RAAF BASE AMBERLEY

REDEVELOPMENT STAGE TWO

QUEENSLAND

STATEMENT OF EVIDENCE
TO THE
PARLIAMENTARY STANDING COMMITTEE
ON PUBLIC WORKS

DEPARTMENT OF DEFENCE
CANBERRA, ACT
June 2005

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INDEX

ATTACHMENTS:

1. Base Location Plans
2. Current Base Layout
3. Proposed Facilities Layout Plan
4. Detail of Proposed Works
5. Schematic Design Sketches for Proposed Works

RAAF BASE AMBERLEY REDEVELOPMENT STAGE TWO

QUEENSLAND

PART A – JUSTIFICATION

INTRODUCTION

Background

1. This evidence to the Parliamentary Standing Committee on Public Works presents a proposal for the RAAF Base Amberley Redevelopment Stage Two, Queensland.

2. The site has been used for military operations since 1938. In the early 1940's the American Air Corps was stationed at the Base with approximately 2,000 personnel serving there. Post World War II, the site became a major RAAF bomber base with *Lincoln* bombers originally and then *Canberra* bombers stationed at the site. At that time, a major realignment of the main runway was undertaken. During the mid 1950's, *Wirraway*, *Vampire* and *Meteor* aircraft were stationed on-site. During the Vietnam war period, the Base was again used by the United States military. Additional accommodation and working facilities including a runway extension were constructed in the late 1960's and early 1970's. In 1963, Australia commenced the procurement of the F-111's with the first six aircraft arriving at RAAF Base Amberley on 1 June 1973. The twenty-fourth aircraft was delivered on the 31 October the same year. Since the arrival of the F-111, upgrading and construction of facilities has been ongoing at the Base including a major redevelopment between 1999 and 2000.

3. **The Base.** RAAF Base Amberley is located approximately 8km west of the City of Ipswich at the western edge of the Brisbane Metropolitan Area. Location plans are at Attachment 1. The Base is bordered to the north, west and east by the Bremer River and Warrill Creek to the south and east. The area surrounding the Base is primarily agricultural, but increasingly becoming more residential in nature. The Base and its surrounding buffer area comprise approximately 2,503 hectares. The developed area of the Base, within the perimeter security fencing covers 1,664 hectares. A current Base layout is at Attachment 2.

4. RAAF Base Amberley's primary role is to be the home base and to provide full operational and maintenance support for the Precision Strike element of the Air Combat Group. It accommodates the following organisations:

a. **Headquarters Combat Support Group**. Headquarters Combat Support Group provides the command and control of all combat support functions required for deployment or activation of operational airfields by RAAF.

b. **No 82 Wing Headquarters**. No 82 Wing Headquarters commands the two operational F111 squadrons, No 1 Squadron and No 6 Squadron, both of which are located at RAAF Base Amberley.

c. **No 38 Squadron.** No 38 Squadron provides a light tactical transport aircraft capability and currently operates Caribou aircraft.

d. **No 382 Expeditionary Combat Support Squadron**. No 382 Expeditionary Combat Support Squadron role supports military operations at remote airfields at short notice. This unit does not provide any operational support to RAAF Base Amberley units and has few functional interrelations with other units on the Base.

e. **No 23 (City of Brisbane) Squadron.** No 23 (City of Brisbane) Squadron is a General Air Force Reserve unit, which trains and administers Air Force Reserve personnel in the Brisbane region.

f. **Airfield Defence Wing.** The RAAF's Airfield Defence Wing commands No 2 and No 3 Airfield Defence Squadrons.

g. **RAAF Security and Fire School.** RAAF Security and Fire School provides training for Defence firemen and security personnel.

h. **No 44 Wing Detachment.** No 44 Wing provides for Air Traffic Control services on all RAAF Bases. There is a detachment of No 44 Wing at RAAF Base Amberley to provide air traffic control services.

i. **Corporate Services and Infrastructure – Amberley**. Corporate Services and Infrastructure – Amberley provides administrative and logistic support to Defence Organisations at Amberley.

