



Parliamentary Standing Committee on Public Works

DEPARTMENT OF THE SENATE

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John Curran

CLERK OF THE SENATE

REPORT

relating to

PERTH AIRPORT INTERNATIONAL TERMINAL COMPLEX AND PARALLEL TAXIWAY

(Tenth Report of 1983)

THE PARLIAMENT OF THE COMMONWEALTH OF AUSTRALIA

1983

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PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

R E P O R T

relating to

PERTH AIRPORT
INTERNATIONAL TERMINAL
COMPLEX AND
PARALLEL TAXIWAY

(Tenth Report of 1983)

ERRATUM

Page 3, Paragraph 14, second dash, delete:

"north-west 06/24 runway"; insert:

"south-west 06/24 runway"

Page 18, Paragraph 65, third dash, delete:

"mimimisation"; insert "minimisation"

Page 22, Paragraph 84, 4th line, delete:

"neveretheless" insert "nevertheless"

MEMBERS OF THE PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

(Twenty-Seventh Committee)

Senator Dominic John Foreman (Chairman)

The Honourable Wallace Clyde Fife, M.P. (Vice-Chairman)

Senate

Senator Gerry Norman Jones

Senator Bernard Francis
Kilgariff

House of Representatives

David Bruce Cowan, Esq., M.P.

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EXTRACT FROM
THE VOTES AND PROCEEDINGS OF THE HOUSE OF REPRESENTATIVES
NO. 22 DATED 15 SEPTEMBER 1983

- 5 PUBLIC WORKS COMMITTEE - REFERENCE OF WORK - PERTH AIRPORT, W.A.-
INTERNATIONAL TERMINAL COMPLEX AND PARALLEL TAXIWAY:
Mr. Hurford (Minister for Housing and Construction),
pursuant to notice, moved - That, in accordance with the
provisions of the Public Works Committee Act 1969, the
following proposed work be referred to the Parliamentary
Standing Committee on Public Works for consideration and
report: Perth Airport international terminal complex and
parallel taxiway.

Mr. Hurford presented plans in connection with the proposed work.

Question - put and passed.

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PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

PERTH AIRPORT INTERNATIONAL TERMINAL COMPLEX
AND PARALLEL TAXIWAY

R E P O R T

By resolution on 15 September 1983 the House of Representatives referred to the Parliamentary Standing Committee on Public Works for consideration and report Perth Airport international terminal complex and parallel taxiway.

The Committee has the honour to report as follows:

THE REFERENCE

1. The proposal is for extension of the existing taxiway system and construction of new international terminal facilities for Perth Airport, comprising:

- a new international passenger terminal building;
- associated engineering services;
- taxiway works, apron, car parks and access roads; and
- construction of a taxiway on the western side of the existing 02/20 runway.

2. The estimated cost of the proposed work when referred to the Committee was \$53 million at July 1983 prices, comprising \$3.0 million for the western parallel taxiway and \$50.0 million for the international terminal complex.

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THE COMMITTEE'S INVESTIGATION

3. The Committee received submissions and plans from the Department of Aviation (Aviation) and the Department of Housing and Construction (DHC) and took evidence from their representatives at a public hearing held in Perth on 25 and 26 October 1983. The Committee gratefully acknowledges the assistance of Belmont City Council in providing the venue for the public hearing.

4. Prior to the hearing the Committee inspected existing international terminal facilities at Perth Airport and the proposed site for the new terminal.

5. The Committee also received written submissions from State and local government, airlines, a public interest group and a number of private citizens. A list of witnesses and the organisations which they represented is at Appendix "A".

6. The Committee's proceedings will be printed as Minutes of Evidence.

7. A list of Exhibits is at Appendix "B".

BACKGROUND

8. Perth Airport is located in the Shire of Swan and the City of Belmont in the Perth Metropolitan area.

9. A plan showing the existing layout of the airport is at Plan C-1.

10. The airport site, about 10 kilometres to the east of the Central Business District, comprises 1469 hectares on which the movement area, passenger terminal and associated infrastructure

are located. The airport building area, which has been extensively developed over the past two decades, is located on the mid-western edge of the site. The movement area, comprising three runways, is located generally east of the building area but extends to the north, south and east.

11. A further 688 hectares of land south east of the building area, has been progressively acquired by the Commonwealth for what is generally agreed to be a second main runway.

12. International traffic to Perth Airport commenced in 1952. At the time a temporary international terminal constructed from war time buildings was used.

13. Although the present site for the airport was selected in 1938, the bulk of development and expenditure on movement areas, terminals and associated infrastructure occurred during the early 1960s and 1970s. During the 1960s the main north-south runway was extended to permit international jet aircraft operations. International and domestic facilities in the main airport terminal building were extended during the 1970s.

14. The three runways at Perth Airport are arranged in a triangular configuration and are as follows:

- the main north-south 02/20 runway;
- a north-east to north-west 06/24 runway; and
- an east-west 11/29 runway.

15. The runways are linked to the building area by a system of taxiways. For the purposes of this report it should be noted that the main 02/20 runway is not supported by a full length parallel taxiway. The existing apron area can accommodate seven domestic passenger jet aircraft and three international jet aircraft.

16. Perth Airport is the western gateway into Australia for international aircraft and international operations account for about 25 percent of passenger movements through Perth.

17. A curfew does not apply at Perth Airport and regular passenger transport aircraft may proceed at any time during the day or night, especially between 11 pm and 6 am which are the curfew hours applying at a number of airports in the eastern States.

THE NEED - INTERNATIONAL TERMINAL COMPLEX

18. The international and domestic terminals are located in the same building which, because of its somewhat irregular shape, shows obvious signs of modifications and additions over many years. Domestic airlines use the northern section of the building while international operations are carried out from the southern section. Whilst passenger processing areas are separated, public areas such as the main lounge area, shops and the cafeteria cater for both international and domestic traffic.

19. The international terminal complex was opened in October 1962 and was designed to handle aircraft with a capacity of less than 100 passengers. Since 1962 the terminal has been extended on two occasions. In 1975 an international departure/transit lounge was added; in 1981 an enlarged baggage claim hall and extensions to health, immigration and customs areas were added. The Committee was advised that the latter extensions cost \$675,000 and were originally intended as the first phase of a larger redevelopment. Aviation conceded that they were stop-gap measures designed to alleviate congestion in some areas and generally reflected Government policy in the 1970s to incrementally develop airports at minimum cost.

20. Terminal Congestion Aviation advised the Committee that at present the capacity of the international terminal in terms of passenger process times and the extent of facilities available is as follows:

For inward passengers

. quarantine clearance	720 passengers/hour
. primary immigration/ customs clearance	175 passengers/hour
. baggage claim area capacity	350 passengers

For departing passengers

. departure/transit lounge capacity	400 passengers
. airline check-in	220 passengers/hour
. immigration clearance	180 passengers/hour or 350 passengers/hour if no simultaneous inwards clearance

21. In brief, this capacity allows for the handling of one terminating Boeing 747 aircraft at any one time. The relatively limited capacities of key areas such as primary immigration and customs mean that passengers near the end of queues could experience long delays in proceeding through the terminal.

