

Parliamentary Standing Committee on Public Works

REPORT

relating to the

REDEVELOPMENT OF FACILITIES AT DARWIN INTERNATIONAL AIRPORT

Northern Territory

(Seventh Report of 1984)

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THE PARLIAMENT OF THE COMMONWEALTH OF AUSTRALIA
PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

R E P O R T

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REDEVELOPMENT OF FACILITIES

AT

DARWIN INTERNATIONAL AIRPORT

Northern Territory

(Seventh Report of 1984)

Australian Government Publishing Service
Canberra 1984

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 Garry Norman Jones

Senator Bernard Francis
Kilgariff

House of Representatives

David Bruce Cowan, Esq., M.P.

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John Saunderson, Esq., M.P.

EXTRACT FROM

JOURNALS OF THE SENATE

NO. 62 DATED 15 DECEMBER 1983

- 32 PUBLIC WORKS - JOINT STATUTORY COMMITTEE - REFERENCES OF WORK: The Minister for Social Security (Senator Grimes), by leave and pursuant to Notices of Motion not objected to as Formal Motions, moved the following Motions together:

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.

Upgrading of facilities for introduction of F28 Aircraft, Wagga Wagga Airport, New South Wales.

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:

Redevelopment of facilities at Darwin International Airport, Northern Territory.

Questions - put and passed.

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PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

REDEVELOPMENT OF FACILITIES AT DARWIN INTERNATIONAL
AIRPORT, NORTHERN TERRITORY

R E P O R T

By resolution on 15 December 1983 the Senate referred to the Parliamentary Standing Committee on Public Works for investigation and report the proposed redevelopment of facilities at Darwin International Airport, Northern Territory.

The Committee has the honour to report as follows:

THE REFERENCE

The proposed work is for major new facilities at Darwin international airport for domestic, international and general aviation (GVA) services and comprises the following elements:

- a new terminal building for both domestic and international services;
- aircraft movement area pavements and apron for heavy domestic and international aircraft;
- a taxiway parallel to the 11/29 runway, access roads, car parks and associated facilities;
- an administration building, workshops, powerhouse and navigational aid facilities; and

- GA facilities including a terminal, operational and flight service centre building, receiver station, radio maintenance building, apron and taxiway.

The estimated cost of the proposed work is \$95 million.

THE COMMITTEE'S INVESTIGATION

2. 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 Darwin on 16-17 February 1984.
3. The Committee also received written submissions from the Northern Territory Government, Darwin City Council, airlines, the Federal Member for the Northern Territory and a Member of the Northern Territory Legislative Assembly. A list of witnesses and the organisations which they represented is at Appendix A.
4. On 15 February 1984 the Committee inspected Darwin Airport. The inspection included the existing terminal building and an overflight of the northern side of the airport site where the majority of the proposed work will be located. The Committee would like to record its appreciation to the RAAF for providing a helicopter for the flight.
5. The Committee's proceedings will be printed as Minutes of Evidence. A list of exhibits is at Appendix B.

BACKGROUND

6. Location The present Darwin Airport was commissioned as a RAAF facility in July 1941. Prior to 1941 civil and military aviation was based at what was known as the Parap Police Paddock which witnessed many pioneering flights in the early days of aviation.
7. Civil aviation commenced at RAAF Base Darwin (hereafter called Darwin Airport) in 1945 under a joint user policy between the then Departments of Air and Civil Aviation. The civil building area was developed as a separate, self contained entity on the airport site.
8. The Airport is located 6.5 kilometres north-east of the Darwin Central Business District. It is bounded by three major arterial roads - Bagot Road along the western boundary, the Stuart Highway along the southern boundary and McMillans Road along the northern boundary. (See Locality Plan - Page C-1)
9. Movement Areas When commissioned in 1941 the main runway was in the 13/31 orientation; a secondary runway was aligned on 18/36. The old 13/31 runway was replaced in 1962 with the present high strength 3,352 metre 11/29 runway. The 18/36 runway, 1,524 metres long, was reconstructed and sealed in 1964. The 11/29 runway is serviced by a full length parallel taxiway. The RAAF Fighter Replenishment Apron and Bomb Replenishment Aprons are located along the south-eastern edge of the main runway.
10. Air Services Air services operating from or through the airport include international, domestic and commuter airlines, and charter and freight operators.

11. Table 1, below, gives a broad overview of the nature of civil operations at Darwin Airport for 1981.

Table 1
1981 Aircraft and Passenger Movements
Darwin Airport

	Average No. of Weekly Movements	Aircraft Types	% Total Passenger Movements
International	8	B747, DC9, B737	11
Interstate	80	B727, DC9, F28	76
Intra Territory	25	F27, F28	9
Commuter	80	Various	4

12. The airport is also used by fixed and rotary wing charter and international and interstate freight operators.

13. Military movements over the past few quarters have averaged nine RAAF and six non-RAAF per day.

14. Forecasts Aviation forecasts of passenger activity at Darwin are given in Table 2 below.

Table 2 - Forecast Passenger Activity 1985-2005

	1982	1985	1990	1995	2000	2005
International	37,828	42,400	50,800	59,100	67,500	75,900
Domestic	276,541	333,300	400,100	466,900	533,600	600,400
Commuter	27,042	35,100	37,000	38,600	40,000	41,300
TOTAL	341,411	410,800	487,900	564,600	641,100	717,600

15. Table 3, below, gives the forecast aircraft movements for Darwin. The proportion of commuter and other aviation movements are high, reflecting the heavy reliance on air travel by Northern Territory residents.

Table 3 - Forecast Aircraft Movements 1985-2005

	1982	1985	1990	1995	2000	2005
International	540	710	640	710	690	750
Domestic	4,900	5,160	5,900	6,280	6,480	6,990
Commuter	5,779	4,850	4,870	4,960	5,020	5,070
Other Aviation	48,420	90,200	98,200	106,200	114,100	122,100
TOTAL	59,639	100,920	109,610	118,150	126,290	134,910

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Other Aviation	48,420	90,200	98,200	106,200	114,100	122,100
TOTAL	59,639	100,920	109,610	118,150	126,290	134,910

16. Constraints on Expansion. The existing civil facilities are located almost entirely within areas developed and operated by the RAAF. The terminal building, with associated apron, carparks and access road, is situated around the southern end of the 18/36 runway in the south-west sector of the airport.

17. Existing civil facilities located near the terminal include a light aircraft apron and associated hangars (immediately west of the 18/36 runway) airline freight and catering facilities, the Aviation Flight Services Centre and technical maintenance areas. The fuel depot is located immediately north of the light aircraft apron.

