

Parliamentary Standing Committee on Public Works

REPORT

relating to the

STAGE 3 - DEVELOPMENT OF RAAF BASE TINDAL, NT

(Ninth Report of 1991)

THE PARLIAMENT OF THE COMMONWEALTH OF AUSTRALIA 1991

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



Report Relating

to the

Stage 3 - Development of RAAF Base Tindal, NT

(Ninth Report of 1991)

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MEMBERS OF THE PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS

(Thirtieth Committee)

Mr Colin Hollis MP (Chairman) Mr William Leonard Taylor MP (Vice-Chairman)

Senate House of Representatives

Senator Bryant Robert Burns
Senator Paul Henry Calvert* Mr Lloyd Reginald O'Neii MP
Senator John Robert Devereux Mr Russell Neville Gorman MP
Mr Bruce Craig Scott MP

 Appointed on 24.8.90 following the retirement of Senator Dr Glenister Sheil

Committee Secretary: Peter Roberts

Inquiry Secretary: Michael Fetter

Secretarial Support: Di Singleton

EXTRACT FROM THE VOTES AND PROCEEDINGS OF THE HOUSE OF REPRESENTATIVES

No. 86 dated Wednesday, 11 September 1991

11 PUBLIC WORKS - PARLIAMENTARY STANDING

COMMITTEE - REFERENCE OF WORK - STAGE 3 DEVELOPMENT OF RAAF BASE, TINDAL, NT: Mr Baldwin (Minister for Higher Education and Employment Services), for Mr Beddall (Minister representing the 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: Stage 3 development of RAAF Base, Tindal. NT.

Mr Baldwin presented plans in connection with the proposed work. Question - put and passed.

PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS STAGE 3 DEVELOPMENT OF RAAF BASE TINDAL, NT

By resolution on 11 September 1991 the House of Representatives referred to the Parliamentary Standing Committee on Public Works for consideration and report the Stage 3 development of RAAF Base Tindal, NT.

THE REFERENCE

- 1. Stage 3 of the development of RAAF Base Tindal (Tindal) involves the provision of air defence facilities, comprising the Sector Operations Centre and No. 2 Control and Reporting Unit headquarters, living-in accommodation associated with projected personnel increases stemming from the air defence facilities, deployed squadron operational and technical facilities, aircraft pavements, aircraft shelters and associated engineering services.
- 2. The estimated cost of the proposed works is \$53.5m at April 1991 prices.

THE COMMITTEE'S INVESTIGATION

- 3. The Committee received a submission and drawings from the Department of Defence (Defence) and took evidence from representatives of the Department and Australian Construction Services (ACS) at a public hearing held at Tindal on 31 October 1991.
- 4. The following individuals and organisations also presented submissions and appeared before the Committee at the public hearing:
 - Hon M A Reed MLA Member for Katherine
 - Jawoyn Association Aboriginal Corporation
 - Barunga-Wugularr Community Government Council
 - Northern Territory Government

- Katherine Town Council
- Territory Construction Association.
- 5. Submissions and letters were also received from the following:
 - . Commonwealth Department of the Arts, Sport, the Environment, Tourism and Territories
 - . Australian Heritage Commission
 - . Northern Territory Treasury
 - . Commonwealth Department of Transport and Communications
 - . Association of Consulting Engineers
 - . Mr R Brons
 - . Northern Territory Department of Lands and Housing
 - . Federal Airports Corporation
 - Commonwealth Fire Board
 - Armed Forces Federation of Australia
 - Civil Aviation Authority.
- 6. Whilst transiting through Darwin the Committee inspected existing ordnance storage facilities located adjacent to RAAF Base Darwin. These structures are similar to those proposed to be constructed for the Sector Operations Centre at Tindal as part of the Stage 3 development.
- 7. On 30 October the Committee inspected Tindal. The inspection included facilities which formed part of Stages 1 and 2 of the development of the Base as well as the sites for proposed buildings and aircraft pavements forming Stage 3 of the development. The Committee also inspected houses owned by the Defence Housing Authority on-base and in Katherine. The Committee also took the opportunity to inspect parts of the drainage system adjacent to the Base.

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

BACKGROUND

RAAF Base Tindal

- 10. Tindal is about 14km south of Katherine and 330km by road south of Darwin. Drawing B 1, in Appendix B, shows the location of Tindal in relation to other major centres. The terrain around Tindal is generally flat with scattered limestone outcrops and occasional subterranean sink holes and caverns. It is situated in an area prone to heavy rain during the hot and humid wet season and to warm to hot generally dry conditions during the winter.
- 11. Tindal was originally known as Carson's Airfield and was one of three airfields, suitable for heavy bombers, constructed between Katherine and Daly Waters during the Second World War. In mid-1942 construction was commenced by an American engineer regiment. The Victorian Country Roads Board completed the project at the end of 1944. Since then Tindal has undergone a number of developments. In October 1963 reconstruction and extension was commenced to provide a back-up airfield to Darwin and to provide a 'defence in depth' capability. These works were completed in 1970. A map of Tindal and its environs is shown in Appendix B, Drawing B 2.

Development Planned

12. Commencing in September 1984 Tindal has undergone significant development to enable a squadron of F/A-18 Hornet aircraft to be permanently based there and for operational and intermediate level maintenance of aircraft to be undertaken there. The decision to proceed with the development of Tindal originated from Government commitments, which were made in 1981, to base a squadron of Mirage replacement fighters in Northern Australia and to match this commitment with the provision of facilities to support the aircraft. Three locations, which could be developed to provide the support facilities, were considered. These locations were RAAF Base Darwin, Tindal and a completely new site in the

general region. Tindal was selected as the most appropriate site for the following reasons:

- . a modest civilian infrastructure the town of Katherine and the Stuart Highway and the former Darwin to Larrimah railway
- . the existing bare base at Tindal
- freedom of operational constraints Tindal is out of noise range of Katherine and substantial areas in the region are uninhabited
- . the Katherine area is not subject to cyclones
- the distance from the coast gives some additional warning time in the event of penetration of coastal defences.
- 13. A master plan for Tindal was developed taking into consideration requirements, proposed and possible future activities to be carried out at Tindal, and environmental constraints. The master plan is illustrated at Appendix B, Drawing B 3.

Committee Recommends Development

- 14. In May 1984 the Committee recommended to Parliament that approval be given for the construction of the first stage of the development of Tindal. The Committee's report on the development (Twelfth Report of 1984, Parliamentary Paper 73/1984) concluded that Tindal was the most suitable site in Northern Australia for the development of a new home base for No. 75 Squadron which, at the time, was to be re-equipped with F/A-18 aircraft. The Committee recommended the construction of minimum essential facilities for the squadron comprising operational, technical, support and domestic facilities, aircraft pavements and associated engineering services estimated to cost \$167m at December 1983 prices. Construction of these works commenced in September 1984 and critical facilities were completed in time for flying operations to commence in October 1988. The Stage 1 works are now substantially completed at a cost of \$251m.
- 15. In July 1988 the Committee considered works comprising Stage 2 of the development of the Base. These works, estimated to cost \$37.65m at December 1987 prices, were required to enhance operational and support

capabilities. They comprised additional aircraft pavements, technical and support facilities, associated engineering services and the provision of 20 additional married quarters on the Base.

