in process, and to stay 30 minutes more in the public area, accordingly 60 minutes in total.
- (3) A departing passenger is estimated to spend 60 minutes in the departuer lounge.
- (4) The number of visitors per passenger is estimated to be 0.7 based on the results of the traffic survey.

**Table-1. Average Occupancy Time and Required Floor Area per Passenger and/or Visitor**

Departuer Concurs (30+30)	Passenger	60 minutes	1.2 sqm/person
	Visitor	60 minutes	1.0 sqm/person
Departure Lounge (standing)	Passenger		1.0 sqm/person
Passenger (seated)		2.0 sqm/person	

**2. Performance Standards (maximum processing time)**

The maximum processing or occupancy time for a passenger at each location are planned as listed below:

- Check-in Lobby 30 minutes
- Check-in Counter 30 minutes
- Departuer Immigration 15 minutes
- Departuer Security Checked 15 minutes
- Departure Lounge 50 minutes
- Arrival Immigration 20 minutes
- Customs Clearance 20 minutes

3. Peak Hour Number of Passengers

The peak hour number of passengers -- a -- are estimated as shown below:

	One side	Both sides
- International (Present: Year 1990)	400	560
- International (Phase 1: Year 2000)	600	840
- International (Phase 2: Year 2010)	1080	1520

4. Number of Required Check-in Counters\*

$$N = a/60 \times t1 + 10\% \quad t1 = 3.17$$

- Existing Counters	46
- International (Present)	23.25 -- 23
- International (Phase 1)	34.87 -- 35
- International; (Phase 2)	62.77 -- 63

\*Note on condition that the counters be in 100% flexible use.

4-a. Number of Required Check-in Counters\*\*

- Existing Counters	46
- International (Present)	-
- International (Phase 1)	60
- International; (Phase 2)	-

\*\* On condition that some counters be used exclusively by each of the airlines.  
(Quoted from the recent study by DGAC)

5. Number of Required Departure Immigration Counters

$$N = a/60 \times t2 + 10\% \quad t2 = 0.8$$

- Existing Counters	4
- International (Present)	5.78 -- 6
- International (Phase 1)	8.80 -- 9
- International (Phase 2)	15.84 -- 16

6. Number of Required Security Check Units (X-Ray type)

$$N = a/221 + 10\%$$

- Existing	2 (2 Walk-through Metal Detector)
- International (Present)	1.99 -- 2 (1 Walk-through Metal Detector)
- International (Phase 1)	2.99 -- 3 (2 Walk-through Metal Detector)
- International (Phase 2)	5.38 -- 6 (3 Walk-through Metal Detector)

7. Required Floor Area for Departure Lounge

$$A = s(50/60 \times a) + 10\%$$

$$s = 2 \text{ sqm/seat}$$

- Existing	1051 sqm (525 seats)
- International (Present)	733 sqm (366 seats)
- International (Phase 1)	1100 sqm (550 seats)
- International (Phase 2)	1980 sqm (990 seats)

8. Required Floor Area for Departure Public Area

Total floor area = Check-in queue area + Lobby area for Passengers and Visitors

8-1. Check-in queue area :

$$(\text{Total length of check-in counters}) \times 10 + 10\%$$

- Existing	547 sqm
- International (Present)	$(1.4 \times 23) \times 10 \times 1.1 = 354 \text{ sqm}$
- International (Phase 1)	$(1.4 \times 35) \times 10 \times 1.1 = 539 \text{ sqm}$
- International (Phase 2)	$(1.4 \times 63) \times 10 \times 1.1 = 970 \text{ sqm}$

8-2. Lobby area for passengers and Visitors

$$A = 30/60 \times 1.2a + 60/60 \times 0.7 = 1.3a$$

- Existing	271 sqm
- International (Present)	520 sqm
- International (Phase 1)	780 sqm
- International (Phase 2)	1400 sqm

8-3. Total Floor Area Required

- Existing	901 sqm
- International (Present)	874 sqm
- International (Phase 1)	1319 sqm
- International (Phase 2)	2370 sqm

9. Arrival Immigration Counters

$$N = a/60 \times t4 + 10\% \quad t4 : 0.87$$

$$A = 0.33a + 10\%$$

- Existing	N = 8 (16)	A = 240 sqm
- International (Present)	N = 6.38 -- 6	A = 145 sqm
- International (Phase 1)	N = 9.57 -- 10	A = 218 sqm
- International (Phase 2)	N = 17.22 -- 17	A = 392 sqm

10. Customs Clearance Counters

$$N = a/60 \times t5 + 10\% \quad t5 : 1.57$$

$$A = 0.33a + 10\%$$



- Existing Counters       $N = 6$        $A = 105 \text{ sqm}$
- International (Present)       $N = 11.51 \text{ -- } 12$        $A = 145 \text{ sqm}$
- International (Phase 1)       $N = 17.27 \text{ -- } 17$        $A = 218 \text{ sqm}$
- International (Phase 2)       $N = 31.09 \text{ -- } 31$        $A = 392 \text{ sqm}$

11. Number of Baggage Claim Devices

$N_n = a/300$  (For Narrow body aircraft), or  
 $N_w = a/425$  (For Wide body aircraft)

$A = 0.9a + 10 \%$

- Existing       $N_n = 2$       Total length:  $13 + 18 = 31\text{m}$   
 $A = 354 \text{ sqm}$  ( Excluding 3m wide path)
- International (Present)       $N_n = 1.33 \text{ -- } 1$       Total length:  $30\text{m} \times 1.33 = 40\text{m}$   
 $A = 96 \text{ sqm}$
- International (Phase 1)       $N_n = 2.00 \text{ -- } 2$       Total length:  $30\text{m} \times 2 = 60\text{m}$   
 $N_w = 1.41 \text{ -- } 1$       Total length:  $50\text{m} \times 1 = 50\text{m}$   
 $A = 94 \text{ sqm}$
- International (Phase 2)       $N_n = 3.60 \text{ -- } 4$       Total length:  $30\text{m} \times 4 = 120\text{m}$   
 $N_w = 2.54 \text{ -- } 3$       Total length:  $50\text{m} \times 3 = 150\text{m}$   
 $A = 1069 \text{ sqm}$

**B. Domestic Terminal**

1. Peak Hour Number of Passengers

The peak hour number of passengers -- a -- are estimated as shown below:

	One side	Both side
- 1990	40	60
- Domestic (Phase 1)	60	80
- Domestic (Phase 2)	60	100

2. Number of Required Check-in Counters

$N = a/60 \times t_1 + 10\%$       processing time per person :  $t_1 = 1.0$

- 1990.      733 -- 1 + 1 ticket counter
- Domestic (Phase 1)      1.1 -- 1 + 1 ticket counter
- Domestic (Phase 2)      1.1 -- 1 + 1 ticket counter

3. Required Floor Area for Departuer Lounge

Floor area =  $1.33a + 10\%$

- 1990 59 sqm
- Domestic (Phase 1) 88 sqm
- Domestic (Phase 2) 88 sqm

4. Required Floor Area for Departuer Public Arrea

Total floor area = Check-in queue area + Lobby area for Passengers and Visitors

4-1. Check-in queue area :

(Total length of check-in counters + ticket counters ) x 10 x 1.2

- 1990  $(1.4 + 2) \times (10 \times 11) = 37$  sqm
- Domestic (Phase 1) "
- Domestic (Phase 2) "

4-2. Lobby area for passengers and Visitors

Required floor area =  $0.84a$

- 1990 34 sqm
- Domestic (Phase 1) 50 sqm
- Domestic (Phase 2) 50 sqm

4-3. Total floor area

- 1990 71 sqm
- Domestic (Phase 1) 87 sqm
- Domestic (Phase 2) 87 sqm

**APPENDIX-10.3.2 COMPARATIVE STUDY OF  
IMPROVEMENT OF THE EXISTING  
TERMINAL BUILDING BY DGAC**



CARACTERISTICAS		SIMBOLOGIA										ESQUEMA OPERACIONAL	AREAS DE EDIFICIOS							
													EDIFICIOS	SOTANO	1 NIVEL	2 NIVEL				
OPCIONES		NECESIDAD DE AREAS PARA SATISFACER LA DEMANDA A CORTO Y MEDIANO PLAZO (10-15 AÑOS)	EXPANSION DE AREAS PARA LA DEMANDA A LARGO PLAZO (A 20 AÑOS)	APROVECHAMIENTO DE AREA DE SOTANO	APROVECHAMIENTO DE AREA EN PRIMER NIVEL	APROVECHAMIENTO DE AREAS EXTERIORES PARA CIRCULACIONES VEHICULARES Y PARQUEOS	APROVECHAMIENTO DE AREAS EN EDIFICACIONES PARA CONEXIONES	INTEGRACION DE LAS DIFERENTES FUNCIONES	CIRCULACIONES VERTICALES	CIRCULACIONES HORIZONTALES	PROCESO CONSTRUCTIVO	MOVIMIENTO DE TIERRAS	PUNTOS	OBSERVAC	↓					
1		VARIACION DEL CONCEPTO LINEAL EN EL AREA DE LLEGADAS INTERNACIONALES	△	△	△							△	4			ESTA OPCION PRESENTA UNA EXCELENTE SOLUCION FUNCIONAL (INTERACCION OPERACIONAL DESARROLLO DE FLUJOS) SIN EMBARGO NO SATISFACE LA DEMANDA DE ESPACIO REQUERIDA DE ACUERDO A LAS PROYECCIONES Y SU PROCESO CONSTRUCTIVO PRESENTARIA PROBLEMAS A LA OPERACION NORMAL DE LA TERMINAL.		NUEVO ED. OESTE	2 378	2 378
													□	2	EDIFICIO EXISTENTE			1 944	1 944	780
															5			NUEVO ED. ESTE	1 080	2 910
2		CONCEPTO LINEAL OPERACION EN UN SOLO NIVEL			△		△						2	ESTA PRESENTA LA MAXIMIZACION OPERACIONAL EN UN SOLO NIVEL, SIN EMBARGO PRESENTA PROBLEMAS DE HACINAMIENTO Y SU EXPANSION ES MUY COMPLEJA, NO RECOMENDABLE POR QUE QUEDA SATURADA A MUY CORTO PLAZO. CONSTRUCTIVAMENTE ES LA SOLUCION MAS SENCILLA TANTO COMO A NIVEL DE EDIFICIOS COMO AREAS EXTERIORES.		NUEVO ED. OESTE	2 214	2 870	1 650	
			□	□		□		□		□			5			EDIFICIO EXISTENTE	1 944	2 520	720	
							○		○		○	○				4				
3		CONCEPTO LINEAL OPERACION EN DOS NIVELES NIVEL RAMPA.- LLEGADAS PRIMER NIVEL SALIDAS INTLS Y DESPACHO DE LINEAS AEREAS										△	1	ESTA OPCION NOS DA LA OPORTUNIDAD DE QUE LA TERMINAL SE DESARROLLE REALMENTE COMO AEROPUERTO DE TERCERA GENERACION DE CONCEPTO LINEAL, OPTIMIZANDO LOS FLUJOS DE PASAJEROS Y EQUIPAJE. DANDO RESPUESTA A HORAS PICO PROLONGADAS Y CON ALTA CONCENTRACION DE AVIONES, PASAJEROS Y VUELOS FLETADOS (CHARTER), RESOLVIENDO LAS ACTIVIDADES HOLGADAMENTE		NUEVO ED. OESTE	2 870	2 870	1 650	
								□	□	□			3			EDIFICIO EXISTENTE	2 520	2 520	720	
			○	○	○	○	○	○		○						7				
4		CONCEPTO LINEAL OPERACION EN DOS NIVELES PRIMER NIVEL- SALIDAS Y DESPACHO LINEAS AEREAS NIVEL SOTANO- LLEGADAS RAMPA												ESTE PLANTEAMIENTO ES EL RESULTADO DEL ESTUDIO DE LAS ANTERIORES OPCIONES. 1-UTILIZACION TOTAL DE LAS AREAS DISPONIBLES 2-SIMPLIFICACION DE LAS FUNCIONES		NUEVO ED. OESTE	2 214	2 870	1 650	
								□		□	□	□	4			EDIFICIO EXISTENTE	1 944	2 520	720	
			○	○	○	○		○	○		○					7	NUEVO ED. ESTE	1 400	1 400	—