18. Relocation Long term planning for the future airport needs of Darwin has been the subject of several studies undertaken by the Commonwealth and Northern Territory Governments over the past decade. In summary, these studies addressed:

- the value of the existing airport site to the Defence needs of Australia;
- the advantages of making the airport site available for urban development; and
- the planning implications of continued joint use of the present site.

19. The question of relocating the airport was given impetus in 1975 when population projections for Darwin indicated that the city would have a population of 85,000 by the late 1980s. The area of developable land was insufficient for the projected population size. It was recognised that a new centre would need to be established and the options available were Darwin East (Palmerston) or the existing airport site. The Palmerston option was adopted, and has progressed to the

development stage. It is therefore unlikely that the existing airport site will again be considered for urban development in the future development of Darwin.

20. Development of the Airport The terminal building was substantially damaged by Cyclone Tracy and required significant expenditure. The Committee was advised that the cost of repairs to the terminal has never been quantified; it would be in the order of \$3 million.

21. It would be obvious to any passengers and members of the non-travelling public who have visited or used the terminal facilities that the repairs were of a minimum nature, designed to enable passenger services to continue whilst studies to determine the future location of civil aviation facilities at Darwin airport were carried out by Aviation. These studies evaluated possible civil aviation development strategies, available sites and the timing and costs of any relocation. They were carried out against the background of future Defence requirements for RAAF Base Darwin. A key element prompting consideration of relocation in 1980 and 1981 was the planned redeployment of a RAAF Mirage Fighter squadron from Butterworth, Malaysia, to Darwin. As a consequence Defence advised Aviation that future planning of civil aviation facilities should aim at the completion of a new terminal and remaining civil facilities by 1986 to meet the timetable for the construction of facilities for the Mirage/Tactical Fighter Force (TFE) Squadron.

22. The Mirage squadron was redeployed to RAAF Base Darwin in early 1983. Permanent facilities for the Mirage/TFE squadron will not be constructed in Darwin. Instead, it is now proposed to develop RAAF Tindal as a permanent base for a squadron of TFE aircraft. Works comprising the development of RAAF Tindal have been referred to the Committee for consideration and will be the subject of a separate report.

THE NEED

23. Existing Terminal The existing terminal, which caters for domestic and international aircraft and passengers, is sub-standard and inadequate in terms of the level of amenity and comfort offered to passengers and the non-travelling public and in terms of its capacity to facilitate the orderly flow of passengers during daily peak periods. In short, the terminal is too small and has reached the end of its economic life. If retained, the level of amenity would continue to deteriorate and recurrent maintenance costs would continue to escalate. In addition the structural inadequacies for high wind loadings require evacuation when winds exceed 70 knots.

24. Terminal Congestion Terminal facilities are incapable of processing passengers from large domestic and international passenger aircraft at a reasonable standard. Qantas B747 services from Singapore usually arrive in the early morning and there is limited queuing space in the international section. This significant deficiency requires passengers to queue on the aircraft apron, often in rain. Present policy is that all inbound passengers are required to undergo a health clearance at their first Australian port of call. Transit passengers are therefore required to disembark from inbound international flights and add to the congestion at the entrance to the terminal.

25. Areas inside the terminal for customs/health/immigration are relatively small and badly ventilated. The greatest cause of delays to passenger processing is the present baggage claim arrangements in the customs hall. The customs hall is not equipped with a "race track" conveyor belt baggage claim facility. Baggage from aircraft is assembled in the baggage collection area, separated from the adjacent customs hall by roller doors. The doors are opened when all baggage has been unloaded. This arrangement, the environment in which it operates

and the limited amount of space available at the baggage collection area would tax the patience of passengers with the most equable temperament. Passenger processing times may take up to two hours. Measures to be implemented in the short term to alleviate discomfort to disembarking passengers and to expedite passenger flows are discussed later.

26. Congestion and the level of services offered to the non-travelling public are not confined to the international section of the terminal. In the domestic area, which is also poorly ventilated, public lounge areas are very limited and there is no separation of arriving and departing passengers.

27. The domestic baggage reclaim area is only partly under cover. Passengers are required to reclaim their bags direct from baggage trolleys. This arrangement presents problems of safety and the Committee was advised that airline staff have expressed concern at the potential dangers to passengers with the present system.

28. Aircraft Parking Positions The existing apron is inadequate at daily peak periods. Further extensions of apron space are limited by the location of the terminal building and the RAAF apron and taxiways. The apron shape limits the amount of aircraft parking space available at the front of the terminal. Passengers must therefore walk some distance through lines of parked aircraft.

29. Car Parking There is limited car parking space available near the terminal. Remote car parking is available but limited and has poor pedestrian access to the terminal.

30. General Aviation Facilities The light aircraft apron and hangar areas, located to the east of the terminal do not have sufficient capacity for existing demand. Existing sealed and

unsealed apron areas are able to accommodate parking requirements but only with sub-standard separations between aircraft which creates a safety problem.

31. Committee's Conclusion Facilities at Darwin Airport for international and domestic passengers and aircraft are grossly deficient and measures designed to rectify the situation should be implemented.

CONSIDERATION OF DEVELOPMENT OPTIONS

32. Aviation advised that a number of options for the development of civil facilities were considered against the background of the continued presence of the RAAF at Darwin. It was suggested to the Committee that any consideration of relocating civil facilities before future RAAF requirements arising from the Tindal development is premature. The Committee understands that in the longer term it is planned to relocate some RAAF Darwin elements to Tindal, RAAF Base Darwin will clearly continue as a major Defence facility for the foreseeable future, and the assessment of a number of development options for civil facilities, which are summarised below, recognises this fact.

33. Option 1 - North Central Site This option is desirable because it completely separates civil aviation and RAAF activities. Its main disadvantages are its higher total cost, compared with other options and that it requires immediate relocation of GA facilities, estimated to cost \$7 million, to the north of the main runway. Civil aviation costs were \$102 million at September 1982 prices.

34. Option 2 - South Central Site This option is desirable from a civil aviation point of view but poses significant aircraft noise and operational problems as well as additional costs to the Department of Defence; \$15 million would be required

for facility replacement. Civil aviation costs for this option were \$77 million at September 1982 prices but total costs were \$92 million.

35. Option 3 - South Western Site This is the least acceptable option which poses a number of significant disadvantages and penalties for civil aviation and Defence. It is the highest cost option because about \$50 million would be required for the relocation or replacement of defence facilities. Civil aviation cost for this option were \$83 million at September 1983 prices but total costs were \$133 million.

