

Chapter 21

European heritage



Contents

	Page number
21. European heritage	21-1
21.1 Assessment approach	21-2
21.1.1 Literature and database review	21-2
21.1.2 Field surveys	21-3
21.1.3 Archaeological test excavations	21-4
21.1.4 Cultural landscape, social values and intangible cultural heritage	21-4
21.1.5 Significance assessments	21-5
21.1.6 Cumulative assessment	21-5
21.2 Existing environment	21-6
21.2.1 Historical context	21-6
21.2.2 Statutory and non-statutory listings	21-11
21.2.3 Survey results	21-14
21.2.4 Built environment analysis	21-28
21.2.5 Moorebank cultural landscape	21-31
21.2.6 Archaeological test excavation results	21-31
21.2.7 Rail access options	21-32
21.2.8 Predictive assessment of Georges River and Glenfield Landfill	21-34
21.3 Significance assessment	21-35
21.4 Impact assessment	21-43
21.4.1 Direct impacts	21-43
21.4.2 Indirect impacts	21-48
21.4.3 Impacts associated with the rail access options	21-49
21.5 Management and mitigation	21-54
21.5.1 Basis for mitigation measures	21-54
21.5.2 Rail access options	21-57
21.5.3 Proposed mitigation strategies	21-58
21.6 Summary of key findings	21-60

List of tables

	Page number
Table 21.1	Relevant Commonwealth EIS Guidelines and NSW SEARs 21-1
Table 21.2	Key dates and events in the European development of the Project site 21-6
Table 21.3	Items addressed in ERM (2013) Heritage Impact Assessment for MUR Project 21-9
Table 21.4	Summary of European archaeological recordings 21-20
Table 21.5	Review of subsurface archaeological potential associated with archaeological recording, WWII buildings and the location of former (WWII or before) structures according to chronological phase 21-24
Table 21.6	Significance of building types to the SME 21-29
Table 21.7	Summary of significance assessments 21-36
Table 21.8	European cultural heritage elements within the Project site, grouped according to their respective significance rankings 21-41
Table 21.9	Direct impacts associated with the development of the main IMT site 21-45
Table 21.10	Summary of European heritage impacts associated with the Project for the development footprint, without mitigation, for each rail access option 21-61

List of figures

	Page number
Figure 21.1	Precinct location plan of the Project site and location of listed items adjacent to the Project site 21-13
Figure 21.2	the location of all European archaeological recordings and former identified structures and activities within the Project site, relative to areas of mapped major disturbance 21-22
Figure 21.3	Location of items that meet local, State and Commonwealth heritage thresholds 21-42
Figure 21.4	Post-MUR Project, tangible and intangible heritage values relative to the Project concept (based on the northern rail access option) 21-51
Figure 21.5	Post-MUR Project, tangible and intangible heritage values relative to the Project concept (based on the central rail access option) 21-52
Figure 21.6	Post-MUR Project, tangible and intangible heritage values relative to the project concept (based on the southern rail access option) 21-53

List of photographs

	Page number
Photo 21.1	General view of ABB site looking north-west 21-15
Photo 21.2	Building 99 21-16
Photo 21.3	Building B14 – Q Stores 21-17
Photo 21.4	Clive Steele Memorial Gates 21-17
Photo 21.5	Representative 1990s live-in accommodation 21-18
Photo 21.6	Western elevation of the RAE Chapel and Commemorative Bell 21-19
Photo 21.7	CUST Hut (S135) viewed from south-west 21-19
Photo 21.8	RAAF STRARCH Hangar 21-20
Photo 21.9	RAE Vietnam War Memorial 21-31

21. European heritage

Chapter 21 provides an assessment of the European (i.e. non-Aboriginal) heritage items present on the Project site. It also presents assessments of cultural heritage significance and the potential impacts on European heritage values as a result of the Moorebank Intermodal Terminal (IMT) Project (the Project). This chapter summarises the detailed European Heritage Assessment prepared by Navin Officer Heritage Consultants Pty Ltd (NOHC), which is included in Technical Paper 11 – *European Heritage Impact Assessment* in Volume 8 of this Environmental Impact Statement (EIS).

The assessment addresses the Commonwealth Department of the Environment (DoE)'s Environmental Impact Statement (EIS) Guidelines and the Secretary for the NSW Department of Planning and Environment (NSW DP&E)'s Environmental Assessment Requirements (NSW SEARs) for the Project as listed in Table 21.1.

Table 21.1 Relevant Commonwealth EIS Guidelines and NSW SEARs

Requirement	Where addressed
Commonwealth EIS Guidelines under the Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)</i>	
<ul style="list-style-type: none"> Provide description of the existing environmental values including historical values, of the site which may be affected by the proposal. 	Section 21.2 (this chapter) and Technical Paper 11 – <i>European Heritage Impact Assessment</i> (Volume 8).
<ul style="list-style-type: none"> Identify, describe and map places or items of historical heritage value. Describe the significance of the values to people or groups associated with those places. 	Sections 21.2 and 21.3 (this chapter) and Technical Paper 11 – <i>European Heritage Impact Assessment</i> (Volume 8).
<ul style="list-style-type: none"> Provide a comprehensive heritage assessment of the impacts the proposed action will have on any items with historical heritage values. 	Section 21.4 (this chapter) and Technical Paper 11 – <i>European Heritage Impact Assessment</i> (Volume 8).
NSW SEARs under the NSW <i>Environmental Planning and Assessment Act 1979 (EP&A Act)</i>	
<ul style="list-style-type: none"> Historic heritage (including archaeology, heritage items and conservation areas). Where impacts to National, State or locally significant historic heritage items are identified the assessment shall: 	This chapter and Technical Paper 11 – <i>European Heritage Impact Assessment</i> (Volume 8).
<ul style="list-style-type: none"> outline the proposed mitigation and management measures (including measures to avoid significant impacts and an evaluation of the effectiveness of the mitigation measures) generally consistent with the guidelines in the NSW Heritage Manual (Heritage Office and Department of Urban Affairs and Planning 1996); 	Section 21.5 (this chapter). An evaluation of the effectiveness of the mitigation measures is discussed in Chapter 28 – <i>Environmental management framework</i> .
<ul style="list-style-type: none"> be undertaken by a suitably qualified heritage consultant(s); 	Section 21.1 (this chapter).
<ul style="list-style-type: none"> include a statement of heritage impact for all heritage items (including significance assessment). This should include detailed mapping of all heritage items and how they are affected by the proposal including actual or residual heritage impacts arising from pre-cursor or ancillary activities or projects (such as early works, decontamination, demobilisation or relocating the School of Military Engineering from the site); 	Sections 21.3 and 21.4 (this chapter) and Technical Paper 11 – <i>European Heritage Impact Assessment</i> (Volume 8).
<ul style="list-style-type: none"> include details of any proposed mitigation measures (architectural and landscape); 	Section 21.5 (this chapter).
<ul style="list-style-type: none"> consider impacts from vibration, demolition, archaeological disturbance, altered historical arrangements and access, landscape and vistas, and architectural noise treatment; 	Noise and vibration impacts are covered in Chapter 12 – <i>Noise and vibration</i> .

Requirement	Where addressed
<ul style="list-style-type: none"> develop an appropriate archaeological assessment methodology, including research design, in consultation with the Department, and the Heritage Council of New South Wales, to guide physical archaeological test excavations and include the result of these excavations: and 	Section 21.1 (this chapter) (the subsurface methodology was endorsed by the Office of Environmental and Heritage).
<ul style="list-style-type: none"> provision of future mitigation strategies for all identified archaeological impacts that would arise from the Project. 	Section 21.5 (this chapter).

21.1 Assessment approach

The cultural heritage significance and potential impacts on European heritage values within the Project site were assessed by undertaking the following tasks:

- literature and database review;
- initial field surveys of the built environment and non-built environment of the Project site;
- archaeological test excavation;
- assessment of cultural landscape and social values; and
- assessment of the heritage significance and heritage impacts for individual items and the Project site as a whole.

21.1.1 Literature and database review

A range of archaeological and historical data was reviewed for the Project site and its surrounds, including a search of heritage registers and schedules, local histories and archaeological reports such as the *Moorebank Defence Site Heritage Assessment* (Graham Brooks and Associates 2004). Searches were undertaken of the following statutory and non-statutory heritage registers and schedules:

- Statutory listings:
 - > World Heritage List;
 - > The National Heritage List (Australian Heritage Council);
 - > The Commonwealth Heritage List (CHL) (Australian Heritage Council);
 - > The State Heritage Register (NSW Heritage Branch, Office of Environment and Heritage (OEH));
 - > Section 170 NSW State agency heritage register; and
 - > Heritage Schedule(s) from the Liverpool City Council (LCC) Local Environmental Plan (LEP) 2008.
- Non-statutory listings:
 - > The State Heritage Inventory (NSW Heritage Branch, OEH);
 - > OEH Maritime Heritage Sites Database;

- > The Register of the National Estate (Australian Heritage Council) (no longer in operation);
- > Register of the National Trust of Australia (NSW); and
- > Australian Institute of Architects, Heritage Buildings List.

21.1.2 Field surveys

The European heritage component was assessed in two parts:

1. an assessment of the built environment (including all above ground structures) conducted by Eric Martin and Associates (EM&A); and
2. an assessment of the potential for subsurface archaeological deposits in the non-built environment conducted by NOHC.

Built environment

A site inspection was undertaken by EM&A on 4 and 5 November 2010, with guidance from various Defence personnel as required for building access. The exteriors of all standing structures were inspected, with varying degrees of scrutiny and recording according to potential or previously determined significance. A number of buildings and locations identified in the desktop study as having recognised or potential significance were inspected in greater detail than other areas.

Where access was open and unrestricted, the interiors of a select number of buildings with known or potential heritage significance were inspected. The recording of items included the use of photography, and basic site type, location and condition descriptions.

The built environment survey undertaken in 2010 was limited to the Defence-owned land to the east of the Georges River (the main Moorebank IMT Project site) and a preliminary and broad-scale visual inspection of the LCC Northern Powerhouse Land from public easements. A subsequent survey of the Northern Powerhouse Land in February 2013 confirmed the absence of any built environment elements at this location.

