



Australian Government

Department of Defence

Facilities Requirements for the New Air Combat Capability

RAAF Base Williamtown, NSW

RAAF Base Tindal, NT

RAAF Base Darwin, NT

RAAF Base Scherger, QLD

RAAF Base Townsville, QLD

RAAF Base Edinburgh, SA

RAAF Base Pearce, WA

RAAF Base Learmonth, WA

RAAF Base Curtin, WA

Defence Establishment Myambat, NSW

Statement of Evidence

to the

Parliamentary Standing Committee

on Public Works

Canberra, Australian Capital Territory

June 2014

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Facilities Requirements for the New Air Combat Capability

Identification of the need

1. The AIR6000 (New Air Combat Capability) Project Phase 2A/B will acquire 72 F-35A aircraft to replace the current fleet of F/A-18A/B (Classic Hornet) aircraft operated by the Royal Australian Air Force (RAAF).
2. The F-35A aircraft is a fifth-generation, multi-role fighter being developed for the United States of America and eight international partner nations, including Australia. Of the three variants being produced, Australia is purchasing the Conventional Take-Off & Landing variant. Lockheed Martin is the prime contractor and its partners are Northrop Grumman and BAE Systems. When integrated fully into a networked Australian Defence Force, Australia's F-35A will deliver the air dominance and strike functions currently provided by the F/A18A/B (Classic Hornet). Further information on the F-35A aircraft is included in Attachment 1.
3. The new air combat capability being acquired under the AIR6000 project includes:
 - a. a fleet of 72 aircraft;
 - b. armaments, ammunition and counter-measures;
 - c. Full Mission Simulators for pilot initial and continuation training;
 - d. a range of maintainer training devices for maintainer students;
 - e. deployable simulator and mission planning facilities;
 - f. the introduction of an off-board information system to integrate and automate operations, maintenance and logistics; and
 - g. a through-life support contract for maintenance and logistics.
4. The F-35A differs from the Classic Hornet which it replaces in a number of areas, including:
 - a. the F-35A aircraft maintenance and flying operations require a higher level of security classification and protection than the Classic Hornet;

- b. the aircraft has a single engine;
- c. the F-35A has a defined footprint for the maintenance of each aircraft;
- d. the operational, logistical and maintenance systems for the aircraft are heavily reliant on communication infrastructure;
- e. the pilot training concept includes a heavy reliance on simulation for initial and continuation training to optimise throughput, safety and cost; and
- f. maintenance training will be conducted utilising training devices and aircraft with a greater reliance on the former than exists with current platforms.

Project History

- 5. The 2000 Defence White Paper identified the increasing capability of regional air forces and the need to upgrade Australia's air combat capability to retain air superiority over maritime approaches. Meeting this challenge required the acquisition of new air-to-air refuelling aircraft, airborne early warning and control aircraft and a new fighter aircraft to replace the F/A18 (Classic Hornet) and F-111.¹ The air-to-air refuelling and airborne early warning and control aircraft have been successfully introduced into service while the F-111 was retired from service in 2010.
- 6. In October 2002, Australia joined the System Development and Demonstration phase of the multi-national Joint Strike Fighter (JSF) Program. The other partner nations participating in the JSF Program are Canada, Denmark, Italy, the Netherlands, Norway, Turkey, the United Kingdom and the United States.
- 7. In December 2006, the then Minister for Defence signed the JSF Production, Sustainment and Follow-on Development Memorandum of Understanding with the United States Government. The Memorandum of Understanding provides the cooperative framework for the acquisition and support of the F-35A aircraft over its life.
- 8. In November 2009, the Government approved funding for Phase 2A/B (Stage 1) to acquire 14 F-35A aircraft and associated elements required to establish the initial pilot and maintainer training capability in the United States and to allow conduct of operational testing in the

¹ Commonwealth of Australia, *'Defence 2000 – Our Future Defence Force'*, 2000, pp85-87

United States and Australia. The first two Australian F-35A aircraft will be delivered in the US in mid-2014.

9. In April 2014, the Government approved the AIR6000 Phase 2A/B to acquire an additional 58 aircraft, bringing the total fleet on order to 72 F-35A. The first aircraft will arrive in Australia in late 2018, with the complete fleet arriving by 2022. The Government's approval also included necessary supporting requirements to enable the F-35A capability including facilities and infrastructure.

Command and Control of Australia's Air Combat Capability

10. The RAAF's Air Combat Group is responsible for the generation of Australia's air combat capability. Command and control of the Classic Hornet fleet, and in the future the F-35A fleet, is exercised by 81 Wing, which is subordinate to Air Combat Group. This structure will remain unchanged for the F-35A.
11. 81 Wing's subordinate units include No. 2 Operational Conversion Unit (2OCU), No. 3 Squadron, No. 75 Squadron and No. 77 Squadron.
12. 2OCU is currently responsible for the initial and continuation training of pilots for the Classic Hornet units. This unit operates both simulators and aircraft. No. 278 Squadron, which is a part of 78 Wing, is responsible for the training of maintainers. Under the future air combat structure for the F-35A, training for both pilots and maintainers will be integrated under 2OCU and No. 278 Squadron will continue to provide maintainer training for the Hawk Lead-In Fighter aircraft, which are also operated by Air Combat Group. Training will be provided by both RAAF and contractor personnel. 2OCU will operate 24 aircraft.
13. Australia's three operational Classic Hornet squadrons are Nos. 3 and 77 Squadrons, based at RAAF Base Williamtown, and No. 75 Squadron, based at RAAF Base Tindal. With the approval of Air 6000 Phase 2A/B, these squadrons will transition to the F-35A and will operate 16 aircraft each.
14. Through life support of the Classic Hornet capability is provided by the Tactical Fighter Systems Program Office. The F-35A will be supported by the Air Combat Systems Program Office, a Defence Materiel Organisation unit, in partnership with Lockheed Martin's National Operations Centre, both of which are proposed to be located at RAAF Base Williamtown.

Transition of Air Combat Capability

15. Australia will maintain a full air combat capability throughout the transition. Maintaining a seamless level of air combat capability requires concurrent F-35A and Classic Hornet operations throughout the transition.
16. Squadrons will transition from Classic Hornet to F-35A operations at a rate of one squadron per year. No. 3 Squadron will transition in 2019, followed by 2OCU, No. 77 Squadron and then No. 75 Squadron.
17. Classic Hornet flying operations will continue until the planned withdrawal date of 2022. The existing Classic Hornet squadrons will continue to operate from their existing facilities at RAAF Base Williamtown and RAAF Base Tindal as the F-35A is introduced into service.
18. The Tactical Fighter Systems Program Office will remain to complete the disposal of the Classic Hornet fleet, and to transition to management of the F-35A.
19. The Australian F-35A is expected to reach Initial Operating Capability in late 2020, and Full Operating Capability in late 2023.

Facilities to Support AIR6000

20. This Statement of Evidence to the Parliamentary Standing Committee on Public Works presents a proposal to provide facilities at RAAF Bases Williamtown, Tindal, Townsville, Darwin, Curtin, Scherger, Learmonth, Pearce and Edinburgh and Defence Establishment Myambat in support of the AIR6000 (New Air Combat Capability) project. Base locations are provided in Attachment 2.
21. RAAF Base Williamtown (NSW) will remain as the premier base for the train and sustain functions of Australia's air combat capability, as well as providing the staging point for deployment to forward operating bases. New and refurbished facilities and infrastructure are proposed for RAAF Base Williamtown to support its role as the home base for one training squadron (2OCU), and two operational squadrons (No. 3 Squadron and No. 77 Squadron).
22. New and refurbished facilities and infrastructure are proposed at RAAF Base Tindal (NT) to support the train and sustain functions as the home for the third operational squadron (No. 75 Squadron) as well as being a forward operating base for visiting F-35A squadrons.

23. RAAF Bases Townsville (QLD), Darwin (NT), Curtin (WA), Scherger (QLD), Learmonth (WA), Pearce (WA) and Edinburgh (SA) will provide forward operating bases for visiting F-35A squadrons. Minor facilities to accommodate squadron support functions are proposed at these 'Forward Operating Bases'.
24. Construction of additional explosive ordnance and counter measure storage capacity is proposed at Defence Establishment Myambat (NSW) for the storage of F-35A armaments.

Need for the Work

25. Facilities works proposed at RAAF Base Williamtown and RAAF Base Tindal include squadron facilities to support the operation and maintenance of the aircraft, training facilities to develop and sustain pilots and maintenance staff, airfield infrastructure, and logistics facilities. These functions are most efficiently and securely performed through the provision of facilities in a consolidated precinct based around a parking apron from which the aircraft operate.
26. **Security Requirements.** The agreement between the USA and Australia for the supply of the aircraft requires that Australia comply with certain specific USA security requirements. These include the information and physical security of all aspects of the aircraft system, including training, maintenance and operations. The security requirements must meet the higher physical security zone requirements of the Protective Security Policy Framework. The physical security of aircraft requires a secure apron and maintenance areas, while uninstalled components (software and hardware) require secure storage. The security standards as specified in the agreement significantly exceed those required for Classic Hornet security.
27. **Squadron Facilities.** The command, administrative and maintenance functions for both the training and operational squadrons require facilities which physically separate secure and non-secure activities while supporting the functional requirements of a modern air combat squadron.
28. **Simulators and Other Training Devices.** Simulators and other training devices will support the training of both pilots and maintainers for the F-35A. The simulators and training devices being procured are detailed below:
 - a. **Full Mission Simulators.** The Full Mission Simulator is the primary F-35A pilot training device for F-35A conversion courses and continuation training. As there is

no dual seat variant of the F-35A, instructors cannot fly with students during training. Consequently, the Full Mission Simulator will play a more significant role in F-35A pilot training than earlier flight simulators have played in supporting legacy weapon systems such as the Classic Hornet.

- b. **Deployable Simulators.** The Deployable Simulators will provide F-35A pilots with enhanced mission planning and rehearsal capability when deployed. The Deployable Simulators will also be used in combination with the Full Mission Simulators in the Detached Training Facility at RAAF Base Tindal to support No. 75 Squadron training. The Deployable Simulator contains two cockpits and an instructor station in a seagoing primary container. A secondary container, about half the size of the primary container, holds a power supply and air conditioning unit for the simulator.
- c. **Aircraft Systems Maintenance Trainer.** The Aircraft Systems Maintenance Trainer simulates aircraft structural, mechanical, electrical and avionics systems, support equipment and test equipment in normal and emergency situations. The simulations are performed on a desktop computer with a number of monitors.
- d. **Ejection System Maintenance Trainer.** The Ejection System Maintenance Trainer is a functional and geometrically correct simulation of the F-35A canopy and an external seat configuration. It will provide training for seat and canopy removal, maintenance, repair and installation and maintenance of the Flexible Linear Shaped Charge. The Ejection System Maintenance Trainer will also be used for pilot egress training.
- e. **Weapons Load Trainer.** The Weapons Load Trainer is an aircraft mock-up which will provide maintainers with experience in the operational maintenance of weapons systems, loading and unloading of explosive ordinance, and conducting the procedures for rendering explosive ordinance safe.
- f. **Propulsion Maintenance Trainer.** The Propulsion Maintenance Trainer is a mock-up engine which provides hands-on engine training.

- 29. Simulators will provide a more realistic training environment with direct oversight by instructors, allow simulation of rare situations such as emergencies and enable scenarios to be repeated for training value. The training devices are proposed to be housed in secure buildings with accommodation for support staff.

30. **Information System.** The F-35A is supported by a world-wide information system which integrates the operations, training, logistics, maintenance and administration systems for the platform with Lockheed Martin's worldwide support network. The information system requires a secure point of entry to connect the Australian system to Lockheed Martin's global network, a specialised support facility for updating, managing and developing software, servers and training devices, and significant information communication technology infrastructure in squadron buildings, maintenance areas and aircraft parking positions.
31. **Logistics System.** The F-35A information system transfers data directly from the aircraft and maintenance systems to inform the provision of spare parts and other maintenance requirements, which will be delivered on a 'just-in-time' basis to the squadron doors. This process will reduce the need for logistics storage space compared to the Classic Hornet.
32. **Maintenance System.** The F-35A maintenance system includes operational maintenance before and after each flight, squadron level maintenance on the aircraft, centralised maintenance of uninstalled aircraft components and deeper level maintenance for major repairs and upgrades. Maintenance spaces are needed for the F-35A which include storage for specialist tools and ground support equipment. Maintenance areas must provide safe separation distances around aircraft, and meet squadron networking, deployability, security and operational requirements. Aircraft and engine wash facilities are needed to manage the effect of salt and dust on the aircraft. Specialist facilities will also be required for deeper level maintenance of the aircraft and maintenance of the surface finish for the aircraft.
33. **Runway Requirements.** Sufficient runway length is required to ensure the safety of pilots operating the F-35A. The key safety consideration is the reaction time which a pilot has available to abort a take-off and safely stop the aircraft within the runway length. Considerations used to calculate the safety margin include runway length, whether afterburners are used to accelerate the aircraft to take-off speed faster, and the weather. The F-35A requires a minimum runway length of 8,000 feet to safely operate. At RAAF Base Williamtown, because there is no two-seat version of the F-35A to allow trainee pilots to practice under direction supervision, a runway length of 10,000 feet is required to provide trainee pilots with an additional safety margin compared to that afforded to experienced pilots. Further, a 10,000 foot runway is required at RAAF Base Williamtown to support Air Force's strategy for noise mitigation.

34. **Operational Readiness Platforms.** Operation of the aircraft requires a parking area for the aircraft with direct access to the runway thresholds to allow the aircraft to be held at a high state of readiness for prolonged periods. The Operational Readiness Platforms must be outside the statutory clearance areas of the runway and have sufficient parking spaces for the sortie generation rates intended for the squadrons. Operational Readiness Platforms have been constructed at most RAAF bases, however, in many cases they do not comply with current offset requirements from the runway.
35. **Aircraft Shelters.** The F-35A aircraft require secure parking positions when not being flown or deployed on exercises. As the surface coating of the aircraft is susceptible to damage from prolonged exposure to ultra-violet radiation, the aircraft must be protected from direct sunlight. A further characteristic of the F-35A that is common to most fighter aircraft is the exposed cockpit glass canopy. When stationary, direct sunlight can cause the temperatures in the cockpit to rise to uncomfortable temperatures, adversely affecting maintenance and operations. Conversely, during wet weather the cockpit must be protected from water inundation. Accordingly, the aircraft must be sheltered from both sunlight and weather.
36. **Forward Operating Bases.** The deployable mission planning facilities and simulators described earlier will support the deployment of the aircraft to forward operating bases for training and operations. USA security requirements apply to these modules, requiring protection from unauthorised access. Many of the Forward Operating Bases are characterised by high temperatures or torrential downpours at times. Crew comfort considerations and the need to protect the equipment mean that the deployable mission planning facilities need to be protected from the extremes of the weather.
37. **Explosive Ordnance Storage.** The F-35A will be armed with weapons and counter measures which are not currently in use with the Classic Hornet, though some legacy weapons will also be used. The weapons are suitable for storage in existing Defence explosive ordnance facilities, however specialised facilities are required for the storage of countermeasures.
38. **Ordnance Loading Aprons.** The ordnance loading aprons at RAAF Base Williamtown are functionally restricted. The lack of lighting and protection from weather restricts the ability of crews to perform emergency procedures such as clearing gun jams in some weather conditions. Accordingly, shelter and lighting is required on at least one of the ordnance loading aprons. The ability of crews to operate for extended periods in the ordnance loading

aprons is restricted by the lack of access to data networks to access maintenance systems and the lack of ablutions and amenities to provide crews with respite. Temporary facilities have been provided, but are in need of replacement.

Description of the Proposal

39. **RAAF Base Williamtown.** The main works elements proposed for RAAF Base Williamtown are shown at Attachment 3 and include:

- a. a new 2OCU Complex for pilot and maintainer training;
- b. a new Combined 3 & 77 Squadron Headquarters facility;
- c. a central maintenance facility for uninstalled aircraft components;
- d. a specialised facility to enable technical support of the F-35A information system and associated hardware;
- e. improvements to the existing Ordnance Loading Aprons;
- f. a new parking apron with aircraft shelters, an aircraft wash facility and related infrastructure for the operation, low-level maintenance and storage of the aircraft;
- g. runway and taxiway improvements, including extension of the existing runway and taxiways, replacement of Operational Readiness Platforms and relocation of navigational instruments;
- h. replacement of explosive ordnance and counter measure preparation facilities and some minor displaced facilities;
- i. a Deeper Level Maintenance Facility;
- j. a maintenance and testing facility for the surface finish of the aircraft;
- k. site engineering infrastructure necessary to support the facilities, including parking and roads, stormwater management infrastructure and augmentation of the high voltage feed and reticulation for the base; and
- l. demolition of redundant facilities and infrastructure.

