PART Ⅳ MASTER PLANNING FOR THE NEW AIRPORT

PART IV MASTER PLANNING FOR THE NEW AIRPORT

12. Airport Facilities (Ref. to Chapter 14, Vol. II)

The new airport with 142 ha, is located as close to Talao Bunga and Batang Anai as possible as shown in Figure 5. The 2500 meters runway is oriented N 24° W at S 0° 47' 26" and E 100° 17' 5" taking into the account the following conditions :-

- no influence of aircraft noise to Padang city,
- construction economy and efficient use of land, and
- harmony with the present land use and runway expansion potential.

The general outline of the airport is summarized in Table 12.

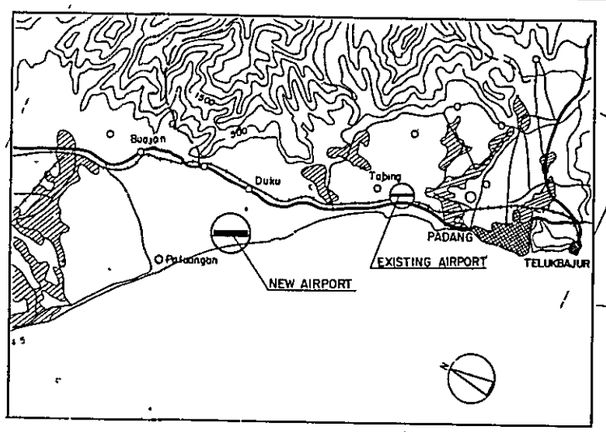
The existing terrain for the airport property area is generally flat with only irregular differences of elevation between 2 and 5 meters. The vertical alignment of the runway is planned as low as possible at elevations from 5 meters to 4.5 meters with 0.03 percent down-gradient to the south in order to achieve economical earth work and adequate storm water drainage.

The fill earth work volume is estimated to be about 370,000 m^3 for the first Phase.

The terminal area will be connected by a 3.8 km long access road to the existing coastal highway at Muarakasang and is located at the center of the length of the runway. It will accommodate the necessary terminal facilities including administrational facilities and general services for civil air transport and will be capable of orderly expansion up to at least the demand in the year 2005.

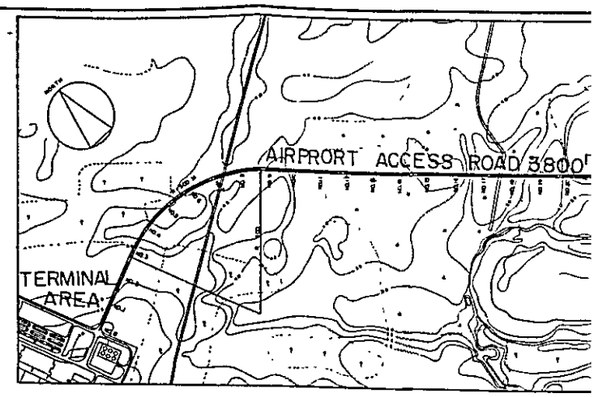
With regard to the utilities, the Vital Installation area is provided isolated from the terminal area for better security protection and allocated for housing the main power substation, the water treatment plant for potable water, and the sewage treatment plant together with the HF RX. station. The power will be supplied from Lubuk Alung substation of PLN by 22kv transmission line.

The water supply will be derived from a plant with an intake in Batang Anai and the effluent water from the sewage treatment plant will be discharged into Talao Bunga.



LOCATION MAP

SCALE IN KILOMETERS 0 1 2 5 10



TRUE NORTH
MAG. NORTH

AIRPORT ACCESS ROAD

AERODROME BEACON

NDB

CAR PARKING

TAXI POOL

FUEL STORAGE

WATER TREATMENT PLANT

HF RX

SEWAGE TREATMENT PLANT

HOUSING DEVEL

PROPOSI

BY

AREA RESERVED FOR POSSIBLE FUTURE MAINTENANCE FACILITIES

PASSENGER TERMINAL APRON

GENERAL AVIATION APRON

HELIPORT

WIND CONE

WIND CONE

50:1 APPROACH SURFACE

SIMPLE APPROACH LIGHTING SYSTEM

OPEN CHANNEL

VASIS

LANDING STRIP (W=30M)

VASIS

O/R

O/R

N 24°00 W (TRUE)

RUNWAY (2500M x 45M)

ARP

ILS LOCALIZER /DME

EL 5.00

OPEN CHANNEL

AIRFIELD ROAD

RVR METER

ILS GLIDE SLOPE

AREA RESERVED FOR FUTURE RUNWAY EXTENSION

METEOROLOGICAL OBSERVATION SITE

VOR/DME

GOSONG

TALAO BUNGA

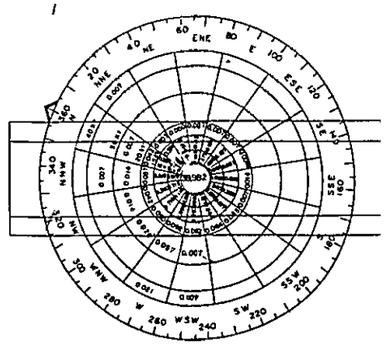
INDONESIAN SEA

BASIC DATA TABLE	
RUNWAY DATA	
EFFECTIVE RUNWAY GRADIENT (IN%)	0 020
% WIND COVERAGE	20 KNOT 99.9% 13 KNOT 98.0%
INSTRUMENT RUNWAY	✓
PAVEMENT STRENGTH	B 747 AND DC 10 CLASS
APPROACH SURFACES	1 - 50
LIGHTING	HIRL
MARKING	ALL WEATHER
NAVIGATIONAL AIDS	ILS, ALS, VASIS