Non-built environment

An archaeological field survey to assess the European archaeological (subsurface) environment was conducted by NOHC personnel concurrently with the Aboriginal heritage field survey (described in Chapter 20 – *Aboriginal heritage* of this EIS). Additional surveys were conducted separately in December 2010, February 2013 and May 2014.

The 2010 survey encompassed the Defence-owned land east of the Georges River, while the 2013 survey was focused on the Northern Powerhouse Land to the west of the river. The 2014 survey assessed the central and southern rail access option areas (excluding the Glenfield Landfill site due to access restrictions). Survey involved inspection of areas with assessed potential for subsurface remains, and areas where historical sources indicated the former presence of structures.

The bed of the Georges River (i.e. the area currently underwater) within the Project site was not directly surveyed for this assessment. The assessment of the archaeological potential of this area was based on a review of historical source material, heritage registers and predictive analysis.

21.1.3 Archaeological test excavations

An archaeological test excavation program was carried out by NOHC between 14 and 24 August 2012 (associated with Moorebank historical potential archaeological deposit (MHPAD) 1 and MHPAD2) and between 12 and 14 September 2013 (associated with MHPAD3) (refer to Figure 21.2 for the locations of MHPAD1, MHPAD2 and MHPAD3).

The primary objectives of the test excavation program were to:

- gain a representative sample of the likely archaeological resources present;
- determine the nature and significance of any European archaeological evidence within the potential archaeological deposit (PAD) areas; and
- determine the appropriate strategies for the management of cultural heritage values related to any confirmed archaeological evidence.

Excavation was undertaken using both mechanical and by-hand methodologies. All artefacts were recovered and analysed. Refer to section 3.5 of Technical Paper 11 – *European Heritage Assessment* (Volume 8) for further details on excavation methodologies.

21.1.4 Cultural landscape, social values and intangible cultural heritage

An evaluation was made of cultural landscape values, together with social and intangible cultural heritage values. The recognition of cultural landscapes is based on physical evidence within the environment. However, social and intangible values are also contained in human experience and action, and while they may be closely associated with physical items and places, they can exist independently. No detailed social values assessment was undertaken. Instead, the recognition of social values was assessed based on input from a limited number of interviewees. The definitions of the value categories are as follows:

- Cultural landscape: The World Heritage Committee (in Phillips 2003) defined cultural landscapes as 'areas that are illustrative of the evolution of human society and settlement over time, under the influence of physical constraints and/or opportunities presented by their natural environment and of successive social, economic and cultural forces, both external and internal'.
- Intangible cultural heritage: The United Nations Educational, Scientific and Cultural Organisation (UNESCO) 2003 Convention for the Safeguarding of the Intangible Cultural Heritage defined intangible cultural heritage as 'the practices, representations, expressions, knowledge, skills – as well as the instruments, objects, artefacts and cultural spaces associated therewith – that communities, groups and, in some cases, individuals recognise as part of their cultural heritage'.
- Social value: The Burra Charter defines social value as embracing 'the qualities for which a place has become a focus of spiritual, political, national or other cultural sentiment to a majority or minority group'. Most definitions of social significance, including that of the NSW Heritage Office, refer to the way a place may be important to a community's identity. Both the Australian and NSW governments' defined significance assessment criteria for cultural heritage recognise social values. These criteria are discussed in the following section.

21.1.5 Significance assessments

A significance assessment was undertaken of values identified within the Project site. The significance assessment drew on results of the historical research, field investigations and previous heritage assessments. The significance of the Project site itself and of the items it contains was assessed against both NSW and Commonwealth assessment criteria (refer to Appendix 4 of Technical Paper 11 – *European Heritage Assessment* (Volume 8) for the full list of criteria). The significance assessment is summarised in section 21.3.

NSW assessment criteria

The NSW Heritage Branch of the OEH has defined a methodology and set of criteria for the assessment of cultural heritage significance for items and places, where these do not include Aboriginal heritage from the pre-contact period (NSW Heritage Office & DUAP 1996, NSW Heritage Office 2000). To be listed on the State Heritage Register, the item under consideration must satisfy a set of heritage assessment criteria (detailed in section 9.1 of Technical Paper 11 – *European Heritage Assessment* (Volume 8)). In many cases items will be significant under only one or two criteria.

The State Heritage Register was established under Part 3A of the *Heritage Act 1977* (NSW) to record items of environmental heritage that are of State heritage significance. Environmental heritage means those places, buildings, works, relics, moveable objects, and precincts of State or local heritage significance (s4 of the *Heritage Act 1977* (NSW)). In using the criteria, the values must be assessed first, then the local or State context in which they may be significant. These assessments are provided in Appendix 4 of Technical Paper 11 – *European Heritage Assessment* (Volume 8) and follow the Heritage Branch methodology.

Commonwealth assessment criteria

The Commonwealth Heritage List (CHL) is a register of natural and cultural heritage places owned or controlled by the Australian Government. These may include places associated with a range of activities such as communications, customs, defence or the exercise of government. This list was established under the EPBC Act and nominations are assessed by the Australian Heritage Council.

To be listed on the CHL, the item under consideration must satisfy Commonwealth heritage criteria (s341D of the EPBC Act) (refer to section 9.2 of Technical Paper 11 – *European Heritage Assessment* (Volume 8) for a list of criteria). In many cases, items will be significant under only one or two criteria.

In addition to the heritage criteria, the Australian Heritage Council may also use threshold tests and Commonwealth heritage management principles to determine the level of significance of an item. A significance threshold test would be applied in addition to the heritage criteria to help the Council judge the level of significance of a place's heritage value. Commonwealth heritage management principles are listed in Section 9.2 of Technical Paper 11 – *European Heritage Assessment* (Volume 8). In addition to applying the primary test of the Commonwealth Heritage Listing criteria and the significance thresholds, reference would need to be made to the Commonwealth heritage management principles when assessing the Commonwealth heritage significance of places within the Project site.

21.1.6 Cumulative assessment

In accordance with the NSW SEARs, this EIS includes a cumulative assessment of the European heritage impacts of the Project in combination with the development of the Sydney Intermodal Terminal Alliance (SIMTA) site and other planned developments within the surrounding region. The findings of the cumulative assessment are provided in Chapter 27 – *Cumulative impacts*.

21.2 Existing environment

21.2.1 Historical context

A summary of the key dates and European development of the Project site is given in Table 21.2 below.

At the turn of the 19th century, the Project site was part of the Moorebank Estate, which comprised small rural landholdings and farms first established by Thomas Moore.

The Project site was first used for military purposes in the late 19th century, when it was established as a military training camp that quickly expanded during World War I. Other uses on the site have included sandmining on the eastern bank of the Georges River, and the construction of a light railway to service the operation, during the 1930s. The School of Military Engineering (SME) is the largest of the Defence units on the Project site and was established during World War II, in what is now called the Steele Barracks Army Base. The SME is home to the Royal Australian Engineers (RAE), whose role is to provide geospatial, combat and force support engineering capabilities. The buildings and facilities at the SME have undergone major change and redevelopment since the 1940s. Most of the buildings dating from that period have since been demolished and replaced with new structures. Various training facilities and schools have been established at the SME including the School of Signals, Central Training Depot, specialist dog training, explosive ordnance disposal and the nuclear, biological and chemical warfare wing.

The land west of the Georges River was a largely undeveloped rural landscape prior to the 20th century. Later, this area was developed as a golf course. The Southern Sydney Freight Line (SSFL), parallel and immediately adjacent to the Main South Railway Line (passenger line), has resulted in substantial disturbance to all of the remaining locally elevated ground and a proportion of the river flats on this land. This was due to the use of this land as construction depots and ancillary areas for the SSFL construction.

Table 21.2 Key dates and events in the European development of the Project site

Key date	Development
Pre 1788	The Liverpool district was home to the Cabrogal clan of the Darug tribe.
1798	The first land grants in the Liverpool area were made between 1798 and 1805 – including land granted to Eber Bunker on the western bank of the Georges River.
1805	The major recipient of land in the area was Thomas Moore, who received his first grant in the area of present day Moorebank. He ultimately received a total of 8000 acres on the east bank of the Georges River.
1809	Charles Throsby received his grant of 600 acres at Glenfield.
1810	Moore became the first Magistrate of Liverpool and was responsible for granting town allotments and ensuring development adhered to proper building and planning requirements. Collingwood House was built by Bunker on his Collingwood Estate; he was also granted a further 500 acres of land adjacent his Georges River holdings.
1836	Bunker died at Collingwood on 27 September.
late 1830s–1850s	Collingwood Estate was subdivided and developed with a steam mill, abattoir, wool wash and other industries established on land to the north of the study area.
late 1850s	Main South Railway Line constructed on western bank of Georges River.
1888	The Moorebank Estate was subdivided and offered for sale.
Late 1880s	NSW volunteer soldiers conduct training exercises in the area between the Georges River and the Royal National Park.

Key date	Development
1900–1909	The area adjacent to the Project area and north of the M5 Motorway was regularly used by various military units for the training camps. A rifle range was established in the area at the time.
1910	In January 1910, Lord Kitchener visits the Liverpool camps to inspect existing forces and advise upon the best means of developing the Defence forces of the country.
1912	As a result of Kitchener's report the government begins acquiring large areas of land in the Liverpool district for military purposes.
1914–1918	During World War I, Liverpool Camp was the main training area for new recruits in NSW, including the Light Horse, Engineers and Field Mining Companies.
1931	Liverpool Golf Club established and a new golf course started on the old Collingwood Estate
1930s	Artillery and Ordnance Division occupied north end of Project area.
May 1940	RAE SME established on a permanent basis. Located at Chowder Bay and Field Engineering Wing at Moorebank. SME's first location at Moorebank was in the area of the Base Administration Support Centre (BASC) or Titalka Park.
1940s–1944	Part of the BASG site accommodated units from the Australian Women's Army Service, who worked at the 8th Advanced Workshops, which were located within the present day DNSDC site opposite the Project site on Moorebank Avenue.
1943	War time peak occupation of SME numbered 1300 staff and students.
1944–45	The BASC site was occupied by 2nd Land Headquarters.
1954 to 56	Reconstruction and replanning to large areas of the SME site. Trade wing established. Works included: <ul style="list-style-type: none"> • new entry road; • new sleeping quarters, mess hall, recreation rooms and parade ground; • married quarters built – Jacquinet Court and Chatham Village; • new training areas in buildings and field areas; and • new road layout and road names.
1963	New accommodation wings constructed at the BASC site. Mine training area added to south of SME site. Expansion of SME to accommodate needs of National Service trainees, including construction of simulated Asian village.
1965–68	RAE Memorial Chapel constructed.
1971	Collingwood Golf Course closed prior to residential expansion.
1992–94	Major redevelopment of SME site. Nearly all pre-1950s development demolished. 1950s married quarters villages demolished. New accommodation, workshops, offices, sergeant's mess and headquarters buildings constructed.