40. **RAAF Base Tindal.** The scope of works proposed for RAAF Base Tindal is shown at Attachment 4 and includes:
- a. a new 75 Squadron Headquarters facility;
 - b. a new Detached Training Facility for continuation training, simulators and other training devices;
 - c. new and refurbished maintenance facilities for uninstalled aircraft components;
 - d. an aircraft wash facility;
 - e. a counter measure storage facility;
 - f. a new parking apron with aircraft shelters and related infrastructure for the storage and low-level maintenance of the aircraft;
 - g. minor pavement upgrades;
 - h. facilities for visiting squadrons;
 - i. replacement of some minor displaced facilities;
 - j. a construction camp to accommodate construction workers, which will be refurbished for use as base transit accommodation on completion of construction;
 - k. site engineering infrastructure necessary to support the facilities, including parking and roads and the upgrade of the high voltage feed and reticulation in the base; and
 - l. demolition of redundant facilities and infrastructure.
41. **Forward Operating Bases.** The proposed scope at the forward operating bases is common across all bases. It consists of a secure facility for the storage of a deployable simulator and operations modules and supporting infrastructure.
42. **Defence Establishment Myambat.** The scope proposed for the Defence Establishment Myambat consists of the augmentation of existing explosive storage and provision of a new frangible counter measure storage facility.

Summary

43. In summary, the proposed Facilities Requirements for the New Air Combat Capability project provides new and upgraded facilities and infrastructure to support the introduction, operation and deployment of the F-35A and associated systems.
44. The facilities and infrastructure proposed reflect the security, maintenance and operational requirements of the aircraft and the indirect capability requirements such as working accommodation, training of pilots and maintainers, through-life support and engineering infrastructure works.

Other Options Considered to Fulfil the Need

45. Alternative options have been considered for the facilities at every stage of the development as detailed below.

Strategic Siting Considerations

46. The Australian Defence Force Posture Review,² completed in March 2012, confirmed that the RAAF's main air bases, such as RAAF Base Williamtown, are well-located to generate and sustain capability, with good access to industry support, training facilities and ranges, while having the ability to deploy forces quickly to forward bases when necessary.³
47. The Australian Force Posture Review also found that the RAAF's northern bases, including RAAF Bases Tindal, Darwin, Townsville, Curtin, Scherger and Learmonth, are well located to deliver critical air combat and strike capabilities to Navy and Army in the form of air control and offensive support.⁴

² With respect to ADF basing, the Review stated that "ADF bases have two main functions: generating and sustaining capability, and mounting and supporting operations. Some bases are better suited for only one of these roles, or one particular element of a role such as training, while others can effectively fulfil both roles. Generating and sustaining military capability requires bases to have a number of key characteristics. Bases must have sufficient facilities, infrastructure and training areas for their 'raise, train and sustain' activities, access to necessary industry support for platforms and systems and access to services for ADF members and their families. The importance of both 'industry support' and 'family friendly' locations that facilitate recruitment and retention is also recognised in the strategic basing principles as set out in the 2009 Defence White Paper."

³ A. Hawke and R. Smith, 'Australian Defence Force Posture Review', 30 March 2012, p40

⁴ *ibid*

48. The 2013 Defence White Paper further confirmed the need for upgrade of the main operating bases at RAAF Bases Williamtown and Tindal, and the proposed Forward Operating Bases, to support F-35A operations.⁵

Procurement Options

49. Defence considered procurement options for the delivery of the proposed facilities, including via:
- a. a traditional contracting methodology; or
 - b. a public-private partnership arrangement.
50. The option analysis concluded that the delivery of the proposed facilities via traditional contracting methodology would offer a better outcome as compared to a public-private partnership agreement.

Adaptive Reuse Options

51. Defence considered the viability of adaptively reusing existing facilities for the F-35A, most particularly those currently used by the Classic Hornet. At both RAAF Base Williamtown and RAAF Base Tindal, the Classic Hornet squadrons are currently accommodated in buildings, and utilise airfield infrastructure, which were constructed in the 1980s, or, in some cases at RAAF Base Williamtown, the 1960s. They are functionally inefficient, and deficient in a number of areas, including instances of non-compliance with the National Construction Code – Building Code of Australia (NCC-BCA), Defence’s Manual of Fire Protection Engineering (MFPE), the Defence Aerodrome Manual, the Work Health and Safety Act and environmental legislation. Many buildings contain contaminants such as asbestos, lead paint or chromates.

RAAF Base Williamtown

52. Adaptive reuse was assessed as infeasible for the 20CU Complex, the Combined 3 and 77 Squadron Headquarters, Off-Board Information System Centre and Off-Aircraft Maintenance Facility at RAAF Base Williamtown due to the technical difficulty of upgrading existing buildings to meet the F-35A security and functional requirements, the likely impact on, and cost of, continuing Classic Hornet operations during the construction period, and the extent of

⁵ Commonwealth of Australia, ‘Defence White Paper 2013’, 2013, p50

works required to meet statutory compliance and functional requirements for the facilities and related infrastructure. The adaptive reuse of the simulator building was assessed as infeasible as it does not meet the spatial and functional requirements of the F-35A simulators and it will be required for training until the retirement of the Classic Hornet, which is several years after the F-35A simulators will be required.

53. Building 338 (Base Explosive Storage) will be retained for non-explosive storage. The existing Drop Tank Store and a number of other minor facilities in the Classic Hornet precinct at RAAF Base Williamtown have been identified as suitable for reuse for the same function with minimal modification.

RAAF Base Tindal

54. The adaptive reuse of the 75 Squadron Headquarters and Simulator Buildings at RAAF Base Tindal was assessed as being infeasible for reasons similar to the squadron and simulator facilities at RAAF Base Williamtown.
55. The off-aircraft maintenance function at RAAF Base Tindal is currently provided through a number of stand-alone buildings. Each of these buildings was assessed for adaptive reuse based on functional requirements and value for money. Building 521 is proposed to be adaptively reused as the Non-Destructive Testing Workshop and Alternate Mission Equipment store. Building 538 is proposed to be reused as Ground Support Equipment and Fuel Tank storage and building 540 is proposed to be reused as storage for ground support equipment, alternate mission equipment and engines.
56. No. 75 Squadron currently parks Classic Hornet aircraft in dispersed Ordnance Loading Aprons. These areas are proposed to be retained for the loading of high explosive ordnance on the F-35A and as parking positions for visiting aircraft. Options considered for the Ordnance Loading Aprons are described below.
57. RAAF Base Tindal currently utilises four hangarettes for squadron level maintenance of the Classic Hornet. These structures were assessed as being an inefficient solution for the maintenance of the F-35A. However, they are suitable for reuse as facilities for deployed F-35A squadrons, including as storage for supporting operations and maintenance.

Forward Operating Bases

58. Most of the forward operating bases in northern Australia have earth-covered bunkers used for the command and administration functions of deployed squadrons. These facilities will continue to be used for squadron administrative and management functions.

Defence Establishment Myambat

59. There are no buildings available for adaptive reuse at Defence Establishment Myambat.

Reuse of the Parking Apron at RAAF Base Williamtown

60. The existing Classic Hornet parking apron at RAAF Base Williamtown, if reconfigured for use by the F-35A, would not provide adequate prevention against the risk of a fuel spill spreading under multiple aircraft and causing a fire. Rectification of this issue utilising the current apron is technically infeasible without a complete rebuild of the pavement.
61. A number of apron options were considered including reconfiguring the shelters, extending the existing apron to the south, relocation of 76 Squadron to another area of the base to allow extension of the Classic Hornet apron over the area currently occupied by the 76 Squadron apron and providing a new apron on a greenfield site. A new apron was selected as it provided an efficient, low cost outcome which meets current statutory requirements. The other options were discounted due to the cost of replacing the existing Classic Hornet apron, the significant adverse impact which they would have had on the Classic Hornet capability during transition and the work health and safety risks inherent in conducting large scale construction work on an operational apron with regular movements of aircraft. The Classic Hornet parking apron is proposed to be retained for use by visiting aircraft, with selected redundant shelters being removed.

Consolidated Apron at RAAF Base Tindal

62. The Classic Hornet facilities at RAAF Base Tindal are dispersed over a wide area to meet operational requirements. Under this arrangement, aircraft are parked in the Ordnance Loading Aprons. The wide distribution of Ordnance Loading Aprons introduces inefficiencies in squadron operations increasing the number of personnel needed for aircraft maintenance and management of flying operations.

63. Continued use of the dispersed Ordnance Loading Aprons as the primary parking positions for the No. 75 Squadron F-35As would require security measures to be constructed or installed across the entire precinct and infrastructure works to each of the Ordnance Loading Aprons.
64. Defence considered the option of continuing to use the Ordnance Loading Aprons as the primary parking position for the F-35As and the alternative of providing a consolidated apron adjacent to the hangar. The consolidated apron was assessed as providing better value for money as it reduced the whole of life cost of the facilities, significantly reduced the number of personnel required for aircraft maintenance and management of flying operations, increased the efficiency of squadron operations, better met the security requirements for the F-35A and increased the capacity of the base to host visiting Australian squadrons.
65. The Ordnance Loading Aprons will continue to be used in operational or exercise scenarios over short periods, for the loading of ordnance onto aircraft and as parking positions for visiting squadrons.

Precinct Siting Options

RAAF Base Williamtown

66. The F-35A Operational Precinct contains most of the buildings and infrastructure required for the capability. When considering the siting of this precinct at RAAF Base Williamtown, three options were considered in detail:
 - a. **The existing Classic Hornet Precinct.** Early development activities focussed on siting the new facilities around the Classic Hornet Precinct in similar positions to the existing facilities. This siting option was not pursued as it:
 - i. gave rise to substantial risks of impacting on the continuity of Classic Hornet operations;
 - ii. created a substandard functional outcome;
 - iii. did not allow key program dates to be met;
 - iv. was more expensive due to the extent of temporary facilities required; and
 - v. relied on the reuse of the Classic Hornet parking apron, subsequently determined as being technically infeasible as detailed above.

- b. **The domestic precinct.** A brownfield option used the area currently occupied by the gymnasium, base commercial precinct, messes and other facilities. This option was not pursued as it:
 - i. required the complete redevelopment of a large area which is significant to the heritage values of the base as noted in the Commonwealth Heritage List;
 - ii. was the most expensive as it required the relocation of all units in this area;
 - iii. did not allow key program dates to be met; and
 - iv. resulted in unacceptable noise exposure for personnel entering and leaving the proposed squadron facilities due to proximity to the runway threshold.
- c. **Site between No. 2 Squadron and Explosive Ordnance Precinct.** The site behind No. 2 Squadron represented the best operational and masterplanning outcome, minimised the impact of aircraft noise and construction on the remainder of the base and was the cheapest option in terms of both capital and whole of life cost. An additional positive is that selection of this site adds to the heritage value of the base by continuing the progressive development of capability through the Jet Age across the site.

67. Other sites considered included a site adjacent to the north-western runway threshold and a site on the Newcastle Airport side of the runway. These sites were discounted as they are dislocated from the remainder of the base and required clearance of large areas of vegetation.

RAAF Base Tindal

68. When considering the location for the F-35A Operational Precinct at RAAF Base Tindal, four areas were assessed. These options were:
- a. **The north-west end of the base, adjacent to the Air Movements Apron.** This option was assessed as infeasible as it would restrict the expansion of the air movements apron and would create security issues due to its proximity to the area used by deployed and foreign forces.
 - b. **The area to the north of the dispersed Ordnance Loading Aprons.** This area was assessed as infeasible as it would create a congested area between the Airborne Early Warning and Control facilities, No. 75 Squadron Ordnance Loading Aprons and the

Liquid Dry Breathing Oxygen Store. It also impinges on the explosive ordnance standoff distances of the northern Ordnance Loading Aprons.

- c. **Towards the centre of the base, at the intersection of the main taxiways.** This option provided a greenfield site requiring no staging of works or temporary accommodation. It also retained the existing No. 75 Squadron facilities for visiting squadrons. It was not selected as it is dislocated from enabling capabilities such as Ordnance Loading Aprons and fuel farms, which would introduce operational inefficiencies, was close to a site of Indigenous significance and limited the capacity for the expansion of the base for potential future projects.
- d. **The existing 75 Squadron Precinct.** The existing 75 Squadron precinct was selected as the preferred option as it retained the flexibility for No. 75 Squadron and visiting F-35A squadrons to operate from either a consolidated flightline or the dispersed Ordnance Loading Aprons, provided the opportunity for adaptive reuse of existing buildings and was already serviced by most of the required infrastructure. The impact of construction on existing operations was minimised by locating the proposed 75 Squadron Headquarters into the south of the area away from the existing facilities.

Pavement Options

RAAF Base Williamtown

- 69. **Operational Readiness Platforms.** The position of the existing Operational Readiness Platforms breaches current statutory clearance requirements for airfields. The number of parking positions on the operational readiness platforms is insufficient to achieve the sortie generation rates required to maintain the F-35A capability. The preferred option for new Operational Readiness Platforms was selected from a number of siting and design options based on the minimisation of pavement areas, provision of a safe weapon arming position for aircraft and ready access to the runway thresholds. The proposed design balances operational capability with minimisation of the cost of construction and maintenance.
- 70. **Runway Extension.** Defence considered a range of options for the runway extension in order to maximise the safety of operation of the aircraft and reduce the impact of aircraft noise on the community. The options considered included:

- a. **2,000' extension to the south-east across the current line of Medowie Road.** This option was assessed as being infeasible due to the high cost of the infrastructure required, the impact on the local community of relocating Medowie Road and the adverse environmental impact on the nearby wetlands.
- b. **Building a 10,000' runway 1.5 km to the south-east.** This option was assessed as infeasible due to the above issues, even higher cost and the resultant dislocation of the runway from the remainder of the base.
- c. **Various options involving a shorter runway.** Options involving a shorter runway were considered but not selected as they increase the risks faced by trainee pilots and require greater use of afterburners, with associated noise implications.
- d. **2,000' extension within the current base boundary.** The preferred option is to extend the runway to the south-east as far as feasible within the existing base boundary, with the balance of the required extension to the north-west as shown in Attachment 3. This option reduces the noise impact on the community in general by reducing the frequency to use afterburners, achieves the full capability required by the aircraft and minimises the environmental impact and cost of the extension.

71. The Environmental Impact Statement on the flying operations of the F-35A aircraft studied three runway options at RAAF Base Williamtown, including a further option raised through community consultation. This study included a comparison of the noise impact on the community from each option. Based on noise, cost and environmental impacts the 10,000 foot runway option within the base was determined to be the preferred option.

RAAF Base Tindal and the Forward Operating Bases

- 72. **Operational Readiness Platforms.** Defence considered the relocation of operational readiness platforms at RAAF Base Tindal and a number of the forward operating bases. This option was not pursued due to the adequacy of existing management solutions, although the pavement will be upgraded at aircraft hold positions at RAAF Base Tindal.
- 73. **Runway Extensions.** The runway lengths at RAAF Base Tindal and the forward operating bases were assessed as being adequate for the operation of the F-35A and do not require extension.

Layout and Orientation of Buildings

74. **RAAF Base Williamtown.** The layout and orientation of buildings within the F-35A Operational Precinct was selected from a range of options. The preferred option, shown in Attachment 3:
- a. provided a clear site for those facilities required to be delivered first, allowing the program targets to be met;
 - b. orientated the closed portion of the 2OCU Complex towards the runway, minimising the impact of aircraft noise on building occupants;
 - c. orientated the open side of hangars away from noise sources where possible;
 - d. provided flexibility for future expansion of 2OCU;
 - e. facilitated coordination of the construction program with the delivery program for the aircraft, so that the construction of the apron and shelters can be staged such that the construction area does not interfere with aircraft movements as the F-35A aircraft are introduced;
 - f. simplifies the delineation of the construction site from operational activities during construction;
 - g. utilises a predominantly greenfield site which does not require demolition of significant structures to commence construction;
 - h. provides a clear line of sight between the flightline and the aircraft shelters for each squadron; and
 - i. minimised the apron size, thus reducing costs.
75. **RAAF Base Tindal.** The layout and orientation of buildings and infrastructure within the F-35A Operational Precinct was selected from a range of options. The preferred option, shown in Attachment 4:
- a. achieves all functional requirements within the available space;
 - b. retains perimeter roads including the main north-south roadway (Milne Bay Road) through the No. 75 Squadron precinct;
 - c. provides flexibility for future expansion of facilities;

- d. minimises the impact on existing No. 75 Squadron operations during construction;
- e. utilises a predominantly greenfield site which does not require demolition of any major structures to commence construction;
- f. simplifies the delineation of the construction site from operational activities during construction; and
- g. locates the No. 75 Squadron precinct further away from common use facilities such as the Liquid Dry Breathing Oxygen compound and Fuel Farm 1.

Internal Layout of Buildings

76. Numerous options were developed for the internal layout of the buildings. The preferred layouts were selected on the basis of functional efficiency, ability to facilitate information security, minimisation of the building footprint and cost. The layout of the squadron facilities to be provided at both RAAF Bases Williamtown and Tindal is broadly consistent with those delivered recently at RAAF Base Amberley for the Australian Super Hornet, providing ease of interoperability.