22. The problem of inadequate capacity is compounded when an inward flight arrives within an hour of an earlier flight. In these circumstances, which are not unusual, significant delays to inbound terminating passengers invariably result. Aviation representatives stated they were not aware of any internationally accepted maximum period for the clearance of international

passengers. It is nevertheless unfortunately ironic that passenger clearance times may take as long as the flying time between Sydney and Adelaide.

23. Departing flights can be processed concurrently with arriving flights but the two opposing processes lead to congestion in public areas such as the public concourse and concession areas, which are shared with domestic passengers. In these circumstances congestion can be particularly severe in the area of the terminal where arriving passengers enter the public area. This general area is also used by departing passengers to check-in with airlines, where they farewell their friends before entering secure areas, and where departure tax is collected. Queuing space for departing passengers at the check-in desk and at the departure tax collection area is limited.

24. Peak Hour Traffic Peak hour traffic periods occur at identifiable "schedule windows" whose timing and duration can be attributed to curfews at other ports en route, operational requirements and the avoidance by international airlines of non-commercial departure times at major originating ports. At Perth Airport the scheduling windows occur around midnight and noon. The most intense peaks occur around noon on Saturdays and at mid-night on Thursdays.

25. Average peak hour international passenger movements for the year ended 30 June 1982 are as follows:

Departures - during the departure peak hour between 12.50 and 1.50 pm on Saturdays 660 passengers to board two Boeing 747 aircraft require to be handled.

Arrivals - during the arrival peak hour between 2.05 and 3.05 am on the same day 360 terminating arrival passengers from DC10 and Boeing 747 aircraft.

Transit - during the transit peak hour between 9.00 and 10.00 pm on Mondays 500 transit passengers need to be accommodated in the transit/departure lounge.

26. Table 1, below, illustrates international aircraft movements and passenger flows during the 24-hour period on Saturday, 10 September 1983.

Table 1 - Recorded International Traffic
Saturday, 10 September 1983

			Passengers	Passengers
Time	Type	Interval between previous movement hrs/mins	T = Terminating O = Originating	Transit
0210}	Arrival	- }	T - 85	220
0252}	Arrival	0:42}	T - 277*	-
0320}	Arrival	0:18}	T - 402	-
0335}	Departure	0:26}	O - 6	220
0401}	Arrival	0:26}	T - 361	-
1311	Departure	9:10	O - 216	-
1505	Arrival	1:54	T - 8	199
1607}	Departure	1:02}	O - 106	199
1626}	Departure	0:19}	O - 188*	-
1815}	Departure	1:49}	O - 307	-
2006	Arrival	1:51	T - 376	-

* DC-10 aircraft

27. The table shows that commencing at 2.10 am and concluding at 4.01 am five flights involving 1125 terminating passengers were recorded. Similarly, for departing passengers, the table shows that in the two-hour period between 4.07 and 6.15 pm three outward flights involving 601 passengers were recorded.

28. Congestion in the public concourse of the terminal is further compounded by the presence of "meeters" and "farewellers", the non-travelling public. Studies carried out by Aviation indicate that on average every two passengers departing on overseas flights would be accompanied by five friends; on average every incoming passenger would be met by two friends. In terms of Table 1 this would mean that in the two-hour period between 2.10 and 4.01 am the 1125 terminating passengers would collectively be met by about 2250 friends and in the two hour period between 4.07 and 6.15 the 601 departing passengers would be farewelled by 1500 friends. These numbers of peak hour arriving and departing passengers and their friends are far in excess of terminal capacity.

29. Schedule Control Limitations It was suggested to Aviation that congestion could be alleviated by a more even spacing of aircraft movements. In response Aviation stated that there is some scope to evenly space flights within the scheduling window through the application of schedule control limitations. This has been tried by the Department but actual arrival and departure times vary from the schedule, occasionally significantly, and therefore this type of control is only partially effective.

30. Aviation stated the number of terminating flights and terminating passengers would be markedly increased if schedule control limitations were not applied. A comparison of the number of terminating flights for peak hours on Saturdays, with and without schedule control limitations is as follows:

With control

1 terminating DC10
1 transitting Boeing 747
360 disembarking passengers

Unconstrained

1 terminating Boeing 747
1 terminating DC10
1 transitting Boeing 747
700 disembarking passengers

31. Forecasts Whilst the number of international aircraft movements have in recent years remained relatively stationary at about 3400, the number of passengers handled per annum has steadily grown from about 100,000 in 1973 to over 400,000 in 1982. These totals do not include transit passengers. Inbound transit passengers are required to undergo a health check.

32. Forecasts of annual international airline traffic for Perth Airport, prepared by Aviation and Qantas, are as follows:

Table 2
Forecast Aircraft and Passenger Movements Perth
1985 to 2010 prepared by Aviation and Qantas

Year	Aircraft Movements (Aviation)	Aircraft Movements (Qantas)	Variation	Revenue Passengers (Aviation)	Total Passengers (Qantas)	Variation
1982	3414	-	-	428,069	481,720	53,651
1985	3610	3980	370	460,800	512,000	51,200
1990	4370	4680	310	600,400	653,456	53,056
1995	5430	5430	-	739,400	792,456	53,056
2000	6070	6000	70	878,000	931,056	53,056
2005	6860	7000	140	1,016,100	1,069,156	53,056
2010	7670	8000	330	1,153,800	1,206,856	53,056

33. The variation in forecasts between Aviation and Qantas shown in Table 2 is due to the inclusion of domestic on-carriage passengers travelling on international services as well as non-revenue passengers in the Qantas forecasts. The Committee believes the forecasts are generally similar.

34. By themselves, these forecasts only illustrate the overall magnitude of numbers and are of limited relevance in assessing terminal capacities in terms of peak hour demands. Accordingly, Aviation has prepared micro forecasts of peak hour movements for 1995 for both arrival and departure processes. These forecasts are shown below:

Table 3
Forecasts - Peak Hour International Aircraft and
Passenger Movements, Perth Airport 1995

Process	Aircraft				Passengers		
	Number	Flight Category			Flight Category		
		Term.	Transit	Orig.	Term.	Transit	Orig.
Arrivals	5	2	3		1038	593	
		3	2		1174	394	
Departures	5		3	2		594	1038
			2	3		594	1174

35. Aircraft Parking Positions The apron adjacent to the terminal has capacity for parking 4 Boeing 747 aircraft. One position is shared with the domestic airlines who have priority of use. The international operators consequently have three assured parking positions early in regular peak periods.

36. Walking Distances Departing passengers are required to proceed across the aircraft apron in order to board their aircraft. Walking distances can vary and may involve up to about 200 metres.