- 16. The Committee's report on Stage 2 (Tenth Report of 1988, Parliamentary Paper 232/1988) concluded that there was a need to augment the Stage 1 facilities, including the provision of 20 additional married quarters, and recommended that construction proceed.
- 17. Defence advised the Committee that subsequent to Parliamentary approval the works forming Stage 2 were divided into three phases for programming reasons.

Phase 2A

18. This phase involved the replacement of the interim equipment warehouse, extensions to the combined medical and dental complex and the provision of additional ordnance preparation facilities. These works accounted for \$9.18m of the \$34.9m approved scope of works. The Committee was advised that Phase 2A was committed to construction in 1988-89 and is now substantially complete at an estimated completion cost of \$8.87m

Phase 2B

- 19. This phase provides for the commitment of the higher priority items in the balance of Stage 2. An amount of \$12.2m was authorised in 1990-91 for the provision of the aviation fuel installation, the Base calibration centre, the general engineering workshop and some of the ordnance storage facilities. Construction of the aviation fuel installation commenced in May 1991 and tenders for the other items are being called progressively throughout 1991.
- 20. The Committee was advised that the provision of floodlights to the second sports field has now been accorded the status of a 'minor works item' with Base management being responsible for deciding upon its priority. The Committee believes that since this item formed part of Stage 2, for which compelling arguments were advanced, it should be removed as a 'minor work' and accorded a high priority under Phase 2B.

Phase 2C

- 21. This final phase contains Stage 2 works a number of which have been deferred beyond the Defence Five Year Program and others which have been incorporated into the Stage 3 works which are the subject of this report. The 'subsumed' works include the provision of Taxiways L and S and the electrical engineering trunk services.
- 22. Stage 2B included the provision of ordnance storage facilities needed for the most urgent requirements. The Committee's Stage 2 report to Parliament recommended the construction of four explosive ordnance storage igloos and eight earth-covered explosive ordnance storage buildings.
- 23. Stage 2 also included the provision of a Base chapel, and the floodlighting of a second oval and the provision of additional tennis courts, the provision or construction of which has been deferred beyond the Defence Five Year Program. In relation to the chapel, Defence advised that the site office used by ACS during Stage 1 is now used as the Base community centre. Part of the centre is used as a chapel pending the provision of a permanent facility. During the inspection the site for the chapel was pointed out to the Committee; it will be located adjacent to the Base canteen and the gymnasium.
- 24. The provision of a ground photographic facility was also included in Stage 2. It was envisaged that this facility would provide accommodation for industrial and personnel photography and ground photography processing and printing. Defence advised in evidence presented at the Stage 2 hearing that as an interim arrangement photographic processing and printing activities would be performed at RAAF Base Darwin. This arrangement, Defence argued, would be inefficient. Instead of providing the fully airconditioned facility containing darkrooms, studio, print finishing area, storage, offices and amenities, a transportable building has been established giving a minor photographic capability. Following the public hearing Defence advised that the funding of photographic facilities depends on tender prices for the Phase 2B works. If funds are not available, photographic facilities will be included in Phase 2C, or depending on priorities and funds, as a medium new works item.

Reasons for Deferral

25. The Committee sought to establish why the provision of a number of significant elements of Stage 2 had been deferred beyond the Defence Five Year Program. Defence advised that it is under constant pressure to accommodate all needs within the resources allocated to it. The Stage 2 works were accordingly broken down into three separate phases and those works remaining to be carried out are included in Phase 2C which, in the judgement of Defence, are of a lesser priority and can be deferred for some years. It should be noted that some components of operational works, formerly in Stage 2, have been subsumed into Stage 3.

Civil Aviation

26. Tindal is also a joint-user airfield with the Department of Transport and Communications (DTC) as the tenant. Civil aviation facilities are located in the northwest corner of the airfield. Defence advised the Committee that the joint use of the airfield does not pose any significant problems. Nevertheless, the DTC is the civil aviation airport operator and a recent Cabinet decision that DTC should divest itself of the operation of its remaining airfields may lead to changes to existing arrangements. Arising from the Cabinet decision, Defence expects that the DTC will approach other organisations, such as Katherine Town Council and the Northern Territory Government, to ascertain whether they are prepared to take over the civil airport facilities at Tindal. Defence will be involved in working out the new arrangements.

Tindal Today

- 27. The Base occupies about 122km² and is 11 times larger than RAAF Base Amberley, previously Australia's largest base. It has a 2 740m runway with a parallel taxiway, four interconnecting taxiways, a general purpose aircraft apron and the operational, technical, support and domestic facilities required to support No. 75 Squadron.
- 28. Associated off-base facilities include the Delamere Air Weapons Range, 120km southwest of Tindal, the Air Traffic Control Surveillance Radar site and the site for high frequency remote radio receivers.

29. The development of Tindal over the past seven years represents one of the largest and most expensive defence infrastructure developments in Australia's history. What in 1984 was essentially a bare base located in a remote area with a relatively harsh climate has been transformed into a modern air force base with most of the infrastructure required to support operational fighter aircraft, and the personnel required to fly and support them as well as their dependents. It was obvious to the Committee during the inspection of the Base that personnel are proud of what has been achieved.

Current Defence Planning

It is the long-term intention of Defence to centre the majority of RAAF activity in the Northern Territory at Tindal. Activities carried out at RAAF Base Darwin will be limited to the management of the airfield and the support of operational activities including the storage, preparation and loading of explosive ordnance. It is planned to relocate other existing functions from Darwin to Tindal, although the rate of relocation will be dependent on technical, financial and Defence planning considerations. In this context RAAF Base Darwin will remain as a forward operational base, catering for activities associated with airhead functions, air defence and communications. RAAF Base Darwin would also provide for the air defence of Darwin and its maritime approaches and also for the support of air operations and training. As part of its role as a forward operational base, RAAF Base Darwin will be used for regular deployments of elements of the RAAF and for major exercises. Defence advised that the close proximity of two major RAAF bases in northern Australia - Tindal and Darwin - provides the RAAF with an environment in which it can train and conduct exercises.