Reasons for Adopting the Proposed Course of Action

77. The reasons for adopting the proposed options outlined above are that they all:
- a. meet the facilities requirement for the F-35A capability and address current shortfalls in infrastructure in a cost effective manner;
 - b. address the Australian and USA security requirements of the F-35A program in an effective manner;
 - c. create effective and streamlined interaction between related functions in consolidated areas which will improve efficiency of squadron operations;
 - d. meet the minimum requirements that satisfy the current NCC-BCA, Defence Aerodrome Design Manual, Defence's Manual of Fire Protection Engineering, and other statutory requirements;
 - e. maximise opportunities to achieve optimised Ecologically Sustainable Development (ESD) and Green Building outcomes;

- f. maximise opportunities to integrate similar functions to achieve construction economies of scale and facility performance efficiencies post construction;
- g. minimise the requirement for temporary facilities and decanting, which in turn minimises disruption to ongoing training and operations;
- h. minimise the need to conduct extensive construction activities in close proximity to operational aircraft, which mitigates significant work health and safety risks; and
- i. minimise whole of life costs.

Related Projects

- 78. A large number of projects are planned for delivery at the sites for the works over the relevant period. The projects described below are those that have been assessed as having the potential to impact upon, or be impacted by, the works.
- 79. The following proposed projects will deliver facilities or infrastructure at a number of the sites for the proposed works:
 - a. The AIR5431 Phase 2/3 ADF Air Traffic Control Complex Infrastructure Project will replace or upgrade the air traffic control towers at most of the airfields which are sites for the proposed works. PWC consideration of this project is anticipated for late 2015. The towers at RAAF Bases Williamtown and Tindal are planned for construction in the period of 2017 to 2018.
 - b. The National Airfields Program and the National Airfield Maintenance Program conduct a rolling program of pavement and airfield ground lighting maintenance across all RAAF airfields. Works are planned on most of the sites over the relevant period.
 - c. The AIR 7000 Phase 2 Maritime Patrol and Response Aircraft Capability will deliver upgrades to pavements and squadron facilities at RAAF Bases Edinburgh, Darwin, Townsville and Pearce. PWC consideration of this project is anticipated for early 2015. Construction is planned between March 2016 and June 2019.

RAAF Base Williamtown

80. In addition to the projects listed above, two further projects are proposed to be delivered at RAAF Base Williamtown in the near future:
- a. The RAAF Base Williamtown Stage 2 Redevelopment, which is proposed to upgrade base infrastructure, provide new centralised base office accommodation, and construct new facilities for No. 4 Squadron. This project is planned for construction from July 2015 to August 2021. PWC consideration of this project is anticipated for late 2014.
 - b. The Lead-In Fighter Capability Project, which will deliver a new simulator for No. 76 Squadron is a medium works project, which is currently in the development phase and planned for delivery in 2015.

RAAF Base Tindal

81. The following major projects are planned for RAAF Base Tindal over the relevant period:
- a. The RAAF Base Tindal Stage 6 Redevelopment is yet to be scoped, but could include upgrades to base infrastructure and base working and living-in accommodation. This project may be delivered in the period 2017 to 2019, subject to approval.
 - b. The US and Australian governments are investigating options for increased co-operation and bilateral training between the USAF and RAAF. Under this plan, RAAF Base Tindal could potentially host deployed USAF aircraft. If this were to occur, construction is likely to commence in 2017 or 2018 following necessary approvals.
 - c. Facilities associated with the KC30 Multi Role Tanker Transport Upgrade Project are currently in the early planning stages and are yet to be fully scoped. These works could be delivered in 2017 to 2018.

Defence Establishment Myambat

82. The Explosive Ordnance Logistics Reform Project, which is still in the early stages of development, will likely include scope to be delivered at Defence Establishment Myambat in 2017.

Historical Background

RAAF Base Williamtown

83. RAAF Base Williamtown is Australia's premier fighter base and home to the majority of Australia's fighter aircraft and over 3,000 military and civilian personnel. Squadrons currently based at RAAF Base Williamtown include No. 3 Squadron, No. 77 Squadron and 2OCU (Classic Hornet), No. 4 Squadron (Forward Air Control Development Unit), No. 76 Squadron (Hawk Lead-in Fighter) and No. 2 Squadron (Airborne Early Warning & Control).
84. The base was built in 1940 and used by the RAAF and United States Army Air Force for training and as a base for fighter aircraft and bombers conducting anti-submarine patrols during World War II.
85. Following World War II, RAAF Base Williamtown was retained as the main RAAF fighter wing and training base. It has been the home of a series of RAAF fighter capabilities, from World War II era Mustang fighters, through a series of jet aircraft, including the de Havilland Vampire, Gloster Meteor, F-86 Saber, Dassault Mirage, and most recently, the Classic Hornet.
86. RAAF Base Williamtown plays a central role in the delivery of RAAF operational capability and is the nation's primary fighter pilot training base. It is home to key components of the air combat capability command structure, including Air Combat Group, 81 Wing and the Tactical Fighter Systems Program Office. No. 3 Squadron, No. 77 Squadron and 2OCU will transition to the F-35A when introduced. The Tactical Fighter Systems Program Office will remain to complete the disposal of the Classic Hornet fleet, and to transition to management of the F-35A.

RAAF Base Tindal

87. RAAF Base Tindal plays an important strategic role as Australia's northern-most RAAF base hosting a permanent squadron of fighter aircraft. It is the home of No. 75 Squadron, which currently operates Classic Hornet aircraft, and regularly hosts visiting squadrons from Australia and international partners.
88. The base was built in 1942 as Carson's Airfield, a base for allied bombers to attack Japanese targets in Papua New Guinea and Dutch East Indies, and renamed as RAAF Base Tindal in

1946. It was upgraded to become an ‘unmanned operational base’ in 1963, providing an airfield to which aircraft and equipment could be forward deployed when required. The location was deemed to be desirable as it was close enough to RAAF Base Darwin to provide mutual support, but was far enough from the coast to be protected from enemy attack and cyclones.

89. In 1984, the Australian government decided to move a fast jet squadron to RAAF Base Tindal in line with the defence in depth doctrine and the realignment of the Australian Defence Force to the north. The base was upgraded again in 1988 to become the home of No. 75 Squadron, which operates the new Classic Hornet aircraft, and the RAAF’s main operational base in the north of Australia. It played a key role in supporting Australian forces during the 1999 East Timor crisis and was the base for deployment of Classic Hornet aircraft to the Iraq war in 2003. It regularly hosts major international and domestic exercises and operates as a forward operating base for the airborne early warning and control aircraft, maritime patrol aircraft and fighter squadrons from RAAF Bases Williamtown and Amberley.

Forward Operating Bases

90. RAAF Bases Townsville, Darwin and Pearce are fully manned and operational RAAF bases that are largely focussed on the support of other Defence capabilities or support for exercises in Australia’s north. RAAF Bases Townsville and Darwin were developed as northern air bases to counter the developing threat from Japanese forces during the early stages of World War II, while RAAF Base Pearce was opened during that war as a training base. They have remained as operational military airfields since that time. Today, they are home to enabling capabilities and are used regularly for forward deployment of other RAAF capabilities for exercises and operations.
91. RAAF Base Edinburgh was constructed in 1955 as a support base for weapons development at the joint UK-Australian Weapons Research Establishment at Woomera. It was upgraded in 1977 to become the home of Australia’s maritime patrol aircraft capability. Today it is home to No. 10 Squadron and No. 11 Squadron (maritime patrol), as well as being a major Defence Science and Technology Organisation establishment and home of the Army’s 7th Battalion, the Royal Australian Regiment.
92. RAAF Bases Curtin, Scherger and Learmonth were progressively developed as bare bases to provide the Australian Defence Force with forward operating bases with direct access to the

northern maritime approaches. RAAF Base Learmonth was built first in 1973, followed by RAAF Base Curtin in 1988 and RAAF Base Scherger in 1998. Bare bases are manned by caretaker staff and have only basic infrastructure. Bare bases are supplemented with staff and equipment during exercises and operations.

Defence Establishment Myambat

93. Defence Establishment Myambat was established as an ammunition store in 1939. It is now Australia's largest and most comprehensive ammunition storage depot.

Environmental Impact

94. In consultation with the Department of Environment, Defence is conducting separate environmental approval processes for the operation of the aircraft and the construction of the proposed works.

Environmental Impact of the Operation of the Aircraft

95. The impact of the operation of the F-35A aircraft on the environment and the local community is being addressed through an Environmental Impact Statement for the AIR6000 project. The Environmental Impact Statement has been submitted to the Department of Environment for adequacy review. The public exhibition period will be conducted mid-2014. A decision from the Minister for the Environment is expected by 2015. The outcomes of that process are not expected to impact on the scope or timing of the construction activities.

Acoustic Impact of the Aircraft on the Community

96. An assessment of the likely acoustic footprint of the flying operations of the F-35A aircraft has been undertaken as part of the F-35A Lightning II Environmental Impact Statement. The Environmental Impact Statement describes the existing noise environment surrounding RAAF Bases Williamtown, Tindal, Townsville and Darwin and the potential noise impacts associated with the replacement of the existing operations of the Classic Hornet aircraft with the flying operations of the F-35A aircraft.
97. To minimise the impact of aircraft noise on the surrounding community at RAAF Base Williamtown, the F-35A will continue the mitigation measures already in place for flying operations of the Classic Hornet aircraft, as well as capitalising on the ability of the F-35A aircraft to perform procedures using a lower level of engine thrust. Consequently, little or no

change, in some cases some improvement, is expected in the forecast noise exposure levels as demonstrated by Australian Noise Exposure Forecast contours. Noise levels in areas surrounding RAAF Base Williamtown will be monitored after the arrival of the aircraft to assess the actual impact on the community.

98. The Australian Noise Exposure Forecast for RAAF Base Tindal has been revised to reflect current operations and the arrival of the F-35A. The local community will be consulted on these changes as part of the community consultation process for the F-35A Lightning II Environmental Impact Statement.
99. Further information on the acoustic impact of the aircraft on the community can be found in the F-35A Lightning II Environmental Impact Statement for the flying operation of the F-35A aircraft.

Acoustic Impact of the Aircraft on the Bases

100. An assessment of the impact of aircraft noise against Work Health and Safety Regulation criteria will be undertaken on the areas of the RAAF Base Williamtown surrounding the runway. Generally, it is expected that noise levels from the F-35A aircraft will be within a similar range or less than that of the Classic Hornet aircraft when noise mitigation strategies are implemented. Further mitigation measures will be developed, if necessary, with RAAF Base Williamtown staff to ensure that operation of the aircraft does not adversely impact the health of staff.
101. Existing RAAF noise management protocols will be assessed to determine whether updates are required. Master planning for RAAF Base Williamtown will ensure that future base development relocates sensitive uses away from high noise zones.
102. The noise exposure of personnel at RAAF Base Tindal and the Forward Operating Bases is routinely and effectively managed under current operations. Noise exposure is not expected to reach unmanageable levels through the introduction of the F-35A.

Environmental of the Proposed Facilities Works

103. An environmental impact assessment for the proposed facilities works was prepared in 2010 and updated in March 2013. It identified the potential impact of the proposal on flora and fauna, noise, soil contamination, water quality, waste management, air quality, traffic management and unexploded ordnance. The assessment concluded that the impact of the

proposed works would not be significant. A referral of the facilities works under the *Environment Protection and Biodiversity Conservation (EPBC) Act 1999 (Cth)* on environmental grounds is not required.

104. The proposed works will be managed in accordance with the Defence Environmental Management Framework. The Managing Contractor's Construction Environmental Management Plan (CEMP) for construction activities will need to comply with the requirements of the project's Environmental Assessment Report prepared by the Defence Directorate of Environmental Protection and Assessments, and the associated Environment Clearance Certificate. The CEMP will address issues such as coordination of construction with civil and RAAF flight schedules, noise and dust generation, traffic management and impacts to visual amenity.

RAAF Base Williamtown

105. The following key issues have been identified for RAAF Base Williamtown in the Environmental Impact Assessment.
106. **Ecology.** Field surveys have been undertaken to identify the extent and quality of native vegetation, fauna habitats and species diversity, while targeting any threatened biodiversity with a moderate to high likelihood of occurrence in the area. The surveys identified the following:
 - a. Two threatened fauna species were positively recorded from the field investigations: the Koala (*Phascolarctos Cinereus*) and Wallum Froglet (*Crinia Tinnula*); both listed as vulnerable species under schedule 3 of the *Threatened Species Conservation Act 1995* (NSW).
 - b. One Commonwealth listed flora species, the Drooping Red Gum (*Eucalyptus Parramattensis* subsp. *Decadens*) was confirmed in the project area and a second species, *Rulingia Prostrata* is considered a potential inhabitant with restricted distribution.
107. **Clearance of Vegetation.** The proposed works will require the clearance of remnant vegetation in the areas of the F-35A Operational Precinct and Explosive Ordnance Preparation Facilities. 85 hectares of vegetation will be required to be cleared or lopped to meet statutory requirements for the runway extension to the north-west. Defence conducted an

EPBC Act assessment of significance which concluded that the proposed vegetation clearance is unlikely to lead to significant impacts on local populations of the identified species.

Defence is preparing an application for a Threatened Species Permit to be submitted to the Department of Environment. This application will detail the likely impacts and the planned mitigation measures, such as transplantation of seeds.

108. **Koalas.** Koalas are known to reside at RAAF Base Williamtown. Surveys of the areas where vegetation is to be cleared have been completed and have identified a small number of resident animals, which will be relocated prior to the commencement of construction. The proposed works have been assessed by the Defence Directorate of Environmental Protection and Assessments to not have a significant impact on the local population. Mitigation measures to manage any risk to the koala population are being developed for incorporation into the CEMP prior to commencement of construction.
109. **Wallum Froglet.** The proposed works are not expected to impact on the Wallum Froglet. Appropriate mitigation measures to manage any unexpected discovery of individuals during construction will be included in the CEMP.
110. **Site contamination.** Low levels of sub-surface contaminants have been identified in the area of the proposed F-35A Operational Precinct. Contamination is known to exist in the area of the existing Classic Hornet facilities. A number of buildings are proposed to be either adaptively reused or demolished as part of the project. Preliminary investigations undertaken to date have identified that hazardous materials are likely to be present in these buildings. These may include asbestos, lead paint and strontium chromate coatings on structural members. An Environmental Remediation Action Plan to appropriately deal with all known and found contaminants will be implemented alongside the project CEMP.
111. **Unexploded ordnance (UXO).** An assessment of UXO risk identified that the area of the existing explosive ordnance preparation precinct at RAAF Base Williamtown has a medium to high risk of UXO. Appropriate management strategies have been identified for incorporation into the CEMP prior to commencement of construction.

RAAF Base Tindal

112. The following were the key issues identified for RAAF Base Tindal in the Environmental Impact Assessment.

113. **Geophysical.** RAAF Base Tindal and the surrounding Katherine region have a propensity for the development of sinkholes as a result of the underlying geology. Surveys were conducted to assess the risk associated with potential sinkhole development at the site of the proposed facilities. The geophysical investigation identified sub-surface features at the proposed site which have been allowed for in the foundation design. In addition some removal of sandstone outcrops may be required. A further geotechnical investigation will be conducted as design progresses to determine the detailed sub-surface geology and will be used to develop the mitigation measures as required.
114. **Clearance of Vegetation.** The proposed works will require the clearance of approximately 8.1ha of remnant vegetation in previously undeveloped areas of the base. This vegetation has a low to medium habitat value and is of a type widespread throughout the region. These works are considered to be of low environmental significance.
115. **Impact on Fauna.** An assessment has been made of the potential impact on nationally listed threatened and migratory species identified as possibly occurring on the Base. It was concluded that the proposed facilities would be unlikely to lead to significant impacts on the local populations of the assessed species or on important habitat for threatened species.
116. **Site contamination.** A detailed site contamination investigation will be completed during the development of the design. A number of buildings are proposed to be either adaptively reused or demolished as part of the project. Preliminary investigations undertaken to date have identified that hazardous materials are likely to be present in the existing buildings. These include asbestos in the external cladding material, carbon fibre contamination from workshops and strontium chromate coatings on structural members. An Environmental Remediation Action Plan to appropriately deal with all known and found contaminants will be implemented alongside the project CEMP.
117. **UXO.** The risk of UXO at the proposed sites for RAAF Base Tindal was assessed as low. Appropriate management strategies have been identified for incorporation into the CEMP prior to commencement of construction.

Forward Operating Bases

118. The facilities to be delivered at the Forward Operating Bases are minor in nature and not expected to have a significant impact on the environment. They are expected to be constructed

in areas close to the runway which are already developed. The site selection process will consider environmental issues as well as value for money and operational effectiveness.

Defence Establishment Myambat

119. The facilities to be delivered at Myambat are minor in nature, are in an area identified for future expansion of the site capacity and are not expected to have a substantive impact on the environment. The facilities have been sited to reduce environmental impact including siting the new Earth Covered Bunkers in areas of previously cleared vegetation and clear of the existing shallow drain. The new Counter Measure Storage building will require only minor clearing of vegetation, which has been assessed as not being significant.