## **APPENDIX TO CHAPTER 11**



**APPENDIX-11.2.1 RESTRICTED, DANGER, FUEL  
DUMPING AND TRAINING AREAS**



Dimension of Restricted and Danger Areas

AIP-COSTA RICA

RAC 5-2

NOMBRE	LÍMITE SUPERIOR		TIPO DE RESTRICCIÓN	OBSERVACIONES
	LÍMITES LATERALES	LÍMITE INFERIOR		
1		2	3	4
<p><u>ZONA RESTRINGIDA</u></p> <p>MRR1: Sector limitado de configuración geométrica rectangular comprendido dentro de las coordenadas</p> <p>09 55' 30"N 84 04' 38" W 09 54' 32"N 84 03' 00" W 09 55' 25"N 84 02' 05" W 09 56' 28"N 84 03' 58" W</p>		<p><u>ALT 7000 FT MSL</u> <u>AGL</u></p>	CASA PRESIDENCIAL	
<p><u>ZONA RESTRINGIDA</u></p> <p>MRR2: Area de dimensiones definidas comprendida dentro de las coordenadas:</p> <p>10 56' 00"N 83 39' 00" W 10 55' 30"N 83 40' 30" W 10 56' 00"N 83 42' 00" W 10 53' 30"N 83 41' 00" W 10 53' 00"N 83 40' 00" W</p>		<p><u>ALT 7000 FT MSL</u> <u>GND</u></p>	SECTOR FRONTERIZO NORTE NICARAGUA/COSTA RICA	

AIS-COSTA RICA

26 SEP 85  
AMD No. 6

ZONAS PROHIBIDAS, RESTRINGIDAS O PELIGROSAS				
NOMBRE	LIMITE SUPERIOR		TIPO DE RESTRICCION	OBSERVACIONES
	LIMITE INFERIOR			
LIMITES LATERALES	2		3	4
1				
MRR2 (CONTINUACION)				
10 48' 30" N 83 40' 00" W				
10 47' 30" N 83 42' 30" W				
10 46' 00" N 83 45' 00" W				
10 46' 00" N 83 47' 00" W				
10 45' 00" N 83 48' 00" W				
10 44' 45" N 83 50' 00" W				
10 43' 00" N 83 52' 00" W				
10 42' 30" N 83 56' 00" W				
10 43' 00" N 83 56' 30" W				
10 43' 30" N 83 58' 30" W				
10 45' 00" N 83 58' 00" W				
10 47' 30" N 84 01' 30" W				
10 46' 00" N 84 02' 15" W				
10 46' 36" N 84 03' 00" W				
10 46' 00" N 84 04' 00" W				
10 45' 30" N 84 06' 00" W				
10 46' 30" N 84 06' 30" W				
10 46' 00" N 84 07' 30" W				
10 47' 30" N 84 08' 00" W				
10 47' 00" N 84 12' 00" W				
10 49' 00" N 84 14' 30" W				
10 49' 30" N 84 13' 00" W				
10 52' 00" N 84 13' 00" W				
10 54' 00" N 84 17' 30" W				
10 55' 00" N 84 17' 45" W				
10 55' 00" N 84 19' 00" W				
10 57' 00" N 84 21' 00" W				
10 58' 30" N 84 20' 30" W				
	ALT 7000 FT MSL GND		SECTOR FRONTERIZO NORTE NICARAGUA/COSTA RICA	

ZONAS PROHIBIDAS, RESTRINGIDAS O PELIGROSAS				
NOMBRE	LIMITE SUPERIOR LIMITE INFERIOR		TIPO DE RESTRICCIÓN	OBSERVACIONES
	LIMITE SUPERIOR LIMITE INFERIOR			
1	2		3	4
<p>10 59' 30" N 84 21' 30" W</p> <p>10 58' 40" N 84 22' 30" W</p> <p>10 58' 30" N 84 24' 00" W</p> <p>10 57' 25" N 84 25' 30" W</p> <p>10 58' 00" N 84 27' 00" W</p> <p>11 00' 00" N 84 29' 00" W</p> <p>11 01' 50" N 84 33' 30" W</p> <p>11 03' 00" N 84 34' 30" W</p> <p>10 56' N 83 39' W</p> <p>10 49' N 83 36' W</p> <p>10 47' N 83 39' W</p> <p>10 43' N 83 39' W</p> <p>10 37' N 83 56' W</p> <p>10 42' N 84 13' W</p> <p>10 57' N 84 55' W</p>	<p><u>ALM 7' 10' ET MSL</u> GND</p>		<p>SECTOR FRONTERIZO NOROCCIDENTAL COSTA RICA/NICARAGUA.</p>	
<p><u>ZONA RESTRINGIDA</u></p> <p>AREA:</p> <p>Area de dimensiones definidas comprendida dentro de las coordenadas</p> <p>11 02' 00" N 85 09' 00" W</p> <p>11 08' 00" N 85 21' 30" W</p> <p>11 08' 00" N 85 25' 30" W</p> <p>11 09' 50" N 85 31' 30" W</p> <p>11 13' 00" N 85 34' 00" W</p> <p>11 13' 00" N 85 37' 00" W</p> <p>11 06' 00" N 85 41' 00" W</p>	<p><u>ALM 7' 10' ET MSL</u> GND</p>		<p>SECTOR FRONTERIZO NOROCCIDENTAL NICARAGUA/ COSTA RICA.</p>	

ALM-COSTA RICA

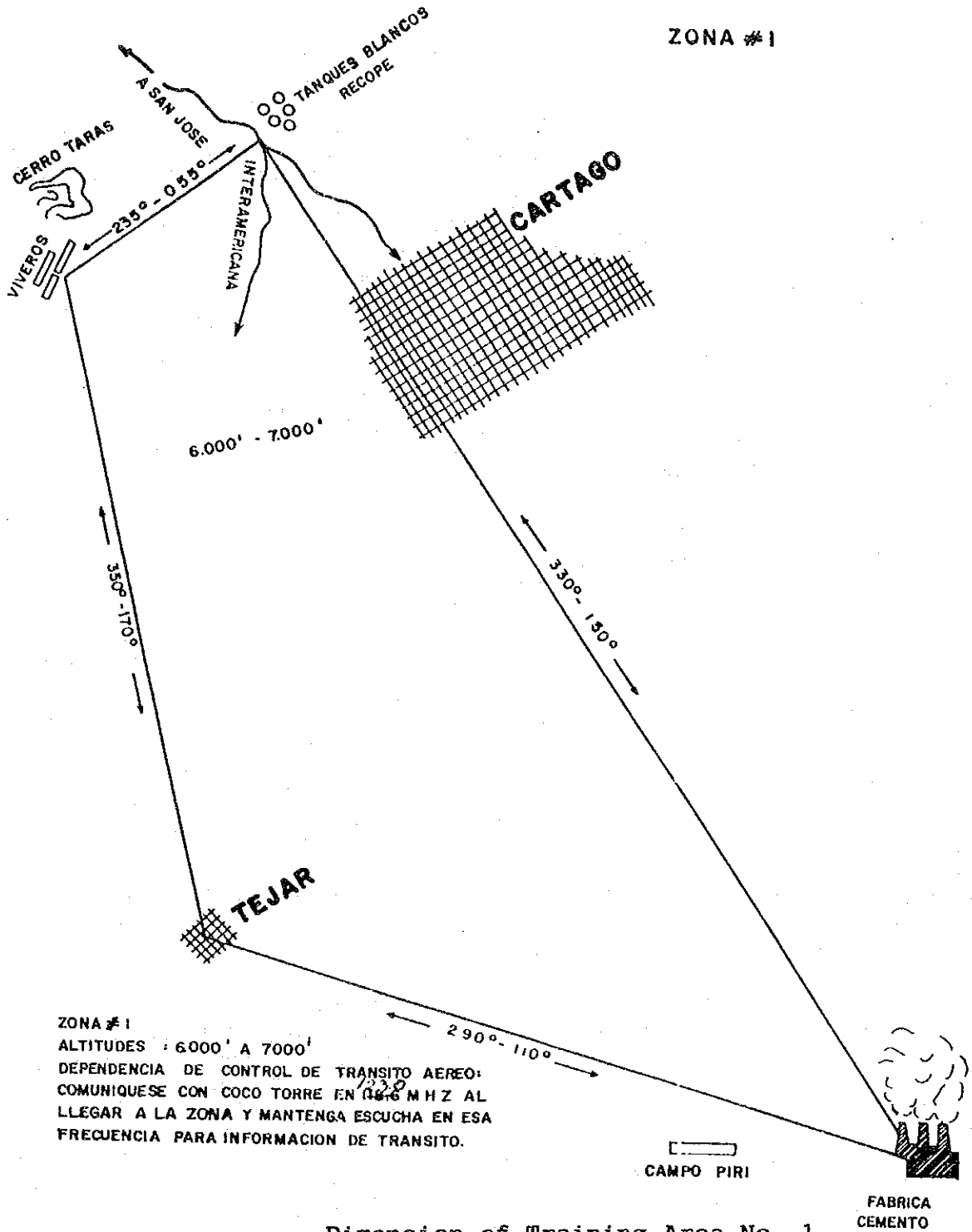
26 SEP 85  
AM 15. 6

ZONAS PROHIBIDAS, RESTRINGIDAS O PELIGROSAS			
NOMBRE	LIMITE SUPERIOR LIMITE INFERIOR		OBSERVACIONES
LIMITES LATERALES			
1	2	3	4
10 55' N 85 09' W 11 00' N 85 26' W 11 00' N 85 39' W 11 06' N 85 41' W  <u>ZONA PELIGROSA</u> MPD1: Area de dimensiones defini- das dentro de las coordi- nadas: 11 03' 00" N 84 34' 30" W 11 02' 00" N 84 35' 30" W 11 05' 00" N 84 41' 00" W 10 57' 00" N 84 54' 30" W 11 02' 00" N 85 09' 00" W 10 57' N 84 35' W 10 52' N 84 54' W 10 57' N 85 09' W	ALT 7000 FT MSL GND.	SECTOR FRONTERIZO NOROCCIDENTAL NICARAGUA/COSTA RICA	
<u>ZONA RESTRINGIDA</u> MP24: Espacio aéreo de configuración geométrica circular comprendida dentro de un radio de 7NM con centro en las coordenadas 10 55' N 85 43' W	ALT 9000 FT GND.	SECTOR FRONTERIZO NOROCCIDENTAL NICARAGUA/COSTA RICA	

26 SEP 85  
 AMD No. 6

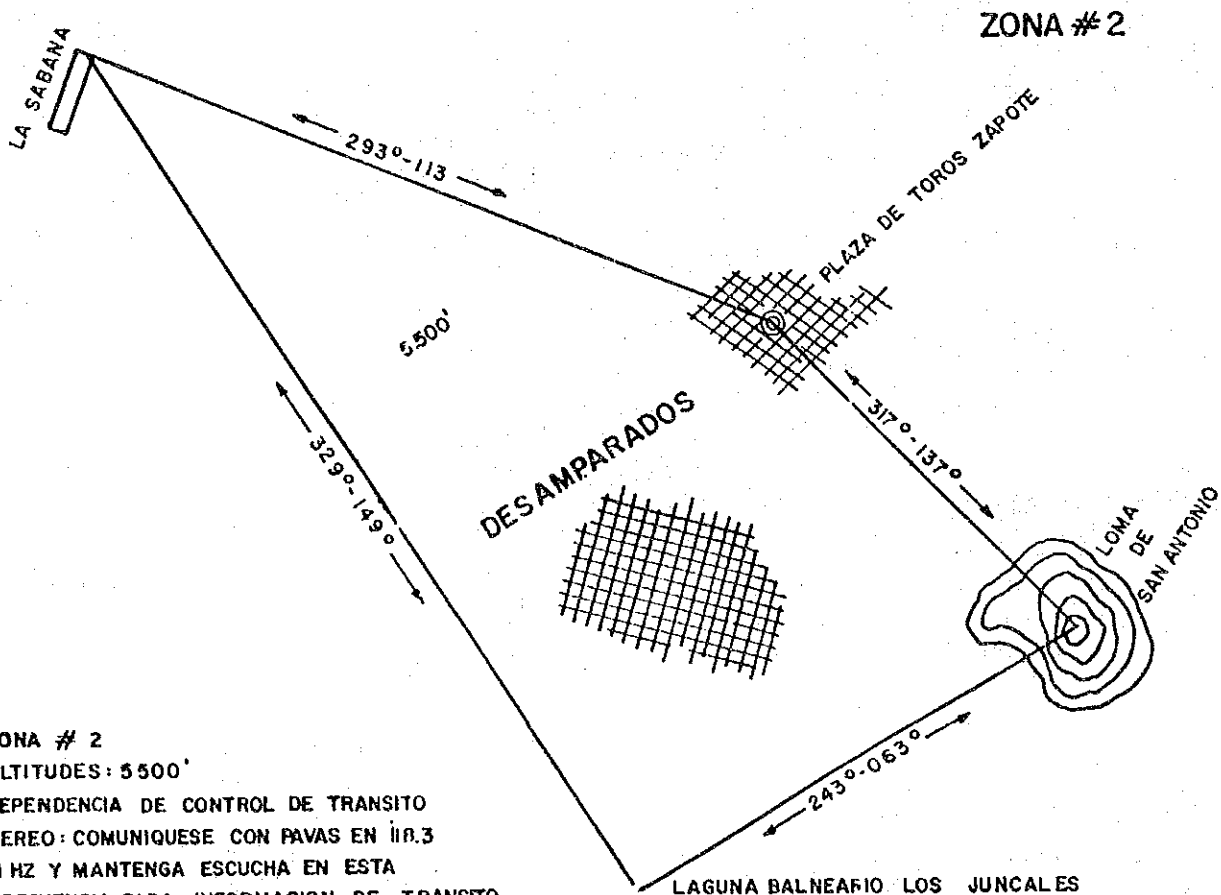
AIS-COSTA RICA

ZONA #1



ZONA #1  
ALTITUDES : 6000' A 7000'  
DEPENDENCIA DE CONTROL DE TRANSITO AEREO:  
COMUNIQUESE CON COCO TORRE EN 123.6 MHZ AL  
LLEGAR A LA ZONA Y MANTENGA ESCUCHA EN ESA  
FRECUENCIA PARA INFORMACION DE TRANSITO.