Source: Table 4.1, Technical Paper 11 – *European Heritage Assessment* (Volume 8)

Previous cultural studies

A number of environmental and heritage studies on the Project site and its surrounds have previously been undertaken and have informed this assessment. These are described in turn below. Of these, the studies undertaken by ERM (2013), CDFD (2011) and Graham Brooks and Associates (2004) are directly concerned with the Project site, while the Urbis (2012) and Parsons Brinckerhoff (2006) studies relate to the surrounding local area.

Moorebank Unit Relocation (MUR) Project: Steele Barracks, NSW, Heritage Impact Assessment (ERM 2013)

In 2013, ERM undertook a heritage impact assessment to assess the potential impacts of the proposed relocation of 18 heritage items from the SME site to the Holsworthy Barracks as part of the approved MUR Project, due to be completed before the start of the Moorebank IMT Project. These items are listed in Table 21.3. The heritage significance of two items that will remain at the SME site after the MUR Project was also assessed (the Cullen Universal Steel Truss (CUST) Hut and the STRARCH Hangar). The assessment found that the items proposed for relocation have local heritage significance, with some of the items meeting the threshold for nomination to the CHL.

The MUR report also acknowledged that relocation of heritage items is not normally a preferred outcome; however, given the alternative of potential demolition if left in situ, relocation was considered to be an appropriate mitigation strategy in this case. All the items proposed for relocation to Holsworthy Barracks would be placed in locations and landscape settings consistent with their respective heritage values and the overall heritage context of Holsworthy Barracks.

The items were primarily identified as having heritage significance in terms of their social value (i.e. their association with Defence personnel). As Defence will be relocating from the SME site to Holsworthy Barracks, it is appropriate that the memorials and other heritage items of social value are also relocated to continue this association. The relocation process will also ensure ongoing access to these items for ceremonial and commemorative activities.

The MUR Project, including the relocation of these heritage items, was subject to assessment under the provisions of the EPBC Act, and was determined not to be a 'controlled action' under the terms of the Act. All impacts associated with the MUR Project are considered to be outside the scope of the Moorebank IMT Project and this EIS. This includes the impact of the MUR Project both on the items being relocated, and on the heritage significance of the SME site as a result of the removal of the items and relocation of the Defence activities. As a consequence, for the assessment of heritage impacts from the Moorebank IMT Project, the 'baseline' environment comprises the SME site with these items removed.

The residual heritage impacts at the SME site are summarised by ERM (2013 p 44) as follows:

The focus of the LCC LEP Heritage Schedule listing for the SME is on the Museum and its Collection, the Chapel and memorials. The great majority of the heritage values currently present at Steele Barracks will therefore be relocated to Holsworthy Barracks and conserved. Once the relocation has been undertaken, the CUST Hut and STRARCH Hangar will remain at Steele Barracks until the commencement of the IMT Project.'

As indicated, the only items at the SME site that will not be relocated as part of the MUR Project are the CUST Hut and STRARCH Hangar. Therefore, the impact of the Project on these items has been assessed in this EIS (refer section 21.4).

Table 21.3 Items addressed in ERM (2013) Heritage Impact Assessment for MUR Project

No	Name	Items to be relocated as part of the MUR Project
1	Burma-Thai Cross	To be relocated
2	Headstone of Lieutenant Hodgson	To be relocated
3	Bell and bell tower	To be relocated
4	Hanging plant containers, Chapel	To be relocated
5	Baptismal font, Chapel	To be relocated
6	Altar chairs, Chapel	To be relocated
7	Three badges on front of Chapel	To be relocated
8	Sandstone in the walls of the Chapel and plaques	To be relocated
9	Clive Steele Memorial Gates	To be relocated
10	The Service dog cemetery	To be relocated
11	The Commanding Officers (CO's) walk, vicinity of the Officers Mess	To be relocated
12	Australian Panel Bridge	To be relocated
13	Bailey Bridge	To be relocated
14	Heavy Girder Bridge	To be relocated
15	Steele Bridge	To be relocated
16	The RAE Memorial and Fountain	To be relocated
17	The Vietnam Veterans' Memorial and associated plaques	To be relocated
18	RAE Corps Museum wall and collection	To be relocated
19	CUST Hut	To remain at SME site
20	STRARCH Hangar	To remain at SME site

Source: Table 4.2, Technical Paper 11 – *European Heritage Assessment* (Volume 8)

Environmental Assessment Part 3A Concept Application for SIMTA (Sydney Intermodal Terminal Alliance) of the Moorebank Intermodal Terminal Facility (Urbis 2012)

This assessment identified the SME as a listed item in the Liverpool LEP (2008), which includes the RAE Memorial Chapel, RAE Monument, Major General Sir Clive Steele Memorial Gates and the CUST Hut, and an area around these built structures.

This assessment also identified the Casula Regional Arts Centre as listed in the Liverpool LEP. This building was built in the 1950s by the Electricity Commission of NSW, as one of a number of 'package' power stations, all of a similar design. The assessment of the building's heritage significance was based on the ability of the site to demonstrate the development of Casula post-WWII, when industrial expansion and residential growth necessitated an interim local power supply.

Moorebank Intermodal Terminal – Existing Aboriginal and European Heritage (CDFD 2011)

In 2011 Parsons Brinckerhoff prepared a review of the existing Aboriginal and European heritage for the Moorebank Intermodal Terminal (CDFD 2011).

The Project area included Commonwealth-owned land occupied by the Department of Defence and was generally defined as the land bounded by the Georges River to the west, Moorebank Avenue to the east, the M5 Motorway and ABB Medium Voltage Production facility to the north and the East Hills Railway line to the south.

This European heritage assessment addressed both a European built environment component and a European archaeological (non-built environment), or subsurface, component. The archaeological field surveys identified six European archaeological sites and one potential archaeological deposit within the Project area. The report recommended that an assessment of heritage impacts should be undertaken upon confirmation of a preferred concept.

Environmental assessment for the proposed South Sydney Freight Line (Parsons Brinckerhoff 2006)

In 2006 Parsons Brinckerhoff undertook an Environmental Assessment on behalf of ARTC for the proposed South Sydney Freight Line between Macarthur and Sefton in southern Sydney. For the section of the freight line adjacent to the Project site, this assessment identified the following sites as being of cultural heritage significance:

- Casula railway station and footbridge, opened in 1894 (located south-west of the Project site), was identified as being of local significance. In addition, the footbridge is listed on the RailCorp (now Sydney Trains) s170 register (a register of relevant rail heritage under the NSW *Heritage Act 1977*);
- The Casula Powerhouse Arts Centre (former Liverpool Power Station), built in 1953, was assessed as having local significance but was not yet listed; and
- Casula Railway Viaduct, an 1891 brick masonry viaduct, was assessed as being of local significance and listed on the Campbell City LEP.

Moorebank Defence Site Heritage Assessment (Graham Brooks and Associates, 2004)

This assessment included all of the Defence lands within the Project site. The assessment of heritage significance concluded that the following elements on the SME and Base Administration Support Centre sites were of cultural heritage significance:

- road pattern and boundary alignment;
- naming of roads and areas within the SME;
- memorials, chapel, museum, entrance gates and movable heritage relating to the use of the SME by the RAE; and
- cultural plantings and natural landscape.

Based on these previous studies and the surveys and investigation of the built environment undertaken for the Project, the Project site has been divided into four precincts, defined by physical character, function and defined location. The precincts are identified in Figure 21.1.

Details of the survey results for each of the four precincts are described in section 21.2.3.

21.2.2 Statutory and non-statutory listings

Commonwealth Heritage List (CHL)

The Project site is not entered on the CHL. The CHL Place #105641 Defence National Storage and Distribution Centre, Moorebank Avenue, is on the eastern side of Moorebank Avenue and outside the Project site.

State Heritage Register and Inventory

There is one place near the Project site that is listed on the State Heritage Register. Glenfield Farm (see Figure 21.1) is listed under the NSW Heritage Act for its notable associations with Dr Charles Throsby, his nephew Charles Throsby and his family. This farm is the oldest continuously worked farm in Australia, and its buildings rank among the earliest in the country for their design and workmanship. The dairy, barn, homestead and Glenfield Farm Group (i.e. the collective grouping of the Glenfield homestead, barn and dairy) are on the Inventory.

There are seven places (see Figure 21.1) in or near the Project site listed on the State Heritage Inventory by local government and NSW Government agencies:

- *Glenfield Farm* is listed separately as:
 - > Glenfield Farm homestead;
 - > Glenfield Farm barn;
 - > Glenfield Farm (former) dairy; and
 - > Glenfield Farm Group.
- *Kitchener House (formerly Arpateelie), 208 Moorebank Avenue (item no. 58)*. This is a Federation cottage used by Lord Kitchener in 1910 to review the status of the Australian army. The building is now privately owned and is outside the Project site.
- *Australian Army Engineers Group (Item 57)* (located within Precinct 4 on Figure 21.1). The Heritage Schedule defines this item as Lots 3001 to 3005 on DP1125930 and as including:
 - > RAE Memorial Chapel;
 - > RAE War Memorial;
 - > Major-General Clive Steele Memorial Gates; and
 - > CUST Hut.
- *Former Casula Power Station (Item 10)*. This site is on the western side of the Georges River near the main northern railway and outside the Project site. The building has been adaptively re-used as an art gallery.
- *Railway viaduct, Main South Railway Line (Item 12)*, adjacent to Woodbrook Road, Casula. This is outside the Project site but adjacent to the proposed connection point for the northern rail access corridor to the SSFL.