5. **Contractor Groups**. Due to outsourcing of a number of non-core Defence activities, there are now many contractors located at RAAF Base Amberley. These contractors perform many functions, ranging from garrison support services (waste collection, grounds maintenance and catering) to aircraft (engine and avionics) maintenance. The contractors for F-111 aircraft maintenance include:

(1) Honeywell – Avionics Business Unit;

(2) Boeing – Weapons System Unit; and

(3) Tasman Aviation – Workshop Business Unit.

6. **Australian Air Force Cadets.** The Australian Air Force Cadets has a Flight located at RAAF Base Amberley. This is a part-time organisation that occupies its facilities one night per week and on some weekends, with more intense activities being conducted during school holidays.

7. RAAF Base Amberley has a population of approximately 2,500 comprising about 2,000 military personnel. The remainder are civilian Defence staff, contractors and service providers working full time at the Base.

8. **Multi Role Tanker Transport Capability.** The RAAF's air-to-air refuelling capability is performed by No 33 Squadron. This squadron is an element of No 84 Wing that comes under the command of RAAF's Air Lift Group. No 33 Squadron is currently located at RAAF Base Richmond with other elements of the Air Lift Group. No 33 Squadron will be re-equipped with the Multi Role Tanker Transport aircraft due at the end of 2008. The associated Logistic Management Unit provides logistic support to this capability. As part of the introduction of the new Multi Role Tanker Transport aircraft, No 33 Squadron will relocate and the Logistics Management Unit and Contractor Support Organisation will stand-up, commencing in early 2008.

9. **9th Force Support Battalion.** 9th Force Support Battalion is a force support unit that provides the Australian Defence Force's strategic military heavy lift road transport capability. One of the Battalion's key functions is to provide heavy lift vehicles to move the armoured vehicles and heavy construction plant of various Army units and bulk stores between their home bases and training areas. Additionally, it provides the technical and stockholding

capability for stores required by deployed forces. For historical reasons, the Battalion is dispersed over various locations in Queensland, NSW and Victoria. The facilities proposed for the 9th Force Support Battalion at RAAF Base Amberley will accommodate the following elements of the Battalion:

a. Headquarters 9th Force Support Battalion, including the Logistic Support Company;

b. 26th Transport Squadron including:

(1) Headquarters 26 Transport Squadron, 86th and 87th Transport Troops and 26 Transport Squadron Workshop; and

(2) 85th Transport Troop and 26 Transport Squadron Workshop detachment; and

c. 37th Force Supply Company.

Cost Implications

10. The proposed redevelopment of facilities and engineering infrastructure at RAAF Base Amberley would involve construction of new buildings, upgrading of existing support facilities and assets and the construction and upgrading of the engineering services infrastructure at an estimated out-turn cost of $285.6 million (excluding GST). In addition, a simulator facility is included in the capital equipment acquisition contract and is proposed to be delivered as a turn-key system in this contract. While no detailed design has been completed, recent experience in delivering these types of facilities indicates an out-turn cost of about $12 million (excluding GST) could be expected. The funding provision for this facility is included in the approved budget for the acquisition of the Multi Role Tanker Transport aircraft.

Summary of Requirement

11. The relocation of No 33 Squadron and the nominated 9th Force Support Battalion elements requires the provision of new facilities, as there are no suitable existing facilities at RAAF Base Amberley.

12. While the existing Base engineering infrastructure remains operational, it is ageing and some services, such as water reticulation and sewer require major replacement or significant upgrading. Work on the infrastructure is also required to provide the basic infrastructure to underpin future development of the Base.

13. The redevelopment proposals outlined in this evidence are designed to ensure that RAAF Base Amberley can operate effectively as a Defence base over a thirty-year planning horizon and will involve:

a. providing new working accommodation and infrastructure for the Multi Role Tanker Transport and 9th Force Support Battalion elements;

b. upgrading of existing aircraft pavements for Multi Role Tanker Transport operations; and

c. upgrading and refurbishing the Base's engineering services and infrastructure.

OBJECTIVES

14. The three projects included in this proposal are consistent with current Defence force disposition planning, which acknowledges that Amberley will remain a major Defence base for the long term.