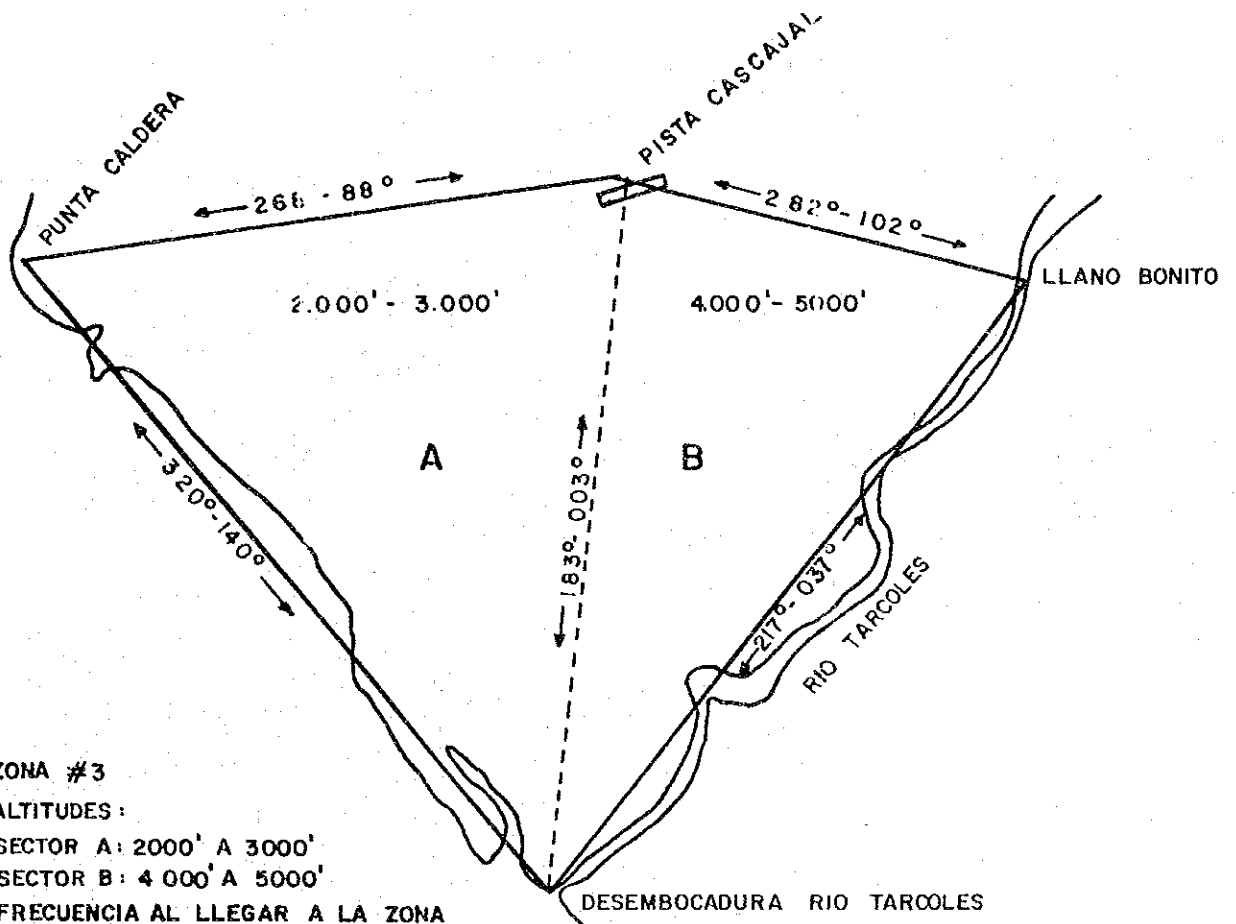
Dimension of Training Area No. 1



ZONA # 2  
 ALTITUDES: 5500'  
 DEPENDENCIA DE CONTROL DE TRANSITO  
 AEREO: COMUNIQUESE CON PAVAS EN 118.3  
 MHZ Y MANTENGA ESCUCHA EN ESTA  
 FRECUENCIA PARA INFORMACION DE TRANSITO  
 NOTA: ES RECOMENDABLE LA PERMANENCIA DE UNA  
 SOLA AERONAVE EN ENTRENAMIENTO EN ESTA ZONA

The Dimension of Training Area No. 2

ZONA # 3



ZONA #3

ALTITUDES:

SECTOR A: 2000' A 3000'

SECTOR B: 4000' A 5000'

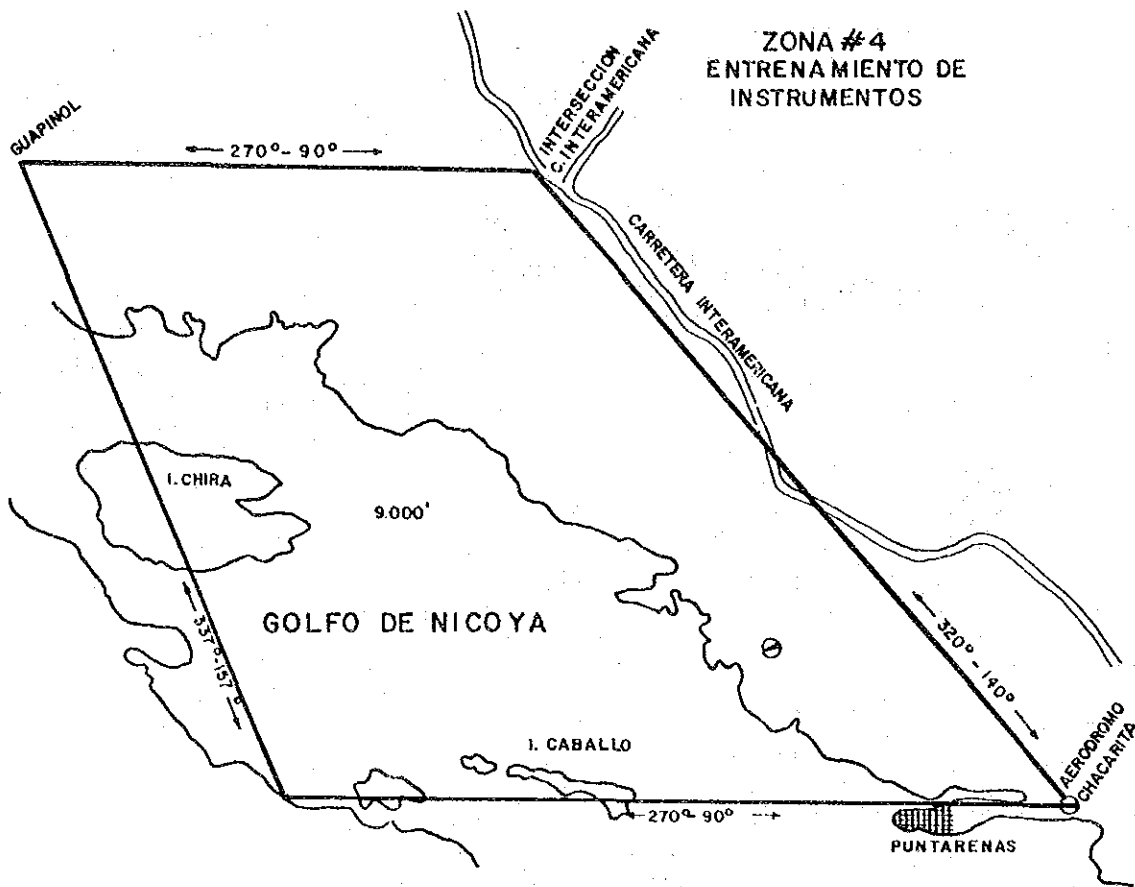
FRECUENCIA AL LLEGAR A LA ZONA

ANUNCIE SU PRESENCIA EN 1230 MHZ

Y MANTENGA ESCUCHA EN ESTA FRECUENCIA

PARA INFORMACION TRANSITO AEREO

The Dimension of Training Area No. 3

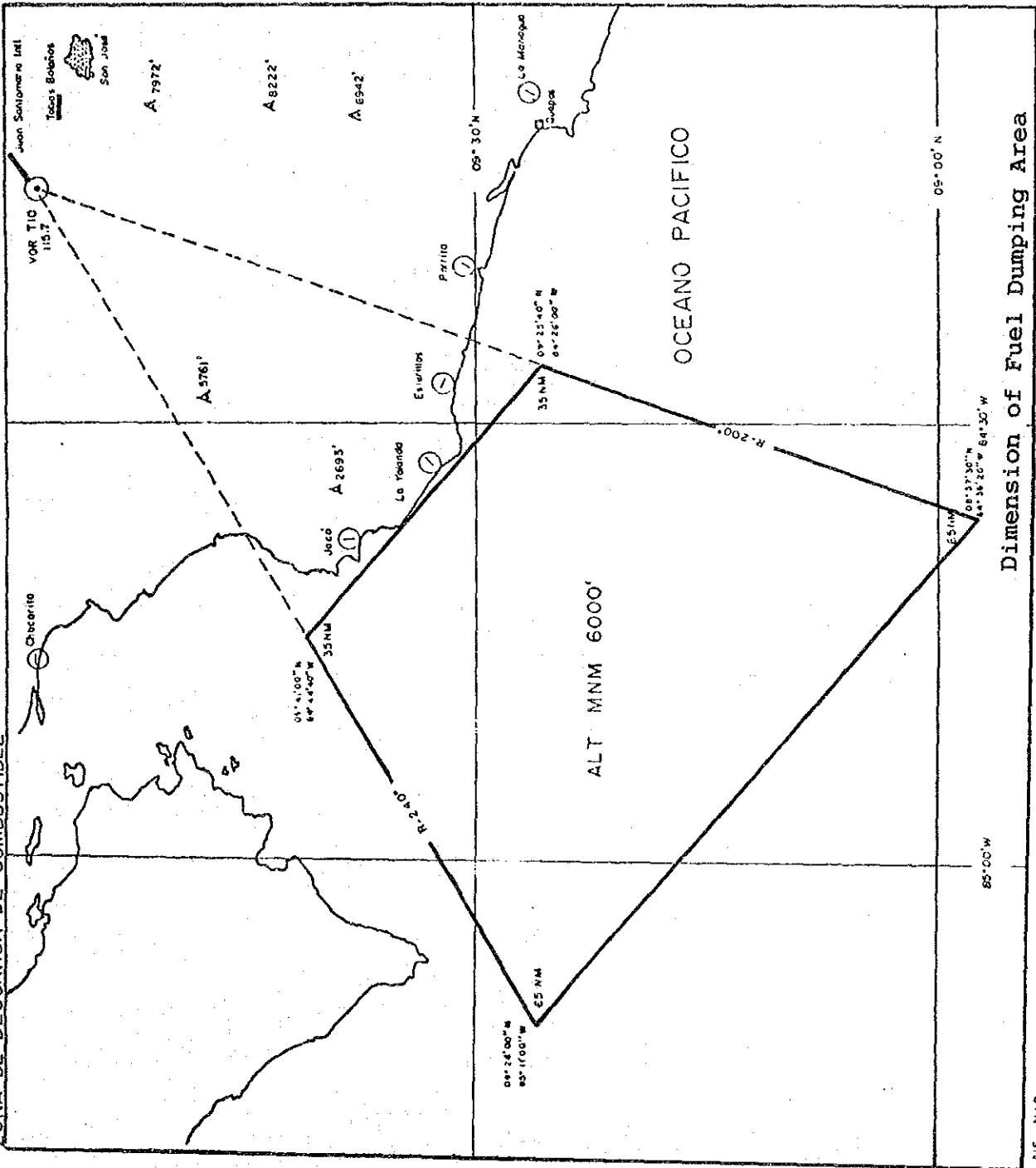


ALTITUDES :  
 DE LA SUPERFICIE A 9.000  
 DEPENDENCIA DE CONTROL DE TRANSITO AEREO  
 COMUNIQUESE CON COCO APP.EN 119.6 M HZ  
 AL LLEGAR A LA ZONA Y MANTENER ESCUCHA EN  
 ESTA FRECUENCIA PARA INFORMACION DE TRANSITO

The Dimension of Training Area No. 4



ZONA DE DESCARGA DE COMBUSTIBLE



**APPENDIX-11.3.1 DETAILED EXPLANATION OF  
FIGURE 11.3.2**

### Explanation of Figure 11.3.2

Figure 11.3.2 shows the result of study about the relation ship of aircraft operation between Tobias Bolanos and Juan Santamaria airports.