BASIC DATA TABLE	
AIRPORT DATA	
AIRPORT ELEVATION	4 87 M
AIRPORT REFERENCE POINT (ARP) COORDINATES	LAT 00°47'26 S LNG 100°17'05 E
AIRPORT AND TERMINAL NAVAID	VOR/DME
AIRPORT REFERENCE TEMPERATURE	33° C

LEGEND	
----	AIRPORT PROPERTY LINE
~40~	GROUND CONTOURS
	COCONUTS TREES
	BUSH AND FOREST
	RICE FIELD
O/R	OVER RUN
	PHASE I
	PHASE II

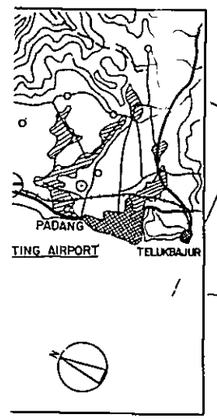
BUILDINGS	
NO	STRUCTURE
①	PASSENGER TERMINAL BUILDING
②	CARGO TERMINAL BUILDING
③	ADMINISTRATION BUILDING
④	FIRE STATION
⑤	MAINTENANCE WORKSHOP
⑥	CONTROL TOWER
⑦	MAIN SUBSTATION

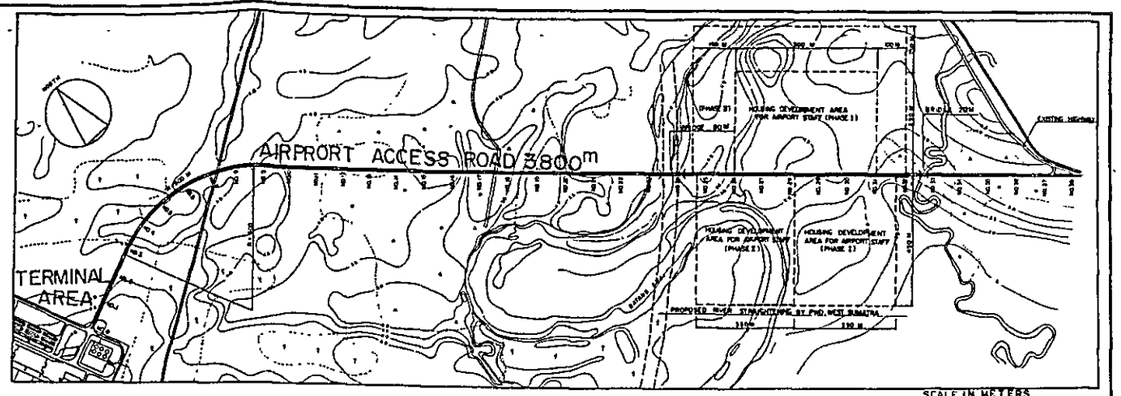


SOURCE : PUSAT METEOROLOGI DAN GEOFISIKA
TABING AIRPORT
PERIOD : 1976 - 1978

20 KT CROSS
13 KT CROSS

WIND ROSE





SCALE IN KILOMETERS
0 1 2 5 10

TRUE NORTH
MAG NORTH

AIRPORT ACCESS ROAD

AERODROME BEACON

NDB

CAR PARKING

TAXI POOL

FUEL STORAGE

WATER TREATMENT PLANT

HF RX

SEWAGE TREATMENT PLANT

AREA RESERVED FOR POSSIBLE FUTURE MAINTENANCE FACILITIES

HOUSING DEVELOPMENT AREA

PROPOSED RIVER STRAIGHTENING BY PWD WEST SUMATRA

RIVER ANAI

PASSENGER TERMINAL APRON

GENERAL AVIATION APRON

HELIPORT

WIND CONE

OPEN CHANNEL

VASIS

LANDING STRIP (W=300M)

N 24°00 W (TRUE)

RUNWAY (2500M x 45M)

ARP

O/R

ILS LOCALIZER /DME

OPEN CHANNEL

AIRFIELD ROAD

RVR METER

ILS-GLIDE-SLOPE

50:1 APPROACH SURFACE

APPROACH LIGHTING SYSTEM (CAT I)

ILS MIDDLE MARKER

CEILOMETER

METEOROLOGICAL OBSERVATION SITE

VOR / DME

GOSONG

TALAO BUNGA

INDONESIAN SEA

	0 020
	20 KNOT 99.9% 13 KNOT 98.0%
	✓
	B747 AND DC10 CLASS
	I 50
	HIRL
	ALL WEATHER
	ILS, ALS, VASIS

BASIC DATA TABLE

AIRPORT DATA

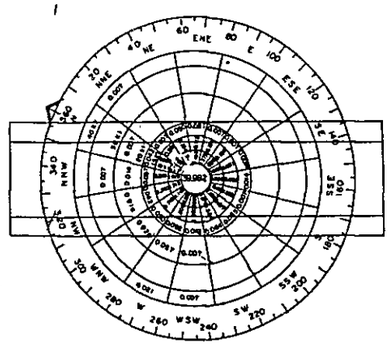
AIRPORT ELEVATION	4.87 M
AIRPORT REFERENCE POINT(ARP) COORDINATES	LAT 00°47'26"S LNG 100°17'05"E
AIRPORT AND TERMINAL NAVAID	VOR/DME
AIRPORT REFERENCE TEMPERATURE	33° C

LEGEND

----	AIRPORT PROPERTY LINE
~40~	GROUND CONTOURS
⅄ ⅄	COCONUTS TREES
? ?	BUSH AND FOREST
≡ ≡	RICE FIELD
O/R	OVER RUN
▭	PHASE I
▭	PHASE II

BUILDINGS

NO	STRUCTURE
①	PASSENGER TERMINAL BUILDING
②	CARGO TERMINAL BUILDING
③	ADMINISTRATION BUILDING
④	FIRE STATION
⑤	MAINTENANCE WORKSHOP
⑥	CONTROL TOWER
⑦	MAIN SUBSTATION



SOURCE : PUSAT METEOROLOGI DAN GEOFISIKA TABING AIRPORT
PERIOD : 1976 - 1978

20 KT CROSS WIND COVERAGE 99.9 %
13 KT CROSS WIND COVERAGE 98.0 %

WIND ROSE

NOTE 1; This map was reproduced based on "SITUASI PROYEK IRIGASI DRAINAGE DATARAN ANAI" issued by D.P.U WEST SUMATRA.

