RAAF Base Amberley, QLD

Archival Report associated with EPBC Approval Ref. EPBC 2014/7123

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Summary

This archival report has been prepared to comply with Condition 2 attached to an approval under sections 130(1) and 133 of the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) for the removal of 38 Commonwealth heritage listed buildings at RAAF Base Amberley. It has been prepared in accordance with the Queensland Department of Environment and Heritage (DEHP) Archival Recording of Heritage Places (2013).

This report contains the following information:

- A summary of the historical development of RAAF Base Amberley (Section 2.0);
- A statement of significance for the RAAF Base Amberley Group included on the Commonwealth Heritage List (CHL). This assessment makes reference to the CHL citation as well as the current Heritage Management Plan (HMP) (Converge, 2012) (Section 3.0);
- Technical descriptions of the 38 heritage buildings approved for removal under the EPBC Act Approval (ref. EPBC 2014/7123) (Section 4.0);
- Details of the oral history recording exercise undertaken with a list of the individuals who participated (Section 5.0);
- Descriptions of the methodologies employed for the archival photography, aerial photography, 3D terrestrial scanning and the production of the scale drawings (Section 6.0);
- An inventory of archival documents (Section 7.0) which includes:
  - a photographic archival report;
  - a current aerial photograph of the Heritage Precincts impacted by the approved action;
  - 3D scanning results presented as still models;
  - measured drawings of the 38 heritage buildings to be removed including floor plans, elevations and roof plans as specified in Condition 2 of the EPBC Approval; and
  - Oral history recording results including recording and transcripts.
- References (Section 8.0).

The archival recording results are provided in appendices.
1.0 Introduction

RPS has been engaged by Point Project Management on behalf of the Department of Defence to undertake an archival record of 38 Commonwealth heritage listed buildings at RAAF Base Amberley. The removal of the heritage buildings has been granted approval under sections 130(1) and 133 of the Environment Protection and Biodiversity Conservation Act 1999 (EPBC 2014/7123).

1.1 Background

The Amberley RAAF Base Group was included on the Commonwealth Heritage List (CHL) on 22 June 2004 (Place ID: 105650) for its historic, rarity and aesthetic heritage values. The Department of Defence has received approval under sections 130(1) and 133 of the Environment and Biodiversity Conservation Act 1999 for the removal of 38 heritage buildings and associated structures from the southern Flight Line area of RAAF Base Amberley (EPBC 2014/7123).

The buildings are within the CHL boundary and date from the World War II era. They occupy premium land adjacent to the runway on the southern part of the flight line area. The planned introduction of supporting infrastructure for two capability related projects, Battlefield Airlifter and Growler facilities Projects, has resulted in increased pressure on the Amberley Flight Line such that the removal of the buildings and related structures are necessary.

Condition 2 of the EPBC Act Approval requires the approval holder to undertake archival recording of all Commonwealth Heritage listed buildings in the project area prior to the commencement of the action. This entails the recording of 38 Commonwealth heritage listed buildings identified in Figure 1 and listed in the table in Section 4.0 of this report. The condition states that the recording must:

(a) Be in accordance with the guidelines set out in the Queensland Department of Environment and Heritage Archival Recording of Heritage Places (2013);
(b) Include an archival photographic record of the heritage buildings within the project area. This must be undertaken by a photographer with experience in compilation of archival records and include satellite imagery or photography from an aircraft to capture aerial images of the base;
(c) Include a technical description of the precincts, buildings and operations, as well as oral history accounts with people associated with the airbase;
(d) Include a description of the equipment and techniques employed in compilation of the record;
(e) Include a catalogue of all images, referenced to location plans;
(f) Include measured drawings, comprising floor plans, elevations of each building element and roof plans. These must include a description of the measurement techniques employed to produce drawings;
(g) Include 3D digital recording of the assets in their current context in order to generate virtual models of the place;
(h) Be lodged with the National Archives of Australia, the State Library of Queensland’s John Oxley Library and the Ipswich Central Library; and
(i) Be available to view online at no monetary cost, in an easily accessible form, from the State Library of Queensland’s John Oxley Library or similar website, for at least the life of the approval.

The archival recording exercise has been completed to ensure compliance with the above condition and best practice standards, in particular, Archival Recording of Heritage Places (DEHP, 2013).
Figure 1 Heritage Precincts

Legend
- Heritage Structures
- Other Structures
- Roads
- School Precinct
- Hangar Precinct
- WWII Precinct
- Command and Administration Sub-Precinct

Figure 1: RAAF Base Amberley - Heritage Precincts
1.2 Scope of Report

The scope of this report has been determined by the requirements set out in EPBC Act Approval Condition 2 (EPBC 2014/7123) reproduced above and the DEHP Guideline Archival Recording of Heritage Places (July, 2013).

The following table describes the scope of this report with reference to each section and appendix. Where relevant, reference is made to part of Condition 2 or the DEHP guideline.

<table>
<thead>
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<th>Section/Appendix</th>
<th>Description of Contents</th>
<th>Reference Document</th>
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<tbody>
<tr>
<td>1. Introduction</td>
<td>Section includes details of instruction; background including reason archival record being made; and, authorship and acknowledgements.</td>
<td>The DEHP Guideline requires that the archival record covering report include full address details of the site, a statement about why the record has been made, details of authorship and where the report will be lodged.</td>
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<tr>
<td>2. Summary History</td>
<td>Summary chronological history of RAAF Base Amberley</td>
<td>The DEHP Guideline requires that the archival record covering report include a statement about the cultural significance of the place. The history of the base is integral to understanding its heritage significance.</td>
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<td>3. Statement of Significance</td>
<td>Summary of the heritage values embodied by RAAF Base Amberley as noted in the Commonwealth Heritage List (CHL) citation.</td>
<td>The DEHP Guideline requires that the archival record covering report include a statement about the cultural significance of the place.</td>
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<td>4. Technical Descriptions</td>
<td>Descriptions of the 38 heritage buildings to be removed under the EPBC Approval as well as the related heritage precincts and operations/uses.</td>
<td>Part c. of Condition 2 requires the provision of technical descriptions.</td>
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<tr>
<td>5. Oral History Recording</td>
<td>Background to the oral history recording exercise and list of those who participated.</td>
<td>Part c. of Condition 2 requires that oral accounts be recorded with people associated with the airbase.</td>
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<tr>
<td>6. Methodology</td>
<td>Summary of the methodologies employed in compiling the archival record including photography, 3D scanning and aerial photography.</td>
<td>Part d. of Condition 2 requires the archival exercise to include a description of the techniques and equipment employed.</td>
</tr>
<tr>
<td>7. Inventory of Archival Documents</td>
<td>List of archival documents, where they can be found and how they have been stored/archived.</td>
<td>The DEHP Guideline requires that the archival record covering report include an inventory of archival documents.</td>
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<td>8. References</td>
<td>References for documents used to inform report</td>
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<td>Appendix 1: Photographic Report</td>
<td>Description of methodology employed as well as descriptions of all photographs cross referenced to contact sheets and photoplans.</td>
<td>DEHP guideline followed</td>
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<td>Appendix 2: Aerial Photograph</td>
<td>Self-explanatory</td>
<td>Required by part b. of Condition 2</td>
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<tr>
<td>Appendix 3: 3D extracts</td>
<td>Extracts of 3D terrestrial scanning results presented as models in a plan format</td>
<td>Part g. of Condition 2 requires 3D digital recording of the assets in their current context.</td>
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<td>Appendix 4: Measured drawings</td>
<td>Measured drawings of the 38 heritage buildings to be removed including floor plans, elevation plans and roof plans</td>
<td>Part f. of Condition 2 requires the preparation of these plans.</td>
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<td>Appendix 5: Oral history transcripts</td>
<td>Transcripts of the 5 oral history accounts recorded as part of the exercise.</td>
<td>Part c. of Condition 2 requires oral accounts with people associated with the base.</td>
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1.3 Authorship & Acknowledgements

This report has been prepared by Joanne McAuley, RPS Principal Heritage Consultant, with inputs from Darrell Rigby, RPS Regional Technical Director Cultural Heritage, Laraine Nelson, RPS Senior Heritage Consultant and Nick McKelvey, RPS Senior Surveyor – Terrestrial Scanning. The photographic archival recording exercise was undertaken by Darrell Rigby; the 3D scanning exercise and measured drawing preparation was overseen by Nick McKelvey; the UAV exercise was undertaken by Mark Stopford, RPS Surveying & Mapping Technical Director and Bill Farry, RPS Business Development Manager Mapping; and, the oral history recording was overseen by Laraine Nelson. Review was provided by Darrell Rigby and Virginia Glyde, Point Project management.