Multi Role Tanker Transport

15. In December 2004, a contract was signed with European Aeronautic Defence and Space Construcciones Aeronaticas SA for the supply of five air-to-air refuelling aircraft. These aircraft will be based on the Airbus A330 commercial aircraft currently operated by Qantas. The basic aircraft will be constructed in Europe, with four of five having refuelling modifications installed by Qantas in Australia. The first aircraft is planned for delivery at the end of 2008. The aircraft are scheduled to enter service in 2009.

16. The aircraft will significantly enhance the ADF's air-to-air refuelling capability and will be able to refuel the F/A-18, F-111, Airborne Early Warning and Control and Joint Strike Fighter aircraft. They will also provide the ADF with a secondary strategic lift capability.

17. No 33 Squadron will be re-equipped with the new aircraft. The facilities required for the aircraft to be located at RAAF Base Amberley are addressed within this proposal.

9th Force Support Battalion

18. 9th Force Support Battalion provides strategic heavy lift vehicles to convey tanks, armoured vehicles, major construction plant, and bulk stores. The Battalion's primary customers are 1st Armoured Regiment (Darwin), 2nd Cavalry Regiment (Darwin), 5th/7th Battalion Royal Australian Regiment (Darwin), 21st Construction Squadron (Brisbane), 2nd/14th Cavalry Regiment (Brisbane), 17th Construction Squadron (Sydney) and B Squadron 3rd/4th Cavalry Regiment (Townsville). The Battalion also provides support to 1st, 3rd and 7th Brigades in Darwin, Townsville and Brisbane respectively. Typically, 9th Force Support Battalion transports its customers from their home bases to training areas in Queensland, Northern Territory and less frequently, South Australia.

19. For historical reasons, elements of 9th Force Support Battalion are currently located in Townsville, Randwick, Moorebank, Richmond and Puckapunyal. With the exception of 176 Air Despatch Squadron, which will remain collocated with the RAAF's Air Lift Group at RAAF Base Richmond, these elements are to be relocated and consolidated at RAAF Base Amberley.

Upgrading Engineering Services Infrastructure

20. The main engineering trunk services at Amberley are for the most part over 40 years old and require major upgrading and extension. The proposed works will provide a network of services and roads that meet current needs and also provide the basic infrastructure required to underpin future development. Key works include increasing the capacity of the electrical supply to the Base, providing a commensurate increase in emergency power capacity, as well as improving water supply pressure and reliability. The balance of the works will address shortcomings in the existing communications, stormwater, sewer and trunk road systems.

Date for Completion

21. Subject to Parliamentary clearance of this project, the RAAF Base Amberley Redevelopment Stage 2 project could commence in the latter half of 2005 and be complete by December 2007.

THE PROPOSAL

22. The proposal addressed in this evidence involves three projects that are briefly summarised in the following paragraphs and are confined to RAAF Base Amberley. A proposed facilities layout plan is at Attachment 3.

23. **Facilities for the Multi Role Tanker Transport.** The facilities proposed for the Multi Role Tanker Transport include:

a. a new aircraft parking apron with an aircraft washpoint;

b. a new Squadron Headquarters, Maintenance Complex and Ground Support Equipment shelter;

c. an extension to the refuelling system with hydrant points on the apron;

d. upgrades to the main runway and parallel taxiway;

e. a new office facility for the Logistic Management Unit, and

f. a simulator facility (included in acquisition contract)

24. **Facilities for 9th Force Support Battalion**. The facilities to be provided for the 9th Force Support Battalion include:

a. a new combined Battalion Headquarters and Logistic Supply Company office and stores building;

b. new office, stores and maintenance facilities for 26 Transport Squadron;

c. a new area fuel and vehicle washpoint; and

d. new office and stores facilities for 37th Force Support Company and a separate Petrol Platoon complex.

25. **Upgrading Base Engineering Services Infrastructure.** The proposed engineering services upgrading works include:

a. upgrading of the electrical reticulation, central emergency power station and services supervisory systems;

b. upgrading of the water, sewerage and stormwater reticulation (including rehabilitation of the Sewerage Treatment Plant);

c. upgrading of the communications infrastructure and networks; and

d. providing new link roads and an upgrade of an existing road.