2; The elevations indicated in this drawing are based on B.M. at Teluk Bayur (H=+3.6 m)

SCALE IN METERS
0 100 200 500

Figure 5 NEW AIRPORT LAYOUT PLAN

Table 12 OUTLINE OF THE NEW AIRPORT FACILITIES FOR THE FIRST PHASE

Country	Name of Airport	INT./DOM. / ICAO CODE	Commencement of Services	Airport Total Area	Aerodrome Ref. Point	Airport Elevation	Runway Orientation	Aerodrome Ref. Temp.	Operation Hours	Seasonal Availability	Note:
Indonesia	Ketaping (PDG)	Int. & Dom. / "A"	April 1988	142 ha.	500°47'26" / E100°17'05"	5 m MSL	N 24° W	33°	23 - 14 (GMT) 15 hours	All seasons	Control Agency: DGAC Additional 10 ha. land area required for HF, TX, access road, and temporary road.

City/Town			Transportation			Wind Coverage	Operational Minimum					Note:
Name	Population	Distance to Airport	Railway	Taxi	Bus		Runway	Procedure	DH/MDA	VIS	RVR	
Padang	450 thousand	25 km		X	X	98% (13 knot Cross Wind)	34	ILS	220	800	800	
								VOR/DME	420	1200	1200	
							16	VOR/DME	420	1200	1200	

Air Navigation

Nav.	NDB		VOR		DME		TACAN		ILS		LOCATOR		D.F.								Note: CAT-1 operation
	X		X		X				X		X										
ATC/COM	ASR		SSR		PAR		ASDE		ARTS		AMS		AFS		TTY		UHF		ATIS		
											4 VHF channels		3 HF channels		X						
LIGHT	ALS	SFL	SALS	ALB	CGL	RWL	RWCL	RWIL	ORL	TDZL	REIL	DML	VASIS	TWL	TWCL	TGL	ABN	WIDL	AFL	O.L.	
	X		X			X		X	X				X	X			X	X	X	X	
MET	RWY Surface Sensors		RVR		Ceilometer		WX-FAX		WX-TTY		ART-RX		Radiosonde		WX Radar						
	X		X		X		X		X												

Basic Facilities

		Size	Pavement	Note
Runway Strip		2620m x 300m		
Runway		2500m x 45m	A/C, LCN85	
Taxiway		2 exit twy (415m)	A/C, LCN85	
Apron	Design Aircraft	No. of Stand	Pavement	Parking Configuration / Note
	DC10/A300	4	PCC	nose-in / two stands for general aviation aircraft
	DC9	2	PCC	nose-in
	L-188 class	1	A/C	angle out

Other Facilities

	Size	Structure	Note
Passenger Bldg.	13800 m²	RC	2 floors
Cargo Bldg.	2600 m²	steel frame	
Administration Bldg.	1800 m²	RC	2 floors
Control Tower	Cab: App. 60m²	RC	Cab:25m AGL
Fire Station	400 m2	RC	Cat. 8
Fuel Depot	2520 kl		
Car Parking Lots	430		

Flight Services

INT/DOM	Major Air Route	Airline	Aircraft	Flight/week	

Traffic Statistics

LDG and TOF	4,960	11,600	13,400	13,900	19,100
Annual Freight (ton)	2,888	9,300	16,000	25,500	41,000
Annual Passengers	222,000	750,000	1,300,000	2,000,000	3,000,000
Year	1980	1990	1995	2000	2005

Note:
No. of DGAC staff:
410 in 1995
880 in 2005

No. of airport employees:
950 in 1995
2,200 in 2005

Air navigation system facilities necessary for ICAO Cat. 1 and automatic meteorological data collecting system will be provided in the airport except for a compass locator for final approach course guidance and TX. station for AFTN which will be unavoidably located outside the airport.

13. Airsapce Use (Ref. to Chapter 15, Vol. II)

There is no obstacle infringing the obstacle limitation surfaces except for coconut trees adjacent to the airport which will be felled in order to avoid forming obstructions to the surface or radio navaid facilities.

The airways around the airport will be maintained as they are at present except to shift the fix "KATANG2" westward from which the arriving aircraft will descend and intercept the localizer course keeping away from the Padang city while the ILS approach from Medan, will make VOR base turn and intercept the localizer course.

Departure aircraft except for the aircraft heading toward Medan will climb up to more than 7000' at VOR/DME and be bound for respective destinations in order to avoid the mountains on the east and maintain the necessary clearance.

The new airport is located at an ideal place based on aircraft operations, and can be assured of runway usability of more than 99 percent for the maximum allowable cross wind component of 20 knot. High safety and efficiency of operations with air navigation system, which will be provided, are also guaranteed.

14. Aircraft Noise (Ref. to Chapter 16, Vol. II)

The noise contours for the new airport for the years 1990 and 2005 have been estimated and are indicated in Figures 6 and 7 respectively.

