APPENDIX TO CHAPTER 9

APPENDIX-9.2.1 CALCULATION OF RAINFALL INTENSITY

(1) Rainfall Intensity Duration Curve

Rainfall intensity duration curve is calculated by German consultant and shown in Table A.9.1.1.

Table A.9.1.1 Rainfall Intensity Duration Curve

Duration (min)	10	20	30	40	50	60
5 year recurrence (mm/hr)	174.6	138.6	113.4	97.2	84.6	75.6
10 year recurrence (mm/hr)	174.6	169.2	144.7	126.0	109.8	100.8

(2) Rainfall Intensity

Rainfall intensity is determined based on the Japanese standard for designing of drainage systems. 10 years return period is adopted for the design of storm water drainage. The detailed process of calculation is as follows:

$$i = \frac{a}{t + b}$$

$$b = \frac{60 - 10 \times \beta}{\beta - 1}$$

$$\beta = \frac{I_{10}}{R_{60}}$$

$$a = R_{60} \times (b + 60)$$

where i : Rainfall intensity
t : Time of concentration
a,b : Constants
β : Specific modulus
R_{60} : Rainfall precipitation for 60 minutes
I_{60} : Rainfall precipitation for 10 minutes

therefore, $\beta = \frac{174.6}{100.8} = 1.73$

$$b = \frac{60 - 10 \times 1.73}{1.73 - 1} = 58.49$$

$$a = 100.8 \times (58.49 + 60) = 11.944$$

$$i = \frac{11.944}{t + 58.49}$$

APPENDIX-9.3.1 REQUIRED FLOOR AREA OF MAIN COMPONENTS OF PASSENGER TERMINAL BUILDING

The required floor area of the major components of the new passenger terminal building are calculated by using the criteria of International Air Transport Association (IATA) as well as the data obtained from the survey. The peak hour number of passengers (a in the succeeding formula) are as follows:

Short-term development (year 2000)

International	: 360	(both ways)
	180	(one way) for 260 aircraft seats
Domestic	: 80	(both ways)
	44	(one way)

Long-term development (year 2010)

International	: 520	(both ways)
	260	(one way) for 370 aircraft seats
Domestic	: 146	(both ways)
	73	(one way)

(1) Number of Required International Check-in Counters

$N = a/60 \times t1 + (10\%)$ $t1 = 1.8$

- Short-term: 5.940 → 6 + 1 ticket counter
- Long-term: 8.580 → 8 + 1 ticket counter

(2) Number of Required Departure Immigration Counters

$N = a/60 \times t2 + (10\%)$ $t2 = 0.5$

- Short-term: 1.650 → 2
- Long-term: 2.38 → 3

(3) Number of Required Security Check Counters

$N = a/300 \times t3 + (10\%)$ $t3 = 0.9$

- Short-term: 0.59 → 1
- Long-term: 0.86 → 1

(4) Required Floor Area for International Departure Public Area

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

4-1) Check-in queue area:
(Total length of check-in counters + ticket counters) x 10 x 1.2

- Short-term: (1.75 x 6 + 2) x 10 x 1.2 = 150 sq.m
- Long-term: (1.75 x 8 + 2) x 10 x 1.2 = 192 sq.m

4-2) Lobby area for Passengers and Visitors

A = 0.75 x a(1 + W) W: Number of visitors per passenger 1.1

- Short-term: 284 sq.m
- Long-term: 410 sq.m

4-3) Total Floor Area Required

- Short-term: 434 sq.m
- Long-term: 602 sq.m

(5) Required Floor Area for International Departure Lounge

Floor area = Number of Required Seats x Standard Floor Area per Seat

- Short-term: 260 seats x 1.5 sq.m/seat = 390 sq.m
- Long-term: 370 seats x 1.5 sq.m/seat = 555 sq.m

(6) Arrival Immigration Counters and Arrival Hall

N = a/60 x t4 + (10%) t4 = 1.8
A = 0.82a

- Short-term: N = 5.94 → 6 A = 148 sq.m
- Long-term: N = 8.58 → 9 A = 213 sq.m

(7) Customs Clearance Counters and its Queuing Area

N = a/60 x t5 + (20%) t5 = 1.0
A = 0.25a + (10%)

- Short-term: N = 3.60 → 4 A = 49 sq.m
- Long-term: N = 5.20 → 5 A = 72 sq.m

(8) Number of Baggage Claim Devices and its Dwelling Area

N = a/300
A = 0.9a + 10%

- Short-term: N = 0.60 → 1 A = 178 sq.m
- Long-term: N = 0.87 → 1 A = 257 sq.m

(9) Number of Required Domestic Check-in Counters

N = a/60 x t1 + (10%) t1 = 1.0

- Short-term: 0.806 → 1 + 1 ticket counter
- Long-term: 1.338 → 2 + 1 ticket counter

(10) Required Floor Area for Domestic Departure Public Area

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

10-1) Check-in queue area:
(Total length of check-in counters + ticket counters) x 10 x 1.2

- Short-term: (1.75 + 2) x 10 x 1.2 = 45 sq.m
- Long-term: (2 x 1.75 + 2) x 10 x 1.2 = 66 sq.m

10-2) Lobby area for Passengers and Visitors

Required floor area = 0.75a

- Short-term: 33 sq.m
- Long-term: 60 sq.m

10-3) Total floor area

- Short-term: 78 sq.m
- Long-term: 126 sq.m

(11) Required Floor Area for Domestic Departure Lounge

Floor area = 1.33a + (10%)

- Short-term: 64 sq.m
- Long-term: 106 sq.m

APPENDIX TO CHAPTER 10

APPENDIX-10.2.1 STANDARD INSTRUMENT DEPARTURE

Standard Instrument Departure at HONIARA International Airport

HONIARA ONE DEPARTURE

Take off runway 06 : Climb on runway heading until 500 feet, then.....

Take off runway 24 : Complete right turn within 3nm, then.....

Climb via HONIARA R-060 (060 degrees from HONIARA NDB) to 4,500 feet or above within 18nm, then turn left, proceed via HONIARA R-045 (225 degrees to HONIARA NDB) to HONIARA VOR (HONIARA NDB).

Cross HONIARA VOR (HONIARA NDB) at 8,000 feet or an altitude specified by ATC.

GUADALCANAL ONE DEPARTURE

Take off runway 06 : Climb on runway heading until 500 feet, then.....

Take off runway 24 : Complete right turn within 3nm, then.....

Climb via HONIARA R-015 (015 degrees from HONIARA NDB) to 4,500 feet or above within 18nm, then turn left, proceed via HONIARA R-360 (180 degrees to HONIARA NDB) to HONIARA VOR (HONIARA NDB).

Cross HONIARA VOR (HONIARA NDB) at 8,000 feet or an altitude specified by ATC.

SOUTH ONE DEPARTURE

Take off runway 06 : Climb on runway heading until 500 feet, then.....

Take off runway 24 : Complete right turn within 3nm, then.....

Climb via HONIARA R-060 to 4,500 feet or above, then turn right proceed via HONIARA 18 DME clockwise ARC to intercept and proceed via following transitions.

GRACIOSA BAY Transition : via HONIARA R-093 to CHARLIE. Cross CHARLIE at an altitude specified by ATC.

Port Vila Transition : via HONIARA R-127 to ECHO.
Corss ECHO at an altitude specified by ATC.

NORTH ONE DEPARTURE

Take off runway 06 : Climb on runway heading until 500 feet, then.....

Take off runway 24 : Complete right turn within 3nm, then.....

