Appendix to Chapter 5

Appendix 5.2.1 Calculation of Required Runway Length

1. Airports served by F28 - MK3000/4000 at Present

(1) Weight Condition

Study Airport	Longest Sector (to)	Distance (NM)	Fuel (kg)	DOW (kg)	Max. Payload (kg)	TOW (kg)
1. Pekanbaru	- Jakarta	545	6,555	18,200	7,880	32,635 *
2. Semarang	- Jakarta	255	4,825	"	"	30,905
3. Pontianak	- Balikpapan	467	5,880	"	"	31,960
4. Palangkaraya	- Jakarta	515	6,235	"	"	32,315 *
5. Palu	- U. Pandang	312	5,720	"	"	31,800
6. Ambon	- U. Pandang	552	6,760	"	"	32,840 *
7. Mataram	- Surabaya	230	4,480	"	"	30,560
8. Merauke	- Jayapura	376	5,775	"	"	31,835

Note : 1) Distance and fuel data based on Garuda information.
2) Payload at Pekanbaru, Palangkaraya and Ambon airports to be reduced due to limitation of MTOW.
(MTOW = 32,205 kg > TOW)

(2) Basic Condition for Calculation

1) Data used : Garuda operations manual
2) Flap 18^{O} , zero wind, zero slope and wet condition

Study Airport	Temperature (^{O}C)	Altitude (ft)	Required Length (m)
1. Pekanbaru	32	100	1,900
2. Semarang	35	10	1,750
3. Pontianak	31	10	1,850
4. Palangkaraya	32	80	1,850
5. Palu	33	285	1,850
6. Ambon	28	33	1,800
7. Mataram	27	50	1,650 *
8. Merauke	26	10	1,700

Note : 1) Payload at Surabaya to Mataram to be reduced due to limitation of MLW caused by no refulling facility.

2. Airports assumed to be served by F28 - MK3000/4000 in 2004

(1) Weight Condition

Study Airport	Longest Sector (to)	Distance (NM)	Fuel (kg)	DOW (kg)	Max. Payload (kg)	TOW (kg)
1. Tg. Pinang	- Jakarta	452	5,895	18,200	7,880	31,975
2. Tarakan	- Balikpapan	298	5,320	"	"	31,400
3. Gorontalo	- Palu	199	4,470	"	"	30,550

(2) Basic Condition for Calculation

1) Data used : Garuda operations manual
2) Flap 18^{O} , zero wind, zero slope and wet condition

Study Airport	Temperature (^{O}C)	Altitude (ft)	Required Length (m)
1. Tg. Pinang	33	55	1,850
2. Tarakan	32	20	1,750
3. Gorontalo	34	60	1,700

3. Airports served by F27 - MK500 at Present

(1) Basic Condition for Calculation

1) Data Used : FAA AC 150/5325 - 4A

Study Airport	Longest Sector (to)	Distance (SM)	Temp. (^{O}C)	Altitude (m)	Required Length (m)	
1. Tg. Pinang	- Jakarta	515	33	17	TKOF	1,750
					LDG	1,350
2. Tarakan	- Balikpapan	322	32	6	TKOF	1,650
					LDG	1,350
3. Gorontalo	- Palu	230	34	18	TKOF	1,650
					LDG	1,350
4. Ternate	- Ambon	314	30	15	TKOF	1,650
					LDG	1,350
5. Bima	- Denpasar	242	34	1	TKOF	1,650
					LDG	1,350
6. Wamena	- Jayapura	151	22	1,550	TKOF	1,850
					LDG	1,550

Note : 1) Required RWY length for landing based on MLW.
2) TKOF RWY length at Bima airport can be reduced to 1,400 m (same as present runway), if refulling facility are provided at Mataram, (Distance to Mataram : 181 SM).

4. Airports assumed to be served by F-27 - MK500 in 1995

1) Data Used : FAA AC 150/5325 - 4A

Study Airport	Longest Sector (to)	Distance (SM)	Temp. (°C)	Altitude (m)	Required Length (m)
1. Sampit	- Banjarmasin	360	31	45	TKOF 1,650 LDG 1,350

Note : Required RWY length for Landing based on MLW.

5. Airports served by DC9 - 32 at Present

1) Data Used : FAA AC 150/5325 - 4A
2) Weight condition

Study Airport	Longest Sector (to)	Distance (NM)	Trip Fuel (lbs)	DOW+Res.Fuel (lbs)	Max.Payload (lbs)	TOW (lbs)
1. Palembang	- Padang	312	6,140	69,640	25,280	101,060
2. Jayapura	- Biak	304	5,990	69,640	25,280	101,910

Note : 1) DOW + Reserved Fuel based on FAA.
2) Max. payload based on Garuda Information.

3) Basic Condition for Calculation

Study Airport	Temp. (°C)	Altitude (m)	Required Length (m)
1. Palembang	33	11	TKOF 1,850 LDG 1,650
2. Jayapura	27	89	TKOF 1,850 LDG 1,650

Note : 1) Required RWY length for landing based on MLW and Wet condition

6. Airports assumed to be served by DC9 in 1995 or 2004

1) Data Used : FAA AC 150/5325 - 4A
2) Weight condition

Study Airport	Longest Sector (to)	Distance (NM)	Trip Fuel (lbs)	DOW+Res.Fuel (lbs)	Max.Payload (lbs)	TOW (lbs)
1. Pekanbaru	- Jakarta	545	10,710	69,640	25,280	105,630
2. Semarang	- Jakarta	255	5,015	"	"	99,935
3. Pontianak	- Balikpapan	467	9,180	"	"	104,100
4. Ambon	- U. Pandang	552	10,850	"	"	105,770

3) Basic Condition for Calculation

Study Airport	Temp. (^{o}C)	Altitude (ft)	Required Length (m)	
1. Pekanbaru	32	100	TKOF	2,150
			LDG	1,650
2. Semarang	35	10	TKOF	2,150
			LDG	1,650
3. Pontianak	31	10	TKOF	2,200
			LDG	1,650
4. Ambon	28	33	TKOF	2,250
			LDG	1,650

Note : Required RWY length for landing based on Max. Landing Weight.

7. Airports served by DHC6 / CS212 at Present

(1) Data used : Aircraft Characteristic of DHC6
(2) Basic Condition for Calculation

Study Airport	Longest Sector	Temp. (°C)	Altitude (m)	Required Length (m)	
1. Gn. Sitoli	- Medan	26	6	TOD	600
				ASD	800
2. Sampit	- Banjarmasin	31	45	TOD	600
				ASD	800
3. Tana Toraja	- U. Pandang	26	825	TOD	700
				ASD	900
4. Kaimana	- Timika	30	1	TOD	600
				ASD	800

Note : 1) Required RWY length based on MTOW.

8. Airports assumed to be served by A300 B4-200 in 2004

(1) Weight condition

Study Airport	Longest Sector (to)	Distance (NM)	Fuel (kg)	DOW (kg)	Max.Payload (1bs)	TOW (kg)
1. Palembang	- Jakarta	312	16,600	91,900	33,000	140,600
2. Semarang	- Jakarta	255	15,300	"	"	139,300

Note : 1) Alternate airport is Medan for Palembang - Padang route and Palembang for Semarang - Jakarta route.

2) Max. Take-off Weight = 165,000 kg.

(2) Basic Condition for Calculation

Study Airport	Temp. (°C)	Altitude (ft)	Required Length (m)	
1. Palembang	33	35	TKOF	2,250
			LDG	2,500
2. Semarang	35	10	TKOF	2,200
			LDG	2,500

Note : 1) Lengths for take-off based on slat 16°, Flap 8°, zero wind, zero slope and wet condition.

2) Lengths for Landing based on Max. Landing Weight (134,000 kg), Slat 16°, Flap 15° and Wet condition.

Appendix 5.4.1 (1) Area to be cut with Mower and Growth Speed of Grass

No.	Airport	Grass Cutting area (m2)		Growth speed of Grass (cm/month)
		Present (1990)	1995	
1	Tanjung Pinang	250,000	290,000	20
2	Pekanbaru	400,000	500,000	20
3	Gunung Sitoli	80,000	80,000	20
4	Palembang	313,000	418,000	20
5	Semarang	270,000	282,000	40
6	Pontianak	270,000	290,000	20
7	Sampit	58,000	58,000	15
8	Palangkaraya	300,000	300,000	40
9	Tarakan	160,000	240,000	20
10	Tana Toraja	40,000	60,000	20
11	Palu	270,000	270,000	5
12	Gorontalo	250,000	250,000	20
13	Ambon	230,000	230,000	50
14	Ternate	170,000	220,000	50
15	Mataram	267,000	273,000	10
16	Bima	220,000	250,000	4
17	Jayapura	270,000	360,000	50
18	Wamena	65,000	169,000	20
19	Kaimana	98,000	98,000	80
20	Merauke	300,000	300,000	20

Appendix 5.4.1 (2) Area to be cut with Handy Mower and Growth Speed of Mower

No.	Airport	Grass Cutting area (m2)		Growth speed of Grass (cm/month)
		Present (1990)	1995	
1	Tanjung Pinang	8,580	9,960	20
2	Pekanbaru	13,380	13,420	20
3	Gunung Sitoli	4,790	4,790	20
4	Palembang	10,360	10,400	20
5	Semarang	9,540	9,940	40
6	Pontianak	8,780	9,580	20
7	Sampit	4,550	4,550	15
8	Palangkaraya	10,000	10,000	40
9	Tarakan	7,780	7,900	20
10	Tana Toraja	4,360	4,400	20
11	Palu	9,430	9,430	5
12	Gorontalo	10,250	10,250	20
13	Ambon	9,200	9,200	50
14	Ternate	6,930	7,890	50
15	Mataram	8,000	8,200	10
16	Bima	6,780	7,780	4
17	Jayapura	9,560	9,960	50
18	Wamena	6,900	8,200	20
19	Kaimana	6,910	6,910	80
20	Merauke	9,020	9,020	20

Appendix to Chapter 6

Appendix 6.2.1 Evaluation of Existing Civil Facilities

A.1 Runway
A.1.1 Length

Airport	Present Length (m)	Required Length (Longest Sector) (m)	Evaluation	Remarks
1. Tanjung Pinang	1,406	1,750 (-Jakarta)	A	Largest Aircraft:F27
2. Pekan-baru	2,150	1,900* (-Jakarta)	C	Largest Aircraft:F28 *Restricted by MTOW
3. Gunung Sitoli	900	800 (-Medan)	C	Largest Aircraft:DHC6
4. Palem-bang	2,200	1,850 (-Padang)	C	Largest Aircraft:DC9
5. Semar-ang	1,650	1,750 (-Jakarta)	A	Largest Aircraft:F28
6. Ponti-anak	1,650	1,850 (-Balikpapan)	A	Largest Aircraft:F28
7. Sampit	855	800 (-Banjarmasin)	C	Largest Aircraft :CS212
8. Palang-karaya	1,850	1,850* (-Jakarta)	C	Largest Aircraft:F28 *Restricted by MTOW
9. Tarakan	1,650	1,650 (-Balikpapan)	C	Largest Aircraft:F27
10. Tana Toraja	900	900 (-UjungPandang)	C	Largest Aircraft :CS212
11. Palu	1,850	1,850 (-UjungPandang)	C	Largest Aircraft:F28
12. Goron-talo	1,650	1,650 (-Palu)	C	Largest Aircraft:F27
13. Ambon	1,850	1,800* (-UjungPandang)	C	Largest Aircraft:F28 *Restricted by MTOW
14. Tern-ate	1,420	1,650 (-Ambon)	A	Largest Aircraft:F27
15. Mata-ram	1,600	1,650 (-Surabaya)	A	Largest Aircraft:F28
16. Bima	1,400	1,650 (-Denpasar)	A	Largest Aircraft:F27
17. Jayap-ura	1,850	1,850 (-Biak)	C	Largest Aircraft: DC9/L100
18. Wamena	1,500	1,850 (-Jayapura)	A	Largest Aircraft: F27/L100
19. Kai-mana	1,500	800 (-Timika)	C	Largest Aircraft:DHC6
20. Mera-uke	1,850	1,700 (-Jayapura)	C	Largest Aircraft:F28

A.1 Runway
A.1.2 Width

Airport	Present Width (m)	Required Min. (m)	Evaluation	Remarks
1. Tanjung Pinang	30	30	C	ICAO Code letter =3C
2. Pekan-baru	30	30	C	=3C
3. Gunung Sitoli	30	18	C	=1B
4. Palem-bang	45	45	C	=4C
5. Semar-ang	30	30	C	=3C
6. Ponti-anak	30	30	C	=3C
7. Sampit	23	18	C	=1B
8. Palang-karaya	30	30	C	=3C
9. Tarakan	30	30	C	=3C
10. Tana Toraja	23	18	C	=1B
11. Palu	30	30	C	=3C
12. Goron-talo	30	30	C	=3C
13. Ambon	45	45	C	=4D
14. Tern-ate	30	30	C	=3C
15. Mata-ram	30	30	C	=3C
16. Bima	30	30	C	=3C
17. Jayap-ura	45	45	C	=4D
18. Wamena	30	45	A	=4D (by L100)
19. Kai-mana	30	18	C	=1B
20. Mera-uke	30	30	C	=3C

A.1 Runway
A.1.3 Maximum Longitudinal Slope

Airport	Present Maximum Slope (%)	Allowable Maximum Slope (%)	Evaluation	Remarks
1. Tanjung Pinang	0.80	1.50	C	ICAO Code =3
2. Pekan-baru	1.38	1.50	C	=3
3. Gunung Sitoli	N.A.	2.00	-	=1
4. Palem-bang	0.81	1.25	C	=4
5. Semar-ang	N.A.	1.50	-	=3
6. Ponti-anak	N.A.	1.50	-	=3
7. Sampit	N.A.	2.00	-	=1
8. Palang-karaya	N.A.	1.50	-	=3
9. Tarakan	N.A.	1.50	-	=3
10. Tana Toraja	2.27	2.00	A	=1
11. Palu	1.20	1.50	C	=3
12. Goron-talo	N.A.	1.50	-	=3
13. Ambon	N.A.	1.25	-	=4
14. Tern-ate	N.A.	1.50	-	=3
15. Mata-ram	N.A.	1.50	-	=3
16. Bima	N.A.	1.50	-	=3
17. Jayap-ura	N.A.	1.25	-	=4
18. Wamena	0.35	1.25	C	=4
19. Kai-mana	N.A.	2.00	-	=1
20. Mera-uke	N.A.	1.50	-	=3

N.A : Data Not Available

A.1 Runway
A.1.4 Transverse Slope

Airport	Present Slope (%)	Allowable Slope (%)	Evaluation	Remarks
1. Tanjung Pinang	N.A.	1.50	-	ICAO Letter =C
2. Pekan-baru	N.A.	1.50	-	=C
3. Gunung Sitoli	1.00	2.00	C	=B
4. Palem-bang	1.00	1.50	C	=C
5. Semar-ang	1.00	1.50	C	=C
6. Ponti-anak	1.00	1.50	C	=C
7. Sampit	N.A.	2.00	-	=B
8. Palang-karaya	N.A.	1.50	-	=C
9. Tarakan	1.00	1.50	C	=C
10. Tana Toraja	1.00	2.00	C	=B
11. Palu	1.25	1.50	C	=C
12. Goron-talo	N.A.	1.50	-	=C
13. Ambon	N.A.	1.50	-	=D
14. Tern-ate	1.50	1.50	C	=C
15. Mata-ram	1.00	1.50	C	=C
16. Bima	1.50	1.50	C	=C
17. Jayap-ura	N.A.	1.50	-	=D
18. Wamena	1.00	1.50	C	=D
19. Kai-mana	1.00	2.00	C	=B
20. Mera-uke	1.00	1.50	C	=C

N.A.: Data Not Available

A.1. Runway
A.1.5 Pavement Strength

Airport	ACN			PCN		Evaluation	Remarks
	Aircraft	Design CBR	ACN	Thickness	PCN		
1. Tanjung Pinang	F27	(%) 6.0	12	(Cm) 41.5	13	C	Official PCN = 13FCZU
2. Pekanbaru	F28	6.8	17	73.0	46	C	Official PCN = 29FCXU
3. Gunung Sitoli	DHC6	6.0	3	34.0	9	C	
4. Palembang	DC9	4.1	29	82.5	34	C	Official PCN = 35FCXU
5. Semarang	F28	4.5	17	61.0	20	C	Official PCN = 21
6. Pontianak	F28	2.0	20	104.5	26	C	Official PCN = 26FDYU
7. Sampit	C212	6.0	3	30.0	7	C	Official PCN = 10
8. Palangkaraya	F28	6.8	17	56.5	27	C	
9. Tarakan	F27 /HS748	6.0	12	52.5	21	C	Official PCN = 15FCZU
10. Tana Toraja	C212	6.0	3	45.0	15	C	
11. Palu	F28	11.0	20	52.5	41	C	Official PCN = 21FCYU
12. Gorontalo	F27 /HS748	6.0	12	59.5	27	C	Official PCN = 12
13. Ambon	F28	4.0	17	69.5	23	C	Official PCN = 31FCZU
14. Ternate	F27 /HS748	2.0	13	51.5	7	B	Official PCN = 12FCZU
15. Mataram	F28	6.0	17	64.0	31	C	
16. Bima	F27 /HS748	6.0	12	65.0	32	C	
17. Jayapura	DC9	10.0	29	49.5	32.5	C	Official PCN = 45
18. Wamena	F27	6.0	12	60.0	27	C	Official PCN = 12FCZU
19. Kaimana	DHC6	6.0	3	39.0	11	C	Official PCN = 10FCZU
20. Merauke	F28	11.0	15	41.0	24	C	Official PCN = 18FBXU

A.1. Runway
A.1.6. Pavement Deterioration

Airport	Crack		Rutting		Other Deterioration		Total Evaluation	Remarks
	Crack Ratio	EV.	Max. Rut	EV.	Description	EV.		
1. Tanjung Pinang	(%) 0	C	(m/m) 4	C	-	C	C	
2. Pekan-baru	0	C	6	C	-Weathering/Raveling	B	B	
3. Gunung Sitoli	Severe Crack	A	22	B	-Steep tapering -Weathering/Raveling	A	A	
4. Palem-bang	5	B	35	B	-Serious unduration	A	A	
5. Semar-ang	0	C	0	C	-	C	C	-Overlaid in 1989
6. Ponti-anak	0	C	0	C	-	C	C	-Overlaid in 1989
7. Sampit	50	A	15	B	-Alligator Crack -Bleeding	A	A	
8. Palang-karaya	0	C	0	C	-	C	C	
9. Tarakan	2	B	20	B	-Bleeding/Pothole -Reflection crack	A	A	
10. Tana Toraja	0	C	0	C	-Weathering/Raveling -Grass Growing	B	B	
11. Palu	0	C	0	C	-	C	C	-Overlaid in 1989
12. Goron-talo	0	C	0	C	-	C	C	-Overlaid in 1989
13. Ambon	1	B	20	B	-Weathering/Bleeding	A	A	
14. Tern-ate	0	C	15	B	-Weathering/Raveling -Bleeding	B	B	
15. Mata-ram	0	C	0	C	-	C	C	-Overlaid in 1989
16. Bima	0	C	0	C	-	C	C	-Overlaid in 1989
17. Jayap-ura	4	B	6	C	-Partial Weathering	C	B	
18. Wamena	0	C	5	C	-Laveling	B	B	
19. Kai-mana	60	A	25	B	-Weathering/Bleeding -Grass Growing	A	A	
20. Mera-uke	0	C	30	B	-Weathering/Raveling	A	A	

A.2 Runway Strip

A.2.1 Width (Minimum Distance From Runway Centerline)

Airport	Present Width (m)	Required Width (m)	Evaluation	Remarks
1. Tanjung Pinang	75	150	A	ICAO Code =3
2. Pekan-baru	75	150	A	=3
3. Gunung Sitoli	40	75	A	=1
4. Palem-bang	75	150	A	=4
5. Semar-ang	75	150	A	=3
6. Ponti-anak	75	150	A	=3
7. Sampit	30	75	A	=1
8. Palang-karaya	60	150	A	=3
9. Tarakan	45	150	A	=3
10. Tana Toraja	32	75	A	=1
11. Palu	75	150	A	=3
12. Goron-talo	75	150	A	=3
13. Ambon	75	150	A	=4
14. Tern-ate	45	150	A	=3
15. Mata-ram	75	150	A	=3
16. Bima	75	150	A	=3
17. Jayap-ura	75	150	A	=4
18. Wamena	30	150	A	=4
19. Kai-mana	40	75	A	=1
20. Mera-uke	75	150	A	=3

Note : If no definite figures are available, the widths of present graded areas were applied for the runway strip width

A. 2 Runway Strip

A. 2. 2 Width of Graded Area (Distance From Runway Centerline)

Airport	Present Width (m)	Required Width (m)	Evaluation	Remarks
1. Tanjung Pinang	75	75	C	ICAO code =3 Non Precision
2. Pekan-baru	75	105	A	ICAO code =3 Precision
3. Gunung Sitoli	40	40	C	ICAO code =1 Non Precision
4. Palem-bang	75	105	A	ICAO code =4 Precision
5. Semar-ang	75	75	C	ICAO code =3 Non Precision
6. Ponti-anak	75	75	C	ICAO code =3 Non Precision
7. Sampit	34 (North) 40 (South)	40	A	ICAO code =1 Non Precision
8. Palang-karaya	75 (North) 60 (South)	75	A	ICAO code =3 Non Precision
9. Tarakan	45	75	A	ICAO code =3 Non Precision
10. Tana Toraja	32	40	A	ICAO code =1 Non Precision
11. Palu	75	75	C	ICAO code =3 Non Precision
12. Goron-talo	75	75	C	ICAO code =3 Non Precision
13. Ambon	75	75	C	ICAO code =4 Non Precision
14. Tern-ate	75 (North) 45 (South)	75	A	ICAO code =3 Non Precision
15. Mata-ram	75	75	C	ICAO code =3 Non Precision
16. Bima	75	75	C	ICAO code =3 Non Precision
17. Jayap-ura	75	105	A	ICAO code =4 Precision
18. Wamena	35 (North) 30 (South)	75	A	ICAO code =4 Non Precision
19. Kai-mana	40 (East) 45 (West)	40	C	ICAO code =1 Non Precision
20. Mera-uke	75 (East) 45 (West)	75	A	ICAO code =3 Non Precision