Non-Indigenous Heritage Considerations

RAAF Base Williamtown

120. RAAF Base Williamtown is included on the Commonwealth Heritage List. It is described in the Commonwealth Heritage citation as being significant for “*the operational and training focus for Australia’s jet fighter aircraft*”. These include the “*Vampire (1949-1964), Sabre (1955-1964), Mirage (1965-1982) and F/A18 Hornet (1983-present)*”.
121. The evolving landscape of RAAF Base Williamtown is also of Commonwealth Heritage significance, which is evident through the historic phases of development on the Base, which include:
 - a. World War II (1939-1945);
 - b. The birth of the jet age (1946-1964);
 - c. The age of the Mirage (1965-1982); and
 - d. The F/A18 Hornet Era (1983-present).
122. Each historic phase or deployment of new aircraft types on the base is represented by purpose built structures for the aircraft. There are several individual buildings and elements within the base listed in the citation for their historic contribution to the base.
123. The siting of the proposed works is consistent with the development of the base, locating the F-35A precinct in an area which demonstrates a progression from the Hornet Era and earlier phases of development.

124. The construction of the F-35A Operational Precinct will require the demolition of the following Commonwealth Heritage Listed Explosive Ordnance Preparation Facilities:
- a. Building 317 – 81 Wing Armament Component Store;
 - b. Building 319 – 81 Wing Armament Assembly Building; and
 - c. Building 320 – 81 Wing Armament Preparation Facility.
125. A referral under the *Environment Protection and Biodiversity Conservation (EPBC) Act 1999* (*Cth*) is currently being prepared to consider the heritage impact of demolishing these buildings and the reconfiguration of the explosive ordnance preparation precinct.
126. The demolition of a number of Commonwealth Heritage Listed facilities is also proposed under the RAAF Base Williamtown Redevelopment Stage 2 project. The referral will address the proposed demolitions under both projects, as they will all occur over a similar timeframe.
127. The community will be consulted with respect to the proposed demolitions in accordance with the requirements of the EPBC Act. A decision by the Minister for Environment is expected by the end of 2014.
128. Building 338 (Base Explosive Storage) is also listed on the Commonwealth Heritage List and will become redundant when the new explosive ordnance preparation facilities are completed. It will be retained for non-explosive storage in the consolidated explosive ordnance area. This building provides an example of the jet age structures in the existing explosive storage precinct.
129. Classic Hornet Facilities not identified for adaptive reuse by Air Force units will be demolished when vacated. A Heritage Impact Assessment conducted in 2013 concluded that some Classic Hornet Facilities may also be of heritage significance. The Classic Hornet units will vacate these buildings from 2019. The plan to adaptively reuse these buildings will be finalised and a Heritage Impact Assessment completed prior to this date. Should it be determined that a referral under the EPBC Act is required for these buildings then heritage issues will be resolved prior to any demolition works proceeding.

RAAF Base Tindal

130. No buildings, structures, or sites at RAAF Base Tindal are registered with the Northern Territory Heritage Register, Commonwealth Heritage Register or under the EPBC Act. An

archaeological survey was conducted of the proposed site and did not identify any World War II artefacts. Consequently, a significant impact on non-indigenous heritage values is not expected. A further assessment of heritage impact will be conducted when the demolition list for Classic Hornet facilities at RAAF Base Tindal is finalised.

Forward Operating Bases

131. Minimal demolition or modification of structures or infrastructure is planned for the forward operating bases. The new structures are planned to be delivered in developed areas close to the runway. Consequently, no impact is expected on the non-indigenous heritage values at these bases.

Defence Establishment Myambat

132. The proposed works at Defence Establishment Myambat are consistent with the form and function of existing facilities and will be constructed in an adjacent area identified for future expansion. No demolitions or modifications of existing structure are planned. Consequently, no impact is expected on the non-indigenous heritage values at this establishment.

Indigenous Heritage Considerations

133. Sites of Indigenous heritage significance are present at both RAAF Base Williamtown and RAAF Base Tindal, but are located away from the areas of the proposed works at both bases.
134. The Worimi Land Council has been consulted on the potential for impact on Indigenous heritage values in RAAF Base Williamtown and appropriate mitigation measures to be implemented during construction.
135. The Northern Land Council will be consulted on the development in RAAF Base Tindal during the community consultation process.
136. An assessment of the potential impact on Indigenous heritage values at the forward operating bases will be conducted as part of the site selection process at each site.
137. The facilities to be delivered at Defence Establishment Myambat are in a cleared area immediately adjacent to existing facilities. No impact is expected on Indigenous heritage values.
138. Mitigation measures will be included in the Construction Environmental Management Plan for each site and addressed as part of the site induction.

Impact on Local Community

139. The project will generate a significant amount of short-term employment predominantly in the building, construction and unskilled labour markets, particularly in the areas surrounding RAAF Bases Williamtown and Tindal. Significant numbers of personnel are expected to be directly employed on construction activities as well as off-site functions for manufacturing and distribution of materials, as well as additional ancillary services.

RAAF Base Williamtown

140. As a result of using the Managing Contractor form of delivery Defence anticipates that local building sub-contractors will be employed on a large proportion of the construction works. The Managing Contractor will continue to engage with local industry groups to maximise opportunities for local businesses, providing a positive economic impact to small and medium enterprises in the region. Where the local market has insufficient capacity to manage the volume of the work, Defence anticipates employing building sub-contractors from the Sydney market, providing wider economic benefits from the project.
141. Construction traffic routes will be managed to minimise disruption to the local communities. Improvements proposed to the area's traffic infrastructure to minimise disruption caused by construction traffic entering the base include providing additional turning lanes on Medowie Road and sealing the existing Hunter Water access road located to the north of the Base to provide a separate construction entrance.
142. Each of the sites is located within the base boundary and predominantly in the north section of the base away from local residents and businesses. Construction activities are not expected to cause any disruption to residents or businesses located in the vicinity of the base.
143. The extension of the runway to the south-east will increase the noise exposure levels at Fighter World museum, which is currently operating under a lease from Defence. Defence is engaging with Fighter World in regards to an acceptable solution to retain the heritage benefits of the museum.
144. Construction of the runway and taxiway extensions will be coordinated with the RAAF and Newcastle Airport Limited to minimise disruption to airport operations.

RAAF Base Tindal

145. The project is likely to employ skilled construction workers from the Katherine and Darwin areas over the construction period. The Managing Contractor will also engage with local industry groups to maximise opportunities for local building sub-contractors, providing a positive economic impact to small and medium enterprises in the region. However, Defence anticipates that the local market will not have sufficient capacity to manage the volume of the work.
146. Defence anticipates employing some building sub-contractors from interstate markets, providing wider economic benefits from the project. The introduction of workers from interstate is likely to provide additional demand for local businesses and services such as hotels and restaurants. The impact on the local housing market will be minimised through the provision of an on-site construction camp for workers employed on the project.
147. RAAF Base Tindal is located approximately 14km southeast of the township of Katherine. Consequently, the impact from construction activities such as traffic, noise and visual amenity are not expected to be significant.

Forward Operating Bases and Defence Establishment Myambat

148. The proposed works at the forward operating bases and Defence Establishment Myambat are minor in nature. They are expected to create short-term employment opportunities, particularly for skilled workers, and some infrequent minor increases in traffic due to construction deliveries are expected.

Indigenous Employment Opportunities

149. Defence anticipates that the project will present employment and training opportunities for indigenous people and organisations at both RAAF Base Williamtown and RAAF Base Tindal. An Industry Participation Plan, which will include opportunities for indigenous labour, will be developed in collaboration with the local land council for each of the sites.
150. The Managing Contractor will consult various accredited indigenous Job Provider Organisations to seek their interest in providing specialised advice relating to the recruiting and training of indigenous labour. Specifically the Managing Contractor will engage with the Worimi Land Council in Newcastle, and both the Jawoyn Association and Northern Land

Council in Katherine, to communicate employment and training opportunities for the local indigenous community.

Details of Consultation Carried Out Among Relevant Stakeholders

151. Defence recognises the importance of providing local residents, statutory authorities and other interested stakeholders an opportunity to provide input into, or raise concerns relating to, major projects such as the Facilities Requirements for the New Air Combat Capability Project.
152. Defence has engaged with a variety of internal and external stakeholders in the areas of RAAF Bases Williamtown and Tindal. Further consultation will be conducted prior to the PWC hearing. These groups include the local members of Federal and State Parliament; the local councils; parties from whom land may potentially be acquired; the local Aboriginal land councils; local industry; special interest groups, particularly related to the environment and heritage values of the sites; utility providers; and the operators of airports using the same runway.
153. Due to the minor nature of the facilities at the remaining sites, and the long period prior to construction of the facilities, Defence has not yet engaged with stakeholders in these areas. Where appropriate, Defence will engage with these stakeholders prior to finalising the design and commencing construction. Local Federal and State Members will be informed of the proposed works by letter during the community consultation period.
154. A list of stakeholders with whom Defence has, or plans to consult with is provided in Attachment 5.

Detailed Description of the Proposed Scope of Works

Purposes of the Works

155. The aim of the project is to provide the facilities and supporting infrastructure necessary to support the introduction into service and operation of the new F-35A aircraft.

Project Location

156. The proposed works will be constructed at RAAF Bases Williamtown, Tindal, Darwin, Townsville, Edinburgh, Pearce, Curtin, Learmonth and Scherger and Defence Establishment Myambat.
157. RAAF Base Williamtown is located approximately 15km north-east of the City of Newcastle and 8km south-east of Raymond Terrace.
158. RAAF Base Tindal is approximately 14km southeast of the township of Katherine and 340km south-east of Darwin in the Northern Territory.
159. RAAF Bases Curtin and Learmonth are located in remote locations close to Derby and Exmouth in Western Australia. RAAF Base Scherger is located in a remote location close to Weipa in northern Queensland.
160. The remaining sites are all located close to large regional centres or capital cities. A location plan is provided at Attachment 2.
161. With the exception of RAAF Base Williamtown, the location of the proposed works at each site is on Commonwealth owned and Defence controlled land. At RAAF Base Williamtown, access to land from the State of NSW and private parties will be required to enable the maintenance of tree heights within the obstacle clearance surfaces for the runway. High intensity approach lighting is proposed to be installed on land currently owned by the State of NSW at the north-western end of the runway.

RAAF Base Williamtown Works

162. The proposed works at RAAF Base Williamtown will include an F-35A Operational Precinct, runway pavement upgrades, explosive ordnance preparation facilities, engineering infrastructure and replacement of displaced elements.
163. **F-35A Operational Precinct.** The F-35A Operational Precinct is proposed to provide a secure precinct which will be the basis of F-35A operations at RAAF Base Williamtown. A 3D drawing of the proposed precinct is provided in Attachment 6. The F-35A Operational Precinct includes the following facilities:
 - a. **2OCU Complex.** 2OCU will provide training to pilot and maintainer trainees in the classroom, simulators and, for pilots, real world flying in F-35As. It will provide pilots and maintainers accepted into the F-35A program with their initial training on the platform. The proposed facility will house squadron working accommodation,

maintenance areas to support the flying squadron and two training wings, one for pilot training and one for maintainer training. A floor plan for the proposed facility is included in Attachment 7. Key aspects of this facility include:

- i. The total population, including students, is approximately 390 personnel;
- ii. The proposed maintenance areas include administration areas, seven hangar spaces, workshops and a tool store;
- iii. The proposed squadron operations area will include:
 1. a flightline area adjacent to the apron;
 2. an operations administration area;
 3. a flight planning facility;
 4. a lecture theatre for flight briefings and training; and
 5. classrooms for pilot training.
- iv. The proposed administration and support areas include a 140 person lecture theatre for use by 2OCU and other units on the base, a pilot fit facility which will service all operational squadrons as well as the training squadron; storage and maintenance facilities for life support equipment; administrative areas; crew and locker rooms; offices for senior staff; and open plan office space for other staff;
- v. The proposed pilot training wing will house the Full Mission Simulators and associated briefing, administration and control rooms;
- vi. The proposed maintainer training wing will include a learning resource centre, ten classrooms, a range of training devices to simulate maintenance activities on various components of the aircraft, and associated administration areas.

- b. **Combined 3 & 77 Squadron Headquarters Facility.** A Combined Squadron Headquarters facility is proposed, providing efficiencies and facilitating interoperability. Each squadron will have its own headquarters area to exercise effective command and control of F-35A operations and to prepare for exercises and deployments. Maintenance and operations areas will have similar facilities to the

flying squadron area of the 2OCU Complex. Efficiencies will be gained through sharing of some administrative functions between squadrons. Each hangar will include five aircraft spaces in accordance with the manufacturer's recommendation regarding squadron level maintenance. A floor plan for the proposed facility is provided in Attachment 8. The total expected population of the facility is approximately 380 personnel.

- c. **Off-Aircraft Maintenance Facility.** Off-aircraft maintenance for all three squadrons at RAAF Base Williamtown is proposed to be conducted at a shared facility. Components or elements that can be removed from the aircraft for maintenance, such as engines, wheels, tyres, canopies and batteries will be maintained in this facility. The proposed facility is divided into sections that are operated independently, either by Defence or contractor personnel, and includes a facility logistics section for the receipt of stores and distribution of parts for off-aircraft maintenance. A floor plan for the proposed facility is included in Attachment 9.
- d. **Off-Board Information System Centre.** The proposed Off-Board Information System Centre is a secure facility that will facilitate through-life support of the off-board information system. It will be a dedicated computer laboratory for secure functions such as the installation of software updates and preparation of equipment for operations and deployments. This facility will also provide storage and a testing facility for the F-35A information system devices and servers, including the Deployable Simulators, and will be staffed by both Defence and contractor personnel. A floor plan for the proposed facility is included in Attachment 10.
- e. **Parking Apron.** The proposed parking apron provides a secure area where aircraft are parked when not flying and minor maintenance tasks can be conducted. The parking apron has been designed to accommodate 54 aircraft in seven shelter structures, orientated in a north-west – south-east direction. The orientation of the shelters will minimise exposure of the aircraft to UV radiation. The spacing between aircraft shelters has been based on refuelling safety requirements and the jet blast safety distance required behind the aircraft. The apron will be fenced in accordance with the Australian and USA requirements. Each squadron's shelters will be

positioned directly in front of their headquarters and hangar for that squadron with line of sight to all aircraft from the flightline. 16 aircraft positions are proposed to be provided per operational squadron and 22 aircraft positions are to be provided for the training squadron. An aircraft wash facility with two bays will be shared between the three squadrons. One of the bays is proposed to include an engine wash facility.

- f. **Deeper Level Maintenance Facility.** Deeper level maintenance is proposed to be conducted in a specialised, contractor-run, facility that will be delivered after 2020 through adaptive re-use of the existing Hornet Upgrade Hangar. This hangar is required to support the drawdown of the Classic Hornet fleet until about 2020, at which time the fleet will be nearing retirement and deeper level maintenance will no longer be required. The squadron hangars, proposed to be delivered as part of each squadron's headquarters facility, will be used to provide this capability in the interim. The detailed requirements for this facility will be developed in consultation with the maintenance contractor and will reflect the requirements of the aircraft maintenance contract.
- g. **Low Observability Refresh Facility.** The F-35A requires a facility for testing and painting the surface finish of the aircraft. As with the proposed Deeper Level Maintenance Facility, the requirements for this facility are still under development with the maintenance contractor.

164. **Runway Works.** The safe operation of the aircraft will require improvements to the runways and associated infrastructure at RAAF Base Williamtown. A drawing of all pavement works proposed for RAAF Base Williamtown is included in Attachment 11. The proposed works include the following:

- a. **Runway Extension.** The required length of the runway is 3,048m (10,000 feet). This distance allows acceleration to take-off speed, plus the distance required to safely stop the aircraft if take-off is aborted at the latest possible time, with an allowance for the reaction time of trainee pilots. This runway length will facilitate aircraft operations with the minimum use of afterburners. The south-eastern component of the extension works is the maximum possible extension that can be achieved within the existing boundary of the base. The balance of the required distance is proposed to be achieved through the extension of the runway to the north-west.

- b. **Runway Approaches, Airfield Lighting and Navigation Aids.** Aircraft safety requirements for runways limit the height of trees and structures in the runway approaches. High intensity airfield lighting and instrument landing systems must also be installed in set locations around the new thresholds, and obstructions to their effective operation removed. The existing runway is not compliant with current statutory requirements for obstacle clearance surfaces and high intensity airfield lighting. Access to land will be required at each end of the runway to facilitate the relocation of the high intensity airfield lighting and instrument landing systems and the lopping or clearance of trees to achieve obstacle clearance standards.
- c. **Taxiways.** The taxiway which runs parallel to the runway is proposed to be extended at both ends to provide direct access for aircraft to the runway thresholds.
- d. **Operational Readiness Platforms.** Operational readiness platforms provide an area where aircraft weapons can be armed before take-off and where aircraft can wait at high states of readiness during exercises or operations. New operational readiness platforms are proposed to be provided at each end of the runway on the outer side of the parallel taxiway, adjacent to the runway thresholds. Each proposed operational readiness platform will include multiple aircraft parking positions and revetments to provide a safe arming direction for the aircraft.