The RPS project team would like to acknowledge the generous assistance in carrying out the archival recording exercise provided by those listed in the table below.

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1.4 Lodgement

As per Condition 2 of the EPBC Act Approval (EPBC 2014/7123) noted above, this archival record and attachments will be lodged with the National Archives of Australia, the State Library of Queensland’s John Oxley Library and the Ipswich Central Library.

It will also be available to view online in accordance with Condition 2, Item (i) of the EPBC Act Approval (EPBC 2014/7123).
2.0 Summary History

To enable an understanding of the historical significance of RAAF Base Amberley, the following section provides a summary of the Base’s history. This summary draws on the information contained within several reports and documents including the CHL citation and the HMPs that have been prepared for the Base (refer to Section 8.0 ‘References’).

The Royal Australian Air Force

In 1914 the Central Flying School was established at Point Cook, Victoria in recognition of the potential value of flight to the armed services. This foresight was rewarded in WWI when the Australian Flying Corp was added to the capabilities of the Australian Imperial Force (AIF) (Department of Air 1971:p.ii). While the Australian Flying Corp was disbanded with cessation of hostilities at the end of WWI, the Central Flying School at Point Cook remained operational (Department of Air 1971:xvi).

The need for an operational air defence capability was justified by the success of the Australian Flying Corps in WWI which led to the Minister for Defence establishing an Air Council to provide advice on the establishment of an air force. The long debate that followed on the process for developing and managing an air defence system led ultimately to a positive outcome when on 31 March 1921, the Australian Air Force was established. The addition of the word ‘Royal’ and the nomenclature Royal Australian Air Force (RAAF) was adopted following the approval of King George V (Gillison 1962:16).

In 1928 the Marshal of the Royal Air Force, Sir John Salmond, reviewed the Air Force and the resulting report recommended the expansion of air defence over nine years. The impetus to expand was tempered by the economic depression of the 1930s; however by 1934, growing tensions in Europe saw the Australian government implementing the recommendations of the Salmond Report. By 1936 the number of RAAF personnel had increased to 1,365 including 138 officers, 61 cadets and 1,166 aviators and the need for aircraft led to the establishment of the Commonwealth Aircraft Corporation.

It was during this period of expansion that the need for a base in Queensland was recognised. While a number of locations had been considered, on 22 December 1938, the Commonwealth Gazette reported that 882 acres had been purchased at Amberley, south west of Brisbane. An amount of £12,500,000 was set aside for the construction of what was to become RAAF Base Amberley (Woodhead 2008:40).

RAAF Base, Amberley

Amberley, 45 kilometres south-west of Brisbane and in close proximity to Ipswich, was a logical choice for the establishment of an air force base. In the event of war, while there was a recognised need to provide defence for the region’s coal mines and railway workshops, it was important to be a sufficient distance from the major population base of Brisbane (Amberley History n.d.)

The design of the new base was in keeping with pre-World War II air force planning and construction with the plan and layout for RAAF Base Amberley also conforming to inter war British design (CHL 2004:2). The centre of the base was the diamond-shaped Parade Ground (Asset 242) that incorporated a saluting station and was to be flanked by the administrative and operational buildings of the base.

While the construction of the new base had commenced by early 1939, the rate of construction was slow. By September 1939, the only buildings in place were a guardhouse, Hangar 76 (Asset 076), a hospital and an Air Traffic Control Tower. One of the factors in the slow rate of building was the desire for substantial well-designed buildings constructed in brick. Hangar 76 (Asset 076) fulfilled this criterion. It was designed and built using a RAF ‘C’ style post World War I hangar as a template.
The declaration of war in Europe on 3 September 1939 gave the impetus to make the base functional as quickly as possible and led to an abandonment of brick as the main component for building construction and the adoption of timber and fibro and pre-fabricated structures (Amberley History n.d.:4).

Constructed between 1939 and 1940 and reflecting the change in urgency for new buildings is the **Air Base Headquarters** (later the School of Instruction) (Asset 065). Built of timber with weatherboard cladding on brick foundations with a gable roof, the building has a south facing entrance porch.

![Plate 1 Parade Ground saluting station (Source: Amberley History n.d. 129)](image1)

![Plate 2 Hangar 76 (Source: Amberley History n.d.: 4)](image2)

![Plate 3 Air Base Headquarters (Source: Amberley History n.d.: 4)](image3)
Plate 4 RAAF Base Amberley 1941 – outline of the diamond parade ground is evident centre plate with Hangar 76 (Asset 076) to the left top and Air Base Headquarters (Asset 065) immediately below (Source: Department of Defence)

Plate 5 RAAF Base Amberley 1942 – the changes to the base are evident - diamond parade ground is centre with the Bellman Hangars on the left (Source: Amberley History n.d.:28)
1940 – 1945 (World War II)

The establishment of Station Headquarters on 17 June 1940 marked the commencement of Amberley operations. On 17 July 1940, His Excellency Air Commodore the Right Honourable Sir Leslie Orme Wilson CGST, GCMG, GCIE, DSO, Governor of Queensland, officially inspected the base. This was followed by an inspection by the Minister for Defence J. V Fairburn on 22 July 1940 (Amberley History n.d.:10).

The first squadron assigned to the base was No 24 Squadron; however, by October of the same year that squadron had departed for Townsville. The commencement of the No 3 Service Flying Training School (No 3 SFTS) and No 3 Recruit Depot in October 1940 saw RAAF Base Amberley’s role in pilot training and the recruiting of personnel established, a role it maintained during the initial stages of WWII. The Units formed as part of the Empire Air Training Scheme (EATS) initially had thirty-six trainees with Wirraway and Anson used as trainee aircraft. In the early years operations at the base were hampered by the lack of serviceability of the runways during heavy rain. This made the construction of an all weather runway and the construction of hangars a priority (Amberley Airfield during WWII).

Prior to the war RAAF pilots graduated at a rate of around 50 per annum. This increased dramatically with the advent of war when Australia committed to provide 10,000 aircrew per year under the Empire Air Training Scheme. The ultimate destination in most instances was the UK (Amberley History n.d.:12). The trainees spent the first two months in the Intermediate Training Squadron before moving onto the Advanced Training Squadron. A rigorous training schedule concluded with a parade and a presentation of ‘wings’ and the air crew commencing duty either in Australia or overseas.

Plate 6 No 3 SFTS Trainee air crew - twelve members were later killed in action (Source: Australian War Memorial)

The Base’s role in the training of aircrew changed rapidly following the bombing of Pearl Harbour in December 1941 and the subsequent declaration of war between Japan and the United States. The US needed a base to support their operations in the western Pacific and RAAF Base Amberley was chosen as an important part of those operations.

In late December 1941 Amberley saw the arrival of 4,600 National Guard troops from the Pensacola Convoy together with USAAF members of the 88th Reconnaissance Squadron and the 7th Bombardment Squadron. The Convoy also carried crates containing 18 P-40 Kittyhawk and 52 A-24 Dauntless aircraft (Amberley History n.d.:10). The primary focus of the base for the remainder of the war was the assembly, maintenance and salvage of aircraft (CHL 2004:6). Assisting the USAAF in assembling the P-40 Kittyhawk and 52 A-24
Dauntless aircraft were the RAAF No. 3 SFTS. The assembly work for the aircraft was conducted by three teams of nine people taking two to three days to assemble each aircraft (Amberley History n.d.:33).