36. Option 4 - Staged Northern Development This is a derivative of Option 1 and retains most of the advantages of Options 1 and 2. It involves the retention of existing GA facilities on the south side and the development of new GA facilities at the northern site. There would, however, be a split in GA operations in the short term. Civil aviation costs associated with this option were \$90 million at September 1982 prices.

37. Northern Sites Possible northern sites were examined by Aviation. Three alternatives were identified. They were: the north-west; north-east; east of Mararra Swamp and north-east, west of Mararra Swamp. The Committee was advised that an analysis of economic, engineering, operational and environmental aspects of these alternatives indicated that development in the north-east sector west of Mararra Swamp to be preferable to the other northern sites.

38. Committee's Conclusion The staged northern development option has operational and cost advantages over other options examined and is supported.

THE PROPOSAL

39. It is proposed to implement Option 4 - the staged northern development. The location of the elements to be developed at the northern site are in accordance with the Provisional Master Plan for Darwin Airport. The extent of the redevelopment is extensive, comprising a new terminal complex, Commonwealth buildings and other facilities, GA development and associated infrastructure. These components of the proposal are discussed below. A site plan which shows the location and extent of the proposed work is at Page C-2.

RPT TERMINAL COMPLEX

40. Extent RPT facilities will be relocated from the south to the north of the main runway. A new shared use terminal, capable of accommodating peak hour passengers and the non-travelling public and four aircraft at aerobridge positions, will comprise the major component of the redevelopment. Other works associated with the terminal include an RPT aircraft parking apron with capacity for four gate positions and two or three stand-off positions, a taxiway system including a full length parallel taxiway north of the main 11/29 runway. A road loop will provide vehicular access to the terminal. Parking space will comprise a 440 space short term car park with provision for long term car parking and space for buses and rental cars.

41. Commonwealth buildings and facilities and infrastructure for GA are also included in the proposed redevelopment, and are described later in this report.

42. Terminal Building The new terminal, designed to cater for domestic and international passengers and aircraft, will be a two level, rectangular linear structure incorporating four aerobridges. The basic design was adopted following an evaluation of other possible alternatives which included both compact linear and curvilinear concepts.

43. The terminal has been designed so that no expansion work will be necessary for a ten year period after commencement of operations in 1988. Aviation advised that the design will provide desired levels of service for seven years after commencement of operations. Levels of service will then diminish through the next 3 years before the facility is expanded.

44. Sizing Determinants Aviation advised that forecasts were analysed to determine peak aircraft parking requirements and peak hour passenger populations. The terminal has been sized to take into account processing rates, the number of passengers and non-travelling public estimated to be in the terminal during the peak hour and providing standard space allowances per passenger.

45. Aviation stated that the number of passengers expected in the terminal during the design hour depends on the number of departing and arriving aircraft in the design hour and the number of passengers on each aircraft. The following factors were taken into account in estimating design hour loadings:

- forecast annual passenger numbers;
- design aircraft seating capacities;
- design load factors;
- derived relationships between the number of annual and average peak hour flights; and
- the proportion of transit flights.

46. Based on these considerations Aviation forecast six flights during a combined international and domestic design hour as follows:

- one international B757 flight either originating or terminating;

- two domestic A300/B767 originating flights and one terminating flight or vice versa; and
- one domestic B727/B737 originating flight and one terminating flight.

47. Load factors of 100 per cent for international flights and 90 per cent for domestic flights were adopted for design purposes. International transit passengers were estimated at 30 per cent.

48. Finally, ratios between passengers and the non-travelling public were adopted on the basis of survey results carried out at the airport and are as follows:

	Passengers	Non-Travelling Public
International and domestic departures	1	2.5
International and domestic arrivals		1.5

49. For the international design hour the forecasts indicate that there will be 450 originating or terminating passengers. An allowance for 315 transitting passengers has also been made. The overall requirement for the international design hour should therefore be based on 1575 persons for an originating/terminating flight and 785 persons for a transitting flight.

50. The combined international and domestic design hour forecasts indicate that there will be 770 originating and 370 terminating passengers (or vice versa) in the terminal, of which 200 would be international passengers. The overall allowance made is for 3040 persons using the combined international and domestic facilities. The number of persons in the terminal will, however, vary with time. Aviation stated that 2200 persons will be in the terminal at the beginning of the design hour, rising to a maximum of 3040 persons within the first 15 minutes and then falling away to about 700 persons at the end of the design hour.

51. Having established the population numbers, floor area was then allocated with due regard to the requirements of specific functional areas; additional space was allocated to ensure freedom of movement within and between functional areas. Space for airlines and government departments was decided after consultation. Concession areas were allocated on the basis of commercial analysis and experience at Darwin and other Australian terminals.

52. Description The two-level structure will have the main concourse, check-in facilities and baggage reclaim areas on the ground floor. Concessions, a further concourse, passenger and gate lounges will be at the first floor level to provide direct access to aircraft by aerobridges. Space underneath the first floor concourse will be used by airline offices, aviation engineering and baggage make-up and break-down. Aviation will administer common user facilities such as baggage make-up and break-down areas made available for operational use by the airlines.

53. Plant rooms will be mainly located at roof level, their distribution reflecting air conditioning needs. All enclosed public lounge and concourse areas, secure lounges, health, immigration and customs areas, Aviation and other Commonwealth

- two domestic A300/B767 originating flights and one terminating flight or vice versa; and
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	Passengers	Non-Travelling Public
International and domestic departures	1	2.5
International and domestic arrivals	1	1.5

49. For the international design hour the forecasts indicate that there will be 450 originating or terminating passengers. An allowance for 345 transitting passengers has also been made. The overall requirement for the international design hour should therefore be based on 1575 persons for an originating/terminating flight and 785 persons for a transitting flight.

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53. Plant rooms will be mainly located at roof level, their distribution reflecting air conditioning needs. All enclosed public lounge and concourse areas, secure lounges, health, immigration and customs areas, Aviation and other Commonwealth

administration areas will be air conditioned. The aim of the air conditioning will be to achieve specified comfort conditions in the tropical climate of Darwin.

54. The distribution of facilities within the terminal will separate international and domestic passenger arrival and departure flows. Queue space and overflow space at processing points have been located to avoid interference with other passenger movements. Permanent obstructions such as lifts and staircases will be located in areas in which future flexibility will be a requirement. For example, the baggage reclaim area will be capable of expansion; airline office space could be adjusted to accommodate additional carriers.

55. Four gate lounges will be located on the second level; two will be for domestic aircraft and passengers and two will be for a combination of domestic/international gate lounges which could be separated if an international and a domestic aircraft are departing at the same time. The gate lounges have been sized to accommodate the following passenger loadings:

- two gate lounges of 350 square metres for wide body aircraft;
- one gate lounge of 200 square metres for narrow body aircraft; and
- international gate lounge of 260 square metres which could be expanded to 610 square metres if required.

