

Parliamentary Standing Committee on Public Works

REPORT

relating to the

AIR TRAFFIC CONTROL FACILITIES FOR DARWIN INTERNATIONAL AIRPORT

(Nineteenth Report of 1995)

THE PARLIAMENT OF THE COMMONWEALTH OF AUSTRALIA
1995

The Parliament of the Commonwealth of Australia
Parliamentary Standing Committee on Public Works

Report Relating

to the

**Air traffic control facilities for Darwin
International Airport**

(Nineteenth Report of 1995)

CONTENTS

	Page
Members of the 31st Parliamentary Standing Committee on Public Works	vi
Extract from the Votes and Proceedings of the House of Representatives of 29 June 1995	vii
	Paragraph
THE REFERENCE	1
THE COMMITTEE'S INVESTIGATION	3
BACKGROUND	6
History of RAAF Base Darwin	8
Role of RAAF Base Darwin	12
Development of Civilian Aviation Facilities	15
THE NEED	19
History of Air Traffic Control Facilities at RAAF Base Darwin	19
Federal Airports Corporation and Civil Aviation Authority	22
Division of Responsibilities for Air Traffic Control Services	24
Air Traffic Control Operations	25
Existing Deficiencies	28
Committee's Conclusion	33
THE PROPOSAL	34
Siting Options	34
Committee's Conclusion	37
Benefits of New Facilities	38
Functions to be Accommodated	39
Accommodation and Technical Requirements	41

Air Traffic Control Tower	42
Approach Control Section Building	43
DESIGN CONSIDERATIONS	46
Design Standards	46
Design Philosophy	48
Committee's Conclusion	50
Scope of Works	51
Air Traffic Control Tower	51
Approach Control Building	52
Features Common to both Buildings and External Works	53
Security Features	57
Landscaping	58
Fire Protection	59
Energy Management and Lighting	61
Precautions Against Legionella	64
MASTER PLANNING	65
Committee's Conclusion	67
ENVIRONMENTAL AND HERITAGE CONSIDERATIONS	68
Environmental Approval	68
Environmental Implications	69
Heritage Implications	71
CONSULTATION	72
Consultation with External Authorities	72
FUTURE WORKS	75
Development of Operational Facilities at RAAF Base Darwin	75
PERSONNEL IMPLICATIONS	77
Establishment Population	77

Construction Workforce	78
CONSTRUCTION PROGRAM	79
COST ESTIMATES	81
Committee's Recommendation	86
CONCLUSIONS AND RECOMMENDATIONS	87
APPENDIXES	
Appendix A - List of Witnesses	A-1
Appendix B - Plans and Illustrations	B-1 to B-3

**MEMBERS OF THE PARLIAMENTARY STANDING COMMITTEE
ON PUBLIC WORKS**

(Thirty-First Committee)

Mr Colin Hollis MP (Chair)
Senator Paul Henry Calvert (Vice-Chair)

Senate

Senator Bryant Robert Burns
Senator Shayne Michael Murphy*

House of Representatives

Mr John Neil Andrew MP
Mr Raymond Allen Braithwaite MP
Mr Russell Neville Gorman MP
Mr Robert George Halverson OBE MP
Hon Benjamin Charles Humphreys MP

* replaced Senator John Devereux on 10 February 1995

SECTIONAL COMMITTEE

**AIR TRAFFIC CONTROL FACILITIES FOR DARWIN
INTERNATIONAL AIRPORT**

Mr Colin Hollis MP (Chair)
Hon Benjamin Charles Humphreys MP (Vice-Chair)
Mr Russell Neville Gorman MP
Senator Shayne Michael Murphy

Committee Secretary: Peter Roberts
Inquiry Secretary: Denise Denahy
Secretarial Support: Belynda Zolotto

**EXTRACT FROM THE VOTES AND PROCEEDINGS OF
THE HOUSE OF REPRESENTATIVES**

No. 152 dated Thursday, 29 June 1995

**9 PUBLIC WORKS – PARLIAMENTARY STANDING
COMMITTEE – REFERENCE OF WORK - AIR TRAFFIC
CONTROL FACILITIES FOR DARWIN INTERNATIONAL
AIRPORT**

Mr Walker (Minister for Administrative Services), 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: Air traffic control facilities for Darwin International Airport.

Question - put and passed.

PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

AIR TRAFFIC CONTROL FACILITIES FOR DARWIN INTERNATIONAL AIRPORT

By resolution on 29 June 1995, the House of Representatives referred to the Parliamentary Standing Committee on Public Works for consideration and to Parliament the development of air traffic control facilities for Darwin International Airport.

THE REFERENCE

1. The proposal includes:
 - . construction of an air traffic control tower
 - . construction of an approach control building
 - . provision of engineering services and site works.
2. The estimated cost of the project is \$8.4m at May 1995 prices with an outturn cost of \$8.8m.

THE COMMITTEE'S INVESTIGATION

3. On 29 June 1995 the Committee appointed a Sectional Committee comprising Mr C Hollis MP (Chair), the Hon B Humphreys MP (Vice-Chair), Mr R Gorman MP and Senator S Murphy to undertake this inquiry. The Committee received a written submission from the Department of Defence (Defence) and the Sectional Committee took evidence from its representatives in Darwin on 14 August 1995. Prior to the hearing the Sectional Committee inspected the existing Air Traffic Control Tower and the site for the proposed Air Traffic Control Tower.
4. Written submissions regarding the project were received from the following organisations and are incorporated in Committee's proceedings:
 - . Department of Asian Relations, Trade and Industry
 - . Australian Heritage Commission

- . Department of Primary Industries and Energy
- . Darwin City Council
- . Commonwealth Fire Board
- . Federal Airports Corporation
- . Environment Protection Agency
- . Northern Territory Fire Service

5. A list of the witnesses who gave evidence at the hearing is at Appendix A. The Committee's proceedings will be printed as Minutes of Evidence.