The study was executed based on the criteria of FAA TERPS(Terminal Instrument Procedures) because of the almost instrument procedures established in Costa Rica are established based on the FAA TERPS.

The study was conducted with the following assumptions:

#### 1. Circling approach area radii

FAA criteria describes the circling approach area radial for each approach category of aircraft as follows.

CIRCLING APPROACH AREA RADIAL	
Approach Category	Radius (Miles)
A	1.3
B	1.5
C	1.7
D	2.3
E	4.5

#### 2. Maximum approach category for aircraft operating at both airports.

- 1) Juan Santamaria airport  
The approach category "D" is applied for this airport as the maximum approach category. Accordingly, circling approach area radial should be 2.3nm.
- 2) Tobias Bolanos airport  
The approach category "B" is applied for this airport as the maximum approach category. Accordingly, circling approach area radial should be 1.5nm.

#### 3. Upper limit of airport traffic pattern at Tobias Bolanos Airport

The upper limit of airport traffic pattern should be 4,100 feet above mean sea level.

#### 4. Departure aircraft from Juan Santamaria Airport

Departuer aircraft from Runway 07 at Juan Santamaria Airport should be climbed straightly to 3,600 feet or above (the elevation of Runway 25 is 921m/3021 feet) until 4.5 DME of TIO VOR/DME (2nm from runway 25 end), them turn right, climb to TIO VOR/DME with the climb rate of 300feet/nm.

#### 5. Missed approach aircraft after ILS approach to Runway 07 at Juan Santamaria Airport

Aircraft should be climbed straightly to 3,700 feet or above (decision altitude is 3,162 feet for ILS approach) until passing 3.5 nm from missed approach point, them turn right, climb to TIO VOR/DME with the climb rate of 300 feet/nm. (On the missed approach course, first 1.5nm from missed approach point is level flight, them climb with the climb rate of 300 feet/nm.)

#### 6. Clearance between departuer/missed approach aircraft from Juan Santamaria airport and aircraft operating at Tobias Bolanos Airport

As a result of the study in accordance with the assumptions mentioned above, it is considered that the following matters are ascertained:

- 1) Circling areas of both airports will be completely separated.
- 2) Vertical clearances between aircraft operations at both airports will be maintained.

## **APPENDIX-11.4.1 AIRPORT OPERATION CHARTS**

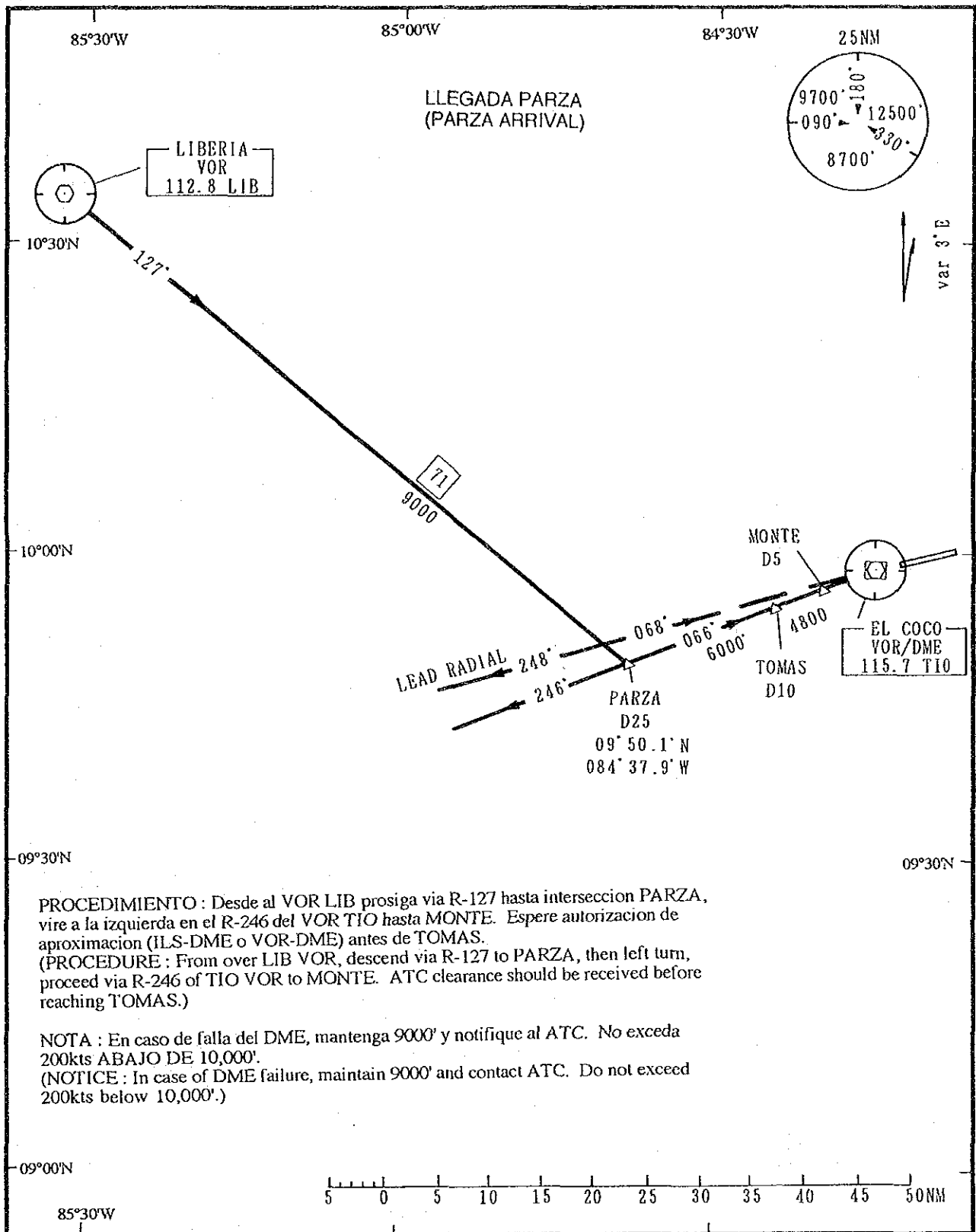


CARTA DE LLEGADA  
(ARRIVAL CHART)

ELEVACION DE  
AERODROMO 3021'

APP 119.6  
TWR 118.6

ALAJUELA/  
JUAN SANTAMARIA INTL  
MAP2



PROCEDIMIENTO : Desde al VOR LIB prosiga via R-127 hasta interseccion PARZA, vire a la izquierda en el R-246 del VOR TIO hasta MONTE. Espere autorizacion de aproximacion (ILS-DME o VOR-DME) antes de TOMAS.  
(PROCEDURE : From over LIB VOR, descend via R-127 to PARZA, then left turn, proceed via R-246 of TIO VOR to MONTE. ATC clearance should be received before reaching TOMAS.)

NOTA : En caso de falla del DME, mantenga 9000' y notifique al ATC. No exceda 200kts ABAJO DE 10,000'.  
(NOTICE : In case of DME failure, maintain 9000' and contact ATC. Do not exceed 200kts below 10,000'.)

85°30'W  
AIS COSTA RICA/AIP

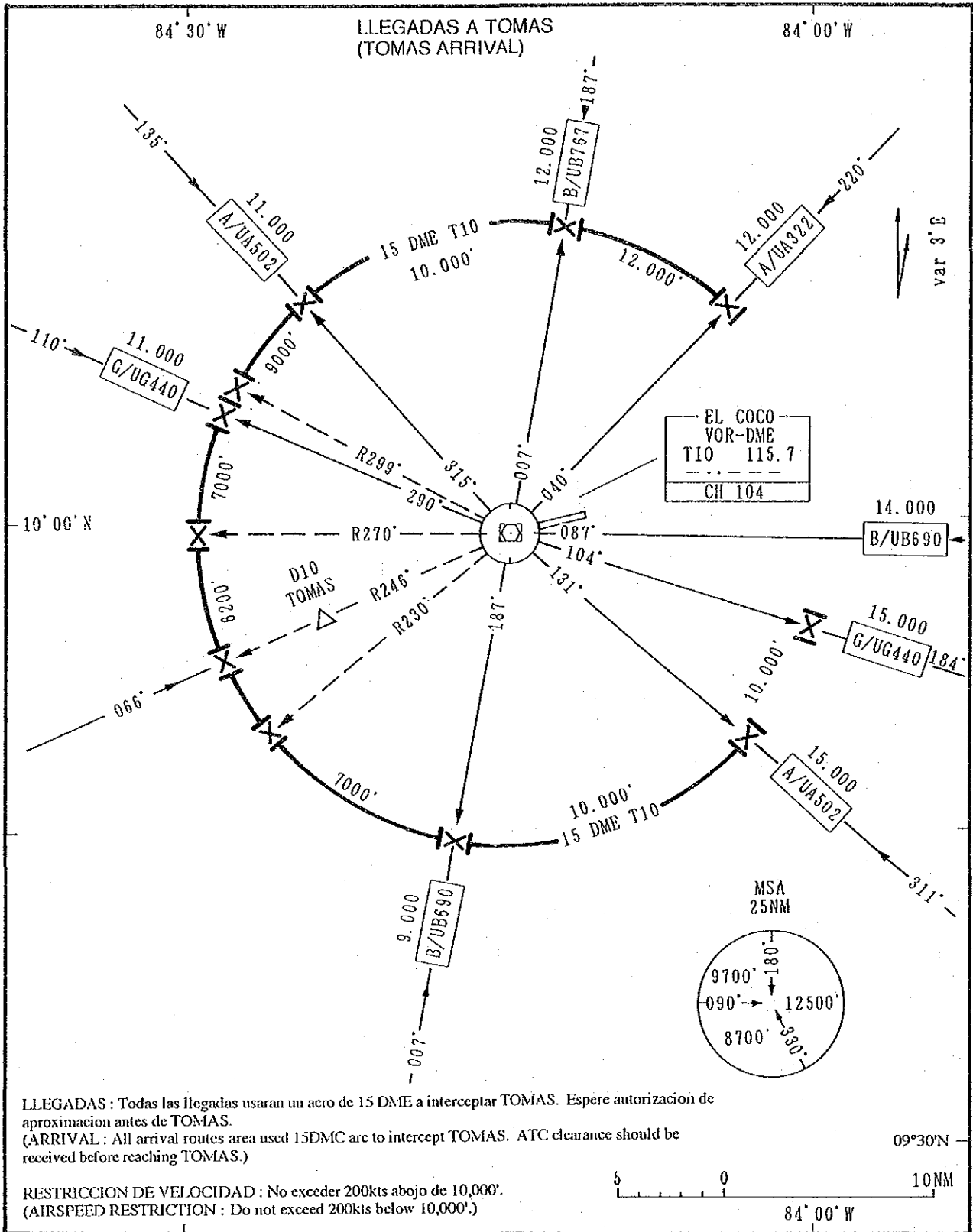
85° 00' W

24 SET 1987 AMD13

TWR	118.6
APP	119.6
GND	121.3

ALAJUELA/  
JUAN SANTAMARIA INTL  
MAP3

STAR



LLEGADAS : Todas las llegadas usaran un arco de 15 DME a interceptar TOMAS. Espere autorizacion de aproximacion antes de TOMAS.  
(ARRIVAL : All arrival routes area used 15DMC arc to intercept TOMAS. ATC clearance should be received before reaching TOMAS.)

RESTRICCION DE VELOCIDAD : No exceder 200kts abajo de 10,000'.  
(AIRSPEED RESTRICTION : Do not exceed 200kts below 10,000'.)