Plate 7 Crates containing aircraft with a P-39 being unpacked. To the left is Hangar 76 centre top is Station Headquarters (Asset 065) [Amberley n.d.:36 sourced from US National Archives]

Plate 8 Hangar 76 and the assembly line for P-39 (Amberley History n.d.:37)

Plate 9 RAAF Base Amberley runway with Kittyhawk n.d. (Source: Department of Defence)
The huge commitment to the assembly of aircraft required a substantial increase in the construction of facilities. This can be seen by comparing the aerial photographs taken in 1941 and 1942 (Plate 4 & Plate 5). The construction of 14 Bellman hangars (Asset 255 – 258; 260 – 263; 277 – 280; 340) built in pairs in a C shaped formation near the runway (Amberley History n.d. p.10) was the most significant component of the works. The hangars were crucial to the maintenance and construction of aircraft for the remainder of World War II and were closely linked to the US involvement at the base (CHL 2004:2).

Initially the USAAF were housed with the No.3 SFTS and then with the No. 3 Recruit Depot. The numbers rapidly outgrew the available accommodation and US personnel were also housed in tents erected on the base by the US Army (Amberley History n.d.:31).

Amberley was crucial to the US war effort in the Pacific. Further US air force personnel arrived in February 1942 with the USAAF’s 38th bomber group arriving by truck convoy to assist with the assembly of the Cobras (P-39) and Kittyhawk (P-40) (Amberley History n.d.:34).

Other USAAF teams that worked at RAAF Base Amberley included the:
- 22nd Bomber group together with the B-26 (Martin Marauder) bombers (Amberley History n.d.:39);
- 68th Pursuit Squadron ground crews, these became part of the team assembling Cobras (P-39) and Kittyhawk (P-40) (Amberley History n.d. p.39). The 68th Pursuit Squadron later became the 68th Fighter Squadron; based in Tonga they flew the aircraft assembled at Amberley;
- 49th Pursuit Squadron conducting the assemblage of their Kittyhawk (P-40) (Amberley History n.d.:43);
- The USAAF 39th Fighter Squadron assembled their Cobras (P-39) at Amberley before proceeding to New Guinea. They later returned to Amberley and were provided with Lightning (P-38) aircraft (Amberley History n.d.:43); and
- Other US forces based at Amberley by 1942 included United States Army Forces in Australia (USAFIA), the USAFIA Ferry Division of Air Transport, the US Army Airways Communication Service and the 5th Air Force- 22nd Service Group.

The role of No. 3 SFTS was significant. The USAAF were responsible for assembling the aircraft whilst No. 3 SFTS were responsible for transferring the aircraft to Darwin. They also conducted training for Kittyhawk pilots in specifics such as air gunnery, night flying and dive bombing (Woodhead 2008:43).

Another important role for RAAF Base Amberley was as a staging post for US troops heading to the war zone (CHL 2004:6). In September 1942, General Macarthur, in collaboration with the RAAF and the Australian Government, introduced a strategy whereby every 24 hours 600 American troops were flown from the United States. The first touchdown after the Pacific crossing was Amberley where the troops were given a health check before being lodged in nearby Ipswich (Marks 1994:175). From Amberley they were transferred to the frontline in New Guinea (Halstead 1994:141). Known as the Trans Pacific Ferry Service this was an extensive freight and ferry service and a link between the US and the war in the Pacific. Furthermore, substantial numbers of US forces were stationed at and moved through the base during the peak war years and up to 2,000 Australian and British forces were also stationed there (Woodhead 2008:43). RAAF Base Amberley remained the location for the South West Pacific Area operations until 1943 when it moved to Townsville. The move was largely a result of the unsuitability of the Amberley runways for repeated heavy load landings (Marks 1994:176).

With regard to RAAF personnel at the base during World War II; No. 3SFTS established at Amberley in mid 1940 was disbanded on 22 April 1942. The No. 3SFTS had more than 500 trainees flying Avro Ansons pass through the school prior to moving onto to the Advanced Flying Training Phase. Following closure of the school the responsibility for instruction moved to Point Cook, Victoria and Mallala, South Australia (Amberley History n.d.:33). The disbandment of the No. 3SFTS was followed by the formation of the No. 3 Aircraft Depot (3AD) and the re-establishment of Station Headquarters. The role of the 3AD was the assembly, repair and salvage of aircraft and when established included 1 officer and 106 airmen (Amberley History n.d.:35).
The number of Australian men enlisted for the war effort was substantial and the need to draw on additional labour resources resulted in the recruitment of women. Prior to World War II the service had been exclusively for males; however, the formation of the Women's Auxiliary Australian Air Force (WAAAF) resulted in women being employed at Amberley (Amberley History n.d.:179). The WAAAF personnel assumed more than 70 roles including radar operators, parachute packers, instrument repairers and drivers but they were not permitted to join the flying crews (RAAF Museum. Point Cook). At Amberley, by 1943 the number of WAAAF at the base numbered 1856 (Marks 1994:177).
Another role allocated to RAAF Base Amberley was a meteorological base for producing specialist forecasts relayed in code and used throughout the south-west Pacific regions (Halstead 1994:141).

Little written information on the social life at Amberley is available; however, the Astra Cinema (Asset 060) was constructed during the war. Showing films twice a week with a nominal charge for entry the Cinema was also important to the local community who came to the Base to visit it. In May 1945 Wing Commander J W Kingsford-Smith arrived with cinema technicians to film the *Life of Kingsford-Smith* (Amberley Airfield during WWII). Dances were also held in the building referred to as the Gymnasium which in World War II was known as the Airmen’s Mess (Asset 042).

By the end of the World War II RAAF Base Amberley had housed a range of aircraft types including the Wirraway, Hudson, Martin Marauder, Kittyhawk, Vultee Vengeance, Aerocobra, Lancer, Boston, Hamilton, De Haviland and Curtis Electric. Toward the end of the war, the RAF Spitfires and B24J Liberator arrived (Woodhead 2008:45). In November 1944, the veteran bomber “G” for George arrived at the base for inspection before it left for a promotional tour of Australia. The bomber was subsequently restored and is now on display at the Australian War Memorial, Canberra (Amberley Airfield during WWII).
The building phase from 1939 to 1943 included the construction of the Station Headquarters (Asset 065), the Parade Ground (Asset 242), the Sergeant’s Mess (Asset 041), Airmen’s Mess (Asset 042), the Astra Cinema (Asset 060), the Hospital (Asset 061), the Hospital Ward (Asset 243), the Air Base Support building (Asset 240); and, the Commanding Officer’s Support Building (Asset 246).

1946 – 1965

The end of World War II and the demobilisation of forces saw a dramatic reduction in base personnel. In March 1945 the No 85 (Heavy/Bomber) Wing Headquarters was formed at RAAF Base Amberley under the control of Headquarters Eastern Area. Its purpose was the administration, maintenance and operational control of several units, namely the No 31 Air Stores Park, No 85 Operational Base Unit, No 12 Heavy Bomber Squadron and No 99 Heavy Bomber Squadron.

The post war role for the base was consolidated in February 1948 when it was designated as the RAAF’s major base for bomber aircraft in addition to maintaining its capability for aircraft maintenance. During this period the operational units were renamed:

- No 12 Heavy Bomber Squadron to No 1 Bomber Squadron;
- No 21 Heavy Bomber Squadron to No 2 Bomber Squadron;
- No 23 Heavy Bomber Squadron to No 6 Bomber Squadron; and
- No 82 Heavy Bomber Wing to No 82 Bomber Wing.

The No 3 AD remained with a commitment to the maintenance and overhaul of Lincoln aircraft and the Rolls Royce Merlin engines for Lincolns, Mustang and Mosquito aircraft (Amberley History n.d.:94).