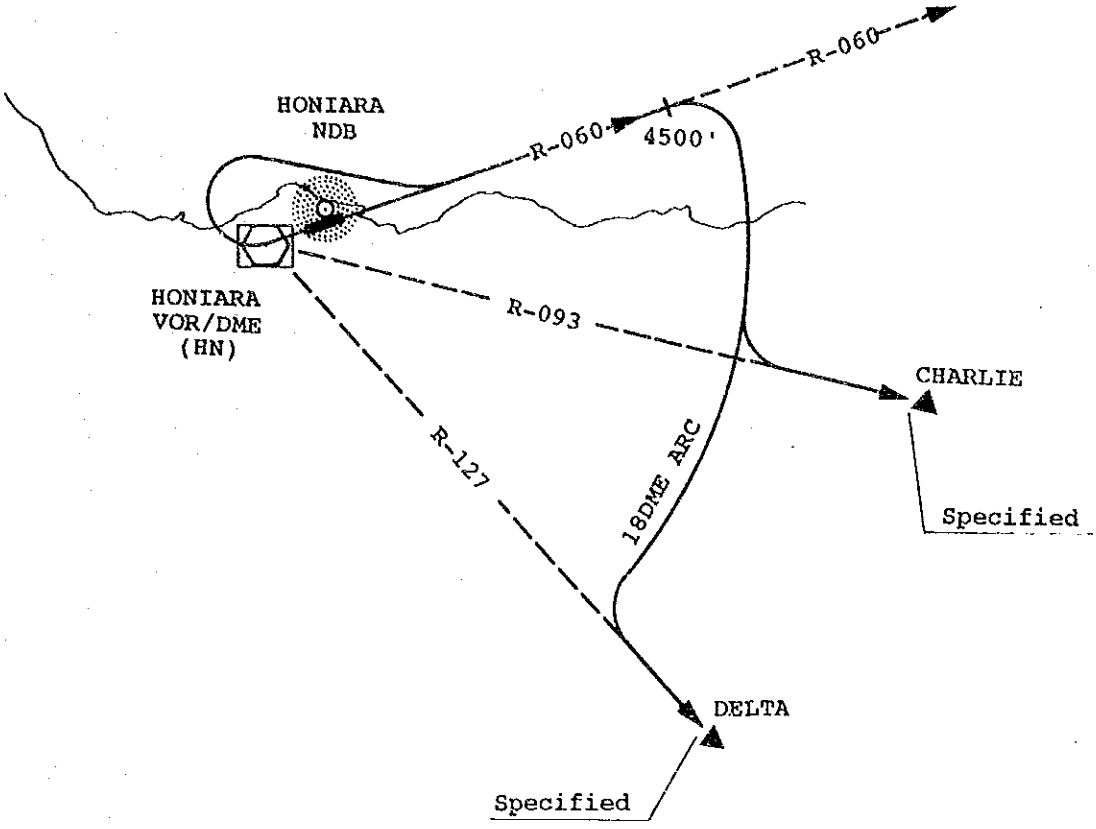
Climb via HONIARA R-060 to 4,500 feet or above, then turn right via HONIARA 18 DME counter-clockwise ARC to intercept and proceed via HONIARA R-029 to ALFA. Cross ALFA at an altitude specified by ATC.

TAKE OFF MINIMA

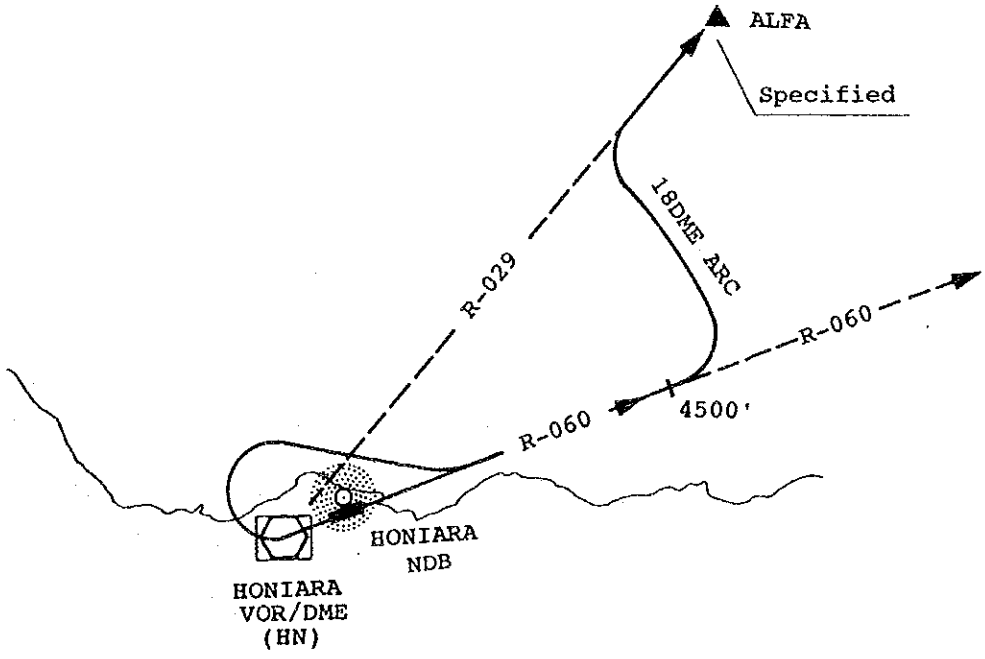
<table>
<tr><td colspan="4">I. Departure alternate airport is provided.</td></tr>
<tr><td colspan="2" rowspan="2"></td><td>Runway center line marking only available</td><td>Runway edge lights or runway center line lights available</td><td>Runway edge lights and runway center line lights available</td></tr>
<tr><td>CEIL - VIS</td><td>CEIL - VIS</td><td>CEIL - VIS</td></tr>
<tr><td>R
W
Y</td><td>06

24</td><td>300 ft - 1,200 m</td><td>300 ft - 1,000 m</td><td>300 ft - 800 m</td></tr>
<tr><td colspan="4">II. Departure alternate airport is not provided.</td></tr>
<tr><td>R
W
Y</td><td>06

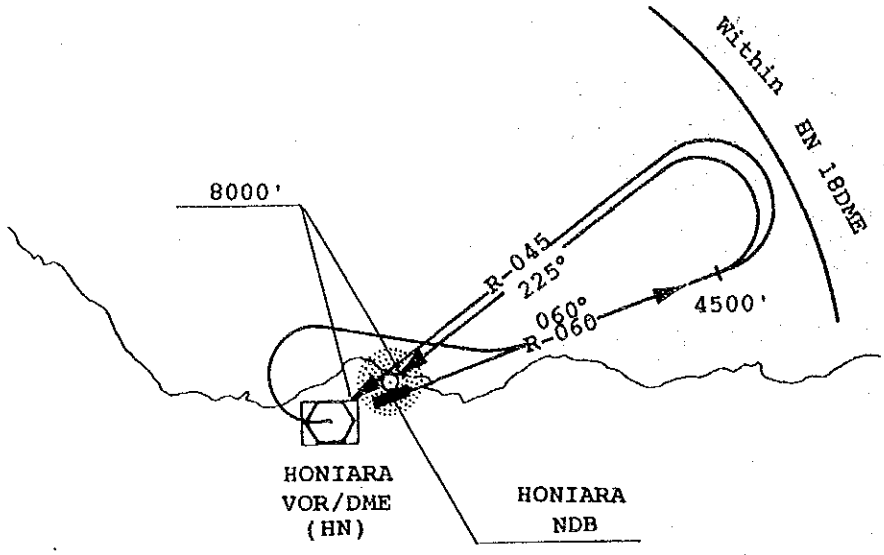
24</td><td colspan="3">Same as LANDING MINIMA</td></tr>
</table>