BACKGROUND

6. RAAF Base Darwin is located some 6½km north-east of Darwin's central business district. It is bounded by three major arterial roads - the Stuart Highway on the south, Bagot Road on the west and McMillans Road on the north. The airfield on the Base serves both military and civil aviation.

7. The RAAF Base and the civilian airport occupy an area of approximately 1600 hectares. The location of RAAF Base Darwin and the civil airport is shown at Appendix B.

History of RAAF Base Darwin

8. Darwin's original airfield was at the suburb of Parap. Because of the limitations of that site, land for a new airfield was purchased in 1937 and construction of the RAAF Base commenced in 1939, and was essentially completed by 1940. RAAF Base Darwin was formed on 1 June 1940. The Base was bombed by Japanese aircraft in February 1942, and during the Second World War together with numerous other airfields in the Darwin/Katherine area, was used in mounting operations for the air defence of Darwin and targets north of Australia.

9. Since the Second World War no RAAF operational flying squadron has been based at Darwin, apart from No 75 Squadron (equipped with Mirage aircraft) on its relocation from Butterworth in 1983, and pending its home basing at Tindal, when it was re-equipped with F/A18 aircraft. Civil aviation operations from RAAF Base Darwin commenced at the end of 1945.

10. No 2 Control and Reporting Unit (2CRU) was relocated to Darwin in the early 1960s, and occupies operational facilities at Lee Point. Also relocated to Darwin at that time was No 30 Squadron, which was equipped with Bloodhound Missiles - that Unit was disbanded in the late 1960s.

11. In recent years a permanent detachment of No 35 Squadron Caribou aircraft has been located on the Base, and Army's No 161 Reconnaissance Squadron is also based there. In addition, RAAF Base Darwin continues to be used by the RAAF and overseas Air Forces as a major exercise and training base.

Role of RAAF Base Darwin

12. RAAF Base Darwin fulfils a number of roles, as outlined below:

- . it forms part of a chain of airfields, stretching across northern Australia from Learmonth in the west to Townsville in the east, that are maintained for the air defence and surveillance of the northern approaches to Australia
- . in conjunction with RAAF Base Tindal, it provides for the air defence of Darwin
- . it is a manned forward operational deployment base, providing for rapid build-up of defensive forces if required
- . it is used to support air defence and joint exercises for training of the Australian Defence Force
- . it is a military air head for transport operations
- . it is a base for Army aviation activities conducted in the 'Top End'.

13. At the public hearing, Defence advised the Committee that RAAF Base Darwin, in conjunction, with RAAF Base Tindal is vital to the air defence of the approaches to northern Australia.

14. In its recent report, the Committee on Darwin recommended that an alternative site for a possible future airport be identified. Defence believes that the development of an alternative airport will not occur until well into the next century.

Development of Civilian Aviation Facilities

15. Civilian aviation activities recommenced at Darwin at the end of 1945. A joint user policy between the then Commonwealth Departments of Air and Civil Aviation enabled civil operators to use military facilities for their activities. Those activities took place in the southern portion of the airfield, and a Second World War hangar was used as a passenger terminal and for aircraft maintenance.

16. Until the mid 1980s civil aviation facilities remained, and were further developed as a distinct separate entity in the southern portion of the airfield in close proximity to RAAF installations. It was always the intention that civil and military operations should be separated, with civilian aviation activities being conducted on the northern side of the present main runway. Indeed, RAAF master planning conducted in the late 1960s made reservation for the separation to take place. The then Department of Civil Aviation also recognised the benefits of separate military and civilian development at RAAF Base Darwin.

17. In 1984 the Committee examined a proposal to locate civil aviation facilities to the north of the main runway and this proposal was the subject of the Seventh Report of 1984. Work on that proposal commenced but was stopped as a result of a Government examination to ascertain the best location for civil aviation activities.

18. On 1 April 1988 the Federal Airports Corporation (FAC) assumed responsibility for the ownership of Darwin Airport. In its negotiations with the Commonwealth Government for the acquisition of Darwin Airport, the FAC agreed that it would undertake the development of new civil aviation facilities on the northern side of the runway. As a result, the land on the northern side of the airport was ceded to the FAC. In 1989 a new proposal for development of civil aviation activities was examined by the Committee and was the subject of the Seventeenth Report of 1989. Those works are now complete and civil aviation airport activities take place from that area.

THE NEED

History of Air Traffic Control Facilities at RAAF Base Darwin

19. The Base's first control tower facility was built under the original main water tank. (This water tank is still used and has been given heritage classification). This tower was used to control operations at RAAF Base

Darwin until the present air traffic control tower was constructed by No 5 Airfield Construction Squadron in 1957/58.

20. The present tower, where visual control eye height is at 22 metres above ground level, was damaged by Cyclone Tracy at the end of 1974, and was repaired to a level for it to become operational again.

21. Approach control facilities at RAAF Base Darwin were provided in the early 1970s, in conjunction with an airfield surveillance radar installation. These facilities are located at the base of the present control tower and continue to be used.

Federal Airports Corporation and Civil Aviation Authority

22. The FAC has responsibility for ownership, management and development of civil aviation facilities at the airfield. The Government has announced its intention to lease civil aviation facilities throughout Australia to the private sector. It is envisaged that the relationship which the FAC enjoys with Defence through specific agreements would continue under any new privatisation arrangement.

23. In July 1995 the Civil Aviation Authority (CAA) was reorganised into the Civil Aviation Safety Authority (CASA) and Airservices Australia (AA). Essentially, the CASA formulates policy on air safety, and AA has responsibility for civilian air traffic control services and air navigation facilities. Some AA functions have been relocated to the north of the airfield, but the functions it performs from its operations building, which is located on the RAAF Base, are yet to be relocated. This is planned to take place in the near future.