As seen from these figures, the contour of WECPNL 70 remains within the sparsely populated area along the coast consisting of rice fields, wasteland, etc. between Lubuk Alung and Lubuk Buaya. There will be no noise influence on Padang city or other populated areas.

The owners of the existing 60 houses enclosed by WECPNL 85 or more will be compensated for moving as they request.

These noise contours are based on the assumptions that 86 percent and 14 percent of the landings and take-offs will be made from the south and the north respectively.

1990 contour are thicker than those for 2005 because the major aircraft in service up to 1990 will be DC-9 while after the year 2000, the most of aircraft will be of at least the noise level of the current jumbo and wide bodied aircraft which are not as noisy.

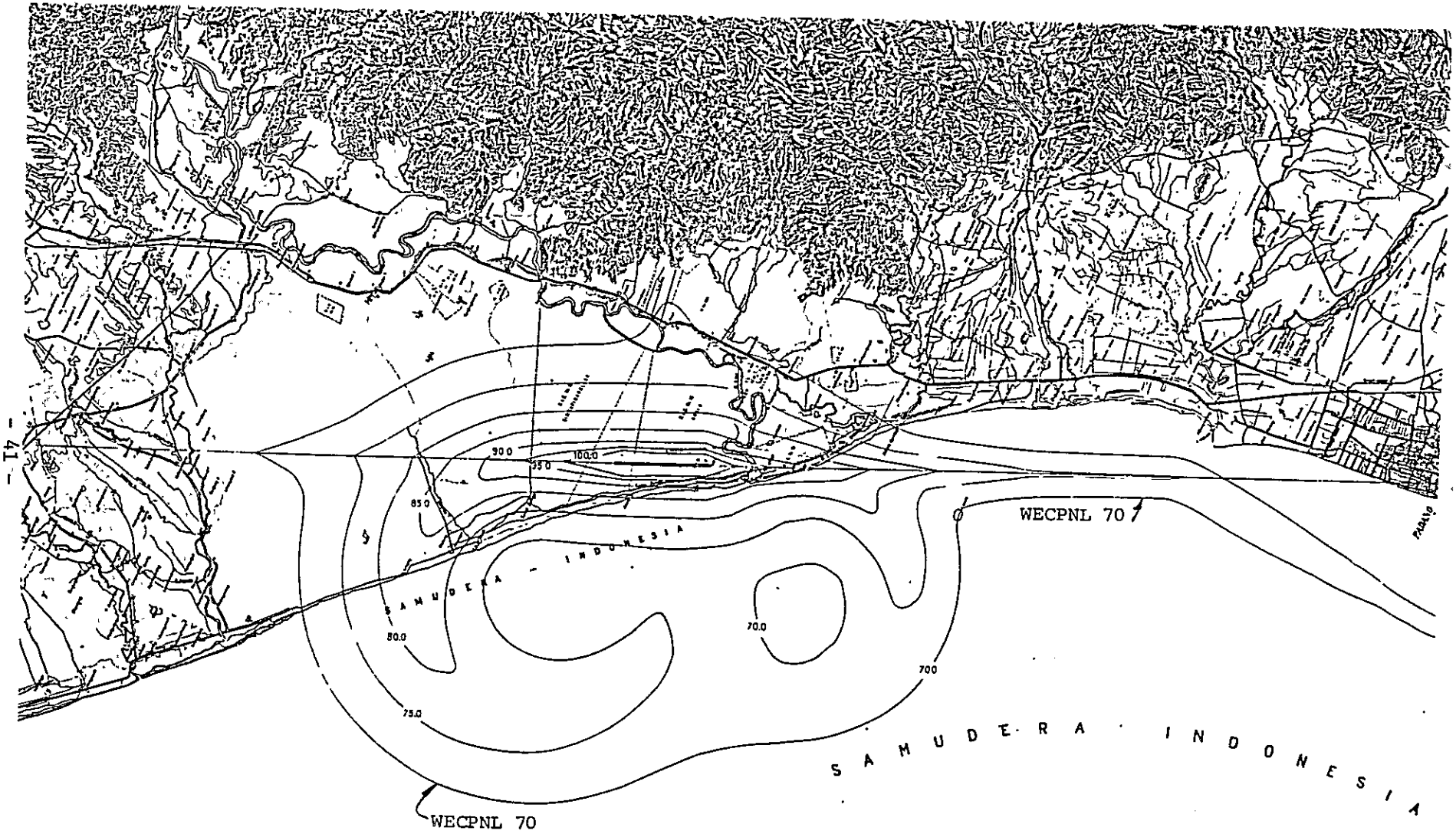


Figure 6 AIRCRAFT NOISE CONTOUR (Year 1990)