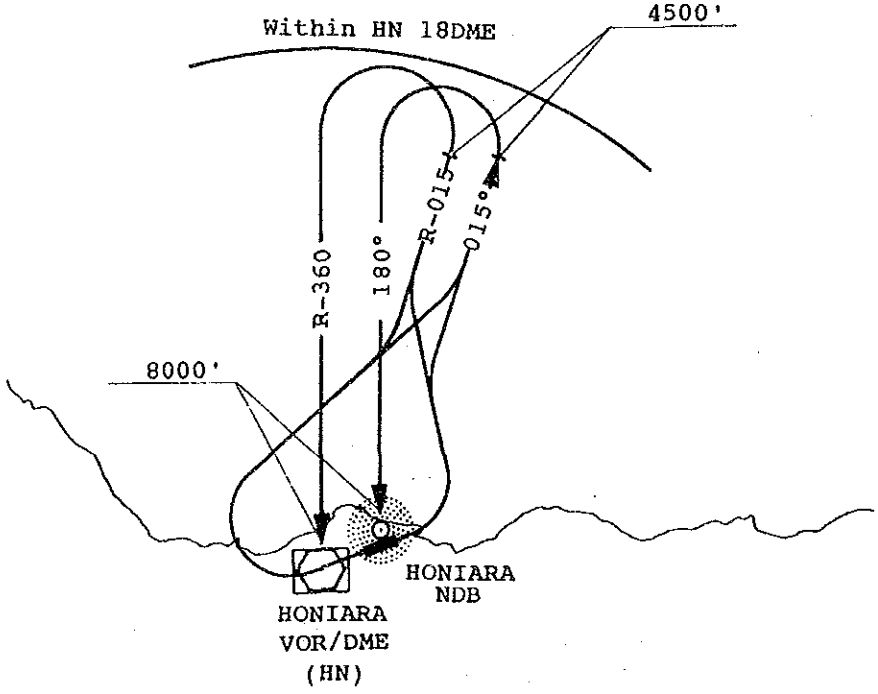
SOUTH ONE DEPARTURE



NORTH ONE DEPARTURE



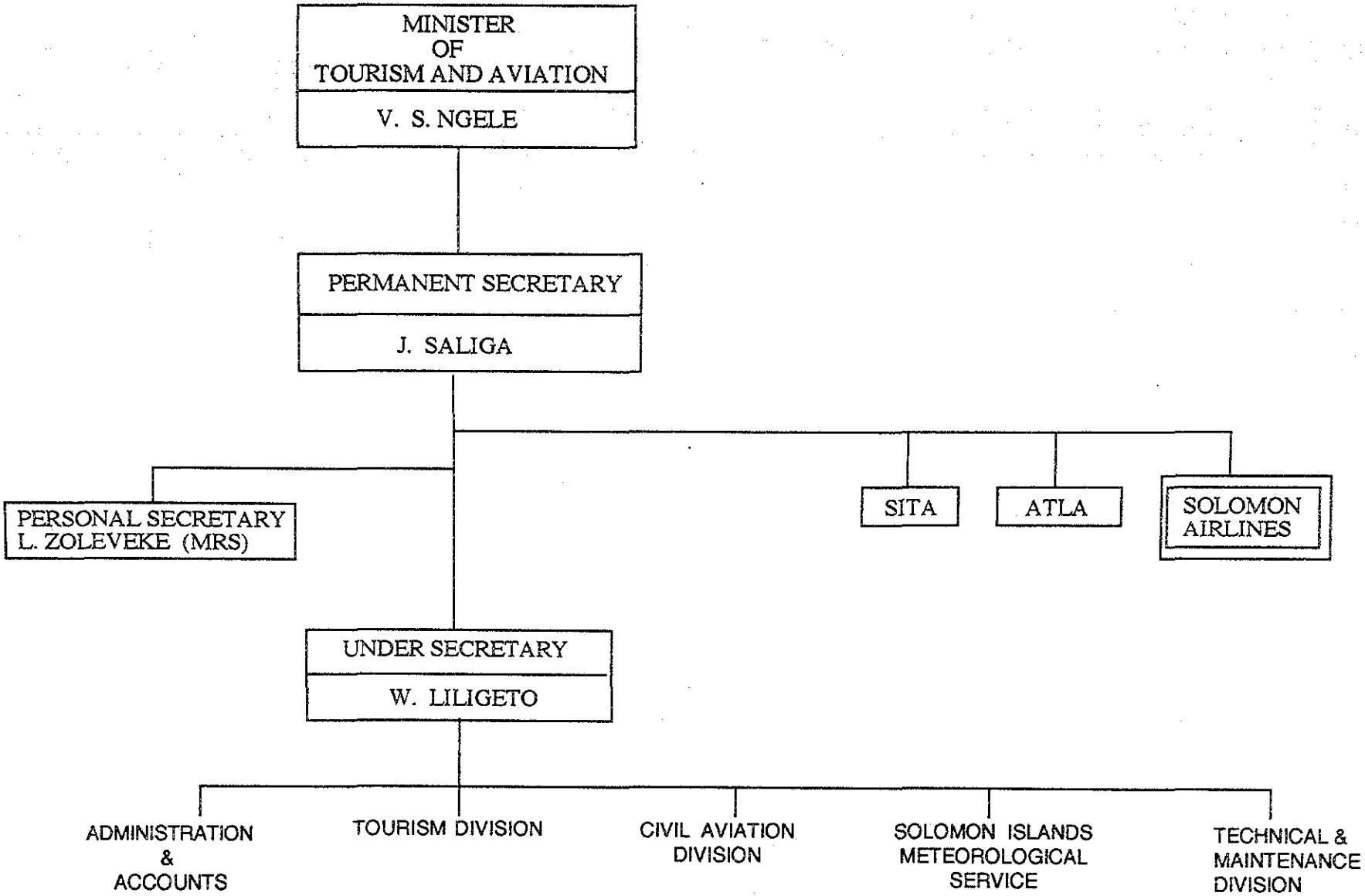
HONIARA ONE DEPARTURE



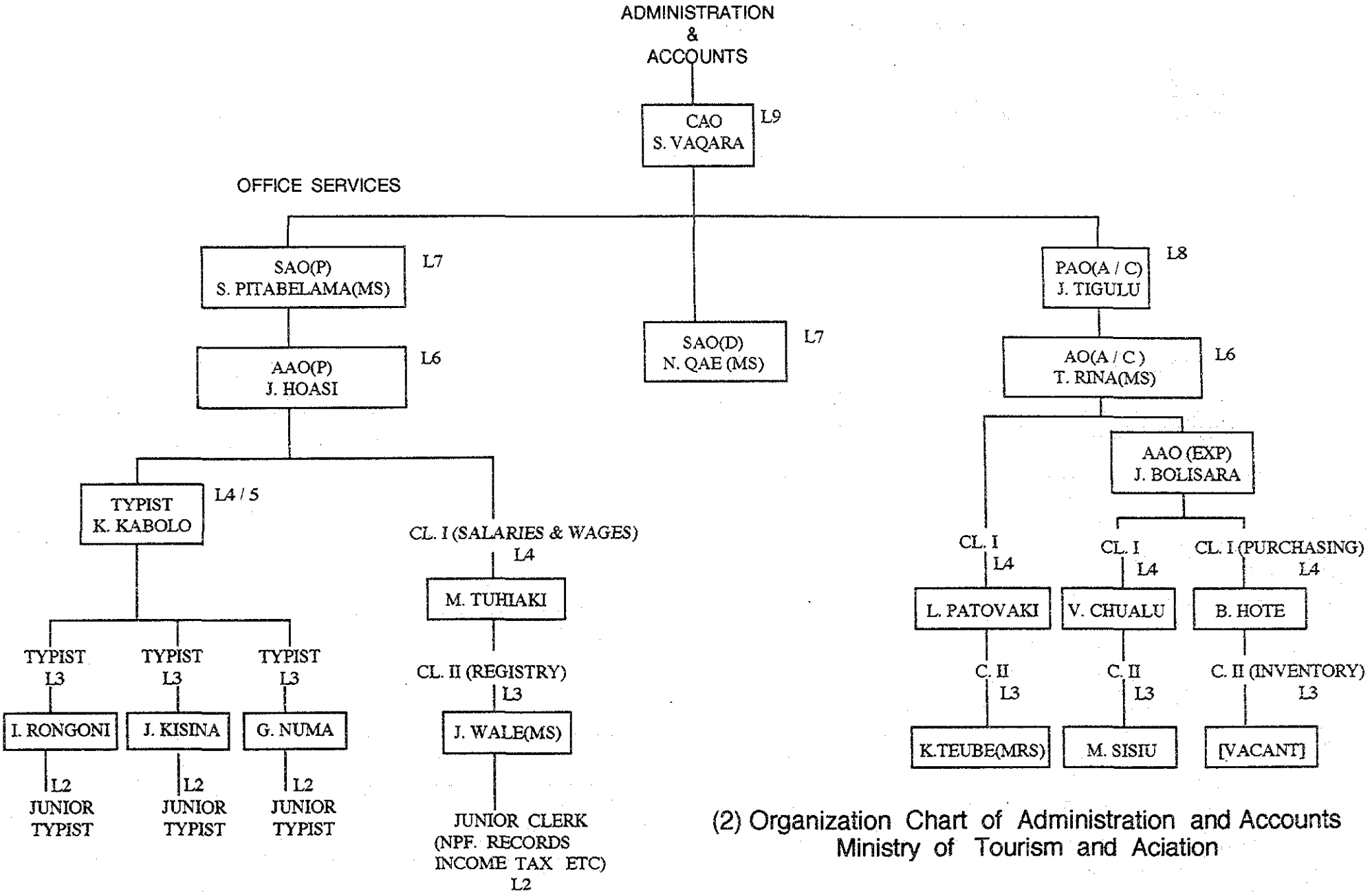
GUADALCANAL ONE DEPARTURE

APPENDIX TO CHAPTER 11

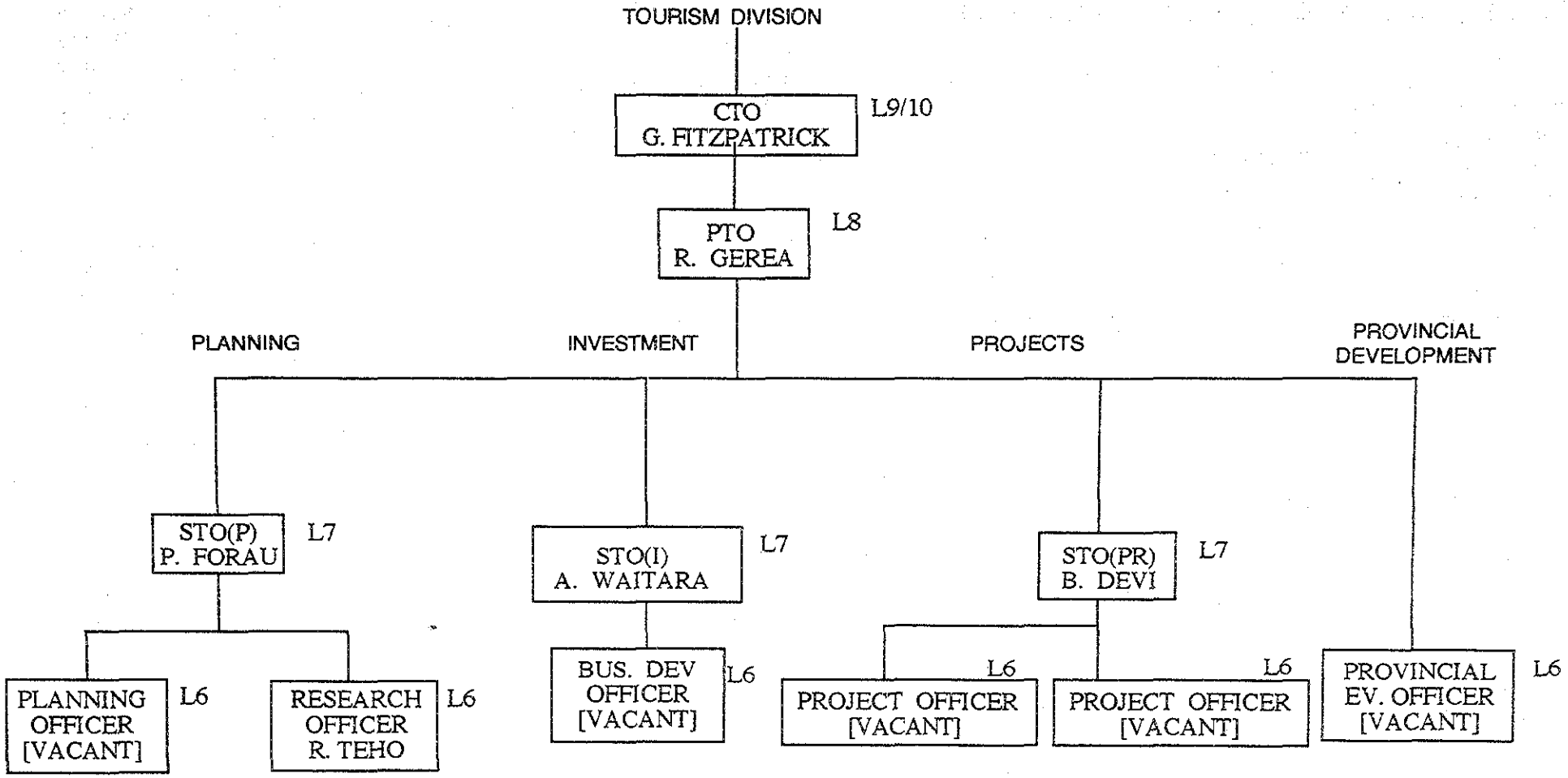