Division of Responsibilities for Air Traffic Control Services

24. Normally airspace within a radius of 60 nautical miles of Darwin is under military administration and control. However, during Defence exercises this airspace extends to 160 nautical miles to the west and south-west of Darwin. Agreements concluded with the then CAA provide for Defence to assume prime responsibility for all air traffic control in this airspace. In late 1994, AA relocated its air traffic controllers to Brisbane but it retains a liaison function in relation to airspace management.

Air Traffic Control Operations

25. In addition to being a military airfield, Darwin is a civil international and domestic airport. The airfield is active 24 hours a day, seven days a

week. Any disruption to the airport or air traffic control services impacts heavily on these operations. When scheduled disruptions are to occur, appropriate notifications have to be issued well in advance.

26. In the event of a major disaster, such as a cyclone, disruption of airport activities need to be minimised. Vital air traffic control facilities are to be capable of functioning immediately after the disaster.

27. For air safety considerations, a new surveillance radar and new air telecommunications equipment are planned to be procured for Darwin as a matter of urgency. Disruption to air traffic control activities are required to be minimised during the installation of that equipment.

Existing Deficiencies

28. Defence advised the Committee that the need for a new air traffic control facility at RAAF Base Darwin stems from several considerations:

- . the existing control tower is in urgent need of repair and refurbishment
- . the location of the existing tower is incompatible with the future development of military facilities on the Base
- . the existing control tower is of insufficient height to provide full visibility to all aircraft movement areas and vital features.

29. The structural damage caused to the control tower by Cyclone Tracy in 1974 was never fully repaired and the likelihood of it surviving another major cyclone is debatable. Also, it lacks the post disaster capability required for such a vital installation. A proposal to properly repair and refurbish the tower was examined in 1992/93 but was withdrawn. Plans to build a new facility were formulated at that time. The potential disruption to air traffic control services would be minimised by the provision of a new facility.

30. The proposed development of the southern side of the airfield for ordnance loading operations would place the existing air traffic control facility within restricted hazard areas.

31. The height of the present control tower precludes full visibility of all aircraft movement areas and it is impractical to increase the height of the existing structure.

32. The RAAF has conducted a safety audit of air traffic control services

at RAAF Base Darwin. That safety audit revealed that safety features require improvement, and that replacement of the air traffic surveillance radar and air communications equipment was crucial for continuing safe air traffic control operations at Darwin. The safety audit concluded that the timing for the construction of a new air traffic control facility should be advanced to ensure that no disruption occurred to air traffic services whilst allowing the efficient introduction into service of the new radar and communications equipment. At the public hearing Defence advised that the safety audit identified a number of staffing weaknesses in the Darwin air traffic control services and that these had now been rectified.

Committee's Conclusion

33. There is an urgent need for new air traffic control facilities at the Darwin international airport to replace the existing unsatisfactory facilities which are structurally unsound and are located in an area which is incompatible with the future development of RAAF Base Darwin. The control tower is now of insufficient height to provide full visibility of all general aviation pavement areas.

THE PROPOSAL

Siting Options

34. Siting of a new control tower midway along either the south or north side of the main runway was considered. A south side location was eliminated for the following reasons:

- . the buildings would be inside the Large Public Building Explosive Ordnance safeguarding distance
- . glare from the early morning and late afternoon sun severely degrades vision
- . existing and planned airfield lighting presents more restrictions to night vision with a control tower on the southern site than on the northern site.

35. Four sites were considered on the northern side of the main runway and a Technical Site Selection Board was convened to assess each location. The Board included representatives of the FAC and the then CAA. All sites were in the general area north of the mid point of the main runway and east of the FAC terminal and support buildings. The Board considered such

issues as visibility of airfield movement areas, height limitations, compatibility with future development, and existing engineering and support services. The selected location is shown at Appendix B.

36. The proposed location for the air traffic control facility will be on FAC land. A lease agreement will be concluded to enable the site to be used for a Defence installation and appropriate easements. Following the public hearing Defence advised the Committee that further negotiations had taken place between the FAC and Defence regarding the site and FAC confirmed that the lease will stipulate a rent of "\$1 per year, if demanded".

Committee's Conclusion

37. The site selected for the proposed air traffic control facilities on the northern side of the Darwin international airport is suitable as it meets the required criteria laid down by the Technical Site Selection Board.

Benefits of New Facilities

38. The benefits, savings, economic and social effects stemming from the provision of the new air traffic control facility are as follows:

- it would replace existing facilities which are poorly located and where the control tower, which is in poor structural condition, is approaching the end of its economic life.
- it would enable air traffic control operations to be performed in a safer manner. Not only would it provide better visibility of all aircraft movement areas, but extraneous impediments to visibility caused by glare and reflections would be reduced through better design features and better location and orientation
- it would enable air traffic control operations to continue from the existing facility while the new facility is being equipped
- the proposed new facility would be designed to specifically accommodate the displays associated with the proposed new surveillance radar
- the improved visibility afforded from the control tower, together with improved control of aircraft in the surrounding airspace stemming from the provision of the proposed new surveillance radar, would enable better control to be exercised over aircraft on the approaches

to the runways. Thus, the possibility of noise complaints caused by aircraft deviating from their defined flight paths should be reduced

- . the location of the proposed air traffic control facility on the north side of the airfield would permit greater flexibility with the use of the only available land on the RAAF Base on which to site aircraft dispersals and ordnance loading facilities
- . working conditions for air traffic control personnel would be improved in a modern purpose-built facility. This would be beneficial to air traffic controllers' comfort and should lead to an improved standard of performance, with a consequential effect of improved air safety
- . the provision of the new facility would obviate the need for potential high repairs and maintenance expenditure on the existing facilities.