- *Railway viaduct, Main South Railway Line (Item 11)*, approximately 200 m south of the former Casula Power Station. This is outside the Project site but adjacent to the proposed connection point for the central rail access corridor to the SSFL.
- The SME is included in the State Heritage Inventory Database (Database no. 1970180) (located within Precinct 4 on Figure 21.1) as a complex/group due to its listing on the Heritage Schedule of the LCC LEP. The Inventory employs the term 'SME' as an overall name, but also refers to the Steele Barracks, Australian Army Engineering Museum and Heritage Park. The LCC LEP Heritage Schedule uses the overall name 'Australian Army Engineers Group', and identifies a number of specific items as belonging to that group (refer to the following section). However, the LCC LEP listing includes a cadastral definition that is inclusive of the entire Project site south of Bapaume Road.

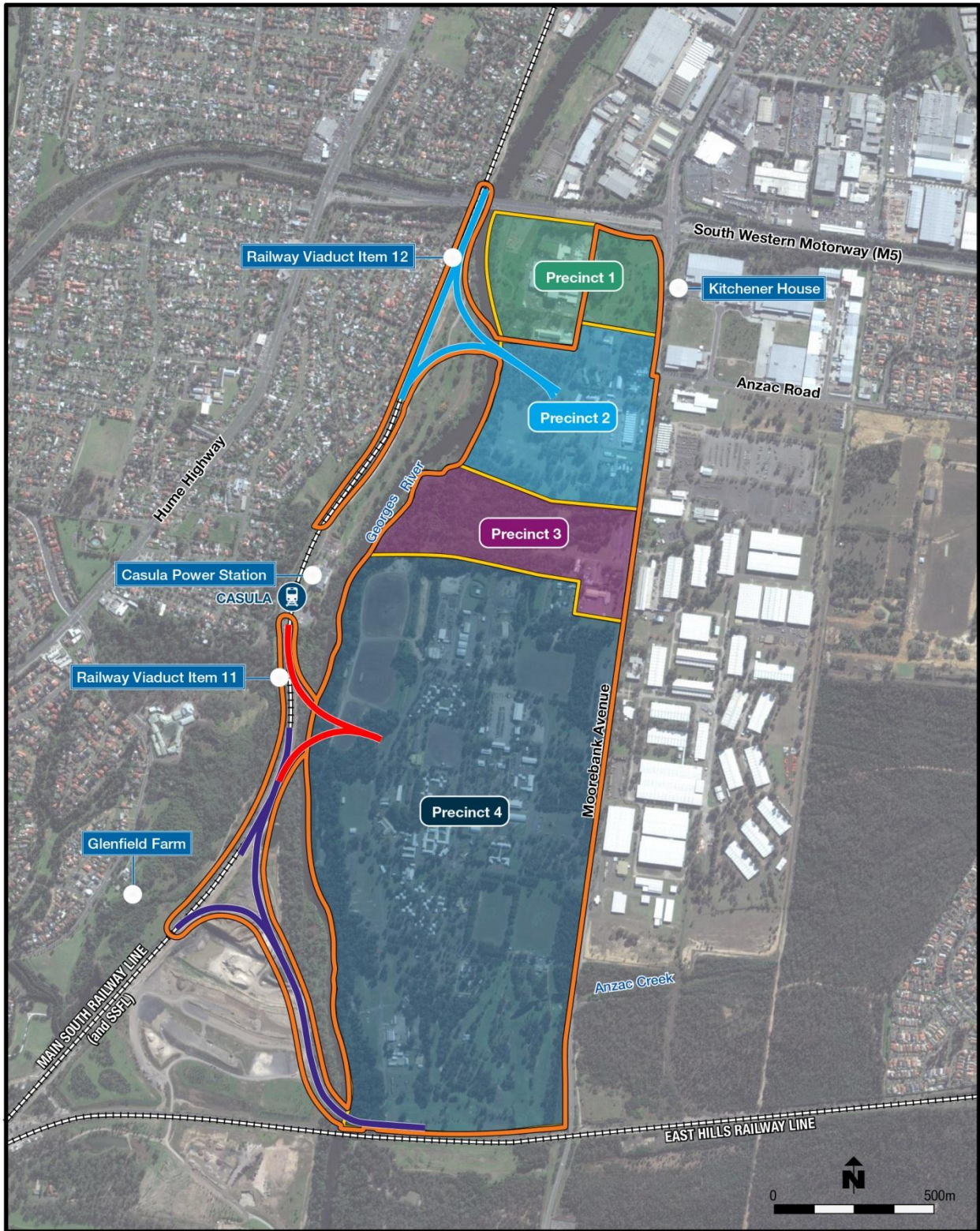


Figure 21.1 Precinct location plan of the Project site and location of listed items adjacent to the Project site

- Project site boundary
- Northern rail access option
- Central rail access option
- Southern rail access option
- Heritage precinct boundary
- Listed heritage items

LCC LEP 2008

Six of the above items listed on the State Heritage Inventory are also listed on the Heritage Schedule of the LCC LEP. These include:

- *Glenfield Farm Group*, including homestead, barn (former dairy and stables);
- *Kitchener House*;
- The *Australian Army Engineers Group (Item 57)* (including the RAE Memorial Chapel; RAE War Memorial; Major General Clive Steele Memorial Gates and CUST Hut);
- *Former Casula Power Station (Item 10)*;
- *Railway viaduct, Main South Railway Line (Item 12)*; and
- *Railway viaduct, Main South Railway Line (Item 11)*.

The Register of the National Estate

Kitchener House and Glenfield Farm, which are located outside but near to the Project site (refer Figure 21.1 and Figure 4.17 in Technical Paper 11 – *European Heritage Assessment*, Volume 8), are also listed on the Register of the National Estate. This is now a static register and has no statutory influence on the activities of the Commonwealth. However, it is an indication of potential community interest in a place.

21.2.3 Survey results

Overview of the precincts

For the purposes of undertaking surveys of the built environment, the Project site (east of the Georges River) was divided into four distinct precincts, as identified in Figure 21.1. Details of the survey results are described further in section 5 of Technical Paper 11 – *European Heritage Assessment* (Volume 8). The four precincts are shown in Figure 21.1 and discussed below.

Surveys of the rail access options for European archaeological (subsurface) resource were undertaken in February 2013 and May 2014 concurrently with the Aboriginal heritage field survey.

Precinct 1: Defence and private land north of Bapaume Road

Precinct 1 is bordered to the south by Defence land (the northern boundary fence of Moorebank Base Administration Support Centre), to the west by the Georges River, to the north by the M5 Motorway and to the east by Moorebank Avenue. The western half is occupied by a privately owned industrial complex (the ABB site), as shown in Photo 21.1, while the eastern side is primarily vacant and overgrown with grass. The vacant grassland is the former Moorebank Village residential accommodation. There is some evidence within the overgrown site of the main roads from the Moorebank Village era. The site presently has an open parkland character.



Source: EM&A 2011

Photo 21.1 General view of ABB site looking north-west

Precinct 2: Moorebank Base Administration Support Centre (BASC)

Precinct 2 extends south of Bapaume Road and west from Moorebank Avenue through to the Georges River (refer to Figure 21.1). The precinct has large areas of open space between the buildings which, combined with large areas of natural bushland, playing fields and recreation spaces to the south, west and north, provide a very open character to the precinct. An area set aside as parkland in 1949, known as Titalka Park, is located in the north-eastern corner of this precinct. The majority of the buildings in this precinct have been demolished since the built environment assessment undertaken by EM&A in 2010, with the exception of Building 99 and some sheds in the transport depot (Bermagui Constructions 2012). The demolished buildings were either one- or two-storey structures built at various times throughout the 1940s, 1960s, 1970s, 1980s and 1990s.

The buildings of the 1940s were called P1 style buildings (i.e. 1940s era buildings). The buildings that once stood in this location include the Drill Hall, former Officer's Mess and the Sergeant's Mess. General descriptions of these buildings and others are discussed further in section 5.1.2.2 of Technical Paper 11 – *European Heritage Assessment* (Volume 8).

The only existing building from the 1940s era is Building 99, which was constructed pre-1943. It is a large saw-toothed roofed workshop building (two to three storeys in height) currently used as a transport workshop, as shown in Photo 21.2.



Source: EM&A 2011

Photo 21.2 Building 99

Precinct 3: Defence Support and Reform Group (DSRG)

The eastern end of the precinct is occupied by car parks and a compact group of administration and stores buildings (refer to Figure 21.1). The majority of the site is occupied by native vegetation, including mature eucalypt trees and open grassland. The precinct contains a number of buildings in a compact group close to Moorebank Avenue. The precinct has a fragmented character due to its mix of building types (weatherboard clad buildings, prefabricated transportable buildings) from various periods.

The buildings in the precinct include:

- face brick single-storey office from the 1980s;
- weatherboard clad buildings (World War II (WWII) style); and
- stores areas (including a prefabricated office, single storey weatherboard P1 office building, and a large steel and concrete framed Q-Store building, shown in Photo 21.3) which are enclosed by a perimeter chain wire fence and located around a large bitumen car park.

None of the buildings in the precinct have any outstanding characteristics.



Source: EM&A 2011

Photo 21.3 Building B14 – Q Stores

Precinct 4: School of Military Engineering (SME) – Steele Barracks

Precinct 4 occupies the majority of the Project site. It extends from Moorebank Avenue through to the Georges River in the west (refer to Figure 21.1). The southern boundary of the precinct is formed by the East Hills Railway Line. All of the built development within the precinct is located north of this rail line.

The principal entry to the SME is from Moorebank Avenue along Chatham Avenue. The site entrance is marked by commemorative steel truss gates (the Clive Steele Gates) and four concrete pillars either side of the entry road. These commemorate Major General Sir Clive Steele, after whom the Barracks are named (refer Photo 21.4).