APPENDIX-11.2.1 ORGANIZATION CHARTS



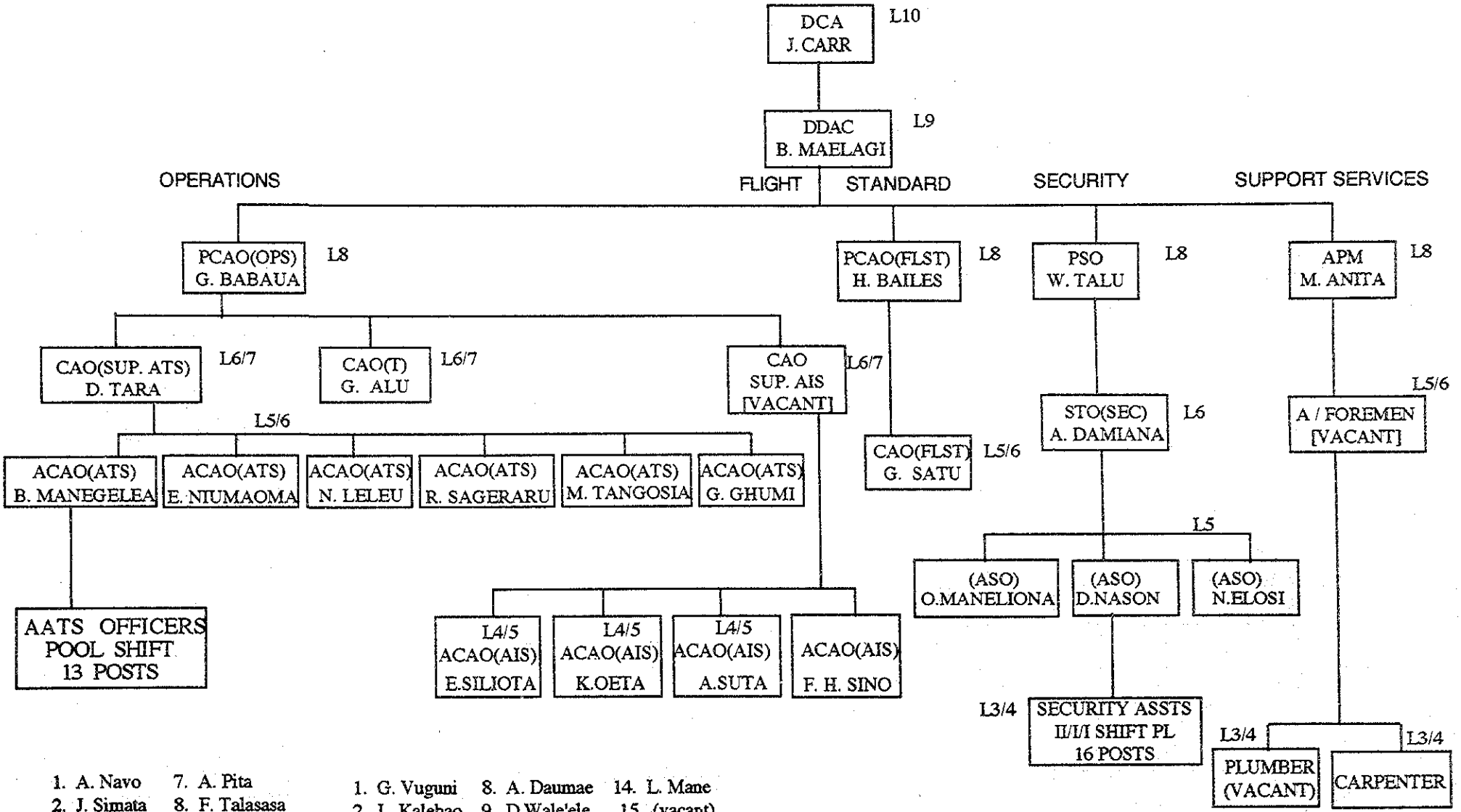
(1) Organization Chart of Ministry of Tourism and Aviation



(2) Organization Chart of Administration and Accounts
Ministry of Tourism and Aciation