Functions to be Accommodated

39. The requirements for the proposed new air traffic control facility are based on the need to undertake the following air traffic control functions on a 24 hour a day basis:

- . tower control
- . surface movement control
- . tower supervision
- . aerodrome clearance delivery/coordination
- . approach control
- . departures control
- . traffic direction
- . airways clearance delivery/coordination
- . approach supervision
- . approach flight data processing
- . technical and operations monitoring.

40. In addition, administration, technical maintenance and training are to be performed within the facility.

Accommodation and Technical Requirements

41. Accommodation to provide for the functions listed in paragraphs 39 and 40 is required in two separate buildings - an air traffic control tower and an approach control building.

Air Traffic Control Tower

42. The control tower must provide an elevated cabin which permits controllers unrestricted views of movement areas and terminal airspace under their control. Associated with the control cabin are staff amenities and a tower equipment room. The required eye-height in the control cabin has been calculated at 40.6m above the ground for the selected site. Air conditioning and sound attenuation are required within the occupied areas for occupational health and safety considerations. The tower requires a lift to convey staff to the control cabin. The tower is to be capable of having external communications antennae attached.

Approach Control Section Building

43. This building is required to provide operational working areas from which airspace management and control of all Darwin-administered airspace can be conducted. It has to make provision for the installation of equipment associated with the new airfield surveillance radar and airspace control communications. Because of inter-related functions, it needs to be located next to the control tower. For occupational health and safety considerations, functional areas are to be air conditioned and sound attenuated. It has to be capable of having external communications antennae attached.

44. There are technical advantages for AA in co-siting its airways equipment within the new tower complex. AA will reimburse Defence for its component of the work. The Committee was advised at the public hearing that the AA contribution will be in the order of \$350 000 for the 150m² of space it will require (see paragraph 82).

45. Required facilities external to the building include roadworks, communications ducts, security fencing, landscaping, and car parking for a total of 27 maintenance, staff and visiting vehicles.

DESIGN CONSIDERATIONS

Design Standards

46. The design of new facilities are to conform to the relevant sections of:
- . the Building Code of Australia
 - . Northern Territory Building Code
 - . relevant current Australian Standards and Codes
 - . International Civil Aviation Organisation Air Traffic Services Planning Manual
 - . CAA Guide to Airport Control Towers
 - . Defence Fire Protection Engineering Manual (FACMAN 2)
 - . Defence Security Manual (SECMAN).

47. Defence advised the Committee at the public hearing that the facility will cater for foreseeable increases in traffic at Darwin for the next 20-25 years.

Design Philosophy

48. The philosophy adopted in the design of the proposed facilities has incorporated the following considerations:

- . the provision of quality and utilitarian facilities without pretentiousness
- . structural design to:
 - wind loading - Region C - tropical cyclone
 - terrain - Category 2 - flat open site
 - post disaster function - capable of being operated immediately following a disaster
 - tower to have highest degree of stability - the structural design is

to cater for dynamic loading conditions, so that stability requirements for the structure would be met

- . adoption of conventional construction techniques and materials, in particular those commonly used by the construction industry in Darwin
- . utilisation of readily available and durable materials that combine long life with minimum maintenance
- . careful attention to the visual impact

49. The governing criteria on the design of the building is the cyclone wind loading which is far higher than the seismic loading. The buildings have a life expectancy of 25 years as stipulated in the design brief. The buildings are expected to be maintenance free for 15 years.

Committee's Conclusion

50. **The proposed facilities have been designed in accordance with the wind loading requirements for the Darwin region and should be capable of operating immediately following a cyclone.**

Scope of Works

Air Traffic Control Tower

51. The design of the proposed air traffic control tower will incorporate the following features:

- . the tower is to be a composite steel and concrete structure, clad in metal, with a top mounted glass faced control cabin and with a metal roof capable of supporting lightning conductors and communications antennae
- . the roof structure is to be capable of supporting maintenance personnel and have balustrades for safety. Below the control cabin another floor is to be provided to house ancillary activities, plant and equipment
- . the proposed orientation of the control cabin will ensure that clear lines of sight are available to all critical movement areas and roof supports are to be located in such a manner as to minimise viewing obstruction

- . deep pile foundations would be provided to support the tower and are designed to suit the geophysical conditions of the site
- . the supporting spine of the tower is to incorporate a services duct, a personnel lift and a stairway
- . the control cabin is to have angled glass and all-round visibility. Particular care was taken in its design to ensure that glare and reflections would be minimised
- . non-metallic anti-glare blinds are proposed to be incorporated
- . noise absorbing materials are to be incorporated into the cabin to minimise noise intrusion
- . air conditioning, incorporating humidity control, is proposed in order to provide a quiet and comfortable environment to meet the needs of personnel and equipment accommodated in the control tower: the air conditioning system is to use redundancy to achieve high reliability and to cater for routine maintenance or equipment failure
- . perimeter radiant heating is to interact with the air conditioning in order to ensure effective de-misting of the glass under all weather conditions. A substantial roof overhang would provide shading to the air traffic controllers
- . a walkway is to be provided around the exterior of the control cabin to enable staff to make weather observations, observe aircraft more closely and clean the cabin glass
- . an uninterruptable power supply, backed up by locally generated power, is to be provided to essential areas of the control cabin and to essential communications and radar display equipment. Strict operating tolerances have been set for these emergency power supplies to ensure equipment reliability
- . the radio equipment room would be screened against radio frequency interference.

Approach Control Building

52. The design of the proposed approach control building will incorporate the following features:

- . the building would be a single story steel framed structure with insulated metal roofing and metal wall cladding
- . the building is to be supported on a stiffened concrete floor slab above bored piers
- . internal masonry walls are proposed in those areas requiring acoustic isolation
- . window glazing would address the issues of thermal efficiency, acoustics and control of natural lighting
- . air conditioning, and emergency power supplies in critical areas would be similar to those proposed for the control tower
- . screening against radio frequency interference is proposed to the technical equipment room, the uninterruptable power supply room, the radio transmitter room and the AA technical facility.