THE NEED

Facilities for Deployed Aircraft

31. At present Tindal can only accommodate a squadron of F/A-18 aircraft and some transit aircraft. Defence advised that Tindal is the hub of air operations in the north of Australia but the deployment of additional military aircraft from other bases in Australia or from overseas is limited by insufficient ordnance loading areas. This lack of additional capacity presents some limitations on the utilisation of the Delamere Air Weapons Range. Accordingly, Defence submitted that there is a need for the operational and

training capability to be enhanced by the provision of ten dispersed ordnance loading aprons, to accommodate fighter and strike aircraft, as well as protective gun and missile barricades and explosive ordnance traverses. These aprons would enable aircraft deployed to Tindal to be armed with explosive ordnance in a manner that complies with Defence safety standards.

- 32. There is also a need for aircraft shelters to reduce the effects of the harsh environment on deployed aircraft, equipment and personnel. Defence advised that the harsh climate, especially heat build-up and ultraviolet radiation, degrades cockpit materials, seals and instruments which result in premature and costly replacement. Furthermore, without protection, seasonal monsoon conditions lead to water leaking into aircraft which contributes to corrosion and damage to instruments. Aircraft shelters would alleviate some of the effects of the sun and rain.
- 33. Personnel engaged in aircraft maintenance at each shelter will require a small acoustic shelter in which to store aircraft maintenance records. There is also a requirement for ablutions.
- 34. The provision of ten aprons and associated aircraft shelters will ensure that two flights of four fighter aircraft could be launched. Each flight of four aircraft requires a fifth aircraft to be fuelled and armed with ordnance in case one of the other aircraft becomes unserviceable prior to take-off.
- 35. During the inspection of the Base, the Committee was briefed by personnel from No. 75 Squadron and inspected the squadron's operational facilities. It was clear to the Committee that the squadron's operational and support facilities would be somewhat cramped if they were to be shared with personnel from an additional squadron. Defence submitted that there is therefore a requirement for the following facilities to be provided for squadrons deployed to Tindal:
 - a facility in which flying missions can be planned, prepared and managed
 - an area for deployed photographic cabins strike aircraft squadrons deploy with photographic cabins when missions include reconnaissance work

- buildings to provide office accommodation for technical and supply administration staff, a storage and maintenance area for aircrew safety equipment and a storage area for supply items
- a building for the storage of 'fly away kits' and the parking of ground support equipment
- an ablution building.
- 36. These facilities should be provided adjacent to the aircraft aprons and shelters for deployed aircraft.

Committee's Conclusions

- 37. Operational and support facilities occupied and used by No. 75 Squadron are inadequate to support activities associated with aircraft and personnel deployed to Tindal.
- 38. If it is intended to continue the deployment of fighter and strike aircraft to Tindal adequate facilities must be provided for aircraft parking, ordnance loading and technical and support activities.

Aircraft Pavements

39. The construction or completion of a number of taxiways, provided for in the master plan, would need to be undertaken to enable aircraft to taxi from the deployed aircraft dispersal area to the runway. Taxiway S, which provides access to the runway from the No. 75 Squadron aircraft dispersal area, is partially completed and is 455m long. Construction of Taxiway R and completion of Taxiway S would complete Tindal's 'coathanger' airfield thereby providing the master planned capability for the main runway to be complemented with three emergency taxiways. The need now for the completion of Taxiway S and construction of a new Taxiway R follows from the need for the additional deployed aircraft dispersal and ordnance loading area.

Heat Stress on Pilots

40. The Committee questioned the functionality of the No. 75 Squadron dispersal area after noting its configuration and the limited number of access points to the runway. The Committee also raised the question of the effects

of severe heat on pilots required to remain in aircraft cockpits for extended periods whilst taxiing or waiting to takeoff. Temperatures in excess of 70°C are apparently common on pavement areas at Tindal during some periods of the year.

- 41. Defence advised that the potential problems of heat stress are recognised and airmen are being educated about the effects of dehydration and the need to take in fluids before taxiing. Missions are cancelled if set periods during which aircraft must become airborne are exceeded. The provision of lightweight cotton flying suits, which could reduce some of the serious impacts of heat, remains to be addressed.
- 42. To reduce the time aircraft spend on the runway and thereby increase the rate of takeoffs and landings, Defence indicated a requirement for two high-speed exit taxiways.

Committee's Conclusion

43. Additional taxiways are required at Tindal to enhance the functionality of the present runway and taxiway system.

Lighting, Drainage and Engineering

- 44. Defence advised that taxiway and runway lights will be required, as well as a modest extension to the building housing the airfield lighting power centre to accommodate additional airfield lighting equipment.
- 45. Drains and associated structures for the collection and disposal of stormwater are also required to prevent flooding and erosion of the airfield.
- 46. Additional roads, water supply, sewerage and power will also be required to serve deployed aircraft and air defence facilities.

Committee's Conclusion

47. If additional facilities for deployed aircraft, support activities and taxiways are to be provided, it will be necessary to undertake related work comprising runway lighting, power supplies, drainage, road access, and water and associated services to enable them to be operated effectively.

No. 2 Control and Reporting Unit

48. No. 2 Control and Reporting Unit (2CRU) is located in Darwin where facilities are old and vulnerable to cyclones and hostile attack. A substantial proportion of the air defence display and communications equipment is scheduled for replacement in 1994. Installation of the replacement equipment directly into a new Sector Operations Centre at Tindal would save the Commonwealth about \$1m in equipment relocation costs. Defence advised that this replacement program therefore presents an ideal opportunity to capitalise on the timing for relocation to coincide with the replacement program. The relocation to Tindal is consistent with plans to relocate a number of activities from Darwin to Tindal when technically and economically appropriate. Facilities at Tindal will therefore be required to house the Sector Operations Centre, a headquarters building and living-in accommodation for 2CRU personnel.

Committee's Conclusions

- 49. Existing facilities occupied by No. 2 Control and Reporting Unit in Darwin would be inadequate to house replacement equipment being acquired by Defence.
- 50. There would be strategic and operational advantages as well as financial benefits if No. 2 Control and Reporting Unit were located at Tindal and for the relocation to coincide with the delivery of replacement equipment.

THE PROPOSAL

- 51. The following works are proposed for the Stage 3 development:
 - deployed squadron operational and technical facilities
 - aircraft shelters
 - aircraft pavements
 - engineering services
 - air defence facilities

living-in accommodation associated with the provision of air defence facilities.

Location and Master Planning

52. The master plan was developed in 1984 to indicate the layout envisaged at the completion of the works identified in the environmental impact statement. Master plans are basic plans which reserve real estate, or delineate zones, for specific functional requirements. Defence advised that the master plan presented to the Committee in 1984 in conjunction with the Committee's inquiry into the Stage 1 works has been updated to reflect siting changes. In relation to sites for facilities which are the subject of this reference, Defence advised that there have been changes to the locations and nomenclature for the air defence facilities, the deployed aircraft dispersal and ordnance loading area and associated operational and technical facilities. Sites for the emergency runways, high-speed exit taxiways and living-in accommodation accord with the original master plan. A site plan of the Stage 3 works is shown in Appendix B, Drawing B - 4.