The No 23 Squadron, stationed at the base intermittently between 1942 to 1954 was finally assigned to Amberley as a permanent home in September 1955 (Amberley History n.d.:45).

In 1950 the escalation of conflict in Korea led to the need for a capable air force and Amberley’s role was bomber base with the assignment of Canberra and Lincoln bombers. International tensions escalated further in 1950 with the rise of Communist insurgency in Malaya.

In response, the Amberley based No 1 Squadron was deployed to Malaya to conduct bombing raids against communist insurgents. As the conflicts escalated the No 6 Squadron began conversion training for the 82 Bomber Wing (Eather 2007:118).

In December 1953 the last Lincoln mission was flown and the crews were transferred to the Canberra jet bombers (Eather 2007:121). The introduction of new aircraft led to a realignment of the main runway and taxiway and construction of a new control tower, the original control tower was located on the north eastern corner of brick facade of Hangar 76.
In the early 1950s compulsory military training was introduced in Australia. This led to a substantial increase in force numbers and the consequent need for accommodation at bases such as Amberley (Woodhead 2008:45). The construction of new facilities led to the conversion of the Airmen’s Mess (Asset 042) for use as a gymnasium (Woodhead 2008:45).

In the early 1950s RAAF Base Amberley played an important role during the testing of nuclear devices by the British Government in Australia. The programme commenced at Monte Bello (1952) and later at Maralinga (1956 to 1963). RAAF Base Amberley assisted in the testing program with Canberra and Lincoln bombers monitoring and tracking the fallout from the atomic clouds formed from those blasts. The aircraft flown by 6 Squadron were fitted with under wing canisters to collect dust samples. In 1954, a decontamination centre was constructed at the base to house the aircraft used in the program (Woodhead 2008:46). Two starter cartridge Stores (Asset 763 & 764) are associated with the testing program (GML 2014:41). The testing program ceased in the mid 1960s.
During the period 1946 to 1965 another significant project carried out at Amberley was the assembly of Bell B-47G Sioux helicopters in Hangar 76. In November 1960 the 3 AD began assembly of the first Sioux helicopter hangar and when constructed they were handed over to the 16 Army Light Aircraft Squadron for training of Army pilots.

Army aviation was established at RAAF Base Amberley in December 1960 when the No 16 Army Light Aircraft (ALA) Squadron was formed. The 16 ALA Squadron equipped with new Cessna 180A and the Bell 47 Sioux played a role in supporting the Army throughout Australia. In 1962 the first overseas deployment for the 16 ALA Sqn occurred when it was dispatched as part of a United Nations Temporary Executive Authority (UNTEA). As part of a humanitarian mission the 16 ALA was tasked with providing air support to combat a cholera outbreak in western New Guinea.

In July 1965 the increase of hostility in Vietnam led to the 161 Reconnaissance Flight (161 Recce Flt) being raised from 16 ALA Sqn at RAAF Base Amberley in support of 1st Australian Task Force (Army Aviation in Australia 1970 -2015).
RAAF Base Amberley played an important role in the establishment of civil aviation in Australia. In 1947 Dakota (DC3) aircraft, serviced and test flown by the 3AD, were supplied by the Australian Government to establish what was to become Trans Australian Airways (TAA) (Amberley History n.d.87).

In May 1957 the Mayor of Brisbane presented the No 23 Squadron with a Charter that consolidated the links between the City and the Squadron which was then known as the No 23 (City of Brisbane) Fighter Squadron (Royal Australian Air Force. 1996:3).

The heritage structures constructed during this era include the two Starter Cartridge Stores (Asset 763 & 764) and the former Air Safety Building (Asset 467).

1966 – 1980

Major changes to RAAF Base Amberley were guided by a Master Plan developed between 1966 and 1969. As Australia’s largest base for bomber aircraft it had hosted the B-24 Liberator, the Lincoln and later the Canberra bombers. The ageing bomber fleet, political factors and the advent of the Cold War as well as changing strategic circumstances in South East Asia in 1963 led to the decision to replace the existing bomber fleet with the American built F-111 (Lax 2010:2). While the first F-111 did not arrive at Amberley until June 1973 it was ultimately to remain in service at the base until December 2010 (Lax 2010:238).

In the mid 1960s RAAF Base Amberley was home to:

- No. 1 (Bomber) Operational Conversion Unit;
- No. 482 (Maintenance) Squadron;
- No. 3 Aircraft Depot;
- No. 23 (City of Brisbane) (Auxiliary) Squadron;
- No. 16 Army Light Aircraft Squadron; and
- No. 114 Mobile Control and Reporting Unit.

The base grew rapidly from the late 1960s as a result of upgrade works for the new F-111 and the training of Canberra bomber crews for service with No. 2 Squadron in Vietnam. The base population grew from 1295 in 1965 to 1875 in 1968 and 2747 by 1970 (Stephens 1995:393).

Works to the base during this period, particularly to house the new F-111, were the most expensive refurbishments in RAAF history and cost $10.53 million. Fifty buildings were moved to make way for the new facilities (Amberley History n.d.:143). Changes to the base included twenty five new technical and administrative buildings, a maintenance hangar, an armament workshop, a new headquarters building, officers’ mess and Women’s Royal Australian Air Force (WRAAF) accommodation. Equipment including a flight simulator for training on the F-111 were also constructed and/or installed (Amberley History n.d.:143). Works also included the extension of the runway together with associated taxiways and hardstands.

An important outcome of the introduction of the F-111 was the decision to conduct all maintenance on the F-111 Pratt and Whitney TF-30 engines on the base. Hangar 76 (Asset 076), the original base hangar, was extensively modified for the purpose [(Amberley History n.d.:145) and (Lax 2010)]. Staff from No 3AD were sent to the United States in 1967 for training on maintenance of the engines (Amberley History n.d.:145).

The introduction of the F-111 as the new strike aircraft for the 82 Bomber Wing based at Amberley was extremely important as the RAAF Official Historian Dr Alan Stephens noted:

*The F-111 is the most significant aircraft in the RAAF’s history. When it finally arrived in 1973 after ten years of controversy it gave Australia for the first time a genuine,*
independent strategic strike capacity. More than any other weapon system, the F-111 has underwritten the notion of defence self reliance and the strategy of controlling the air-sea gap (Blue light: 144).

The F-111, Australia’s primary defence deterrent, was to remain at the base until its retirement in 2010.

Plate 25 Official welcoming ceremony for F-111 – 1 June 1973 (Lax 2010:110)

From 1966 there was increased commitment to the Vietnam War and the RAAF No 2 Squadron and eight Canberra bombers were redeployed to the war zone in 1967. The squadron was integrated into the 35th Tactical Fighter Wing. Restrictions associated with the capability of the Canberra bomber led to it being used as Sky Spot, where the plane is guided to the location by radar and the bombs dropped on request (Amberley History n.d.:139). At the same time, the No. 6 Squadron acted as an operational conversion unit.

Plate 26 F-111 (Source: Amberley Heritage n.d.:259)
transferring newly trained crews to South Vietnam (Amberley History n.d. p.140). The No. 9 Squadron was established at the base following its return from duty in Vietnam in 1971 (Amberley History n.d.:178).

The 1st Aviation Regiment was formed at Amberley during this period to support Army activities and provide training for Army pilots and ground staff. The Lysaght Huts (Assets 095 - 104) known as ‘Silver City’ were constructed in 1967 – 1968 to accommodate the Army Helicopter and Fixed Wing Training Area to support Vietnam War operations (CHL 2004:7). The regiment was also supplied with the Pilatus PC-6 Porter; a Swiss designed and built aircraft, with 19 Porters in service with Australian Army from 1968 to 1992.