56. Construction Details. Perspectives and elevations of the terminal are at Pages C-3 and C-4 respectively. Construction details are at Appendix D.

57. Terminal Operation - Departing Passengers. Surface access to the terminal for departing passengers will be by way of an access road from McMillans Road. The access road, to be funded by the Commonwealth and the Northern Territory Government, will comprise two lanes which will be separated by a median strip, forming a one-way loop, in the vicinity of the terminal.

58. Vehicles carrying departing passengers may proceed direct to the kerb-side passenger set-down area adjacent to the terminal entrance or to the car park. The car park, which will be centrally located within the one-way access road loop, will have capacity for 440 short term and 60 long term parking spaces. Provision has been made for future expansion if required.

59. Departing passengers will enter the terminal through doors at the eastern end and proceed to airline check-in areas located opposite the entry. International and Domestic airline desks will be located in close proximity to each other. It is worth noting that airlines have been allocated office space in the area behind the check-in areas. The joint user baggage make-up area is located adjacent to the check-in area.

60. Having checked-in their tickets and deposited non-cabin baggage departing passengers and the non-travelling public will proceed by escalator to the second level. A public viewing lounge and a number of concessions will be located on the second level.

61. Departing domestic passengers will proceed through a security check to one of the domestic gate lounges and board their aircraft via one of three aerobridges.

62. International departing passengers will basically follow the same route to the second level. Facilities for international passengers will be located at the western end of the terminal, and departing passengers will proceed through

customs and security to one of two gate lounges, boarding their aircraft via the western aerobridge. Common use areas such as the public lounge and concessions will be accessible to all departing passengers and members of the non-travelling public.

63. Terminal Operation - Arriving Passengers - Arriving domestic passengers will proceed from their aircraft along aerobridges, to the terminal and proceed to the ground level by the central escalators. The domestic baggage reclaim area will be located in close proximity to the escalator.

64. Arriving international passengers will proceed through the health check, then by escalator to the ground level primary customs check, and then enter the baggage reclaim area. After claiming their baggage they will proceed through baggage inspection and enter the arrivals hall.

65. International Transit Passengers - Passengers from aircraft transitting through Darwin are required to undergo a health check if Darwin is their first port of call in Australia. After a health and security check they will enter the international gate lounge.

66. Aircraft Apron and Gate Positions - Aviation advised the following aircraft types were used in determining the size and design of the aircraft apron:

- Gate 1 - International - B747-200 or extended B747;
- Gate 2 - International or domestic - B747-200 or A300B4;
- Gate 3 - Domestic - A300B4; and
- Gate 4 - Domestic - B757-200.

67. In addition, the apron will provide for two stand off positions sized to accommodate A300B4 (domestic) and B747 "extended" (international) aircraft.

68. The apron depth of 143 metres will allow sufficient space to accommodate a road along the airside from the terminal, nose-in aircraft parking and manoeuvring of tugs. The apron will be provided with two access taxi-ways.

69. Parallel Taxi-way - Aviation advised that operational safety and cost aspects gave advantage to the proposal to construct a full length northern taxi-way parallel to the 11/29 runway and the upgrading of taxi-way "Alpha". Alternatives examined would involve aircraft being required to backtrack on active runways and require expenditure on upgrading a number of existing taxi-ways. Basically heavily laden aircraft will need access to each threshold. The provision of a northern parallel taxi-way would facilitate access.

70. Reactions to Proposed Terminal Complex - Most witnesses representing Territory and local government and the airlines expressed general satisfaction with the design and the capacity of the proposed terminal. There were, however, a number of reservations expressed about matters of detail, on forecasts and the interpretation of requirements and capacities proposed for a number of functional areas. Requests that consideration be given to the provision of a number of additional facilities and measures to facilitate terminal operations were also made. The Committee requested Aviation to advise on ways in which the congestion and delays in the existing terminal could be alleviated. The relative cost of the proposed terminal was also questioned.

71. Forecasts A number of witnesses questioned the basis on which forecasts of annual aircraft and passenger movements had been prepared. According to Aviation passenger movements are forecast to increase by 66,800 every five years between 1985 and 2005. Aviation stated that the forecasts may appear simplistic in view of the constant 5 yearly increments, but advised that they were prepared in the context of an economic framework which takes into account normal market development.

72. A number of other witnesses stated they believed the forecasts to be conservative, not reflecting potential increases in tourism to be derived from planned expansion of tourist infrastructure in the Northern Territory. As stated previously, the terminal has been designed so that no expansion work will be necessary for a ten year period after commencement of operations in 1988. Desired levels of service will be provided for seven years after the commencement of operations. The Committee believes that there is sufficient flexibility in the design to remedy any deficiencies in advance of the 10 year design year should terminal capacity be exceeded prematurely.

73. Gate Positions A number of airlines stated that the number of gate positions to be provided would be insufficient to handle peak hour movements. They believed the number of aerobridge gate positions for domestic jet aircraft should be six and not three as proposed.

74. Aviation advised that provision of three gate positions for domestic trunk aircraft was based on the following factors relating to present and future operations to and from Darwin:

- (a) the number of gate positions required depends on aircraft scheduling and the duration of the peak;

- (b) the daily domestic peak period is not an hour but extends through the period from 12 to 3 pm; there is little flexibility for changing the duration of the peak period - aircraft depart major cities in the early morning and arrive at Darwin and return in the afternoon;

- (c) the turnaround time for aircraft is 35-40 minutes for narrow body aircraft and 45-50 minutes for wide body aircraft; it is therefore possible for a single gate position to handle 3-4 aircraft in the 3 hour peak period; and

- (d) the major airlines do not parallel schedule flights and, based on present and forecast passenger growth rates, this pattern will continue.

75. Comparative Cost of Terminal The two domestic airlines commented that the estimated cost of the terminal seemed relatively high when compared to the cost and extent of the new terminal at Cairns Airport. It was submitted that the airlines should not be required to pay for facilities in excess of fundamental requirements. Aviation and DHC advised that the estimated cost of terminal facilities comprising the terminal, car park, access road, and full length parallel taxi-way is \$54.4 million. Direct comparisons with Cairns are difficult, because the extent and composition of works proposed at Darwin are different to Cairns. After adjustments the total cost of the Darwin RPT complex is about \$43.5 million, compared to \$33 million for Cairns. Building costs in Darwin are significantly higher than in Cairns. The two-level terminal design at Darwin is due to site restraints and the adoption of common user combined and domestic functions. The aerobridges, which are provided at Darwin to alleviate the extreme nature of the tropical climate,

also add extra costs. Aviation stated that the unit cost (square metre) of the Darwin terminal is directly comparable with the cost of new terminals proposed at Brisbane and Perth.