Deployed Squadron Operational and Technical Facilities

- 53. The proposed location of these works is shown in Appendix B, Drawing B 5. The works comprise the following elements:
 - a squadron operations facility of 395m² for operations planning. The building will be an above ground buried reinforced concrete twin igloo structure. A plan of the proposed facility is shown in Appendix B, Drawing B 6.
 - a concrete paved area of 150m² for deployed photographic cabins
 - four transportable buildings each of 36m² to provide office accommodation for technical and supply administration staff, a storage and maintenance area for aircrew safety equipment and a storage area for maintenance supply items. These will be standard prefabricated buildings
 - a building of 125m² for storing fly away kits and a shelter for parking ground support equipment. This will be a steel framed,

metal clad structure. Plans and elevations are shown in Appendix B, Drawing B - 7

- acoustic shelters and ablution facilities comprising 12 transportable buildings of 5m² each for the acoustic shelters, five toilets for the dispersal area and one ablution building adjacent to the deployed squadron operational and technical facilities
- aircraft dispersal and ordnance loading area comprising ten ordnance loading aprons sized to accommodate fighter and strike aircraft. The aprons will be interconnected with taxiways and linked by two taxiways to Taxiway R which will provide access to and from the main runway. The area will also be served by an internal road system for support vehicles. Protective gun or missile barricades will be provided. The area will be designed to comply with Defence explosives ordnance safety principles. The configuration is different from the random layout adopted in Stage 1. A configuration as proposed would be cheaper to construct than the random layout and Defence acknowledged the lessons learned from the Stage 1 layout. The random layout was the first dispersal and ordnance loading area designed by the RAAF since the Second World War. The Stage 3 will largely eliminate access problems to the runway for both dispersal and ordnance loading areas. A plan of the proposed dispersal and ordnance loading facility is shown in Appendix B, Drawing B - 8.
- ten aircraft shelters at the ordnance loading aprons. These will be prefabricated steel framed, metal clad structures similar to those used by aircraft from No. 75 Squadron
 - the dispersal area and the operational and technical facilities will be enclosed by a high security fence.

Committee's Conclusion

54. The operational and technical facilities proposed for fighter and strike aircraft deployed to Tindal appear to be adequate and will be sited at functional locations.

Aircraft Pavements

- 55. It is proposed to provide 15m-wide aircraft pavements along the full length of Taxiway R (1 525m) and to complete the full length of Taxiway S (currently 455m). These taxiways will provide access from the deployed aircraft dispersal area to the runway and additional access to the runway from the existing dispersal area used by No. 75 Squadron. In short, the problem of access points from the dispersal area is being addressed by the provision of three access points to the main runway. These access points will comprise the existing connection at the southern end of Taxiway S, and new connections at Taxiway V and Taxiways S and R. The proposed configuration of taxiways is shown in Appendix B, Drawing B 9.
- 56. In addition 15m-wide taxiway pavements, for use as high-speed exit taxiways, will be provided along the full lengths of Taxiways U and V. These taxiways will increase runway utilisation during high activity periods.
- 57. The taxiways will be flexible pavements surfaced with bituminous concrete.

Committee's Conclusion

58. The proposed aircraft pavements will enhance the capacity of existing pavements and ensure that the full potential of the runway and taxiway system is realised.

2CRU

59. There are three main elements associated with the relocation of this unit from Darwin to Tindal, namely the Sector Operations Centre, 2CRU headquarters and living-in accommodation.

Sector Operations Centre

60. The Sector Operations Centre will comprise a 2 120m² building which will accommodate air defence operations activities. This will be an above ground buried reinforced concrete twin igloo structure. A plan of the proposed building is shown in Appendix B, Drawing B - 10.

2CRU Headquarters

61. The headquarters will be a 750m² building which will house administrative and support functions for the Sector Operations Centre. It will be a conventional framed steel structure similar to many of the technical and support facilities provided as part of the Stage 1 development of Tindal. A plan is shown in Appendix B, Drawing B - 11.

Gulf War

62. The Committee asked Defence whether any lessons learned from the Gulf War were reflected in the design of buildings at Tindal which may be primary targets in the event of hostilities. Defence advised that a RAAF officer had spent eight weeks in Iraq as a member of the United Nations verification party. Defence is now in a better position to advocate certain design measures to enhance the survivability of buildings.

Committee's Conclusion

63. The design, extent and location of facilities for the Sector Operations Centre are adequate.

Living-in Accommodation

- 64. The living-in accommodation will comprise three double-storey units and will be able to house 24 airmen. Each floor will contain four bedrooms, a common room and shared ablution facilities. Existing living-in accommodation for airmen comprise single-storey units for four persons and double-storey units for eight persons. The buildings are constructed of masonry block work walls and prefinished steel sheet roofs and are interconnected with prefinished steel covered walkways. The additional three double-storey units proposed in this reference will be in the same style and form as the existing buildings.
- 65. The Committee inspected some existing accommodation blocks during its visit to the Base. The level of comfort and privacy being provided to all ranks is impressive and is a far cry from the ageing and substandard living accommodation observed by Members during inspections, some years ago, of other Defence establishments. Much has been done to eliminate the accommodation problem. Plans and elevations of the proposed accommodation is shown are shown in Appendix B, Drawing B 12.

Committee's Conclusion

66. The design, scope and location of additional living-in accommodation are consistent with current standards and the master plan for the development of Tindal.

Additional Houses

67. Defence advised that there may be a need for about 15 additional married quarters when the planned population is reached as a result of the completion of the Stage 3 works. A number of reviews are currently being undertaken by RAAF which could influence the number of RAAF personnel to be located at Tindal. These reviews are of the technical trade structure and non-technical trades. Defence undertook to advise the Committee once the requirement for additional married quarters has been determined.

Committee's Recommendation

68. Defence should liaise with the Defence Housing Authority to ensure that sufficient numbers of houses are available at Tindal or in Katherine for personnel when the planned population of the Base is achieved.

Engineering Services

- 69. The high voltage electrical reticulation system will be augmented by the provision of a new airfield ring main feeder cable. This new feeder will serve the proposed deployed aircraft dispersal and ordnance loading area and squadron operational and technical facilities. It will also serve existing facilities including the aviation fuel installation. The new air defence facilities and living-in accommodation will be supplied from the existing distribution system. All power cabling will be underground. Trunk communications and systems cabling will follow the route of the power cable.
- 70. External electrical services will include cables for telephones, security alarms, fire alarms, monitoring of engineering services and power system control and monitoring.
- 71. Airfield lighting will be provided for aircraft pavements and external lighting will be provided to roads and car parks.