(3) Organizaion Chart of Tourism Division, Ministry of Tourism and Aviation



1. A. Navo
2. J. Simata
3. Kapu
4. R. Alafa
5. P. Kita
6. J Maeraola

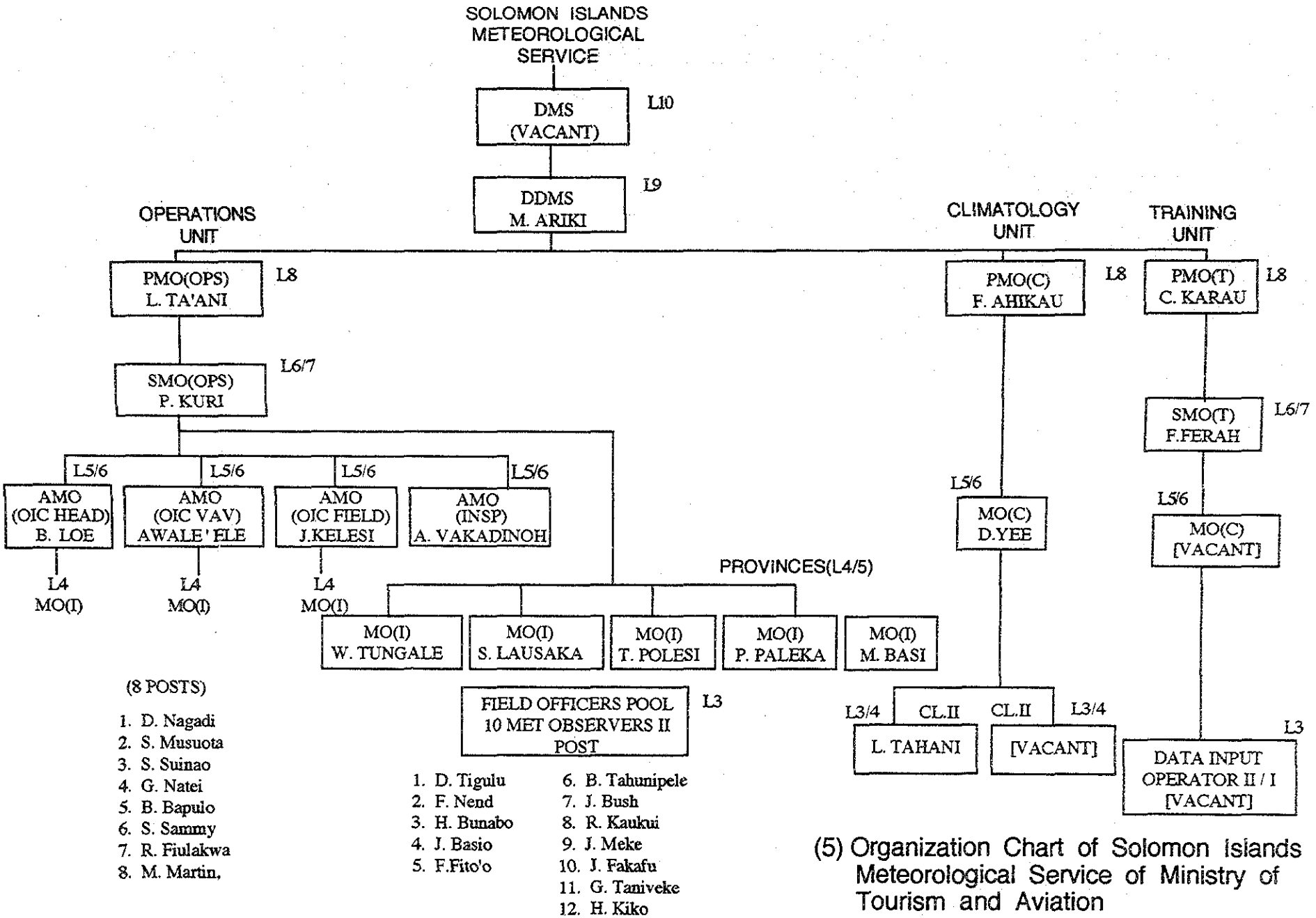
7. A. Pita
8. F. Talasasa
9. J. Urasi
10. A. Babalu
11. (vacant)
12. (vacant)
13. (vacant)