76. Hydrant Refuelling Refuelling of aircraft will be by fuel tanker. Aviation advised that the amount of fuel uplifted at Darwin is relatively low - about 30 million litres per annum. The throughput would need to be increased to about 100 million litres per annum before the installation of a hydrant system by oil companies is economically justifiable. A hydrant system would cost about \$1 million comprising \$400,000 for the pipeline underneath the apron and \$600,000 for the pipeline from the oil storage farm to the apron.

77. The Aviation view is that the installation of hydrant refuelling would be considered if there were economic or safety grounds. There is no strong case on safety grounds and the economics have already been mentioned. It would not be difficult to install a hydrant system under the apron when the economic level of throughput is reached.

78. The two domestic airlines supported the use of tankers and believed the installation of a hydrant system would lead to increased fuel costs at Darwin. Qantas stated that, although truck refuelling is adequate, if continued to the future, sector lengths flown from Darwin would be limited by the capacity of the refuelling trucks. At the very least the pipes for a hydrant refuelling system should be installed under the apron whilst it is being constructed. Aviation advised that that this option had been considered but found to present technical problems.

79. The existing RFT apron at Darwin has a hydrant refuelling system.

80. The Committee believes it prudent for the oil companies to install a hydrant refuelling system to be operational when the international terminal complex is opened. Amortisation costs should be attributed to Australia wide operating costs and not exclusively attributed to the cost of the investment at Darwin.

81. Existing Terminal A number of organisations and individuals expressed concern about conditions at the existing terminal and submitted that measures designed to rectify at the very least some of the worst aspects of congestion in the international arrivals/customs hall should be implemented as an interim measure while the new terminal is under construction. Aviation advised it is intended to confine improvements to areas relating to safety such as electrical wiring.

82. Since the public hearing the Committee has been advised by Aviation of a number of measures which will alleviate congestion problems in the international arrivals/customs hall. Methods of improving ventilation in the customs hall have been investigated. It is proposed to immediately install wall-mounted fans at a cost of \$7,000 which will increase air movement.

83. A baggage conveyor system, removed from the Brisbane International Terminal in 1981, will be installed in the customs hall. The conveyor belt is an L-shaped, non-recirculating unit and will enable the progressive delivery of baggage as it is unloaded from containers. The Committee was advised that the conveyor unit has arrived in Darwin and that installation is expected to be completed by August 1984. Some minor modifications to the unit may be necessary to suit the terminal layout and to replace wornout sections of belt. The estimated cost is about \$30,000.

GENERAL AVIATION FACILITIES

84. The Committee requested that consideration be given to modifying health check procedures currently used for transit passengers at Darwin Airport. It was suggested that international passengers transitting through Darwin could be held on their aircraft and health checked at their port of disembarkation. This would obviate the requirement for transit passengers to disembark from their aircraft, often in the early hours of the morning, join queues at the health check desks, and proceed to the existing sub-standard transit/departure lounge.

85. Aviation advised the Committee that the matter was referred to the Department of Health which, as a result of the Committee's suggestion, is presently considering the introduction of revised health clearance procedures for transit passengers throughout Australia. The Committee believes that the situation in Darwin and the implicit acceptance by the Department of Health that present procedures are unsatisfactory lend weight to the conclusion that revised health check procedures for transit passengers be implemented forthwith on a trial basis as part of the evaluation of their application on an Australia-wide basis.

86. Committee's Conclusions The Committee is satisfied that the factors which contributed to the design of the proposed new terminal and associated aprons and taxiways at Darwin International Airport were rigorously examined by Commonwealth Departments and reflect realistic forecasts and spatial requirements. The overall design is very satisfactory and should provide a high level of service to passengers and the non-travelling public. Revised health check procedures for international transit passengers should be implemented forthwith at the existing Darwin terminal by the Department of Health on a trial basis.

87. The adoption of the phased northern development option means that GA activities will eventually be relocated to a site adjacent to the RPT terminal. The Committee understands that GA operators will be able to continue operations from existing facilities until 1995-2000. Any proposals by GA operators involving the extensions to existing southern facilities will be subject to negotiation between the operators and Aviation. The condition and age of existing buildings is such that expenditure on their replacement will be necessary between now and 2000. The phased development option therefore aims at the gradual replacement of existing buildings in the south with new facilities in the north.

88. The GA facilities to be provided at the northern site, include an apron, taxiways, terminal, serviced hangar sites and serviced sites for GA industry support facilities.

89. Apron and Taxiways The Aviation assessment of design year requirements indicates that a sealed apron for parking 40 fixed wing aircraft is required. The proposed apron, which will have an area of 35,000 square metres, has been designed to provide sufficient parking without compromising access to taxiways and hangars. The helicopter apron of 5,000 square metres will accommodate six helicopters with a rotor diameter to 15 metres.

90. Serviced Sites Five hangar sites will be provided, each allowing direct access to the apron. Nine commercial sites will be provided to accommodate GA activities not requiring direct access to the apron. The sites will be connected to the main airport access road, and the RPT terminal.

OTHER AIRPORT AND DEPARTMENT OF AVIATION FACILITIES

91. Terminal It is proposed to include a GA terminal in the overall development provided that guaranteed rental arrangements are negotiated to offset development costs. The committee understands that this will involve individual operators or an entrepreneur entering into a rental agreement.

92. Aviation Justified the provision of a separate terminal because of the specialised nature of the extensive network of commuter services operating from Darwin which do not interline to any great extent with RPT activity. The proposed terminal will be designed for four operators and includes the provision of parking for 55 vehicles. Construction details for the terminal are at Appendix D.

93. Relocation of RAAF Surveillance Radar The RAAF Surveillance Radar (SURAD) is located near the south-eastern corner of the proposed GA apron. For technical reasons large metal objects should not be located within 200 metres of the radar. The location of the GA facility at the proposed site will mean that hangars and parked aircraft will be located 65 metres from the radar.

94. It is therefore proposed to relocate the SURAD to the west of the 11/29 runway. Relocation of the SURAD to this site will require the relocation of the Aviation Very High Frequency Omni Range (VOR) and Distance Measuring Equipment - Domestic (DME-D) from their existing sites.

95. Committee's Conclusion The extent and nature of General Aviation facilities to be provided appears adequate. They reflect the staged relocation of GA activities at the northern site and are supported.