37. Summary Perth Airport International terminal cannot adequately cope with present passenger numbers and aircraft movements. There is severe congestion in public areas, particularly during daily peak hours. Facilities and space available for passengers are limited, often leading to long queues and delays. Attempts to spread flights more evenly, through schedule control limitations, in order to reduce the magnitude of daily peaks, have been only partially successful. Forecasts of international movements and passenger numbers indicate that both will continue to grow. The already inadequate terminal will not be able to satisfactorily handle these increases.

38. Committee's Conclusion Adequate facilities for the handling of international aircraft, passengers and the non-travelling public, should be provided at Perth Airport.

OPTIONS

39. In developing the proposal before the Committee Aviation assessed a number of broad options aimed at improving facilities.

40. The following paragraphs describe the options considered by Aviation in 1980 to meet forecast requirements.

41. Option 1 This involves the redevelopment of new international terminal facilities on the present site and on adjacent sites to the south. It would require the relocation of the Qantas catering facility and the progressive relocation of airline maintenance facilities to provide additional apron space. Domestic airline facilities would be expanded on land

adjacent to the present site. This would require relocating a cargo building and catering facilities at some stage in the future. Longer term development could require the relocation of a commercial maintenance base and the general aviation facilities.

42. Option 2 Under this alternative the existing international terminal would be developed to the maximum extent possible on the present site and relocated to a new site at a later date. Aviation advised that there is scope to further expand and modify the terminal building and any additional apron parking would have to be provided as remote parking.

43. Option 3 This alternative involves the construction of a terminal on a new site and subsequently developing the existing terminal for use by domestic airlines.

44. Option 4 This is a variation of Option 3 involving the construction of a domestic terminal complex on a new site and subsequently redeveloping the existing terminal for international traffic.

45. Aviation advised the Committee that Option 3 was recommended to the Government. This recommendation was based on the following factors:

- the existing building area has limited potential for future building development;
- Options 1, 3 and 4 all involve construction of new international terminal facilities in some form. Option 1 would involve the greatest cost, requiring the relocation of a number of existing facilities. Any savings attributable to retention of part of the existing building would be more than offset by inherent relocation cost penalties;

- the present terminal is more suited as a domestic terminal than as an international terminal because of special requirements for processing international passengers. Recent and current extensions to the domestic end of the terminal have proceeded on the basis that international operations will eventually be relocated in accordance with Option 3;
- support facilities for domestic airlines, including interstate airlines, are located in the existing terminal area;
- to develop the international terminal at its present site (Option 2) would only be a stop-gap measure and would incur additional expenditure in the order of \$10 million and offers no significant advantages.

46. Committee's Conclusion The Committee agrees that construction of an international terminal at a new site offers considerable advantages over other options examined.

SITING OF THE TERMINAL

47. The siting of a future international terminal was considered by the previous Committee in the context of the master plan for Perth Airport. The Committee's inquiry into the construction of a new traffic services centre and control tower at Perth Airport in 1981 prompted Aviation to develop a master plan for the future development of Perth Airport.

48. In its twelfth report of 1981 (Parliamentary Paper 266/1981), the Committee recommended the construction of air traffic services facilities. The Committee did not recommend the construction of a new control tower. Construction of the control tower should be delayed until the master plan for Perth Airport

had been made available. It was felt that siting of the control tower was a key ingredient in determining the direction of master planning future airport development. Accordingly the Committee's 1981 Report recommended against construction of the control tower pending the release by Aviation of the master plan for the development of Perth Airport.

49. In May 1982 Aviation released for public comment the Provisional Master Plan and Draft Environmental Impact Statement on Perth Airport. The Committee examined the proposed construction of the control tower following publication of the Provisional Master Plan and presented a final Report in October 1982 (Parliamentary Paper 292/1982).

50. The Provisional Master Plan put forward four alternative development strategies for public comment. All strategies made provision for the relocation of the international terminal at a new site. It is not intended here to describe each strategy in detail. It is sufficient to make the following points in relation to the Committee's recommendations.

- (a) The Committee recommended the adoption of Strategy 4 for the development of Perth Airport with the provision of a wide-spread parallel runway when aircraft movements demand it or earlier if recommended by the House of Representatives Standing Committee on Environment and Conservation. The control tower should be located at the site required under Strategy 4.
- (b) Under Strategy 4, between now and the year 2000, a wide spaced parallel runway and full length taxiway would be constructed on the 02/20 alignment, 2 kms east of the present runway with taxiway connections to an international terminal area to the east of the present 02/20 runway.

(c) Strategy 4 was supported by most organisations and individuals who appeared before the Committee. Of particular relevance in this regard was the support from local and State government.

(d) The Government accepted the Committee's recommendation. The master plan for Perth Airport, contained in the supplement to the Draft Environmental Impact Statement, provides for the location of a future international terminal and parallel taxiway to the east of the 02/20 runway.

51. Committee's Conclusion The new international terminal building should be located east of the 02/20 runway in accordance with the master plan for the development of Perth Airport.

THE PROPOSAL

52. It is proposed to construct a new international terminal building, an aircraft apron and associated infrastructure at a site east of the 02/20 runway.

53. A component of the terminal work involves the proposed construction of an eastern taxiway parallel to the main runway. At the same time, it is proposed to construct a full length western taxiway to serve the domestic terminal. Both taxiway proposals generated considerable comment at the public hearing and as they are inter-related they are considered together later in this report.

54. A plan of Perth Airport showing the location of the terminal and taxiways is at Plan C-2.

INTERNATIONAL TERMINAL

55. Aviation advised that final details of the precise location of the terminal were determined in consultation with the Minister for Aviation during June 1983. Witnesses from the airlines, local and State governments endorsed the siting of the terminal.

56. Details of construction, including engineering services and finishes to be provided, are at Appendix "D".

57. Design Factors Aviation advised that in determining the size of the new terminal a 1995 peak hour activity design year was selected. This means that the new terminal would operate for between 7-10 years at acceptable levels of service and with a minimum of congestion and delays. It was pointed out that adoption of a shorter design horizon could result in an almost continual program of terminal expansion with accompanying cost penalties associated with new construction on an operating facility and disruptions to terminal operations.

58. Forecast Peak Hour Activity Aviation advised that forecast peak hour flights, passengers, and the number of friends of passengers likely to be in the terminal during the design peak hour were key determinants in sizing the terminal. The number of flights in arrivals and departures peak hours were forecast as five. That is, three terminating or originating flights and two transit flights. During the transit peak hour there would also be five arrivals and departures - three transit arrivals and two terminating flights or three transit departures and two originating flights. Aviation advised that 1995 design peak hour passenger movements based forecast on micro peak hour forecasts in Table 4 are as follows:

Table 4
1995 Design Hour Passenger Movements

Design Peak	Passenger Movements			
	Term.	Origin.	Transit	Total
Arrivals	1174		394	1568
Departures		1174	394	1568
Transit	1038		593	1631
		1038	583	1631

59. Friend/passenger ratios of 3:1 for departures and 2:1 for arrivals were adopted following a recent survey of terminal population. The number of friends of passengers likely to be in public areas during the design peak hour, derived from applying these ratios to the number of terminating or departing passengers influenced the sizing of public areas.