Source: EM&A 2011

Photo 21.4 Clive Steele Memorial Gates

The SME largely comprises buildings constructed during the major redevelopment period from 1992 to 1994 and include accommodation blocks and workshops (refer to Photo 21.5). The original development of the SME occurred between the 1940s and mid 1950s. Surviving buildings from this era include the RAE Museum, Officer's Mess and Peeler Club.



Source: EM&A 2011

Photo 21.5 Representative 1990s live-in accommodation

The following buildings and structures were built outside any major redevelopment phase and are of a different design from the other buildings on site:

- RAE Chapel: A two-storey high building containing a single level chapel and office areas. Two significant memorials are also located outside in the courtyard (refer to Photo 21.6);
- 1970s Lysaght sheds: constructed from a prefabricated steel building system which was used extensively on Defence installations during the 1970s. These buildings are located in the bridging yard and Museum's stores area of the SME site;
- CUST Hut: The CUST Hut features a large, clear span vaulted roof. The building was erected pre-1949 and was refurbished during the 1990s redevelopment. The building stores large vehicles and equipment from the RAE Museum collection (refer to Photo 21.7 and Figure 21.2);
- Bicentenary building: This is a small, single-storey display building located within the Heritage Park north of the RAE. Training course opening and closing addresses are conducted in the building;
- Royal Australian Air Force (RAAF) STRARCH Hangar: The Hangar building is located within the Heritage Park. The building is 30 m x 32 m and comprises a post-tensioned steel truss roof tied down to large concrete footings. The building is a recent addition to the Heritage Park and houses large machinery and equipment from the RAE Museum collection (refer to Photo 21.8); and
- Memorials and Heritage Park: a number of memorials are located in the SME, many within the Heritage Park. Two key memorials are located within the Heritage Park: the RAE Vietnam Memorial and the Services Dogs Memorial.

None of the buildings in the precinct have any outstanding characteristics.



Source: EM&A 2011

Photo 21.6 Western elevation of the RAE Chapel and Commemorative Bell



Source: EM&A 2011

Photo 21.7 CUST Hut (S135) viewed from south-west



Source: EM&A 2011

Photo 21.8 RAAF STRARCH Hangar

Archaeological features

This section describes the archaeological recordings made during the field survey of the Project site to the east of the Georges River. A summary of European archaeological recordings is presented in Table 21.4 and shown on Figure 21.2. The archaeological recordings made during the field survey are listed below with further details in Section 5.2 of Technical Paper 11 – *European Heritage Assessment* (Volume 8).

Table 21.4 Summary of European archaeological recordings

Site code	Site type/description	Size
MH1	Dog cemetery	Approx. 20 x 20 m
MH2	Drainage ditches (military origin)	Approx. 5 x 10 m
MH3	Portion of light rail (not in situ)	-
MH4	Portion of light rail (not in situ)	-
MH5	Large above ground concrete slab (military origin)	Approx. 2.5 x 2.5 x 0.8 m
MH6	Commemorative garden	Approx. 70 x 60 m
MH7	Liverpool Golf Course	Approx. 400 x 100 m

Source: Table 5.1, Technical Paper 11 – *European Heritage Assessment* (Volume 8)

MH1 – Dog Cemetery

This recording is located adjacent to the current dog training area in the northern portion of the SME (refer to Figure 21.2). Dog training at Moorebank was first established in the 1950s. It was briefly suspended in the 1960s but revived in 1969. The cemetery grounds are defined by a gravelled rectangular earth platform, approximately 20 x 20 m, which contains at least seven graves. The borders around these graves are defined by stone cobbles, brick and wooden elements.

MH2 – Drainage ditches

This recording is located in the upper slopes of the Tertiary terrace edge on the western boundary of the Project construction footprint (refer to Figure 21.2). The recording consists of two parallel excavated gutters, 2 m apart, aligned in an east–west direction. The gutters were possibly installed to drain water from the playing fields that are situated on the western side of the Project site. Based on location, form and construction of these features, this recording is interpreted as a Defence-related feature dating back to the establishment of the playing fields.

MH3 – Light rail portion

This recording comprises a section of light rail exposed in the bank of a deeply entrenched vehicle track. This site was recorded along the embankment of the Tertiary terrace on the western boundary of the Project construction footprint (refer to Figure 21.2).

MH4 – Light rail portion

This recording comprises a section of light rail and a bent linear metal plate exposed in spoil associated with the disturbed embankment of the Tertiary terrace on the south-western edge of the Project construction footprint (refer to Figure 21.2). This portion of the terrace embankment, like the majority of the slope within the Project site, has been substantially disturbed by the construction of training course earthworks and obstacles.

The rail portion is not in situ and may not be close to its original location. This item may have originally formed part of the light rail line which serviced a sand mining operation on the Project site between 1917 and 1930.

MH5 – Above ground concrete slab

This recording consists of a large, low, above ground, square concrete slab. It is situated near the eastern boundary of the Project construction footprint (refer to Figure 21.2). It is situated near the eastern boundary of the Project site, in a bushland strip, recently used for training in the defusing of heavy ordnance. The slab is probably a consequence of a Defence training action, and/or may have served as a platform for machinery or tank(s).

MH6 – Commemorative garden

This recording consists of a commemorative garden comprising a number of plantings, commemorative cairns and rock-edged garden beds located towards the middle of the Project site (refer to Figure 21.2). The garden has the form of an open garden bed. The commemorative nature of the garden is informal and has elements of local heritage values with the use of pre-Defence era materials.

MH7 – Liverpool Golf Course

This recording consists of tree plantings, earthworks, paths and posts that relate to the former Liverpool Golf Club. A series of tree plantings, including native and introduced species, run parallel to the river along the western bank. The land surface in this area is highly modified and includes artificial mounds and depressions. These surface features and tree plantings appear to be the remains of the mid to late 20th century golf course.



- Heritage assessment study area
- Areas of ground disturbance based on field survey, historical aerial photography and construction/demolition events
- Buildings indicated on circa 1890 Moorebank Farms Subdivision Plan
- Buildings indicated on circa 1912 plan of Moorebank area (Liverpool regional museum)
- Riverbank indicated on circa 1890 subdivision plan
- Riverbank indicated on circa 1912 plan
- Sand loading bins
- Recorded item
- To remain on Project site
- To be relocated as part of MUR Project

Figure 21.2 The location of all European archaeological recordings and former identified structures and activities within the Project site, relative to areas of mapped major disturbance

- Core group of heritage buildings - Australian Army Engineers Group
- Former WWII buildings (circa 1943 aerial photography)
- Liverpool camp (circa 1915)
- Military isolation camp (circa 1920)
- P.E. Barker orchard and vineyard
- Former light rail - Moorebank Sand company line (approximate location only) 1917-1930s

Potential archaeological deposits (PADs)

The field survey and a review of historical information for the Project site to the east of the Georges River identified three PADs (MHPAD1, MHPAD2 and MHPAD3) at the locations of former structures and activities. The structures and activities are listed in Table 21.5; their locations are shown in Figure 21.2. The potential for these locations to retain significant archaeological deposits has been compromised by subsequent Defence-related land use practices, such as large-scale earthworks, detonation of artillery and multiple phases of road and building construction.

The locations of former pre-Defence items such as tenant farms, homesteads and orchards are now characterised by extensive land surface modification. The field survey did not reveal any surviving archaeological deposits of pre-Defence items. The majority of the Project site was found to be affected by Defence-related development, such as training infrastructure (including pits, trenches and areas used for shelling) which has significantly altered the 19th century landscape.

Refer to section 5.2 of Technical Paper 11 – *European Heritage Assessment* (Volume 8) for further discussion on PAD survey results.

Table 21.5 Review of subsurface archaeological potential associated with archaeological recording, WWII buildings and the location of former (WWII or before) structures according to chronological phase

ID	Site type/description	Age period	Inside construction footprint? Y/N	Degree of existing disturbance to site	Summary of subsurface archaeological potential	Is deposit/location physically accessible?
Pre-Defence Occupation Phase						
19C Farm – 1	Former building shown on 1890 Moorebank Farms subdivision plan	1840s to c.1912	Y	High – two phases of Defence construction and demolition have occurred in this area since 19th century occupation.	Nil	Yes
19C Farm – 2	Former building shown on 1890 Moorebank Farms subdivision plan	1840s to c.1912	Y	High – two phases of Defence construction and demolition have occurred in this area since 19th century occupation.	Low	Yes
19C Farm – 3	Former building shown on 1890 Moorebank Farms subdivision plan	1840s to c.1912	N	High degree of disturbance from construction and subsequent demolition of former sewage treatment plant.	Nil	Yes
19C Farm – 4	Former building shown on 1890 Moorebank Farms subdivision plan	1840s to c.1912	Y	High degree of disturbance from construction and subsequent demolition of adjacent former sewerage treatment plant.	Low	Yes
19C Farm – 5	Former building shown on 1890 Moorebank Farms subdivision plan	1840s to c.1912	Y	High degree of disturbance from Defence related excavations and landscaping, include removal of original land surface.	Nil	Not applicable
19C Farm – 6	Former building shown on 1890 Moorebank Farms subdivision plan	1840s to c.1912	Y	High degree of disturbance from Defence related excavations and landscaping.	Nil	Yes
19C Farm – 7	Former building shown on 1890 Moorebank Farms subdivision plan	1840s to c.1912	Y	Despite the presence of tree cover, this area has been highly disturbed by Defence training earthworks.	Nil	Yes