AIS/AIP

DGAC

21 SET 1989 AMD17

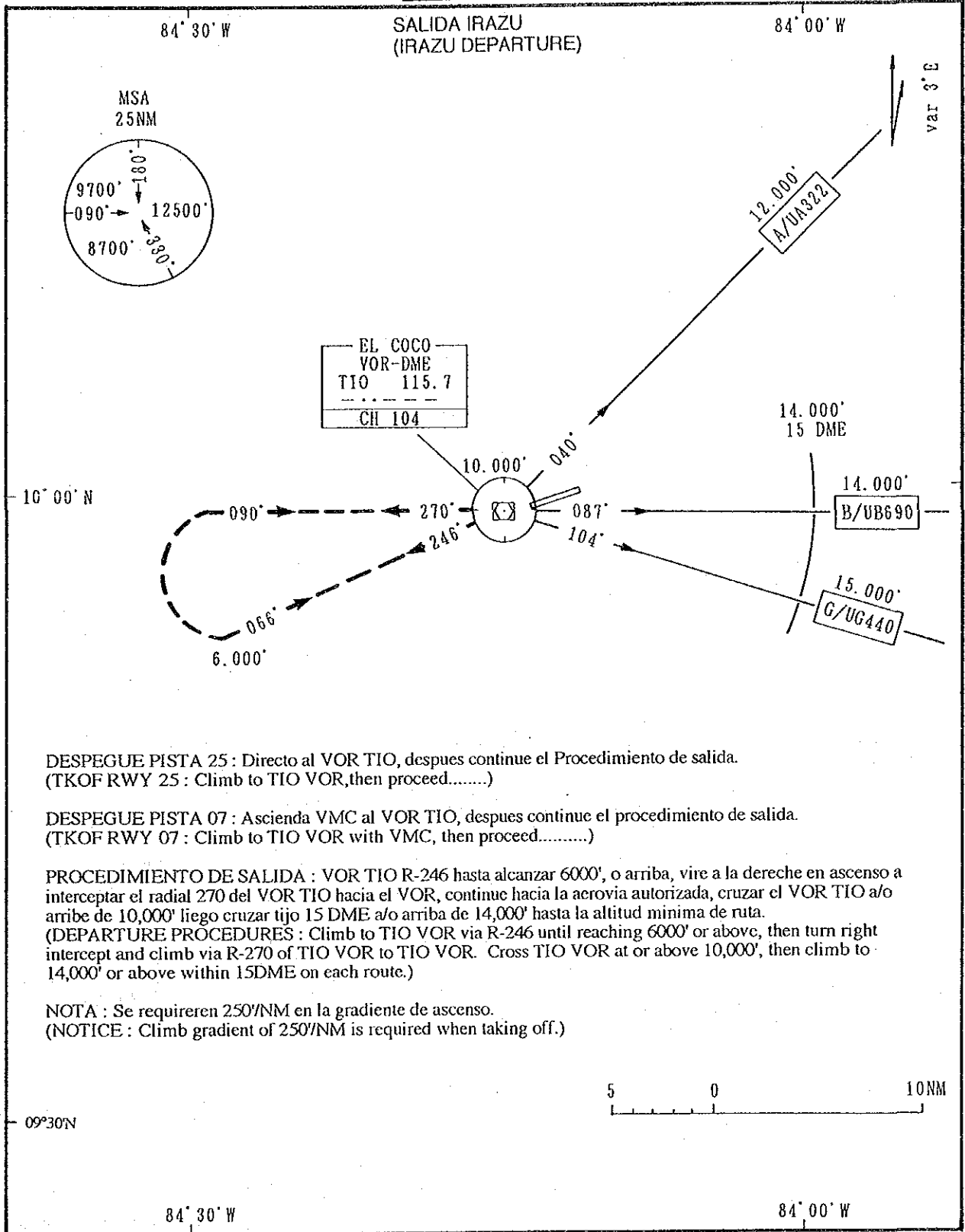


SID

ELEV.3012'

TWR	118.6
APP	119.6
GND	121.3

ALAJUELA/  
JUAN SANTAMARIA INTL  
MAP4



DESPEGUE PISTA 25 : Directo al VOR TIO, despues continue el Procedimiento de salida.  
(TKOF RWY 25 : Climb to TIO VOR, then proceed.....)

DESPEGUE PISTA 07 : Ascienda VMC al VOR TIO, despues continue el procedimiento de salida.  
(TKOF RWY 07 : Climb to TIO VOR with VMC, then proceed.....)

PROCEDIMIENTO DE SALIDA : VOR TIO R-246 hasta alcanzar 6000', o arriba, vire a la derecha en ascenso a interceptar el radial 270 del VOR TIO hacia el VOR, continúe hacia la aerovia autorizada, cruzar el VOR TIO a/o arribe de 10,000' luego cruzar tijo 15 DME a/o arriba de 14,000' hasta la altitud minima de ruta.  
(DEPARTURE PROCEDURES : Climb to TIO VOR via R-246 until reaching 6000' or above, then turn right intercept and climb via R-270 of TIO VOR to TIO VOR. Cross TIO VOR at or above 10,000', then climb to 14,000' or above within 15DME on each route.)

NOTA : Se requireren 250'/NM en la gradiente de ascenso.  
(NOTICE : Climb gradient of 250'/NM is required when taking off.)



AIS/AIP

DGAC

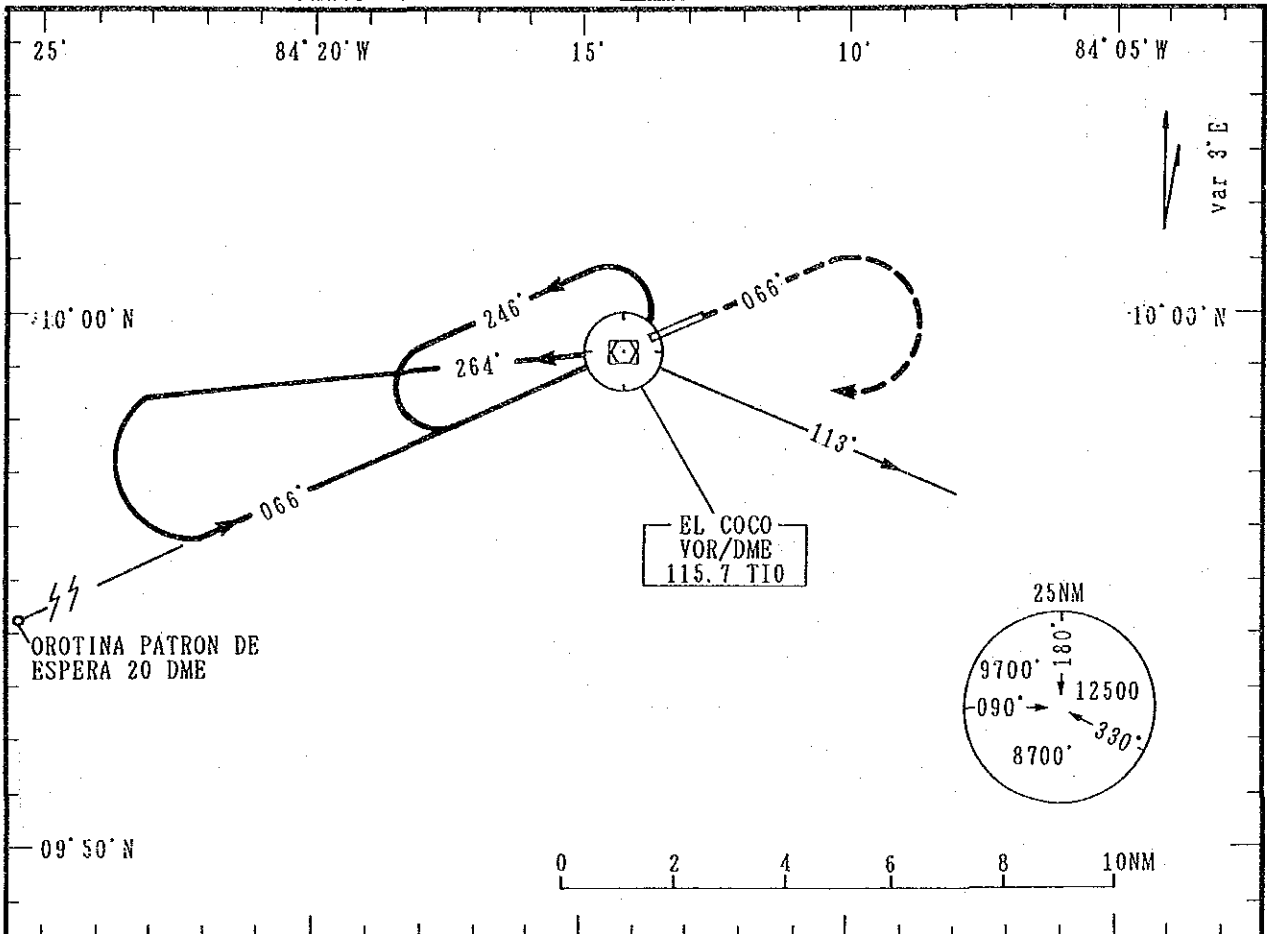
21 SET 1989 AMD17

VOR RWY 07

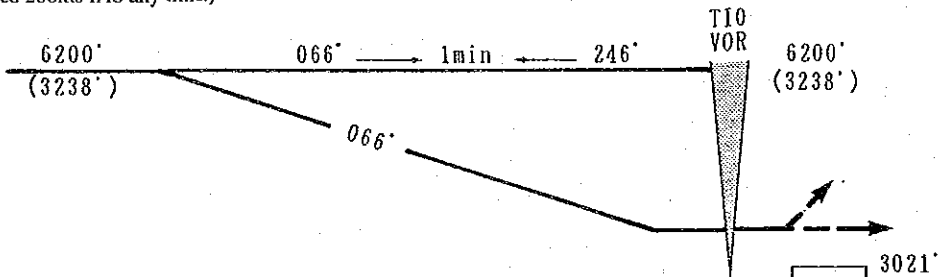
ELEVACION DE AERODROMO 3021'

TWR	118.6
APP	119.6
GND	121.3

ALAJUELA/  
JUAN SANTAMARIA INTL  
MAP5



NOTA :En niuguna fase del procedimicento se puodo exceder mas de 200kts IAS.  
(NOTICE : Do not exceed 200kts IAS any time.)



APPROXIMACION FRUSTRADA : Ascienda directo en el radial 066, despues vire a la derecha al VOR TIO ascendiendo hasta 6200'.  
(No exceder el radial 113 del VOR) Matenga en el patron de espero.  
(MISSED APPROACH : Climb via R-066, then turn right climb to TIO VOR and hold at 6200'.  
(Do not exceed R-113 when turn right))

APRÓXIMACION DIRECTA RWY 07		EN CIRCUITO	
A	NA	A	MDA
B		B	3820' (799') 3.6Km
C		C	3820' (799') 4.4Km
D		D	

AIS COSTA RICA/AIP

24 SET 1987 AMD13



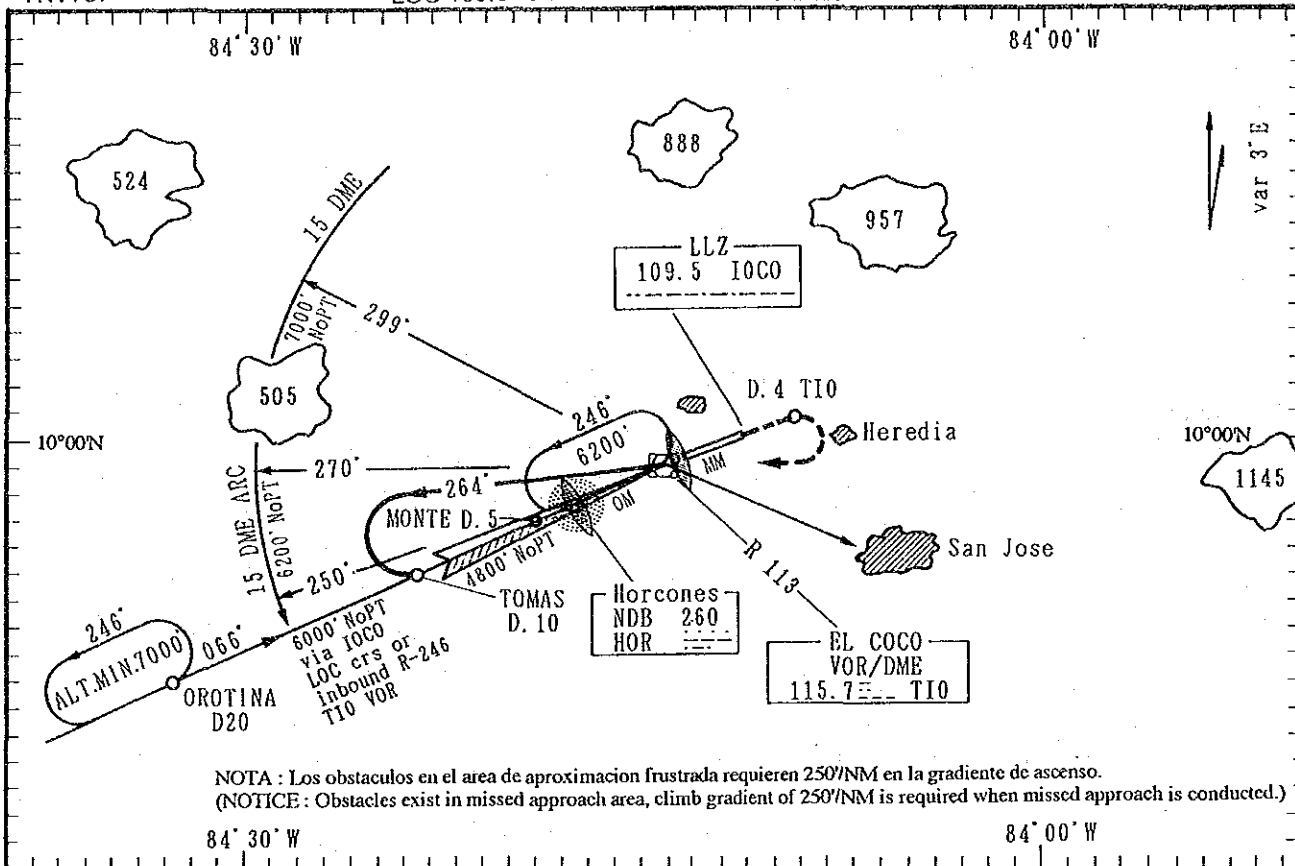
CARTA DE APROXIMACION  
POR INSTRUMENTOS  
RWY07