A. 2 Runway Strip
A. 2. 3 Transverse Slope

Airport	Present Maximum Slope (%)	Allowable Maximum Slope (%)	Evaluation	Remarks
1. Tanjung Pinang	N. A.	2. 50	A*	ICAO Code = 3 *Upward slope
2. Pekan-baru	N. A.	2. 50	-	ICAO Code = 3
3. Gunung Sitoli	2. 00	3. 00	C	ICAO Code = 1
4. Palem-bang	N. A.	2. 50	-	ICAO Code = 4
5. Semar-ang	2. 00	2. 50	C	ICAO Code = 3
6. Ponti-anak	2. 00	2. 50	C	ICAO Code = 3
7. Sampit	N. A.	3. 00	-	ICAO Code = 1
8. Palang-karaya	N. A.	2. 50	-	ICAO Code = 3
9. Tarakan	2. 00	2. 50	C	ICAO Code = 3
10. Tana Toraja	2. 50	3. 00	C	ICAO Code = 1
11. Palu	2. 50	2. 50	C	ICAO Code = 3
12. Goron-talo	N. A.	2. 50	A*	ICAO Code = 3 *Upward slope
13. Ambon	N. A.	2. 50	-	ICAO Code = 4
14. Tern-ate	5. 00	2. 50	A	ICAO Code = 3
15. Mata-ram	N. A.	2. 50	-	ICAO Code = 3
16. Bima	2. 50	2. 50	C	ICAO Code = 3
17. Jayap-ura	N. A.	2. 50	-	ICAO Code = 4
18. Wamena	2. 00	2. 50	C	ICAO Code = 4
19. Kai-mana	2. 00	3. 00	C	ICAO Code = 1
20. Mera-uke	N. A.	2. 50	-	ICAO Code = 3

N. A. : Data Not Available

A.3 Taxiway
A.3.1 Width

Airport	Present Width (m)	Required Width (m)	Evaluation	Remarks
1. Tanjung Pinang	A-TWY : 18 B-TWY : 18	15	C	ICAO Letter = C
2. Pekan-baru	20	15	C	ICAO Letter = C
3. Gunung Sitoli	15	10.5	C	ICAO Letter = B
4. Palem-bang	A-TWY : 23 B-TWY : 23	18	C	ICAO Letter = C
5. Semar-ang	23	15	C	ICAO Letter = C
6. Ponti-anak	A-TWY : 18 B-TWY : 18	15	C	ICAO Letter = C
7. Sampit	20*	10.5	C	ICAO Letter = B *New Taxiway
8. Palang-karaya	20	15	C	ICAO Letter = C
9. Tarakan	20	15	C	ICAO Letter = C
10. Tana Toraja	15	10.5	C	ICAO Letter = B
11. Palu	23	15	C	ICAO Letter = C
12. Goron-talo	A-TWY : 18 B-TWY : 20	15	C	ICAO Letter = C
13. Ambon	23	23	C	ICAO Letter = D
14. Tern-ate	20	15	C	ICAO Letter = C
15. Mata-ram	18	15	C	ICAO Letter = C
16. Bima	20	15	C	ICAO Letter = C
17. Jayap-ura	A-TWY : 23 B-TWY : 23	23	C	ICAO Letter = D
18. Wamena	A-TWY : 20 B-TWY : 20	23	A	ICAO Letter = D
19. Kai-mana	A-TWY : 20 B-TWY : 20	10.5	C	ICAO Letter = B
20. Mera-uke	23	15	C	ICAO Letter = C

A.3 Taxiway
A.3.2 Maximum Longitudinal Slope

Airport	Present Maximum Slope (%)	Allowable Slope (%)	Evaluation	Remarks
1. Tanjung Pinang	N.A.	1.50	-	ICAO Letter = C
2. Pekan-baru	N.A.	1.50	-	ICAO Letter = C
3. Gunung Sitoli	N.A.	3.00	-	ICAO Letter = B
4. Palem-bang	N.A.	1.50	-	ICAO Letter = C
5. Semar-ang	N.A.	1.50	-	ICAO Letter = C
6. Ponti-anak	N.A.	1.50	-	ICAO Letter = C
7. Sampit	N.A.	3.00	-	ICAO Letter = B
8. Palang-karaya	N.A.	1.50	-	ICAO Letter = C
9. Tarakan	N.A.	1.50	-	ICAO Letter = C
10. Tana Toraja	N.A.	3.00	-	ICAO Letter = B
11. Palu	N.A.	1.50	-	ICAO Letter = C
12. Goron-talo	N.A.	1.50	-	ICAO Letter = C
13. Ambon	N.A.	1.50	-	ICAO Letter = D
14. Tern-ate	N.A.	1.50	-	ICAO Letter = C
15. Mata-ram	N.A.	1.50	-	ICAO Letter = C
16. Bima	N.A.	1.50	-	ICAO Letter = C
17. Jayap-ura	N.A.	1.50	-	ICAO Letter = D
18. Wamena	N.A.	1.50	-	ICAO Letter = D
19. Kai-mana	N.A.	3.00	-	ICAO Letter = B
20. Mera-uke	N.A.	1.50	-	ICAO Letter = C

N.A. : Data Not Available

A.3 Taxiway
A.3.3 Transverse Slope

Airport	Present Slope (%)	Allowable Slope (%)	Evaluation	Remarks
1. Tanjung Pinang	N.A.	1.50	-	ICAO Letter = C
2. Pekan-baru	N.A.	1.50	-	ICAO Letter = C
3. Gunung Sitoli	N.A.	2.00	-	ICAO Letter = B
4. Palem-bang	N.A.	1.50	-	ICAO Letter = C
5. Semar-ang	1.00	1.50	C	ICAO Letter = C
6. Ponti-anak	1.00	1.50	C	ICAO Letter = C
7. Sampit	1.00*	2.00	C	ICAO Letter = B *New Taxiway
8. Palang-karaya	N.A.	1.50	-	ICAO Letter = C
9. Tarakan	N.A.	1.50	-	ICAO Letter = C
10. Tana Toraja	N.A.	2.00	-	ICAO Letter = B
11. Palu	0.80	1.50	C	ICAO Letter = C
12. Goron-talo	N.A.	1.50	-	ICAO Letter = C
13. Ambon	N.A.	1.50	-	ICAO Letter = D
14. Tern-ate	1.00	1.50	C	ICAO Letter = C
15. Mata-ram	N.A.	1.50	-	ICAO Letter = C
16. Bima	N.A.	1.50	-	ICAO Letter = C
17. Jayap-ura	N.A.	1.50	-	ICAO Letter = D
18. Wamena	N.A.	1.50	-	ICAO Letter = D
19. Kai-mana	N.A.	2.00	-	ICAO Letter = B
20. Mera-uke	1.00	1.50	C	ICAO Letter = C

A.3. Taxiway
A.3.4 Pavement Strength

Airport	ACN			PCN		Evaluation	Remarks
	Aircraft	Design CBR	ACN	Thickness	PCN		
		(%)		(Cm)			
1. Tanjung Pinang	F27	6.0	12	54.0	22	C	
2. Pekanbaru	F28	6.8	17	70.0	42	C	
3. Gunung Sitoli	DHC6	6.0	3	34.0	9	C	
4. Palembang	DC9	6.0	29	90.0	61	C	
5. Semarang	F28	3.8	20	80.5	30	C	
6. Pontianak	F28	2.0	20	104.5	26	C	
7. Sampit	C212	6.0	3	30.0	7	C	
8. Palangkaraya	F28	6.8	20	49.5	21	C	
9. Tarakan	F27 /HS748	6.0	13	50.5	19	C	
10. Tana Toraja	C212	6.0	3	45.0	15	C	
11. Palu	F28	11.0	20	122.0	22	C	
12. Gorontalo	F27 /HS748	6.0	12	59.5	27	C	
13. Ambon	F28	3.0	20	82.5	24	C	
14. Ternate	F27 /HS748	2.0	12	53.0	25	C	
15. Mataram	F28	6.0	17	59.0	26	C	
16. Bima	F27 /HS748	6.0	12	53.0	21	C	
17. Jayapura	DC9	10.0	29	51.5	35	C	
18. Wamena	F27	6.0	12	55.0	23	C	
19. Kaimana	DHC6	6.0	3	39.0	11	C	
20. Merauke	F28	11.0	15	39.0	21	C	

A. 3. Taxiway

A. 3. 5. Pavement Deterioration

Airport	Crack		Rutting		Other Deterioration		Total Evaluation	Remarks
	Crack Ratio	EV.	Max. Rut	EV.	Description	EV.		
1. Tanjung Pinang	(%) 0	C	(m/m) 4	C	-	C	C	
2. Pekan-baru	0	C	6	C	-Weathering/Raveling	B	B	
3. Gunung Sitoli	Severe Crack	A	26	B	-Weathering/Raveling	A	A	
4. Palem-bang	7	B	13	C	-Crack in drainage crossing	B	B	
5. Semar-ang	0	C	0	C	-	C	C	Overlaid in 1989
6. Ponti-anak	Severe Crack	A	20	B	-Partial depression -Weathering	B	A	A-twy evaluated
7. Sampit	0	C	0	C	-	C	C	Overlaid in 1989
8. Palang-karaya	0	C	0	C	-	C	C	
9. Tarakan	0	C	10	C	-Depression	B	B	
10. Tana Toraja	0	C	0	C	-Weathering/Raveling -Grass growing	B	B	
11. Palu	0	C	0	C	-	C	C	Overlaid in 1989
12. Goron-talo	0	C	0	C	-	C	C	Overlaid in 1989
13. Ambon	10	B	10	B	-Weathering/Bleeding	A	A	
14. Tern-ate	0	C	11	B	-Raveling	C	B	
15. Mata-ram	0	C	0	C	-	C	C	
16. Bima	25	A	7	C	-Weathering/Raveling -Damaged by tide	A	A	
17. Jayap-ura	0	C	8	C	-Partial depression	B	B	
18. Wamena	24	A	13	B	-Weathering/Raveling	B	A	
19. Kai-mana	60	A	32	B	-Weathering/Bleeding -Grass growing	A	A	
20. Mera-uke	0	C	22	B	-Pothole -Weathering/Raveling	A	A	

A.4 Apron

A.4.1 Number of Aircraft Stands

Airport	Present Number of Stands	Required Number of Stands for Present Scheduled Flight	Evaluation	Remarks
1. Tanjung Pinang	4:F27	2:F27, 1:CS212	C	
2. Pekanbaru	4:F28, 2:F27 4:CN235	1:F28, 2:F27	C	
3. Gunung Sitoli	2:DHC6	1:DHC6	C	
4. Palembang	7:DC9, 7:CS212	2:DC9, 2:F28 3:F27	C	
5. Semarang	4:F28, 1:F27 3:CN235	3:F28, 1:F27 3:CN212	C	
6. Pontianak	9:F28	1:F28, 4:F27	C	
7. Sampit	4:CS212	2:CS212, 1:BN2A	C	
8. Palangkaraya	3:F28, 1:BN2A	1:F28, 1:F27 2:BN2A	A	
9. Tarakan	4:F27	2:F27, 2:DHC6	A	
10. Tana Toraja	2:CS212	1:CS212	C	
11. Palu	1:F28, 1:F27 2:CS212	1:F28, 1:F27 1:CS212	A	
12. Gorontalo	3:F27, 1:CS212	2:F27	C	
13. Ambon	5:F28	2:F28, 2:DHC6	C	
14. Ternate	2:F27, 2:CS212	2:F27	C	
15. Mataram	1:F28, 2:F27 2:CS212	1:F28, 2:F27 1:CS212	A	
16. Bima	3:F27, 1:CS212	2:F27, 3:CS212	A	
17. Jayapura	7:DC9	1:DC9, 1:F28 2:F27, 1:L100 2:DHC6	A	
18. Wamena	3:F27	2:F27, 1:DHC6	A	
19. Kaimana	3:DHC6	1:DHC6	C	
20. Merauke	2:F28	1:F28, 2:DHC6	A	

A.4 Apron

A.4.2 Location (Relationship between Aircraft on Apron and Transitional Surface)

Airport	Infringement to the present transitional surface (m)	Infringement to the required transitional surface (m)	Evaluation	Remarks
1. Tanjung Pinang	75 -Obstacle	150 -Obstacle	A	
2. Pekan-baru	75 -Obstacle	150 -Obstacle	A	
3. Gunung Sitoli	40 -Not obstacle	75 -Not obstacle	C	
4. Palem-bang	75 -Obstacle	150 -Obstacle	A	
5. Semar-ang	75 -Not obstacle	150 -Not obstacle	C	
6. Ponti-anak	75 -Obstacle	150 -Obstacle	A	
7. Sampit	30 -Not obstacle	75 -Obstacle	B	
8. Palang-karaya	75 -Not obstacle	150 -Obstacle	B	
9. Tarakan	45 -Not obstacle	150 -Obstacle	B	
10. Tana Toraja	31.5 -Not obstacle	75 -Obstacle	B	
11. Palu	75 -Not obstacle	150 -Obstacle	B	
12. Goron-talo	75 -Not obstacle	150 -Obstacle	B	
13. Ambon	75 -Not obstacle	150 -Obstacle	B	
14. Tern-ate	75 -Obstacle	150 -Obstacle	A	
15. Mata-ram	75 -Not obstacle	150 -Obstacle	B	
16. Bima	75 -Obstacle	150 -Obstacle	A	
17. Jayap-ura	75 -Not obstacle	150 -Obstacle	B	
18. Wamena	30 -Obstacle	150 -Obstacle	A	
19. Kai-mana	40 -Not obstacle	75 -Obstacle	B	
20. Mera-uke	75 -Not obstacle	150 -Not obstacle	C	

A.4 Apron
A.4.3 Transverse Slope

Airport	Resent Slope (%)	Allowable Slope (%)	Evaluation	Remarks
1. Tanjung Pinang	N.A.	1.00	-	
2. Pekanbaru	N.A.	1.00	-	
3. Gunung Sitoli	N.A.	1.00	-	
4. Palembang	N.A.	1.00	-	
5. Semarang	0.40	1.00	C	
6. Pontianak	0.80	1.00	C	
7. Sampit	0.80	1.00	C	
8. Palangkaraya	N.A.	1.00	-	
9. Tarakan	N.A.	1.00	-	
10. Tana Toraja	N.A.	1.00	-	
11. Palu	N.A.	1.00	-	
12. Gorontalo	N.A.	1.00	-	
13. Ambon	N.A.	1.00	-	
14. Ternate	0.80	1.00	C	
15. Mataram	N.A.	1.00	-	
16. Bima	N.A.	1.00	-	
17. Jayapura	N.A.	1.00	-	
18. Wamena	N.A.	1.00	-	
19. Kaimana	N.A.	1.00	-	
20. Merauke	N.A.	1.00	-	

N.A. : Data Not available

A.4. Apron
A.4.4 Pavement Strength

Airport	ACN			PCN		Evaluation	Remarks
	Aircraft	Design CBR	ACN	Thickness	PCN		
1. Tanjung Pinang		(%)		(Cm)			
	F27	6.0	12	54.0	22	C	
2. Pekanbaru		(K4.5)	(17)	(32)	(48)	(C)	
	F28	6.8	17	70.0	42	C	
3. Gunung Sitoli	DHC6	6.0	3	34.0	9	C	
4. Palembang	DC9	6.0	29	90.0	61	C	
5. Semarang	F28	3.8	20	80.5	30	C	
6. Pontianak	F28	1.1	20	104.5	26	C	
7. Sampit	C212	6.0	3	30.0	7	C	
8. Palangkaraya	F28	6.8	20	49.5	21	C	
9. Tarakan	F27 /HS748	6.0	13	50.5	19	C	
10. Tana Toraja	C212	6.0	3	45.0	15	C	
11. Palu	F28	11.0	20	122.0	22	C	
12. Gorontalo	F27 /HS748	6.0	12	59.5	27	C	
13. Ambon		(K2.7)	(18)	(32)	(48)	(C)	
	F28	3.0	20	82.5	24	C	
14. Ternate	F27 /HS748	7.0	12	53.0	25	C	
15. Mataram	F28	6.0	17	59.0	26	C	
16. Bima	F27 /HS748	6.0	12	53.0	21	C	
17. Jayapura		(K5.5)	(30)	(29)	(35)	(C)	
	DC9	10.0	29	-	-	-	
18. Wamena	F27	6.0	12	55.0	23	C	
19. Kaimana	DHC6	6.0	3	39.0	11	C	
20. Merauke	F28	11.0	15	39.0	21	C	

( )for rigid pavement

A.4. Apron

A.4.5. Pavement Deterioration

Airport	Crack		Rutting		Other Deterioration		Total Evaluation	Remarks
	Crack Ratio	EV.	Max. Rut	EV.	Description	EV.		
1. Tanjung Pinang	(%) 0	C	(m/m) 27	B	-A lot of patching -Rutting at AC stand	B	B	
2. Pekan-baru	0	C	0	C	-	C	C	: Rigid -Completed in 1990
	1	C	55	B	-Oil spillage	B	B	: Flexible
3. Gunung Sitoli	Severe Crack	A	26	B	-Weathering/Raveling -Bleeding	A	A	
4. Palem-bang	7	B	18	C	-Oil spillage	A	A	
5. Semar-ang	0	C	0	C	-	C	C	Overlaid in 1989
6. Ponti-anak	0	C	30	B	-Partial depression -Weathering/Oil spil	B	B	
7. Sampit	0	C	0	C	-	C	C	New apron in 1989
8. Palang-karaya	0	C	0	C	-	C	C	
9. Tarakan	0	C	15	C	-Depression	B	B	
10. Tana Toraja	0	C	0	C	-Weathering/Raveling -Grass growing	B	B	
11. Palu	0	C	0	C	-	C	C	Overlaid in 1989
12. Goron-talo	0	C	0	C	-	C	C	Overlaid in 1989
13. Ambon	0	C	0	C	-	C	C	: Rigid -Completed in 1989
	12	B	30	B	-Bleeding/Crack/Oil	A	A	: Flexible
14. Tern-ate	0	C	11	B	-Depression	B	B	
15. Mata-ram	35	A	3	C	-Oil spillage -Patching	B	A	
16. Bima	20	A	5	C	-Weathering/Raveling -Damaged by tide	A	A	
17. Jayap-ura	0	C	0	C	-Completed in 1989	C	C	: Rigid
	-	-	-	-	-	-	-	: Flexible
18. Wamena	0	C	11	C	-Oil spillage -Weathering/Raveling	B	A	
19. Kai-mana	60	A	28	B	-Weathering/Bleeding -Grass growing	A	A	
20. Mera-uke	26	A	3	A	-	-	A	: Rigid
	10	B	32	B	-Weathering/Oil spil	A	A	: Flexible

Appendix 6.3.1 Evaluation of Existing Building Facilities

B.1 Passenger Terminal Building
B.1.1 Function
1) Domestic

Airport	Total Floor Area	Check-in Lobby Area	Departure Lounge Area	Baggage Claim Area	Total Evaluation	Remarks
1. Tanjung Pinang	C	C	C	C	C	
2. Pekan-baru	C	C	C	C	C	
3. Gunung Sitoli	C	C	C	C	C	New Bldg.
4. Palem-bang	A	C	C	A	A	
5. Semar-ang	C	A	C	A	A	
6. Ponti-anak	B	A	A	C	A	
7. Sampit	A	C	C	C	B	New Bldg.
8. Palang-karaya	A	C	C	C	B	
9. Tarakan	A	C	A	A	A	
10. Tana Toraja	B	C	C	C	C	
11. Palu	C	C	C	C	C	
12. Goron-talo	C	C	C	C	C	
13. Ambon	C	C	C	C	C	
14. Tern-ate	B	A	A	A	A	
15. Mata-ram	B	C	C	C	C	
16. Bima	A	A	C	A	A	
17. Jayap-ura	C	C	C	C	C	
18. Wamena	B	A	C	C	B	
19. Kai-mana	B	C	C	C	C	
20. Mera-uke	A	A	A	C	A	

a) Total Floor Area

Airport	Total floor area (sq.m)	Floor area per peak hour passenger(2way)	Evaluation	Remarks (2way Pax.)
1. Tanjung Pinang	816	11.8	C	69
2. Pekanbaru	4,103	17.3	C	237
3. Gunung Sitoli	216	6.2	C	35
4. Palembang	1,920	3.1	A	614
5. Semarang	1,850	6.9	C	267
6. Pontianak	1,285	4.4	B	294
7. Sampit	216	2.5	A	87
8. Palangkaraya	600	3.5	A	172
9. Tarakan	310	3.4	A	90
10. Tana Toraja	128	4.0	B	32
11. Palu	1,610	8.2	C	196
12. Gorontalo	1,254	13.2	C	95
13. Ambon	1,983	8.1	C	246
14. Ternate	400	5.3	B	75
15. Mataram	1,604	5.7	B	282
16. Bima	500	3.8	A	132
17. Jayapura	1,345	7.1	C	190
18. Wamena	708	5.5	B	130
19. Kaimana	90	5.2	B	17
20. Merauke	518	3.2	A	160

b) Check-in Lobby Area

Airport	Present Area (sq.m)	Required Area (sq.m)	Evalu-ation	Remarks
1. Tanjung Pinang	80.0	45.0	C	
2. Pekan-baru	180.0	110.0	C	
3. Gunung Sitoli	18.0	5.0	C	
4. Palem-bang	196.0	180.0	C	
5. Semar-ang	280.0	330.0	A	Public
6. Ponti-anak	100.0	130.0	A	
7. Sampit	63.0	45.0	C	
8. Palang-karaya	220.0	190.0	C	Public
9. Tarakan	60.0	60.0	C	
10. Tana Toraja	0.0	20.0	C	Outside
11. Palu	150.0	90.0	C	
12. Goron-talo	80.0	45.0	C	
13. Ambon	540.0	260.0	C	Public
14. Tern-ate	17.5	40.0	A	Actual area 5x3.5=17.5
15. Mata-ram	192.0	130.0	C	
16. Bima	86.0	200.0	A	Public
17. Jayap-ura	150.0	120.0	C	
18. Wamena	105.0	135.0	A	Actual area 15x7=105 Public
19. Kai-mana	0.0	20.0	C	One lobby for Dep&Arr
20. Mera-uke	65.0	100.0	A	

c) Departure Lounge Area

Airport	Present Area (sq.m)	Required Area (sq.m)	Evaluation	Remarks (1way Pax.)
1. Tanjung Pinang	180	70	C	60
2. Pekan-baru	580	165	C	150
3. Gunung Sitoli	54	20	C	17
4. Palem-bang	425	360	C	320
5. Semar-ang	224	200	C	175
6. Ponti-anak	320	370	A	200
7. Sampit	54	50	C	45
8. Palang-karaya	136	110	C	100
9. Tarakan	60	100	A	90
10. Tana Toraja	33	20	C	16
11. Palu	305	143	C	130
12. Goron-talo	195	70	C	60
13. Ambon	340	240	C	210
14. Tern-ate	54	70	A	60
15. Mata-ram	348	230	C	205
16. Bima	114	110	C	105
17. Jayap-ura	240	210	C	190
18. Wamena	151	80	C	70
19. Kai-mana	0	14	C	One lobby for Dep&Arr 12
20. Mera-uke	65	90	A	80

d) Baggage Claim Area

Airport	Present Area (sq.m)	Required Area (sq.m)	Evaluation	Remarks
1. Tanjung Pinang	96	60.0	C	
2. Pekan-baru	512	150.0	C	
3. Gunung Sitoli	45	20.0	C	
4. Palem-bang	173	320.0	A	
5. Semar-ang	137	180.0	A	
6. Ponti-anak	360	220.0	C	
7. Sampit	40	30.0	C	
8. Palang-karaya	100	100.0	C	
9. Tarakan	36	90.0	A	
10. Tana Toraja	24	16.0	C	
11. Palu	145	130.0	C	
12. Goron-talo	82	60.0	C	
13. Ambon	265	210.0	C	
14. Tern-ate	36	60.0	A	
15. Mata-ram	144	110.0	C	Arr peak 100 pax
16. Bima	93	104.0	A	
17. Jayap-ura	130	130.0	C	Arr peak 128 pax
18. Wamena	126	70.0	C	
19. Kai-mana	0	12.0	C	One lobby for Dep&Arr
20. Mera-uke	112	80.0	C	