Benefits Expected from this Proposal

26. The proposed redevelopment provides suitable facilities and infrastructure to meet the RAAF's requirement to support the introduction of the Multi Role Tanker Transport aircraft, Army's requirement to improve the efficiency and effectiveness of 9th Force Support Battalion and a broader requirement to address existing shortcomings in the engineering services infrastructure at RAAF Base Amberley.

27. Given the significant operational constraints that would be imposed on operating the Multi Role Tanker Transport aircraft from RAAF Base Richmond, RAAF Base Amberley is considered the optimum location for home basing this aircraft. The facilities proposed for RAAF Base Amberley will enable the base to operate effectively as the home base.

28. Relocating 9th Force Support Battalion to Amberley will significantly improve unit effectiveness and efficiency by:

a. collocating the Battalion's elements on one site;

b. providing purpose-built working accommodation and support facilities, such as vehicle wash and fuel points; and

c. by moving the unit closer to its customer base.

29. The Queensland Government's plan for a major transport hub within close proximity to RAAF Base Amberley should also improve the Battalion vehicle fleet's access to the national road network.

30. The proposed upgrading of the existing engineering services infrastructure will address a range of capacity – related issues. As much of the engineering infrastructure is now over 40 years old, the upgrading will replace deteriorated services, providing improved capacity where needed and improved reliability. The environmental impact of stormwater

flows will also be reduced and improvements will also be made to transit corridors for local koalas. Extensions to existing services will address the planned developments for No 33 Squadron and 9th Force Support Battalion. The proposed improvements to the engineering services infrastructure will be designed to ensure they provide the basic infrastructure required to underpin future base development.

COSTS

Capital Cost Estimates

31. The estimated out-turn cost of the proposed redevelopment project is $285.6 million (excluding GST). The cost estimate includes construction costs, fitout, professional fees, furniture and fittings and a contingency sum. The indicative cost of about $12 million (excluding GST) for the proposed simulator facility for the Multi Role Tanker Transport aircraft is additional to the redevelopment project out-turn cost.

Estimated Operating Costs

32. There will be no revenue directly derived from the proposal. There will be an increase in annual operating costs resulting from the new facilities and extended engineering infrastructure. These increased costs will outweigh the savings expected from reduced energy and maintenance costs.

OPTIONS

33. The primary aim of the proposal is to provide facilities capable of supporting relocated RAAF and Army capabilities. While other options were considered for home basing the Multi Role Tanker Transport, RAAF Base Amberley is considered to be the only viable location for the aircraft. Relocating 9th Force Support Battalion provides a range of operational benefits and locates the Battalion near to a planned major transport node in South East Queensland.

34. Given the lack of suitable existing facilities at RAAF Base Amberley, the only viable option for meeting the requirements is the construction of new facilities and improvements to existing infrastructure. Value management and extensive design review processes have been used in the project development process, to ensure that the investment in capital works infrastructure has been minimised to essential functional requirements, while ensuring that considerations for reducing environmental impacts have been addressed.

35. Planning completed to date indicates the following broad course of action should be adopted:

Project Element	Strategy
Multi Role Tanker Transport Facilities:	
Aircraft parking apron	New construction
No 33 Squadron working facilities	New construction
Main Runway and Taxiway B	Upgrade
Air to Air Refuelling Logistic Management Unit	New construction
Simulator facility (acquisition contract)	New construction
9th Force Support Battalion:	
Headquarters 9th Force Support Battalion and Logistics Supply Company	New construction
26 Transport Squadron	New construction
37th Force Supply Company	New construction
Engineering Services Infrastructure:	
Various trunk services	Upgrading/replacement/new construction

ECONOMIC, ENVIRONMENTAL AND SOCIAL IMPACTS

Economic Impacts

36. RAAF Base Amberley contributes significantly to the local economy and local employment, which includes up to 500 civilian employees, contractors and service providers working full time at the Base.