165. **Explosive Ordnance Facilities.** The existing explosive ordnance preparation facilities at RAAF Base Williamtown are at the end of their useful life and do not meet current standards. The explosive safeguarding distances associated with the facilities impinge on the proposed F-35A Operational Precinct requiring the relocation of the storage facility. The explosive ordnance facilities to be delivered include:

- a. **High Explosive Ordnance Preparation Facilities.** New high explosive preparation facilities which meet current standards and the functional requirements for F-35A Ordnance are proposed to be provided in the north-eastern area of the base adjacent to the existing access road. The proposed location will allow direct access to the Ordnance Loading Aprons, will be a safe distance from other base infrastructure and will ensure that all safeguarding areas remain within Defence controlled land.
- b. **Ammunition and Counter-Measure Preparation Facilities.** The existing explosive ordnance preparation functions are proposed to be consolidated through

the provision of new ammunition and counter-measure preparation facilities which meet current standards and the functional requirements for ordnance carried by all aircraft currently planned to operate from RAAF Base Williamtown. The proposed location will provide direct access to the parking aprons for the F-35A and other aircraft operating from RAAF Base Williamtown and will be a safe distance from other base infrastructure.

- c. **Ordnance Loading Apron Facilities.** The functionality of the Ordnance Loading Apron will be improved through the provision of a gun jam shelter over one of the aprons and a launch and recovery shelter for maintenance staff. The scope of each is as follows:
 - i. The proposed gun jam shelter will facilitate emergency maintenance tasks such as the clearance of gun jams in all weather conditions and at night. It has been located on the apron closest to the runway in order to minimise aircraft travel distance.
 - ii. The proposed launch and recovery shelter will facilitate extended operations by providing maintenance staff with a small area for the flightline management area, rest, ablutions, and protection from aircraft noise and the elements during the launch and recovery of aircraft. It has been located to optimise the line of site and travel time to each aircraft parking position in the ordnance loading area.

- 166. **Engineering Infrastructure.** Site engineering infrastructure is proposed to be upgraded to support the facilities being delivered as part of the proposed works and to comply with modern statutory requirements. The high voltage feed to the base is proposed to be augmented to provide the capacity for the F-35A facilities and stormwater infrastructure upgraded to accommodate the increase of impervious area on the base. Roads and car parking have been designed based on the projected population of the existing facilities and the proposed works.
- 167. **Through Life Support.** Through life support for the aircraft system will be provided by the Air Combat Systems Program Office and the Lockheed Martin National Operations Centre. These organisations are planned to be accommodated in the Flexible Working Accommodation proposed for delivery by the RAAF Base Williamtown Redevelopment Stage 2 project. Minor refurbishment of the Tactical Fighter Systems Program Office

buildings is proposed to be undertaken to accommodate these organisations as an interim measure until the new accommodation is available.

168. **Displaced Facilities.** The following existing base facilities will be displaced by the siting of the proposed F-35A Operational Precinct and are proposed to be replaced by the project:
- a. Some access roads;
 - b. Liquid Dry Breathing Oxygen storage; and
 - c. Bureau of Meteorology weather station.

Tindal Works

169. The proposed works at RAAF Base Tindal will include an F-35A Operational Precinct, upgrades to the on-base warehouse, minor pavement upgrades, counter measure storage and preparation facilities, engineering infrastructure and replacement of displaced elements.
170. **F-35A Operational Precinct.** The proposed F-35A Operational Precinct will provide a secure precinct which will be the basis of F-35A operations for both No. 75 Squadron and visiting Australian squadrons at RAAF Base Tindal. A 3D drawing of the proposed precinct is included in Attachment 12. The F-35A Operational Precinct includes the following facilities:
- a. **75 Squadron Headquarters Facility.** The headquarters facility will allow No. 75 Squadron to exercise effective command and control of F-35A operations and to prepare for exercises and deployments. The proposed facility is consistent in layout and functionality to the squadron headquarters being constructed at RAAF Base Williamtown. A 200 person secure briefing room will provide a facility for briefings involving multiple squadrons during exercises and operations. The hangar will have five aircraft spaces in accordance with the manufacturer's recommendation. A floor plan of the proposed facility is included in Attachment 13. The squadron headquarters will accommodate up to 270 personnel.
 - b. **Off-Aircraft Maintenance Facility.** Off-aircraft maintenance for No. 75 Squadron will be conducted across a number of buildings utilising both new build and adaptive reuse. Building 521 (Non-Destructive Inspection and Auxiliary Mission Equipment Storage) and Building 540 (Ground Support Equipment Maintenance and Engine Storage) are proposed to be reused, while other off-aircraft maintenance functions will be performed in a new facility opposite the No. 75 Squadron Hangar.

- c. **Detached Training Facility.** The proposed detached training facility will provide facilities and training infrastructure to support continuation training for No. 75 Squadron personnel. It includes administration areas, classrooms, full mission simulators and a deployable mission rehearsal trainer. A floor plan for the proposed facility is included in Attachment 14.
 - d. **Parking Apron.** The proposed consolidated parking apron will provide a secure area for aircraft to be parked when not flying and where minor maintenance tasks may be conducted. The parking apron has been designed to accommodate 16 aircraft in two shelters, orientated in an east-west direction. The spacing between aircraft shelters has been based on refuelling safety requirements and the jet blast safety distance required behind the aircraft. The apron will be fenced in accordance with the Australian and USA security requirements.
 - e. **Manual Aircraft Wash and Engine Wash.** A manual aircraft wash and engine wash facility is proposed to be provided adjacent to the existing No. 75 Squadron apron, providing access to both No. 75 Squadron and visiting squadron aircraft.
171. **Base Warehouse.** The existing base warehouse is proposed to be fitted out to meet the functional and security requirements for the F-35A logistics system. The remote location of RAAF Base Tindal necessitates a higher level of stockholding than the equivalent levels for the RAAF Base Williamtown squadrons. The warehouse requirements have been determined to ensure adequate support of the F-35A in these circumstances.
172. **Pavement Upgrades.** Aircraft hold points on the taxiways, Ordnance Loading Aprons, and the runway thresholds are proposed to be upgraded to rigid pavement to prevent deterioration due to the F-35A's heat output and tyre pressure. A drawing showing all pavement works proposed for RAAF Base Tindal is included in Attachment 15.
173. **Counter Measure Storage and Preparation.** New facilities are proposed to be constructed in the vicinity of the existing explosive ordnance storage area for the storage and preparation of counter measures.
174. **Transit Accommodation.** As noted earlier, Defence anticipates that much of the construction workforce will come from outside the Katherine area. Accordingly, as an efficiency measure and to minimise the impact of the project on the availability of housing in the area, Defence proposes to develop a construction accommodation facility for the workforce. Long term

benefits will be realised by resolving the existing shortfall of transit accommodation on base by refurbishing and retaining the construction accommodation once construction is complete.

175. **Engineering Infrastructure.** Site engineering infrastructure is proposed to be upgraded to support the facilities being delivered as part of the proposed works and to comply with modern statutory requirements. The high voltage feed from the base entrance to the No. 75 Squadron precinct is in poor condition and will need to be upgraded to provide the capacity for the F-35A facilities.

Forward Operating Base Works

176. A lightweight facility is proposed to be constructed at each of the forward operating bases to store the supporting operation and maintenance modules that will accompany deployed squadrons. The works will also include a compound and passive security measures.

Defence Establishment Myambat Works

177. Two new earth covered bunkers are proposed to be constructed adjacent to the existing bunkers at Defence Establishment Myambat. They will augment the existing storage capacity to meet the projected demand for the F-35A ordnance.
178. A frangible counter measure storage facility is proposed to be constructed for the wholesale storage of F-35A counter measures.

Demolition and Reuse of Existing Structures

RAAF Base Williamtown

179. The Liquid Dry Breathing Oxygen facility, the Bureau of Meteorology weather station and three structures in the current explosive ordnance precinct will need to be demolished to make way for the proposed F-35A Operational Precinct. All of these structures are proposed to be replaced in new locations appropriate to their function.
180. The following structures are proposed to be re-used by the project at RAAF Base Williamtown:
 - a. Building 338 (Base Explosive Storage) will be retained with minor modifications for non-explosive storage in the consolidated explosive ordnance area;

- b. Sections of Buildings 283 or 555 (Tactical Fighter Systems Program Office) will be fitted out to provide temporary accommodation for the Air Combat Systems Program Office and National Operations Centre until the Flexible Working Accommodation building is constructed via the RAAF Base Williamtown Redevelopment Stage 2 project; and
- c. The existing Drop Tank Store and a number of other minor facilities in the Classic Hornet precinct will continue to be used by the F-35A squadrons for the same purpose without modification.

- 181. The existing Classic Hornet facilities will be vacated as each Classic Hornet squadron transitions to the F-35A. This process is expected to occur over the period 2019 to 2022.
- 182. A number of the existing Classic Hornet facilities are being considered for adaptive reuse under a separate project to allow relocation of units currently located in ageing buildings in high noise exposure areas.
- 183. Buildings that have not been identified for adaptive reuse or are assessed as having reached the end of their serviceable life will be demolished.

RAAF Base Tindal

- 184. The dangerous goods store needs to be demolished to make way for the proposed new Detached Training Facility. This building is proposed to be replaced in a nearby location.
- 185. The following structures are proposed to be re-used by the project at RAAF Base Tindal:
 - a. Building 521 (Non-Destructive Inspection and Auxiliary Mission Equipment Storage) and Building 540 (Ground Support Equipment Maintenance and Engine Storage) are proposed to be adaptively reused for off-aircraft maintenance;
 - b. The existing No. 75 Squadron hangar and corrosion control facility will be reused with minimal modification for use by visiting squadrons and for storage of deployable simulator and mission planning facilities; and
 - c. The existing No. 75 Squadron Ordnance Loading Aprons will be reused, with only minor pavement upgrades, for loading of weapons on aircraft, as well as for parking positions for visiting F-35A squadrons.

186. The existing Classic Hornet facilities will be vacated as No. 75 Squadron transitions to the F-35A. This process is expected to occur in about 2022.
187. A number of the existing Classic Hornet facilities are being considered under a separate project for adaptive reuse by visiting squadrons as working accommodation, hangars and workshops.
188. Facilities that have not been identified for adaptive reuse or are assessed as having reached the end of their serviceable life will be demolished.

Land Acquisition, Zoning and Approvals

189. With the exception of some of the works at RAAF Base Williamtown, all project elements are located within the boundaries of Commonwealth owned and Defence controlled land. For these elements, no civilian authority design or construction approvals are required, although the works will comply with the relevant standards and regulations (where applicable).
190. At RAAF Base Williamtown, external works are required to provide a construction access, and to augment the high voltage feed to the base. In these cases, Defence will seek necessary approvals from Port Stephens Council and the NSW Government prior to works commencing.
191. Access will be required to adjoining land, not owned by the Commonwealth, at RAAF Base Williamtown to facilitate the works required to comply with the statutory requirements for the runway extension. At the south-eastern end constraints will need to be imposed to limit the height of trees and structures so that they do not impinge on the obstacle clearance surface for the runway. At the north-western end, Defence will require access to land currently owned by NSW Government to clear or lop vegetation and install high intensity approach lighting.
192. Acquisition of land from the current owners may be required if access to the required land or imposition of the constraints is not achievable, economic or practical. Defence has engaged with the affected parties and will conduct negotiations and any acquisition of interest in land that is necessary, in accordance with the *Lands Acquisition Act 1989* (Cth).

Details of Applicable Codes and Standards

193. The design will comply with all relevant and current Defence Standards, Australian Standards, Codes and Guidelines including, but not limited to, the following:
 - a. National Construction Code, 2012;

- b. Defence Aerodrome Design Manual;
- c. Defence Manual of Fire Protection Engineering; and
- d. Defence Estate Quality Management System (DEQMS).

Planning and Design Concepts

- 194. The project will provide safe, functional, and cost effective facilities of energy efficient design suitable for the local climate, and of a style consistent with the character of the sites and other comparable Defence facilities. The requirement to comply with US security requirements in the RAAF operational context is a fundamental design objective which has been balanced against other design factors.
- 195. Infrastructure services planning and structure design has been developed taking into account future flexibility. The design is based on projected demand and Defence policies for redundancy and reliability.
- 196. Where security requirements permit, buildings have been planned in such a manner as to allow ease of adaptability of internal spaces over time by utilising a structural frame with lightweight partition walls that can be modified if requirements change. Office spaces are in accordance with the latest Defence accommodation standards. A high ratio of open plan workstations to enclosed offices will enable greater flexibility in planning for surges in operation. Per person spatial allowances are in accordance with Defence standards and comparable to other Defence facilities.
- 197. Where possible and appropriate, buildings have been designed and sited to allow for future expansion should that be required. For example the siting of the training wings to the 2 Operational Conversion Unit Complex allows for future expansion along their length and the off-aircraft maintenance facility has been designed to enable future expansion without impacting on the nearby ground support equipment shelters.
- 198. The design has adopted techniques and materials that are sustainable, robust, have low or no maintenance requirements, and reduce whole of life costs. They are consistent with the capacity and capability of the local construction industry to reduce risk on site with respect to both program and quality.

Acoustics

199. The proposed facilities have been sited and designed in accordance with AS2021:2000 Acoustics – Aircraft noise intrusion – Building siting and construction, and AS/NZS2017:2000 Acoustics – Recommended Design Sound Levels and Recommended Reverberation Times for Building Interiors. An acoustic survey of noise exposure of on-site personnel from Hornet and Hawk aircraft taking off and landing at RAAF Base Williamtown has been completed to inform the design with adjustments made based on measurements taken for the F-35A in the United States.

Fire Protection and Security Measures

200. All construction and fire protection requirements will, as a minimum, be in accordance with the provisions of the Building Code of Australia, the Defence Manual of Fire Protection Engineering and all other applicable Codes and Standards.
201. In accordance with Government initiatives to improve physical security arrangements across Government Departments, advice from designated security authorities has been incorporated in the design solutions for the proposed facilities as appropriate. The security threat assessment has been reviewed during the detailed design phase and the facilities will be secured as appropriate to the classification level required for activities conducted.
202. Security protection will be provided in accordance with the Defence Security Manual and US requirements. This requires high levels of base physical security including enclosures/compounds, surveillance technology, security guarding, and enhanced physical security measures for facilities. These protection measures are in addition to the general requirements for armouries, secure storage and maintenance areas.

Environmental Sustainability of the Project

203. The Commonwealth is committed to Ecologically Sustainable Development (ESD) and the reduction of greenhouse gas emissions. Defence reports annually to Parliament on its energy efficiency targets established by the government as part of its commitment to improve ESD. Defence also implements policies and strategies in energy, water and waste to improve natural resource efficiency and to support its commitment to the reduction of energy consumption, potable water consumption and waste diversion to landfill.

204. The ESD targets and requirements for Defence projects shall comply with the Defence Building Energy Performance Manual. The ESD targets and measures for this project have been balanced with other requirements for Defence buildings such as functional and security requirements, heritage considerations and Work Health and Safety. Defence ESD policies have been addressed by adopting cost-effectiveness and ecologically sustainable development as key objectives in the design development and delivery of new facilities.

Energy Targets

205. Defence has adopted the principles of the Energy Efficiency in Government Operations policy in relation to office accommodation. For those office buildings that have a floor area of greater than 2000m² where the office area comprises greater than 50 per cent of the total building area, such as the 2 Operational Conversion Unit Complex and Squadron Headquarters, the whole building will target 4.5 stars under the National Australian Built Environment Rating System. An energy management plan will be developed for each building for implementation by Defence.
206. For all other mixed-use buildings that have office floor area of less than 2000m² or where the office area does not comprise 50% of the total building area, separate digital energy monitoring devices will be installed and office lighting will not exceed 10W/m².

Details of Compliance with Local, State/Territory and Commonwealth Water and Energy Policies

207. All buildings will be designed, constructed, operated and maintained in order to use energy and water as efficiently as possible and comply with the following statutory and Defence requirements:
- a. Parts J1 – J8 of Section J of the National Construction Code – Building Code of Australia 2012;
 - b. Building Energy Performance Manual, November 2011;
 - c. The Energy Efficiency in Government Operations policy;
 - d. National Australian Built Environment Rating System;
 - e. Defence Energy Policy; and
 - f. Department of Defence Water Management Strategy.

Measures to Reduce Energy and Water Use

208. Passive design features have been embedded in building design throughout the project including:

- a. Where possible given the constraints of the site, orientating the buildings to minimise east and west solar gain;
- b. Natural light is utilised where practical and artificial lights are linked with daylight sensors to limit energy use;
- c. “Energy Star” compliant appliances and equipment will be installed where available;
- d. Gas Hot Water systems will be utilised for domestic hot water;
- e. Artificial lighting in the building will utilise energy efficient lighting and incorporate lighting control systems such as daylight sensing, occupancy sensors and time switches to minimise energy usage; and
- f. Energy metering will be installed to separately monitor regulated and unregulated energy usage of each building and all the main loads. Metering will be linked back to the Building Management System to allow monitoring of energy consumption.