B.1 Passenger Terminal Building
B.1.1 Function
II) International

Airport	Total Floor Area	Dep. Lounge Area	Baggage Claim Area	Dep. Imm. Counter	Arr. Imm. Counter	Arr. Customs Counter	Total Evalu-tion	Remarks
1. Tanjung Pinang	C	C	C	C	C	C	C	
2. Pekan-baru	C	C	C	C	C	C	C	
3. Gunung Sitoli	-	-	-	-	-	-	-	
4. Palem-bang	-	-	-	-	-	-	-	
5. Semar-ang	-	-	-	-	-	-	-	
6. Ponti-anak	B	C	C	C	C	C	C	
7. Sampit	-	-	-	-	-	-	-	
8. Palang-karaya	-	-	-	-	-	-	-	
9. Tarakan	C	C	C	C	C	C	C	
10. Tana Toraja	-	-	-	-	-	-	-	
11. Palu	-	-	-	-	-	-	-	
12. Goron-talo	-	-	-	-	-	-	-	
13. Ambon	-	-	-	-	-	-	-	
14. Tern-ate	-	-	-	-	-	-	-	
15. Mata-ram	-	-	-	-	-	-	-	
16. Bima	-	-	-	-	-	-	-	
17. Jayap-ura	-	-	-	-	-	-	-	
18. Wamena	-	-	-	-	-	-	-	
19. Kai-mana	-	-	-	-	-	-	-	
20. Mera-uke	-	-	-	-	-	-	-	

a) Total Floor Area

Airport	Total floor area(Int'l) (sq.m)	Floor area per peak hour passenger(2way)	Evaluation	Remarks (2way Pax.)
1. Tanjung Pinang	246	10.3	C	24
2. Pekan-baru	625	11.4	C	55
3. Gunung Sitoli	-	-	-	-
4. Palem-bang	-	-	-	-
5. Semar-ang	-	-	-	-
6. Ponti-anak	560	6.2	B	90
7. Sampit	-	-		-
8. Palang-karaya	-	-		-
9. Tarakan	120	12.0	C	10
10. Tana Toraja	-	-	-	-
11. Palu	-	-	-	-
12. Goron-talo	-	-	-	-
13. Ambon	-	-	-	-
14. Tern-ate	-	-	-	-
15. Mata-ram	-	-	-	-
16. Bima	-	-	-	-
17. Jayap-ura	-	-	-	-
18. Wamena	-	-	-	-
19. Kai-mana	-	-	-	-
20. Mera-uke	-	-	-	-

b) Departure Lounge Area

Airport	Present Area (sq.m)	Required Area (sq.m)	Evaluation	Remarks (1way Pax.)
1. Tanjung Pinang	48	19	C	12
2. Pekan-baru	168	85	C	55
3. Gunung Sitoli	-	-	-	-
4. Palem-bang	-	-	-	-
5. Semar-ang	-	-	-	-
6. Ponti-anak	109	85	C	55
7. Sampit	-	-	-	-
8. Palang-karaya	-	-	-	-
9. Tarakan	27	15	C	10
10. Tana Toraja	-	-	-	-
11. Palu	-	-	-	-
12. Goron-talo	-	-	-	-
13. Ambon	-	-	-	-
14. Tern-ate	-	-	-	-
15. Mata-ram	-	-	-	-
16. Bima	-	-	-	-
17. Jayap-ura	-	-	-	-
18. Wamena	-	-	-	-
19. Kai-mana	-	-	-	-
20. Mera-uke	-	-	-	-

c) Baggage Claim Area

Airport	Present Area (sq.m)	Required Area (sq.m)	Evaluation	Remarks
1. Tanjung Pinang	36	12	C	-
2. Pekan-baru	460	50	C	-
3. Gunung Sitoli	-	-	-	-
4. Palem-bang	-	-	-	-
5. Semar-ang	-	-	-	-
6. Ponti-anak	55	50	C	-
7. Sampit	-	-	-	-
8. Palang-karaya	-	-	-	-
9. Tarakan	16	10	C	-
10. Tana Toraja	-	-	-	-
11. Palu	-	-	-	-
12. Goron-talo	-	-	-	-
13. Ambon	-	-	-	-
14. Tern-ate	-	-	-	-
15. Mata-ram	-	-	-	-
16. Bima	-	-	-	-
17. Jayap-ura	-	-	-	-
18. Wamena	-	-	-	-
19. Kai-mana	-	-	-	-
20. Mera-uke	-	-	-	-

d) Immigration Counter (Departure)

Airport	Present Number	Required Number	Evaluation	Remarks
1. Tanjung Pinang	1	1	C	-
2. Pekanbaru	2	2	C	-
3. Gunung Sitoli	-	-	-	-
4. Palembang	-	-	-	-
5. Semarang	-	-	-	-
6. Pontianak	2	2	C	-
7. Sampit	-	-	-	-
8. Palangkaraya	-	-	-	-
9. Tarakan	2	1	C	-
10. Tana Toraja	-	-	-	-
11. Palu	-	-	-	-
12. Gorontalo	-	-	-	-
13. Ambon	-	-	-	-
14. Ternate	-	-	-	-
15. Mataram	-	-	-	-
16. Bima	-	-	-	-
17. Jayapura	-	-	-	-
18. Wamena	-	-	-	-
19. Kaimana	-	-	-	-
20. Merauke	-	-	-	-

e) Immigration Counter (Arrival)

Airport	Present Number	Required Number	Evaluation	Remarks
1. Tanjung Pinang	1	1	C	-
2. Pekanbaru	2	2	C	-
3. Gunung Sitoli	-	-	-	-
4. Palembang	-	-	-	-
5. Semarang	-	-	-	-
6. Pontianak	2	2	C	-
7. Sampit	-	-	-	-
8. Palangkaraya	-	-	-	-
9. Tarakan	2	1	C	-
10. Tana Toraja	-	-	-	-
11. Palu	-	-	-	-
12. Gorontalo	-	-	-	-
13. Ambon	-	-	-	-
14. Ternate	-	-	-	-
15. Mataram	-	-	-	-
16. Bima	-	-	-	-
17. Jayapura	-	-	-	-
18. Wamena	-	-	-	-
19. Kaimana	-	-	-	-
20. Merauke	-	-	-	-

f) Customs Counter (Arrival)

Airport	Present Number	Required Number	Evaluation	Remarks
1. Tanjung Pinang	1	1	C	-
2. Pekanbaru	2	2	C	-
3. Gunung Sitoli	-	-	-	-
4. Palembang	-	-	-	-
5. Semarang	-	-	-	-
6. Pontianak	2	2	C	-
7. Sampit	-	-	-	-
8. Palangkaraya	-	-	-	-
9. Tarakan	1	1	C	-
10. Tana Toraja	-	-	-	-
11. Palu	-	-	-	-
12. Gorontalo	-	-	-	-
13. Ambon	-	-	-	-
14. Ternate	-	-	-	-
15. Mataram	-	-	-	-
16. Bima	-	-	-	-
17. Jayapura	-	-	-	-
18. Wamena	-	-	-	-
19. Kaimana	-	-	-	-
20. Merauke	-	-	-	-

B.1 Passenger Terminal Building
B.1.2 Structure

Airport	Foundation	R.C Structure	Steel Structure	Wooden Structure	Total Evaluation	Remarks
1. Tanjung Pinang	C	C	-	B	B	
2. Pekanbaru	C	B	-	-	B	
3. Gunung Sitoli	C	C	-	C	C	
4. Palembang -Dom. Dep. -Dom. Arr. Int'l	C C	B C	- -	A -	A C	
5. Semarang	C	C	-	C	C	
6. Pontianak -Dom. Dep. -Dom. Arr. Int'l	C C	C -	- -	B B	B B	
7. Sampit	C	C	-	C	C	
8. Palangkaraya	C	-	-	C	C	
9. Tarakan	C	C	-	B	B	
10. Tana Toraja	C	-	-	C	C	
11. Palu	C	-	-	C	C	
12. Gorontalo	C	C	-	C	C	
13. Ambon	C	C	C	C	C	
14. Ternate	C	-	C	-	C	
15. Mataram	C	C	-	C	C	
16. Bima	C	C	-	B	B	
17. Jayapura	B	B	B	A	A	
18. Wamena	C	C	-	C	C	
19. Kaimana	C	C	-	C	C	
20. Merauke	C	C	B	A	A	

B.1. Passenger Terminal Building
B.1.3. Finishing

Airport		Floor	Interior Walls	Exterior Walls	Door & window	Ceiling	Flat Roof	Clad Roof	Roof Drains and Guttering	Handrails	Total Evaluation	Remarks
1. Tanjung Pinang		B	C	C	B	B	A	A	A	-	A	
2. Pekanbaru		C	C	C	C	B	A	-	B	C	A	
3. Gunung Sitoli		C	C	C	C	C	-	C	C	-	C	
4. Palembang	Dom. Dep.	B	C	B	A	B	A	A	A	-	A	
	Dom. Arr. In'l	C	C	C	C	C	A	B	B	-	A	
5. Semarang		C	C	C	C	C	-	C	C	-	C	
6. Pontianak	Dom. Dep.	B	C	C	C	C	C	B	-	-	B	
	Dom. Arr. In'l	C	C	C	C	C	-	B	-	-	B	
7. Sampit		C	C	C	C	C	C	C	-	-	C	
8. Palangkaraya		A	C	C	C	C	-	C	-	C	A	
9. Tarakan		C	C	C	C	C	-	B	-	-	B	
10. Tana Toraja		C	C	C	C	C	-	C	-	-	C	
11. Palu		C	C	C	C	C	-	C	-	-	C	
12. Gorontalo		C	C	C	C	C	-	C	-	-	C	
13. Ambon		C	C	C	C	B	A	B	B	-	A	
14. Ternate		C	C	C	C	C	-	C	C	-	C	
15. Mataram		C	C	C	C	C	C	C	C	-	C	
16. Bima		C	C	C	C	A	-	B	C	-	A	
17. Jayapura		B	C	B	B	B	A	A	A	-	A	
18. Wamena		C	C	C	C	C	-	C	C	-	C	
19. Kaimana		C	C	B	C	C	-	C	C	-	B	
20. Merauke		B	C	B	B	B	-	A	A	-	A	

B. 2. Control Tower
B. 2. 1 Visibility to runway

Airport	Present	Required	Evaluation	Remarks (m)
1. Tanjung Pinang	Good	Good	C	H=10.50
2. Pekanbaru	Good	Good	C	H=15.50
3. Gunung Sitoli	-	-	-	No Tower
4. Palembang	Good	Good	C	H=16.35
5. Semarang	Good	Good	C	H=10.95
6. Pontianak	Good	Good	C	H=14.20
7. Sampit	-	-	-	No Tower
8. Palangkaraya	Good	Good	C	H=14.20
9. Tarakan	Good	Good	C	H=14.20
10. Tana Toraja	-	-	-	No Tower
11. Palu	Good	Good	C	H=12.40
12. Gorontalo	Good	Good	C	H=11.20
13. Ambon	Good	Good	C	H=10.50
14. Ternate	Good	Good	C	H=12.40
15. Mataram	Good	Good	C	H=11.20
16. Bima	-	-	-	New Tower under const.
17. Jayapura	Good	Good	C	H=9.90
18. Wamena	Good	Good	C	H=12.50
19. Kaimana	-	-	-	No Tower
20. Merauke	Good	Good	C	H=6.00

B. 2 Control Tower
B. 2. 2 Structure

Airport	Foundation	R.C Structure	Steel Structure	Wooden Structure	Total Evaluation	Remarks
1. Tanjung Pinang	C	C	-	-	C	
2. Pekanbaru	-	-	-	-	-	Evaluated w/Adm.
3. Gunung Sitoli	-	-	-	-	-	No Tower
4. Palembang	-	-	-	-	-	Evaluated w/Adm.
5. Semarang	C	C	-	-	C	
6. Pontianak	C	C	-	-	C	
7. Sampit	-	-	-	-	-	No Tower
8. Palangkaraya	C	C	-	-	C	
9. Tarakan	C	C	-	-	C	
10. Tana Toraja	-	-	-	-	-	No Tower
11. Palu	C	C	-	-	C	
12. Gorontalo	C	C	-	-	C	
13. Ambon	-	-	-	-	-	Evaluated w/Adm.
14. Ternate	C	C	-	-	C	
15. Mataram	-	-	-	-	-	Evaluated w/Adm.
16. Bima	-	-	-	-	-	New Tower in const.
17. Jayapura	C	B	-	-	B	
18. Wamena	C	C	-	-	C	
19. Kaimana	-	-	-	-	-	No Tower
20. Merauke	A	C	-	B	A	

B.2. Control Tower
B.2.3. Finishing

Airport	Floor	Interior Walls	Exterior Walls	Door & Window	Ceiling	Flat Roof	Clad Roof	Roof Drains and Guttering	Handrails	Total Evaluation	Remarks
1. Tanjung Pinang	C	C	C	C	C	C	-	C	C	C	
2. Pekanbaru	B	B	B	B	C	C	-	B	A	A	
3. Gunung Sitoli	-	-	-	-	-	-	-	-	-	-	
4. Palembang	B	B	B	B	B	C	B	-	B	B	
5. Semarang	C	C	C	C	C	C	-	C	C	C	
6. Pontianak	C	C	C	C	C	C	-	C	C	C	
7. Sampit	-	-	-	-	-	-	-	-	-	-	
8. Palangkaraya	C	C	C	C	B	C	-	B	C	B	
9. Tarakan	C	C	C	C	C	C	-	C	C	C	
10. Tana Toraja	-	-	-	-	-	-	-	-	-	-	
11. Palu	C	C	C	C	C	C	-	C	C	C	
12. Gorontalo	C	C	C	C	C	C	-	C	C	C	
13. Ambon	C	C	C	C	B	C	-	B	B	B	
14. Ternate	C	C	C	C	C	C	-	C	C	C	
15. Mataram	C	C	C	C	C	C	-	C	C	C	
16. Bima	-	-	-	-	-	-	-	-	-	-	
17. Jayapura	B	B	B	B	B	C	-	B	B	B	
18. Wamena	C	C	C	C	C	C	-	C	C	C	
19. Kaimana	-	-	-	-	-	-	-	-	-	-	
20. Merauke	B	C	C	B	B	-	B	B	B	B	

B.3 Administration and Operation Building
B.3.1 Function

Airport	Class	Total floor area (sq.m)	Floor area per administration staff (sq.m)	Evaluation	Remarks (Adm. staff)
1. Tanjung Pinang	III	384	17.5	C	22
2. Pekan-baru	II	452	9.6	A	47
3. Gunung Sitoli	IV	190	38.0	C	5
4. Palem-bang	I	467	7.9	A	59
5. Semar-ang	II	312	16.4	C	19
6. Ponti-anak	I	548	17.7	C	31
7. Sampit	V	48	12.0	A	4
8. Palang-karaya	II	240	13.3	B	18
9. Tarakan	III	192	17.5	C	11
10. Tana Toraja	IV	147	73.5	C	2
11. Palu	II	342	13.7	B	25
12. Goron-talo	III	264	12.0	B	22
13. Ambon	II	343	13.7	B	25
14. Tern-ate	III	120	6.3	A	19
15. Mata-ram	III	565	24.6	C	23
16. Bima	III	200	14.3	C	14
17. Jayap-ura	II	399	11.4	B	35
18. Wamena	III	241	13.4	C	18
19. Kai-mana	V	35	17.5	B	2
20. Mera-uke	III	392	21.8	C	18

B.3 Administration and Operatioan Building
B.3.2 Structure

Airport	Foundation	R.C Structure	Steel Structure	Wooden Structure	Total Evaluation	Remarks
1. Tanjung Pinang	C	C	-	C	C	
2. Pekanbaru	C	B	-	-	B	
3. Gunung Sitoli	C	C	-	C	C	
4. Palembang	C	C	-	B	B	
5. Semarang	C	C	-	B	B	
6. Pontianak	C	C	-	-	C	Adm. 1
	C	C	-	C	C	Adm. 2
7. Sampit	C	-	-	C	C	
8. Palangkaraya	C	C	-	-	C	
9. Tarakan	C	C	-	-	C	
10. Tana Toraja	C	-	-	C	C	
11. Palu	C	C	-	C	C	
12. Gorontalo	C	C	-	-	C	
13. Ambon	C	B	-	B	B	
14. Ternate	C	C	-	-	C	
15. Mataram	C	C	-	C	C	Adm. 1
	C	C	-	B	B	Adm. 2
16. Bima	C	C	-	C	C	
17. Jayapura	B	B	B	B	B	
18. Wamena	C	-	-	C	C	
19. Kaimana	C	C	-	C	C	
20. Merauke	C	B	B	B	B	

B.3. Administration and Operation Building
B.3.3. Finishing

Airport	Floor	Interior Walls	Exterior Walls	Door & Window	Ceiling	Flat Roof	Clad Roof	Roof Drains and Guttering	Handrails	Total Evaluation	Remarks
1. Tanjung Pinang	B	C	C	C	C	-	C	C	-	B	
2. Pekanbaru	B	B	B	C	B	A	-	B	-	A	
3. Gunung Sitoli	C	C	C	C	B	-	B	B	-	B	
4. Palembang	B	B	B	B	B	A	-	A	-	A	
5. Semarang	B	C	C	C	C	-	C	-	-	C	
6. Pontianak	B	C	C	C	C	C	-	C	-	B	Adm. 1
	C	C	C	C	C	-	C	-	-	C	Adm. 2
7. Sampit	B	B	B	C	B	-	A	-	-	A	
8. Palangkaraya	C	C	C	C	C	C	-	C	-	C	
9. Tarakan	C	C	C	C	C	-	C	C	-	C	
10. Tana Toraja	B	C	C	C	C	-	C	C	-	B	
11. Palu	C	C	C	C	C	C	C	C	-	C	
12. Gorontalo	C	C	C	C	C	C	-	C	-	C	
13. Ambon	B	C	C	C	B	A	-	C	-	A	
14. Ternate	C	C	C	C	C	C	-	C	-	C	
15. Mataram	C	C	C	C	C	-	C	-	-	C	Adm. 1
	B	B	C	C	C	-	B	-	-	B	Adm. 2
16. Bima	C	C	C	C	C	-	C	C	-	C	
17. Jayapura	B	B	B	B	B	A	A	A	-	A	
18. Wamena	C	C	C	C	B	-	C	B	-	B	
19. Kaimana	C	C	C	C	C	C	C	C	-	C	
20. Merauke	B	B	B	C	B	-	A	B	-	A	

Appendix 6.3.2 Evaluation of Existing Building Ancillary Equipment

B.4 X-Ray Baggage Screening Unit

Airport	Present Number A	B	C	Required Number	Sufficiency of Equipment (S) (%)	Evaluation	Remarks
1. Tanjung Pinang	1	0	0	1	0	A	
2. Pekan-baru	2	0	0	2	0	A	
3. Gunung Sitoli	0	0	0	0	-	-	
4. Palem-bang	0	1	2	1	200	C	
5. Semar-ang	0	0	1	1	100	C	
6. Ponti-anak	0	0	2	2	100	C	
7. Sampit	0	0	0	0	-	-	
8. Palang-karaya	1	0	0	1	0	A	
9. Tarakan	1	0	0	1	0	A	
10. Tana Toraja	0	0	0	0	-	-	
11. Palu	0	0	1	1	100	C	
12. Goron-talo	1	0	0	1	0	A	
13. Ambon	0	0	2	2	100	C	
14. Tern-ate	0	0	0	1	0	A	
15. Mata-ram	1	0	0	1	0	A	
16. Bima	0	0	0	1	0	A	
17. Jayap-ura	0	0	1	1	100	C	
18. Wamena	0	0	0	1	0	A	
19. Kai-mana	0	0	0	0	-	-	
20. Mera-uke	1	0	0	1	0	A	

B.5 Walk Through Metal Detector

Airport	Present Number A	B	C	Required Number	Sufficiency of Equipment (S) (%)	Evaluation	Remarks
1. Tanjung Pinang	1	0	0	1	0	A	
2. Pekan-baru	2	0	0	2	0	A	
3. Gunung Sitoli	0	0	0	0	-	-	
4. Palem-bang	3	0	1	1	100	C	
5. Semar-ang	0	0	1	1	100	C	
6. Ponti-anak	0	0	2	2	100	C	
7. Sampit	0	0	0	0	-	-	
8. Palang-karaya	1	0	0	1	0	A	
9. Tarakan	1	0	0	1	0	A	
10. Tana Toraja	0	0	0	0	-	-	
11. Palu	0	0	1	1	100	C	
12. Goron-talo	1	0	0	1	0	A	
13. Ambon	0	0	2	2	100	C	
14. Tern-ate	0	0	0	1	0	A	
15. Mata-ram	1	0	0	1	0	A	
16. Bima	0	0	0	1	0	A	
17. Jayap-ura	0	0	1	1	100	C	
18. Wamena	0	0	0	1	0	A	
19. Kai-mana	0	0	0	0	-	-	
20. Mera-uke	1	0	0	1	0	A	