37. The project will generate a significant amount of short-term employment mostly in the building and construction sub-contractor and unskilled worker areas. Up to 300 personnel are expected to be directly employed on construction activities that would also generate some off-site job opportunities from the manufacture and distribution of materials over the anticipated construction period of some 25 months. It is anticipated that local building

subcontractors would be employed on a large proportion of the construction works and some of the infrastructure works.

Environmental Impacts

38. A Preliminary Environmental Study for the Base was undertaken to determine whether a referral under the Environmental Protection and Biodiversity Conservation (EPBC) Act 1999 was required. The study did not identify any significant environmental issues. Given that the project is developing / redeveloping areas within the RAAF Base's perimeter, a Defence Environmental Clearance has been provided in accordance with Defence's Environmental Management Policy. The project will be managed in accordance with the RAAF Base Amberley's Environmental Management Plan and Environmental Certificates of Clearance will be prepared prior to construction commencing.

39. Contractors will be required to produce Environmental Management procedures for construction activities as a contractual obligation and these procedures will be audited as an element of the management for the project.

40. Improving the quality of stormwater discharging to the local catchment will reduce the impacts of the redevelopment on the environment.

Heritage Considerations

41. The Preliminary Environmental Study included a Cultural and Heritage Assessment. No cultural heritage issues were identified as being associated with any element of this project.

Social Impacts

42. The redevelopment is expected to have minimal impact on the local community during construction. No long term impacts are predicted following completion of construction.

LONGER TERM PLANNING

43. The further redevelopment of RAAF Base Amberley is included in Defence's unapproved Major Capital Facilities program for consideration later this decade.

44. The Single Living Environment and Accommodation Precinct (Single LEAP) project is a separate initiative to improve living-in accommodation across Defence. Living-in accommodation at RAAF Base Amberley will be investigated as part of the Single LEAP project.

ORGANISATIONS CONSULTED

45. Discussions have been held, or are planned to be held with the following organisations:

a. Air Services Australia, RAAF Base Amberley;

b. Bureau of Meteorology, Ipswich;

c. (Queensland) Department of Main Roads;

d. (Queensland) Fire and Rescue Service;

e. Energex;

f. Ipswich City Council (including Ipswich Water);

g. Environment Australia;

h. Telstra;

i. Australian Koala Foundation; and

j. Greening Australia.

46. Project staff also plan to brief the local Federal Member for Blair.

PART B - TECHNICAL INFORMATION

Scope of Work

47. RAAF Base Amberley Redevelopment Stage 2 will involve:

a. the construction of new assets for the Multi Role Tanker Transport aircraft and 9th Force Support Battalion;

b. the upgrading or replacement of support facilities and engineering infrastructure services,

c. the upgrading of the main runway and Taxiway B; and

d. the removal and disposal of redundant services assets.

48. As a proportion of the project budget estimate, about 50% of the cost of the proposed works are associated with working accommodation and about 25% with the upgrading of the engineering services infrastructure. New or upgraded aircraft pavements, including runways, taxiways and aircraft aprons account for the remaining 25% of the budget estimate.

49. The proposed scope of work is further explained at Attachment 4 - Detail of Proposed Works and in the schematic design sketches included at Attachment 5.

Site Selection and Site Description

50. All the proposed works are within RAAF Base Amberley. The site of the proposed works is Commonwealth owned and Defence controlled. The redevelopment does not require the acquisition of additional land. The locations for new facilities are in accordance with the current draft Base Master Plan.

Zoning and Approvals

51. All of the assets referred to in this evidence are, or would be constructed, within the designated boundaries of the Base, which is designated “Defence Special Purposes”. No civilian authority design or construction approvals are required, although works will comply with relevant Standards and Regulations as applicable.

Codes and Standards

52. Where appropriate, design and construction of the proposed works and services will conform to the relevant sections of the following:

a. Building Code of Australia;

b. Current Australian Standards and codes;

c. Commonwealth and State legislation;

d. Defence Manual of Fire Protection Engineering;

e. Defence Facilities Communications Cabling Standard;

f. Relevant Defence Security Publications; and

g. Occupational health, safety and welfare legislation and the Defence Occupational Health and Safety Manual.