ID	Site type/description	Age period	Inside construction footprint? Y/N	Degree of existing disturbance to site	Summary of subsurface archaeological potential	Is deposit/location physically accessible?
19C Farm – 8	Former building shown on 1890 Moorebank Farms subdivision plan	1840s to c.1912	N	Despite the presence of tree cover, this area has been highly disturbed by Defence training earthworks.	Nil	Yes
19C Farm – 9	Former building shown on 1890 Moorebank Farms subdivision plan	1840s to c.1912	Y	High degree of disturbance from Defence related land use, infrastructure and landscaping.	Low	Yes
19C Farm – 10	Former building shown on 1890 Moorebank Farms subdivision plan	1840s to c.1912	Y	High degree of disturbance from previous construction and demolition of Defence residential housing.	Nil	Yes
Orchard	Former orchard 'PE Barker Orchard' shown on 1888 plan	1840s to c.1912	Y	High to moderate degree of Defence related construction, landscaping and earthworks.	Nil	Yes
1912 – 1	Former building shown on 1912 plan	1840s to c.1912	Y	High degree of Defence related disturbance involving complete removal of original land surface.	Nil	Not applicable
1912 – 2	Former building shown on 1912 plan	1840s to c.1912	Y	High degree of disturbance from construction of buildings.	Nil	Yes
WWI and WWII Defence Phases						
SM – 1	Former loading stage – Sand mining and transport via light rail	1917 to 1930s	Y	High degree of disturbance from Defence related construction and landscaping.	Nil	Yes
SM – 2	Former siding and sand loading bins – Sand mining and transport via light rail	1917 to 1930s	Y (southern rail access option)	Moderate degree of disturbance from Defence training earthworks and possibly also from adjacent rail construction.	Low	Yes
MH3	Piece of light rail portion (not in situ)	1917 to 1930	Y	Within area highly disturbed by landscaping for training infrastructure.	Low – not considered to be in situ	Yes
MH4	Piece of light rail portion Consisting of two joined lengths (not in situ)	1917 to 1930	N	Within area highly disturbed by landscaping for training infrastructure.	Low – not considered to be in situ	Yes

ID	Site type/description	Age period	Inside construction footprint? Y/N	Degree of existing disturbance to site	Summary of subsurface archaeological potential	Is deposit/location physically accessible?
MHPAD1	PAD – Titalka Park (location of former group of WWII buildings and WWI isolation camp)	Pre-WWI up to and including the 1950s	Y	WWII buildings have been demolished. Subsequently developed as a park.	High	Yes
MHPAD2	PAD (location of WWII period buildings)	1940s until demolished, probably in the 1950s	Y	WWII buildings have been demolished. PAD consists of remnant areas of undeveloped open space.	Moderate to high	Yes
MHPAD3	Remnant paved and garden areas in the vicinity of the former Drill Hall group of buildings (former buildings B36–40)	1940s to present	Y	All structures were demolished this year; however adjacent paved areas and garden beds remain partially intact.	Moderate to high	Yes
All existing WWII period structures						
CUST Hut	CUST Hut	Relocated from Kapooka to Moorebank after 1946 and before 1948	Y	Building intact and in good condition.	Moderate – building thought to have originally had an earthen floor which was subsequently overlain with a concrete slab. Archaeological deposit may remain under the current slab.	No, any potential archaeological excavation would occur as a salvage strategy in the event that the building is demolished and/or removed.
B99	Large transport depot warehouse	Pre-1948	Y	Building intact and in good condition.	Nil – building considered always to have had concrete floor and surrounding sealed hard surfaces. This would have prevented the deposition of an archaeological deposit.	No

ID	Site type/description	Age period	Inside construction footprint? Y/N	Degree of existing disturbance to site	Summary of subsurface archaeological potential	Is deposit/location physically accessible?
B7-B9 & B103	P1 style buildings now serving as Defence administration buildings	1940s onwards	Y	Buildings have been substantially modified. Buildings have been re-positioned and their current location does not relate to their WWII history or function.	Nil – the deposits under and around these structures do not relate to any significant phase.	Not applicable
Post-WWII Defence Phases						
MH1	Dog cemetery	1960s onwards	Y	Undisturbed at time of survey.	Site significance does not warrant archaeological excavation.	Yes
MH2	Pair of shallow linear drainage ditches, roughly bordered with rough sandstone cobbles (military origin)	20th century	N	Essentially a surface feature, remaining cobbles have been displaced.	Low – site significance does not warrant archaeological excavation.	Yes
MH5	Large above ground concrete slab (military origin)	20th century	Y	Above ground, intact feature.	Site significance does not warrant archaeological excavation.	Yes
MH6	Commemorative garden	From the second half of 20th century	Y	Undisturbed at time of survey – surface features and plantings.	Low	Yes
Non-Defence related 20th century phase						
MH7	Liverpool Golf Course	1931 to late 20th century	Y	High disturbance: the golf course as a whole has effectively been destroyed. The only extant features are tree plantings along some fairways and remnants of the fifth and twelfth tees.	Site significance does not warrant archaeological excavation.	Yes

21.2.4 Built environment analysis

This section analyses the main built environment elements of the Project site (to the east of the Georges River) and their setting in a wider context to understand their significance and the importance of the place.

Location

The Project site has a long association with military forces. Precinct 4 has been the home of the SME since 1940. Although buildings from the first phase of development have since been demolished, original road names and layouts still exist within the precinct. Precinct 2 contains Tiltalka Park, which was the site of the first permanent military buildings within the Project site. There is some surviving evidence of this period in the form of old roads on the overgrown site.

Landscape

The landscape character across the Project site mainly comprises open grassland and stands of eucalypt trees in the middle of the site. Remnant bushland is present along the Georges River corridor which borders Precincts 2 and 3 (refer to Chapter 13 – *Biodiversity* and Chapter 22 – *Visual and urban design*).

The built environment areas of the Project site mainly comprise eucalypts scattered among the buildings and in stands around the Project site. The only garden areas with some potential significance (associational) are in the Vietnam Memorial (Precinct 4). The roses planted in this memorial were relocated from the Holsworthy Barracks.

Analysis of building types in the SME

In terms of building types, a large number of buildings in the SME were constructed in a major redevelopment between 1992 and 1994. These buildings are largely similar in design and character, and exhibit a low level of significance (see Photo 21.5).

Some buildings and structures have a higher level of significance due to their association with the history of the SME. Table 21.6 provides a brief description of the significance of these buildings (for further details please refer to section 7 of Technical Paper 11 – *European Heritage Assessment* (Volume 8)). Individual buildings of interest include:

- RAE Chapel (1968) (refer to Photo 21.6);
- CUST Hut (circa 1948) (refer to Photo 21.7);
- Bicentenary Building;
- Transport Compound Workshop (Building 99);
- RAAF STRARCH Hangar (erected SME 2009-2010); and
- Afghanistan Training Area.

Table 21.6 Significance of building types to the SME

Buildings and structures	Reasons for significance
RAE Chapel (1968) (refer to Photo 21.6)	The RAE Chapel has moderate to high level of significance to the SME as it was designed and built by Sappers and contains a number of memorials of significance to the Corps.
CUST Hut (circa 1948) (refer to Photo 21.7)	The CUST Hut is the oldest surviving building in the SME. The building has historic and technical significance of an increasingly rare construction system for clear span vaulted warehouses. Two CUST huts are still in Defence ownership and in use in Queensland (RAE Museum staff advice). Prior to the installation of the concrete floor, there is some potential for the accumulation of archaeological material relating to the early use of the hut. This accumulation is likely to relate to around 1940.
Bicentenary Building	The building has local significance to the SME as it was designed by Sappers and was the last building on site to be completely constructed by Sappers. It has been used for opening and closing addresses of training courses and so has association with key events in a Sapper's training.
Transport Compound Workshop (Building 99)	This structure is a steel framed, saw tooth roofed workshop constructed during WWII. Similar structures include Hangar 76 at Amberley RAAF Base, Queensland, which has a welded steel frame supporting a saw tooth roof characteristic of late 1930s and early 1940s utilitarian and workshop structures erected by the Commonwealth.
RAAF STRARCH Hangar	<p>This building is a unique example of a RAAF STRARCH re-deployable hangar. SME management believes the hangar may be the only example of this design still in Defence ownership in Australia (identified in staff interviews on SME site during field surveys, 2010). The construction system is unique and was developed to provide prefabricated quick erection hangars to house F111 fighters. The system has since been developed for non-Defence commercial use and the company now operates as STRARCH Australia. This building, still owned by Defence, consequently retains an historic connection to its original design use, which was to house the F111 Squadron when they first arrived in Australia.</p> <p>This type of design and construction occur elsewhere in Australia outside of Defence ownership for example Drage's AirWorld at Wodonga VIC and at Avalon Airport, Melbourne, Victoria.</p>
Afghanistan Training Area	This compound within the SME site is a model of a compound perimeter walling system and other examples of structures presently being used in the Australian deployment in Afghanistan. The compound is used to train Sappers in construction techniques they will encounter if they are deployed to Afghanistan.

In addition, a number of memorial items are located in the SME including:

- Burma-Thai Memorial;
- Service dog cemetery;
- RAE Memorial;
- Clive Steele Memorial Gates;
- RAE Vietnam War Memorial (refer to Photo 21.9);
- Commanding Officers (COs) walk; and
- RAE Museum Collection and Heritage Park.

Social and intangible values

A range of features, places and associations found within the Project site (to the east of the Georges River) have cultural value. Some of these features and places are summarised below, with further detailed outlined in Section 7.4 of Technical Paper 11 – *European Heritage Assessment* (Volume 8).

SME

The history of the SME extends continuously from the commencement of World War II and has always been associated with the Moorebank site. The identity of the SME, its history, traditions and practice are, therefore, intimately related to the SME's location and its current fabric. For all current and former staff, trainees, graduates, and their descendants, there is likely to be a range of emotions, values and perceptions which amount to a strong social value for the SME, its function, historical role and legacy. The skills developed and taught by the SME amount to an intangible cultural heritage that has become a vital component of Australia's military capability and engagement from World War II onwards. Much of this heritage could be expected to continue as a consequence of the continuation of the SME, wherever it is physically situated.

Commemorative and memorial features and places

A large number of memorial features and commemorative places exist across the SME, which act as a focus for the recognition and celebration of its history, identity and function. These generate significant social value through the education and recognition they promote, and their ceremonial function across internal and external audiences. The memorials and commemorative places include the:

- RAE Memorial and Fountain;
- RAE Museum and Former Headquarters (S04);
- RAE Chapel, associated Memorials (S03) and Commanding Officer's Walk;
- RAE Vietnam War Memorial (refer Photo 21.9);
- Service dog cemetery; and
- Clive Steele Memorial Gates.