60. A load factor of 80 per cent was adopted for all flights on the basis of forecast loadings.

61. The proposed apron will provide six aircraft parking positions. Five positions will be linked to the terminal by aerobridges; the sixth will be a stand alone position to be used for parking aircraft for longer periods. Aviation stated the number of aircraft parking positions being provided is consistent with the forecast design peak hour.

62. Qantas and the International Airlines Committee stated that the trend for international operators to replace transitting services by terminating services at Perth has increased the need for aircraft apron parking. On average, terminating aircraft require parking for about 12 hours. According to Qantas

assessments of future trends there will be a requirement for six aircraft parking positions during night time hours in 1983 and a need for eight parking positions by 1995.

63. The Committee notes that the number of aerobridge positions required and being proposed is not disputed by the airlines. The difference concerns the number of longer term overnight parking positions.

64. Aviation advised that the design of the terminal makes provision for ultimately ten parking positions. The additional positions, when warranted, could be provided at a cost of about \$500,000 each without disrupting operations.

65. Functional Requirements Broad planning for the new terminal proceeded on the basis of the following functional criteria:

- separation of arriving and departing passengers consistent with requirements for health, customs, immigration control and airport security;
- efficiency of passenger processing and baggage handling for passenger traffic forecast to 1995;
- minimisation of walking distances;
- flexibility to enable growth and change in terminal capacity.

66. Design Concept A curved linear design concept was adopted following consideration of numerous alternatives. These alternatives included pier, satellite and linear forms. Factors which led to the adoption of the curved linear concept included:

- the available building zone determined by clearances from runways and taxiways, access road requirements and carparks;
- the need for expansion from six to ten aircraft;
- the need to accommodate larger aircraft in future with minimal disruption to existing operations.

67. Building Design Plans and elevations of the terminal as originally proposed are at pages C-3 and C-4 respectively. The Committee was advised that the number of main building levels, of which there will be three, was determined by the number of aerobridge gate positions (five), the need to separate arriving and departing passengers and the need to minimise walking distances.

68. Central passenger processing and check areas will extend to each floor and determined the location of other functional areas. Fixed elements such as lifts, plant and amenities areas, which would be difficult to relocate to provide for expansion, will be centrally located within the terminal. Functional areas such as departures and arrivals halls, which would expand significantly, have been located at each end of the building.

69. Capacity for Expansion Aviation advised the new terminal is the first stage of a larger terminal designed to serve eight primary aircraft parking positions and two stand-off positions. The terminal design has sufficient flexibility to permit expansion of 40 per cent which is expected to accommodate this demand.

70. It is not intended to describe each floor of the terminal separately but rather to describe how the building will function in providing facilities and services to departing passengers and the non-travelling public.

71. Departing Passengers Surface access to the terminal for departing passengers and visitors will be by way of an access road from the Beechboro-Gosnells freeway. The access road, to be constructed by the Commonwealth, will be a two-lane carriageway separated by a median strip which will form a one-way loop in the vicinity of the terminal.

72. Vehicles carrying departing passengers may proceed to either the kerb-side passenger set down area, immediately adjacent to terminal building entrances or to the carpark. Vehicle parking areas will be provided for 1,200 vehicles initially and will be capable of extension when demand warrants. The carpark will be operated by a concessionaire.

73. Pedestrian traffic between the carpark and the terminal will be required to cross the access road. The Committee considers it necessary that appropriate pedestrian crossings be provided.

74. A bus dock for departing passengers will be located on the western side of the building.

75. Departing passengers will enter the terminal building through doors on the south western end of the building. Passengers from buses will enter through a door on the western side. All departing passengers will proceed across the lower departures hall to the passenger and baggage check-in area.

76. Having checked-in their tickets and deposited non-cabin baggage passengers and the non-travelling public will proceed by escalator to the first floor upper departures lounge area. The first floor will contain concessions areas including bar, coffee shop and food and beverage. All will be accessible to the public. A part of the first floor will also be occupied by airline facilities.

77. From the public upper departures lounge departing passengers will proceed to the secure areas by way of two doors, centrally located in the middle of the first floor and undergo an outwards customs check. A departure tax collection office will be located in the public area adjacent to the doors leading to the secure area. They will then proceed by escalators to the second floor forward departure lounge and gate lounge area where they will undergo a security check before entering the area.

78. A departure concourse will extend along the entire length of the airside second floor. The second floor secure areas will also contain duty free shops and a food and beverage concession.

79. It was originally proposed that in order to board their aircraft by way of aerobridges located on the first floor, departing passengers would proceed from the second floor to the first floor by way of stairs located in five nodes along the airside front of the terminal. This was one of the very few features criticised by the airlines.

80. Following the public hearing the Committee sought further details from departments of ways in which direct passenger access from the second floor to aircraft could be achieved without the use of stairs.

81. In response to this request DHC in conjunction with Aviation identified six options which, at added cost, would enable departing passengers to proceed direct to their aircraft. Option 1, involving dual ramp links from the aircraft parking position to the first and second floor is estimated to cost \$2.1 million. The other five options are all estimated to cost \$1.6 million (DHC advised these are indicative costs).

82. Whilst Aviation and DHC remain of the view that the original design is appropriate for the terminal, they prefer Option 6 to the other options. Option 6, illustrated at Plans C-5 and C-6, involves the construction of dedicated links with part spiral ramps. Departing passengers would proceed from the second storey forward departure lounge down a 32 metre straight ramp to a spiral ramp, down one and a quarter circuits of the spiral to the aerobridge. The gradient of the straight and spiral ramps would be 1:12.

83. This option is also preferred by Qantas.

84. In considering the inclusion of facilities above those originally proposed the Committee recognises the adoption of Option 6 would involve cost increases and marginally increase passenger walking distances. It is believed nevertheless that these disadvantages are outweighed by improvements to passenger convenience direct access to aircraft would provide.

85. Arriving Passengers Arriving passengers will enter the terminal at the first floor under the Option 6 dedicated links, proceed up a quarter of the circuit of the spiral ramp and then down a gentle 1:61 gradient, 32 metre long ramp link to the first floor arrivals concourse. Following a health check they will proceed to the ground floor by escalator where they will proceed through the primary customs barrier to the baggage claim area. Three baggage conveyor belts will be provided. After claiming their baggage they will proceed to a marshalling point and through baggage inspection. They will then enter the non-secure arrivals hall.

86. A kerbside passenger pick-up area will be located immediately outside the front of the terminal. A bus dock and a taxi rank will be located on the eastern side of the terminal.