1. G. Vuguni
2. L. Kalebao
3. A. Malegu
4. R. Beto
5. A. Meke
6. A. Meke
7. J. Kela

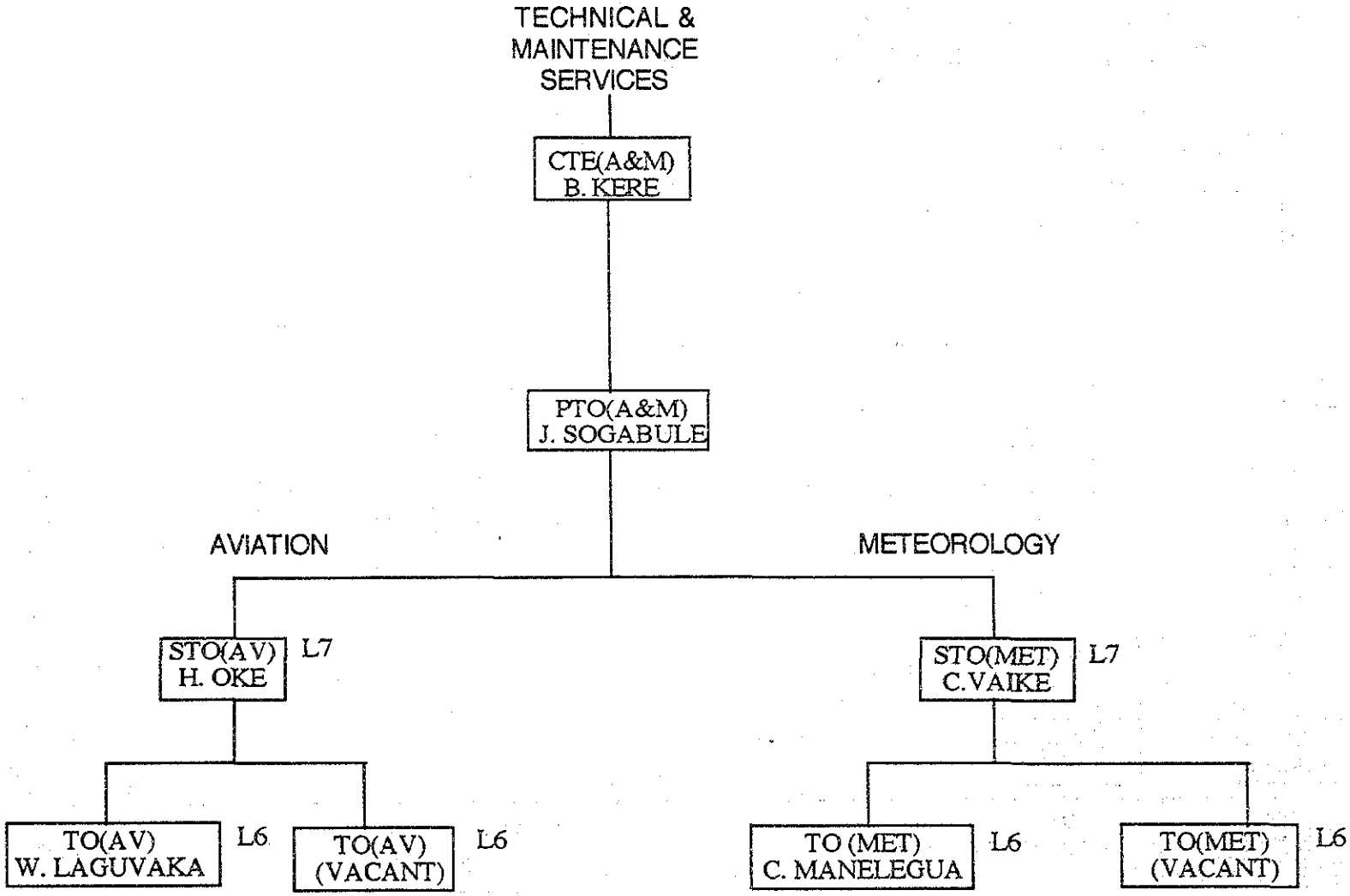
8. A. Daumae
9. D.Wale'ele
10. M. Irumea
11. J. Nokali
12. J. Kwanae
13. A. Navo

14. L. Mane
15. (vacant)
16. (vacant)

(4) Organization Chart of Civil Aviation, Division, Ministry of Tourism and Aviation



(5) Organization Chart of Solomon Islands Meteorological Service of Ministry of Tourism and Aviation



(6) Organization Chart of Technical and Maintenance Division of Ministry of Tourism and Aviation

APPENDIX TO CHAPTER 12

APPENDIX-12.2.2 ASSUMPTION ON THE CALCULATION OF AIRCRAFT NOISE CONTOUR

Item				Case-1	Case-2	Case-3
Target Year				1990 (Present)	2000 (Short -Term-Dev.)	2010 (Long -Term-Dev.)
Runway Length				2,200m	2,200m	2,500m
Approach Angle	RWY 06			CIRCLING	CIRCLING	CIRCLING
	RWY24			3.0 degrees	GP 3.0 degrees	GP 3.0 degrees
Number of Daily Flights	F-28	TKOF	RWY 06	0.13	-	-
			RWY 24	0.01	-	-
		LDG	RWY 06	0.08	-	-
			RWY 24	0.06	-	-
	B737-200	TKOF	RWY 06	1.25	-	-
			RWY 24	0.04	-	-
		LDG	RWY 06	0.71	-	-
			RWY 24	0.58	-	-
	B737-400	TKOF	RWY 06	-	1.52	1.11
			RWY 24	-	0.05	0.03
		LDG	RWY 06	-	0.05	0.03
			RWY 24	-	1.52	1.11
	B767-200	TKOF	RWY 06	-	0.28	1.52
			RWY 24	-	0.01	0.05
		LDG	RWY 06	-	0.01	0.05
			RWY 24	-	0.28	1.52
	DCH-6	TKOF	RWY 06	-	5.40	11.70
			RWY 24	-	0.60	1.30
		LDG	RWY 06	-	3.30	7.15
			RWY 24	-	2.70	5.85
	BN-Islander	TKOF	RWY 06	-	11.70	2.00
			RWY 24	-	1.30	9.00
		LDG	RWY 06	-	7.15	3.38
			RWY 24	-	5.85	17.48
Distribution of Flights				7:00 - 19:00 : 100%		

APPENDIX TO CHAPTER 14

APPENDIX-14.2.1 ESTIMATION OF AVERAGE TIME VALUE OF INTERNATIONAL PASSENGERS

Estimation of Average Time Value of International Passengers

Countries from/to Honiara	In & Outbound Pax at Honiara 1989	Population Thousand 1988	GDP Million US$ 1988	GDP per Capita US$ 1988	(1) x (4)
	(1)	(2)	(3)	(4)	(5)
Australia	12,500	16,530	203,460	12,310	153,875,000
New Zealand	3,800	3,290	34,610	10,520	39,976,000
Papua New Guinea	3,800	3,560	3,210	900	3,420,000
Fiji	1,000	730	1,130	1,550	1,550,000
Japan	1,900	122,610	2,524,660	20,590	39,121,000
United Kingdom	1,500	57,080	713,800	12,510	18,765,000
United States	3,400	246,330	4,737,370	19,230	65,382,000
Total(Average)	27,900	450,130	8,218,240	18,260	322,089,000
Solomon Islands		305	136	450	
Average GDP per Capita weighted by Pax from/to Different Countries(US$)	11,544				

Total number of Foreign air passengers is 33,600 and the number of foreign visiters is 20,000.
The ratio of foreign visitors against total passengers is around 60 % .
The average GDP per capita(AVP) is obtained as follows ;

AVP = 11,544 x 0.6 + 450 x 0.4 = 7,110 US$/Pax

The average time value (SI$/Hour) international air passengers(AVTI) is obtained by following formula.