Features Common to Both Buildings and External Works

53. Common features proposed for incorporation in the overall facility include:

- . both buildings will be connected to the electrical ring main on the Base, which is linked to the Base central emergency power house
- . communications cables will be connected to the Base communications network. External microwave links are proposed from both the control tower and the approach control centre
- . water and sewerage and stormwater connections will be made to the FAC reticulation systems
- . lightning protection is proposed to be installed in order to safeguard electronic equipment. Three separate earthing systems are proposed to ensure personal safety and reliable performance of electronic equipment.

54. At the public hearing the Sectional Committee was advised that two stand-by generators were proposed - one to service the RAAF section of the tower and the approach control building and another to service the AA section of the building.

55. The Sectional Committee questioned the need for two stand-by generators and was advised that this was an issue which was the subject of further discussions between Defence and AA. Following the public hearing Defence advised that AA had agreed to accept the Defence offer of the shared use of its uninterruptable power supply, local emergency generator and central emergency power station. Defence has agreed not to levy a capital acquisition or maintenance charge for the use of this equipment.

56. Following concern expressed by the Sectional Committee at the public hearing, Defence has advised that the electrical power reticulation from the emergency generator to the tower cabin has been re-routed. To ensure integrity of the system the cable is to be routed through fire-isolated conduits in the building floor slab.

Security Features

57. Security features to be included in the proposal include:

- . fencing, of similar standard to the existing airport perimeter fence, around the developed site
- . electronic access control to the security fence, main building and restricted areas within that building
- . closed circuit television monitoring, with infra red capability in unlit/darkened areas, to scan the approaches, entry and car park
- . security alarms and photo-electric detectors within the buildings, connected to the Base security system
- . security lighting to illuminate critical areas of the site.

Landscaping

58. Landscaping, incorporating plants suitable for a tropical area, but ones which would not attract a habitat or food source for birds, is proposed.

Fire Protection

59. The following philosophy has been adopted in respect of the design of the fire protection systems:

- . all construction and fire protection requirements will, as a minimum, be in accordance with the provisions of the Building Code of

Australia (BCA) which is the Defence construction standard, the Defence Manual of Fire Protection Engineering (FACMAN 2) and all other applicable Codes and Standards. The policies for asset protection detailed in FACMAN 2, are the Defence risk management approach to the risk assessment of Defence assets and functions

- . Defence will require certification from a suitably qualified certifier, that the design and construction meet the requirements of the BCA, FACMAN 2, relevant codes and standards and any additional state, local government and Defence requirements
- . the NT Fire Brigade is being invited to comment on the project, visit the site and offer comment to ensure its operational requirements are met
- . any recommended departures from BCA requirements in relation to the project will be technically assessed by Defence specialist fire protection staff. Agreed departures (ensuring an equivalent or higher level of protection than BCA requirements) will require written approval at Director General level
- . successful tenderers will be required to produce a quality assurance plan to clearly show how BCA, Australian standards and any additional Defence requirements in relation to fire protection/fire safety, will be met and the required standards for construction/installation maintained.

60. In submissions to the Committee both the Commonwealth Fire Board and the Northern Territory Fire Service indicated support for the fire safety and fire control measures proposed by Defence.

Energy Management and Lighting

61. The design of all power supply, electrical and mechanical equipment will include an assessment of energy use applying life cycle costing techniques and power demand analysis. Facilities will incorporate building management systems, metering and other provisions to measure and monitor energy use and to allow regular energy audits.

62. Lighting in the control cabin and the approach control room is critical to successful air traffic control operations and are to be specifically designed for the purpose, so as to eliminate reflections, especially from radar screens and from the external glazing of the control cabin. Lighting in areas where

radar and computer screens are used will utilise ultra-low brightness fittings. Appropriate emergency lighting is to be provided to ensure sufficient light to enable air traffic control to continue in the event of a mains power failure. Security lighting is to be provided in areas where security cameras operate.

63. To reduce energy consumption, lighting is to be controlled by photo electric switches in conjunction with time-switch schedules. This is to include provision of personnel sensor-controlled lighting to amenities and other intermittently occupied areas. Lamps are to be high efficiency fluorescent, compact fluorescent or discharge type. External lighting is to be designed to minimise glare and colour distortion.

Precautions Against Legionella

64. As air-cooled air conditioning systems are proposed, no specific precautions against legionella are considered necessary. Potable water would be below the temperature range where legionella can breed to levels affecting health.

MASTER PLANNING

65. The siting of the proposed new air traffic control facility will not be in conflict with the development plan envisaged by the FAC for its area. The siting has no direct master planning implications for the RAAF Base.

66. Master planning studies are currently in progress for RAAF Base Darwin. The master plan is being developed on the basis that the new air traffic control facility would be on the north side of airfield.

Committee's Conclusion

67. The siting of the new air traffic control facilities will not be in conflict with future development plans for civil aviation facilities at the Darwin international airport.

ENVIRONMENTAL AND HERITAGE CONSIDERATIONS

Environmental Approval

68. An Environmental Certificate of Compliance was issued by Defence on

3 July 1995 to cover the proposal to construct a new air traffic control facility.

Environmental Implications

69. No direct adverse environmental impact is foreseen as a result of constructing the proposed new facilities. Nevertheless, precautions will be taken to ensure that no silting or contamination would occur affecting Marrara Swamp or Rapid Creek through construction activities.

70. Noise generated by airborne aircraft should be better confined to defined areas as a result of improved airspace control.

Heritage Implications

71. The Australian Heritage Commission advised the Committee that this proposal will not have an impact on the heritage precincts of RAAF Darwin.