87. Transit Passengers Transit passengers will enter the terminal the same way as terminating arriving passengers. After undergoing a health check they will proceed from the first floor to the second floor forward departure lounge. Before entering the lounge area they will be required to undergo a security check.

88. Access to Domestic Terminal It is proposed to construct a road inside the airport boundary to link the international terminal with the domestic terminal area. It is envisaged that this road would be used primarily by Aviation and airline service vehicles. Passenger transfer between the two terminals could be facilitated by the use of this road. Such an arrangement, involving a shuttle bus, would obviate using an alternate longer route through residential areas.

89. Aviation advised that the limited amount of data available on passenger transfers suggests a very low transfer rate of about 2 per cent of total passengers. Accordingly Aviation stated the option as to which route will ultimately be used to transfer passengers remains open. The Committee believes the possibility of using the service road for transferring passengers should be vigorously pursued by Aviation in discussions between relevant State public transport instrumentalities and private enterprise.

90. Communications The terminal will be served by the following communications:

- a public address system in all areas;
- flight information to all public areas utilising video and electro-mechanical displays;
- master clock controlled time presentation to all public and passenger accessible areas.

91. Baggage Handling A baggage conveyor belt will link the passenger check-in area with the baggage make up area. The baggage make up area will be located immediately adjacent to the check-in area. An internal service road will provide vehicular access to aircraft parking positions from the baggage make up area. This road will also permit vehicular movement from aircraft parking positions to the baggage breakdown area from where items of baggage will be carried to the baggage reclaim area by conveyor belt.

92. Related Works A number of works arising from locating the international terminal at the eastern site are also necessary. These are as follows:

- site works for the relocation of the existing radio receiver station, receiver aerials and the fire training facility;
- an aircraft waste disposal building; and
- site works associated with the relocation of distance measuring equipment (DME).

93. Committee's Conclusion The design and capacity of the international terminal is adequate to serve forecast aircraft and passenger movements to about 1995. Direct access to aircraft by passengers from the second floor forward departure lounge area should be provided in accordance with Option 6 at an additional cost of \$1.6 million.

TAXIWAYS

94. Need The majority of heavy aircraft movements are on the 02/20 runway and most landings and take-offs are directed to the south. Aviation advised that in 1985 80 per cent of landings on

the runway will be to the south and 5 per cent of these landing runs, involving about 72 international aircraft, would proceed to the end of runway 02.

95. For domestic and international take-offs Aviation forecast that in 1985 10 per cent of international and domestic take-offs would be to the north. This would involve 180 international aircraft take-offs and 756 domestic aircraft take-offs.

96. Under present arrangements, the absence of a parallel taxiway linking the aircraft apron area with the southern section of the runway requires aircraft which have landed to the south to backtrack a considerable distance along the runway to a taxiway linking the runway with the apron. An intermediate turning node located about two-thirds of the length of the runway, closest to the southern end, enables aircraft which have landed to the south to turn and backtrack without continuing their landing run to the threshold of runway 02.

97. For take-offs to the north aircraft require to taxi from the apron area to the turning node or to the southern threshold.

98. In all cases taxi-ing aircraft occupying the runway impose an additional delay of five minutes on subsequent operations. Aviation advised that preliminary studies have estimated the cost of delays at about \$0.3 million per annum. This estimate is based on direct aircraft operating costs in relation to delays on the ground and does not include delays in the air resulting from a need to increase the separation between landing aircraft or the value of passenger time losses.

99. The proposed location of the international terminal east of the main runway will mean that international and domestic operations will be carried out from opposite sides of the runway.

100. Domestic traffic constitutes the majority of heavy aircraft movements and domestic operations are likely to continue at the present terminal for the foreseeable future. The most logical location for a taxiway relative to the runway is therefore the western side.

101. At the same time Aviation stated that international operations from the eastern international terminal complex should not be disadvantaged by locating a taxiway on the western side of the runway. It is technically possible to provide a taxiway link from a western parallel taxiway across the main runway to the international terminal site. Such a solution would require international traffic to cross the main runway. The Committee agrees that such an arrangement would not be satisfactory.

102. Proposal It is proposed to construct two taxiways on the 02/20 runway alignment serving the domestic terminal and the new international terminal respectively.

103. The western taxiway, to serve the domestic terminal area, will be connected to the runway by three link taxiways - at the 02 threshold, south of the intermediate turning node and just north of the intermediate turning node.

104. The eastern taxiway, serving the international terminal, will not be full length; it will not extend to the 02 threshold.

105. Justification Reactions to the proposals at the public hearing were mixed. The areas of discussion centred on the need for the western taxiway, a full length western taxiway and a full length eastern taxiway.

106. Aviation advised that their justification for a full length western taxiway was based on present cost penalties associated with present arrangements and the number of domestic interstate and intrastate take-offs to the north. The aircraft involved should have direct access to the southern threshold.

107. According to Aviation, construction of the full length eastern taxiway cannot be justified at this stage because of the relatively low usage forecast for international aircraft. As already stated, by 1985 180 international take-offs will be from the southern end and 72 international aircraft landings will involve a landing run to the 02 threshold. For both take-offs to the north and full length landings to the south international aircraft will be required to taxi along part of the western taxiway and cross the main runway.

108. Views of the Airlines Representatives of international airlines stated it would be desirable from an operational point of view for the eastern taxiway to be extended to the southern threshold. Without this extension a number of aircraft taking off from the south or landing to the south would be required to cross an active runway which is not desirable on operational grounds. Furthermore, in order to proceed to or from the southern end would require more turning and variations to aircraft taxi-ing speeds, additional braking, stopping, and longer taxi-ing distances. Qantas stated that based on 1990 forecasts and fuel costs the additional taxi-ing time would add about \$250 per movement to costs. In a year these additional costs would total \$146,000.

109. A representative of international airline pilots similarly supported the need for a full length eastern taxiway on operational grounds.

110. Local Reactions Representatives of local councils suggested that the eastern taxiway be extended to the southern 02 threshold and the length of the western taxiway be reduced by 800 metres at its southern end. The latter suggestion being based on added noise a full length taxiway would impose on nearby residents and the Councils' understanding of likely runway usage in 1985.

111. In response to this suggestion representatives of domestic airlines and pilots stated that construction of the western taxiway to about 800 metres of the 02 threshold would be justified for aircraft landings. For departures, however, a full length western taxiway is justified. Intersection departures by heavy aircraft are not encouraged and pilots are required to justify such a procedure. In the case of Perth most domestic interstate aircraft are usually heavy and require the full length of runways.

112. A representative of local residents suggested that the eastern taxiway be extended to the southern 02 threshold and that the western taxiway be deleted altogether. This suggestion is based on a logical extension of a Strategy 4 development plan for Perth Airport. Whilst the domestic terminal remains at its present location the suggestion would necessitate all domestic aircraft landing to the south to either cross the main runway or to taxi along the length of the eastern taxiway to the northern end.