B.6 Baggage Claim Device

Airport	Present Number A	B	C	Required Number	Sufficiency of Equipment (S) (%)	Evaluation	Remarks
1. Tanjung Pinang	0	0	0	0	-	-	
2. Pekan-baru	0	0	5	0	-	C	
3. Gunung Sitoli	0	0	0	0	-	-	
4. Palem-bang	0	0	0	1	0	A	
5. Semar-ang	0	0	0	0	-	-	
6. Ponti-anak	0	0	0	0	-	-	
7. Sampit	0	0	0	0	-	-	
8. Palang-karaya	0	0	0	0	-	-	
9. Tarakan	0	0	0	0	-	-	
10. Tana Toraja	0	0	0	0	-	-	
11. Palu	0	0	0	0	-	-	
12. Goron-talo	0	0	0	0	-	-	
13. Ambon	0	0	0	0	-	-	
14. Tern-ate	0	0	0	0	-	-	
15. Mata-ram	0	0	0	0	-	-	
16. Bima	0	0	0	0	-	-	
17. Jayap-ura	0	0	0	1	0	A	
18. Wamena	0	0	0	0	-	-	
19. Kai-mana	0	0	0	0	-	-	
20. Mera-uke	0	0	0	0	-	-	

B.7 Air Conditioning

1) Control Tower

Airport	Floor Area(m2)	Present Capacity (BTU)	Cooling Load (BTU)	Sufficiency of Equipment (S) (%)	Evaluation
1. Tanjung Pinang	24	(1) 17,000	19,000	89	C
2. Pekan-baru	22	(2) 26,000	17,500	148	C
3. Gunung Sitoli	NA	-	-	-	-
4. Palem-bang	20	(2) 32,000	16,000	200	C
5. Semar-ang	22	(1) 16,000	17,500	91	C
6. Ponti-anak	26	(1) 16,000	20,500	78	C
7. Sampit	NA	-	-	-	-
8. Palang-karaya	26	(1) 16,000	20,500	78	C
9. Tarakan	26	(1) 12,000	20,500	58	B
10. Tana Toraja	NA	-	-	-	-
11. Palu	30	(1) 17,000	23,800	71	B
12. Goron-talo	26	(1) 16,000	20,500	78	C
13. Ambon	24	(1) 9,600	19,000	50	A
14. Tern-ate	30	(1) 12,000	24,000	50	A
15. Mata-ram	25	(1) 16,000	20,000	80	C
16. Bima	-	-	-	-	-
17. Jayap-ura	16	(2) 32,000	12,700	251	C
18. Wamena	25	NA	20,000	0	A
19. Kai-mana	NA	-	-	-	-
20. Mera-uke	16	(1) 16,000	13,000	123	C

( ) : Number of Air Conditioning

B.7 Air Conditioning
2) Departure Lounge

Airport		Floor area (m2)	Present Capacity (BTU)	Cooling Load (BTU)	Sufficiency of Equipment (S) (%)	Evaluation
1. Tanjung Pinang	INT'L	48	NA	28,500	0	A
	DOM	180	NA	107,000	0	A
2. Pekan-baru	INT'L	165				
	INT'L	136				
	DOM	580	2,415,000	524,000	460	C
3. Gunung Sitoli	NEW	54	NA	32,100	0	A
4. Palem-bang	DOM	425	(3) 153,000	253,000	60	B
5. Semar-ang	DOM	224	(2) 126,000	133,000	94	C
6. Ponti-anak	INT'L	109	(3) 48,000	65,000	73	B
	DOM	360	NA	210,000	0	A
7. Sampit	NEW	54	NA	32,100	0	A
8. Palang-karaya	DOM	136	(3) 43,000	81,000	53	B
9. Tarakan	INT'L	27	NA	16,000	0	A
	DOM	60	(3) 27,000	36,000	75	B
10. Tana Toraja	DOM	33	NA	19,600	0	A
11. Palu	DOM	305	(6) 380,000	180,000	211	C
12. Goron-talo	DOM	195	NA	116,000	0	A
13. Ambon	INT'L	221	(2) 126,000	131,000	96	C
	DOM	340	NA	202,000	0	A
14. Tern-ate	DOM	72	NA	43,000	0	A
15. Mata-ram	DOM	345	NA	205,000	0	A
16. Bima	DOM	114	NA	68,000	0	A
17. Jayap-ura	DOM	240	(2) 36,000	143,000	25	A
18. Wamena	DOM	151	NA	89,800	0	A
19. Kai-mana	DOM	36	NA	21,500	0	A
20. Mera-uke	DOM	99	NA	59,000	0	A

( ) : Number of Air Conditioning

Appendix 6.4.1 Evaluation of Existing Airport Maintenance Equipment

C.1 Mower

Airport	Present Number A	B	C	Required Number	Sufficiency of Equipment (S) (%)	Evaluation	Remarks
1. Tanjung Pinang	0	0	1	3	33	A	
2. Pekan-baru	0	1	3	4	75	B	
3. Gunung Sitoli	0	0	0	2	0	A	
4. Palem-bang	0	1	2	3	66	B	
5. Semar-ang	0	0	1	5	20	A	
6. Ponti-anak	1	0	2	3	66	B	
7. Sampit	0	0	0	2	0	A	
8. Palang-karaya	1	0	3	5	60	B	
9. Tarakan	0	2	1	2	50	A	
10. Tana Toraja	0	0	0	2	0	A	
11. Palu	1	0	2	2	100	C	
12. Goron-talo	0	0	1	3	33	A	
13. Ambon	0	1	0	5	0	A	
14. Tern-ate	0	1	0	4	0	A	
15. Mata-ram	1	1	3	2	150	C	
16. Bima	0	0	1	2	50	A	
17. Jayap-ura	0	0	0	5	0	A	
18. Wamena	1	0	1	2	50	A	
19. Kai-mana	0	0	0	3	0	A	
20. Mera-uke	0	1	0	3	0	A	

C.2 Tractor

Airport	Present Number A	B	C	Required Number	Sufficiency of Equipment (S) (%)	Evaluation	Remarks
1. Tanjung Pinang	0	2	2	3	66	B	
2. Pekan-baru	1	1	3	4	75	B	
3. Gunung Sitoli	0	0	0	2	0	A	
4. Palem-bang	0	1	3	3	100	C	
5. Semar-ang	0	0	1	5	20	A	
6. Ponti-anak	0	0	5	3	166	C	
7. Sampit	0	0	0	2	0	A	
8. Palang-karaya	0	0	4	5	80	C	
9. Tarakan	2	0	2	2	100	C	
10. Tana Toraja	0	0	0	2	0	A	
11. Palu	0	0	3	2	150	C	
12. Goron-talo	3	0	1	3	33	A	
13. Ambon	0	0	1	5	20	A	
14. Tern-ate	0	0	4	4	100	C	
15. Mata-ram	0	0	5	2	250	C	
16. Bima	0	1	1	2	50	A	
17. Jayap-ura	0	0	2	5	40	A	
18. Wamena	1	0	1	2	50	A	
19. Kai-mana	0	0	0	3	0	A	
20. Mera-uke	2	0	3	3	100	C	

C.3 Handy Mower

Airport	Present Number A	B	C	Required Number	Sufficiency of Equipment (S) (%)	Evaluation	Remarks
1. Tanjung Pinang	0	1	0	2	0	A	
2. Pekan-baru	0	0	5	3	166	C	
3. Gunung Sitoli	0	0	2	1	200	C	
4. Palem-bang	4	0	0	2	0	A	
5. Semar-ang	0	0	0	4	0	A	
6. Ponti-anak	0	0	0	2	0	A	
7. Sampit	0	0	0	1	0	A	
8. Palang-karaya	0	0	0	4	0	A	
9. Tarakan	0	0	0	2	0	A	
10. Tana Toraja	0	0	0	1	0	A	
11. Palu	0	0	1	1	100	C	
12. Goron-talo	0	0	0	2	0	A	
13. Ambon	0	0	0	4	0	A	
14. Tern-ate	0	0	1	3	33	A	
15. Mata-ram	0	0	1	1	100	C	
16. Bima	0	0	0	1	0	A	
17. Jayap-ura	0	0	0	5	0	A	
18. Wamena	4	0	0	2	0	A	
19. Kai-mana	1	0	1	5	20	A	
20. Mera-uke	0	0	0	2	0	A	

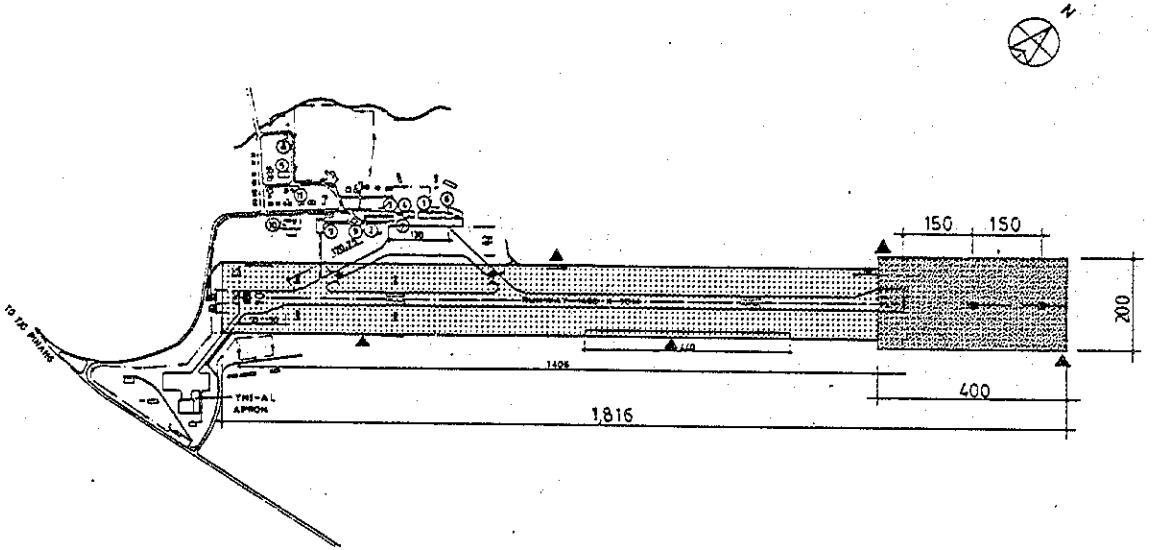
C.4 Sweeper

Airport	Present Number A	B	C	Required Number	Sufficiency of Equipment (S) (%)	Evaluation	Remarks
1. Tanjung Pinang	0	0	0	0	-	-	
2. Pekan-baru	0	0	1	1	100	C	
3. Gunung Sitoli	0	0	0	0	-	-	
4. Palem-bang	0	0	1	1	100	C	
5. Semar-ang	0	0	0	1	0	A	
6. Ponti-anak	0	0	0	1	0	A	
7. Sampit	0	0	0	0	-	-	
8. Palang-karaya	0	0	0	1	0	A	
9. Tarakan	0	0	0	0	-	-	
10. Tana Toraja	0	0	0	0	-	-	
11. Palu	0	0	0	1	0	A	
12. Goron-talo	0	0	0	0	-	-	
13. Ambon	0	0	1	1	100	C	
14. Tern-ate	0	0	0	0	-	-	
15. Mata-ram	0	0	0	1	0	A	
16. Bima	0	0	0	0	-	-	
17. Jayap-ura	0	0	0	1	0	A	
18. Wamena	0	0	0	0	-	-	
19. Kai-mana	0	0	0	0	-	-	
20. Mera-uke	0	0	0	1	0	A	

C.5 Dump Truck

Airport	Present Number A	B	C	Required Number	Sufficiency of Equipment (S) (%)	Evaluation	Remarks
1. Tanjung Pinang	0	0	1	1	100	C	
2. Pekan-baru	0	0	1	1	100	C	
3. Gunung Sitoli	0	0	0	1	0	A	
4. Palem-bang	0	0	2	1	200	C	
5. Semar-ang	0	0	1	1	100	C	
6. Ponti-anak	0	0	1	1	100	C	
7. Sampit	0	0	0	1	0	A	
8. Palang-karaya	0	0	1	1	100	C	
9. Tarakan	0	0	1	1	100	C	
10. Tana Toraja	0	0	0	1	0	A	
11. Palu	1	1	0	1	0	A	
12. Goron-talo	0	0	1	1	100	C	
13. Ambon	0	0	1	1	100	C	
14. Tern-ate	0	0	1	1	100	C	
15. Mata-ram	0	0	1	1	100	C	
16. Bima	0	0	1	1	100	C	
17. Jayap-ura	0	0	1	1	100	C	
18. Wamena	0	0	0	1	0	A	
19. Kai-mana	0	0	0	1	0	A	
20. Mera-uke	0	1	0	1	0	A	

Appendix to Chapter 7



LEGEND
(TOPOGRAPHIC SURVEY)

——·——	Center Line Survey and Profile Levelling 1.816 Km
▨	Area of Cross-section Levelling 1.816 Km
▨	Area of Plane Table Survey 80.000 m^2
▲	Principal Point 5 points

LEGEND
(SOIL INVESTIGATION)

●	Test pit including field density field CBR and physical property test 2 pits

Appendix 7.2.1 (1) Details of Site Survey

SCALE 0 100 200 500M

BASIC DATA TABLE			
AIRPORT CLASS	III	RUNWAY DIRECTION	04-22
AIRPORT STATUS	DOMESTIC	INSTRUMENT RUNWAY	
AIRPORT ELEVATION	19 M	PAVEMENT STRENGTH	PCN 13 FCZU
AIRPORT REF. POINT (ARP) COORDINATES	01°55' N 104° 32' E	NAVIGATIONAL AIDS	NDB.
		DISTANCE FROM CITY	12 KM
AIRPORT REF. TEMP	33.7°C		

MAJOR BUILDINGS					
NO.	NAME OF BUILDING	EXIST.	NO.	NAME OF BUILDING	EXIST.
1	PASSENGER TERMINAL	✓	7	VIP BUILDING	✓
2	ADMINISTRATION BUILDING	✓	8	MAIN POWER HOUSE	✓
3	OPERATIONS BUILDING	✓	9	FIRE STATION	✓
4	CONTROL TOWER	✓	10	FUEL FARM	✓
5	WORKSHOP	✓	11	STAFF HOUSING	✓
6	CARGO TERMINAL BUILDING	✓			

LEGEND	
	FENCE
	DITCH

REV.	DATE	BY	APPD

SOURCE : TJG PINANG AIRPORT AUTHORITY

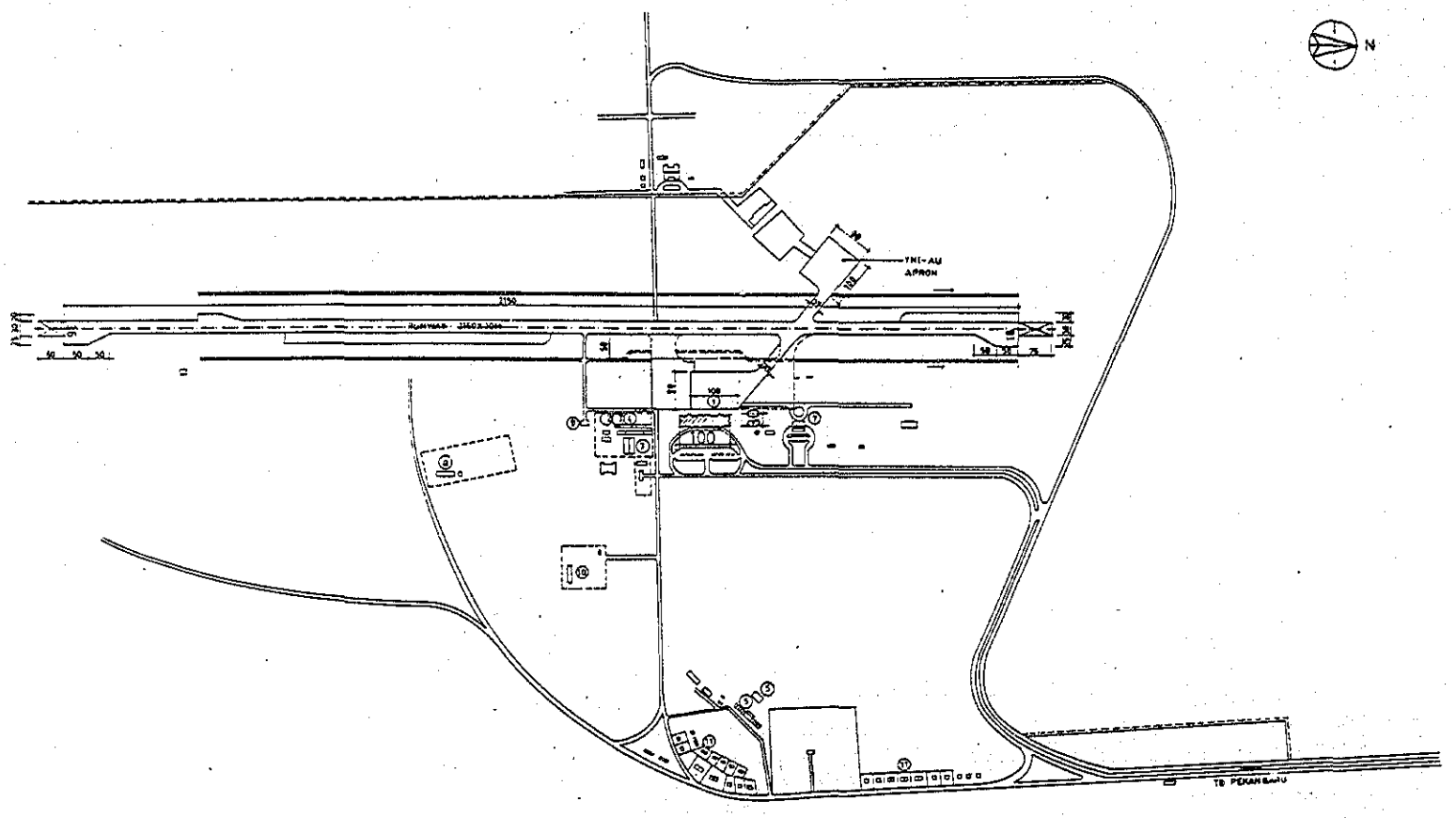
THE GOVERNMENT OF THE REPUBLIC OF INDONESIA
MINISTRY OF COMMUNICATIONS
DIRECTORATE GENERAL OF AIR COMMUNICATIONS

KIJANG / TANJUNG PINANG AIRPORT

DRAWING TITLE: AIRPORT LAYOUT PLAN

PREPARED BY : THE STUDY ON THE MASTER PLAN OF AIRPORT MAINTENANCE AND REHABILITATION
JAPAN INTERNATIONAL COOPERATION AGENCY

Approved :
Checked :
Drawn :
Drawing No.
Scale : -
Date : March, 1990



LEGEND
(BUILDING SURVEY)

Survey and measurement of building structure

3,000 m^2

Appendix 7.2.1 (2) Details of Site Survey

SCALE 0 100 200 500M

BASIC DATA TABLE			
AIRPORT CLASS	III	RUNWAY DIRECTION	18 - 36
AIRPORT STATUS	INT'L/DOMESTIC	INSTRUMENT RUNWAY	V
AIRPORT ELEVATION	30.6 MM	PAVEMENT STRENGTH	PCN 29 FCXU
AIRPORT REF. POINT (ARP) COORDINATES	27°24'N 101°28'E	NAVIGATIONAL AIDS	NDB, VOR/DME
		DISTANCE FROM CITY	10 KM
AIRPORT REF. TEMP.	32°C		

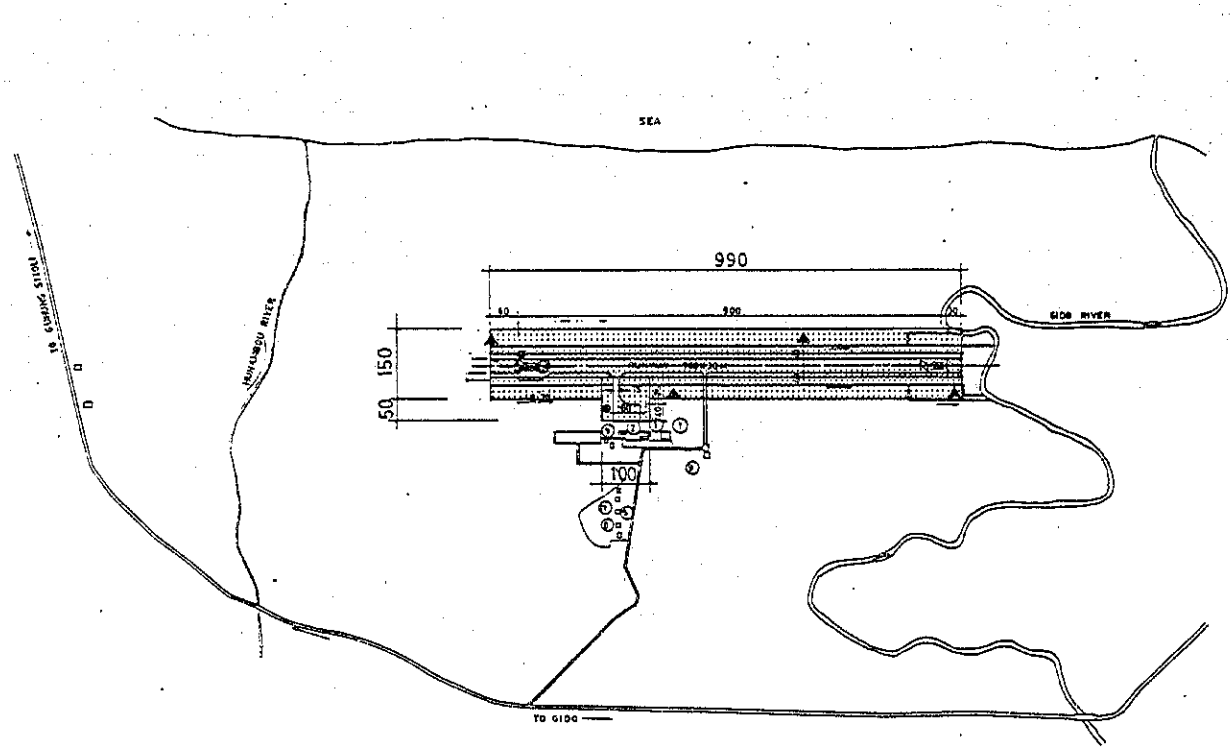
MAJOR BUILDINGS					
NO.	NAME OF BUILDING	NO.	NAME OF BUILDING		
1	PASSENGER TERMINAL	V	7	VIP BUILDING	V
2	ADMINISTRATION BUILDING	V	8	MAIN POWER HOUSE	V
3	OPERATIONS BUILDING	V	9	FIRE STATION	V
4	CONTROL TOWER	V	10	FUEL FARM	V
5	WORKSHOP	V	11	STAFF HOUSING	V
6	CARGO TERMINAL BUILDING				

LEGEND	
	FENCE
	DITCH

REV.	DATE	BY	APPD

SOURCE : PEKANBARU AIRPORT AUTHORITY

THE GOVERNMENT OF THE REPUBLIC OF INDONESIA MINISTRY OF COMMUNICATIONS DIRECTORATE GENERAL OF AIR COMMUNICATIONS	Approved :
SIMPANG TIGA / PEKANBARU AIRPORT	Checked :
DRAWING TITLE : AIRPORT LAYOUT PLAN	Drawn :
	Drawing No.
PREPARED BY : THE STUDY ON THE MASTER PLAN OF AIRPORT MAINTENANCE AND REHABILITATION JAPAN INTERNATIONAL COOPERATION AGENCY	Scale :
	Date : March, 1990



LEGEND
(TOPOGRAPHIC SURVEY)

—·—	Center Line Survey and Profile Levelling 0.99 Km
▨	Area of Cross-section Levelling 0.99 Km
▲	Principal Point 4 points

LEGEND
(SOIL INVESTIGATION)

●	Test pit including field density field CBR and physical property test 2 pits
⊗	Core sampling including dynamic core penetration test and Marshall stability test 2 places

Appendix 7.2.1 (3) Details of Site Survey

SCALE 0 100 200 1:2000

BASIC DATA TABLE

AIRPORT CLASS	IV	RUNWAY DIRECTION	09 - 27
AIRPORT STATUS	DOMESTIC	INSTRUMENT RUNWAY	
AIRPORT ELEVATION	2M	PAVEMENT STRENGTH	
AIRPORT REF. POINT (ARP) COORDINATES	01° 16'N 97° 27'E	NAVIGATIONAL AIDS	
		DISTANCE FROM CITY	18KM
AIRPORT REF. TEMP.			