AVTI = (7,110/450) x AVTD

In the above, AVTD means average time value for domestic passengers, AVTD=2.1 SI$/Hr(See APPENDIX-4.4.3)
Therefore, AVTI = (7,110/450) x 2.1 = 33 SI$/Hr

APPENDIX-14.2.2 BENEFIT OF INCREMENTAL TAX REVENUE ON AIRCRAFT FUEL CONSUMPTION

Benefit of Incremental Tax Revenue on Aircraft Fuel Consumption

YEAR	1989	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	TOTAL
FUEL CONSUMPTION																		
JET A1 (KL)	4,200	5,200	5,400	5,600	5,800	6,000	6,200	6,200	6,200	6,200	6,200	6,200	6,200	6,200	6,200	6,200	6,200	96,200
AVGAS (KL)	1,600	2,600	2,700	2,800	2,900	3,000	3,100	3,100	3,100	3,100	3,100	3,100	3,100	3,100	3,100	3,100	3,100	48,100
TOTAL (KL)	5,800	7,800	8,100	8,400	8,700	9,000	9,300	9,300	9,300	9,300	9,300	9,300	9,300	9,300	9,300	9,300	9,300	144,300
INCREMENTAL VOLUME																		
JET A1 (KL)		1,000	1,200	1,400	1,600	1,800	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	29,000
AVGAS (KL)		1,000	1,100	1,200	1,300	1,400	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	22,500
TOTAL (KL)		2,000	2,300	2,600	2,900	3,200	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	51,500
INCREMENTAL VALUE																		
JET A1 (1,000 SI$)		1,400	1,700	2,000	2,300	2,500	2,800	2,800	2,800	2,800	2,800	2,800	2,800	2,800	2,800	2,800	2,800	40,700
AVGAS (1,000 SI$)		1,800	2,000	2,200	2,400	2,500	2,700	2,700	2,700	2,700	2,700	2,700	2,700	2,700	2,700	2,700	2,700	40,600
TOTAL (1,000 SI$)		3,200	3,700	4,200	4,700	5,000	5,500	5,500	5,500	5,500	5,500	5,500	5,500	5,500	5,500	5,500	5,500	81,300
INCREMENTAL TAX REV.																		
JET A1 (1,000 SI$)		280	340	400	460	500	560	560	560	560	560	560	560	560	560	560	560	8,140
AVGAS (1,000 SI$)		360	400	440	480	500	540	540	540	540	540	540	540	540	540	540	540	8,120
TOTAL (1,000 SI$)		640	740	840	940	1,000	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	16,260

Note: JET A1 (SI$/Liter) 1.41
AVGAS (SI$/Liter) 1.81

APPENDIX-14.2.3 DEFINITION OF EIRR, B/C AND NPV

Appendix-14.2.4 Difinition of Economic Internal Rate of Return (EIRR), Cost Benefit Ratio (B/C Ratio) and Net Present Value (NPV)

(1) Efficiency or acceptability of a project is measured or evaluated through the comparison of an outflow (costs) with an inflow (benefits). The outflow consists of costs for the construction of the facilities and management of the project, while the inflow consists of benefits which are acquired from the operation of the facilities.

Economic Internal Rate of Return (EIRR), Benefit Cost Ratio (B/C Ratio) and Net Present Value (NPV) are used as indicators for the economic evaluation.

(2) Timing of the outflow and inflow are different. The construction cost of the facilities are generated in the early stage of the project evaluation period, while the benefits are generated after the completion of the facilities.

All costs and benefits should be discounted and compared at a fixed time, i.e., the present value of costs and the present value of benefits.

Present value of benefits $$B = \Sigma_{t=0}^{T} \frac{Yt}{(1 + ro)} t$$

Present Value of costs $$C = \Sigma_{t=0}^{T} \frac{It + Ot}{(1 + ro)} t$$

Where;

Yt: Benefits in year t

It: Capital expenditure in year t

Ot: Operation and maintenance costs in year t

ro: Discount rate or opportunity cost of capital of the country concerned
(Maximum profit rate which would be anticipated when the fund is used for other projects)

T: Project life

(3) Definition of the evaluation indicators (EIRR, B/C Ratio and NPV) is as follows:

EIRR : A discount rate to make a present value of the benefits equal to a present value of the cost, i.e., ro in above formulas on condition of B = C.

B/C Ratio : Ratio of the present value of benefits to that of costs, i.e. B/C.

NPV : Difference between the present value of benefits and that of costs, i.e., B - C. This represents the net contribution of the project to the national economy.

(4) Economic Evaluation

(1) When EIRR exceeds the opportunity cost of capital for the country concerned, the project is judged to be economically feasible.

(2) When B/C $\geqq$ 1 or NPV $\geqq$ 0, the project is judged to be economically feasible.

APPENDIX TO CHAPTER 15

APPENDIX-15.1.1 TENTATIVE IMPROVEMENT WORK FOR EXISTING TERMINAL BUILDING

(1) General

This appendix is added based on the request from the Solomon Islands' side at the meeting on the Draft Final Report. Although the existing passenger terminal building has various problems, it will take at least a few years until the completion of the new terminal building. Therefore, the several measures are recommended to improve the existing terminal building to cover this transitional period.

(2) Tentative Improvement Work

The layout plan for the tentative improvement work of the existing passenger terminal building is shown in Figure A.15.1.1. This tentative work is planned so that it will be consistent with the remodelling work of the existing terminal building in the short-term development project.

Basic concept of the tentative improvement work is as follows:

- The domestic passenger handling will be separate from the international passenger handling to alleviate congestion at the terminal,

- The increase of handling capacity at major functional areas are planned mainly by rearranging the internal layout and partitions with minimum extension of the floor area.

The work items of the tentative improvement work are summarized in Table A.15.1.1.

The cost of the tentative improvement is estimated to be approximately US$70 thousand (SI$196 thousand).