CONSULTATION

Consultation with External Authorities

72. The total proposal has been developed with full and continuous consultation with the FAC and the then CAA.

73. The following authorities have been consulted and/or advised during the planning stage:

- . Federal and State Government Representatives for the area
- . Northern Territory Department of Industries and Development, (which is acting as the single point of contact for liaison with all other Northern Territory Departments)
- . Darwin City Council
- . NT Fire Brigade

74. Air traffic controllers in Darwin were consulted during the development of the proposal and also took part in a value management exercise which reviewed the project.

FUTURE WORKS

Development of Operational Facilities at RAAF Base Darwin

75. Planning is in progress to define and cost works to enhance the operational capability of RAAF Base Darwin. These works are presently estimated to cost in the order of \$34.5m. As part of the planning, a revised master plan is being developed for the Base. It is anticipated that this proposal will be sufficiently developed in the first half of 1996 in order for it to be referred to the Committee for examination in mid-1996.

76. It is envisaged that works to demolish the existing air traffic control tower and approach control building would be included as component of the above project.

PERSONNEL IMPLICATIONS

Establishment Population

77. The RAAF's complement at RAAF Base Darwin would remain substantially unaltered as a result of the implementation of the proposed works.

Construction Workforce

78. Over the envisaged construction period of about 12 months, an average of about 50 personnel would be directly employed on construction activities. In addition, it is anticipated that construction would generate further job opportunities off-site from the prefabrication of components and manufacture and distribution of materials.

CONSTRUCTION PROGRAM

79. Subject to Parliamentary approval, tenders will be called in September 1995, with the objective of having construction completed by the end of 1996.

80. The timings of proposed works are influenced by the following considerations:

- installation of the surveillance radar is programmed for early 1997.

This timing predicated the completion of the air traffic control facility by the end of 1996

- . the contract for the provision of airspace control communications equipment has not been placed, but the scheduling is dictated by the surveillance radar project, as installation work for both projects needs to run concurrently
- . for air safety considerations, the provision of improved air traffic control installations at Darwin requires utmost priority, but the timings indicated are the best that can be achieved. Any delay to concurrent facilities construction and equipment installation would exacerbate air traffic safety concerns at Darwin.

COST ESTIMATES

81. The cost of this project is estimated at \$8.4m (May 1995 prices) with an out-turn cost of \$8.8m. The out-turn cost estimate includes construction costs, professional fees and charges, furniture and fittings, construction contingency and a predicted indexation adjustment over the construction period. The estimate includes the cost of relocating existing equipment.

82. To meet CAA (now AA) requirements, an additional 150m² of floor space is to be incorporated in the approach control section building, primarily to house plant and equipment to be relocated from its existing operations building. AA had agreed to make a proportional contribution to the project of some \$350 000 with the actual amount to be determined once a contract has been let. The total estimated cost for the project includes the works for AA.

83. This project had formerly been included in the Defence 1994/95 medium new works program at an estimated cost of \$4.77m. However this estimate had been arrived at prior to:

- . a Technical Site Selection Board confirming the site
- . a detailed functional design brief being prepared
- . the CAA requesting the scope of the project be increased at its expense to include an additional 150m² of space
- . an in-depth consideration of engineering services.

84. Following consideration of the above factors the cost estimate was increased to \$8.4m. Defence regards this estimate as being reliable but will work with its consultants to further reduce the cost estimate during the detailed design process.

85. Defence advised the Committee that payments to subcontractors will be protected as the Defence contracts will specify that contractors must specify that subcontractors have been paid before further payments are made to contractors.

Committee's Recommendation

86. The Committee recommends the development of air traffic control facilities at the Darwin international airport at an estimated cost of \$8.4m at May 1995 prices.

CONCLUSIONS AND RECOMMENDATIONS

87. The conclusions and recommendations of the Committee and the paragraphs in the report to which they refer are set out below:


Paragraph

1. **There is an urgent need for new air traffic control facilities at the Darwin international airport to replace the existing unsatisfactory facilities which are structurally unsound and are located in an area which is incompatible with the future development of RAAF Base Darwin. The control tower is now of insufficient height to provide full visibility of all general aviation pavement areas.** 33

2. **The site selected for the proposed air traffic control facilities on the northern side of the Darwin international airport is suitable as it meets the required criteria laid down by the Technical Site Selection Board.** 37

3. **The proposed facilities have been designed in accordance with the wind loading requirements for**

- the Darwin region and should be capable of operating immediately following a cyclone. 50
4. The siting of the new air traffic control facilities will not be in conflict with future development plans for civil aviation facilities at the Darwin international airport. 67
5. The Committee recommends the development of air traffic control facilities at the Darwin international airport at an estimated cost of \$8.4m at May 1995 prices. 86



Colin Hollis MP
Chair

18 September 1995

APPENDIX A

LIST OF WITNESSES

BOWDEN, Mr William Bruce, Director, Bowden Design Associates—Architects, 12 Myahgah Mews, Spit Junction, New South Wales 2088

HAMMOND, Wing Commander Owen James, Project Director D, Director General of Facilities, Air Force, Department of Defence, Campbell Park Offices, Campbell, Australian Capital Territory 2600

KAVANAGH, Group Captain Brian Lawrence, Officer Commanding 321 Air Base Wing, Headquarters 321 ABW, RAAF Base, Darwin, Northern Territory 0820

KENNEDY, Air Commodore James Frederick George, Director General Facilities, Air Force, Department of Defence, Campbell Park Offices, Canberra, Australian Capital Territory 2600

MARA, Mr Noel Francis, Project Manager, Darwin Facilities Relocation Project, Airservices Australia, 25 Constitution Avenue, Canberra, Australian Capital Territory 2600