MAJOR BUILDINGS

NO.	NAME OF BUILDING	NO.	NAME OF BUILDING
1	PASSENGER TERMINAL	7	VIP BUILDING
2	ADMINISTRATION BUILDING	8	MAIN POWER HOUSE
3	OPERATIONS BUILDING	9	FIRE STATION
4	CONTROL TOWER	10	FUEL FARM
5	WORKSHOP	11	STAFF HOUSING
6	CARGO TERMINAL BUILDING		

LEGEND

	FENCE
	DITCH

REV.	DATE	BY	APPD

SOURCE : GUNUNG SITOLI AIRPORT AUTHORITY

THE GOVERNMENT OF THE REPUBLIC OF INDONESIA
MINISTRY OF COMMUNICATIONS
DIRECTORATE GENERAL OF AIR COMMUNICATIONS

BINAKA/GUNUNG SITOLI AIRPORT

DRAWING TITLE : AIRPORT LAYOUT PLAN

PREPARED BY : THE STUDY ON THE MASTER PLAN OF AIRPORT MAINTENANCE AND REHABILITATION JAPAN INTERNATIONAL COOPERATION AGENCY

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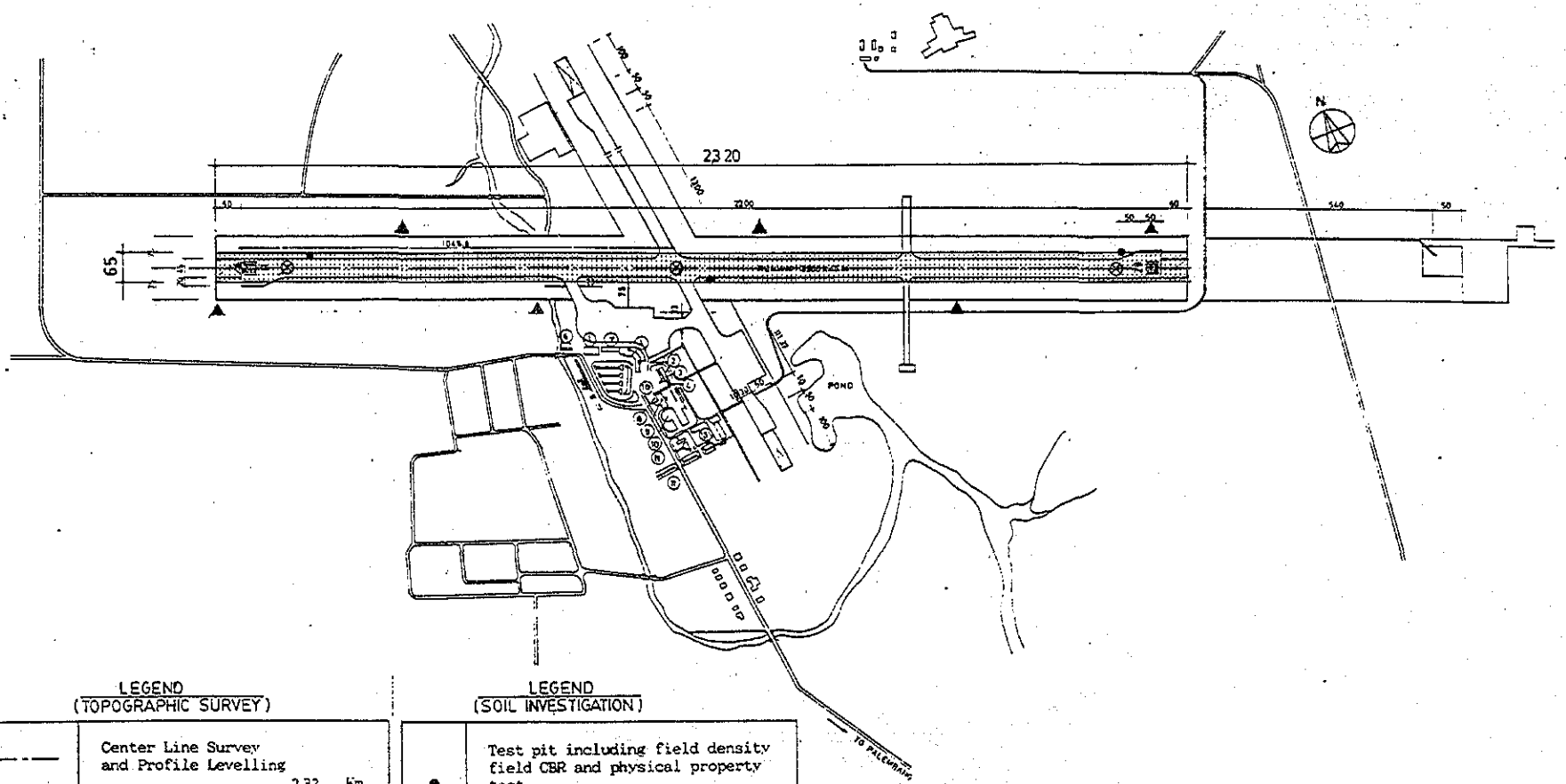
Scale :
Date : March, 1990



LEGEND (TOPOGRAPHIC SURVEY)

——·——	Center Line Survey and Profile Levelling 2.32 Km
▭	Area of Cross-section Levelling 2.32 Km
▲	Principal Point 6 points

LEGEND (SOIL INVESTIGATION)

●	Test pit including field density field CBR and physical property test 3 pits
⊗	Core sampling including dynamic core penetration test and Marshall stability test 3 places

Appendix 7.2.1 (4) Details of Site Survey

SCALE 0 100 200 500M

BASIC DATA TABLE			
AIRPORT CLASS	II	RUNWAY DIRECTION	11 - 29
AIRPORT STATUS	INT'L / DOM	INSTRUMENT RUNWAY	√
AIRPORT ELEVATION	15.3 M	PAVEMENT STRENGTH	PCN 35 R/C/U
AIRPORT REF. POINT (ARP) COORDINATES	02° 54' S 104° 42' E	NAVIGATIONAL AIDS	
		DISTANCE FROM CITY	11 KM
AIRPORT REF. TEMP.	32.9°C		

MAJOR BUILDINGS					
NO.	NAME OF BUILDING	EXIST.	NO.	NAME OF BUILDING	EXIST.
1	PASSENGER TERMINAL	√	7	VIP BUILDING	√
2	ADMINISTRATION BUILDING	√	8	MAIN POWER HOUSE	√
3	OPERATIONS BUILDING	√	9	FIRE STATION	√
4	CONTROL TOWER	√	10	FUEL FARM	√
5	WORKSHOP	√	11	STAFF HOUSING	√
6	CARGO TERMINAL BUILDING				

LEGEND	
	FENCE
	DITCH

REV.	DATE	BY	APP'D

SOURCE : PALEMBANG AIRPORT AUTHORITY

THE GOVERNMENT OF THE REPUBLIC OF INDONESIA
MINISTRY OF COMMUNICATIONS
DIRECTORATE GENERAL OF AIR COMMUNICATIONS

St. MAHMUD BADARUDDIN / PALEMBANG AIRPORT

DRAWING TITLE : AIRPORT LAYOUT PLAN

PREPARED BY : THE STUDY ON THE MASTER PLAN OF AIRPORT MAINTENANCE AND REHABILITATION
JAPAN INTERNATIONAL COOPERATION AGENCY

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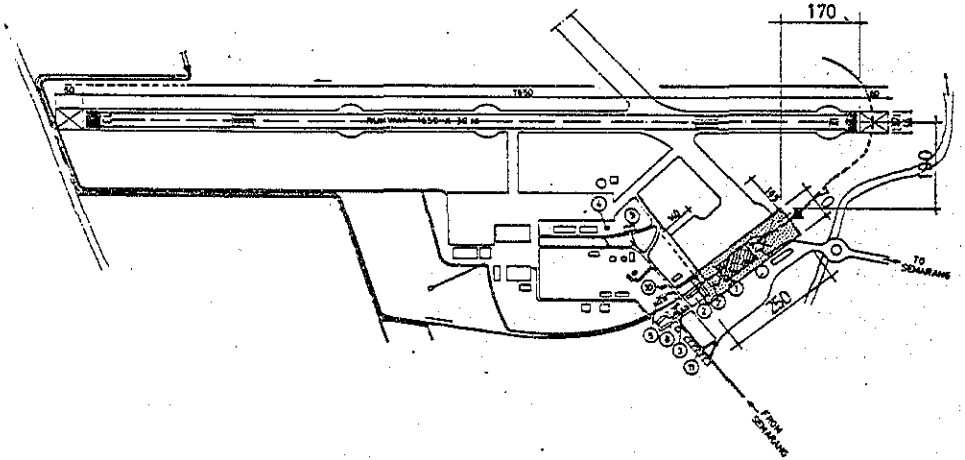
Date March, 1990



Appendix 7.2.1 (5) Details of Site Survey

LEGEND (TOPOGRAPHIC SURVEY)

	Area of Plane Table Survey 17,500 m^2
▲	Principal Point 1 point

LEGEND (SOIL INVESTIGATION)

×	Boring including standard penetration test and physical property test 1 point

LEGEND (BUILDING SURVEY)

	Survey and measurement of building structure 4,000 m^2

SCALE 0 100 200 300M

BASIC DATA TABLE

AIRPORT CLASS	II	RUNWAY DIRECTION	13-31
AIRPORT STATUS	DOMESTIC	INSTRUMENT RUNWAY	
AIRPORT ELEVATION	3 M	PAVEMENT STRENGTH	PCN 23 F/D/U
AIRPORT REF. POINT (ARP) COORDINATES	06°59' S 110° 23' E	NAVIGATIONAL AIDS	NDB, VOR, DME
		DISTANCE FROM CITY	4.5 KM
AIRPORT REF. TEMP.	34.5°C		

MAJOR BUILDINGS

NO.	NAME OF BUILDING	WITH POWER	NO.	NAME OF BUILDING	WITH POWER
1	PASSENGER TERMINAL	√	7	VIP BUILDING	√
2	ADMINISTRATION BUILDING	√	8	MAIN POWER HOUSE	√
3	OPERATIONS BUILDING	√	9	FIRE STATION	√
4	CONTROL TOWER	√	10	FUEL FARM	√
5	WORKSHOP	√	11	STAFF HOUSING	√
6	CARGO TERMINAL BUILDING				

LEGEND

	FENCE
	DITCH

REV.	DATE	BY	APPD

SOURCE : SEMARANG AIRPORT AUTHORITY

THE GOVERNMENT OF THE REPUBLIC OF INDONESIA
MINISTRY OF COMMUNICATIONS
DIRECTORATE GENERAL OF AIR COMMUNICATIONS

AHMAD YANI / SEMARANG AIRPORT

DRAWING TITLE : AIRPORT LAYOUT PLAN

PREPARED BY : THE STUDY ON THE MASTER PLAN OF AIRPORT MAINTENANCE AND REHABILITATION JAPAN INTERNATIONAL COOPERATION AGENCY

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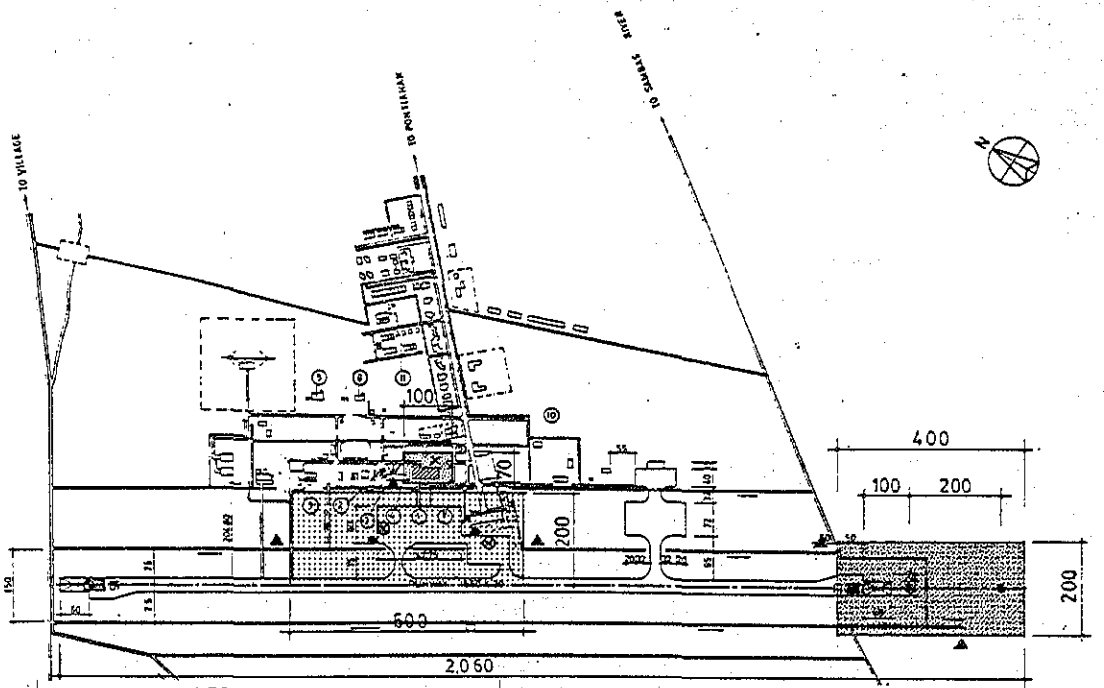
Date March '90



LEGEND (TOPOGRAPHIC SURVEY)

———	Center Line Survey and Profile Levelling 2.06 Km
	Area of Cross-section Levelling 0.9 Km
	Area of Plane Table Survey 87,000 m^2
▲	Principal Point 5 points

LEGEND (SOIL INVESTIGATION)

×	Boring including standard penetration test and physical property test 1 point
●	Test pit including field density field CBR and physical property test 4 pits
⊗	Core sampling including dynamic core penetration test and Marshall stability test 2 places

LEGEND (BUILDING SURVEY)

	Survey and measurement of building structure 1,800 m^2

Appendix 7.2.1 (6) Details of Site Survey

SCALE 0 100 200 500M

BASIC DATA TABLE

AIRPORT CLASS	II	RUNWAY DIRECTION	15-33
AIRPORT STATUS	INT'L/DOMESTIC	INSTRUMENT RUNWAY	
AIRPORT ELEVATION	3M	PAVEMENT STRENGTH	PCN 20FDTU
AIRPORT REF. POINT (ARP) COORDINATES	00°09'S 109°24'E	NAVIGATIONAL AIDS	NDB, VOR, ILS
		DISTANCE FROM CITY	17KM
AIRPORT REF. TEMP.	24°-29°C		

MAJOR BUILDINGS

NO.	NAME OF BUILDING	NO.	NAME OF BUILDING
1	PASSENGER TERMINAL	7	VIP BUILDING
2	ADMINISTRATION BUILDING	8	MAIN POWER HOUSE
3	OPERATIONS BUILDING	9	FIRE STATION
4	CONTROL TOWER	10	FUEL FARM
5	WORKSHOP	11	STAFF HOUSING
6	CARGO TERMINAL BUILDING		

LEGEND

FENCE

DITCH

REV	DATE	BY	APPD

SOURCE PONTIANAK AIRPORT AUTHORITY

THE GOVERNMENT OF THE REPUBLIC OF INDONESIA
MINISTRY OF COMMUNICATIONS
DIRECTORATE GENERAL OF AIR COMMUNICATIONS

SUPADIO / PONTIANAK AIRPORT

DRAWING TITLE : AIRPORT LAYOUT PLAN

PREPARED BY : THE STUDY ON THE MASTER PLAN OF AIRPORT MAINTENANCE AND REHABILITATION
JAPAN INTERNATIONAL COOPERATION AGENCY

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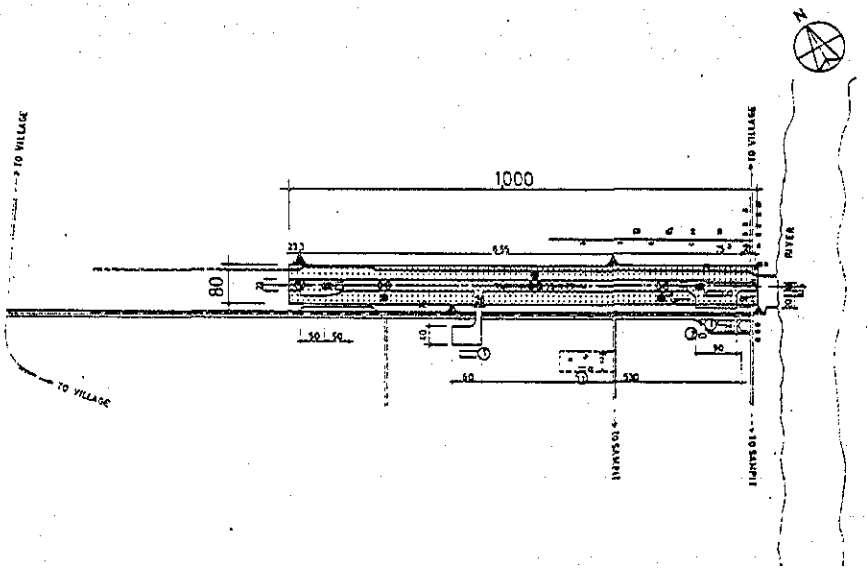


LEGEND
(TOPOGRAPHIC SURVEY)

—·—·—	Center Line Survey and Profile Levelling 1.00 Km
▨	Area of Cross-section Levelling 1.00 Km
▲	Principal Point 4 points

LEGEND
(SOIL INVESTIGATION)

●	Test pit including field density field CBR and physical property test 3 pits
⊗	Core sampling including dynamic core penetration test and Marshall stability test 3 places

Appendix 7.2.1 (7) Details of Site Survey

SCALE 0 100 200 500M

BASIC DATA TABLE

AIRPORT CLASS	[illegible]	RUNWAY DIRECTION	13 – 31
AIRPORT STATUS	DOMESTIC	INSTRUMENT RUNWAY	
AIRPORT ELEVATION	4.5 M	PAVEMENT STRENGTH	
AIRPORT REF. POINT (ARP) COORDINATES	[illegible]	NAVIGATIONAL AIDS	NDB
		DISTANCE FROM CITY	3 KM
AIRPORT REF. TEMP.	30°C		

MAJOR BUILDINGS

NO.	NAME OF BUILDING		NO.	NAME OF BUILDING	
1	PASSENGER TERMINAL	√	7	VIP BUILDING	
2	ADMINISTRATION BUILDING	√	8	MAIN POWER HOUSE	
3	OPERATIONS BUILDING		9	FIRE STATION	
4	CONTROL TOWER		10	FUEL FARM	
5	WORKSHOP		11	STAFF HOUSING	√
6	CARGO TERMINAL BUILDING				