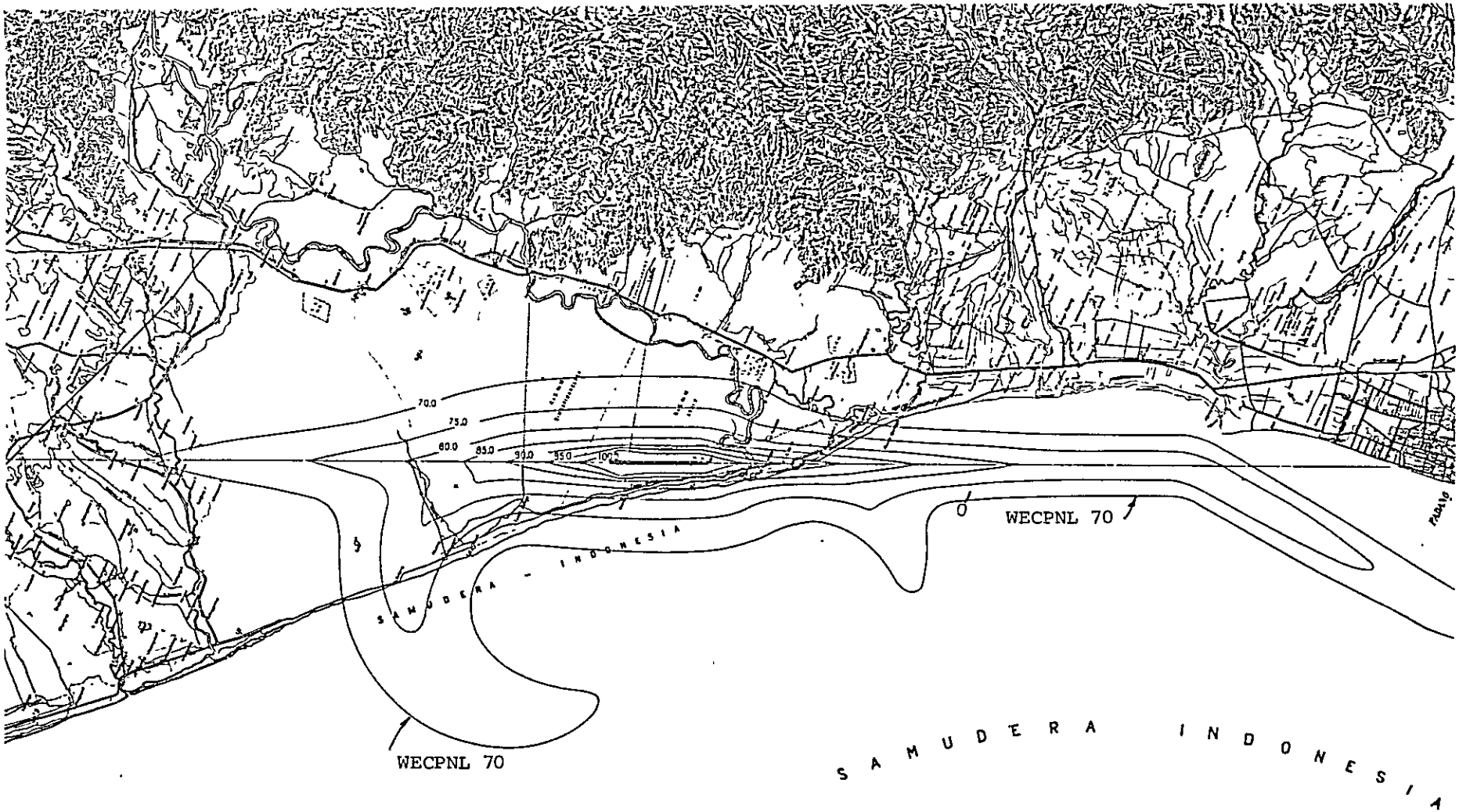


Figure 7 AIRCRAFT NOISE CONTOUR (Year 2005)

15. Consideration on Future Land Use (Ref. to Chapter 16, Vol. II)

The land use controls required for the new airport vicinity are devided into five categories.

These proposed controls are summarized by category as follows:

1) Land use zoning

The noise contours estimated for 1990 are indicated in Figure 6. The following zoning by noise level is proposed taking into account the existing land use and the standards existing and in use in Japan, France, etc.

WECPNL $\geq$ 70: No schools, hospitals, etc. permitted.

$\geq$ 75: No new residence basically permitted.
Continuation of the existing agricultural use is recommended.

$\geq$ 85: Prohibited area for new residences.
Further agricultural use is recommended.

2) Height limitation

All the structures and trees are restricted in order not to infringe on the established obstacle limitation surfaces. For the extension of the runway to 3,500 meters toward the north, the restriction will be enforced for the future expanded surfaces.

3) Obstacle clearance

Any structures and trees constituting obstacles to the safety and satisfactory operations of aircraft and air navigation system should be eliminated in the area indicated in Figure 8.

4) Housing area for airport employees

The area of some 70 ha. is to be reserved along the airport access road and outside the WECPNL 75 contour as shown in Figure 5 in order to be able to house 90 percent of the airport employees and their families which are anticipated in the year 2005.

5) Others

In order to reserve the area necessary for the future runway extension of 1,000 meters, and the possible future aircraft maintenance area as indicated in Figure 5, the existing conditions in wasteland and forest should be maintained.

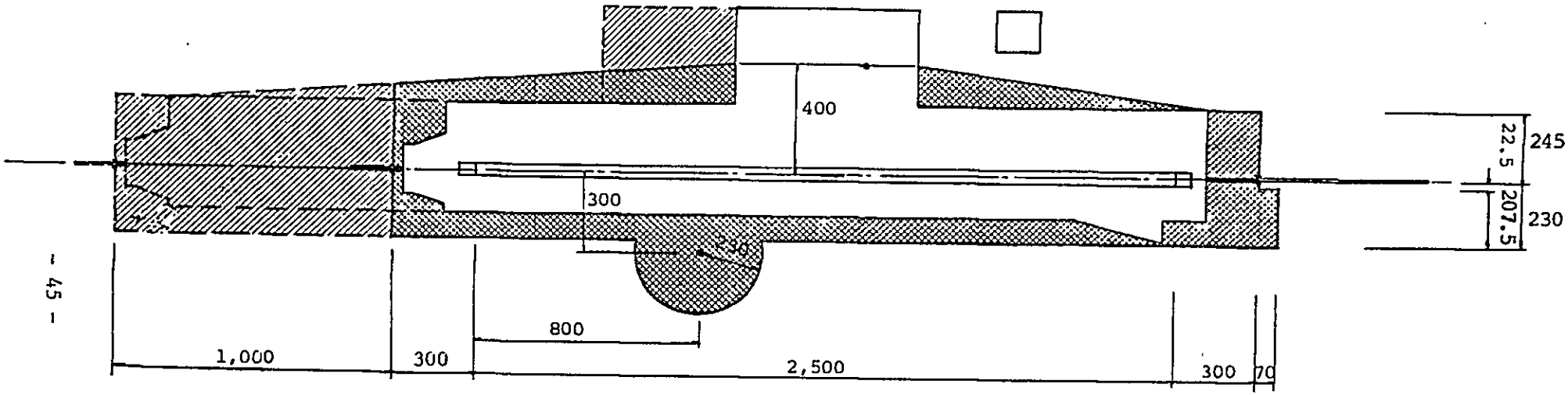
16. Airport Organization (Ref. to Chapter 16, Vol. II)