113. Consideration The western taxiway is required to serve the domestic terminal whose relocation, in accordance with Strategy 4, cannot at present be justified. The western taxiway is required to be full length. Any reduction in length would defeat its purpose. The Committee agrees that the eastern taxiway should be extended to the threshold of the 02 runway. This extension would save on taxi-ing costs and obviate the need for a proportion of international aircraft requiring access to and from the southern threshold to cross an active runway. It would also move taxi-ing international aircraft further away from nearby residential areas.

114. Noise Attenuation Measures A noise attenuation mound is proposed as part of the western taxiway works. The mound will be located between the western taxiway and closest residential areas

and will be eventually covered with trees and shrubs to enhance noise attenuation and to provide a visual screen. Following the public hearing the Committee sought further details as to dimensions and predicted noise attenuation properties from Aviation.

115. The Committee was advised that the mound will be seven metres high and its length will be of the order of 400 metres, depending on the amount of excess material available from runway construction.

116. Aviation also advised that the following taxi-ing noise levels were recorded at Perth Airport about 600 metres from the runway centreline from aircraft landing to the south:

	<u>Noise level (dBA)</u>
Taxi-ing on runway	53-69
Turning on runway	60-70

117. It was pointed out that the proposed taxiway would obviate the need for aircraft to turn on the runway (highest recordings).

118. Aircraft taking off to the north would be required to make a left turn with noise directed at residences to the west. Aviation stated as turning noise would be followed by take-off the noise should be seen as part of a single noise event. Noise from take-off to the north would normally be in excess of 80dBA at the nearest houses. The number of take-offs to the north in 1985 would be 936, of which 180 would be international.

119. Aviation advised that as a result of location of the mounds improvements to noise exposure in the western residential area can be expected. The noise attenuation assessed by Aviation is up to 10dBA for aircraft with low slung engines.

120. Committee's Conclusion The western parallel taxiway should proceed as proposed. The eastern taxiway should be extended south to the 02 threshold at an additional cost of \$1.5 million at July 1983 prices.

ENVIRONMENTAL CONSIDERATIONS

121. The environmental impact of the development of Perth Airport was assessed in the Provisional Master Plan and Draft Environmental Impact Statement and in the Supplement to the Draft Environmental Impact Statement.

122. These documents were lodged with the Department of Home Affairs and Environment. In February 1983 the Minister for Home Affairs and Environment advised that there are no environmental objections to approval being given to construct the new international terminal building, control tower and ancillary works but further consideration should be given to the early construction of a wide-spaced parallel runway.

123. Of particular relevance to the construction of the terminal is the presence of aboriginal sites of anthropological interest near the terminal site. DHC advised that work is currently being finalised in the investigation of the sites. DHC also advised that a survey of flora had been completed. No rare species were found.

PROGRAM

124. In evidence DHC witnesses stated that tenders for the western taxiway will be called in December 1983. Tenders for preliminary site works for the international terminal will be called in February 1984, and for the main terminal building tenders will be called in April 1984. These dates are consistent with a completion date of September 1986.

125. The Committee understands that at this stage it is planned to hold the foreign eliminations and the defence of the America's Cup during the Spring and Summer of 1986/87. Accordingly, the Committee strongly urges that the construction timetable be rigorously adhered to and that the necessary funds are made available throughout the construction period.

COST

126. The limit of cost estimate for the work when referred to the Committee was \$53 million at July 1983 prices, made up as follows:

	\$M
<u>Western taxiway</u>	3.0
<u>Terminal</u>	
Building	18.0
Mechanical Services	7.4
Electrical Services	7.0
Civil Works	16.7
<u>Associated Works</u>	<u>0.9</u>
TOTAL	53.0

127. The Committee has recommended additional work estimated to cost as follows:

	\$M
Extension of eastern taxiway	1.5
Redesigned aerobridge - Option 6 (indicative cost)	<u>1.6</u>
TOTAL	3.1

128. Committee's Recommendation The Committee recommends the construction of the work in this reference with a limit of cost estimate of \$56.1 million at July 1983 prices.

RECOMMENDATIONS AND CONCLUSIONS

129. The recommendations and conclusions of the Committee and the paragraph in the report to which each refers is set out below:

	<u>Paragraph</u>
1. ADEQUATE FACILITIES FOR THE HANDLING OF INTERNATIONAL AIRCRAFT, PASSENGERS AND THE NON-TRAVELLING PUBLIC, SHOULD BE PROVIDED AT PERTH AIRPORT.	38
2. THE COMMITTEE AGREES THAT CONSTRUCTION OF AN INTERNATIONAL TERMINAL AT A NEW SITE OFFERS CONSIDERABLE ADVANTAGES OVER OTHER OPTIONS EXAMINED.	46
3. THE NEW INTERNATIONAL TERMINAL BUILDING SHOULD BE LOCATED EAST OF THE 02/20 RUNWAY IN ACCORDANCE WITH THE MASTER PLAN FOR THE DEVELOPMENT OF PERTH AIRPORT.	51
4. THE DESIGN AND CAPACITY OF THE INTERNATIONAL TERMINAL IS ADEQUATE TO SERVE FORECAST AIRCRAFT AND PASSENGER MOVEMENTS TO ABOUT 1995. DIRECT ACCESS TO AIRCRAFT BY PASSENGERS FROM THE SECOND FLOOR FORWARD DEPARTURE LOUNGE AREA SHOULD BE PROVIDED IN ACCORDANCE WITH OPTION 6 AT AN ADDITIONAL COST OF \$1.6 MILLION.	93
6. THE WESTERN TAXIWAY SHOULD PROCEED AS PROPOSED. THE EASTERN PARALLEL TAXIWAY SHOULD BE EXTENDED SOUTH TO THE 02 THRESHOLD AT AN ADDITIONAL COST OF \$1.5 MILLION AT JULY 1983 PRICES.	120

	<u>Paragraph</u>
7. THE LIMIT OF COST ESTIMATE FOR THE WORK WHEN REFERRED TO THE COMMITTEE WAS \$53 MILLION AT JULY 1983 PRICES.	126
8. THE COMMITTEE RECOMMENDS THE CONSTRUCTION OF THE WORK IN THIS REFERENCE WITH A LIMIT OF COST ESTIMATE OF \$56.1 MILLION AT JULY 1983 PRICES.	128


(D.J. FOREMAN)
Chairman

Parliamentary Standing Committee
on Public Works,
Parliament House,
CANBERRA

1 December 1983

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Wade, R.L. Esq., Principal Airport Engineer, Department of Aviation, Canberra, Australian Capital Territory

LIST OF EXHIBITS

Exhibit
No.