LEGEND

	FENCE
	DITCH

REV	DATE	BY	APP'D

SOURCE SAMPIT AIRPORT AUTHORITY

THE GOVERNMENT OF THE REPUBLIC OF INDONESIA
MINISTRY OF COMMUNICATIONS
DIRECTORATE GENERAL OF AIR COMMUNICATIONS

H. ASAN / SAMPIT AIRPORT

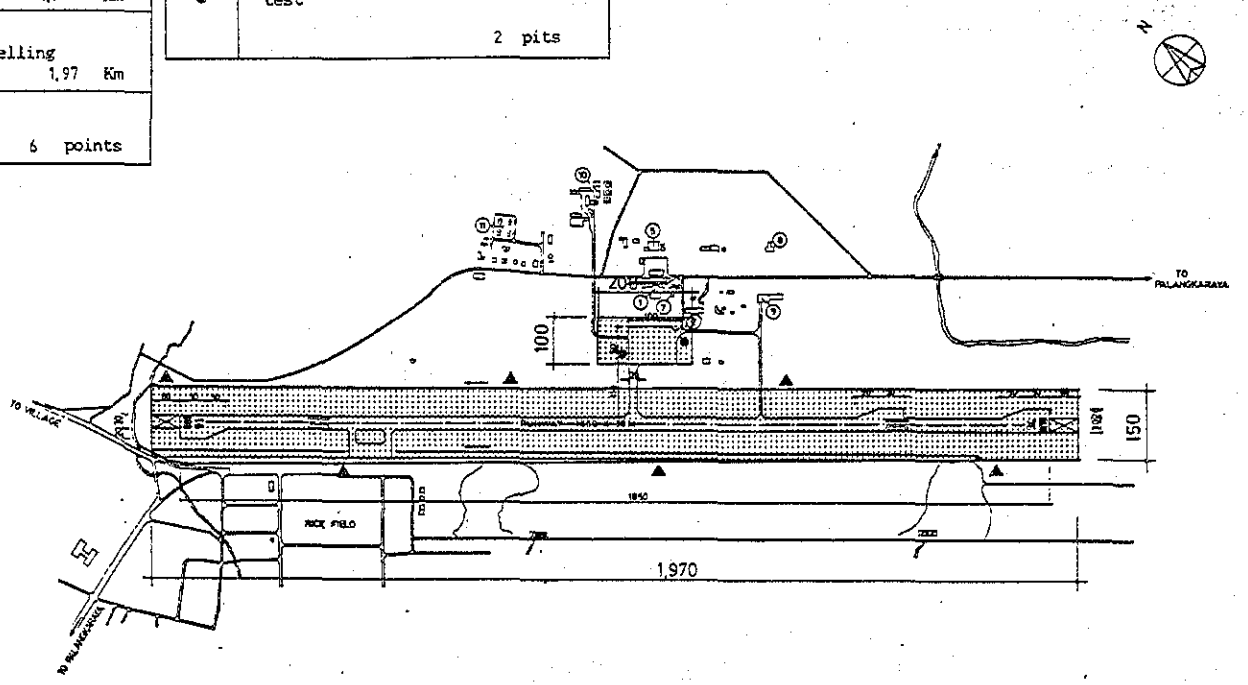
DRAWING TITLE : AIRPORT LAYOUT PLAN

PREPARED BY : THE STUDY ON THE MASTER PLAN OF AIRPORT MAINTENANCE AND REHABILITATION
JAPAN INTERNATIONAL COOPERATION AGENCY

Approved :
Checked :
Drawn :
Drawing No.
Scale :
Date : March '990

LEGEND (TOPOGRAPHIC SURVEY)		
———	Center Line Survey and Profile Levelling	1.97 Km
▭	Area of Cross-section Levelling	1.97 Km
▲	Principal Point	6 points

LEGEND (SOIL INVESTIGATION)		
●	Test pit including field density field CBR and physical property test	2 pits



Appendix 7.2.1 (8) Details of Site Survey

SCALE 0 100 200 500M

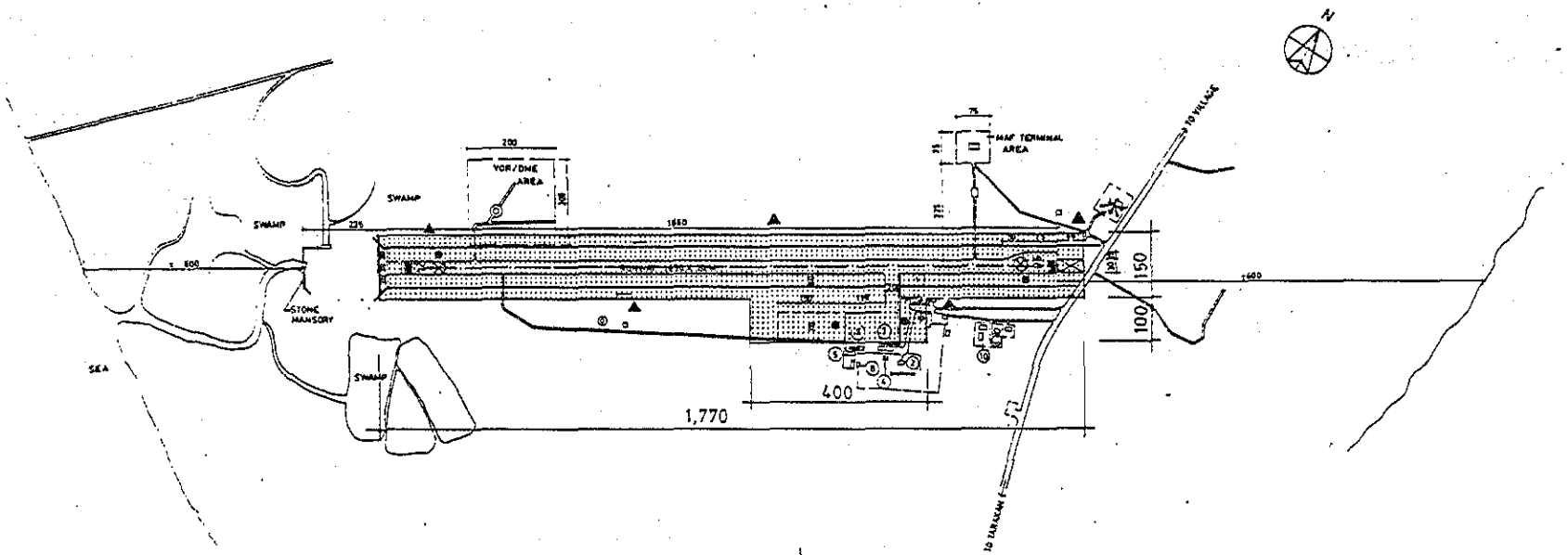
BASIC DATA TABLE			
AIRPORT CLASS	II	RUNWAY DIRECTION	16-34
AIRPORT STATUS	DOMESTIC	INSTRUMENT RUNWAY	
AIRPORT ELEVATION	24.6M	PAVEMENT STRENGTH	PCN 15/FCZU
AIRPORT REF. POINT (ARP) COORDINATES	02°16'S 113°56'E	NAVIGATIONAL AIDS	NDB.
		DISTANCE FROM CITY	12 KM
AIRPORT REF. TEMP.	25°-32°C		

MAJOR BUILDINGS					
NO.	NAME OF BUILDING		NO.	NAME OF BUILDING	
1	PASSENGER TERMINAL	√	7	VIP BUILDING	√
2	ADMINISTRATION BUILDING	√	8	MAIN POWER HOUSE	√
3	OPERATION'S BUILDING		9	FIRE STATION	√
4	CONTROL TOWER		10	FUEL FARM	√
5	WORKSHOP	√	11	STAFF HOUSING	√
6	CARGO TERMINAL BUILDING				

LEGEND	
	FENCE
	DITCH

REV.	DATE	BY	APPD
SOURCE	PALANGKARAYA AIRPORT AUTHORITY		

THE GOVERNMENT OF THE REPUBLIC OF INDONESIA MINISTRY OF COMMUNICATIONS DIRECTORATE GENERAL OF AIR COMMUNICATIONS	Approved : Checked :
CILIK RIWUT / PALANGKARAYA AIRPORT	Drawn :
DRAWING TITLE : AIRPORT LAYOUT PLAN	Drawing No.
PREPARED BY : THE STUDY ON THE MASTER PLAN OF AIRPORT MAINTENANCE AND REHABILITATION JAPAN INTERNATIONAL COOPERATION AGENCY	Scale Date March, 1980



LEGEND (TOPOGRAPHIC SURVEY)

——·——	Center Line Survey and Profile Levelling 1.77 Km
▒	Area of Cross-section Levelling 1.77 Km
▲	Principal Point 5 points

LEGEND (SOIL INVESTIGATION)

●	Test pit including field density field CBR and physical property test 4 pits
⊗	Core sampling including dynamic core penetration test and Marshall stability test 2 places

Appendix 7.2.1 (9) Details of Site Survey

SCALE 0 100 200 500M

BASIC DATA TABLE			
AIRPORT CLASS	III	RUNWAY DIRECTION	06-24
AIRPORT STATUS	INT'L/DOMESTIC	INSTRUMENT RUNWAY	
AIRPORT ELEVATION	6 M	PAVEMENT STRENGTH	PCN 15 F/D/U
AIRPORT REF. POINT (ARP) COORDINATES	03° 20' N 117° 34' E	NAVIGATIONAL AIDS	NDB, VOR/DME,
		DISTANCE FROM CITY	3 Km
AIRPORT REF. TEMP.	32°C		

MAJOR BUILDINGS					
NO.	NAME OF BUILDING	EXIST.	NO.	NAME OF BUILDING	NEW
1	PASSENGER TERMINAL	✓	7	VIP BUILDING	
2	ADMINISTRATION BUILDING	✓	8	MAIN POWER HOUSE	✓
3	OPERATIONS BUILDING	✓	9	FIRE STATION	✓
4	CONTROL TOWER	✓	10	FUEL FARM	✓
5	WORKSHOP	✓	11	STAFF HOUSING	
6	CARGO TERMINAL BUILDING				

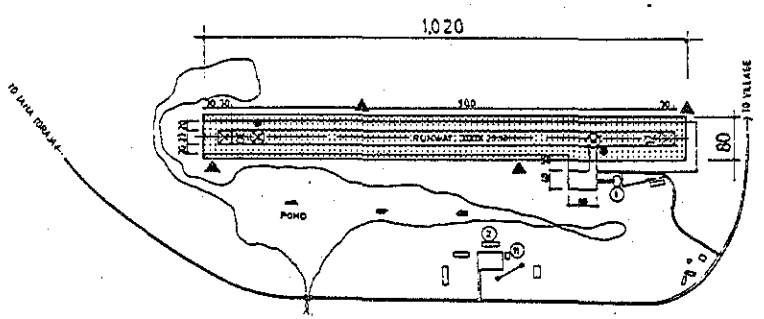
LEGEND

	FENCE
	DITCH

REV.	DATE	BY	APPD

SOURCE : TARAKAN AIRPORT AUTHORITY

THE GOVERNMENT OF THE REPUBLIC OF INDONESIA MINISTRY OF COMMUNICATIONS DIRECTORATE GENERAL OF AIR COMMUNICATIONS	Approved :
TARAKAN AIRPORT	Checked :
DRAWING TITLE : AIRPORT LAYOUT PLAN	Drawn :
PREPARED BY : THE STUDY ON THE MASTER PLAN OF AIRPORT MAINTENANCE AND REHABILITATION JAPAN INTERNATIONAL COOPERATION AGENCY	Drawing No.
	Scale :
	Date : March, 1990



N

LEGEND (TOPOGRAPHIC SURVEY)

———	Center Line Survey and Profile Levelling 1.02 Km
▨	Area of Cross-section Levelling 1.02 Km
▲	Principal Point 4 points

LEGEND (SOIL INVESTIGATION)

●	Test pit including field density field CBR and physical property test 2 pits
⊗	Core sampling including dynamic core penetration test and Marshall stability test 2 places

Appendix 7.2.1 (10) Details of Site Survey

SCALE 0 100 200 500M

BASIC DATA TABLE

AIRPORT CLASS	IV	RUNWAY DIRECTION	13 - 31
AIRPORT STATUS	DOMESTIC	INSTRUMENT RUNWAY	
AIRPORT ELEVATION	825 M	PAVEMENT STRENGTH	
AIRPORT REF POINT (ARP - COORDINATES	03°25'S 119°52'E	NAVIGATIONAL AIDS	NDB
		DISTANCE FROM CITY	3 KM
AIRPORT REF. TEMP.			

MAJOR BUILDINGS

NO.	NAME OF BUILDING	NO.	NAME OF BUILDING
1	PASSENGER TERMINAL	7	VIP BUILDING
2	ADMINISTRATION BUILDING	8	MAIN POWER HOUSE
3	OPERATIONS BUILDING	9	FIRE STATION
4	CONTROL TOWER	10	FUEL FARM
5	WORKSHOP	11	STAFF HOUSING
6	CARGO TERMINAL BUILDING		

LEGEND

←———	FENCE
═══	DITCH

REV	DATE	BY	APPD

SOURCE : TANA TORAJA AIRPORT AUTHORITY

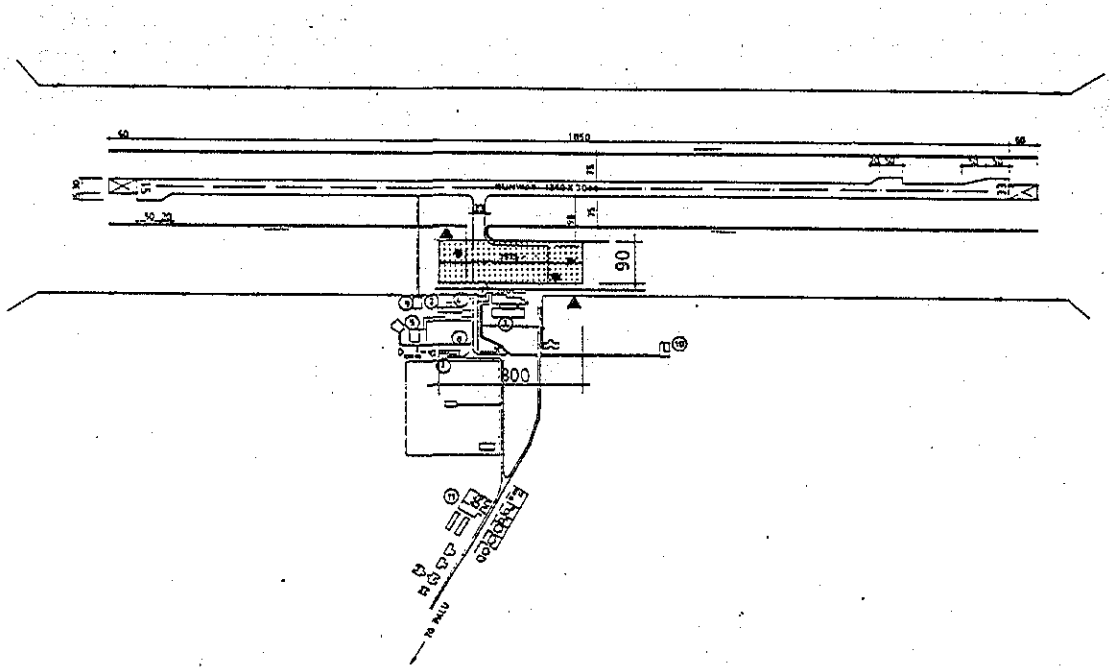
THE GOVERNMENT OF THE REPUBLIC OF INDONESIA
MINISTRY OF COMMUNICATIONS
DIRECTORATE GENERAL OF AIR COMMUNICATIONS

PONGTIKU / TANA TORAJA AIRPORT

DRAWING TITLE : AIRPORT LAYOUT PLAN

PREPARED BY : THE STUDY ON THE MASTER PLAN OF AIRPORT MAINTENANCE AND REHABILITATION
JAPAN INTERNATIONAL COOPERATION AGENCY

Approved :
Checked :
Drawn :
Drawing No.
Scale :
Date : March, 1980



LEGEND
(TOPOGRAPHIC SURVEY)

—·—	Center Line Survey and Profile Levelling 0.3 Km
▨	Area of Cross-section Levelling 0.3 Km
▲	Principal Point 2 points

LEGEND
(SOIL INVESTIGATION)

●	Test pit including field density field CBR and physical property test 2 pits

Appendix 7.2.1 (11) Details of Site Survey

SCALE 0 100 200 500M

BASIC DATA TABLE			
AIRPORT CLASS	II	RUNWAY DIRECTION	15 – 33
AIRPORT STATUS	DOMESTIC	INSTRUMENT RUNWAY	
AIRPORT ELEVATION	87 M	PAVEMENT STRENGTH	PCN 21 F/C/T/U
AIRPORT REF. POINT (ARP) COORDINATES	00°55' S 119°53' E	NAVIGATIONAL AIDS	NDB, VOR/DME
		DISTANCE FROM CITY	2 KM
AIRPORT REF. TEMP.	15°–33° C		

MAJOR BUILDINGS					
NO.	NAME OF BUILDING		NO.	NAME OF BUILDING	
1	PASSENGER TERMINAL	√	7	VIP BUILDING	√
2	ADMINISTRATION BUILDING	√	8	MAIN POWER HOUSE	√
3	OPERATIONS BUILDING	√	9	FIRE STATION	√
4	CONTROL TOWER	√	10	FUEL FARM	√
5	WORKSHOP	√	11	STAFF HOUSING	√
6	CARGO TERMINAL BUILDING				

LEGEND	
	FENCE
	DITCH

REV.	DATE	BY	APPD

SOURCE : PALU AIRPORT AUTHORITY

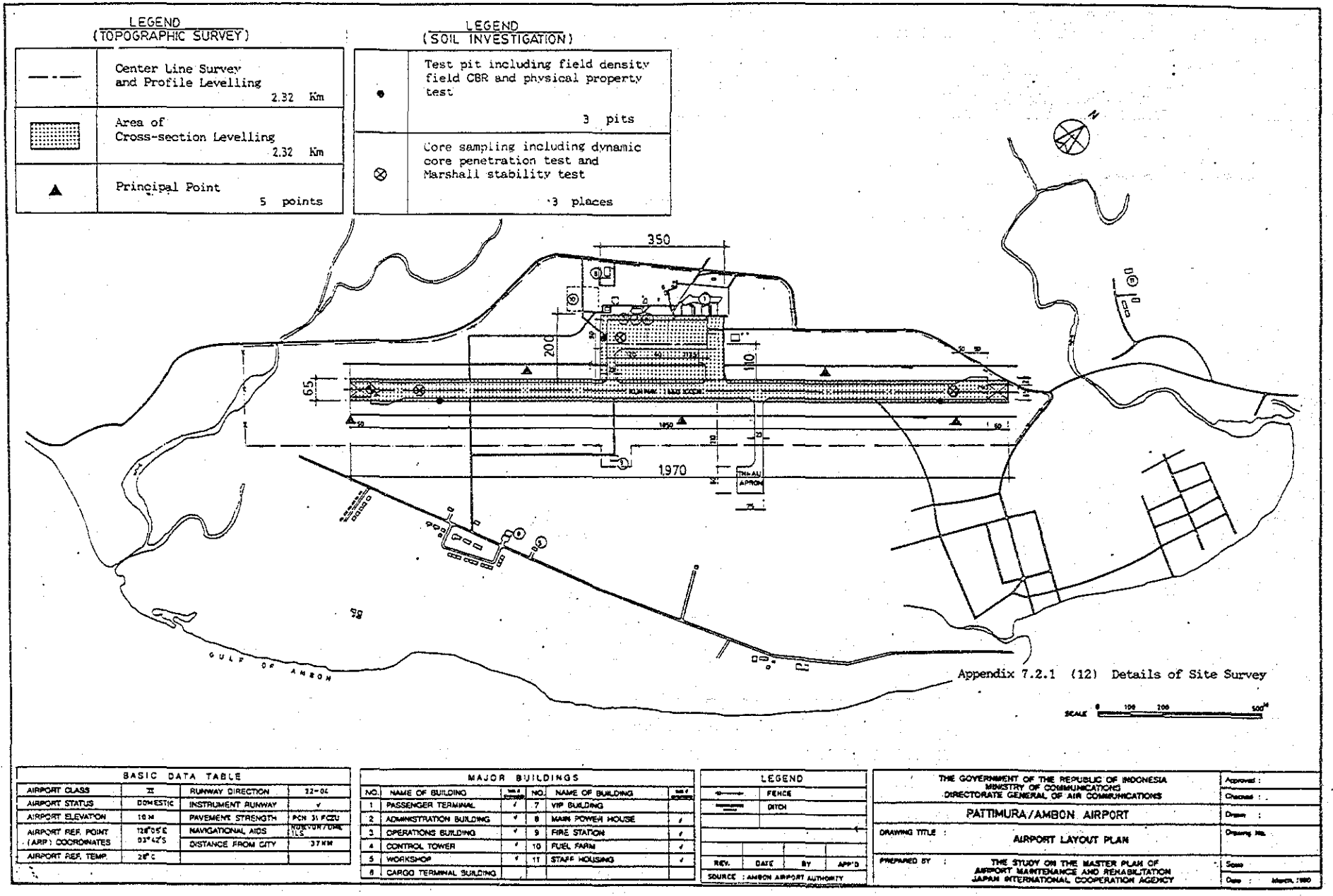
THE GOVERNMENT OF THE REPUBLIC OF INDONESIA
MINISTRY OF COMMUNICATIONS
DIRECTORATE GENERAL OF AIR COMMUNICATIONS

MUTIARA / PALU AIRPORT

DRAWING TITLE : AIRPORT LAYOUT PLAN

PREPARED BY : THE STUDY ON THE MASTER PLAN OF AIRPORT MAINTENANCE AND REHABILITATION
JAPAN INTERNATIONAL COOPERATION AGENCY

Approved | Checked | Drawn | Drawing No. | Scale : | Date : March, 1990



Appendix 7.2.1 (12) Details of Site Survey

BASIC DATA TABLE			
AIRPORT CLASS	II	RUNWAY DIRECTION	32-04
AIRPORT STATUS	DOMESTIC	INSTRUMENT RUNWAY	✓
AIRPORT ELEVATION	10 M	PAVEMENT STRENGTH	PCN 31 FCZU
AIRPORT REF. POINT (ARP) COORDINATES	128°05'E 03°42'S	NAVIGATIONAL AIDS	VOR/DME ILS
		DISTANCE FROM CITY	37 KM
AIRPORT REF. TEMP.	28° C		

MAJOR BUILDINGS					
NO.	NAME OF BUILDING	NO. of FLOORS	NO.	NAME OF BUILDING	NO. of FLOORS
1	PASSENGER TERMINAL	✓	7	VIP BUILDING	
2	ADMINISTRATION BUILDING	✓	8	MAIN POWER HOUSE	✓
3	OPERATIONS BUILDING	✓	9	FIRE STATION	✓
4	CONTROL TOWER	✓	10	FUEL FARM	✓
5	WORKSHOP	✓	11	STAFF HOUSING	✓
6	CARGO TERMINAL BUILDING				