Adequacy of Emergency Power

- 72. The Committee questioned whether additional emergency power generation equipment will need to be installed to ensure full coverage of power requirements, should there be a failure in services provided by the Northern Territory Power and Water Authority.
- 73. Defence advised that the capacity of the Central Emergency Power Station (CEPS) is determined by the nature of facilities being serviced. Loads connected to the CEPS are determined on a priority basis and according to the time of day. For example, loss of power to a gymnasium is not critical, but the continued availability of power to kitchens, medical facilities, aircraft hangars and workshops is considered to be essential. Additionally, a number of critical facilities have their own emergency power generators. These include air traffic control facilities, the communications centre and airfield lighting.
- 74. The Sector Operations Centre is critical and Defence plans to provide local emergency power generators for it.
- 75. The current maximum demand for the Base is 3 mega Watts. After Stages 2B and 3 are complete, the maximum demand is estimated to be 3.6 mega Watts. The current CEPS generating capacity is 2 mega Watts and an additional 1 mega Watt generator is planned as part of Stage 2C. In general terms about 70-80% of maximum demand is catered for by emergency power stations at RAAF bases, which allows them to operate adequately, although with some inconvenience.

Energy Audits

- 76. In keeping with its stance taken towards the need for all departments and agencies to be more energy-conscious in the location, design and construction of new buildings, the Committee sought to establish whether an energy audit had been carried out for Tindal in general and energy targets had been set for the Stage 3 works.
- 77. The Committee was advised that most buildings at Tindal are orientated in an eastwest direction which minimises, to the extent possible, direct western sun on them. Building orientation is augmented by shade trees.

- 78. Tindal has a harsh climate which can cause stress on personnel. For this reason office accommodation, specialist workshops, sleeping quarters and messes are air-conditioned. Large workshops and buildings such as equipment stores are not air-conditioned but adjoining areas such as offices are air-conditioned to provide relief to occupants.
- 79. The Committee was advised that the RAAF was one of the first organisations to undertake energy audits of its establishments and in 1986 it received the Energy Conservation Management Award. Energy audits have not been carried out at Tindal and RAAF Base Williamtown because both bases are undergoing major new development or redevelopment. The RAAF intend, in the foreseeable future, to carry out an energy audit of Tindal

Committee's Recommendation

80. An energy audit of existing facilities at Tindal should be undertaken now.

Energy Conservation - Stage 3

- 81. An operational energy target of 2 276 Gigajoules per annum, estimated to cost \$97 237, is proposed for all buildings and facilities comprising Stage 3.
- 82. Some unusual but significant features of the proposed work which will impact on energy conservation objectives are:
 - the Sector Operations Centre and Squadron Operations facility will be covered with earth - this equates with a well-insulated windowless building and minimises the need for additional passive energy conservation measures
 - all plant in the two facilities, including heat-rejection equipment, needs to be accommodated within their building envelopes for operational reasons. This will necessitate additional plant comprising large fans to pass heat-rejection air.
- 83. A number of passive energy conservation measures, which have been a feature of previous designs, are also proposed. These relate to

orientation, the minimisation of unshaded window areas, insulation, colour, vapour barriers and landscaping.

- 84. Inescapably, air-conditioning is a significant energy consumer at Tindal. Wherever possible the most efficient air-conditioning process proposed is direct-expansion refrigeration. The use of chilled water systems, at a slightly lower efficiency, is proposed only where operational and structural constraints are apparent; the Sector Operations Centre and the Squadron Operations facility fall within this category.
- 85. Maximum use will be made of energy-efficient light sources such as fluorescent tubes operating with low loss circuits.
- 86. The provision of solar collectors for buildings requiring a significant hot water supply has been an established practice at Tindal. In accordance with this practice, solar collectors, with electric boosters, are proposed for domestic water heating in other than the earth covered buildings.

Committee's Conclusion

87. Energy conservation measures proposed for Stage 3 appear to be adequate.

Airfield and Road Drainage

The Committee notes that provision has been made in the estimated cost for drainage works associated with aircraft pavements and roads. The Katherine Town Council submitted to the Committee that unusually heavy flooding of the eastern side of Katherine had occurred during the 1990-91 wet season and believed this flooding may be a result of the development of Tindal. Representatives of the Northern Territory Government advised the Committee that flooding was a problem prior to the development of Tindal. A belief was held by some that the problem had been exacerbated by the Tindal development although, if this were the case, it would be very difficult to quantify the extent of any additional flooding. The Hon M A Reed MLA, Member for Katherine, speaking from personal experience, advised the Committee that the heavy storms experienced during the wet season make even the best placed major roads impassable for short periods. All witnesses who raised the matter of drainage and flooding pointed to a need for a tripartite funded study to identify the source of the problem and practicable means by which it could be reduced, if not eliminated. Katherine Town Council and the Northern Territory Government support the study, and have identified the issues to be considered and drafted the terms of reference.

89. Defence agreed that analysis is needed, but stated a preference for it to be carried out using in-house resources. In previous instances which involved studies of a similar nature, such as at RAAF Base Williamtown, Defence has contributed to a joint study with state and local government. While acknowledging the views of Defence, the Committee believes an independent study would be preferable.

Committee's Recommendation

90. An independent analysis - to be funded by Defence, the Northern Territory Government and Katherine Town Council - of the drainage pattern of the Tindal-Katherine area should be undertaken to identify factors contributing to flooding and to recommend realistic measures to minimise it.

Bicycle Track

- 91. The Hon M A Reed MLA, the Northern Territory Government and Katherine Town Council submitted that a need exists for the scope of the Stage 3 works to be slightly expanded by the provision of a bicycle track linking Katherine with Tindal. It was evident to the Committee that a number of personnel commute between Katherine and Tindal by bicycle using the Stuart Highway. In evidence, it was stated that up to 40 personnel currently use this method and route daily and more personnel would cycle to work if a dedicated bicycle track were provided. Reasons advanced for the provision of a track were:
 - health cycling is regarded by many as an ideal form of exercise
 - safety by using the Stuart Highway, cyclists compete with, and are affected by
 - a range of vehicles including motorcycles, cars and roadtrains, the latter being potentially dangerous particularly as a result of the effects of wake turbulence

- during daily peak traffic movements between the Base and Katherine there is also coincident use of the Highway by cyclists and cars
- the effects of the rising and setting sun on drivers and cyclists - both face the rising sun on outward journeys and on return, the setting sun

conservation and the environment - the use of bicycles is consistent with the Government's environmental policies which are aimed at reducing exhaust gas emissions, the promotion of a cleaner environment and the conservation of non-renewable resources.