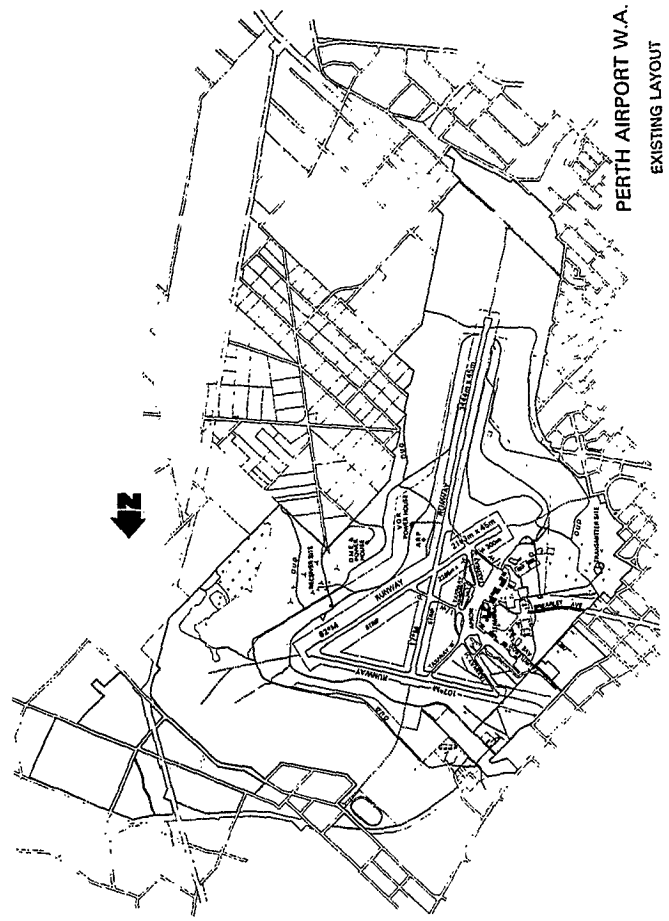
Public Works Committee Reports
and Minutes of Evidence

New Air Traffic Services Centre and
Control Tower, Perth Airport,
Western Australia (Committee's
Twelfth Report of 1981) October
1981 (Parliamentary Paper 266/1981) 1

New Air Traffic Services Centre and
Control Tower, Perth Airport,
Western Australia - Final Report
(Committee's Eighth Report of 1982)
October 1982 2
(Parliamentary Paper 292/1982)

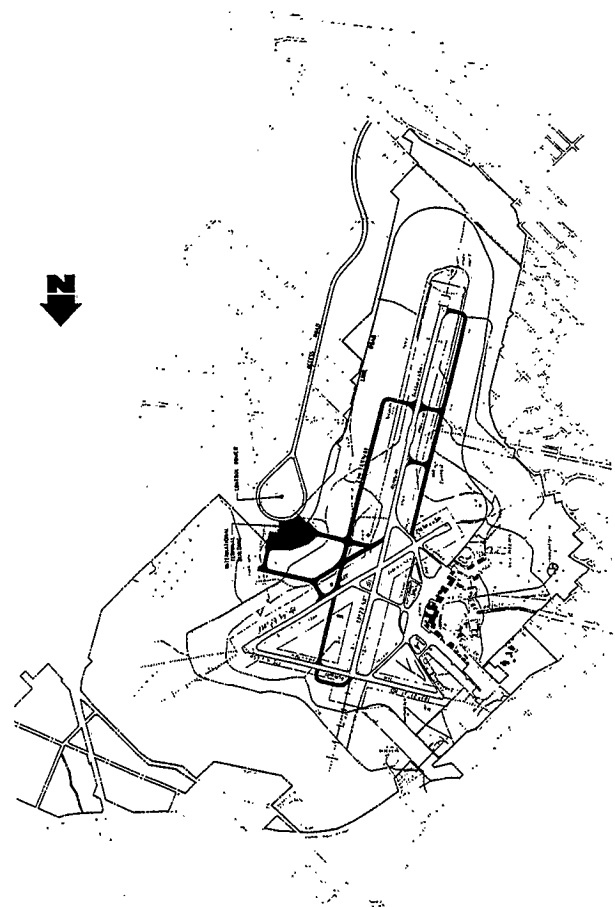
Department of Aviation

Perth Airport - Supplement to the Draft
Environmental Impact Statement,
January 1983 3



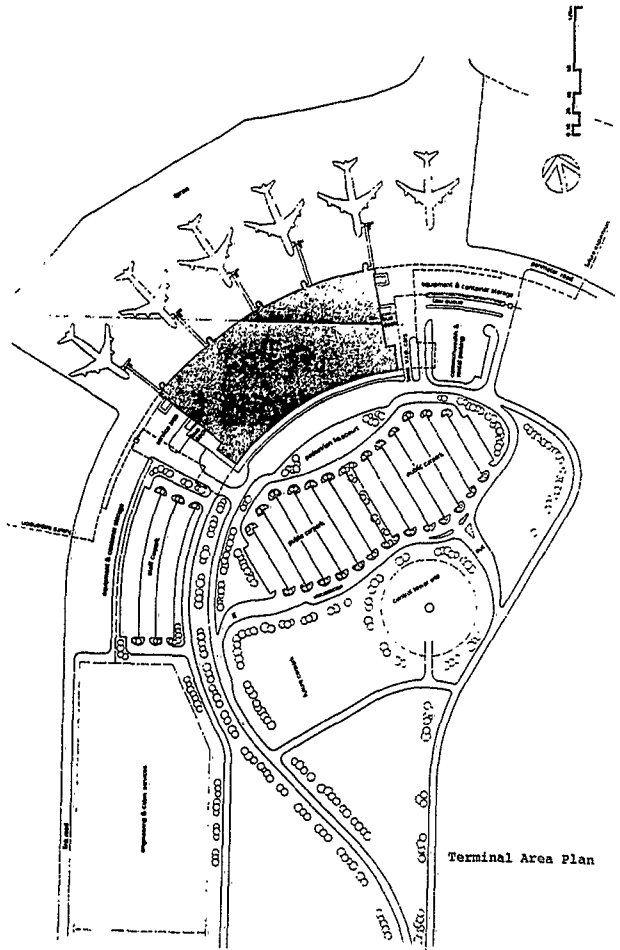
PERTH AIRPORT W.A.
EXISTING LAYOUT

(C-1)



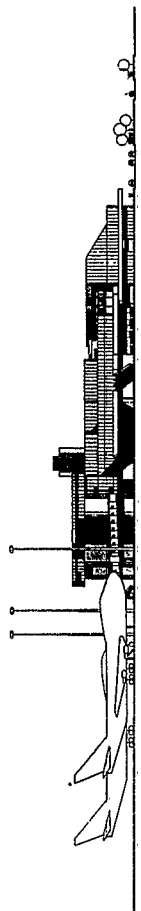
PERTH AIRPORT W.A.
NEW INTERNATIONAL TERMINAL COMPLEX
AND WESTERN PARALLEL TAXIWAY
EXTENT OF WORKS

(C-2)