209. Efficient water use is a key aspect of the design. Key water saving measures will include:

- a. All taps and toilets will be water efficient and rated as at least 4 Star Efficiency Labelling and Standards (WELS) and showerheads rated as 3 Star WELS;
- b. Pressure limiting valves will be installed to limit pressure at all appliances;
- c. Sub-metering of all major water supplies to each new building; and
- d. Rainwater harvesting has been provided complete with rainwater storage tanks and pressure pumping to supply localised landscaping, toilets in some buildings and wash down for pavement areas.

Provisions for People with Disabilities

210. All new buildings are being designed to comply with the requirements of the Disability (Access to Premises – Buildings) Standards 2010 and National Construction Code – Building Code of Australia. These are the applicable reference documents for all new building work, and in turn reference relevant Australian Standards for Access and Mobility. In addition, in

line with Defence's policy 'Disabled Access and Other Facilities for Disabled Persons', disabled access to all buildings is required.

211. Access to, and connections between buildings and facilities on the site, including car parking, will also be designed in accordance with relevant access standards.

Workplace Health and Safety Measures

212. The proposed facilities will comply with the requirements of the *Work Health and Safety Act 2011* (Cth), the Department of Defence Work Health and Safety Manual and operate in accordance with an approved Work Health and Safety Plan.
213. The Australian Government is committed to improving work health and safety outcomes in the building and construction industry. The Managing Contractor holds Work Health and Safety accreditation from the Office of the Federal Safety Commissioner under the Australian Government Building and Construction Occupational Health and Safety Accreditation Scheme.
214. The design for the works has been developed in accordance with the safety in design provisions of the *Work Health and Safety Act 2011* (Cth).
215. The construction of the works will be managed in accordance with the *Work Health and Safety Act 2011* (Cth).
216. All construction sites will be secured appropriately to prevent public access, or access by unapproved Defence personnel, during the construction period. No special or unusual public safety risks have been identified.

Childcare Provisions

217. This project will not significantly increase the base population or affect the requirement for childcare places. No additional childcare facilities are being provided under this project.

Landscaping

218. Landscape design at RAAF Base Williamstown has considered and elaborated upon the principles established in the Base Landscape Master Plan. Within the F-35 Operational Precinct the landscape principles seek to compliment the architecture of the buildings and enhance the base wide experience, whether on foot, bicycle or vehicle.

219. The landscape design at RAAF Base Tindal will be developed further with the design. It will reflect the principles currently used for landscape design and will complement both the natural environment and architecture of the base.

Cost Effectiveness and Public Value

Outline of Project Costs

220. The estimated out-turn cost of the project is \$1,477.4M, excluding Goods and Services Tax. The cost estimate includes the construction costs, management and design fees, furniture, fitting and equipment, contingencies and escalation allowances.
221. An increase in the net operating costs is anticipated due to the addition of new facilities and infrastructure which will increase the associated facilities maintenance, cleaning and utilities expenses.

Details of Project Delivery System

222. A Project Manager/ Contract Administrator has been appointed by the Commonwealth to manage the project works and the associated administration of contracts in the planning phase. A Managing Contractor has been appointed using the Department of Defence – Managing Contractor form of contract, to manage design development to meet the needs of Defence user groups in the Planning Phase.
223. Subject to Parliamentary approval of the project, satisfactory performance of the Managing Contractor in the Planning Phase, and reaching agreement on the Delivery Phase costs and program, the Managing Contractor may be further engaged to procure trade based work packages and construct the proposed works. The Managing Contractor will provide the Commonwealth with professional engineering advice on buildability efficiencies and provide facilities fit for purpose with associated warranties for the project works in accordance with the Contract Brief.
224. The Managing Contractor will actively promote the engagement of small to medium enterprises in design and construction trade packages. The Managing Contractor will deliver the project works in accordance with, but not limited to; all current Building Code 2013 guidelines, Commonwealth Procurement Rules, National Construction Code – Building Code of Australia, Australian Standards, and Workplace Health and Safety legislation.

225. The works to be constructed at the Forward Operating Bases are minor in nature and, in some cases, are located in remote areas. Where it represents value for money to the Commonwealth, these works will be delivered either by contractors engaged to deliver other projects on the same base, or by the local region. These works will be coordinated by the Project Manager / Contract Administrator.
226. The external works required for the augmentation of the high voltage feed to RAAF Base Williamtown will be delivered by Ausgrid.

Construction Program / Project Schedule

227. Subject to Parliamentary approval of the project, construction is expected to begin in January 2015 at RAAF Base Williamtown with all construction being completed by early 2022. Works required for the operation of the first squadron will be completed by October 2018 in preparation for the arrival of the first aircraft in Australia.
228. Works at RAAF Base Tindal are expected to begin by 2017, with completion expected in 2022. Some rescheduling of works may be undertaken to manage risks such as the availability of trade contractors to perform the work.
229. Works at the forward operating bases are planned for 2018 and 2019, but may be delivered earlier if it represents value for money to the Commonwealth.
230. All works are expected to be completed by the end of 2022.

Public Value

231. The proposed works are an enabler for the RAAF's Air Combat Capability. The proposed works will provide a workplace that is fit for purpose and allows personnel to undertake their duties, roles and responsibilities in an environment that meets a specific task. The works will also improve personnel morale, impacting on recruitment and retention, which will have a flow-on impact to capability support levels.

Amount of Revenue to be Derived from the Project

232. No revenue is expected to be derived from the project.

F-35A Lightning II Joint Strike Fighter

Conventional Take-Off and Landing



Australia's Next Generation Air Combat Capability

Fifth Generation Multi-Role Fighter - potent and flexible, cornerstone of Australia's defence posture

DMO

The Australian Government remains committed to acquiring the fifth-generation F-35A Joint Strike Fighter (JSF) aircraft, with three operational squadrons planned to enter service beginning around 2020 to replace the F/A-18A/B Hornet aircraft.

"The Joint Strike Fighter provides the stealth technology, advanced sensors and weapons, networking and data fusion capabilities required to maintain an air combat advantage into the foreseeable future. The Joint Strike Fighter will also provide a highly capable land and maritime strike capability."

Defence White Paper 2013
3 May 2013

NEW AIR COMBAT CAPABILITY PROJECT

AIR 6000 or the New Air Combat Capability (NACC) Project aims to introduce a new air combat capability that will meet Australia's air combat needs out to 2030 and beyond.

The F-35 is a fifth-generation, stealthy, multi-role fighter being developed for the United States and eight international partner nations, including Australia. Three variants are being produced, albeit with a very high level of commonality: the Australia-preferred Conventional Take-Off & Landing (CTOL) variant, a Short Take-Off & Vertical Landing (STOVL) variant and a Carrier Variant (CV). When integrated into a networked Australian Defence Force, Australia's F-35A will fulfil the functions of air dominance and strike capability currently provided by F/A-18A/B Hornets and F/A-18F Super Hornets.

The F-35s low observable stealth allows it to safely enter areas without being seen by radars that 4th generation fighters cannot evade. The combination of the stealth features, the F-35s active

electronically scanned array (AESA) radar technology, advanced voice and data link communications, and the aircraft's ability to carry weapons internally means the F-35 can engage targets at long ranges without detection and use precision weapons to successfully complete air-to-ground and air-to-air missions. In this configuration, the F-35 will enter the battlespace first, clearing the way for legacy coalition forces.

In November 2009, the Government approved funding for Phase 2A/B (Stage 1) to acquire 14 CTOL F-35A aircraft, support and enabling elements required to establish the initial pilot and maintainer training capability in the United States and to allow conduct of operational test in the United States and Australia. Australia's first two F-35As will be delivered in 2014 and will be used to support Australian pilot training in the US. In May 2012, the Government announced a two year deferral to the acquisition of the JSF aircraft beyond the first two.

Phase 2A/B (Stage 2) will consider approving funding for the next tranche of (up to) 58 CTOL F-35A aircraft and support and enabling elements to form the first three operational squadrons and training unit.

On current plans, AIR 6000 Phase 2A/B, the first phase of the acquisition, will consider acquiring up to 72 CTOL F-35A aircraft to establish operational squadrons, a training squadron and necessary supporting/enabling elements to replace the current F/A-18A/B Hornet capability.

A subsequent AIR 6000 Phase 2C is planned to acquire the fourth operational squadron to bring the total number of aircraft to around 100. A decision on Phase 2C is not expected before 2019 and is linked to the withdrawal of the F/A-18F Super Hornets later next decade.

Program Characteristics

ATTACHMENT 1

Overview

JSF Program value (SAR 2012)	US\$391.2b
Total planned orders	Approximately 2600 (US and UK)
Potential additional orders	In excess of 500
First CTOL aircraft flight	15 Dec 2006
First STOVL aircraft flight	11 Jun 2008 (first vertical landing on 18 Mar 2010)
First CV aircraft flight	06 Jun 2010
First night flight	18 Jan 2012
First night refuelling mission	21 Mar 2012
First in-flight weapons release	17 Oct 2012
First in-flight dual refuelling	23 Jan 2013
USAF announces IOC	31 May 2013
First in-flight missile launch	5 Jun 2013

System Development & Demonstration Phase

Commencement date	Oct 2001
Duration	16 years
SDD phase value	In excess of US\$50b
Activities	System development, production of 20 test aircraft, capability demonstration, support system and supply chain development and risk reduction

Production, Sustainment & Follow-On Development Phase

Commencement date	2007
Duration	Life of Type (40 years +)
	<ul style="list-style-type: none"> Activities Low Rate Initial Production leading to Full Rate Production of around one aircraft per day for Partners and Foreign Military Sales customers Sustainment of the total fleet on a global basis Block upgrades of air systems expected on a two-year cycle

Aircraft Characteristics (CTOL Variant)

Empty weight	Approximately 13,290 kg (29,300 lbs)
Internal fuel capacity	8278 kg (18,250 lbs)
Payload	8160 kg (18,000 lbs)
Maximum take-off weight	In excess of 22,700 kg (50,000 lbs)
Length	15.7 m (51.4 ft)
Wing span	10.7 m (35 ft)
Wing area	42.7 sq m (460 sq ft)
Speed	Mach 1.6
Combat radius (internal fuel & weapons)	Over 1,100 km (590 nautical miles)
Crew	One
Weapons	A wide selection of US and UK air-to-air and air-to-ground weapons including: Advanced Medium Range Air-to-Air Missile (AMRAAM), Joint Direct Attack Missile (JDAM), Small Diameter Bomb (SDB), laser-guided bombs and an internally mounted 25mm gun

CUSTOMER BASE & REQUIREMENTS

The F-35 is the first international collaborative development program for a U.S. combat aircraft. The JSF Program is expected to deliver about 2,600 aircraft to the U.S. and UK alone and a further 500+ aircraft to the other international partners and future third party customers.

Australia joined the System Development & Demonstration phase in October 2002 and subsequently joined the Production, Sustainment & Follow-On Development phase in December 2006.

Lockheed Martin is the prime contractor and its partners are Northrop Grumman and BAE Systems (UK). F-35 aircraft will be powered by Pratt & Whitney (F135).

DEFENCE SCIENCE AND TECHNOLOGY ORGANISATION SUPPORT

The Defence Science and Technology Organisation (DSTO) provides direct support to the AIR6000 New Air Combat Capability Project by supporting Defence and Government decision making (e.g. technical risk analysis on the air vehicle, mission systems, weapon systems, operational analysis).

AUSTRALIAN INDUSTRY SUPPORT

Australia's partnership in the JSF Program has provided Australian Industry the opportunity to become part of the F-35 global supply and support chain by competing for F-35 work, years before Australia will operate F-35 aircraft. More than 30 Australian companies have worked/are working on the F-35 and combined they have won hundreds of millions of dollars worth of business.

MORE INFORMATION

Official Defence JSF	www.defence.gov.au/dmo/about/domains/nacc.cfm
F-35 JSF Program	www.jsf.mil
Lockheed Martin	www.lockheedmartin.com/us/products/f35.html

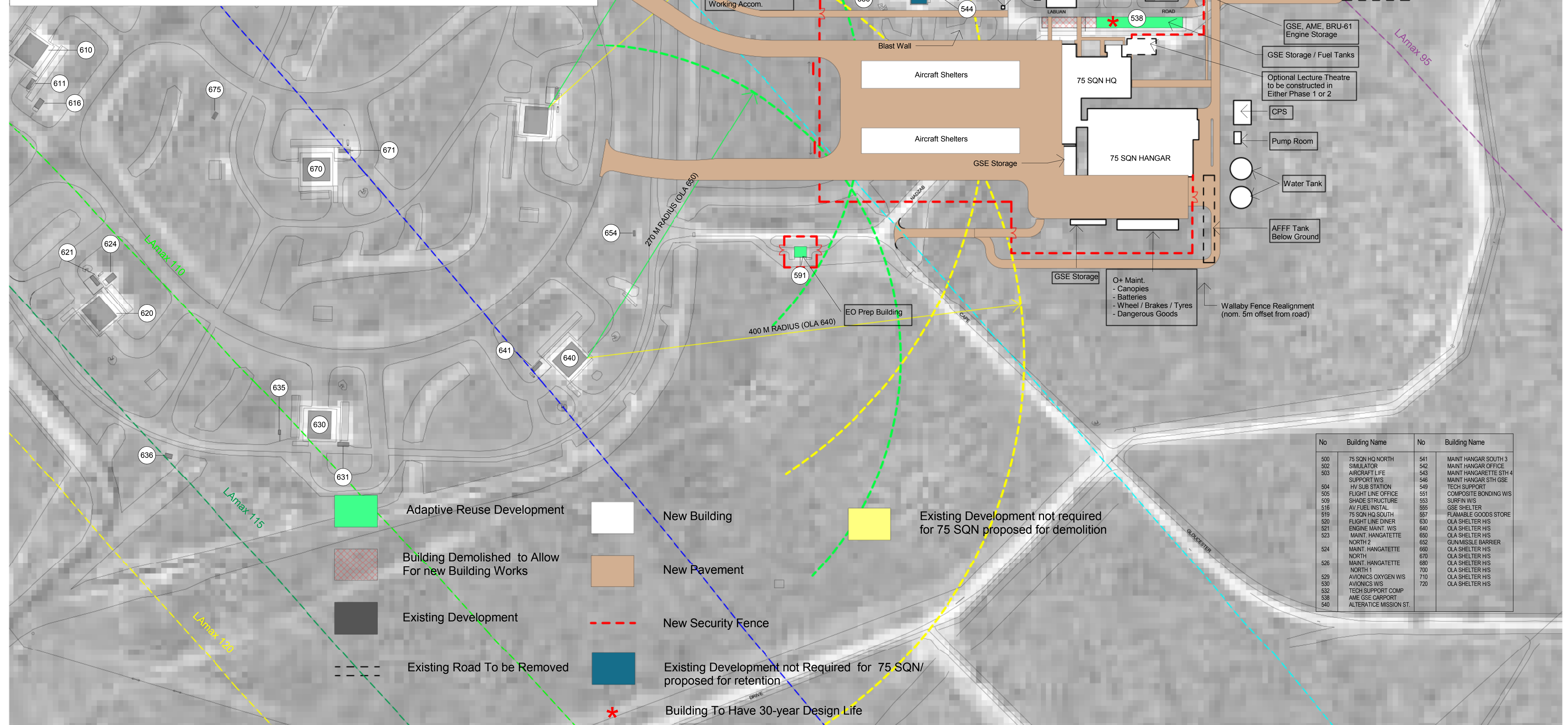


BASE LOCATION



- LEGEND
- MAIN OPERATING BASES
 - FORWARD OPERATING BASES
 - LOGISTICS ESTABLISHMENT





RAAF BASE TINDAL - F35A - PRECINCT PLAN

Attachment 5 – Stakeholder List

RAAF Base Williamtown

1. The following stakeholders have been consulted to date in relation to the facilities for the F-35A at RAAF Base Williamtown:
 - a. Department of Environment;
 - b. Port Stephens Council;
 - c. Newcastle Airport Limited;
 - d. Fighter World;
 - e. Hunter Water;
 - f. NSW Parks and Wildlife;
 - g. Ausgrid;
 - h. Worimi Land Council;
 - i. Hunter Net; and
 - j. The current owners of the properties which have been identified to be acquired.
2. The following stakeholders will be consulted in relation to the facilities for the F-35A at RAAF Base Williamtown:
 - a. Federal Member for Newcastle;
 - b. Federal Member for Paterson; and
 - c. Member for Port Stephens.

RAAF Base Tindal

3. The following stakeholders have been consulted to date in relation to the facilities for the F-35A at RAAF Base Tindal:
 - a. Katherine Council;
 - b. Northern Territory Government;
 - c. Master Builders Association, Northern Territory; and

4. The following stakeholders will be consulted in relation to the facilities for the F-35A at RAAF Base Tindal:
 - a. Federal Member for Lingiari
 - b. Federal Senators for the Northern Territory;
 - c. Member for Katherine; and
 - d. Northern Land Council.