Mick Corkery, Warrant Officer (Retired) 2nd Combat Engineers Regiment remembers the Pilatus first arriving having been flown by Swiss pilots from Europe. The aircraft were sporting civilian colours as Switzerland was a neutral country and it was necessary to fly over potential hot spots. The Pilatus was considered to be the first ‘decent’ aircraft the unit had and quite an amazing aircraft, largely for its ability to take off and land in only twice its own length (Mick Corkery. Oral History Recording, September 2015).

In 1973 the Army Aviation School was relocated away from the base and from then on the Lysaght Huts (Asset 95-104) have been used mainly for storage.

Australia's involvement in the Vietnam War included US personnel stationed at the base with the old WWII operations centre used as a secret US communications base.

In May 1973 the No. 2 Squadron in recognition of its service was presented with the US Air Force Outstanding Unit Award for exceptionally meritorious service in Vietnam 1971 (Amberley History n.d.: 144).
After 1978 extensive new facilities constructed at Amberley included a new Group Headquarters and Communications Centre, accommodation for the RAAF Fire and Security School and the realignment and development of base roads (Woodhead 2008:48).

The Parade Ground (Asset 242) ceased to be used for its original purpose around this time. It had been at the heart of the early base with passing out parades held when trainees received their ‘wings’. Mick Corkery (Oral Recording, September 2015) related that a Base Parade was held on the first Monday of each month. The Parade included Air Force, Army and Naval personnel.

The heritage buildings constructed during this era include the Lysaght Huts (Assets 76 - 104).

1981 – Present day

The Amberley Primary School was moved during 1981, the school building and teachers residence were adaptively re-used as a training facility and they now form the School Heritage Precinct.

In 1990, the decision to retain the upgraded F-111 and purchase additional F-111 aircraft cemented Amberley’s role as RAAF’s major strike bomber base. Additional works included a new Base Medical Station while a number of aircraft maintenance buildings were refurbished (Woodhead 2008 :49).

In December 1992 a Defence Force strategy aimed at increasing the number of personnel in northern Australia saw No. 38 Squadron relocated to Amberley from Richmond. No. 38 Squadron flew the Caribou aircraft in support of the Australian Army (Amberley History n.d.:228).

In 1995 ex-USAF Strategic Air Command F-111 aircraft were purchased to extend the life of the type in RAAF Service, primarily the responsibility of No 6 Squadron. In 1996, the reconnaissance fleet transferred to No 1 Squadron leaving No 6 Squadron dedicated to strike operations (Point Cook RAAF Museum. No 6 Squadron).

In 1997 an impetus to introduce commercialisation to the RAAF led to the introduction of contractors. In 1999 Tasman Aviation Enterprises (TAE) was the successful contractor for the Wings Workshop Business contract and provides electroplating, metal machining, welding, GSE maintenance and carpentry and joinery (Amberley History n.d.:245). TAE currently occupies Hangar 76.

In 2000 Boeing was awarded the contract for the Amberley Weapons Systems Business Unit, the Block Upgrade and the life-of-type support for the F-111 (Lax 2010:223). By 2000, Australia was the only country still flying the F-111 and consequently the maintenance of the aircraft for the RAAF had to be wholly self reliant. In 2010 the F-111 was retired and in 2013 the last F-111 left Amberley departed as freight destined for Hawaii (ABC News 5 Sept 2013).

In 2000 Stage 1 of the RAAF Base Amberley Development Plan saw a new Combat Support Unit Headquarters and No. 82 Wing Headquarters constructed. Stage 2 of the Plan, completed in 2008, saw construction of facilities for the No. 33 Squadron and 9FSB and a base infrastructure upgrade. Stage 3 commenced in 2008 and included refurbishment and upgrades of existing buildings including the construction of facilities for the C-17 Heavy Air Lift aircraft (Woodhead 2008 p.49).

From October 2008 No 6 Squadron became the sole operator of the F-111 with No 1 Squadron preparing for the introduction of the F/A-18F Super Hornet. When the F-111 fleet was retired in December 2010 No 6 Squadron was re-equipped with the F/A-18F.

On 1 July 2010 No 23 (City of Brisbane) Squadron was transferred to Combat Support Group and is now responsible for Fixed Base Management at Amberley. At that time there were approximately 70 RAAF
Active Reserve and 100 Permanent Air Force personnel employed at the base (Point Cook RAAF Museum. No 23 Squadron).

In 2014 overseas deployments included an Air Traffic Control detachment from Amberley assisting in re-establishing Baghdad International Airport as an operational facility.

Other notable events in Amberley’s recent history include:

- Providing a climax for the closing ceremony of the Sydney Olympic Games 2000 with F-111 doing a ‘dump and burn’ display;
- Regular participation in the City of Brisbane ‘River of Fire Festival’ with a F/A-18F Super Hornet and C-17A Globemaster III from RAAF Base Amberley in the flypast;
- RAAF Base Amberley was a Space Shuttle Emergency Landing Site during the US Space Shuttle program (Global Security);
- In October 2008 RAAF Base Amberley was the location for the Defence Force Air Show, a major event it attracted 90,000 visitors over two days; and
- In November 2014 with the G20 Summit of world leaders in Brisbane, Air Force One carrying President Obama landed at RAAF Base Amberley.
RAAF Base Amberley - Present day

The present day landscape of RAAF Base Amberley reflects the growth and development of the base to meet the dynamic needs of technology and the changing role of the RAAF since its inception at Amberley in 1939. The primary function of the base has changed from its role in WWII in the assembly and maintenance of aircraft for the war in the Pacific to its current primary role as a significant Defence establishment in South East Queensland providing a major capability role of the Base encompassing Air Force and Army.

In 2013 the Australian Government released the Defence White Paper: Air Combat Capability. The primary commitment from this was the purchase of the EA-18G Growler. This is an airborne electronic attack aircraft capable of providing force level electronic warfare support by disrupting, deceiving or denying a broad range of military electronic systems, including radars and communications (Department of Defence Press Release).

A Census was conducted in May 2015. RAAF Base Amberley currently has approximately 5774 military personnel and contractors on or deployed from the base. Those personnel comprise 51 different Groups, Wings, Squadrons, Units and Sub-Units with 25 Non-Defence Civilian Organisations also represented.

The base is now predominantly occupied by the Royal Australian Air Force with the FA-18 Super Hornet, KC30A Multi Role Tanker Transport and C-17 Globemaster aircraft. Army units include the 9th Force Support Battalion and the 6th Engineer Support Regiment. Joint Logistics Unit - South Queensland is stationed at the base and comprises a Tri-Service Australian Defence Force Unit. RAAF Base Amberley is home to the air forces strategic airlift capabilities and the headquarters for the air forces Combat support elements (pers. comm. Nigel Raddie).

Forward strategies will see the 12 EA-18G Growlers based at RAAF Base Amberley. The $1.5 billion EA-18G Growler purchase includes the aircraft, required mission and support systems, training and ongoing support to effectively develop and operate a Growler capability. Defence plans to achieve Initial Operational Capability (IOC) in 2018 (RAAF Technology).

The commitment to new aircraft and technologies will result in significant changes to the base including the loss of the physical evidence of the early base that remain in the Hangar and World War II Heritage Precincts.
3.0 Statement of Significance

3.1 Heritage Significance Assessment

This section describes the historical heritage values of RAAF Base Amberley as acknowledged in its inclusion in the Commonwealth Heritage List (CHL). The Base is included in the CHL for its historic, rarity and aesthetic heritage values. The current and former HMPs for the site also flag the existence of other heritage values including historical archaeological value, creative or technical value and community or social value. The following section draws from the CHL citation and the current HMP (Converge, 2012) to identify all heritage values embodied by the historical heritage resource at RAAF Base Amberley.

3.1.1 Summary Statement of Significance

The following is an extract from the CHL Summary Statement of Significance for Amberley RAAF Base Group. The items approved for removal are highlighted in bold type.