The activities of the existing Tabing Airport will be expanded from 11 hours to 15 hours of operation (from 23 thru 14 GMT). From 6 to 14 times the present number of passengers will be handled in 1995 and 2005 respectively.

The airport organization of DGAC is outlined as shown in Figure 9. The existing sections can be grouped into three divisions, i.e. engineering division, administration division and air safety division, under an airport manager for efficient functioning of the larger organization. Therefore, three divisions are planned to be established after 1995 while 15 sections will be directly controlled by the airport manager before 1995.

The present 109 DGAC staff members are estimated to be increased to a total number of about 410 and 880 in 1995 and 2005 respectively. These numbers are judged to be sufficient to allow the abovementioned organization to function satisfactorily with three daily shifts and four rotations for most of the air safety and engineering divisions which will require 15 hours of operations.

The total number of airport employees including the above referred to DGAC staff is estimated to be 950 and 2200 in 1995 and 2005 respectively.



LEGEND

The area necessary for present operations

Area reserved for future extension

Figure 8 OBSTACLE CLEARANCE ZONE

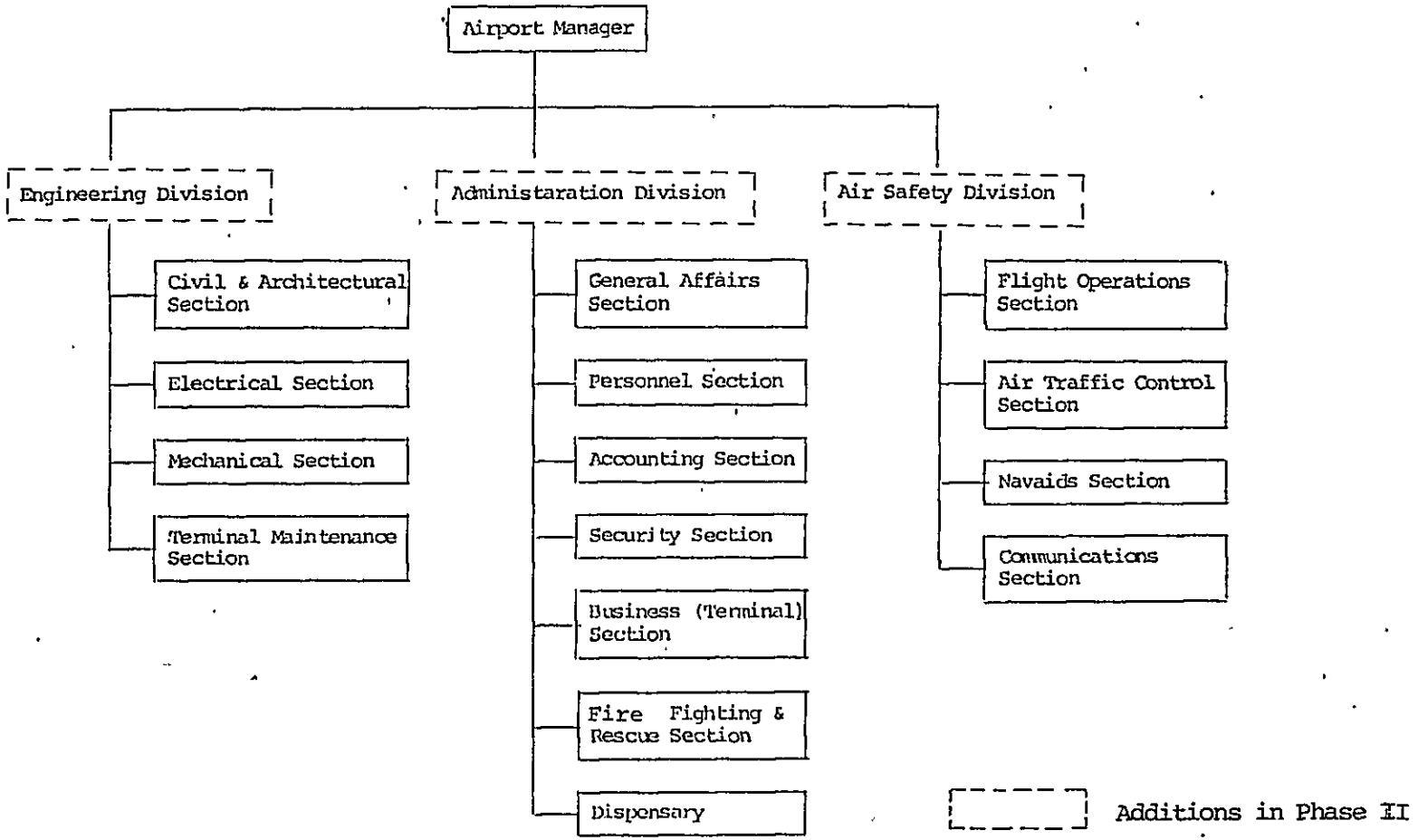


Figure 9 ORGANIZATION CHART FOR NEW AIRPORT

17. Construction Schedule and Cost Estimates (Ref. to Chapter 17,Vol. II)

The planned construction schedule is indicated in Table 13.