Forward Operating Bases and Defence Establishment Myambat

5. The following stakeholders will be consulted during the community consultation period in relation to the facilities for the F-35A at the bases which are relevant to them:
 - a. Federal Member for Hunter (Defence Establishment Myambat);
 - b. Federal Member for Solomon (RAAF Base Darwin);
 - c. Federal Member for Herbert (RAAF Base Townsville);
 - d. Federal Member for Wakefield (RAAF Base Edinburgh);
 - e. Federal Member for Pearce (RAAF Base Pearce);
 - f. Federal Member for Durack (RAAF Bases Learmonth and Curtin); and
 - g. Federal Member for Leichhardt (RAAF Base Scherger).
6. Other local stakeholders, such as the state and local governments, local land councils and industry groups, will be consulted prior to construction commencing.

RAAF Base Williamtown - 3D Aerial Perspective

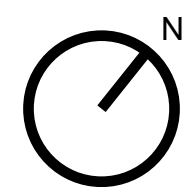




RAAF BASE WILLIAMTOWN

2 OPERATIONAL CONVERSION UNIT COMPLEX

GROUND FLOOR PLAN



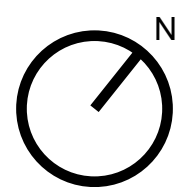


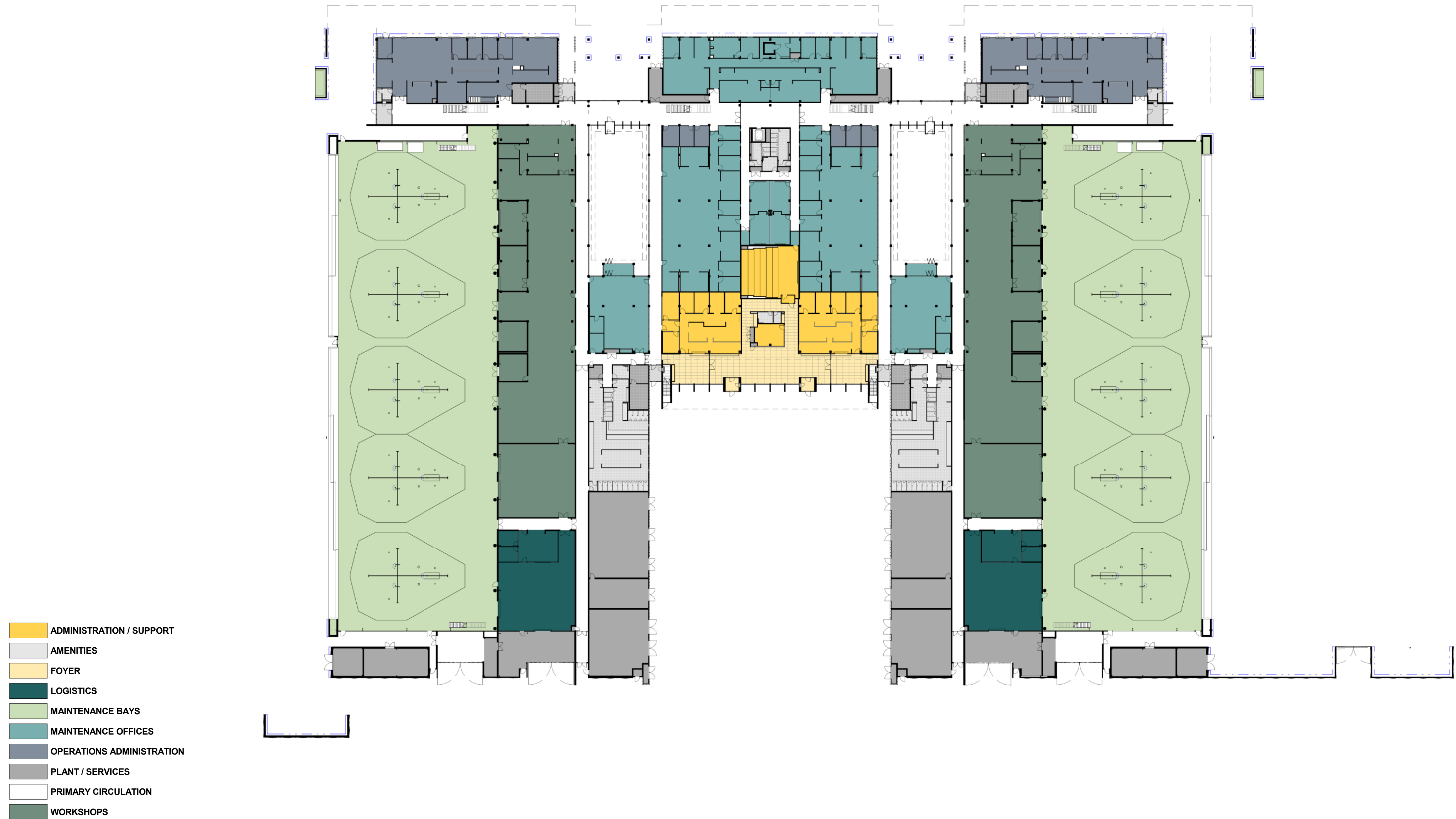
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- WORKSHOPS
- MAINTENANCE BAYS
- MAINTENANCE OFFICES
- OPERATIONS ADMINISTRATION
- OPERATIONS PLANNING / TRAINING
- PLANT / SERVICES
- PRIMARY CIRCULATION
- SHARED AMENITIES
- PILOT TRAINING
- MAINTAINER TRAINING

RAAF BASE WILLIAMTOWN

2 OPERATIONAL CONVERSION UNIT COMPLEX

LEVEL 1 PLAN

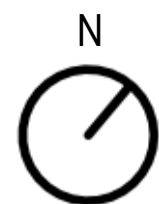


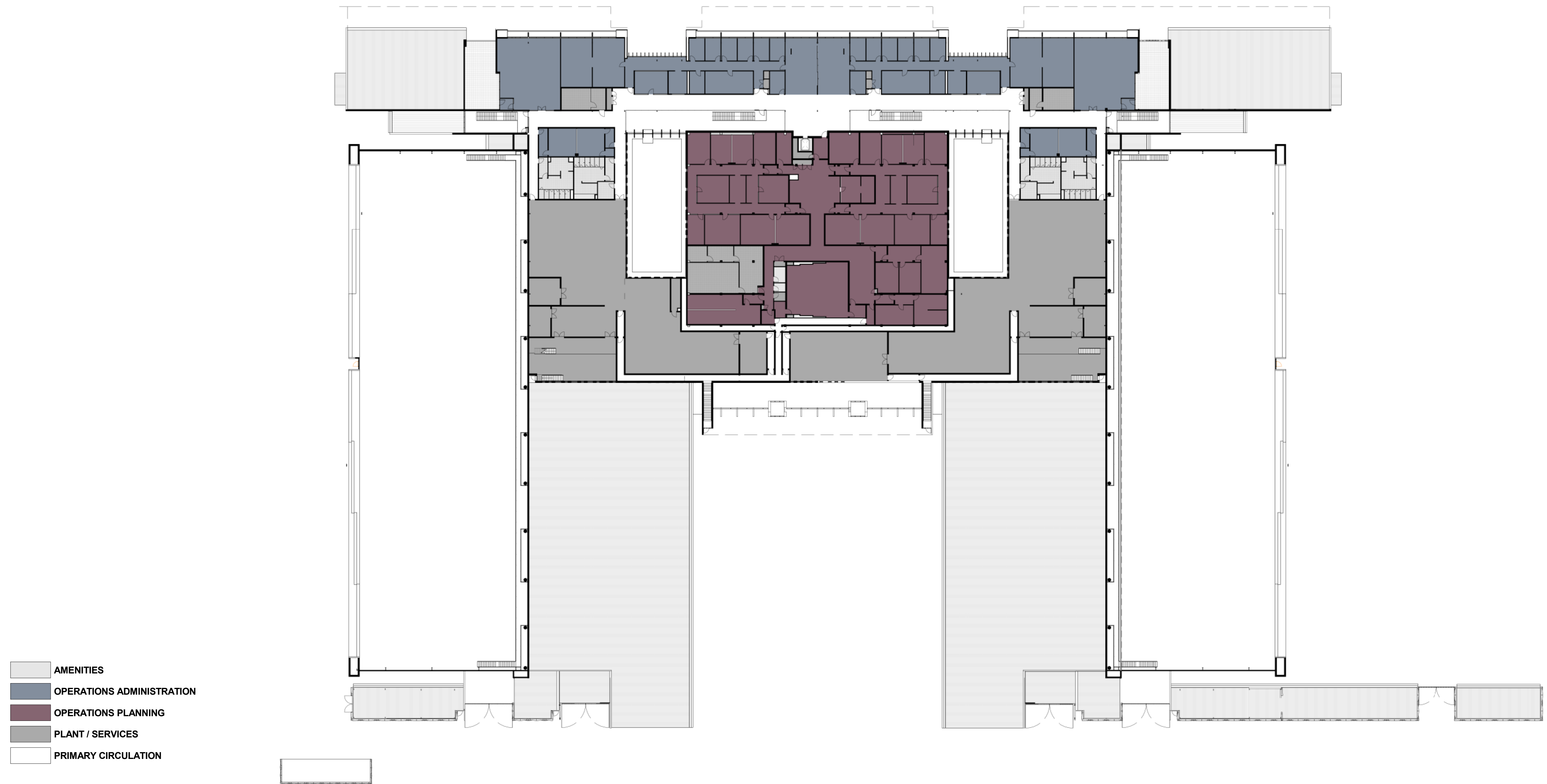


RAAF BASE WILLIAMTOWN

3 & 77 SQUADRON HEADQUARTERS FACILITY

GROUND FLOOR PLAN

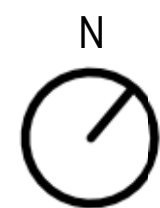




RAAF BASE WILLIAMTOWN

3 & 77 SQUADRON HEADQUARTERS FACILITY

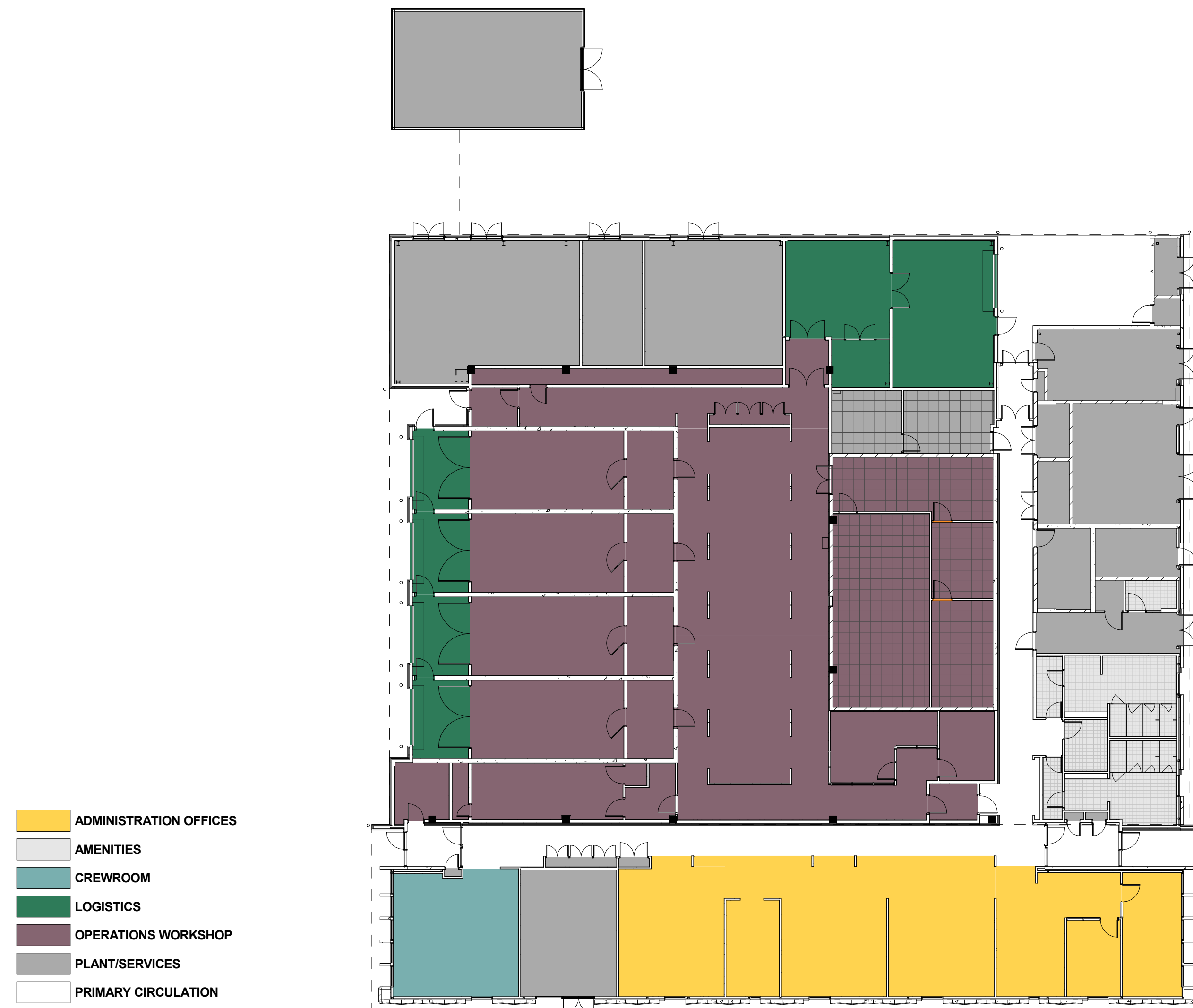
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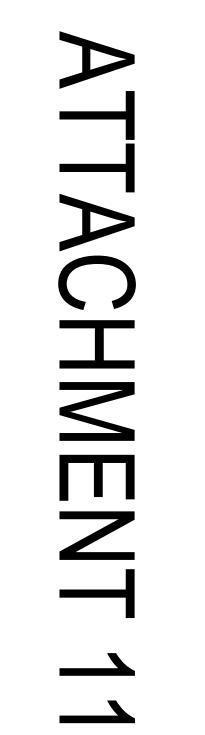