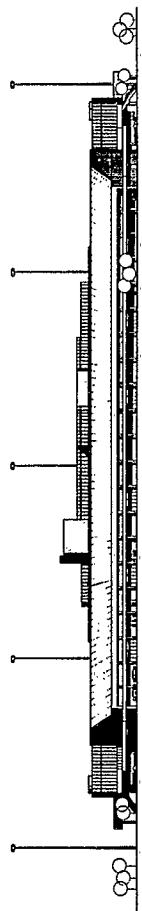


Terminal Area Plan

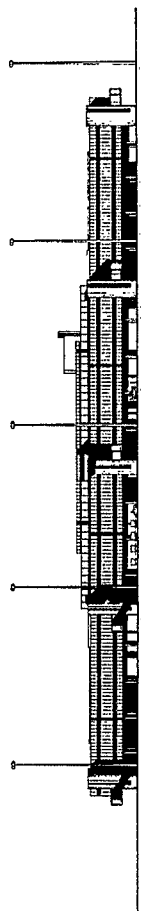
(C-3)



end view



landside view



airside view

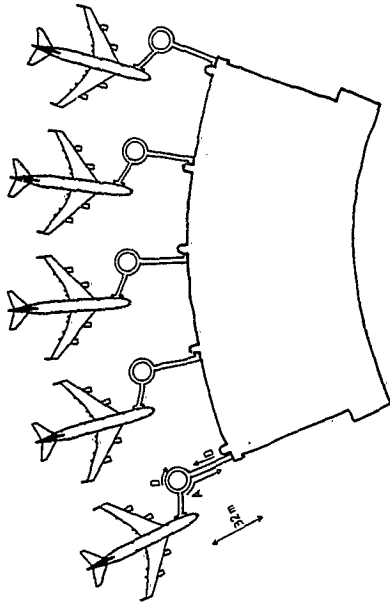
Elevations

WALKING DISTANCES-AIRCRAFT/GATE:

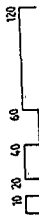
ARRIVALS: 55m
DEPARTURES: 90m

ADVANTAGES

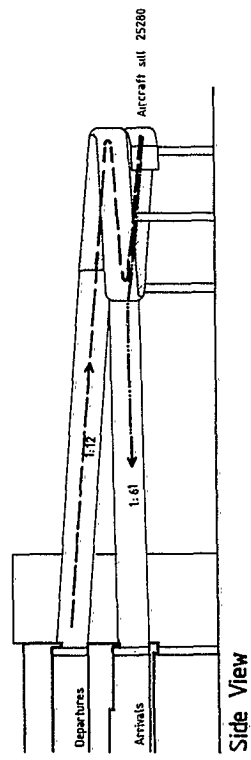
Aircraft at optimum distance from
building. Minimal arrivals
waiting distance. All ramping
free of building face. Provides
maximum flexibility if gate
relocation required in future.
Spiral ramp adjacent stand off
position could be taken to apron
level for passenger access



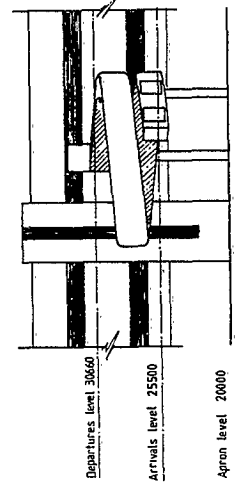
(C-5)



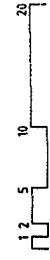
Preferred
Option 6



Side View



End View



Preferred
Option 6

CONSTRUCTION DETAILS

1. **Structure** The structure will be an in situ reinforced concrete column and slab system with shallow pad footings and a reinforced concrete ground floor slab.
2. Areas of reinforced concrete roof slab will be provided to facilitate expansion of upper floors.
3. Roof slabs will be post-tensioned pre-stressed concrete where this system provides the most satisfactory and economic structure.
4. **Finishes** The roof will comprise coloured vinyl coated metal decking and a waterproof membrane system on the concrete roof slab.
5. External walls will be framed and clad with paint finished panels and windows will be of tinted glass.
6. Internal walls in heavy duty areas will be of masonry and paint finished where appropriate. In other areas walls will be painted plasterboard.
7. Floors will be carpeted in public and administrative areas except for very heavily trafficked areas which will be sheeted with profiled synthetic rubber.
8. Toilets and wet areas will be ceramic tiled.
9. Concrete floors in baggage handling and stores areas will be left uncovered.

10. Internal finishes will not be provided in areas designed for airlines or concessionaires. These areas will be fitted out by the users at their cost.

11. Air Conditioning and Ventilation Ducted air conditioning systems will be provided to maintain comfort conditions throughout the building except in areas occupied by concessionaires and airline operators. These areas will be supplied with fresh air and chilled and heating water services. The occupiers will provide their own air handling plant.

12. Outside air will be utilised for cooling when ambient conditions are suitable.

13. A central chiller plant will provide cooling and central gas fired boilers will provide heating. Both plants will be located on the ground floor. Cooling towers will be located on the roof.

14. Mechanical ventilation will be provided for toilets and baggage make-up areas.

15. Fire Protection The building will be protected throughout by an automatic fire sprinkler system, hose reels and hand extinguishers.

16. Early warning fire detection will be provided in the air handling system. Air conditioning systems will automatically change over to a smoke venting mode on activation of a fire alarm.

17. Light and Power Illumination will be provided by fluorescent or meandescent fittings appropriate to the area in which they are to be installed.

18. Electrical power will be distributed through wall and skirting mounted outlets.

19. The provision of light fittings and power outlets in concession and airline areas will be the responsibility of occupiers.

20. High voltage electrical power will be extended to the site from the point of entry of the supply to the existing terminal area.

21. Emergency electrical power will be provided by diesel alternators.

22. Central Supervisory System This will be computer based and will monitor and control building services.

23. Domestic Hot Water Domestic hot water will be provided by solar hot water heaters. Concessionaires and airline operators will provide hot water plant for their own use and requirements.

24. Water Supply Water will be provided by extension of the existing service. The alternative supply required for the fire sprinkler system will be obtained from a main to the south of the airport.

25. Sewerage Sewerage will be connected by a rising main to the Metropolitan Water Authority System at the existing airport building area.

26. Oil Company Area An area reserved for oil company storage will be provided with an access road and water, power and sewerage services will be provided to the boundary. Facilities within the boundary are to be provided by the oil company.

27. **Fencing** The existing security fence will be extended to provide security to the aircraft movement area.

28. A stock proof fence will be provided on the eastern side of the main access road.



DEPARTMENT OF THE SENATE
 PAPER No. 2183
 DATE PRESENTED - 8 DEC 1983
[Signature]
 Clerk

Parliamentary Standing Committee on Public Works

REPORT

relating to the

**PROVISION OF NAVIGATIONAL AIDS,
 HYDROGRAPHERS PASSAGE**

GREAT BARRIER REEF

(Eleventh Report of 1983)

THE PARLIAMENT OF THE COMMONWEALTH OF AUSTRALIA
 1983