Construction for the new airport will begin in April, 1984, and it will be completed 3 1/2 years later. About one half year will be spent for various flight checks, information to IATA, ICAO, etc., training for navaids facilities, test operation of airport facilities, airlines' maturity flights, issue of NOTAM, etc. Operations should be inaugurated around April 1988.

The existing airport will continue its operation until the start of the new airport operation by implementing the least improvement works described in 5.2.

For two years before the start of construction, topographical survey, soil investigation, arrangement of local and foreign finances, detailed engineering services, etc. should be completed.

The construction will be initiated for a temporary road including improvement of the existing narrow village road. There will also be new construction for the mobilization of earth work equipment, site offices and other temporary facilities. The access road is to be completed as soon as possible in order to utilize it as the main temporary road for pavement and building works, etc. upon completion.

The total construction cost for Phase I is estimated to be 27.47 billion Rupiah as summarized in Table 14. In this table breakdowns are also given. This cost estimate includes all the necessary works to provide the DGAC facilities listed in Table 12 including temporary road, 3.8 km access road, land acquisition of 152 ha. for the airport and externally located navaid facilities. Compensations for about 6,700 coconut trees and removal of 5 and 60 houses for the land acquisition and the noise alleviation respectively and engineering fees estimated as 15 percent of the construction works, with 10 percent contingency are also included. The first phase construction cost will be decreased to about 26.23 billion Rupiahs if the 22kv power transmission line (approx. 14km) and airport access road (3.8km) are constructed by PLN and DGBM respectively.

Table 13 CONSTRUCTION SCHEDULE

1st Phase Const.
2nd Phase Const.

Work Items \ Calendar Year	1981	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	2000
										Design Year for the 1st Phase										
Feasibility Study and Engineering Services	F/S	Topo. Soil	D/D	T/E	C/S			Opening time												
Land Acquisition and Compensation																				
CONSTRUCTION																				
1 Temporary Works																				
2 Access Road																				
3 Site Preparation																				
4 Pavement																				
5 Car Parking Area and Internal Road																				
6 Passenger Terminal Building																				
7 Cargo Terminal Building																				
8 Administration and Other Building																				
9 Lighting																				
10 Radio Navaids, Telecommunications and Meteorological Facilities																				
11 Utilities																				
Management and Test Operations							AO	TO												
Informed completion time of related projects by others						Padang bypass road ▽														
	Power transmission line by PLN ▽																			
	Straightening of B. Anai ▽																			

F/S Feasibility Study
Topo. Topographical survey
Soil Soil investigation
D/D Detail design and Tender document
T/E Tender evaluation
C/S Construction supervision
AO Establishment of airport organization
TO Test op-rations, various flight checks, etc.

Table 14 ESTIMATED CONSTRUCTION COST

Unit: Million Rupiah

Item				Phase I Foreign Portion	Phase I Local Portion	Phase I Total	Phase II Foreign Portion	Phase II Local Portion	Phase II Total	Total Foreign Portion	Total Local Portion	Total Total
Civil Works	Temporary Roads			45	24	69	-	-	-	45	24	69
	Access Road			428	244	672	460	296	756	888	540	1,428
	Earthwork			780	580	1,360	415	225	640	1,195	805	2,000
	Drainage Work			49	78	127	19	49	68	68	127	195
	Pavement Work			2,883	1,989	4,872	1,120	612	1,732	4,003	2,601	6,604
	Carparking Area			239	375	614	90	53	143	329	428	757
	Miscelaneous Work			324	31	355	-	-	-	324	31	355
	SUB TOTAL			4,748	3,321	8,069	2,104	1,235	3,339	6,852	4,556	11,408
Building and Equipment Work	Passenger Terminal Bldg.			2,929	2,449	5,378	3,211	2,251	5,462	6,140	4,700	10,840
	Cargo Terminal Bldg.			207	253	460	222	271	493	429	524	953
	Administration and Other Bldg.			426	283	709	92	137	229	518	420	938
	SUB TOTAL			3,562	2,985	6,547	3,525	2,659	6,184	7,087	5,644	12,731
Air Navigation System Work	Lighting			978	379	1,357	643	322	965	1,621	701	2,322
	Radio Navaids, Telecommunications, etc.			2,340	241	2,581	1,050	110	1,160	3,390	351	3,741
	SUB TOTAL			3,318	620	3,938	1,693	432	2,125	5,011	1,052	6,063
Utilities Works	Power Supply System	Transmission Line		135	117	252	-	-	-	135	117	252
		Power Supply in Airport		1,065	305	1,370	465	83	548	1,530	388	1,918
	Water Supply System			286	140	426	181	89	270	467	229	696
	Sewerage			457	225	682	171	84	255	628	309	937
	Incinerator			135	7	142	-	-	-	135	7	142
	SUB TOTAL			2,078	794	2,872	817	256	1,073	2,895	1,050	3,945
TOTAL OF WORKS				13,706	7,720	21,426	8,139	4,582	12,721	21,845	12,302	34,147
Engineering				2,056	1,158	3,214	1,221	687	1,908	3,277	1,845	5,122
Land Acquisition and Compensation	Airport	Land Acquisition		-	203	203	-	-	-	-	203	203
		Compensation	Coconut Trees	-	44	44	-	-	-	-	44	44
			Houses by Land Acquisition	-	2	2	-	-	-	-	2	2
			Houses exposed to noise	-	18	18	-	-	-	-	18	18
	Access Road	Land Acquisition		-	62	62	-	-	-	-	62	62
		Compensation		-	1	1	-	-	-	-	1	1
	SUB TOTAL			-	330	330	-	-	-	-	330	330
Contingency				1,576	921	2,497	936	527	1,463	2,512	1,448	3,960
GRAND TOTAL				17,338	10,129	27,467	10,296	5,796	16,092	27,634	15,925	43,559