96. Airways Operations Facilities It is proposed to extend and refurbish the existing operations building on the south side to house the following areas related to functions performed by Aviation in support of airport operations:

- operational control centre;
- rescue coordination centre/emergency operations sub-centre;
- weather service office;
- aeronautical telecommunications network traffic entry office;
- search and rescue store;
- associated administrative and technical support areas;
- flight service centre; and
- radio technical maintenance workshop.

97. Administration Building A new building for Aviation administrative personnel will be located immediately adjacent to the main access road and the internal road servicing the GA areas. For convenience and economic reasons it is proposed to house the following Aviation administrative staff in the one building:

- Airport director and staff;
- Airworthiness;
- Airports branch; and
- Air safety investigation.

98. Most administrative staff are at present housed in rented accommodation in the City of Darwin.

99. Electrical and Mechanical Building This building, to be located between the administration building and the central emergency powerhouse will provide a depot base for the maintenance of electrical and mechanical equipment used in the operation of the airport.

100. Central Emergency Powerhouse The powerhouse will provide standby and no-break power required by:

- the RPT terminal and associated facilities;
- RPT apron flood lighting and docking aids; and
- electrical and mechanical maintenance building.

101. The provision of the powerhouse is in accordance with Aviation policy that there be no interruption to the normal operation of the airport as a consequence of a failure to the normal commercial electricity supply.

102. Airport Maintenance Complex The airport maintenance complex, already located to the north of the main runway, will be retained and upgraded. The complex provides facilities and the storage of equipment required for the maintenance of the airport and plant.

103. A number of existing facilities including the vehicles shelter, nursery and store are to be retained. New facilities to be provided will include:

- Mechanical Maintenance Building;
- Ground Staff Building;
- Lines Depot;
- Building Maintenance Unit; and
- Airport Stores Building.

104. Committee's Conclusion Buildings and facilities designed to enable the Department of Aviation to carry out operational, technical and maintenance functions at Darwin International Airport are necessary and appear to be adequate.

ENGINEERING SERVICES

105. Electricity Supply High voltage power supply will be provided from the Northern Territory Electricity Commission system to a sub-station near the northern boundary. A dedicated underground feeder from the Casuarina sub-station will also be provided to provide a high reliability of supply. The high voltage supply will be distributed around the site by an underground ring system to eight sub-stations and distributed to the various facilities from the sub-stations.

106. The RAAF ring main, which supplies electrical power to the navigational facilities, will be partly relocated to suit new taxiway construction.

107. Water Supply Water requirements will be provided from the existing supply mains in McMillans Road. Two on-site water storages will be provided. An elevated 100,000 litre capacity tank will provide for domestic purposes. A 2.2 million litre capacity tank at ground level will provide a reserve for domestic water supply and fire fighting. Water reticulation will comprise a ring system.

108. Sewerage A sewerage system will be provided for kitchen, lavatory and industrial wastes. The system will be a conventional gravity flow system connected to a pumping station adjacent to access road. The main will be connected to the Northern Territory Department of Transport and Works sewer main, which runs parallel to McMillans Road, by a short rising main. Remote facilities will be provided with septic tank systems.

CONSULTATIONS

109. Organisations with vital interests in the project have been represented on a number of formal groups which were established to seek comment and agreement on matters of concern.

110. A Joint Government Coordinating Committee, with membership from the Commonwealth, the Northern Territory Government and Darwin City Council was formed to maintain close liaison on matters requiring local assistance and attention.

111. An Aviation Industry Consultative Committee was established with membership from Aviation, the major airlines and the Airline Operators Association of the Northern Territory. An Aviation Fuel Industry Committee was also formed.

112. An on-going public information program was mounted by Aviation to provide information to the public about the project and the reasons for major decisions. The public information program also sought public reaction and comment on the general acceptability of the project.

ENVIRONMENTAL CONSIDERATIONS

113. A Notice of Intent, covering the proposal alternatives considered and possible effects on the environment was prepared by Aviation and referred to the Department of Home Affairs and Environment in February 1981. In August 1981 Aviation was advised by the Minister for Home Affairs and Environment that the preparation of an Environmental Impact Statement (EIS) was not warranted to achieve the objectives of the Environment Protection (Impact of Proposals) Act 1974. In making this determination the Minister for Home Affairs and Environment noted the importance of constructing and operating the new facilities with appropriate measures being taken to safeguard the environment. The Minister requested that consultation through the Environment, Sanitary

Zone and Waste Disposal Group (the Environment Group), which reports to the Joint Government Coordination Committee, should continue.

114. The Provisional Master Plan was forwarded to the Department of Home Affairs and Environment for comment. In September 1983 Aviation was advised that provided any future environmentally significant supplementary works not fully identified in the Provisional Master Plan were referred to the Department of Home Affairs and Environment for environmental assessment, no EIS would be required.

115. The Committee was advised that the Environment Group will meet regularly during the construction phase to ensure that environmental monitoring and measures to protect the environment will reflect the objectives of minimising adverse effects as far as practicable. This will apply in particular to protecting the water quality and habitats in the Rapid Creek System.

COST RECOVERY

116. A number of witnesses pointed out that the level of terminal rents had not been negotiated with Aviation. The Committee understands that the question of terminal rents will be examined by an independent inquiry recently appointed to investigate and report on the wider subject of costs attributed to the aviation industry under the existing cost recovery policy. The enquiry has been given wide terms of reference including factors to be taken into account in the assessment of rentals on a national basis. The Committee believes the inquiry is most timely and will give the various sectors of the aviation industry the opportunity of presenting their cases for more equitable cost recovery policies on an Australia-wide basis.

LIMIT OF COST

117. The limit of cost estimate for the proposed work is \$95.0 million at October 1983 prices made up as follows:

	\$ Million
Building Works	25.2
Mechanical Services	7.5
Electrical Services	16.5
Civil Engineering Works	38.5
Hydraulic Services	5.3
TOTAL	95.0

TIMETABLE

118. Site works are planned to commence in June 1984 with the main activity being earthworks for the terminal area prior to the 1984/85 wet season.

119. Work on the terminal building is scheduled to commence in April 1985, completed by late 1987 and fitted out by mid-1988. Other engineering and building contracts will be undertaken progressively from late 1984 through to late 1987 to suit the dry seasons and contractual inter-relationships. All fitting out will be completed by mid-1988.