ELEVACION 3021'  
LOC 109.5 IOCO

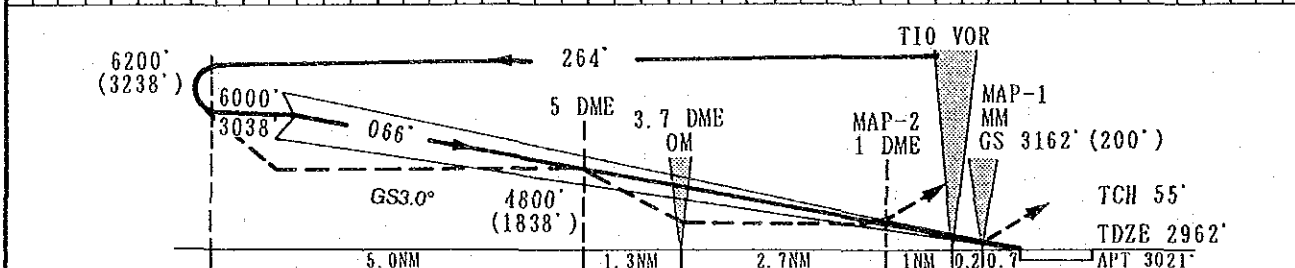
APP	119.6
TWR	120.5
LLZ	109.5 IOCO
GND	121.3

ALAJUELA/  
JUAN SANTAMARIA INTL  
ILS/DME

MAP7



NOTA: Los obstaculos en el area de aproximacion frustrada requieren 250'/NM en la gradiente de ascenso.  
(NOTICE: Obstacles exist in missed approach area, climb gradient of 250'/NM is required when missed approach is conducted.)



APROXIMACION FRUSTRADA: Ascendiendo directo en el radial 066 hasta 4DME, despues vire a la derecha al VOR TIO ascendiendo hasta 6200'.  
No exceder el radial 113 del VOR TIO.  
(MISSED APPROACH: Climb via R-066 of TIO VOR until 4DME, then turn right to TIO VOR and hold at 6200'. Do not fly beyond R-113 when turn right.)

MAP-1		APROXIMACION DIRECTA RWY 07				MAP-2		EN CIRCUITO (CIRCLING)	
Con un regimen normal de ascenso de 250'/NM en la aproximacion frustrada.		Con un regimen menor de 250'/NM en el ascenso para la aproximacion frustrada.							
ILS		LOC (GS out)		ILS		LOC (GS out)			
DA (H)	DA (H)	MDA (H)	DA (H)	MDA (H)	DA (H)	MDA (H)			
3162' (200')	3212' (250')	3360' (398')	3562' (600')	3760' (798')					
FULL	RAIL or ALS out	MM out	FULL	RAIL or ALS out	MM out				
A							MDA (H)		
B	1.2 Km	1.2 Km	1.6 Km	2.2 Km	2.6 Km		A	3820' (799')	1.6 Km *
C							B	3820' (799')	2.0 Km *
D			2.0 Km		3.0 Km		C	3820' (799')	3.6 Km
Gnd Speed Kts	70	90	100	120	140	160	D	3820' (799')	4.0 Km
GS 3'	377	484	538	646	753	861	* 2.6Km con un regimen menor de 250'/NM en el ascenso para la aproximacion frustrada.		
OM a map-2 Min/seg	2.19	1.48	1.37	1.21	1.09	1.00	(*2.6km of Vis. will be applied when climb rate is less than 250'/NM in missed approach)		
OM a MAP-1 Min/seg	3.26	2.40	2.24	2.00	1.43	1.30			

AIS/MAP

DGAC

28 JUN 1990 AMD19

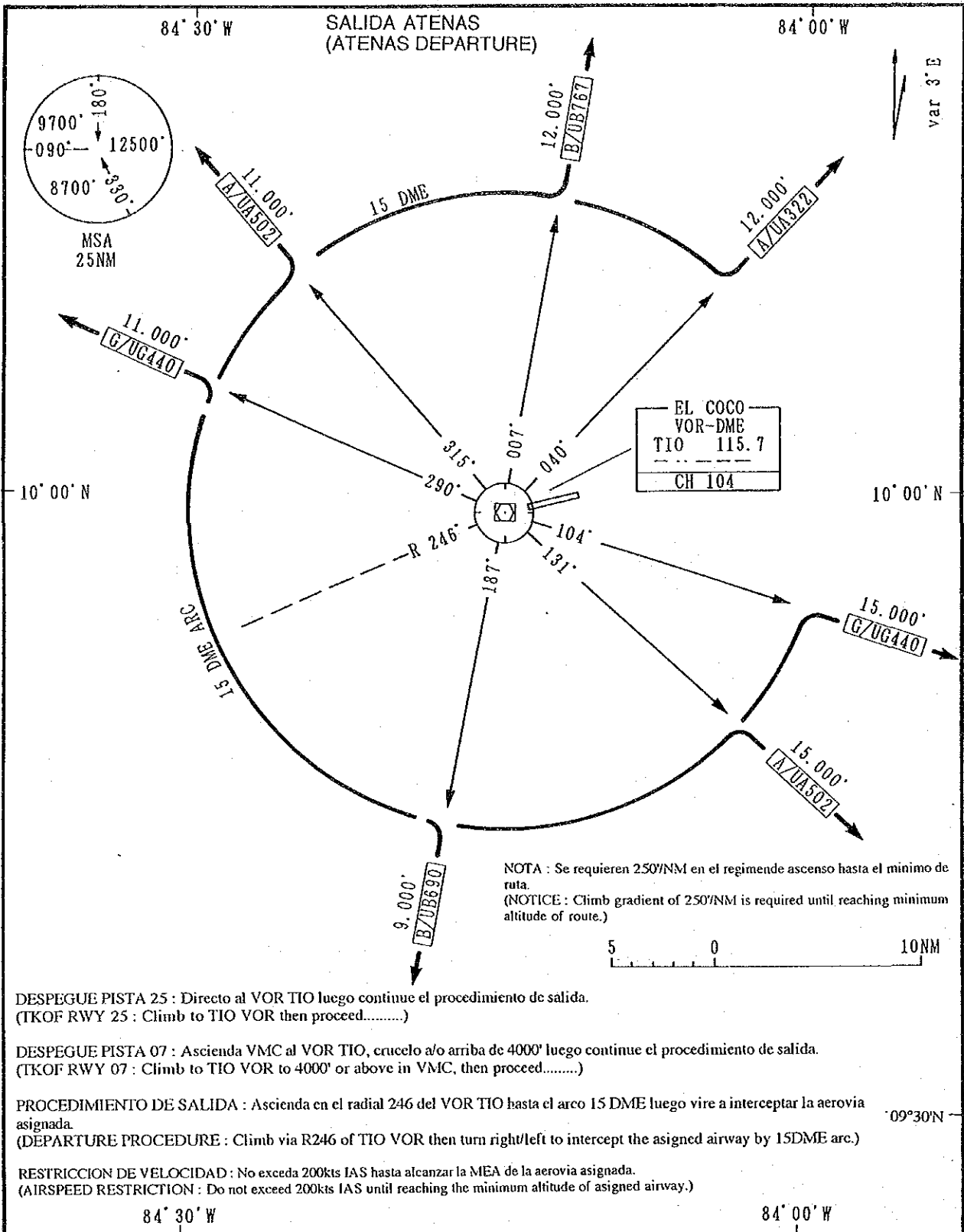


TWR	118.6
APP	119.6
GND	121.3

ALAJUELA/  
JUAN SANTAMARIA INTL  
MAP9

SID ELEV.3012'

SALIDA ATENAS  
(ATENAS DEPARTURE)



DESPEGUE PISTA 25 : Directo al VOR TIO luego continúe el procedimiento de salida.  
(TKOF RWY 25 : Climb to TIO VOR then proceed.....)

DESPEGUE PISTA 07 : Ascienda VMC al VOR TIO, crucelo a/o arriba de 4000' luego continúe el procedimiento de salida.  
(TKOF RWY 07 : Climb to TIO VOR to 4000' or above in VMC, then proceed.....)

PROCEDIMIENTO DE SALIDA : Ascienda en el radial 246 del VOR TIO hasta el arco 15 DME luego vire a interceptar la aerovia asignada.  
(DEPARTURE PROCEDURE : Climb via R246 of TIO VOR then turn right/left to intercept the assigned airway by 15DME arc.)

RESTRICCIÓN DE VELOCIDAD : No exceda 200kts IAS hasta alcanzar la MEA de la aerovia asignada.  
(AIRSPEED RESTRICTION : Do not exceed 200kts IAS until reaching the minimum altitude of assigned airway.)

AIS/AIP

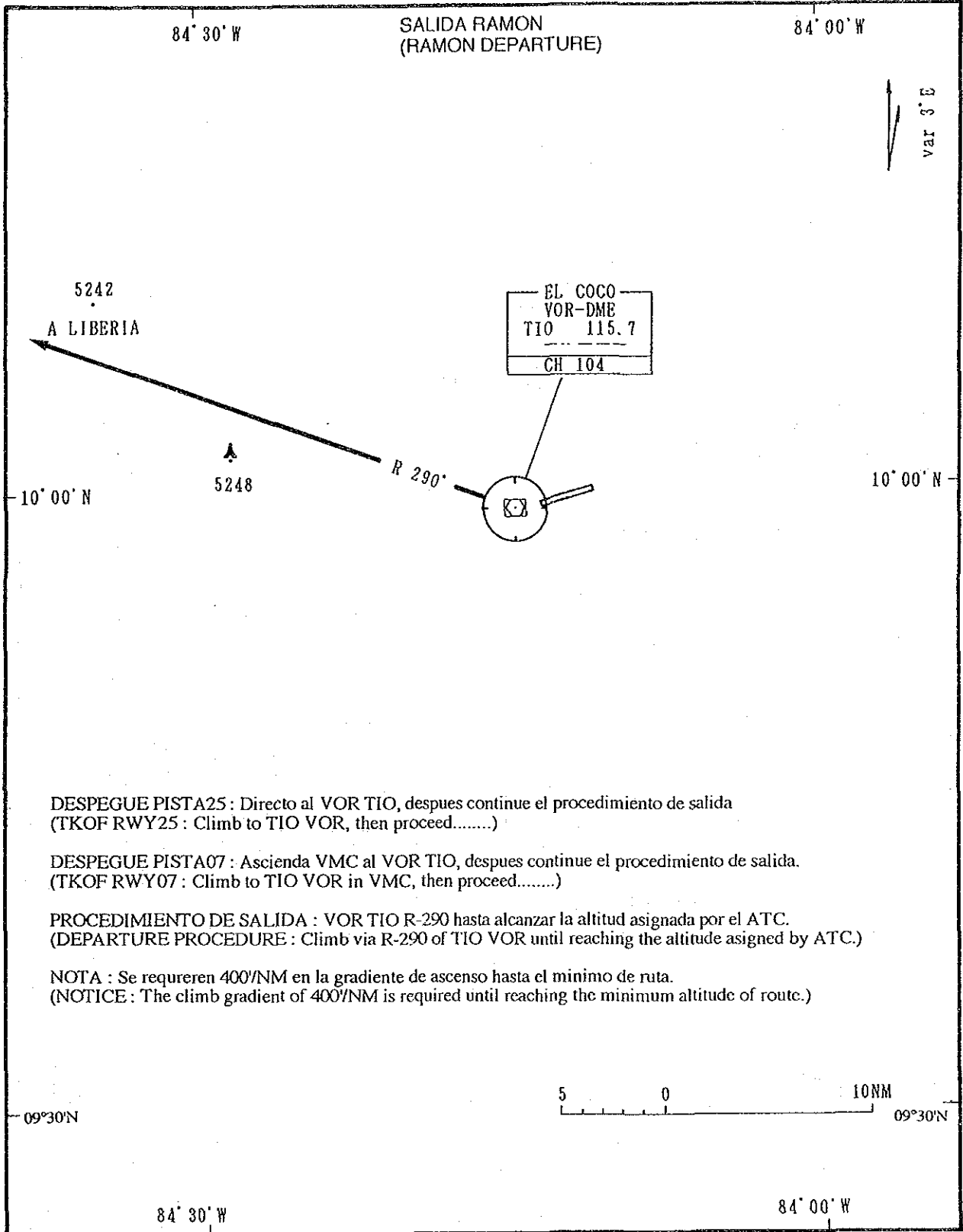
DGAC

21 SET 1989 AMD17

TWR	118.6
APP	119.6
	120.5
GND	121.3

ALAJUELA/  
JUAN SANTAMARIA INTL  
MAP10

SID ELEV.3021'