Source: EM&A: 2010

Photo 21.9 RAE Vietnam War Memorial

21.2.5 Moorebank cultural landscape

The Project site incorporates both Aboriginal and non-Aboriginal cultural landscape values. The Aboriginal values are associated with the Georges River, its immediate geomorphological context, archaeological traces and the remnant fringing native vegetation. These components combine to form a landscape with high cultural and social value.

Early 19th century European land use and development of the Project area included bush grazing and selective land clearance for cropping and the rearing of livestock. Following the deaths of Eber Bunker in 1836 and Thomas Moore in 1840, the Collingwood and Moorebank Estate lands were leased out to a range of tenant farmers. Concurrently, agricultural practice further diversified to include poultry farming, dairying and the establishment of orchards and vineyards. This pattern of land use continued into the late 19th century, when these lands were subdivided and sold.

Military use of the Moorebank Estate lands commenced with training manoeuvres in the 1890s and tented encampments in the first decade of the 20th century. The non-Aboriginal values are associated with the post-World War II fabric, arrangement and continuing function of the SME. The landscape of the SME reflects the evolutionary growth of a Defence training facility and its related infrastructure across the second half of the 20th century. The arrangement and distribution of different functional areas demonstrates planning as well as opportunistic adaptive reuse. As such, this is a cultural landscape that falls into the 'evolved and continuing' category. The fabric post-dates World War II, and the way of life represented is contemporary rather than traditional.

21.2.6 Archaeological test excavation results

Test excavations were conducted at MHPAD1, MHPAD2 and MHPAD3 on the Project site to the east of the Georges River (refer to Figure 21.2). The assemblage from Moorebank consisted of 1842 artefacts, with the vast majority coming from MHPAD1. The following sections summarise the evidence of early and/or mid 20th century military occupation at the three locations, with further details outlined in sections 7 and 8 of Technical Paper 11 – *European Heritage Assessment* (Volume 8).

MHPAD1

This site is located at the northern end of the Project site (Precinct 2) (refer to Figure 21.2) and is thought to have been the original location of the World War I isolation camp and World War II period structures. The excavations revealed a variety of features relating to buildings, paths and landscaping that may have originated from the World War II period. The majority of the items found on site were structural in nature and included machine-made bricks, fragments of asbestos sheeting, nails, bolts and roofing screws. The site also contained a large number of domestic-related items such as ceramic plates, saucers, glass tumblers, bottles, jars, shades and coins. In terms of military evidence found on site, the majority of items uncovered were bullet casings which were likely used for training purposes. MHPAD1 contains evidence that dates primarily from the 1930s through to the 1950s, as well as some evidence from the late 20th century.

MHPAD2

This site is located at the south-eastern side of the Project site (Precinct 4) (refer to Figure 21.2) and corresponds to the former location of World War II period buildings. Evidence that these buildings once existed are in the form of earthworks and remnant in situ items such as concrete. The structural evidence is largely similar to that from MHPAD1, containing items such as timber fastened with nails and screws, asbestos sheeting and bricks. Fewer domestic items were recovered from this site; however, a large number of bullet casings were found. Their presence here indicates that this area had been used for training purposes in the recent past. At this site, the strongest dating evidence is for the period from 1948 onwards.

MHPAD3

This site is located just south of Tiltalka Park (Precinct 2) (refer to Figure 21.2) and corresponds to the former location of the Drill Hall and associated P1 buildings from the 1940s. Excavations revealed evidence of road construction and maintenance, potentially undertaken by Sappers during training. Only a few building related artefacts – such as nails, tacks and bolts – were recovered, from a timber structure. The domestic related items included a single bone button, ceramic tableware and fragments of glass tumblers. Although the small number of artefacts recovered from MHPAD3 make it difficult to infer much, the nature of the artefacts appears to be of a less personalised or individualised nature than those recovered from the other sites. The dating evidence at this site was not definitive.

21.2.7 Rail access options

The assessment of the Liverpool City Council (LCC) land and Commonwealth land west of the Georges River associated with the northern and central rail access options has been comprehensive and based on a review of archival sources and existing information, as well as direct physical inspection and archaeological survey. The Glenfield Landfill site was not able to be accessed for this assessment; therefore, a desktop assessment of this area was undertaken. As noted previously, each rail access option was assessed for the presence of European heritage sites concurrently with the Aboriginal heritage field survey. Details of these findings are discussed below.

Northern rail access option

There is one heritage item located adjacent to the northern rail access option: Railway viaduct, Main South Railway Line (Item 12).

An archaeological subsurface test excavation was undertaken in 2014 (NOHC 2014b) of site MAPAD2 located on the eastern bank of the Georges River at the location of the northern rail access option crossing. Stratigraphic profiles observed in the test pits are broadly consistent with the geological mapping for the area, showing components of a very recent (Holocene) floodplain alluvial landscape. The test pits show a very high degree of well-preserved bedding structure. This was not expected, and is interpreted as reflecting very recent active sand mobilisation and re-deposition associated with 19th and 20th century floods. Deposits excavated across MAPAD2 comprised three groups:

- poorly sorted clayey gravels that have been introduced in some areas, most notably across the southern and northern extremities of the test area, as fill (Unit 3);
- well sorted light grey or light brown clean sands with well-preserved bedding structures and minimal soil development (Unit 2); and
- dark grey-brown silty sands with abundant charcoal (Unit 1).

The test excavation program has demonstrated that while the archaeological significance of the upper 120–150 cm of deposits is generally low, these deposits are likely to have significance in terms of representing environmental changes that resulted from European settlement, in particular the construction of the Liverpool Weir. The Unit 1 and Unit 2 deposits have the potential to be of significance in terms of their scientific value, natural value, educational value, representativeness and social value (importance to the Aboriginal community and the broader Australian community) at local, state and national levels.

Central rail access option

There is one heritage item located adjacent to the central rail access option: Railway viaduct, Main South Railway Line (Item 11).

The field survey undertaken for the central rail access option indicated that subsurface archaeological deposits of potential historical significance (due to their connection to the construction of the Liverpool Weir) may be located in the Project area, on both the eastern and western banks of the Georges River. As such, further investigation of this area would be required, as discussed in section 21.5.2.

Southern rail access option

There is one heritage item located adjacent to the southern rail access option: Glenfield Farm. There are no heritage items within the Project area for the southern rail access option.

21.2.8 Predictive assessment of Georges River and Glenfield Landfill

A desktop analysis was carried out on a small portion of the river bed of the Georges River located within the Project site (refer to Figure 21.2, where the Project site crosses the Georges River) and on the Glenfield Landfill site.

This land on the Georges River bed was unable to be directly surveyed as it is below the river level; therefore a predictive assessment has been undertaken to assess its archaeological potential both on the eastern bank adjacent to the main Project area and on the western bank as it relates to each rail option.

A predictive assessment has also been undertaken of the Glenfield Landfill as this area was unable to be directly accessed for this assessment.

Bed of the Georges River – all rail access options

Potential archaeological material that may be associated with a river bed or bank includes the structural remains and associated debris from bridges, jetties, landings and maritime vessels. Dumped waste may also be present along the adjacent banks, especially if they were used as dump sites by nearby residences or industrial areas.

A review of historical sources and existing heritage registers did not identify any known European sites, former structures or industries within or near this portion of the river. This finding indicates that this portion of the river bed has low archaeological potential.

Eastern Bank – all rail access options

The eastern bank of the river is framed by the steep embankment of the Tertiary terrace and consequently does not offer an easily accessible site for a jetty, bridge or landing. Given that none of the known former 19th century farm houses or structures occurs near this section of the bank, it is an unlikely area for the disposal of associated waste (all former farmhouses are at least 300 metres away).

Western bank – northern rail access corridor

In the vicinity of the northern rail option the western river bank is backed by low river flats and formed part of the Collingwood estate, established by Eber Bunker in the early 19th century. The Project area however, is situated between 0.6 and 1.6 kilometres upstream from the Collingwood homestead, and is unlikely to have been developed for jetties, landings or bridges during the life of this estate. Subsequent development and subdivision of the estate occurred well after the construction, and to the west of, the Great Southern Railway. This railway line served as a barrier which discouraged access and development to the east and along the Georges River.

As described above, the test excavation program at MAPAD2 has identified deposits are likely to have significance in terms of representing environmental changes that resulted from European settlement, in particular the construction of the Liverpool Weir. The deposits have the potential to be of significance in terms of their scientific value, natural value, educational value, representativeness and social value (importance to the Aboriginal community and the broader Australian community) at local, state and national levels.

Western bank – central and southern rail access corridors

In the vicinity of the central and southern rail crossing options, the western river bank is backed by a narrow strip of floodplain along the edge of the Main South Railway Line. As with the eastern side and the land further to the north, there were no known structures or infrastructure along this section of the floodplain to indicate that archaeological material would be expected within this portion of bed of the Georges River. However, the results of the subsurface testing program at MAPAD2 also have direct relevance for these sections of the rail access corridor are assessed as having archaeological potential.

Glenfield Landfill site

Archaeological material is unlikely to remain in the vicinity of the Glenfield Landfill site. This area has undergone significant modification including earthworks and the introduction of substantial quantities of fill. This portion of the Project site (for the southern rail access option) and the adjacent section of the western river bank are predicted to have very low archaeological potential.

21.3 Significance assessment

A summary of significance against the NSW and CHL assessment criteria is shown in Table 21.7. Figure 21.3 shows which items meet local, state and Commonwealth significance thresholds.

The Moorebank Cultural Landscape has been identified as having significance under both sets of criteria. Further details are provided in Section 9.3 of Technical Paper 11 – *European Heritage Assessment* (Volume 8).

In addition, particular items of significance have been grouped according to their respective significance rankings in Table 21.8. The summary of significance does not include built environment items that fall below the threshold of NSW or Commonwealth assessment criteria. For detailed assessment, refer to Appendix 4 of Technical Paper 11 – *European Heritage Assessment* (Volume 8).