120. Committee's Recommendation The Committee recommends the construction of the work in this reference.

RECOMMENDATIONS AND CONCLUSIONS

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

	Paragraph
1. FACILITIES AT DARWIN AIRPORT FOR INTERNATIONAL AND DOMESTIC PASSENGERS AND AIRCRAFT ARE GROSSLY DEFICIENT AND MEASURES DESIGNED TO RECTIFY THE SITUATION SHOULD BE IMPLEMENTED.	31
2. THE STAGED NORTHERN DEVELOPMENT OPTION FOR THE DEVELOPMENT OF FACILITIES AT DARWIN INTERNATIONAL AIRPORT HAS OPERATIONAL AND COST ADVANTAGES OVER OTHER OPTIONS EXAMINED AND IS SUPPORTED.	38
3. THE COMMITTEE IS SATISFIED THAT THE FACTORS WHICH CONTRIBUTED TO THE DESIGN OF THE PROPOSED NEW TERMINAL AND ASSOCIATED APRONS AND TAXIWAYS AT DARWIN INTERNATIONAL AIRPORT WERE RIGOROUSLY EXAMINED BY COMMONWEALTH DEPARTMENTS AND REFLECT REALISTIC FORECASTS AND SPATIAL REQUIREMENTS.	86
4. THE OVERALL DESIGN IS SATISFACTORY AND SHOULD PROVIDE A HIGH LEVEL OF SERVICE TO PASSENGERS AND THE NON-TRAVELLING PUBLIC.	86

Paragraph

5. REVISED HEALTH CHECK PROCEDURES FOR INTERNATIONAL TRANSIT PASSENGERS SHOULD BE IMPLEMENTED FORTHWITH AT THE EXISTING DARWIN TERMINAL BY THE DEPARTMENT OF HEALTH ON A TRIAL BASIS. 86
6. THE EXTENT AND NATURE OF GENERAL AVIATION FACILITIES TO BE PROVIDED APPEARS ADEQUATE. THEY REFLECT THE STAGED RELOCATION OF GA ACTIVITIES AT THE NORTHERN SITE AND ARE SUPPORTED. 95
7. BUILDINGS AND FACILITIES DESIGNED TO ENABLE THE DEPARTMENT OF AVIATION TO CARRY OUT OPERATIONAL, TECHNICAL AND MAINTENANCE FUNCTIONS AT DARWIN INTERNATIONAL AIRPORT ARE NECESSARY AND APPEAR TO BE ADEQUATE. 104
8. THE LIMIT OF COST ESTIMATE FOR THE PROPOSED WORK IS \$95.0 MILLION. 117

Paragraph

9. THE COMMITTEE RECOMMENDS THE CONSTRUCTION OF THE WORK IN THIS REFERENCE. 120

D.J. Foreman
+ (D.J. FOREMAN)
Chairman

Parliamentary Standing Committee
on Public Works
Parliament House
CANBERRA

2 May 1984

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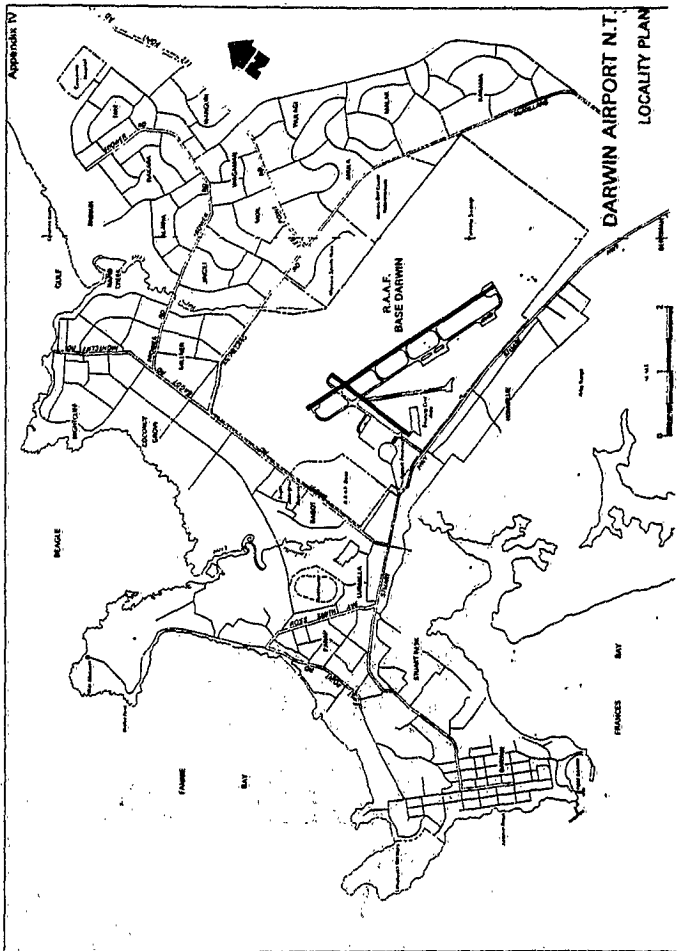
LIST OF EXHIBITS

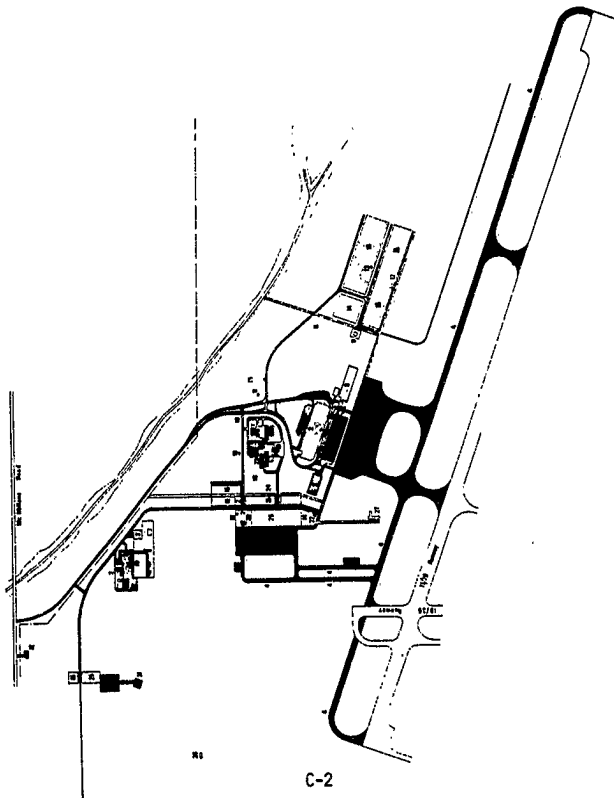
Exhibit
No.

Department of Aviation

Darwin Airport (Civil Areas: RAAF Base Darwin)
Provisional Master Plan - Incorporating an
Environmental Impact Assessment, November 1983. 1.

Redevelopment of Facilities at Darwin
International Airport, Northern Territory -
Background Papers for the Parliamentary Standing
Committee on Public Works (2 vols). 2.