AIS MAP

DGAC

21 SET 1989

AMD17

## APPENDIX TO CHAPTER 12





**APPENDIX-12.2.1 ASSUMPTION ON THE CALCULATION  
OF AIRCRAFT NOISE CONTOUR**

**Juan Santamaria Airport**

Target Year			1990(Present)			2000(Short-term)			2010(Long-term)		
RWY			07	25	Total	07	25	Total	07	25	Total
07:00-19:00	B-747-200B	TKOF	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.16	0.47
		LDG	0.00	0.00	0.00	0.00	0.00	0.00	0.45	0.02	0.47
	DC-10-30	TKOF	0.12	0.06	0.18	0.75	0.37	1.12	1.27	0.63	1.90
		LDG	0.17	0.01	0.18	1.06	0.06	1.12	1.80	0.09	1.90
	B-727-200	TKOF	2.08	1.03	3.11	1.77	0.87	2.65	2.36	1.16	3.53
		LDG	2.95	0.16	3.11	2.51	0.13	2.65	3.35	0.18	3.53
	A-320	TKOF	1.33	0.65	1.98	3.92	1.93	5.85	4.77	2.35	7.11
		LDG	1.88	0.10	1.98	5.56	0.29	5.85	6.76	0.36	7.11
	TWIN OTTER	TKOF	0.67	0.33	1.01	1.46	0.72	2.17	2.05	1.01	3.06
		LDG	0.95	0.05	1.01	2.07	0.11	2.17	2.90	0.15	3.06
	ISLANDER	TKOF	3.30	1.63	4.93	4.31	2.12	6.43	5.64	2.78	8.41
		LDG	4.68	0.25	4.93	6.11	0.32	6.43	7.99	0.42	8.41
19:00-22:00	B-747-200B	TKOF	0.00	0.00	0.00	0.00	0.00	0.00	0.83	0.41	1.23
		LDG	0.00	0.00	0.00	0.00	0.00	0.00	1.17	0.06	1.23
	DC-10-30	TKOF	0.32	0.16	0.48	1.95	0.96	2.91	3.32	1.63	4.95
		LDG	0.45	0.02	0.48	2.76	0.15	2.91	4.70	0.25	4.95
	B-727-200	TKOF	5.44	2.68	8.11	4.63	2.28	6.90	6.17	3.04	9.21
		LDG	7.71	0.41	8.11	6.56	0.35	6.90	8.75	0.46	9.21
	A-320	TKOF	3.46	1.70	5.16	10.22	5.03	15.25	12.43	6.12	18.56
		LDG	4.90	0.26	5.16	14.49	0.76	15.25	17.63	0.93	18.56
	TWIN OTTER	TKOF	1.76	0.87	2.62	3.80	1.87	5.67	5.34	2.63	7.97
		LDG	2.49	0.13	2.62	5.39	0.28	5.67	7.57	0.40	7.97
	ISLANDER	TKOF	8.62	4.24	12.86	11.23	5.53	16.77	14.70	7.24	21.95
		LDG	12.22	0.64	12.86	15.93	0.84	16.77	20.85	1.10	21.95
22:00-07:00	B-747-200B	TKOF	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.12	0.35
		LDG	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.02	0.35
	DC-10-30	TKOF	0.09	0.04	0.14	0.55	0.27	0.82	0.94	0.46	1.40
		LDG	0.13	0.01	0.14	0.78	0.04	0.82	1.33	0.07	1.40
	B-727-200	TKOF	1.54	0.76	2.30	1.31	0.65	1.96	1.75	0.86	2.61
		LDG	2.18	0.11	2.30	1.86	0.10	1.96	2.48	0.13	2.61
	A-320	TKOF	0.98	0.48	1.46	2.90	1.43	4.32	3.52	1.74	5.26
		LDG	1.39	0.07	1.46	4.11	0.22	4.32	5.00	0.26	5.26
	TWIN OTTER	TKOF	0.50	0.25	0.74	1.08	0.53	1.61	1.51	0.75	2.26
		LDG	0.71	0.04	0.74	1.53	0.08	1.61	2.15	0.11	2.26
	ISLANDER	TKOF	2.44	1.20	3.64	3.18	1.57	4.75	4.17	2.05	6.22
		LDG	3.46	0.18	3.64	4.51	0.24	4.75	5.91	0.31	6.22
Total	B-747-200B	TKOF	0.00	0.00	0.00	0.00	0.00	0.00	1.38	0.68	2.05
		LDG	0.00	0.00	0.00	0.00	0.00	0.00	1.95	0.10	2.05
	DC-10-30	TKOF	0.53	0.26	0.80	3.25	1.60	4.85	5.53	2.72	8.25
		LDG	0.76	0.04	0.80	4.61	0.24	4.85	7.83	0.41	8.25
	B-727-200	TKOF	9.06	4.46	13.52	7.71	3.80	11.51	10.28	5.06	15.34
		LDG	12.85	0.68	13.52	10.93	0.58	11.51	14.58	0.77	15.34
	A-320	TKOF	5.76	2.84	8.60	17.03	8.39	25.42	20.72	10.21	30.93
		LDG	8.17	0.43	8.60	24.15	1.27	25.42	29.38	1.55	30.93
	TWIN OTTER	TKOF	2.93	1.44	4.37	6.33	3.12	9.45	8.90	4.38	13.29
		LDG	4.15	0.22	4.37	8.98	0.47	9.45	12.62	0.66	13.29
	ISLANDER	TKOF	14.36	7.07	21.44	18.72	9.22	27.95	24.51	12.07	36.58
		LDG	20.37	1.07	21.44	26.55	1.40	27.95	34.75	1.83	36.58

**Liberia Airport**

Target Year		2010			
RWY		14	32	Total	
07:00-19:00	B-747-200B	TKOF	0.00	0.00	0.00
		LDG	0.00	0.00	0.00
	DC-10-30	TKOF	0.23	0.11	0.34
		LDG	0.23	0.11	0.34
	B-727-200	TKOF	0.00	0.00	0.00
		LDG	0.00	0.00	0.00
	A-320	TKOF	4.08	2.01	6.10
		LDG	4.08	2.01	6.10
	TWIN OTTER	TKOF	5.42	2.67	8.08
		LDG	5.42	2.67	8.08
	ISLANDER	TKOF	4.04	1.99	6.03
		LDG	4.04	1.99	6.03
19:00-22:00	B-747-200B	TKOF	0.00	0.00	0.00
		LDG	0.00	0.00	0.00
	DC-10-30	TKOF	0.00	0.00	0.00
		LDG	0.00	0.00	0.00
	B-727-200	TKOF	0.00	0.00	0.00
		LDG	0.00	0.00	0.00
	A-320	TKOF	0.00	0.00	0.00
		LDG	0.00	0.00	0.00
	TWIN OTTER	TKOF	0.00	0.00	0.00
		LDG	0.00	0.00	0.00
	ISLANDER	TKOF	0.00	0.00	0.00
		LDG	0.00	0.00	0.00
22:00-07:00	B-747-200B	TKOF	0.00	0.00	0.00
		LDG	0.00	0.00	0.00
	DC-10-30	TKOF	0.00	0.00	0.00
		LDG	0.00	0.00	0.00
	B-727-200	TKOF	0.00	0.00	0.00
		LDG	0.00	0.00	0.00
	A-320	TKOF	0.00	0.00	0.00
		LDG	0.00	0.00	0.00
	TWIN OTTER	TKOF	0.00	0.00	0.00
		LDG	0.00	0.00	0.00
	ISLANDER	TKOF	0.00	0.00	0.00
		LDG	0.00	0.00	0.00
Total	B-747-200B	TKOF	0.00	0.00	0.00
		LDG	0.00	0.00	0.00
	DC-10-30	TKOF	0.23	0.11	0.34
		LDG	0.23	0.11	0.34
	B-727-200	TKOF	0.00	0.00	0.00
		LDG	0.00	0.00	0.00
	A-320	TKOF	4.08	2.01	6.10
		LDG	4.08	2.01	6.10
	TWIN OTTER	TKOF	5.42	2.67	8.08
		LDG	5.42	2.67	8.08
	ISLANDER	TKOF	4.04	1.99	6.03
		LDG	4.04	1.99	6.03



## **APPENDIX TO CHAPTER 13**



## **APPENDIX-13.3.1 REVENUE AND EXPENDITURE OF DGAC**



**Appendix 13.3.1 Revenue and Expenditure of DGAC in 1990**

Item	Amount (1,000 colones)	%
<b>Revenue</b>		
a) Approach Service Fee	123,362	38
b) Boarding Fee	76,064	23
c) Landing Fee and Lighting Charges	53,822	17
d) Space Rental and Tenant Charges	51,442	16
e) Others	21,337	6
Total	326,027	100
<b>Expenditure</b>		
a) Salaries and Wages	133,474	54
b) Non-Personnel Service Expenses	51,786	21
c) Materials and Expendables	54,612	21
d) Depreciation	11,311	5
Total	248,183	100

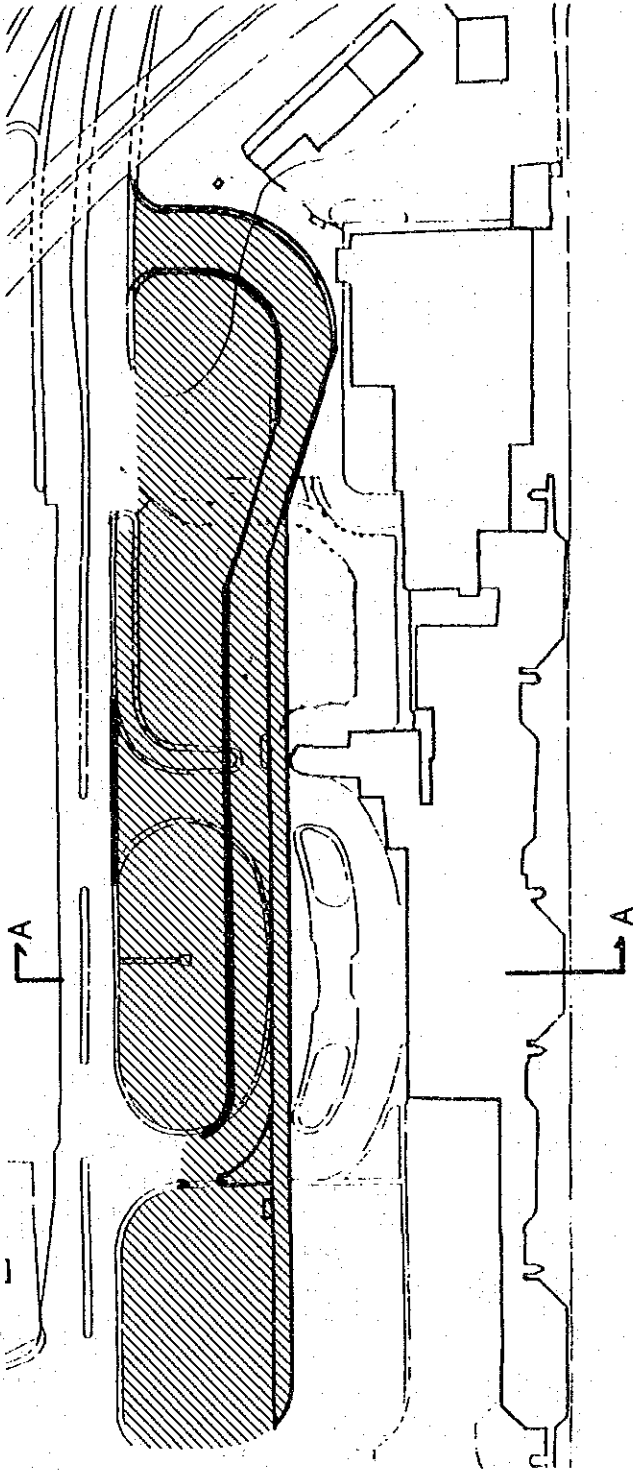
## **APPENDIX TO CHAPTER 14**



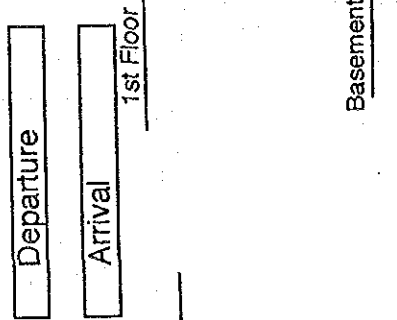
**APPENDIX-14.2.1 CONSTRUCTION PLAN OF THE  
EXISTING TERMINAL BUILDING,  
ROAD AND CARPARK**

# Stage-1

1. Circular road for departure terminal frontage and car parks will be constructed and opened.
2. A temporary car park will be prepared on the north of the existing airport access road during the construction of the road and the car parks.
3. Passenger traffic will be guided by temporary roads during the construction of car parks.