Amberley RAAF Base is important for its association with the development of an Australian Air Force under the Lyons government in 1938, in response to renewed hostilities in Europe prior to the onset of World War Two. The strategic location of the base in Australia’s northern areas during World War Two, saw it serve as the major departure point for traffic to and from the United States and major Pacific ports, to theatres of war in the Pacific and as a major depot for the maintenance, salvage and assembly of new aircraft. This major role continued when the base played a significant role in the Korean War, atomic testing at Maralinga, in South Australia, and during Australia’s involvement in the Vietnam War. Amberley RAAF Base is now the home of Australia's Strike Reconnaissance Group and the associated Command and Training Units. The base was involved in the establishment of the Trans-Australian Airline (TAA) through the transfer and maintenance of Dakota DC3s from the RAAF in the post-war period (Criterion A.4).

These historical processes and events are associated with individual structures, alignments and precincts from the pre-war, World War Two and post war periods.

The pre, and early, World War Two facilities are important in demonstrating the design and operation of pre-World War Two air force bases under British influences. Amberley RAAF Base is one of the few surviving examples of pre World War Two Air Force planning and construction under British influence. A key planning feature is the diamond-shaped command and administration area, which is linked to the Guardhouse (21) by the original access road, which separated the hangars and airstrip from the other areas of the base. The diamond-shaped precinct includes the 301 Air Base HQ (65), the Base Medical Flight building (61 & 243), the Air Base support building (246) and the parade ground (242) and associated landscaping, including mature Norfolk Island Pines and Fig trees. Hangar 76, the largest hangar of the period, is closely linked to the Air Base HQ. Other structures important in illustrating the wartime functional layout of the base include the Emergency Power Generator building (20), the Cinema (60), Airmen’s Mess (42) and Sergeants Mess (41). The Guardhouse (21), identifying the original base entrance, illustrates the operational context of the base during World War Two and is linked both visually and by road with the command precinct (Criterion A.4 and Criterion B.2).

Individual structures within the pre and early World War Two facilities important for their ability to demonstrate the principal characteristics of their type include: the 301 Air Base HQ (65); the Air Base support building (246); Hangar 76; and the Guardhouse (21). Both Buildings 246 and 65 illustrate the use of the prevailing vernacular timber style favoured for utilitarian and functional buildings such as Buildings 41, 42 and 60. Building 240 is an example of the P1 type hut, Building 65 is an interpretation of a standard design with camera obscura for training Bombing crews. Hangar 76, the Base Medical Flight Building (61, 243) and the Guardhouse (21) characteristically display the use of fairface brick and the use of the Art Deco...
style employed for permanent structures in the lead up to the Second World War and the use of standard design solutions. Building 84, Flammable Liquids Store, in brick is representative of the smaller, permanent stores of the wartime period (Criteria D.2 and E.1).

The Bellman hangars (340, 255-258, 260-263 and 277-280) are important in demonstrating the adaptation of existing manufacturing techniques to air defence infrastructure in Australia, following the involvement of the United States in the Second World War in 1942 and the subsequent widespread use of prefabrication. As a group, the 13 hangers are important in illustrating the primary function of the base for maintenance and repair during World War Two and the operational layout of the base. Bellman hangar 744, part of the Air Movements Building, is essentially intact and can be regarded as a particularly good example of its type (Criterion A.4 and Criterion D.2).

Building 467, the Air Safety Building, used for drying and packing parachutes, is important in illustrating the design of utilitarian structures during the Korean War period and a rare example of its type. (Criteria A.4, B.2 and D.2)

The former Army Helicopter and Fixed Wing training area (Lysaght Huts) known as ‘Silver City’ is significant for its association with the Vietnam War era. Structures erected specifically for the Vietnam War are regarded as rare (Criterion A.4 and Criterion B.2).

Additional heritage values not acknowledged in the CHL citation in relation to the base’s historical heritage resource are summarised below. This information is based on findings within the current HMP (Converge, 2012)

- Archaeological/research potential value: the historical archaeological resource has the potential to yield information on the development of early settlement patterns and localised agricultural, industrial and commercial activities;

- Creative or technical value: it is understood that the galvanised steel panelling of the lysaght huts (Asset Nos 95-104) is of interest as a building material that was only manufactured under licence from the Behlen Manufacturing Company, Nebraska, USA for a short period of time in Australia in the 1960s. The rarity value of the material is based on the fact that it can be used as a structural member as well as a cladding sheet such that it can form completely frameless structures; and

- Community or social value: there is evidence to suggest that RAAF Base Amberley has special value to and association with a number of community groups including former servicemen, particularly those who served during WWII; current servicemen and the local community who used the base’s recreational facilities, in particular, the former cinema; and, members of the local community and aviation enthusiasts who visit the Base in large numbers during open days and air shows, particularly associated with the F-111 aircraft at Amberley.
4.0 Technical Descriptions

In line with Condition 2 part (c) of the EPBC approval, the following section provides technical descriptions of the precincts and buildings impacted by the approved action as well as the operations associated with them. The heritage precincts comprise distinct groupings of heritage buildings, structures and associated landscape features.

Information has largely been drawn from the 2008 Woodhead HMP. Descriptions are presented in Table 3 below.

Table 3 Descriptions of heritage buildings recorded & associated heritage precincts