LEGEND
FENCE
DITCH

REV.	DATE	BY	APP'D

SOURCE : AMBON AIRPORT AUTHORITY

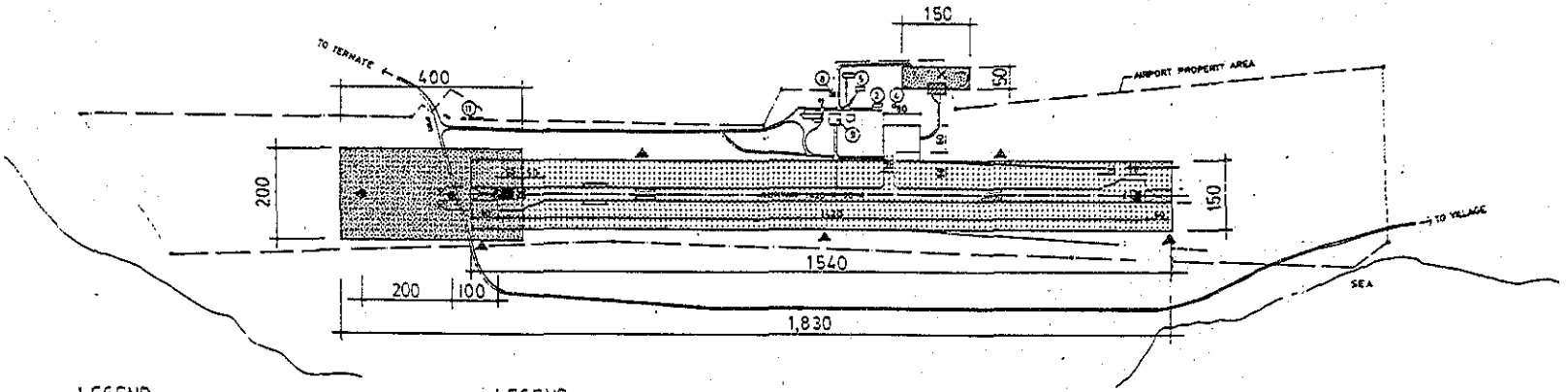
THE GOVERNMENT OF THE REPUBLIC OF INDONESIA
MINISTRY OF COMMUNICATIONS
DIRECTORATE GENERAL OF AIR COMMUNICATIONS

PATTIMURA/AMBON AIRPORT

DRAWING TITLE : AIRPORT LAYOUT PLAN

PREPARED BY : THE STUDY ON THE MASTER PLAN OF AIRPORT MAINTENANCE AND REHABILITATION
JAPAN INTERNATIONAL COOPERATION AGENCY

Approved :
Checked :
Drawn :
Ongoing No.
Scale
Date : March, 1990



LEGEND (TOPOGRAPHIC SURVEY)

Center Line Survey and Profile Levelling	1.83 Km
Area of Cross-section Levelling	1.83 Km
Area of Plane Table Survey	87,500 m^2
Principal Point	5 points

LEGEND (SOIL INVESTIGATION)

Boring including standard penetration test and physical property test	1 point
Test pit including field density field CBR and physical property test	2 pits

LEGEND (BUILDING SURVEY)

Survey and measurement of building structure	2,000 m^2

Appendix 7.2.1 (13) Details of Site Survey

SCALE 0 100 200 500M

BASIC DATA TABLE

AIRPORT CLASS	III	RUNWAY DIRECTION	14-32
AIRPORT STATUS	DOMESTIC	INSTRUMENT RUNWAY	
AIRPORT ELEVATION	15 M	PAVEMENT STRENGTH	PCN 12 FCDU
AIRPORT REF. POINT (ARP) COORDINATES	00° 50' S 127° 23' E	NAVIGATIONAL AIDS	NDB, VOR,
		DISTANCE FROM CITY	4 KM
AIRPORT REF. TEMP.	30° C		

MAJOR BUILDINGS

NO.	NAME OF BUILDING	EXIST.	NO.	NAME OF BUILDING	EXIST.
1	PASSENGER TERMINAL	✓	7	VIP BUILDING	
2	ADMINISTRATION BUILDING	✓	8	MAIN POWER HOUSE	
3	OPERATIONS BUILDING	✓	9	FIRE STATION	✓
4	CONTROL TOWER	✓	10	FUEL FARM	
5	WORKSHOP	✓	11	STAFF HOUSING	✓
6	CARGO TERMINAL BUILDING				

LEGEND

	FENCE
	DITCH

REV.	DATE	BY	APPD

SOURCE : TERNATE AIRPORT AUTHORITY

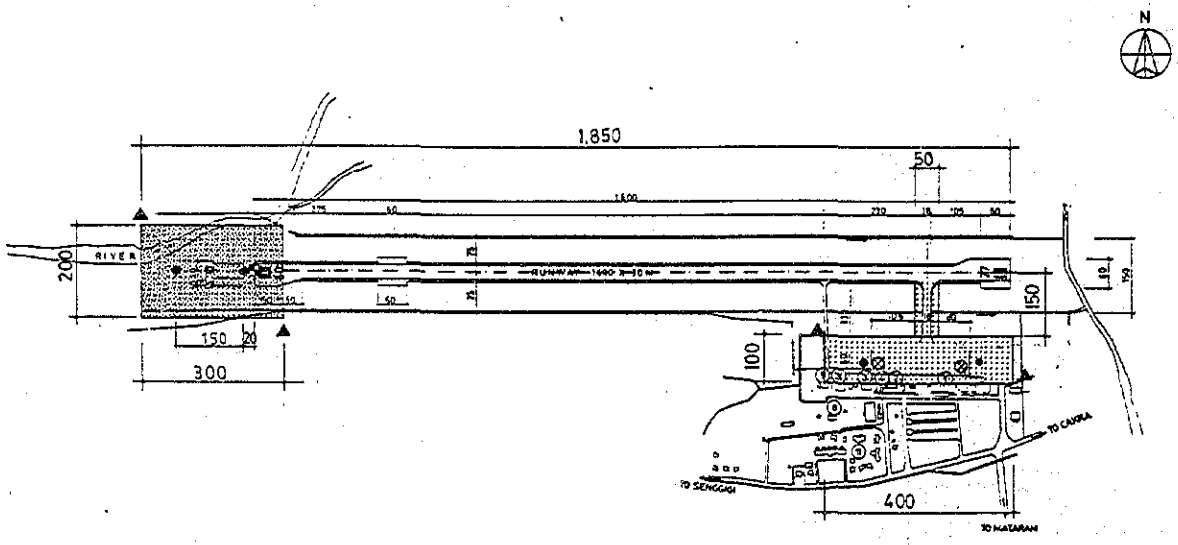
THE GOVERNMENT OF THE REPUBLIC OF INDONESIA
MINISTRY OF COMMUNICATIONS
DIRECTORATE GENERAL OF AIR COMMUNICATIONS

BABULLAH / TERNATE AIRPORT

DRAWING TITLE : AIRPORT LAYOUT PLAN

PREPARED BY : THE STUDY ON THE MASTER PLAN OF AIRPORT MAINTENANCE AND REHABILITATION
JAPAN INTERNATIONAL COOPERATION AGENCY

Approved :
Checked
Drawn
Drawing no.
Scale :
Date March '90



LEGEND
(TOPOGRAPHIC SURVEY)

	Center Line Survey and Profile Levelling 1.85 Km
	Area of Cross-section Levelling 0.7 Km
	Area of Plane Table Survey 60,000 m^2
▲	Principal Point 4 points

LEGEND
(SOIL INVESTIGATION)

●	Test pit including field density field CBR and physical property test 4 pits
⊗	Core sampling including dynamic core penetration test and Marshall stability test 2 places

Appendix 7.2.1 (14) Details of Site Survey

SCALE 0 100 200 500M

BASIC DATA TABLE

AIRPORT CLASS	III	RUNWAY DIRECTION	09-27
AIRPORT STATUS	DOMESTIC	INSTRUMENT RUNWAY	
AIRPORT ELEVATION	15.40 M	PAVEMENT STRENGTH	PCN 20 FCTU
AIRPORT REF. POINT (ARP) COORDINATES	08° 32' S 116° 04' E	NAVIGATIONAL AIDS	NDB, VOR
		DISTANCE FROM CITY	1 KM
AIRPORT REF. TEMP	26.9°C		

MAJOR BUILDINGS

NO.	NAME OF BUILDING	NOW EXISTING	NO.	NAME OF BUILDING	NOW EXISTING
1	PASSENGER TERMINAL	✓	7	VIP BUILDING	✓
2	ADMINISTRATION BUILDING	✓	8	MAIN POWER HOUSE	✓
3	OPERATIONS BUILDING	✓	9	FIRE STATION	✓
4	CONTROL TOWER	✓	10	FUEL FARM	
5	WORKSHOP	✓	11	STAFF HOUSING	✓
6	CARGO TERMINAL BUILDING				

LEGEND

	FENCE
	DITCH

REV.	DATE	BY	APPD

SOURCE : MATARAM AIRPORT AUTHORITY

THE GOVERNMENT OF THE REPUBLIC OF INDONESIA
MINISTRY OF COMMUNICATIONS
DIRECTORATE GENERAL OF AIR COMMUNICATIONS

SELAPARANG / MATARAM AIRPORT

DRAWING TITLE : AIRPORT LAYOUT PLAN

PREPARED BY : THE STUDY ON THE MASTER PLAN OF AIRPORT MAINTENANCE AND REHABILITATION JAPAN INTERNATIONAL COOPERATION AGENCY

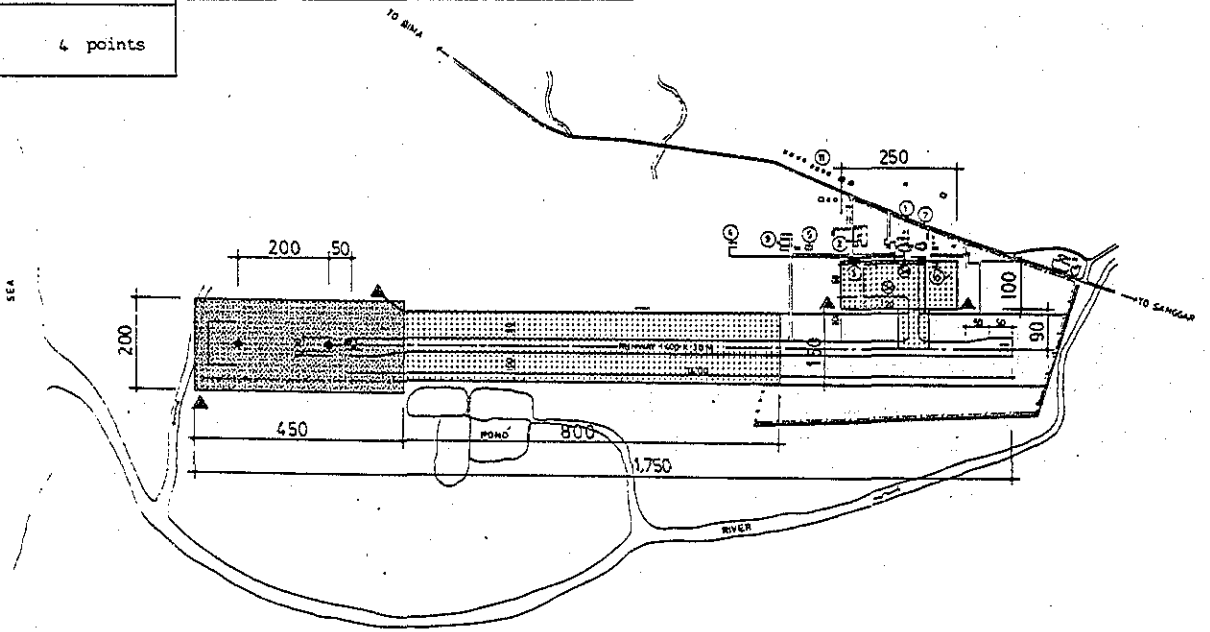
Approved :
Checked :
Drawn :
Drawing No.
Scale :
Date : March, 1990

LEGEND (TOPOGRAPHIC SURVEY)

——·——	Center Line Survey and Profile Levelling 1.75 Km
	Area of Cross-section Levelling 1.5 Km
	Area of Plane Table Survey 90,000 m^2
▲	Principal Point 4 points

LEGEND (SOIL INVESTIGATION)

●	Test pit including field density field CBR and physical property test 4 pits
⊗	Core sampling including dynamic core penetration test and Marshall stability test 2 places



Appendix 7.2.1 (15) Details of Site Survey

SCALE 0 100 200 500M

BASIC DATA TABLE			
AIRPORT CLASS	III	RUNWAY DIRECTION	13-31
AIRPORT STATUS	DOMESTIC	INSTRUMENT RUNWAY	
AIRPORT ELEVATION	1m	PAVEMENT STRENGTH	PCN 11 F/D/ZU
AIRPORT REF. POINT [ARP] COORDINATES	08°30'S 118°42'E	NAVIGATIONAL AIDS	NDB, VOR
		DISTANCE FROM CITY	21 KM
AIRPORT REF. TEMP	29°C		

MAJOR BUILDINGS					
NO.	NAME OF BUILDING	EXIST.	NO.	NAME OF BUILDING	EXIST.
1	PASSENGER TERMINAL	✓	7	VIP BUILDING	✓
2	ADMINISTRATION BUILDING	✓	8	MAIN POWER HOUSE	
3	OPERATIONS BUILDING	✓	9	FIRE STATION	✓
4	CONTROL TOWER	✓	10	FUEL FARM	✓
5	WORKSHOP	✓	11	STAFF HOUSING	✓
6	CARGO TERMINAL BUILDING				

LEGEND

	FENCE
	DITCH

REV.	DATE	BY	APP'D

SOURCE : BIMA AIRPORT AUTHORITY

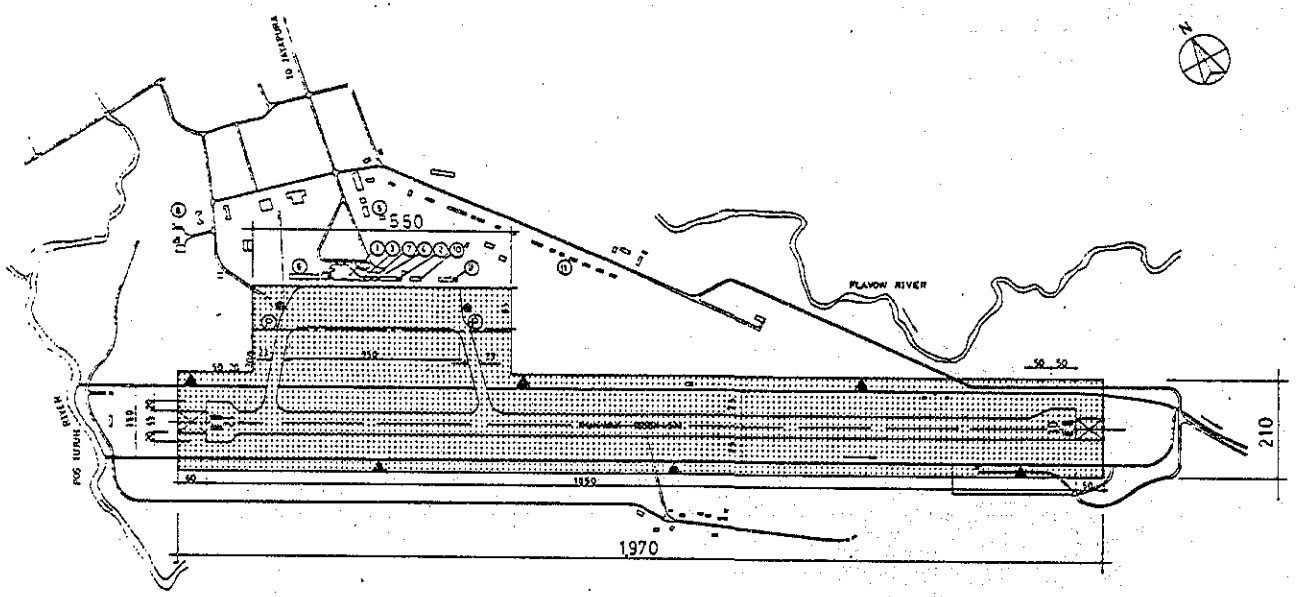
THE GOVERNMENT OF THE REPUBLIC OF INDONESIA
MINISTRY OF COMMUNICATIONS
DIRECTORATE GENERAL OF AIR COMMUNICATIONS

St. SALAHUDIN / BIMA AIRPORT

DRAWING TITLE : AIRPORT LAYOUT PLAN

PREPARED BY : THE STUDY ON THE MASTER PLAN OF AIRPORT MAINTENANCE AND REHABILITATION JAPAN INTERNATIONAL COOPERATION AGENCY

Approved :
Checked :
Drawn :
Drawing No.
Scale :
Date : March '990



LEGEND (TOPOGRAPHIC SURVEY)

Center Line Survey and Profile Levelling	2.52 Km
Area of Cross-section Levelling	2.52 Km
Principal Point	6 points

LEGEND (SOIL INVESTIGATION)

Test pit including field density field CBR and physical property test	2 pits
Plate bearing test	2 places

Appendix 7.2.1 (16) Details of Site Survey

SCALE 0 100 200 500M

BASIC DATA TABLE

AIRPORT CLASS	III	RUNWAY DIRECTION	12 – 30
AIRPORT STATUS	DOMESTIC	INSTRUMENT RUNWAY	/
AIRPORT ELEVATION	88.09 M	PAVEMENT STRENGTH	PCN 25 F/B/Y/U
AIRPORT REF. POINT (ARP) COORDINATES	02° 27'S 140° 37'E	NAVIGATIONAL AIDS	NDB&VOR
		DISTANCE FROM CITY	25 KM
AIRPORT REF. TEMP.	25.8°C		

MAJOR BUILDINGS

NO.	NAME OF BUILDING	NO.	NAME OF BUILDING
1	PASSENGER TERMINAL	7	VIP BUILDING
2	ADMINISTRATION BUILDING	8	MAIN POWER HOUSE
3	OPERATIONS BUILDING	9	FIRE STATION
4	CONTROL TOWER	10	FUEL FARM
5	WORKSHOP	11	STAFF HOUSING
6	CARGO TERMINAL BUILDING		

LEGEND

FENCE

DITCH

REV.	DATE	BY	APP'D

SOURCE JAYAPURA AIRPORT AUTHORITY

THE GOVERNMENT OF THE REPUBLIC OF INDONESIA
MINISTRY OF COMMUNICATIONS
DIRECTORATE GENERAL OF AIR COMMUNICATIONS

SENTANI / JAYAPURA AIRPORT

DRAWING TITLE: AIRPORT LAYOUT PLAN

PREPARED BY: THE STUDY ON THE MASTER PLAN OF AIRPORT MAINTENANCE AND REHABILITATION
JAPAN INTERNATIONAL COOPERATION AGENCY

Approved :
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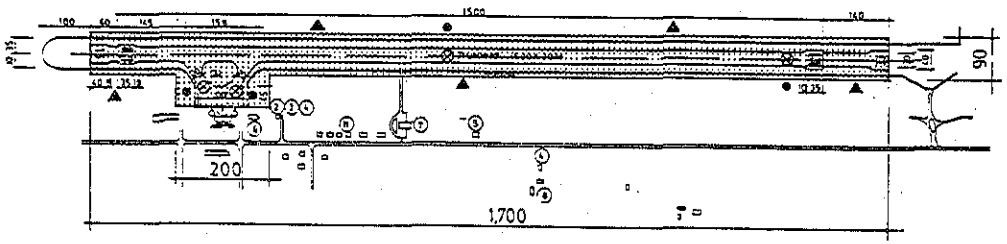
Drawing No.
Scale :
Date : March, 1980



LEGEND
(TOPOGRAPHIC SURVEY)

—·—·—	Center Line Survey and Profile Levelling 1.7 Km
▨	Area of Cross-section Levelling 1.7 Km
▲	Principal Point 5 points

LEGEND
(SOIL INVESTIGATION)

●	Test pit including field density field CBR and physical property test 4 pits
⊗	Core sampling including dynamic core penetration test and Marshall stability test 4 places

Appendix 7.2.1 (17) Details of Site Survey

SCALE 0 100 200 500M

BASIC DATA TABLE			
AIRPORT CLASS	III	RUNWAY DIRECTION	15-33
AIRPORT STATUS	DOM	INSTRUMENT RUNWAY	
AIRPORT ELEVATION	1550 M	PAVEMENT STRENGTH	PCN 19 F/C/U
AIRPORT REF. POINT / ARP'S COORDINATES	04° 39' S 138° 56' E	NAVIGATIONAL AIDS	NDB
		DISTANCE FROM CITY	1 KM
AIRPORT REF. TEMP	19.5°C		

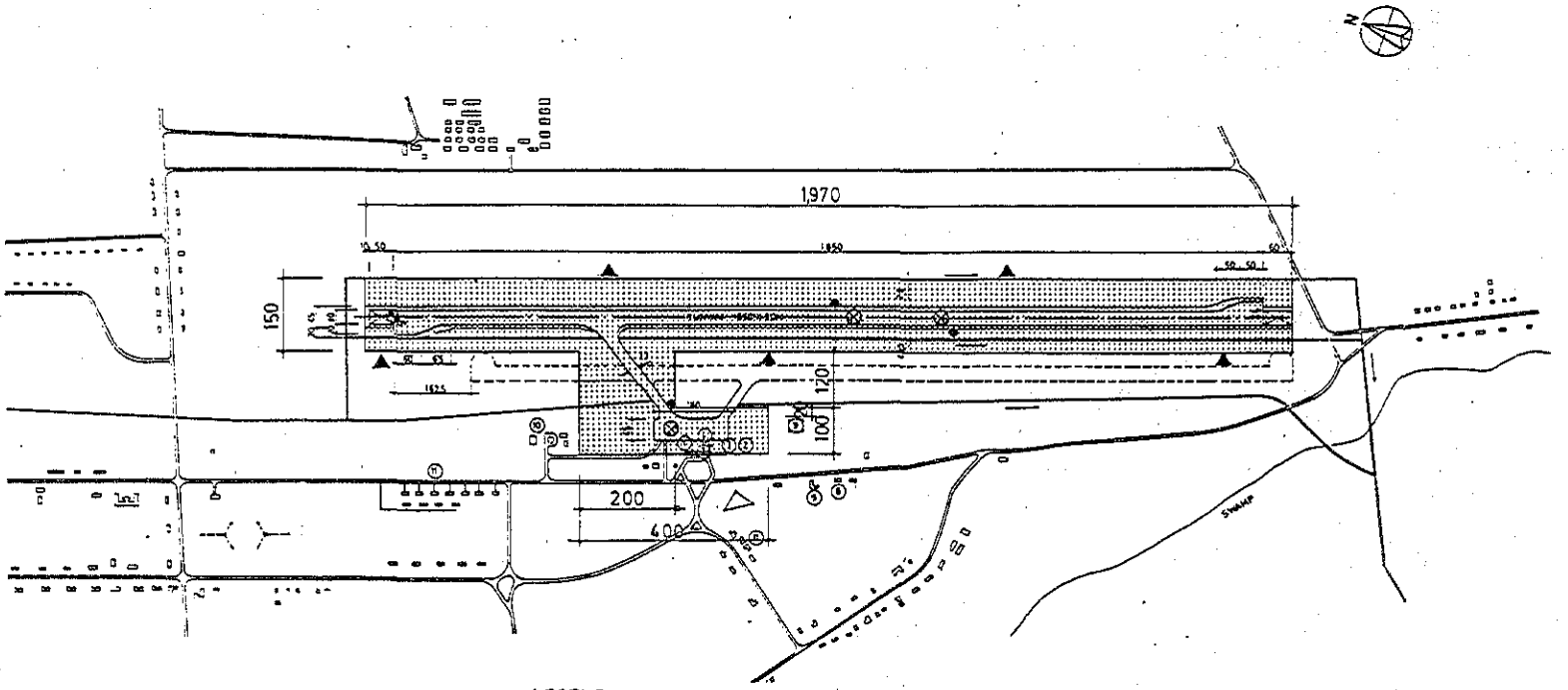
MAJOR BUILDINGS					
NO.	NAME OF BUILDING		NO.	NAME OF BUILDING	
1	PASSENGER TERMINAL	√	7	VIP BUILDING	
2	ADMINISTRATION BUILDING	√	8	MAIN POWER HOUSE	√
3	OPERATIONS BUILDING	√	9	FIRE STATION	√
4	CONTROL TOWER	√	10	FUEL FARM	
5	WORKSHOP	√	11	STAFF HOUSING	√
6	CARGO TERMINAL BUILDING	√			