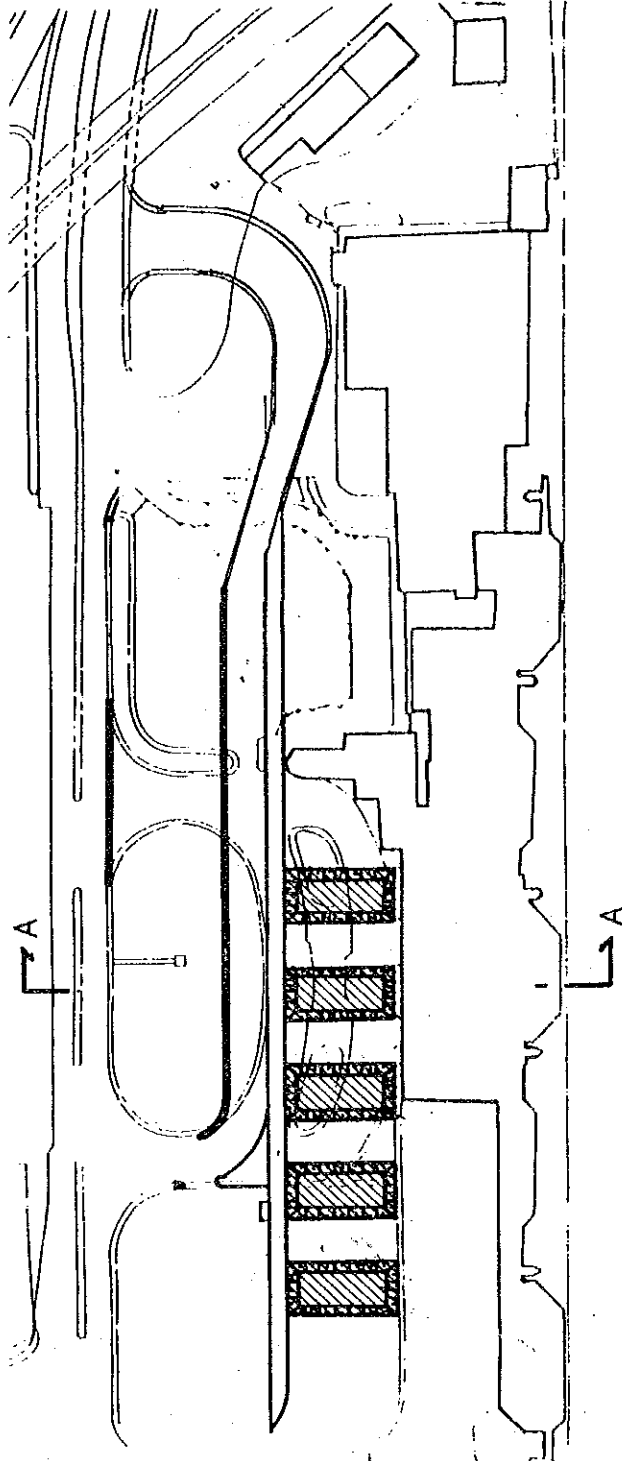


Section A-A

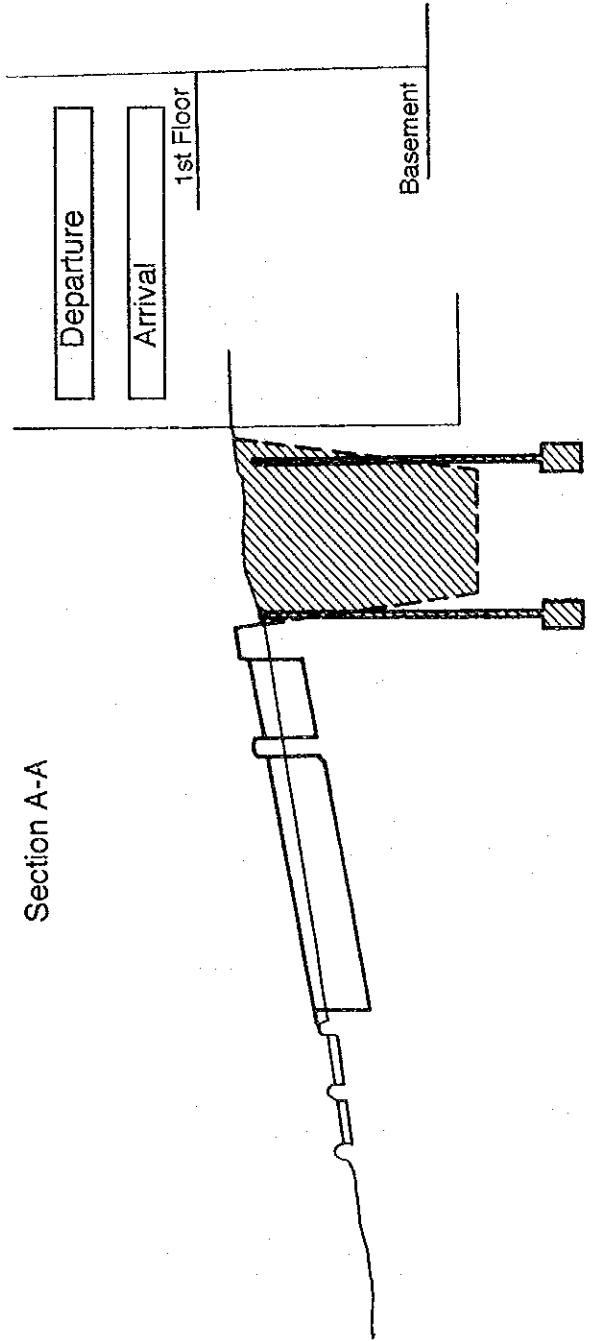


# Stage-2

1. Foundation for the pedestrian bridges and decks will be constructed.
2. Departure and arrival passengers will be conducted from the new departure terminal frontage to passenger terminal building the temporary road in between the foundations which is under construction.

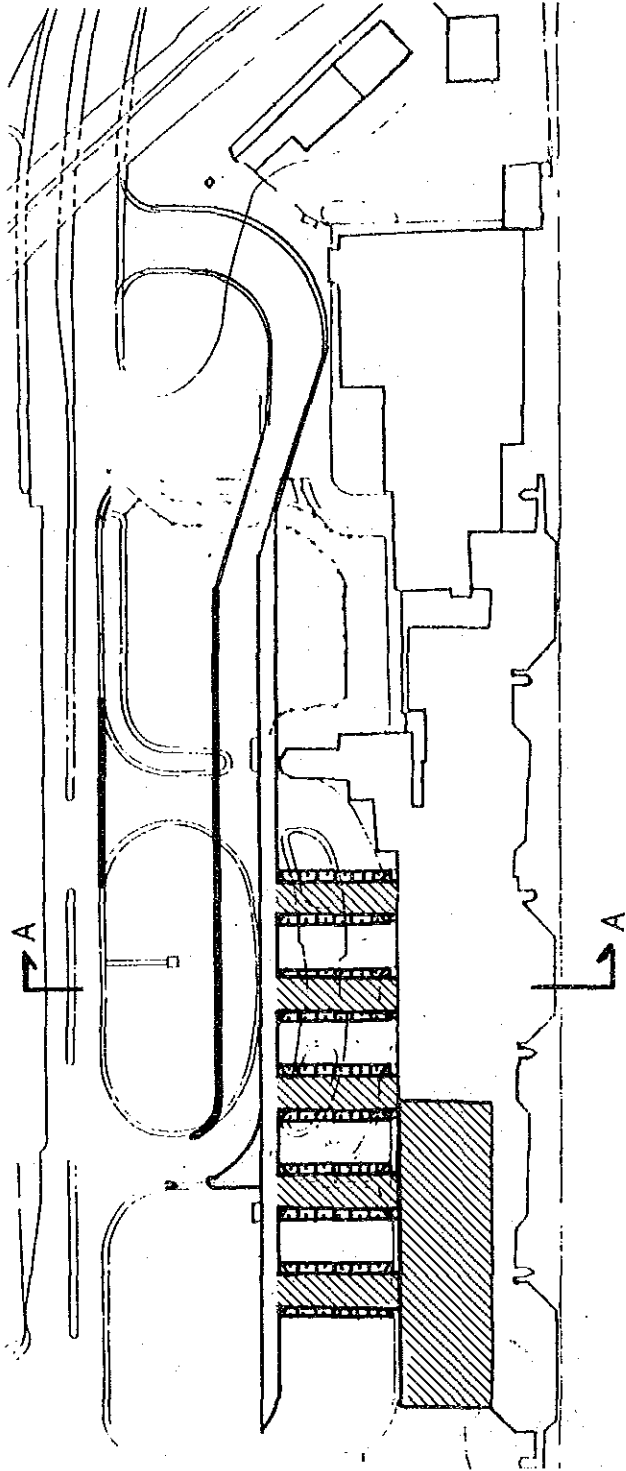


Section A-A

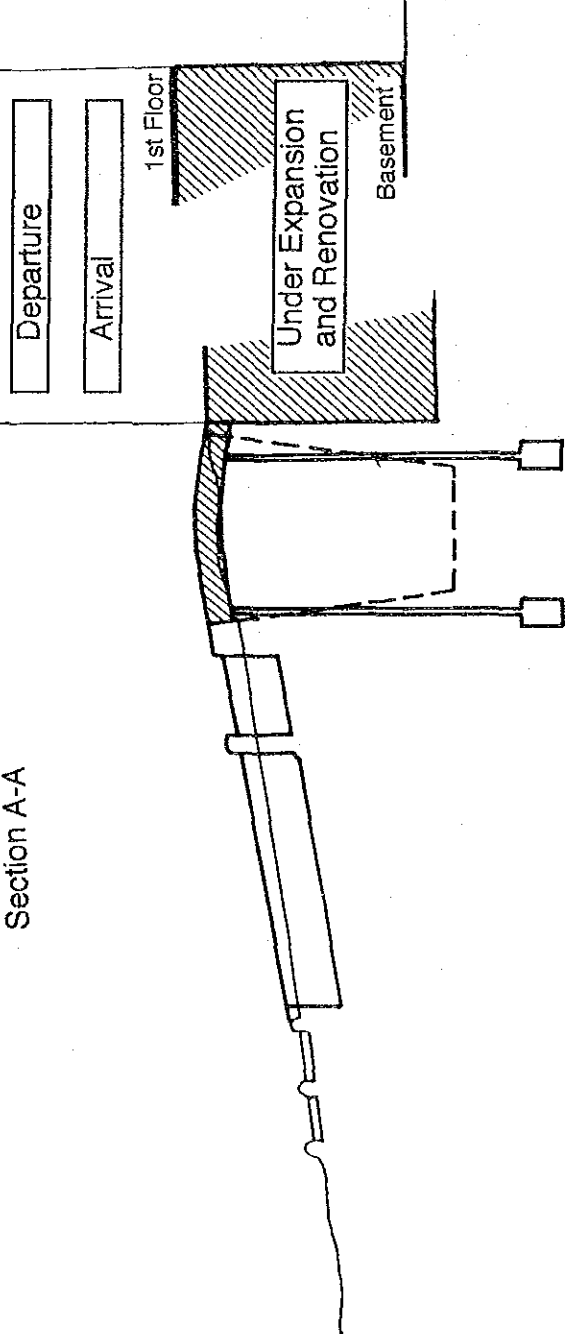


# Stage-3

1. Pedestrian bridges and decks will be constructed and opened.
2. Expansion and renovation works of the existing passenger terminal building will start.



Section A-A



# Stage-4

1. The existing ground in front of the future arrival curb will be excavated to basement level.
2. The basement of the existing passenger terminal building will be renovated continuously.