<table>
<thead>
<tr>
<th>Heritage Building/Asset Number or Heritage Precinct</th>
<th>Description</th>
<th>Associated Operations/Use</th>
</tr>
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<tbody>
<tr>
<td>41 Former Sergeant’s Mess: Part of original group of WWII structures on the site illustrating wartime functional layout. Constructed in 1940, this substantial building demonstrates the quality of building materials and construction during the war period. Plain rectangular timber framed building clad in weatherboards at the lower level with asbestos cement sheeting above. Base plinth wall constructed of glazed brickwork. Fenestration predominantly double hung sash windows with horizontal glazing bars and there are a small number of casement and louvre window types. The original doors are painted timber batten type accessed by simple wooden steps. Utilitarian interior with no remaining decorative features.</td>
<td>Former mess; currently vacant</td>
<td></td>
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<tr>
<td>42 Gymnasium/former Airmen’s Mess: Part of original group of WWII structures constructed in 1940 demonstrating quality in building materials and construction. Large rectangular timber framed building clad in weatherboards on lower half and asbestos cement sheeting above. The gabled roof form is clad in corrugated metal with plain sheet gable ends. Original fenestration has been replaced with aluminium awning type frames with horizontal glazing bars. The front of the building has a projecting brick boiler room. The interior has been much altered to allow its reuse as a gym and most original doors and windows have been replaced.</td>
<td>Formerly used as a mess and then a gymnasium; currently vacant</td>
<td></td>
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<tr>
<td>60 Astra Cinema: Part of original group of WWII structures constructed in 1940 demonstrating quality in building materials and construction. Large rectangular timber-framed single storey building clad in weatherboard and asbestos cement sheeting with glazed brick plinth wall. Corrugated metal roof predominantly gabled with some hipped sections. Original timber framed windows with horizontal glazing bars and door joinery remains. Open verandahs on both sides of building partially enclosed by later timber trellis. Simple Art Deco style entrance with projecting pilasters and canopy accessed via wide brick steps matching the plinth wall. Freestanding ‘Astra’ metal sign on street frontage.</td>
<td>Former cinema; now used in part as a courtroom and meeting/briefing room</td>
<td></td>
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<tr>
<td>61 Former hospital and ward: Part of WWII group of structures constructed in 1943 and associated with the USAF. The pre-war Art Deco style design is well executed in quality materials. Its location opposite the command headquarters balances the diamond shape of the precinct. The former hospital building is a brick rectangular single storey building with formal entrance on the northern facade. The interior shows subtle late 1930s style art deco influences including decorative features with strong vertical and horizontal emphasis, ceiling roundels.</td>
<td>Former hospital building; now vacant</td>
<td></td>
</tr>
<tr>
<td>Heritage Building/Asset Number or Heritage Precinct</td>
<td>Description</td>
<td>Associated Operations/Use</td>
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</tr>
<tr>
<td>62</td>
<td>Former hospital car port: utilitarian demountable metal frame car port located adjacent to the eastern elevation of the hospital building.</td>
<td>Car port associated with hospital; hospital now vacant.</td>
</tr>
<tr>
<td>65</td>
<td>301 Airbase HQ/former School of Instruction: Constructed 1939-40, this building located at the apex of the diamond shape is part of the pre-WWII formal planning of the base. A British influence on its design is discernible in the hierarchical floor plan. Timber building on brick foundations clad at the lower level with weatherboarding with fibro cement sheeting above. It has a fibro-cement hipped roof with a projecting gable. The building has five internal levels although only the ground level covers the entire floor area. Level two is an open mezzanine; level three is closed with south facing windows; level four is an open viewing area accessed by ladder while access to level 5 is via internal timber stairs. The main entrance to the building is through an elegant timber post porch off the former parade ground. The main internal timber staircase and joinery throughout are intact.</td>
<td>Former School of Instruction; now occupied by 5FLT.</td>
</tr>
<tr>
<td>76</td>
<td>Hangar 76 (TAE): Built 1939, Hangar 76 is part of the pre-war planning of the base illustrating quality in materials and construction. It was modelled on the British RAF 'C' type designed for a more peace time function. The original building is brick encased at the corners with a sawtooth roof and an ornate stretcher bond brickwork entrance. The building remains intact beneath later additions andremodelling during its years of operation. Original fenestration is steel framed with horizontal glazing bars. The interior of the original administrative section of the building retains many original joinery details, doors and door furniture.</td>
<td>Former hangar; now TAE Engine Maintenance Workshop &amp; associated offices.</td>
</tr>
<tr>
<td>Nos. 95 – 104 (consec.)</td>
<td>Lysaght huts: Erected in 1967-68, this group of 10 lysaght huts are directly associated with the base’s development and activities during the Vietnam War period. They are known collectively as ‘Silver City’. Ten pre-fabricated steel structures of a standard size and rectangular form with a gabled roof. The sides consist of 12 standard panels, each of which consists of sets of reinforced glass louvre windows above a louvred metal wall panel. The ends and the roof are constructed of deep corrugated steel sheet with steel doors clad in the same material reorientated horizontally. The building material was produced by Lysaght under licence from Behlen Manufacturing Company in the US who patented this strong and frameless type of panel.</td>
<td>Originally constructed for army pilots using helicopters and small fixed wing planes; currently partially used for storage and welfare club sites.</td>
</tr>
<tr>
<td>240</td>
<td>P1 hut (associated with Building 65)/former Airbase Support: Built 1940-41, this is an intact example of a P1 type hut located in its original location in the headquarters area. Rectangular single storey timber framed building with asbestos cladding above weatherboards. The main entrance is from the eastern end beneath a small projecting awning. There are two separate timber batten doors set at angles within the same opening which are not thought to be original (Woodhead, 2008).</td>
<td>Original use and current use for administrative support functions.</td>
</tr>
<tr>
<td>242</td>
<td>Former Parade Ground: Constructed in 1940 and part of the pre-WWII original layout as the former ceremonial heart of the base. The former parade ground is diamond shaped and defined by roads with a rectangular parade ground in the centre. It is surfaced in asphalt. Two small plinths/saluting stations remain. There are a number of mature trees within the diamond. The former parade ground is now used as a car park</td>
<td>Former parade ground; now used as a car park.</td>
</tr>
<tr>
<td>Heritage Building Number or Heritage Precinct</td>
<td>Description</td>
<td>Associated Operations/Use</td>
</tr>
<tr>
<td>---------------------------------------------</td>
<td>-------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>ground is currently used as a car park and carport structures have been erected in the space.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>243</td>
<td>Former hospital ward: Part of WWII building group illustrating quality in design and finish and connected to the hospital building described above via an enclosed walkway. Large rectangular timber framed asbestos sheet clad building elevated on concrete piers with ant caps. The roof is gable ended. There is an enclosed verandah on the western side and an open verandah on the eastern side. Fenestration includes large door height sash windows of four panes with two fixed fanlights.</td>
<td>Former hospital ward; now vacant.</td>
</tr>
<tr>
<td>246</td>
<td>Former Commanding Officer’s Support Building: Built 1940-41 and part of the early, pre-WWII planning of the base. Substantial rectangular building with original double gabled roof form entirely re clad in new metal sheet cladding. It is of simple design with no outstanding features.</td>
<td>Exact original use unknown; currently used as a store.</td>
</tr>
<tr>
<td>Nos. 255-258 (consec.), 260-263 (consec.), 277-280 (consec.), 340, 745</td>
<td>Bellman Hangars: Mainly erected between 1942 and 1943, they form part of the base’s development as a matter of urgency during WWII. The hangars are largely positioned in pairs following the eastern edge of pre-WWII base precinct at the interface between the runway apron and taxiways. Large square prefabricated steel frame hangars clad with steel sheet panels. Mainly erected in pairs with pre-cut galvanised steel frames, low pitched roofs and large sliding steel framed doors that can be opened the entire width of the building. The hangars have been re clad in part with Colorbond sheeting and have new concrete floors but their original form remains intact. Each pair of Bellman Hangar is linked by a small gabled timber building, often a P1 type hut. One Bellman hangar will be retained and relocated on the Base.</td>
<td>Original function as hangars for maintenance and repair during WWII; current use as hangars for storage and maintenance.</td>
</tr>
<tr>
<td>467</td>
<td>Double P1 hut/former Air Safety Building (ARDU Building): Date of construction unknown but part of post-war phase of the base’s development (1946-1968). It is understood to have been relocated in the 1970s. Rectangular plan and simple gable roof form with modified northern gable end to accommodate parachute drying tower. The building is clad in weatherboarding with an asbestos cement roof. Original features include the western entrance with associated external hood and the southern entrance with its skillion roof. The drying tower cupboards and fittings are retained behind new partition walls (ERM, 2006). The building’s interior has been entirely modernised. This building will be retained and relocated to another part of the Base.</td>
<td>Originally used as an air safety building; currently used by the Aircraft Research and Development Unit (ARDU).</td>
</tr>
<tr>
<td>763 &amp; 764</td>
<td>Starter cartridge stores/explosives lockers: Assumed to be constructed in the 1960s, they are associated with the post-war phase of the base’s development and the atomic bomb testing being undertaken by the British Government at Maralinga and other related locations. Constructed of mass concrete fitted with heavy metal doors and roofs clad in corrugated metal sheeting. One of these structures will be retained and relocated to another part of the Base.</td>
<td>Original use as stores, not in current use.</td>
</tr>
<tr>
<td>WWII Precinct &amp; Command and Administration diamond-shaped sub-precinct</td>
<td>The WWII Precinct is located along the eastern boundary of the original base and includes buildings dating from the pre-war and WWII period as well as remnant landscaping indicating the original layout. On its northern edge are a number of substantial original amenity buildings including the former Airmen’s Mess (building no.</td>
<td>Layout and buildings illustrating WWII base. Individual building usage.</td>
</tr>
<tr>
<td>Heritage Building/Asset Number or Heritage Precinct</td>
<td>Description</td>
<td>Associated Operations/Use</td>
</tr>
<tr>
<td>---------------------------------------------------</td>
<td>-------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>42) and former Sergeant’s Mess (building no. 41) and the former cinema (building no. 60). The precinct includes the diamond-shaped Command and Administration sub-precinct which has the original parade ground (asset no. 242) at its centre with the original School of Instruction (building no. 65) at its southern end and the hospital and annex (building nos. 61 &amp; 243) at its northern apex.</td>
<td></td>
<td>described above.</td>
</tr>
<tr>
<td>Hangar Precinct</td>
<td>The Hangar Precinct is located around the eastern boundary of the original base and lies between the administrative, staff amenity areas and the runways. Most of the buildings located within it are hangars and P1 huts. The hangars consist of large permanent brick and steel framework buildings (building nos. 71 &amp; 76) and thirteen Bellman Hangars largely arranged in an arc of pairs. All of these buildings were erected during WWII although modified internally and externally over time. The precinct also includes the ten frameless galvanised steel buildings manufactured by Lysaght known as ‘Silver City’.</td>
<td>Hangars associated with the base’s WWII layout/function as well as F-111 activities and its use during the Vietnam War era. Individual building usage is discussed above.</td>
</tr>
</tbody>
</table>
5.0 Oral History Recording

Oral accounts made by a selection of individuals associated with the base have been recorded as required by EPBC Act Approval Condition 2c. (EPBC 2014/7123). RPS were advised by representatives from the RAAF Amberley Aviation Heritage Centre as to who best to approach and the five people who took part in the exercise are listed in the table below.