- 92. The Committee was advised that the cost of the track would range from \$300 000 for a dedicated track to \$240 000 for widening the Stuart Highway thereby providing a composite track. The latter is not preferred because the danger to cyclists would be only marginally diminished. The route to be followed by the dedicated track would follow an alignment within the Stuart Highway road reserve commencing at the Katherine East subdivision and following a route to the northern side of the Stuart Highway road reserve. It would then meet and cross the Stuart Highway at the intersection of the Highway and the western access road to the Base. This route would be a distance of 5.5km. The Northern Territory Government advised the Committee that land for the track is available.
- 93. Defence advised that, although it supports the provision of the track and acknowledged that the track would enhance rider safety, it is not a Defence responsibility and has not been included in the scope of the works.
- 94. It is clear to the Committee that there are a number of factors in favour of the provision of the track. Of all the reasons advanced to justify its inclusion in the works, the safety of those who elect to commute by bicycle between the Base and Katherine is clearly of paramount importance. This observation is not intended in any way to reflect upon Base management which, although it has the power to order cycling to cease, has permitted it. The Committee acknowledges that there are other Defence establishments whose personnel would benefit greatly from the provision of bicycle tracks; each case must be considered on its merits. In this particular instance, adequate grounds have been identified for the provision of a track. As to the question of cost contribution, the Northern Territory Government

has advised it would make the land available. This should be at no cost to the Commonwealth. The Katherine Town Council advised that it would be prepared to contribute on a percentage basis. The basis for calculating the percentage contribution was, however, not stated by the Council.

Committee's Conclusion

95. A dedicated bicycle track could be constructed linking East Katherine with Tindal with the Northern Territory Government and Katherine Town Council meeting the cost.

ENVIRONMENTAL CONSIDERATIONS

Environmental Impact Statement

96. The development of Tindal was subject to an Environmental Impact Statement (EIS) which was produced in 1984. The EIS detailed the development proposals envisaged at that time and assessed their environmental impact in accordance with the requirements of the Environment Protection (Impact of Proposals) Act 1974. The development works comprising Stage 3 were included in the impact assessment.

Environmental Management Plan

97. Environmental impacts identified in the EIS required the institution of measures to mitigate their effects. An Environmental Management Plan (EMP) was consequently produced in 1987 to identify environmental management objectives and to prescribe guidelines for their achievement. The Committee was assured that the requirements of the EMP have been satisfied in relation to the design of facilities and the implementation of proposed works.

Sites of Significance

98. Representatives of the Jawoyn Association Aboriginal Corporation advised the Committee that the main sites of significance were encompassed in the Stage 1 works and remain protected from any development and from any desecration.

DASETT Clearance

99. The Department of the Arts, Sport, the Environment, Tourism and Territories (DASETT) confirmed that the Stage 3 works are consistent with the EIS.

Impact of Construction on Operations

100. The Committee questioned Defence about the impact of construction activity on the operations of the Base. Defence advised that it is believed that construction activity will not affect the normal role of Tindal in relation to training. Flying operations involving Base personnel will be able to continue. In fact, Defence advised that following the completion of Stage 1 works, there has not been any disruption of normal Base activities due to construction of Stage 2 works.

CONSULTATIONS

- 101. As part of the Stage 1 development, Defence established a formal mechanism for the facilitation of consultation with various interest groups and organisations. Defence advised that consultation has occurred in relation to the Stage 3 development with the following bodies and organisations:
 - . Northern Territory Government Department of the Chief Minister
 - Mayor of Katherine
 - . Jawoyn Association Aboriginal Corporation
 - Aboriginal Areas Protection Authority
 - . Conservation Commission of the Northern Territory
 - . Master Builders Association of the Northern Territory
 - Northern Territory Power and Water Authority

- Northern Territory Department of Works
 - Commonwealth Department of Transport and Communications.

COST

- 102. When referred to the Committee, the estimated cost of Stage 3 was given as \$53.5m at April 1991 prices. At the public hearing the Committee was advised that the project had been cost-capped at \$63.8m. Cost components not included in the \$53.5m are:
 - \$5.9m for design and construction supervision
 - \$4.4m for contingency for construction and design development
 - \$0.3m for furniture.

CONSTRUCTION

Program

103. Construction will be undertaken using a number of separate contract packages for various elements. Subject to all necessary approvals, Defence advised that the first tenders are likely to be called in March 1992 with their completion dependent on departmental priorities and cash availability. Current planning envisages completion by 1996. Priority will be given to completion of the Sector Operations Centre by April 1994 to enable installation of new operations equipment for 2CRU to proceed as scheduled.

Construction Contractors

- 104. The Territory Construction Association (TCA) made useful comments regarding the following matters:
 - project delivery and the benefits of dividing elements of the development into smaller packages ACS has adopted this method for the provision of facilities for 2nd Cavalry Regiment in Darwin and it appears to have worked satisfactorily for all concerned. Defence indicated agreement with the concept of small contract packages for building works, but in the case of

the extensive pavement works involved in Stage 3, this would not be an economical proposition and is therefore not supported. In general terms, therefore, Defence will evaluate all project delivery options which will include a review of previous contract packaging arrangements in the context of departmental priorities, cash availability, cost efficiencies as well as maintaining an ongoing, viable and stable local construction industry

pre-selection of tenders - the TCA believes that restricting the invitation to tender to a small group of contractors would eliminate previous 'cut-throat' tendering which could lead to disputation and litigation. The Committee believes that pre-selection could also lead to collusive tendering and therefore believes the stance in relation to tendering to be adopted by Defence would be more prudent. This involves first, the method of procurement for each package being considered on a value-for-money basis. Secondly, when selective tenders are proposed, contractors will be invited to tender, taking into account their knowledge of the market, working conditions in the Katherine area and their past performance in terms of time, quality and cost

design and construction contracts - the TCA submitted that the construction industry in the Northern Territory has both the ability and capacity to design and construct. Defence advised that project delivery methods would be evaluated and design and construction contracts would be one of the options available for consideration

documentation - the TCA would prefer to have tenders called for fully documented projects which include bills of quantities. Their inclusion would assist contractors and provide optimum quality control. Defence indicated that the relative merits of full documentation will be assessed during the evaluation of project delivery methods.

Barunga-Wugularr Community Government Council

- 105. In a submission to the Committee, the Barunga-Wugularr Community Government Council expressed its interest in undertaking some of the proposed works. The Council pointed to the advantages of using its extensive range of earthmoving equipment in providing much needed involvement and employment to local Aboriginal people.
- 106. ACS advised that tender documentation will contain provisions requiring tenderers to consult with the Commonwealth Employment Service office for information on available local labour and possible assistance by way of subsidies for employment and training.
- 107. Defence advised the Committee that an Aboriginal construction firm was involved in providing fencing, road works and car parks as part of the Stage 1 works. Of the 700 workers involved on the Stage 1 works, 60 were Aborigines.