53. A qualified and practising certifier will be required to certify that the design and finished construction of the proposed facilities meet the requirements of the Building Code of Australia, relevant Codes and Standards, the Defence Manual of Fire Protection Engineering and any additional State, Local Government and Defence requirements.

54. Successful tenderers will be required to produce a Project Quality Plan. This plan will clearly show how building codes, Australian standards and any additional Defence requirements in relation to security, fire protection and fire safety will be met and how the required standards for construction and installation are to be maintained.

Acoustics

55. RAAF Base Amberley is inherently noisy, particularly near the aircraft flight line. In these areas, building sound attenuation provided through construction techniques and materials will generally be supplemented by personal aural protection when personnel are outside. Sound attenuation is particularly important in classrooms and domestic accommodation and specific levels, as specified within Australian Standards, will be met.

56. Vibration isolation of mechanical plant and equipment is an associated and essential design consideration and the designers and construction contractors will be required to limit

vibration levels to comply with the recommended vibration levels as set out in Australian Standards.

Energy Conservation Measures

57. The Commonwealth is committed to Ecologically Sustainable Development (ESD) and the reduction of greenhouse gas emissions. Defence reports annually to Parliament on its energy management performance and on its progress in meeting the energy efficiency targets established by the Government as part of its commitment to improve ESD. This project has addressed this policy by adopting cost effective ESD, as a key objective in the design development and delivery of new facilities.

58. Preliminary design development has included an analysis of energy consumption that could be anticipated from the implementation of the proposal. The energy efficiency of new buildings will be audited within twelve months of occupancy.

59. The preliminary design of new facilities has considered the feasibility of the following measures to reduce energy consumption in a cost effective manner:

a. siting buildings to make maximum use of prevailing winds and the sun for temperature control and lighting;

b. using insulation materials and weatherproof seals;

c. using solar energy and solar hot water systems where considered cost effective;

d. using energy efficient lighting and lighting control systems appropriate to the purpose;

e. using energy efficient plant and equipment;

f. providing capability to control energy use by zones within the facility; and

g. using building energy management systems as part of an area energy management strategy.

Provisions for People with Disabilities

60. Access and facilities for the disabled are to be provided in accordance with the Defence Infrastructure Manual Disabled Access and Other Facilities for Disabled Persons, the Building Code of Australia and Australia Standards.

Philosophy Adopted for Precautions against Legionella

61. The airconditioning systems are required to be air cooled, so no specific precautions against the Legionella Bacillus are considered necessary.

Occupational Health and Safety

62. The proposed facilities will comply with the requirements of the Occupational Health and Safety (CE) Act 1991, the Department of Defence Occupational Health and Safety Manual and relevant Queensland Government Occupational Health and Safety legislation and operate in accordance with an approved Occupational Health and Safety Plan.

63. All construction sites will be appropriately secured to prevent public access during the construction period. No special or unusual public safety risks have been identified.

Planning and Design Concepts

64. Designs must provide a safe, efficient and pleasant workplace and also represent value for money. The designs must offer good economy in relation to floor area, construction techniques, buildability and finishes, while achieving the necessary functional requirements, work flow patterns and work environment required to fulfil the function of the space.

65. Designers have been required to consider, during the preliminary design stage, the implications and estimates of costs for designs, materials, construction techniques, finishes, equipment and energy systems which will deliver economies on a life cycle costing basis.

66. In selection of services and associated equipment, the capital cost is to be balanced against operational and maintenance costs. Operating costs and comparisons will be included in a life cycle costing analysis prior to selection. Particular consideration has been given to energy efficient design solutions employing passive solar energy.

67. The design, structure, servicing and siting of buildings is to ensure that future expansion is possible. Each sub-element of the facility should have the capacity for future

expansion. This is of particular importance in sizing and terminating in-ground services. New mechanical plant should be modular to ensure flexibility.

68. Maximum flexibility is required for most internal office accommodation facilities. Except where the need for security or noise reduction dictates otherwise, minimum use is to be made of structural internal walls or columns. In general terms, internal walls in office areas are to be of demountable partition or workstation type to facilitate economic rearrangement. Building services are to be compatible with this requirement.