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>George Hatchman</td>
<td>Warrant Officer (Retired). Historian. 23 Squadron Association</td>
</tr>
<tr>
<td>Dennis Doggett</td>
<td>Warrant Officer (Retired). 23 Squadron Association</td>
</tr>
<tr>
<td>Mick Corkery</td>
<td>Warrant Officer (Retired). Class 2. 2nd Combat Engineers Regiment Volunteer. Amberley Aviation Heritage Centre</td>
</tr>
<tr>
<td>Jim Topping</td>
<td>Volunteer. Amberley Aviation Heritage Centre</td>
</tr>
</tbody>
</table>

The videoed accounts of those listed above are provided on CR-R/DVD and transcripts of the accounts are provided in Appendix 6.
6.0 Methodology

6.1 Archival Photography

Photography was conducted with a Panasonic Lumix DMC100. This camera has a full size 4/3" Multi-Aspect MOS Sensor and exceptional low light ability. The high-sensitivity sensor is multi-aspect with 16.8MP total resolution. Featuring a fast maximum aperture of f/1.7-2.8, it allows work in low light situations and provides selective focus control for shallow depth of field imagery, enhanced by a nine-bladed aperture for smooth out-of-focus rendering. Hence flash photography was avoided in all situations, preserving natural colour and detail. The Leica DC Vario-Summilux zoom lens has a 35mm-equivalent focal length range of 24-75mm, covering wide-angle to portrait-length perspectives. All photography exceeded 10mp reproduction and was recorded as RAW + JPG format with associated metadata.

In situations where buildings had their windows boarded over the use of Metz LED-480 Mecalight LED Lights was required to enable photography to occur. This related to some photography of the former Sergeant’s Mess (building no.41), the former Airmen’s Mess/Gymnasium (building no. 42), the former Astra Cinema (building no. 60) and the former Hospital (building no. 61). Careful attention was paid to ensure camera white balance was correct. In some cases where daylight and interior light was present a 3200K filter was attached to the lights to again ensure correct white balance was achieved.

- Three sets of thumbnail image (contact) sheets and corresponding file numbers will be provided as part of the record. Contact sheets will be printed on photographic paper and will be cross-referenced to plans/figures.
- All shots will also be archived on CD-R or DVD as necessary and selected shots reproduced on A5 sized (approximately) photographic paper.

The photography conducted captured exteriors (elevations/facades) and interiors of the 38 heritage buildings. Where relevant and possible, details of key elements/design features, key landscape features, significant views and building groups in context were also captured.

The photographic methodology adopted is as follows:

- Master shot on each compass bearing and intermediate compass bearing;
- Individual shots showing detail features where necessary;
- Shots of external elevations (where not captured in master shots);
- Record of external and internal spaces (e.g. courtyards, rooms, cavities etc); and
- Shots of construction detail elements such as joinery and industrial fabrication (selection of principal features rather than exhaustive survey/record).

Whilst the 38 buildings listed for Photographic Archival Recording recorded date from WWII or earlier, much of the fabric/features in the majority of the buildings have been compromised. This has occurred either through infill development limiting unimpeded views of elevations; modern internal fitouts being applied (such as in Building 467 – former Air Safety building); or the internal fabric having been removed (such as Building 61 – former Hospital); or highly modified (Building 246 – former Commanding Officers Support building). As such, the recording focused on those elements, features, fabric and structures that were recognisable, largely intact and representative of type.

A full report on the archival photography is provided in Appendix 1 and includes the photographic record log sheets, the thumbnail image sheets and the photographic plans.
6.2 3D Scanning & Measured Drawing Preparation

Measured drawings were created utilising the latest in survey and measurement technology to ensure accurate, efficient and comprehensive capture of the structures and their surroundings. 3D terrestrial scanning was used to capture the information which was subsequently processed to generate the measured drawings as described below.

An UAS (Unmanned Aircraft System) was used to provide the background information for the detailed building data captured by terrestrial laser scanner. A laser scanner captures between 10 and 20 million points in a full 360 degree dome per setup as well as photography. Point accuracy is 1-2mm and approximately 500 individual scans were completed to capture all 38 structures ensuring accurate and comprehensive capture of all structures. Each scan is joined by reference targets as well as data overlap ensuring QA and tractability of all measurements.

The raw output from the laser scanner is a 3D point cloud which integrates with the UAS data allowing for a complete and detailed dataset of the full scope area. All data was positioned with Virtual Reference Station Global Navigation Satellite System (VRS GNSS) providing real world positioning and sub 50mm absolute position of all data.

The captured point clouds were isolated into each individual building and imported into AutoCAD for digitising. The point clouds could be sliced and manipulated to show the required floor plans and elevations with the necessary linework digitised directly over the point cloud to generate the completed plans. Imagery captured during the scanning process was used to clarify details and treatments and ensure final drawings were a true representation of the structures.

The equipment used included:

- UAS – Trimble UX5 unmanned aircraft system – provides aerial dataset being orthophotography and 3D point cloud. This was used to capture the general precinct layout as well as building details not visible from ground level;
- Laser Scanner – Faro Focus 3D – provides highly accurate and detailed 3D data of the project structures. Approximately 500 scans were conducted with each scan having 10-20 million measurement points depending on used settings; and
- VRS GNSS – Trimble R8 GNSS-high accuracy survey grade GPS providing sub 50mm absolute positioning to all captured data tied into registered survey marks. This was used to align all captured measurement data.

6.3 Aerial Photography

A UAS (Unmanned Aircraft System) was used to capture the general layout and details of the entire precinct and provide context to all the individual structures within the project area. The UAS is a Trimble UX5 unmanned aircraft system which provides an aerial dataset. This comprises orthophotography and a 3D point cloud. This was used to capture the general precinct layout as well as building details not visible from ground level. Quality assurance and absolute positioning was provided by a Virtual Reference Station Global Navigation Satellite System (VRS GNSS).

The UAS was able to provide high resolution orthophotography as well as a detailed 3D point cloud. This UAS provided the background information for the detailed building data captured by terrestrial laser scanner.
7.0 Inventory of Archival Documents

The archival record compiled to comply with EPBC Approval Condition 2 (EPBC 2014/4123) provides a thorough record of the 38 heritage buildings to be removed and comprises:

- An archival photographic record – the results are provided in a photographic archival report (Appendix 1) which includes thumbnail (contact) sheets cross referenced to plans and figures of file numbers; a recording of all shots archived on CD-R or DVD; and, a selection of printed images on archive quality photographic paper (Appendix 2);

- An aerial photographic record – using a UAV, a comprehensive and accurate aerial photograph plan was prepared for the Base (refer to Appendix 3);

- A 3D digital record of the interior and exterior of the buildings and in their context – the results are provided in the form of model extracts of a selection of building groups shown in context (refer to Appendix 4);

- Accurate measured drawings of the 38 buildings including floor, elevation and roof plans. The complete set of drawings are provided in Appendix 5 and the digital files are saved onto CD-R/DVD; and

- Oral history recording results – oral history accounts were recorded by video camera at the base and full transcripts have been prepared. The recordings are provided on CD-R/DVD and the transcripts are provided in Appendix 6.
8.0 References


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