LEGEND	
	FENCE
	DITCH

REV.	DATE	BY	APP'D

SOURCE : WAMENA AIRPORT AUTHORITY

THE GOVERNMENT OF THE REPUBLIC OF INDONESIA MINISTRY OF COMMUNICATIONS DIRECTORATE GENERAL OF AIR COMMUNICATIONS	Approved :
WAMENA / JAYAWIJAYA AIRPORT	Checked :
DRAWING TITLE : AIRPORT LAYOUT PLAN	Drawn :
	Drawing No.
PREPARED BY : THE STUDY ON THE MASTER PLAN OF AIRPORT MAINTENANCE AND REHABILITATION JAPAN INTERNATIONAL COOPERATION AGENCY	Scale :
	Date : March 1990



LEGEND (TOPOGRAPHIC SURVEY)

—·—	Center Line Survey and Profile Levelling 2.37 Km
▭	Area of Cross-section Levelling 2.37 Km
▲	Principal Point 5 points

LEGEND (SOIL INVESTIGATION)

●	Test pit including field density field CBR and physical property test 3 pits
⊗	Core sampling including dynamic core penetration test and Marshall stability test 3 places

Appendix 7.2.1 (18) Details of Site Survey

SCALE 0 100 200 500M

BASIC DATA TABLE			
AIRPORT CLASS	III	RUNWAY DIRECTION	16-34
AIRPORT STATUS	DOMESTIC	INSTRUMENT RUNWAY	
AIRPORT ELEVATION	2.85M	PAVEMENT STRENGTH	PCN 18 F B X U
AIRPORT REF. POINT (ARP) COORDINATES	8°27'S 140°28'E	NAVIGATIONAL AIDS	NDB,VOR/DME
		DISTANCE FROM CITY	4.3 K M
AIRPORT REF. TEMP	28° C		

MAJOR BUILDINGS					
NO.	NAME OF BUILDING		NO.	NAME OF BUILDING	
1	PASSENGER TERMINAL	✓	7	VIP BUILDING	✓
2	ADMINISTRATION BUILDING	✓	8	MAIN POWER HOUSE	✓
3	OPERATIONS BUILDING	✓	9	FIRE STATION	✓
4	CONTROL TOWER	✓	10	FUEL FARM	✓
5	WORKSHOP	✓	11	STAFF HOUSING	✓
6	CARGO TERMINAL BUILDING				

LEGEND

	FENCE
	DITCH

REV.	DATE	BY	APPD

SOURCE : MERAUKE AIRPORT AUTHORITY

THE GOVERNMENT OF THE REPUBLIC OF INDONESIA
MINISTRY OF COMMUNICATIONS
DIRECTORATE GENERAL OF AIR COMMUNICATIONS

MOPAH / MERAUKE AIRPORT

DRAWING TITLE : AIRPORT LAYOUT PLAN

PREPARED BY : THE STUDY ON THE MASTER PLAN OF AIRPORT MAINTENANCE AND REHABILITATION JAPAN INTERNATIONAL COOPERATION AGENCY

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Drawing No.
Scale :
Date : March, 1990

Appendix to Chapter 14

Appendix 14.3.1 Economic Analysis

1. Introduction

An economic analysis is employed only on some limited works with tangible benefits as supplemental indicator to the qualitative evaluation of the works.

2. Economic Costs of the Project

(1) Construction Cost

The construction costs utilized for the economic analysis are listed in Table A14.3.1 based on the project costs estimated in Chapter 13.

Judging from the urgency of the project, the rehabilitation works of facilities and procurement of equipment of 10 airports are assumed to be started and completed in fiscal year 1992.

TABLE A14.3.1 Construction Cost Utilized for Economic Analysis

(Million Rupiah)

Airport	Extension of Runway	Expansion of Apron	Expansion of Passenger Terminal Building	Combined Cost
1. Semarang	-	-	545	545
2. Pontianak	2,875	-	268	3,143
3. Ternate	9,802	-	146	9,948
4. Mataram	814	65	-	879
5. Bima	1,816	190	-	2,006
6. Merauke	-	27	396	423

(2) Operation and Maintenance Costs

The material, equipment and manpower costs required for the operations and maintenance of the facilities are estimated by the following:

- Civil Facilities : 1% of construction cost
- Building Facilities : 2% of construction cost
- Equipment : 5% of equipment cost for airport maintenance equipment and ancillary equipment for building

3. Project Benefits

(1) Benefits to be Quantified

The rehabilitation works such as runway extension, expansion of apron and passenger terminal building will offer various benefits to each airport. In this section, the following tangible benefits are quantified and evaluated:

a) Benefit due to accommodation of overflowing air passengers by runway extension and apron expansion.

b) Time saving benefit by expansion of check-in lobby, departure lounge and arrival lobby.

(2) Definition of "Without Project Case"

In this estimation the "without project case" is specified as maintaining the existing airport in the present condition with minimum maintenance.

- The existing terminal building in Semarang, Pontianak and Merauke Airports have already reached their capacities in terms of space.
- The take-off weight of the largest aircraft in Ternate, Mataram and Bima Airports are restricted due to the insufficient length of runways.
- Apron space of Mataram, Bima and Merauke Airports are not large enough to provide aircraft stand necessary for air traffic demand in 1995.

Therefore it is assumed that in the "without Project Case" the insufficient space of terminal building, the weight restriction due to insufficient runway length, and lack of

aircraft stand of the above airports will remain constant at the present level.

(3) Unit Benefit in Monetary Terms in "With Project Case"

The time value necessary for the estimation of benefits is calculated based on the analyses with the data collected from DGAC and other organization of train, ship and car transportations.

a) Average Time Value per Passenger by OD Pair
The average time value per passenger calculated by application of the before-mentioned MD MODEL and with using the input data of trip time and trip cost (tariff and charge), all of which are the same as those applied for the demand forecast.

Average time value, in practice, produced by the aggravation for the following two categorized benefits :

*) Average time value for the "diverted" passengers
*) Average time value for the "induced" passengers

Further, these are produced by each origin and destination pair.

b) Total Air Passenger Benefit (=Total Saving Time Benefit) for Air Passengers in- and out-bound at each Airport

The total saving time benefit for the air passengers in- and out-bound at each airport represents or means the total air passengers' benefit in economical sense at the respective airport.

c) Calculated Results for Average Time Value, etc., by Zone OD pair

The calculated results items for the year 1995 and 2004 and by airport are shown in Table A14.3.2

Table A14.3.2 Average Time Value

unit: 1000 Rupiah/person

Airport	Year	
	1995	2004
1. Gunung Sitoli	262	274
2. Palembang	109	114
3. Semarang	128	135
4. Pontianak	176	193
5. Sampit	158	167
6. Ambon	186	203
7. Ternate	223	239
8. Mataram	105	114
9. Bima	142	152
10. Merauke	264	281

4. Evaluation of Rehabilitation Works

The evaluation period of the Project is from the beginning of the investment and up to 10 years after the completion of rehabilitation works taking into account the economic project life of rehabilitation works.

(1) Results of Economic Evaluation

The Economic Internal Rate of Return (EIRR), by Facility and Equipment, and by Airport is shown in Table A14.3.3.

Table A14.3.3 Economic Internal Rate of Return by Facilities

Unit : %

Airport	Rehabilitation Works			Combined
	Extension of Runway	Expansion of Apron	Expansion of Passenger Terminal Building	
1. Semarang	-	-	More than 100	More than 100
2. Pontianak	16	-	More than 100	24
3. Ternate	-1.0	-	46	0
4. Mataram	65	More than 100	-	More than 100
5. Bima	2	More than 100	-	83
6. Merauke	-	More than 100	2	More than 100

Table A14.3.4 EIRR for Runway Extension

Unit : Million Rupiah

Pontianak - Balikpapan	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
(1) Investment Cost	2,875.0										
(2) Ope. & Mait. Cost		28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7
(3) Benefit		424.4	448.9	474.8	502.2	531.2	561.8	594.2	628.5	664.8	703.1
(4) Residual Value											2,235.7
E.I.R.R. = 16.0%	1995 Restricted person / year										
	13 persons x 5 flights / 7-week x 365 = 3,389 persons										
Σ OTOVBij(t) = 0	1995 Total benefit : 3,389 persons x 140.1thousand Rp./person = 474.8 mill.Rp.										

Mataram - Surabaya	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
(1) Investment Cost	814.0										
(2) Ope. & Mait. Cost		8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1
(3) Benefit		499.4	523.4	548.6	575.0	602.6	631.6	661.9	693.7	727.1	762.0
(4) Residual Value											633.1
E.I.R.R. = 65.0%	1995 Restricted person / year										
	11 persons x 12 flights / 7-week x 365 = 6,883 persons										
Σ OTOVBij(t) = 0	1995 Total benefit : 6,883 persons x 79.7thousand Rp./person = 548.6 mill.Rp.										

Ternate - Ambon	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
(1) Investment Cost	9,802.0										
(2) Ope. & Mait. Cost		98.0	98.0	98.0	98.0	98.0	98.0	98.0	98.0	98.0	98.0
(3) Benefit		171.8	181.4	191.6	202.3	213.7	225.7	238.3	251.7	265.8	280.7
(4) Residual Value											7,623.5
E.I.R.R. = -1.0%	1995 Restricted person / year										
	6 persons x 7 flights / 7-week x 365 = 2,190 persons										
Σ OTOVBij(t) = -10%	1995 Total benefit : 2,190 persons x 87.5thousand Rp./person = 191.6 mill.Rp.										

Bima - Dempasar	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
(1) Investment Cost	1,816.0										
(2) Ope. & Mait. Cost		18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2
(3) Benefit		69.9	73.6	77.6	81.8	86.2	90.8	95.7	100.9	106.3	112.0
(4) Residual Value											1,412.6
E.I.R.R. = 1.9%	1995 Restricted person / year										
	3 persons x 6 flights / 7-week x 365 = 939 persons										
Σ OTOVBij(t) = 0	1995 Total benefit : 939 persons x 82.6thousand Rp./person = 77.6 mill.Rp.										

Table A14.3.5 EIRR for Apron Extension

Unit : Million Rupiah

Mataram	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
(1) Investment Cost	65.0										
(2) Ope. & Mait. Cost		0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
(3) Benefit		1,113.4	1,168.6	1,226.4	1,287.1	1,350.8	1,417.7	1,487.9	1,561.5	1,638.8	1,720.0
(4) Residual Value											50.7
E.I.R.R. = 1,711.7%	1995 Restricted flight CS212 1 flight / week, capacity 20 persons										
	1995 Restricted person / day 20 x 0.8 x 2 x 365 = 11,680										
Σ OTOVBij(t) = 0	1995 Total benefit : 11,680 persons x 105.0thousand Rp./person = 1,226.4 mill.Rp.										

Bima	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
(1) Investment Cost	190.0										
(2) Ope. & Mait. Cost		1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
(3) Benefit		1,506.6	1,580.8	1,658.6	1,740.2	1,825.9	1,915.8	2,010.1	2,109.0	2,212.8	2,321.7
(4) Residual Value											147.6
E.I.R.R. = 797.8%	1995 Restricted flight CS212 1 flight / week, capacity 20 persons										
	1995 Restricted person / day 20 x 0.8 x 2 x 365 = 11,680										
Σ OTOVBij(t) = 0	1995 Total benefit : 11,680 persons x 142.0thousand Rp./person = 1,658.6 mill.Rp.										

Merauke	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
(1) Investment Cost	27.0										
(2) Ope. & Mait. Cost		0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
(3) Benefit		2,794.9	2,935.1	3,082.4	3,237.1	3,399.5	3,570.0	3,749.1	3,937.2	4,134.8	4,342.2
(4) Residual Value											97.6
E.I.R.R. = 12,316.6%	1995 Restricted flight CS212 1 flight / week, capacity 20 persons										
	1995 Restricted person / day 20 x 0.8 x 2 x 365 = 11,680										
Σ OTOVBij(t) = 0	1995 Total benefit : 11,680 persons x 263.9thousand Rp./person = 3,082.4 mill.Rp.										

Table A14.3.6 EIRR for Expansion of Passenger Terminal building

Unit : Million Rupiah

Semarang	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
(1) Investment Cost	545.0										
(2) Ope. & Mait. Cost		10.9	10.9	10.9	10.9	10.9	10.9	10.9	10.9	10.9	10.9
(3) Benefit		1,458.7	1,531.5	1,608.0	1,688.3	1,772.6	1,861.1	1,954.1	2,051.7	2,154.1	2,261.7
(4) Residual Value											408.9
E.I.R.R. = 270.6 %	1995 Saving time = 0.17(10 minutes), Average time valve : 13.3 thpusand Rupiah Number of Passengers : 711,335 / year										
Σ OTOVBij(t) = 0	1995 Total benefit : 711,335 persons x 13.3thousand x 0.17 = 1,608 mill. Rp.										

Pontianak	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
(1) Investment Cost	268.0										
(2) Ope. & Mait. Cost		5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
(3) Benefit		267.8	281.5	296.0	311.2	327.2	344.0	361.6	380.2	399.7	420.3
(4) Residual Value											200.9
E.I.R.R. = 103.2 %	1995 Saving time = 0.17(10 minutes), Average time valve : 3.67 thpusand Rupiah Number of Passengers : 474,289 / year										
Σ OTOVBij(t) = 0	1995 Total benefit : 474,289 persons x 3.67thousand x 0.17 = 296 mill. Rp.										

Ternate	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
(1) Investment Cost	146.0										
(2) Ope. & Mait. Cost		2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9
(3) Benefit		64.3	67.6	71.0	74.6	78.4	82.3	86.5	90.9	95.5	100.3
(4) Residual Value											109.7
E.I.R.R. = 46.4 %	1995 Saving time = 0.17(10 minutes), Average time valve : 5.31 thpusand Rupiah Number of Passengers : 78,637 / year										
Σ OTOVBij(t) = 0	1995 Total benefit : 78,637 persons x 5.31thousand x 0.17 = 71 mill. Rp.										

Merauke	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
(1) Investment Cost	396.0										
(2) Ope. & Mait. Cost		8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3
(3) Benefit		20.9	21.9	23.0	24.2	25.4	26.6	28.0	29.4	30.9	32.4
(4) Residual Value											310.1
E.I.R.R. = 2.1 %	1995 Saving time = 0.17(10 minutes), Average time valve : 3.57 thpusand Rupiah Number of Passengers : 37,231 / year										
Σ OTOVBij(t) = 0	1995 Total benefit : 37,231 persons x 3.57thousand x 0.17 = 23 mill. Rp.										

Table A14.3.7 EIRR for Runway Extension, Apron Extension and Expansion of Passenger Terminal Building

Unit : Million Rupiah

Semarang	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
(1) Investment Cost	545.2										
(2) Ope. & Mait. Cost		10.9	10.9	10.9	10.9	10.9	10.9	10.9	10.9	10.9	10.9
(3) Benefit		1,458.7	1,531.5	1,608.0	1,688.3	1,772.6	1,861.1	1,954.1	2,051.9	2,164.7	2,261.7
(4) Residual Value											408.9
(5) E.I.R.R	270.6 %										

Pontianak	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
(1) Investment Cost	3,142.4										
(2) Ope. & Mait. Cost		34.1	34.1	34.1	34.1	34.1	34.1	34.1	34.1	34.1	34.1
(3) Benefit		692.2	730.4	770.8	813.4	858.3	905.8	955.9	1,008.7	1,064.5	1,123.4
(4) Residual Value											2,436.6
(5) E.I.R.R	24.2 %										

Ternate	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
(1) Investment Cost	9,947.9										
(2) Ope. & Mait. Cost		100.9	100.9	100.9	100.9	100.9	100.9	100.9	100.9	100.9	100.9
(3) Benefit		236.1	249.0	262.6	276.9	292.1	308.0	324.9	342.6	361.3	381.1
(4) Residual Value											7,733.2
(5) E.I.R.R	-0.2 %										

Mataram	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
(1) Investment Cost	879.2										
(2) Ope. & Mait. Cost		8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8
(3) Benefit		1,612.9	1,692.0	1,775.0	1,862.1	1,953.4	2,049.3	2,149.8	2,255.3	2,365.9	2,482.0
(4) Residual Value											683.8
(5) E.I.R.R	187.4 %										

Bima	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
(1) Investment Cost	2,006.2										
(2) Ope. & Mait. Cost		20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1
(3) Benefit		1,576.5	1,654.4	1,736.2	1,822.0	1,912.1	2,006.6	2,105.8	2,209.9	2,319.1	2,433.7
(4) Residual Value											1,560.2
(5) E.I.R.R	82.5 %										

Merauke	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
(1) Investment Cost	423.0										
(2) Ope. & Mait. Cost		8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5
(3) Benefit		2,815.8	2,957.0	3,105.4	3,261.2	3,424.8	3,596.7	3,777.1	3,966.6	4,165.6	4,374.6
(4) Residual Value											310.1
(5) E.I.R.R	623.7 %										

Appendix 14.3.2 Further Study for Pavement Ovelay

1. Necessity of further study for overlay works

   Existing pavement will be overlaid in order to increase its strength, to improve the deteriorated surface or to secure the safe longitudunal slope. From the view point of the scale of maintenance and rehabilitation works, excessive investment due to thick overlay is not practical to realize the project. The thickness of overlay works are summarized in Table 14.3.8.

   Further studies are carried out in Palembang, Sampit and Ambon airports where thick overlay works are required.

2. Alternative overlay methods

   Thick overlay works in Palembang and Ambon airports are caused from the serious undulations and steep slopes of runway. The reduction of pavement thickness for saveing investment cost oblige to sacrifice the safe aircraft operation. Therefore temporary overlay with minimum thickness,as an alternative overlay method,is not recommendable.

   In Sampit airport overlay thickness is estimated based on the condition of weak foundation. An alternative method i.e. temporary overlay with minimum thickness, is proposed in oder to compromise between the improvement of pavement by low cost and the countermeasure to the damage by settlement. This alternative method is practical in the case of shortage of budget or in the case that weak foundation cause settlement for long term. The comparison study was carried out and the results are shown in the Table 14.3.9.

Table A14.3.8 Study for Alternative Method of Overlay Works

AIRPORT	OVERLAY			PRACTICABILITY OF EMPLEMENTATION FOR OVERLAY WORKS	ALTERNATIVE METHOD
	RUNWAY	TAXIWAY	APRON		
Gunung Sitoli	o (Def)	o (Def)	o (Def)	No problem (T=11cm)	-
Palembang	o (Def)+(Slo)			1. High cost(T=42cm)	1. Temporary overlay with min. thick
Pontianak		o (Str)		No problem (T=14cm)	-
Sampit	o (Str)			1. High cost(T=32cm) 2. Settlement	1. Temporary overlay with min. thickness 2. Re-pave runway closing airport operation
Ambon	o (Def)+(Slo)	o (Def)+(Slo)	o (Def)	1. High cost(T=49cm)	1. Temporary overlay with min. thick
Mataram			o (Str)	No problem (T=14cm)	-
Bima		o (Str)	o (Str)	No problem (T=14cm)	-
Merauke	o (Def)+(Slo)	o (Def)+(Slo)	o (Def)+(Slo)	No problem (T=8cm)	-

Note :

(Def); Overlay to correct defects
(Str); Overlay to increase strength
(Slo); Overlay to change slope

Table A14.3.9 Comparison Table for improvement of Runway Pavement in Sampit

Existing Pavement :

Asphalt surface course	: 5 cm
Graded aggregate base course	: 15 cm
Compacted sand sub-base course:	5 cm
Total	: 25 cm

New Pavement :

Surface and binder course	: 10 cm
Base Course	: 15 cm
Subbase Course	: 25 cm
Total	: 50 cm

Item	Method of Improvement			
	Overlaid with asphalt (T req.= 32 cm)	Overlaid with asphalt (T min.= 7 cm)	Demolish pavement & subgrade (70cm) compact subgrade (20cm) and re-pave 50cm thick	Demolish pavement & subgrade (150cm) compact subgrade (100cm) and re-pave 50cm thick
Cost (Rp./m2)	Surface 42,000 (t=4cm) Binder 23,000 (t=3cm) Total 65,000	Surface 42,000 (t=4cm) Binder 150,000 (t=2&cm) Total 192,000	Demolish 8,000 (t=70cm) Compaction 10,000 (t=20cm 1 layer) Re-Pavement 140,000 (t=50cm) Total 158,000	Demolish 10,000 (t=150cm) Compaction 50,000 (t=100cm 5 layer) Re-Pavement 140,000 (t=50cm) Total 210,000
Construction Period (Month)	3	1	4	5
Suspension of Airport Operation	Not necessary	Not necessary	Necessary	Necessary
Technical Reliability	High	High	Low	High