69. This project will require:

a. the maximum use of existing infrastructure to minimise capital facilities costs;

b. the adoption of conventional construction techniques and materials, commonly used by the construction industry in regional Australia, with due regard given to climatic conditions; and

c. the utilisation of readily available and durable materials that combine long life with minimum maintenance and are sympathetic with the existing buildings, landscaping and precinct;

70. The building works and services will be fully fitted out, with all communications, light fittings, partitions, floor treatments and furniture. Facilities will incorporate building management systems, metering and other provisions to measure and monitor energy use and to allow regular energy audits.

71. **Structure**. Proposed new facilities will generally be a steel framed structures with concrete floor slabs, brick faced or equivalent external walls, and a metal roof appropriate to the environment. Internal walls would generally be non-load bearing frames lined with plasterboard to provide for maximum flexibility in future floor layout. In particular, structural design will take account of the highly reactive soils and weather conditions encountered in the Amberley area.

72. **Materials and Finishes.** Materials and finishes will be selected from those readily available locally for their functionality, durability and low maintenance and for their ecologically sustainable design properties.

73. **Mechanical Services.** New facilities will generally be air-conditioned and the selection of building services and associated equipment would be required to achieve an economic balance between capital cost and operation and maintenance costs. Selection would be based upon a life cycle costing analysis and particular consideration would be given to energy efficient design solutions employing passive solar energy. New facilities would incorporate building management systems, metering and other provisions to measure and monitor energy use and to allow regular energy audits where practicable. Mechanical plant would incorporate a modular system to ensure flexibility.

74. **Hydraulic Services.** New facilities will be connected to the upgraded water and sewage infrastructure within RAAF Base Amberley.

75. **Fire Protection.** The design of the fire protection systems will comply with the Defence Manual of Fire Protection Engineering.

76. **Security**. In accordance with Government initiatives to improve physical security arrangements across Government departments, advice from designated security authorities will be incorporated into the design solutions for the proposed facilities as appropriate. The security threat assessment would be reviewed during the detailed design phase and the facilities would be secured as appropriate to the activities conducted. The highest security classification for the facilities covered by these proposals is expected to be 'Secret'.

77. Security protection will be provided in accordance with the Defence Security Manual. This requires high levels of base physical security including full wire enclosures/compounds, security guards including dog patrols and remote sensor systems. The physical security of aircraft and uninstalled sub-systems (software and hardware) also has facilities implications, including the requirements for armouries and secure storage and maintenance areas.

78. **Civil Works.** None of the proposed sites for new facilities present any particular civil engineering problems, but each will be the subject of further survey and geotechnical investigation during the design phase.

79. **Landscaping**. The redevelopment project will not give rise to any substantial alteration in the essential character of the existing facilities or landscaping, and landscaping works will be directed to the rectification of any areas disturbed during construction, as well as enhancing the general visual environment. Care will be taken to avoid compromising

existing environmental sensitivities by adopting landscaping practices in keeping with local environmental condition. The project will also establish koala habitat corridors to link existing and fragmented koala habitats, in accordance with the findings of the Preliminary Environmental Study.

Project Delivery System

80. The proposed delivery system is a combination of Managing Contractor and Head Contractor. The Managing Contractor form of delivery is particularly well-suited to projects, where there will be a significant number of individual works being executed over a large area. This project will demand a high degree of coordination because of the need for RAAF Base Amberley to continue operating throughout the project period. The Managing Contractor has the ability to control and coordinate concurrent design and construction of disparate works packages and maintain a schedule which relies upon a tight sequence of vacation, relocation and construction. This system also reduces risk associated with latent conditions. This form of contract will be used to deliver the Multi Role Tanker Transport facilities and for upgrading the engineering services infrastructure.

81. The Head Contractor form of delivery is particularly well-suited to projects where the scope is well defined and can be constructed unhindered by operational constraints. It also reduces cost risk, as it will be a lump sum contract. This form of contract will be used for the 9th Force Support Battalion facilities.

82. A Project Manager has been engaged to represent Defence and to act as Contract Administrator for the entire redevelopment project.

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