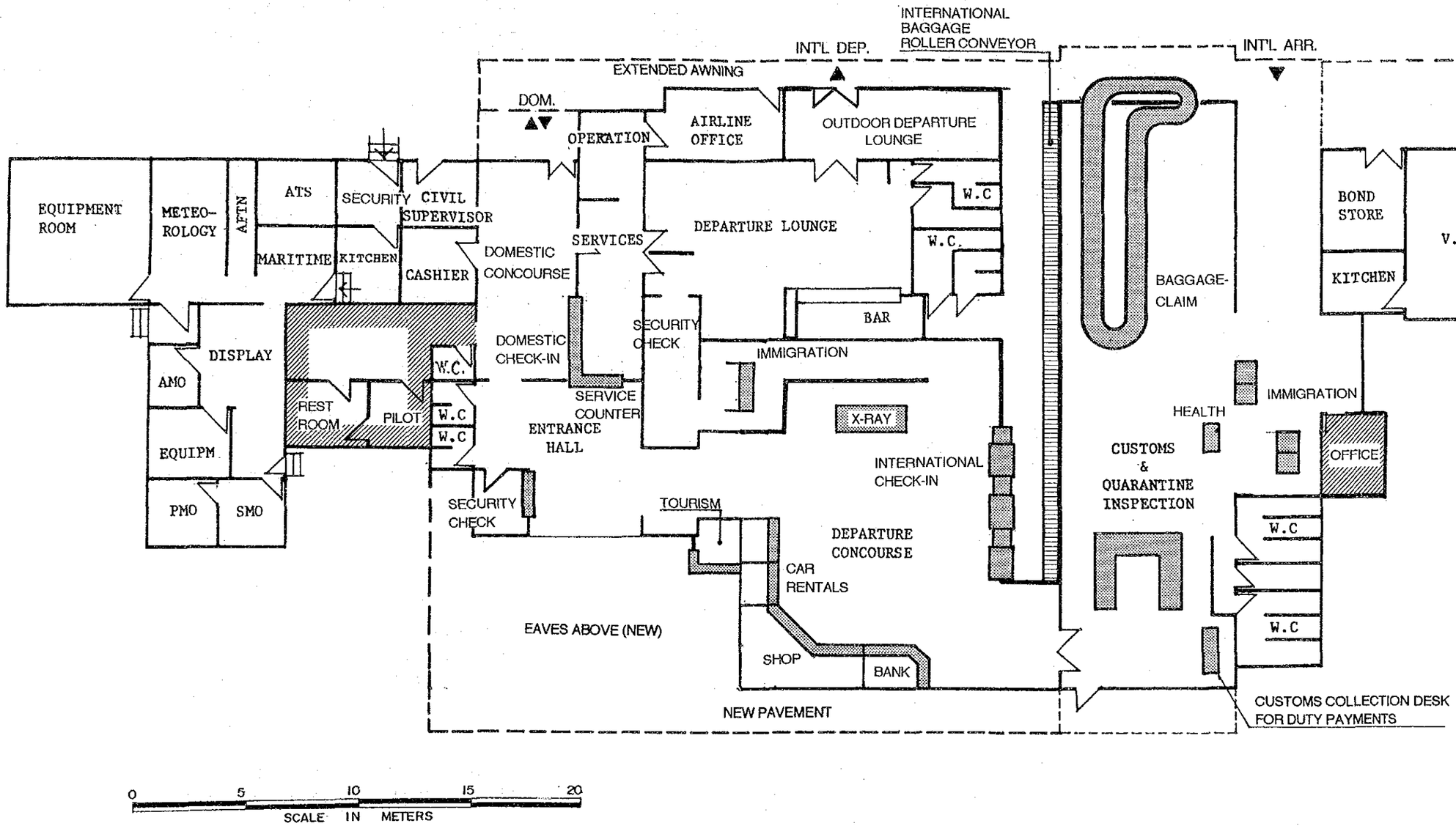


Figure A.15.1.1 Layout Plan of Tentative Improvement work

Table A.15.1.1 Work Items of the Tentative Improvement

1. International Departure Concourse

   - To change the internal layout of the departure concourse to increase queuing space for check-in passengers and to regulate passenger flow preceding to the government controls
   - To provide a baggage roller conveyor for check-in counters.
   - To change the layout of shop, bank and rent-a-car counters.
   - To provide a tourism counter by partially expanding the departure concourse.

2. Outbound Government Controls

   - To change the layout of immigration counter.
   - To provide a new partition between the departure concourse.

3. International Departure Lounge

   - To expand the floor area by demolishing the shore.
   - To utilize open-air space outside the existing departure lounge as an outdoor departure lounge.

4. International Baggage Claim

   - To repair the baggage conveyor and to relocate it to the existing inbound immigration area to increase effective length for baggage collection.

5. Inbound Government Controls

   - To demolish the existing office and to construct it by partially expanding the terminal building to the west.
   - To utilize the space for the existing baggage conveyor and the existing office as immigration counters and their queuing space.

to be continued

Continued Table A.15.1.1

- To change the layout of the health counter and customs & quarantine inspection counter.

- To provide a customs collection deck for duty payments.

6. Entrance Hall

- To provide a security check counter and its office.

7. Domestic Terminal

- To extend the existing office with the service counter and to modify it to be used for domestic check-in as well as for service counter.

- To demolish the briefing room and the rest room and to use them for domestic concourse.

- To provide a briefing room and a rest room for pilots by partially expanding the terminal building to fill a vacant place beside the meteorological office.

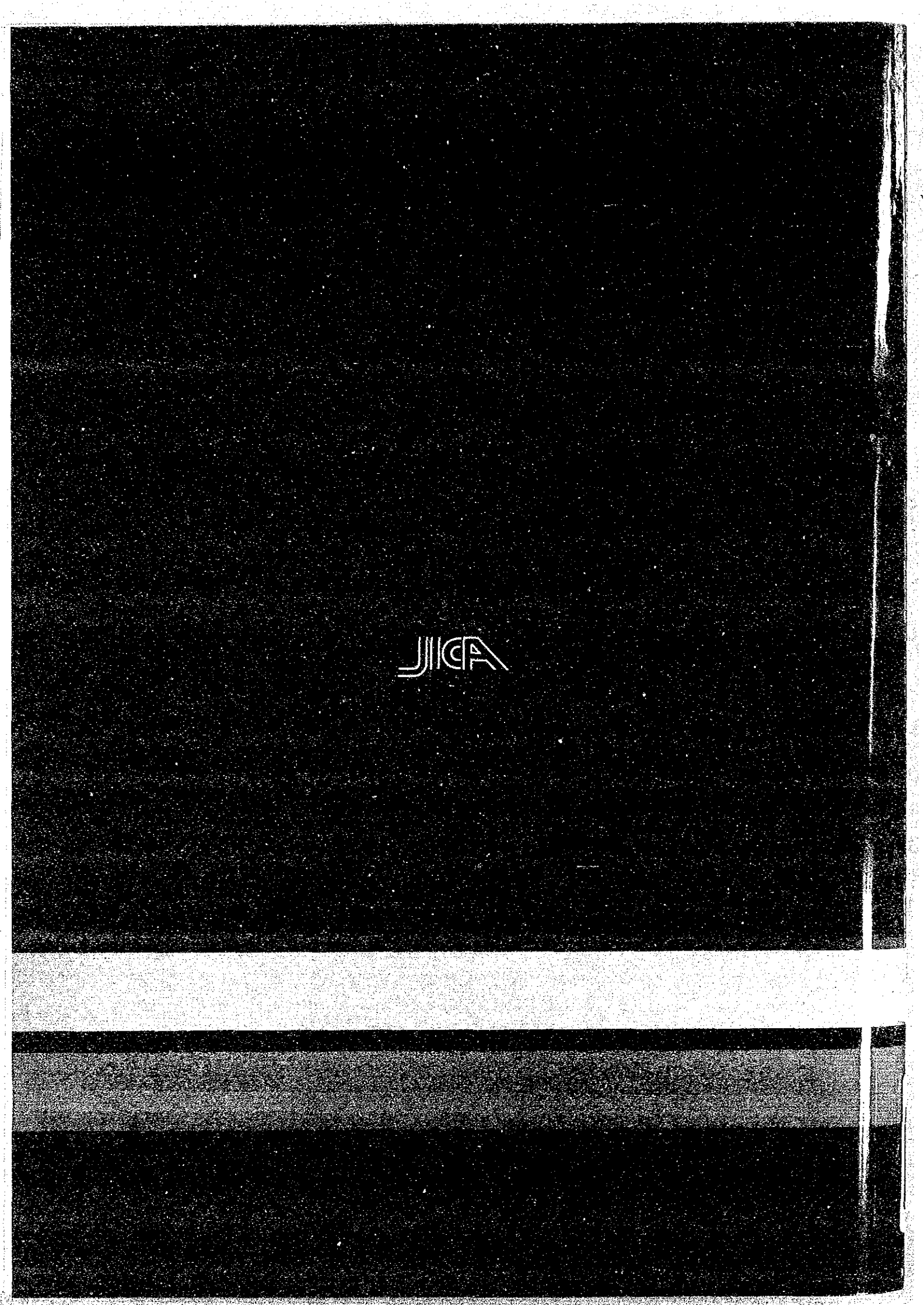
8. Extension of Eaves

- To construct new eaves for landside area.

- To construct new eaves for airside area.

9. Repair of Toilets

- To repair toilets.


JICA