Legend

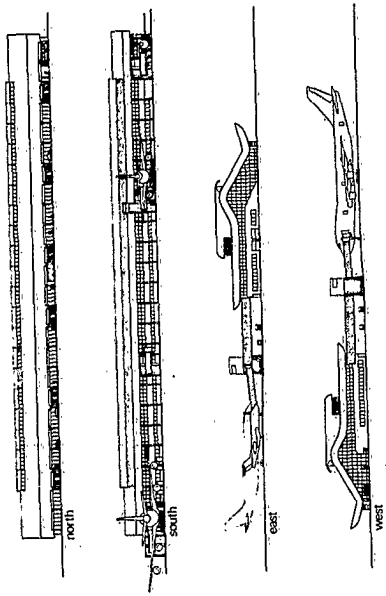
- 1 mobile public transport terminal
- 2 carpark
- 3 bus stop
- 4 bicycle parking
- 5 passenger bus stop
- 6 elevator mechanical and cable workshop
- 7 administration building
- 8 car parking
- 9 waste storage tank and pump house
- 10 car parking
- 11 flight services centre antenna and receiving station
- 12 station
- 13 station
- 14 station
- 15 car parking
- 16 station
- 17 station
- 18 station
- 19 station
- 20 car parking
- 21 car parking
- 22 aircraft waste disposal facility
- 23 operations control room
- 24 flight simulator
- 25 flight simulator
- 26 flight simulator
- 27 meeting aircraft public control terminal building

Site Plan





Regular Public Transport
Terminal
Exterior Perspective



Regular Public Transport
Terminal
Elevations



APPENDIX D

CONSTRUCTION DETAILS

RPT. TERMINAL

1. Construction and Finishes The building envelope will include insulated pre-finished steel deck roofing on steel trusses. External walls will be pre-cast concrete panels with reinforced concrete wall panels which will be painted. Large wall areas will be glazed with laminated safety glass. Glazing on east and west walls will incorporate fixed sun control louvres.

2. Internal walls, except those around fixed elements, will be constructed of steel framing faced with painted plasterboard. Floor coverings to most areas will be carpet, and ceramic tiles in wet areas. Tiled surfaces will be provided in public baggage check-in and reclaim areas. Other baggage handling areas will have non-slip concrete floors.

3. Structural Design The building has been designed as a reinforced concrete floor and column system with a steel framed roof. Structural steel trusses will span over the large main hall area. Reinforced concrete slabs and columns will be provided for the suspended floors. The design allows for future extension on three sides - east, west and south.

4. The building will have a cyclone design classification of "normal" and the design has allowed for cyclonic wind loads on all structural and architectural elements.

5. Mechanical Services A ducted air conditioning system will be provided for maintenance of comfort conditions throughout public areas.

- Mechanical ventilation will be provided to the baggage make-up area; and

Toilet areas will be mechanically ventilated.

6. Domestic hot water will be generated by solar absorbers where appropriate, supplemented by electric storage water heaters where necessary and reticulated to serve toilet and concession areas.

7. Electrical Services Duplicate non-essential and essential electricity supply will be provided, at high voltage, to the terminal building sub-stations.

8. Standby emergency power will be provided from the central emergency power station for building lighting, air conditioning, flight control systems and apron flood-lighting.

9. Natural light in the terminal will be supplemented by prominent light in areas where daylighting is not effective, and for night time use.

10. A switching system will be installed to reduce illumination in unoccupied areas to a minimum level sufficient only for security at night.

11. Emergency lighting and exit signs will be provided to enable safe evacuation of the building and will be powered by a central battery supply.

12. A security system and central monitoring and control system will be provided.

13. Public address, flight information, clock, emergency evacuation warning and aircraft nose-in guidance systems and apron flood lighting controls will be provided.

14. Fire Protection An automatic sprinkler system will provide primary fire protection. Secondary protection will be a fire hydrant and hose reel system to serve internal areas. A combustion/smoke detection system will be provided to lift machine rooms, electrical switch rooms and specific parts of the air conditioning system. A thermal detection system will be provided to aerobridges.

15. Transportation Services Transportation services for people and baggage will comprise:

lifts and escalators between floors;

separate baggage transportation between check-in counters for airlines and the baggage make-up areas;

separate baggage reclaim conveyors for international and domestic passengers; and

aerobridges.

GENERAL AVIATION TERMINAL

16. Construction and Finishes The building will be of steel framed construction with a reinforced concrete on-ground floor slab. The roof will be clad with insulated prefinished metal decking. External walls will be of concrete block, rendered and painted. Internal walls, except around plant rooms, toilets and wet areas, will be of steel framing faced with painted plasterboard. Floor coverings to public areas will be vinyl tiles, with ceramic tiles in toilets and wet areas.

17. Mechanical Services The building will be naturally ventilated throughout by means of high level louvres, protected by roof overhangs. Ceiling fans will be provided to the main public areas.

AIRPORT OPERATIONS FACILITIES

18. Operations and Flight Services Building An extension to the existing Flight Services Centre will be constructed. Upon completion of the extensions the existing operations area will be refurbished for use as a radio maintenance workshop. Internal alterations to the remainder of the existing building will be carried out to meet the requirements of the Flight Services Centre.

19. The existing building structure will be upgraded by an external steel frame to provide a cyclone design classification of "post disaster - category B".

20. Air conditioning will be provided to new areas and existing air conditioning equipment will be retained.

21. Administration Building and Electrical, Mechanical Workshops Building These buildings will be steel framed with metal deck roofing. External walls will be of concrete block, rendered and painted. Internal walls, except those around wet areas and plant rooms will be steel frame faced with painted plasterboard. Floors will be finished with carpet in office areas, vinyl tiles in utility areas and ceramic tiles in wet areas.

22. Both buildings will be air conditioned; air handling plant and cooling condensers will be located at roof level.

AIRPORT MAINTENANCE COMPLEX

23. New buildings to be constructed are:

- Mechanical Maintenance Building;
- Lines Depot;
- Building Maintenance Unit; and
- Airport Stores Building.

24. The buildings will be steel framed structures with a cyclone design classification of "normal". External walls and roofs will profiled metal decking. Floors in office and amenity areas will be vinyl tiles. Concrete floors will be sealed against penetration by oil in the mechanical workshop.

25. Natural cross ventilation will be provided by high level adjustable louvres to all main workshop and storage areas. Air conditioning will be provided to offices, lunch rooms, the training room and the Search and Rescue Equipment Maintenance Room in the Mechanical Maintenance Building.

26. Extensions to the Ground Staff building will provide additional storage, office, toilet and shower facilities and a covered walkway as a sheltered link to the Lines Depot.