Exchange rate: US$1 = Rp. 625 = Jap.Yen 220

18. Financial and Economic Analyses (Ref. to Chapter 18, Vol.II)

The basic concept and methodology for the financial and economic analyses has already been fully explained. Two alternative schemes were compared from both the financial and economic point of view. These analyses are updated here on the basis of cost estimates for the master plan.

Financial Analysis: Based on the revenues and expenditure projections, it is estimated that the level of airport charges should be raised to a level 2.1 times the present charge level in terms of constant prices, in order to cover the necessary capital and recurrent expenditure requirements solely from the current revenues. This is a rather sharp increase and such increase needs to be determined on the basis of policy consideration from the national economic viewpoint.

Economic Analysis: Economic costs were evaluated on the basis of financial cost estimates. Economic benefits were evaluated in the comparison of the two alternative schemes. Both costs and benefits are projected up to the year 2010, which is about 25 years from the end of the first phase construction. It is also assumed that the present development scheme will provide the airport with a capacity to meet the demand up to the year 2005. Based on these projections, it is estimated that the EIRR is 45.4 percent. (Base case).

Sensitivity Analysis: A sensitivity analysis was made to provide a basis for probabilistic judgement on the economic profitability of the project. The EIRR calculated for various projections with assumptions on changes in benefits or costs. They are summarized in Table 15.

The sensitivity analysis indicates that the project yields a high return on investment even under a substantial reduction of traffic or increase in cost. Among the various cost and benefit components, the project profitability is most sensitive to changes in passenger traffic.

*EIRR: Internal Rate of Return

Table 15 SENSITIVITY ANALYSIS
(EIRR in percent)

	Percent Change in Cost/Benefit Items	
	-10%	+10%
Benefits		
Passenger traffic	41.0	49.6
Cargo traffic	45.1	45.7
Costs		
Construction cost	47.8	43.3
O&M cost	45.5	45.3

Memo item: EIRR of Base Case = 45.4 percent

Economic Analysis of Phase I Development: Because the development of this project, hence its financing, is implemented in two separate stages, namely Phase I and Phase II, it will be useful to study the economic profitability of the Phase I development only (i.e., there will be no Phase II development to be implemented) to see whether Phase I alone can stand by itself as an economically profitable scheme. It is assumed that the Phase I development can meet the demand up to the year 2000. EIRR based on this assumption is estimated to be 45.5 percent, which is almost the same as the base case.

Summary: Financial and economic analyses lead to a conclusion that the project is economically profitable from the national economic point of view. A high economic return underscores the urgency of the project with regard to national and regional development. The project is sensitive to changes in the external factors, such as traffic volume, or cost levels. It has also been proven that the Phase I development alone can stand by itself as an economically viable project.

CONCLUSIONS

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SELECTION OF THE NEW AIRPORT

After discussing the comprehensive study presented in Part III, it is recommended that a new airport be constructed at KETAPING, facing the Indonesian sea and located some 25 km north of Padang city. Completion should be accomplished by the end of 1987 and the new airport will serve as a replacement for the existing Tabing airport. This conclusion was reached for the following major reasons:

- The new airport construction is estimated to be much cheaper than the redevelopment of the existing airport because of the low cost of land acquisition and compensation and this will imply less affect from delays and acquisition problems on the progress of the construction and the airport operation in the future;

- The excavation of the Hill is a prerequisite for the redevelopment of the existing airport. It is not, however, considered practically feasible from the environmental view point;

- There is no significant limitation to expansion of the new airport to cope with unexpected changes in demand while the further expansion of the existing airport is not considered economically justifiable;

- If the existing airport is redeveloped because of the advantage in allowing possible step by step redevelopment in line with the demand, the airport would sooner or later suffer from social problems arising from noise pollution etc.,

- The new airport construction will give a beneficial opportunity to the local government to utilize for other purposes the existing airport area of some 280 ha. The new airport construction provides an opportunity to develop an almost virgin area in the future; and

- The new airport construction is judged to be economically feasible from the national economic view point.

THE NEW AIRPORT MASTER PLANNING

1) The new airport construction project at Ketaping, Padang is indispensable to the regional economic development and unity of the country and its urgency and importance are strongly backed by the high internal rate of return (EIRR) of 45.4 percent.

2) The preparations including request for financial assistance, topographic survey, soil investigation, etc. should be initiated at the earliest possible date so that the engineering services including basic design, detailed design, preparation of tender documents, assistance in evaluation of the contractors, etc. can be followed in order to be completed by early 1984 at the latest.

3) The first phase construction work should be started in 1984 so that the airport can become operational in early 1988.

4) The first phase facilities for the new airport are to be so designed to cope with the demand in 1995 and to be utilized without any expansion work until 1996 when the second phase of construction planned based on the year 2005 demand will be completed.

5) The existing Tabing airport should be improved with an overlay of the runway, taxiway and apron, expansion of the passenger terminal building, and completion of the runway extension to 2,150 meters to accomodate A300 in 1983 and is to be used until early 1988 when the new airport operation will be inaugurated.