Highway Construction

108. The Northern Territory Government advised the Committee that significant work, involving the provision of road pavement, is planned for the Victoria Highway during the next few years. Unless the Northern Territory Government and Defence cooperate in the sizing and awarding of contracts, there is potential for the two bodies to compete with one another for available construction resources and material. The Committee was assured, however, that there is unlikely to be any problem given the nature of contractors in the region; both major contractors have the ability to extend their capacity by bringing in resources from elsewhere. Contracts may, in any case, be awarded to other companies. Defence will continue to liaise with the Northern Territory Government in relation to the coordination of construction activities in the area.

Committee's Recommendation

109. Subject to the implementation of recommendations contained elsewhere in this report, the Committee recommends the Stage 3 development of RAAF Base Tindal, NT, at an estimated cost of \$53.5m at April 1991 prices.

CONCLUSIONS AND RECOMMENDATIONS

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

•	•	
	Parag	raph
1.	Operational and support facilities occupied and used by No. 75 Squadron are inadequate to support activities associated with aircraft and personnel deployed to Tindal.	37
2.	If it is intended to continue the deployment of fighter and strike aircraft to Tindal adequate facilities must be provided for aircraft parking, ordnance loading and technical and support activities.	38
3.	Additional taxiways are required at Tindal to enhance the functionality of the present runway and taxiway system.	43
4.	If additional facilities for deployed aircraft, support activities and taxiways are to be provided, it will be necessary to undertake related work comprising runway lighting, power supplies, drainage, road access and water and associated services to enable them to be operated effectively.	47
5.	Existing facilities occupied by No. 2 Control and Reporting Unit in Darwin would be inadequate to house replacement equipment being acquired by Defence.	49
6.	There would be strategic and operational advantages as well as financial benefits if No. 2 Control and Reporting Unit were located at Tindal and for the relocation to coincide with the delivery of replacement equipment.	50
7.	The operational and technical facilities proposed for fighter and strike aircraft deployed to Tindal appear to be adequate and will be sited at functional locations.	54

8	The proposed aircraft pavements will enhance the capacity of existing pavements and ensure that the full potential of the runway and taxiway system is realised.	58
9	The design, extent and location of facilities for the Sector Operations Centre are adequate.	63
1	 The design, scope and location of additional living-in accommodation are consistent with current standards and the master plan for the development of Tindal. 	66
1	 Defence should liaise with the Defence Housing Authority to ensure that sufficient numbers of houses are available at Tindal or in Katherine for personnel when the planned population of the Base is achieved. 	68
10	An energy audit of existing facilities at Tindal should be undertaken now.	80
1:	 Energy conservation measures proposed for Stage 3 appear to be adequate. 	87
14	4. An independent analysis - to be funded by Defence, the Northern Territory Government and Katherine Town Council- of the drainage pattern of the Tindal-Katherine area should be undertaken to identify factors contributing to flooding and to recommend realistic measures to minimise it.	90
1:	 A dedicated bicycle track could be constructed linking East Katherine with Tindal with the Northern Territory Government and Katherine Town Council meeting the cost. 	95

16. Subject to the implementation of recommendations contained elsewhere in this report, the Committee recommends the Stage 3 development of RAAF Base Tindal, NT, at an estimated cost of \$53.5m at April 1991 prices.

109

Colin Hollis Chairman

28 November 1991

WITNESSES

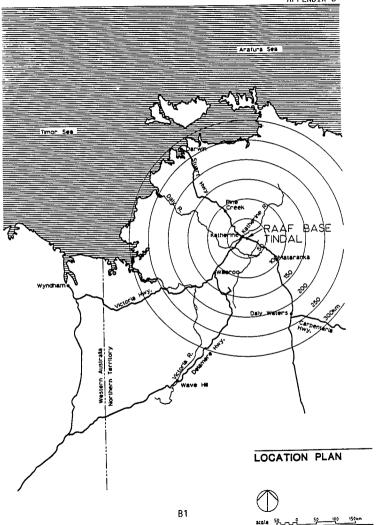
- AH KIT, Mr John, Executive Officer, Jawoyn Association Aboriginal Corporation, PO Box 266, Katherine, NT, 0851
- DONAHOO, Group Captain John Patrick, Director, Facilities Engineering and Services, Department of Defence, Russell Offices C-3-11, Canberra, ACT, 2600
- FANNING, Mr Peter Gerard, Business Services Manager, Territory Construction Association, PO Box 37121, Winnellie, NT, 0820
- FORSCUTT, Mr James Baden, Mayor, Katherine Town Council, PO Box 1071, Katherine, NT, 0851
- GRATTAN, Mr Kenneth William, Strategic Planning Engineer, Land Transport, Northern Territory Department of Transport and Works, Jape Plaza, Cavenagh Street, Darwin, NT, 0800
- GUREVITCH, Air Commodore Richard Norman, Director-General, Facilities Air Force, Department of Defence, Russell Offices C-3-12, Canberra, ACT, 2600
- LEE, Mr Robert, Executive Member, Jawoyn Association Aboriginal Corporation, PO Box 266, Katherine, NT, 0851
- MARLOWE, Mr Rhett, Senior Policy Officer, Infrastructure and Development Branch, Department of the Chief Minister, N.T. House, Mitchell Street, Darwin, NT, 0800
- McCORMACK, Group Captain Errol John, Director-General, Force Development - Air, Department of Defence, Russell Offices B-1-02, Canberra, ACT, 2600
- McGILL, Mr Allan Raymond, Town Clerk, Katherine Town Council, PO Box 1071, Katherine, NT, 0851

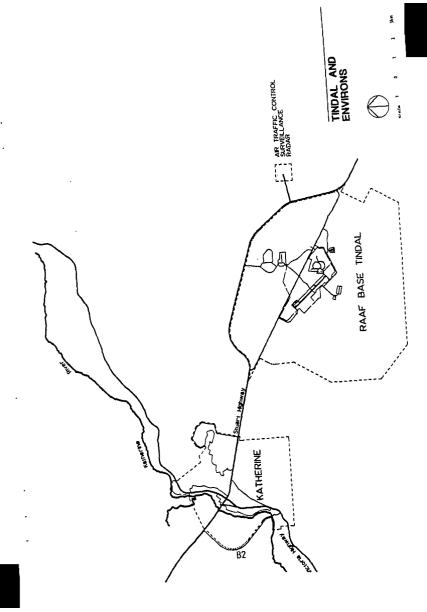
- MOUATT, Group Captain Bruce John Stewart, Officer Commanding RAAF Base Tindal, Headquarters RAAF Base Tindal, Locked Bag 300, Katherine, NT, 0851
- REED, Mr Michael Anthony, Member for Katherine, Legislative Assembly of the Northern Territory, PO Box 1771, Katherine, NT, 0851
- ROSENBAUER, Mr Robert William, Assistant General Manager, Project Services, Australian Construction Services, PO Box 111, Dickson, ACT, 2602
- URE, Mr Gordon, Project Manager, Defence, Australian Construction Services, 10-20 Pulteney Street, Adelaide, SA, 5000