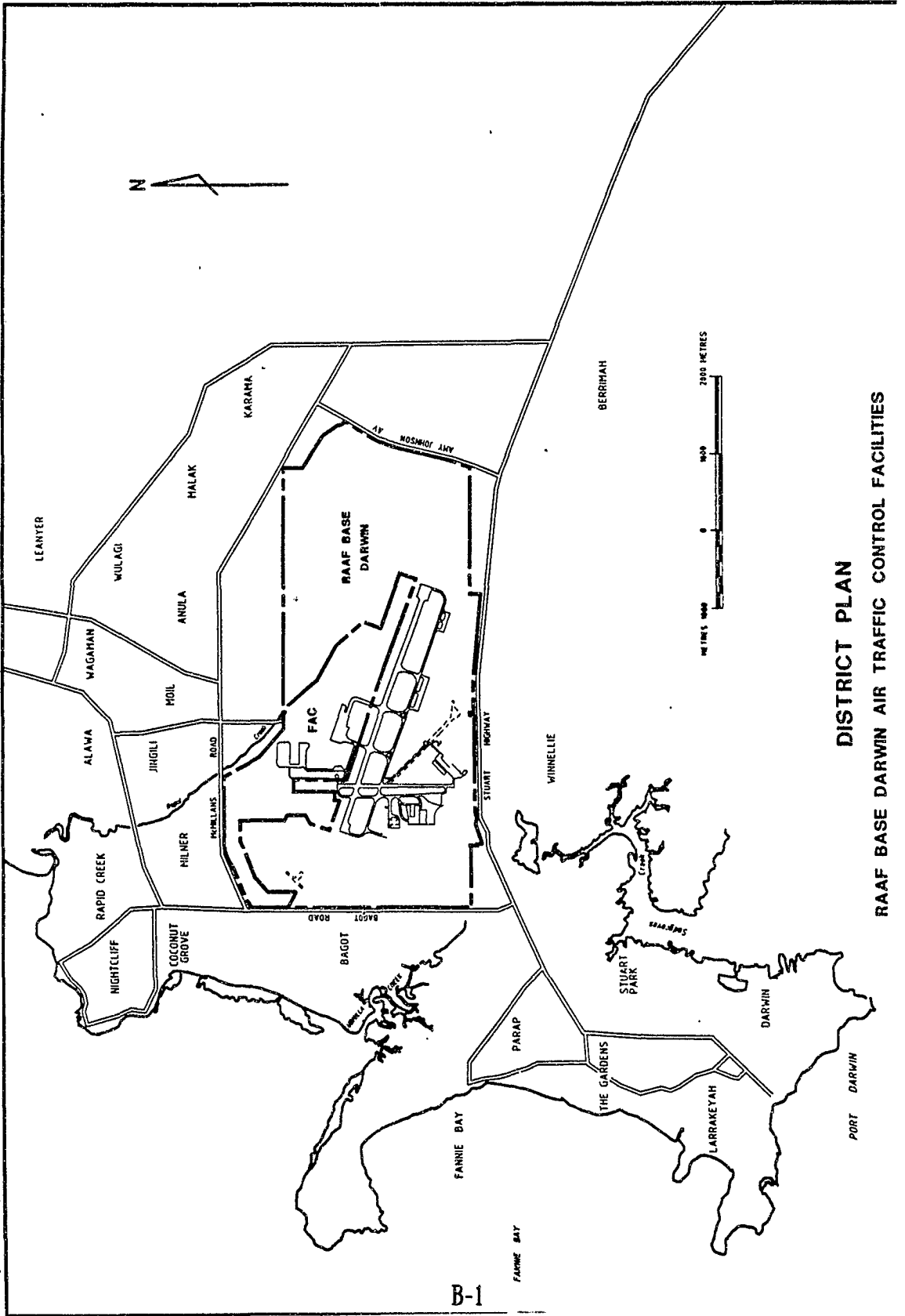
McDONOUGH, Wing Commander Raymond Thomas, Staff Officer, Air Traffic Control, Air Headquarters Australia, RAAF Glenbrook, New South Wales 2773

APPENDIX B

PLANS AND ILLUSTRATIONS

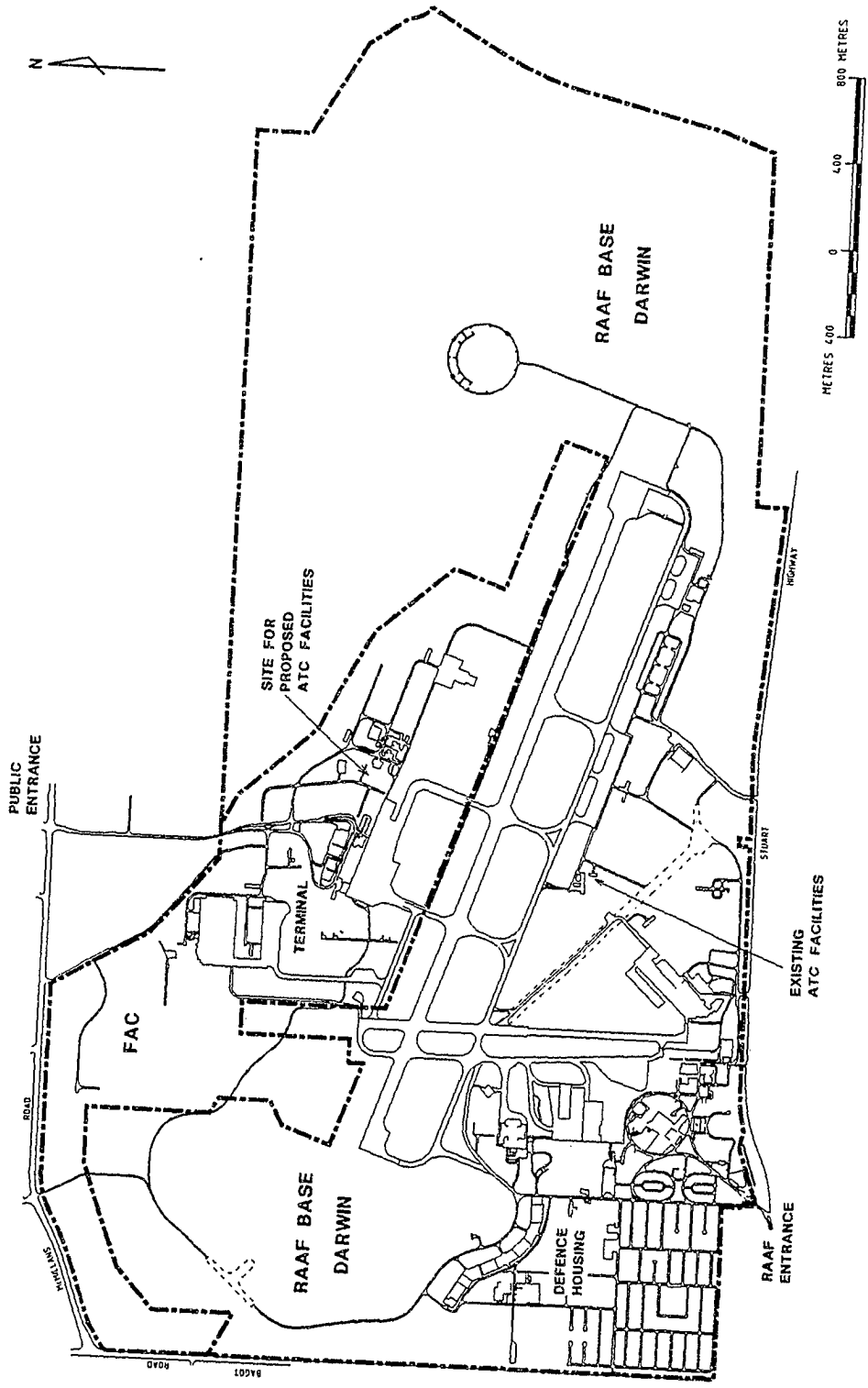
RAAF Base Darwin Air Traffic Control Facilities