RAAF BASE WILLIAMTOWN OFF-AIRCRAFT MAINTENANCE FACILITY

GROUND FLOOR PLAN 

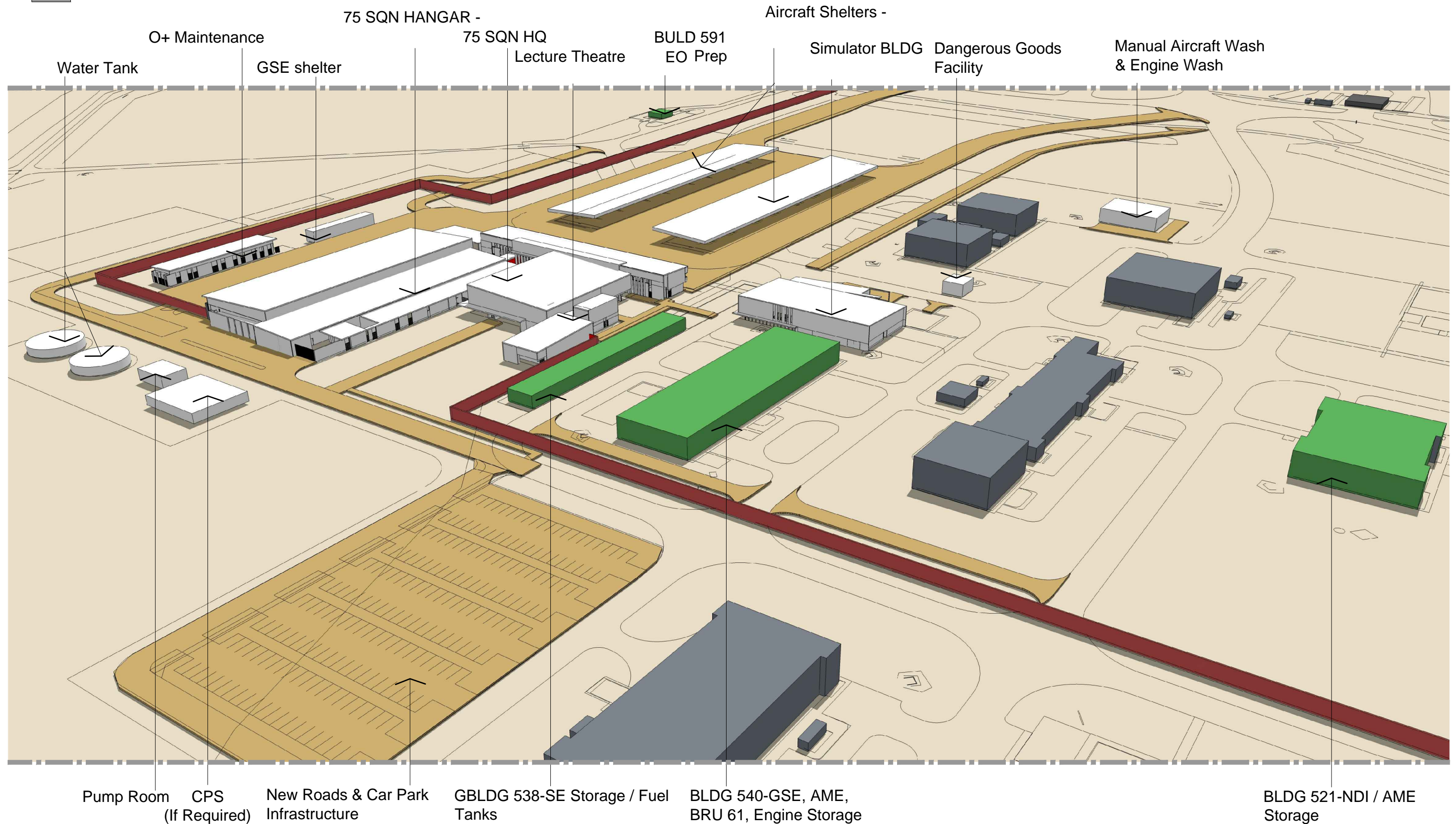


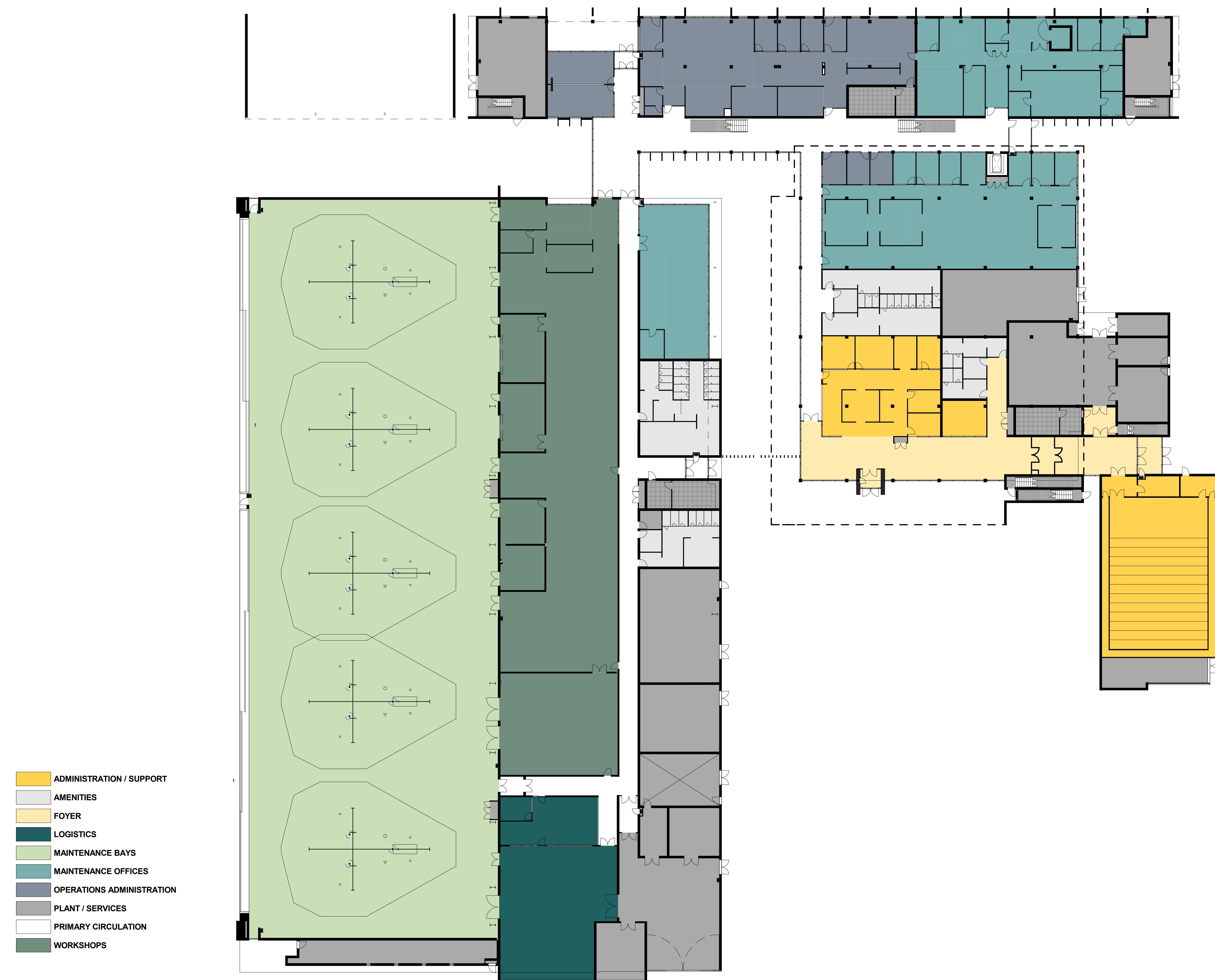
RAAF BASE WILLIAMTOWN -
OFF BOARD INFORMATION SYSTEMS CENTRE
GROUND FLOOR PLAN



RAAF BASE TINDAL - JSF OPERATIONAL PRECINCT

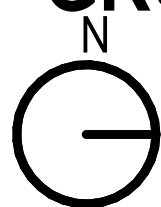
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- ADAPTIVE REUSE BUILDING
- EXISTING BUILDINGS NOT REQ FOR 75 SQN

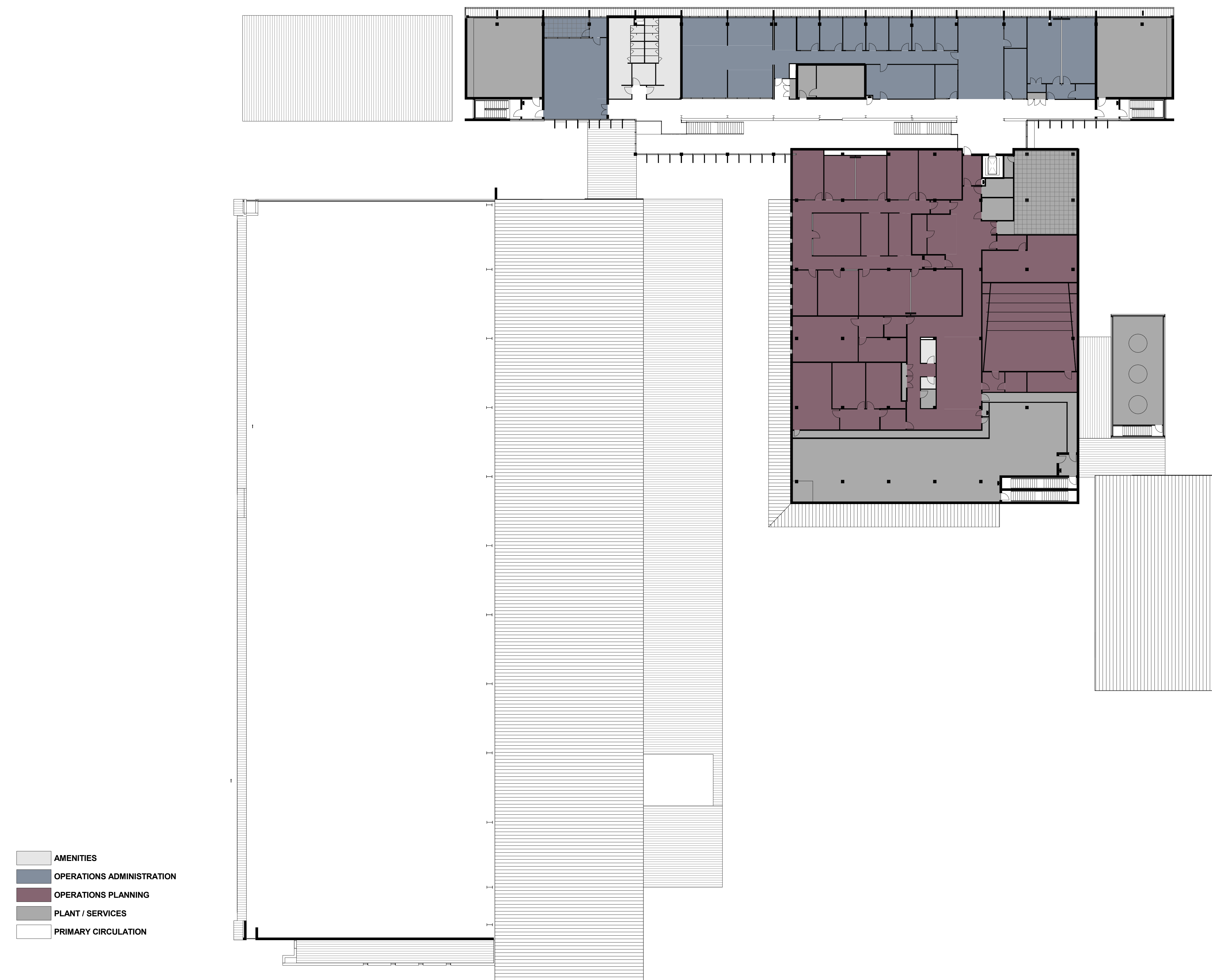




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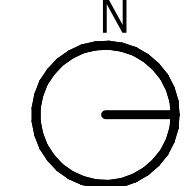
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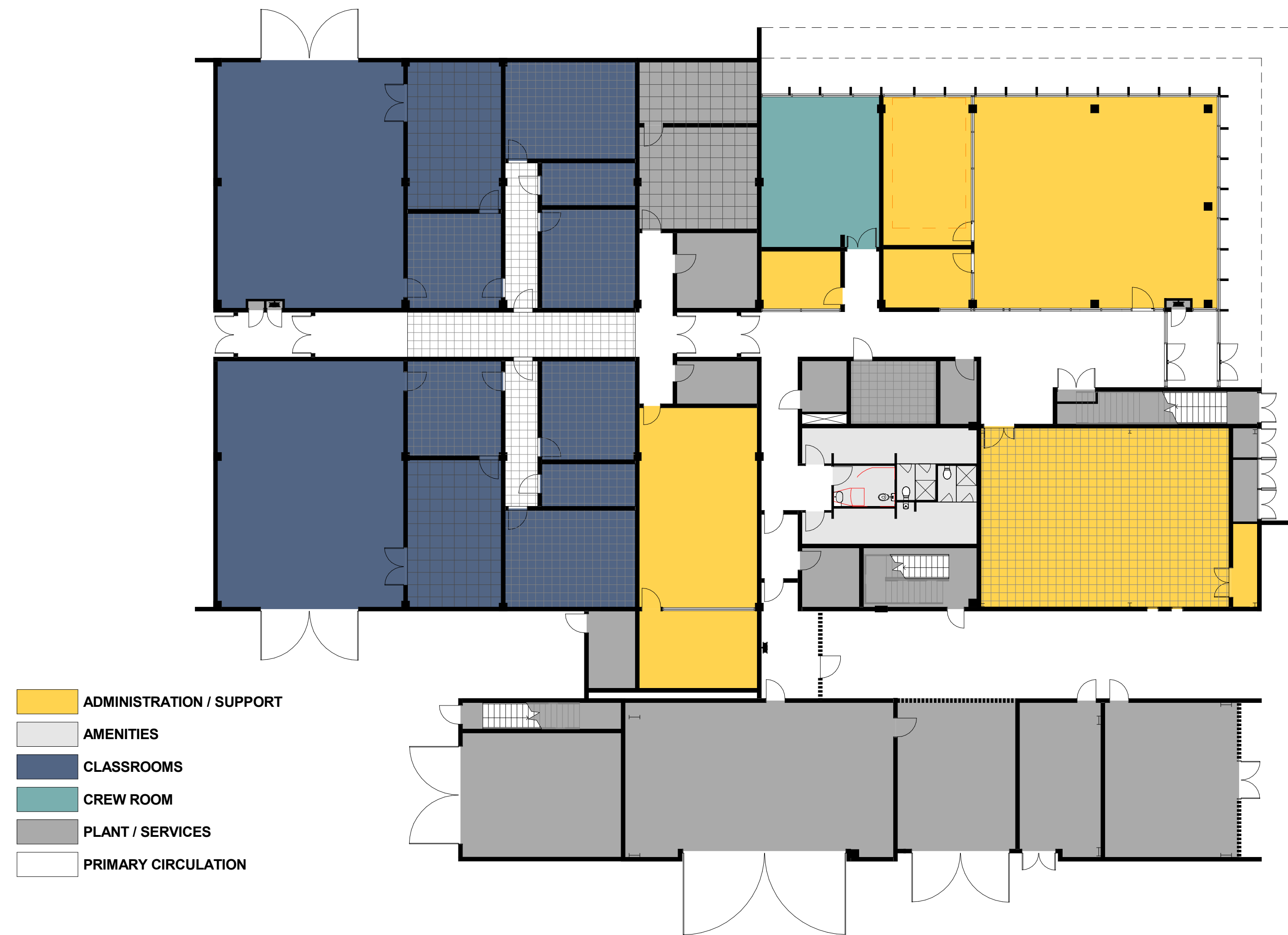




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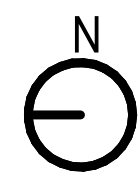
LEVEL 1 PLAN

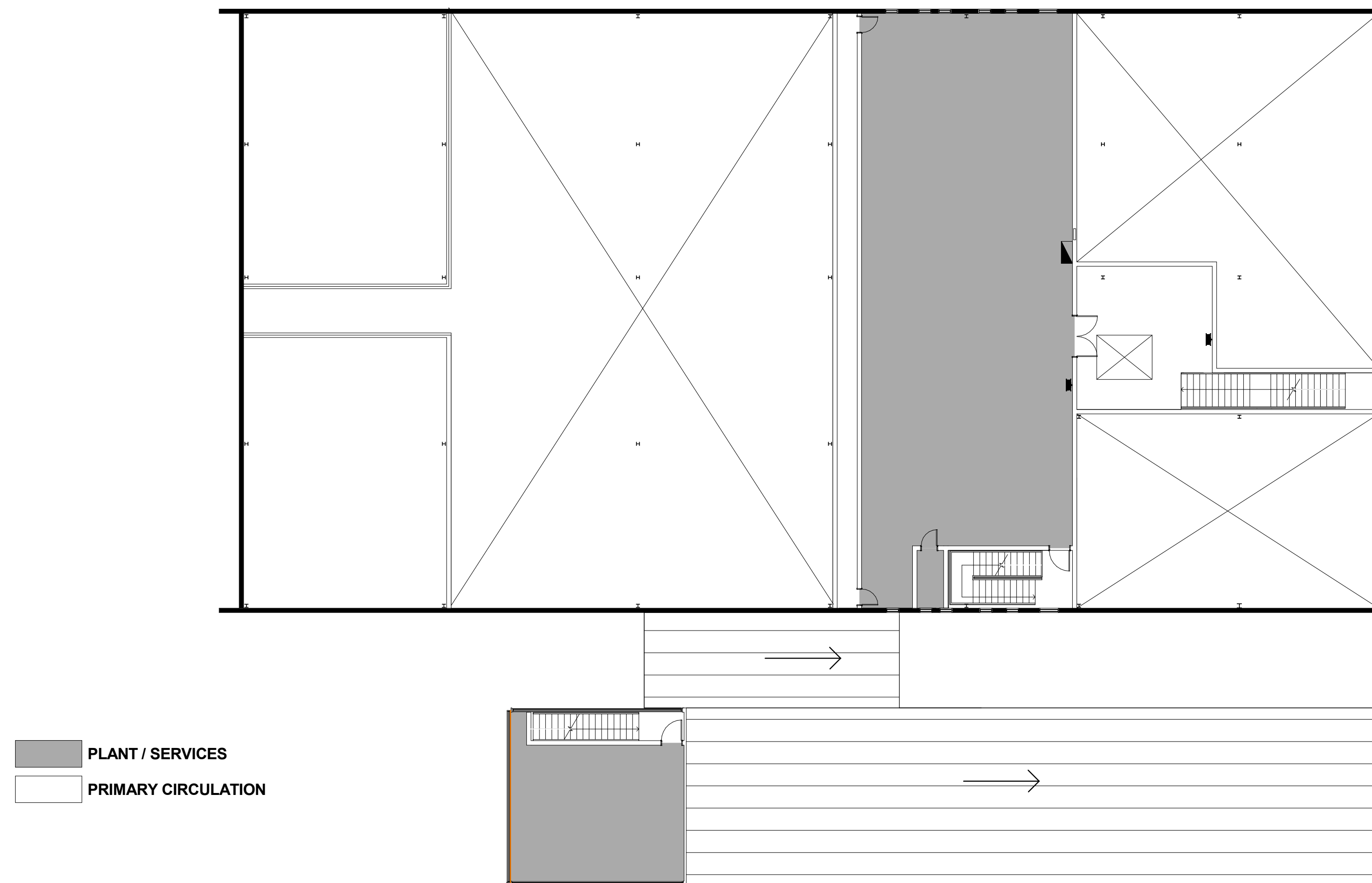




RAAF BASE TINDAL - DETACHED TRAINING FACILITY

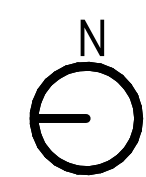
GROUND FLOOR PLAN





RAAF BASE TINDAL - DETACHED TRAINING FACILITY

LEVEL 1 PLAN



RAAF BASE TINDAL - PAVEMENT WORKS

LEGEND:

- NEW IPP PAVEMENT
- AIRCRAFT APRON