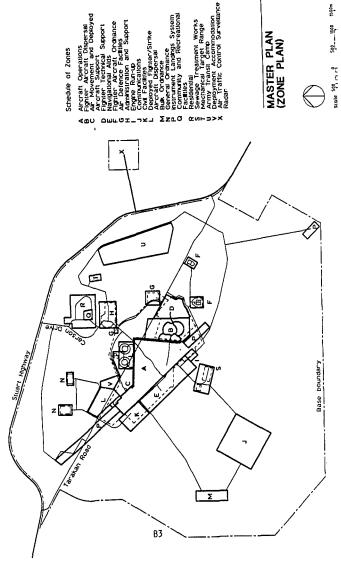
APPENDIX B

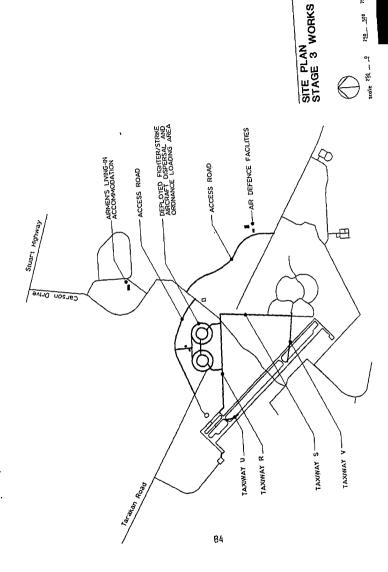
PROJECT DRAWINGS

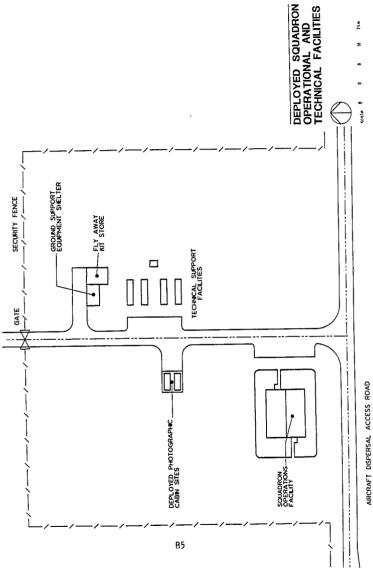
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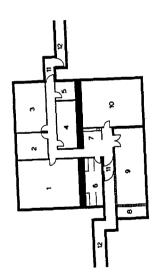


SQUADRON OPERATIONS FACILITY - PLAN



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Legend
1 Breing/Denreling Room
3 Intelling/Denreling Room
4 Intelling Room
5 Storeroom
5 Storeroom
7 Tee Preparation Room
9 Duct Room
9 Duct Room
10 Mission Preparation Room
10 Mission Preparation Room
11 Arcok Tunnel



FLY AWAY KIT STORE/GROUND SUPPORT EQUIPMENT SHELTER PLAN AND ELEVATIONS

scale 3-1 . 9

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WEST ELEVATION

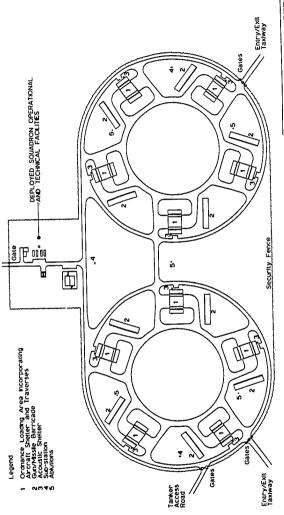
SOUTH ELEVATION

EAST ELEVATION

NORTH ELEVATION

FLY AWAY

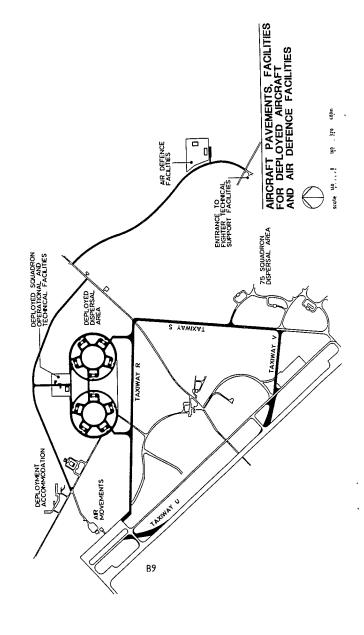
PLAN

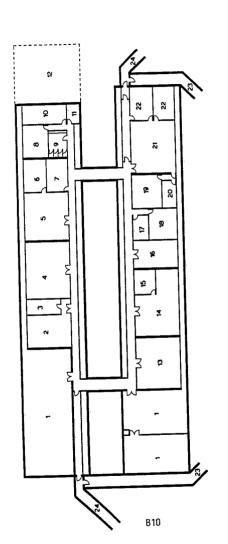


DEPLOYED FIGHTER/STRIKE
AIRCRAFT DISPERSAL AND
ORDNANCE LOADING AREA

80 170m

3





SECTOR OPERATIONS CENTRE - PLAN



scale tarrel tarrel 12m

Video Conferencing/mission Briefing Room Intergence/special Communications Room Sector Al Defence Commander's Office Sector Al Defence Operations Centre As sensor Coordination Certifie 5 Operations Office 6 Contrad Coordination Certifie 17 Intelligence Room 19 Intelligence Room 19 Intelligence/special Communications 19 Sector Air Defence Commander Centural 21 Sector Air Defence Commander Centural 22 Acress Turne In No.2 Control & 23 Acress Turne In Road

Sensor Coordination Centre Operations Office Control Coordination Centre Intelligence Room

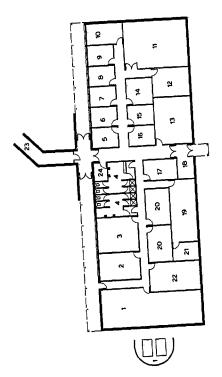
Storeroom Posstble Future Extension Air Defence Control Centre Officers' Ready Room

Communications Room Secure Stockersonn Manuerance Workshop Computer Room Software Cell Simulator Room Armens' Ready Room Armens' Ready Room

Legend







14 Conference Room Marten Conference Room Marten Officer Maintenance 15 Warran Officer Maintenance 16 Warran Officer Operations Transing Snos's Office 16 Walling Rom Conrol Section 19 Maintenance Punkations Office 20 Gastroom Control Sore 22 Express Turnel To Sector Operations Centre 24 Cicener's Room 24 Cicener's Room Tabing Officer officer Administration Officer Mantenance Officer Serior Engineering Officer Operations Officer Plant Room Training Office System Support Office

Legend



Legend
1 Bedroom
2 Common Room
3 Bathroon/Launery
4 Batton

AIRMEN'S LIVING-IN ACCOMMODATION PLAN & ELEVATIONS



FLOOR PLAN