District Plan	B-1
Locality Plan	B-2
Tower Perspective Drawing	B-3

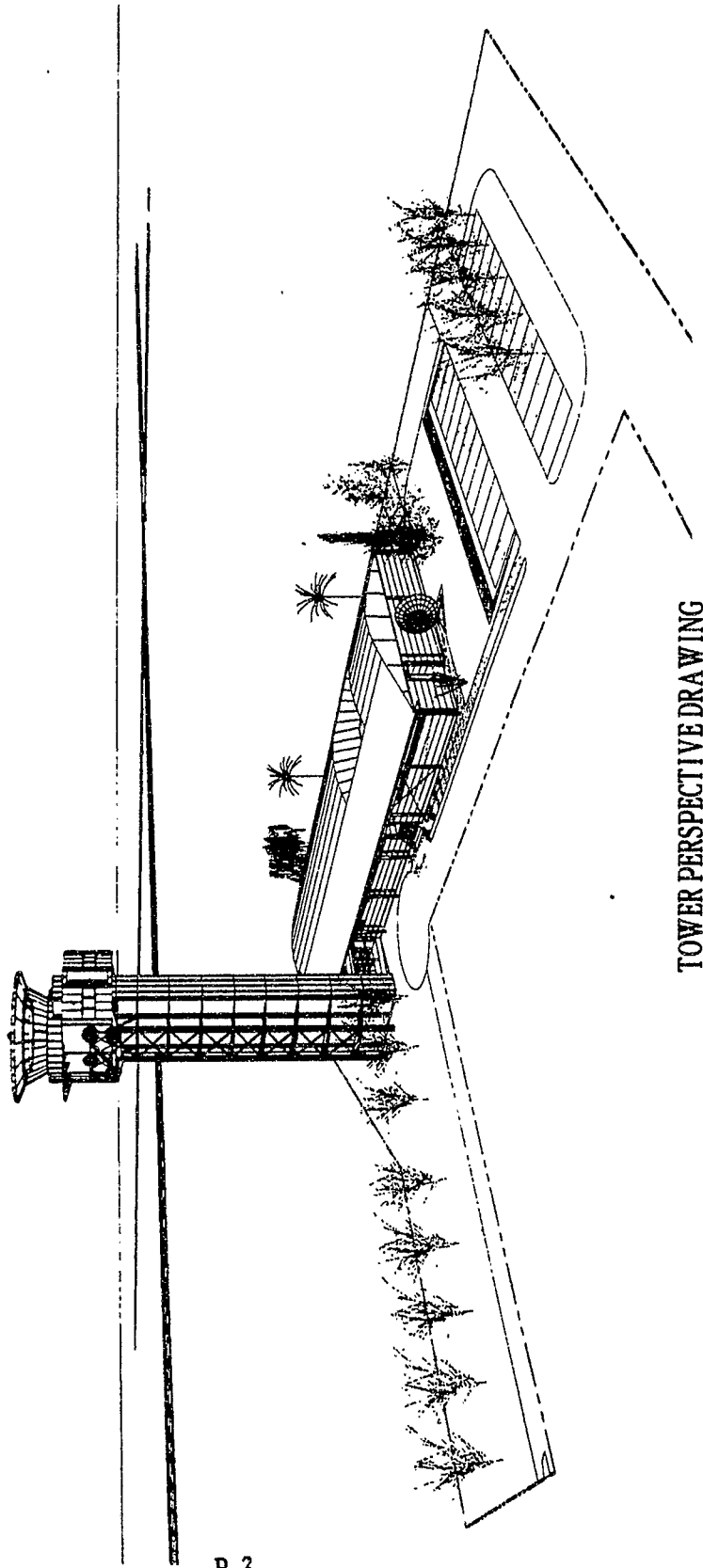


DISTRICT PLAN

RAAF BASE DARWIN AIR TRAFFIC CONTROL FACILITIES



LOCALITY PLAN
RAAF BASE DARWIN AIR TRAFFIC CONTROL FACILITIES



TOWER PERSPECTIVE DRAWING