Table 21.7 Summary of significance assessments

Site name	Significance against NSW criteria	Statement	Significance against CHL criteria	Statement	Impact on items: relocation by MUR Project, demolition or archaeological disturbance
Moorebank Cultural Landscape	Yes – Local (Criteria A, B, C, D, F and G)	The Moorebank Cultural Landscape is the product of numerous phases of landscape occupation and use spanning Indigenous occupation (pre-European settlement) through to the present day. Many of these phases of use and associated cultural history patterns are evidenced within different portions of the landscape. The toponyms, buildings, spatial organisation, memorials, archaeological deposits and elements of the natural landscape have various strong and/or special associations with Thomas Moore, the Australian Army (particularly the SME) and the Aboriginal community. Furthermore, the archaeological deposits identified within the Project site have the potential to yield information that would contribute to an understanding of its cultural history. The landscape as a whole is also notable as a locally distinct and representative cultural landscape.	Yes – Criteria A, B, D, E, F, G and H	This site meets the CHL criteria in terms of historical associations, social values, representativeness, research potential, technological characteristics, uniqueness, and Aboriginal cultural values.	Archaeological disturbance
Two pieces of light rail (MH3 and MH4)	No	These items have been disturbed by subsequent land use activities in the area and are no longer in their original location. Consequently, the items are unable to demonstrate their associated ways of life. The loss of site integrity also impacts on the potential research value of the items and associated ways of life, and consequent changes in significance that may have come from intactness. There are no other heritage values associated with these items e.g. social value.	No	This group of sites does not meet any of the CHL criteria.	Archaeological disturbance

Site name	Significance against NSW criteria	Statement	Significance against CHL criteria	Statement	Impact on items: relocation by MUR Project, demolition or archaeological disturbance
MHPAD1	Yes – Local (Criterion E, with potential for A, C, F and G)	This site maintains a high level of integrity and represents significant archaeological research potential at a local level. The archaeological potential of this site and its association with MHPAD2 are such that potential exists for the two sites to be of State significance. Further heritage value in the form of social value could also be assigned to this site. These aspects of site significance assessment would necessitate broad area excavations.	Yes – Criterion C with potential for A, B, D and F	The integrity of archaeological deposits at this site is such that research and scientific values exist at Commonwealth level.	Archaeological disturbance
MHPAD2	Yes – Local (Criterion E, with potential for A, C, F and G)	This site maintains a high level of integrity and represents significant archaeological research potential at a local level. The archaeological potential of this site and its association with MHPAD1 are such that potential exists for the two sites to be of State significance. Further heritage value in the form of social value could also be assigned to this site. These aspects of site significance assessment would necessitate broad area excavations.	Yes – Criterion C with potential for A, B, D and F	The integrity of archaeological deposits at this site is such that research and scientific values exist at Commonwealth level.	Archaeological disturbance
MHPAD3	No	This site has undergone major disturbance associated with the removal of the buildings that once stood in this area. Consequently, the site is not intact and its ability to demonstrate past activity is compromised. The only area of substantial intact deposit relates to road construction and does not display significant research potential.	No	This site does not meet any of the CHL criteria.	Archaeological disturbance

Site name	Significance against NSW criteria	Statement	Significance against CHL criteria	Statement	Impact on items: relocation by MUR Project, demolition or archaeological disturbance
MAPAD2 (Unit 1)	Potential significance against Criteria A, E, F and G	The sequence identified may be part of a broader sequence of deposits. The extent to which the sequence is preserved elsewhere is not known. On present evidence the conclusion would be that it is one of the few places where this historic stratigraphic record has survived development impacts. The overall conclusion is that the heritage values are considerable, and work should be undertaken to archive the information in the sequence proportional to scheme impacts.	Potential significance against Criteria A, B, C, D, G and I	The site requires further investigation to fully determine its significance.	
MAPAD2 (Unit 2)	Potential significance against Criteria A, B, C, E, F and G	The Unit 2 deposits may contain significant environmental information on the historic and immediately prehistoric environments at close to the upper tidal limit of the Georges River. The assessed significance is high, as the deposits reflect a rare sealing of the floodplain associated with rapid changes to channel hydrology caused by weir construction.	Potential significance against Criteria A, B, C, D, F, G and H	The site requires further investigation to fully determine its significance.	
CUST Hut	Yes – Local/State (Criteria A, B, C, E, F and G)	The CUST Hut has a strong and special association with Lieutenant Colonel D.R. (Dan) Cullen. It is important in the history and development of the SME site. The integrity and intactness of this structure contribute to its high level of technical significance. The possible subsurface integrity of this site represents significant archaeological research potential at a local level. The site is also rare and representative of its type. Further heritage value in the form of social value could also be assigned to this site. Refer to the table entry on 'RAE Museum Collection and Heritage Park' (below) regarding items within the Hut.	Yes – Criteria A, B, C, D, E F and H	The integrity, uniqueness and intactness of this structure provide for a high level of technical significance. The archaeological potential of this site may also contribute to its significance at a Commonwealth level.	Demolition

Site name	Significance against NSW criteria	Statement	Significance against CHL criteria	Statement	Impact on items: relocation by MUR Project, demolition or archaeological disturbance
Building 99	Yes – Local (Criterion F)	The Transport Compound Workshop is locally rare, within the context of the Moorebank Cultural Landscape, as a WWII era building that remains in situ. This building also contributes to the historical significance of The Moorebank Cultural Landscape.	No	This site does not meet any of the CHL criteria.	Demolition
Dog Cemetery (MH1)	Yes – Local (Criteria A, B and D)	The cemetery as a memorial possesses significant social value at a local level, despite not possessing archaeological research potential.	Yes – Criteria A, G and H	This site meets the CHL criteria in terms of historical associations and social values.	Archaeological disturbance
Pair of sandstone bordered ditches (MH2)	No	This site does not possess archaeological research potential. There are no other heritage values associated with this site e.g. social value, technical.	No	This site does not meet any of the CHL criteria.	Archaeological disturbance
Large above ground concrete block (MH5)	No	This site does not possess archaeological research potential. There are no other heritage values associated with this site e.g. social value, technical.	No	This site does not meet any of the CHL criteria.	Archaeological disturbance
Commemorative Gardens (MH6)	Yes – Local (Criteria A, B and D)	The site as a memorial possesses significant social value at a local level, despite not possessing archaeological research potential.	Yes – Criteria A, G and H	This site meets the CHL criteria in terms of historical associations and social values.	Archaeological disturbance
Liverpool Golf Course (MH7)	No	This site does not possess archaeological research potential; the recording comprises disturbed remnants of a golf course from the latter part of the 20th century. There are no other heritage values associated with this site e.g. social value or technical.	No	This site does not meet any of the CHL criteria.	Archaeological disturbance
RAE Chapel	Yes – Local (Criteria A, B and D)	The religious nature of this site and the various items it contains, namely a number of memorials, ascribe to it a social value despite it not possessing archaeological research potential.	Yes – Criteria A, G and H	This site meets the CHL criteria in terms of historical associations and social values.	Relocation as part of MUR Project

Site name	Significance against NSW criteria	Statement	Significance against CHL criteria	Statement	Impact on items: relocation by MUR Project, demolition or archaeological disturbance
RAAF STRARCH Hangar	Yes – Local/State (Criterion C)	The integrity and intactness of this structure contribute to its high level of technical significance; however, it does not possess associated archaeological research potential. Refer to RAE Museum Collection and Heritage Park regarding items within structure.	Yes – Criterion F	The integrity, uniqueness and intactness of this structure provides for a high level of technical significance.	Demolition
RAE Museum Collection and Australian Army Museum of Military Engineering Collections	Yes – Local and State (Criteria A, B and D)	The collection (both movable and fixed) possesses a high level of social, historical and technical or scientific value at a local or state level. The collection contains rare and unique items.	Yes – Criteria A, G and H	The rarity and uniqueness of this collection provides for a high level of social, historical and technical or scientific value at Commonwealth level.	Relocation as part of MUR Project
RAE Museum Sandstone Wall	Yes – Local (Criteria A, B and D)	The site as a memorial possesses significant social value at a local level despite not possessing archaeological research potential.	Yes – Criteria A, G and H	This site meets the CHL criteria in terms of historical associations and social values.	Relocation as part of MUR Project
Other Memorials	Yes – Local (Criteria A, B and D)	The memorials possess significant social value at a local level, despite not possessing archaeological research potential.	Yes – Criteria A, G and H	These items meet the CHL criteria in terms of historical associations and social values.	Relocation as part of MUR Project
Commanding Officers (COs) Walk	Yes Local (Criteria A, B and D)	The site as a memorial possesses significant social value at a local level despite not possessing archaeological research potential.	Yes – Criteria A, G and H	This site meets the CHL criteria in terms of historical associations and social values.	Relocation as part of MUR Project

Source: Table 9.2, Technical Paper 11 – *European Heritage Assessment* (Volume 8)

Table 21.8 European cultural heritage elements within the Project site, grouped according to their respective significance rankings

Commonwealth	State	Local	Nil
<ul style="list-style-type: none"> Moorebank Cultural Landscape CUST Hut RAAF STRARCH Hangar RAE Museum and Australian Army Museum of Military Engineering Collections RAE Museum Sandstone Wall COs Walk MHPAD1 MHPAD2 MAPAD2 (Unit 1) MAPAD2 (Unit 2) MH1 MH6 RAE Chapel Other Memorials 	<ul style="list-style-type: none"> CUST Hut RAAF STRARCH Hangar RAE Museum and Australian Army Museum of Military Engineering Collections 	<ul style="list-style-type: none"> Moorebank Cultural Landscape CUST Hut RAAF STRARCH Hangar RAE Museum and Australian Army Museum of Military Engineering Collections RAE Museum Sandstone Wall Building 99 COs Walk MHPAD1 MHPAD2 MAPAD2 (Unit 1) MAPAD2 (Unit 2) MH1 MH6 RAE Chapel Other Memorials 	<ul style="list-style-type: none"> MH 3-4 MHPAD3 MH2 MH5 MH7

Source: Table 9.3, Technical Paper 11 – *European Heritage Assessment* (Volume 8)

Note: While some elements do not have individual significance, they are essential components of the overall design aesthetic and community values

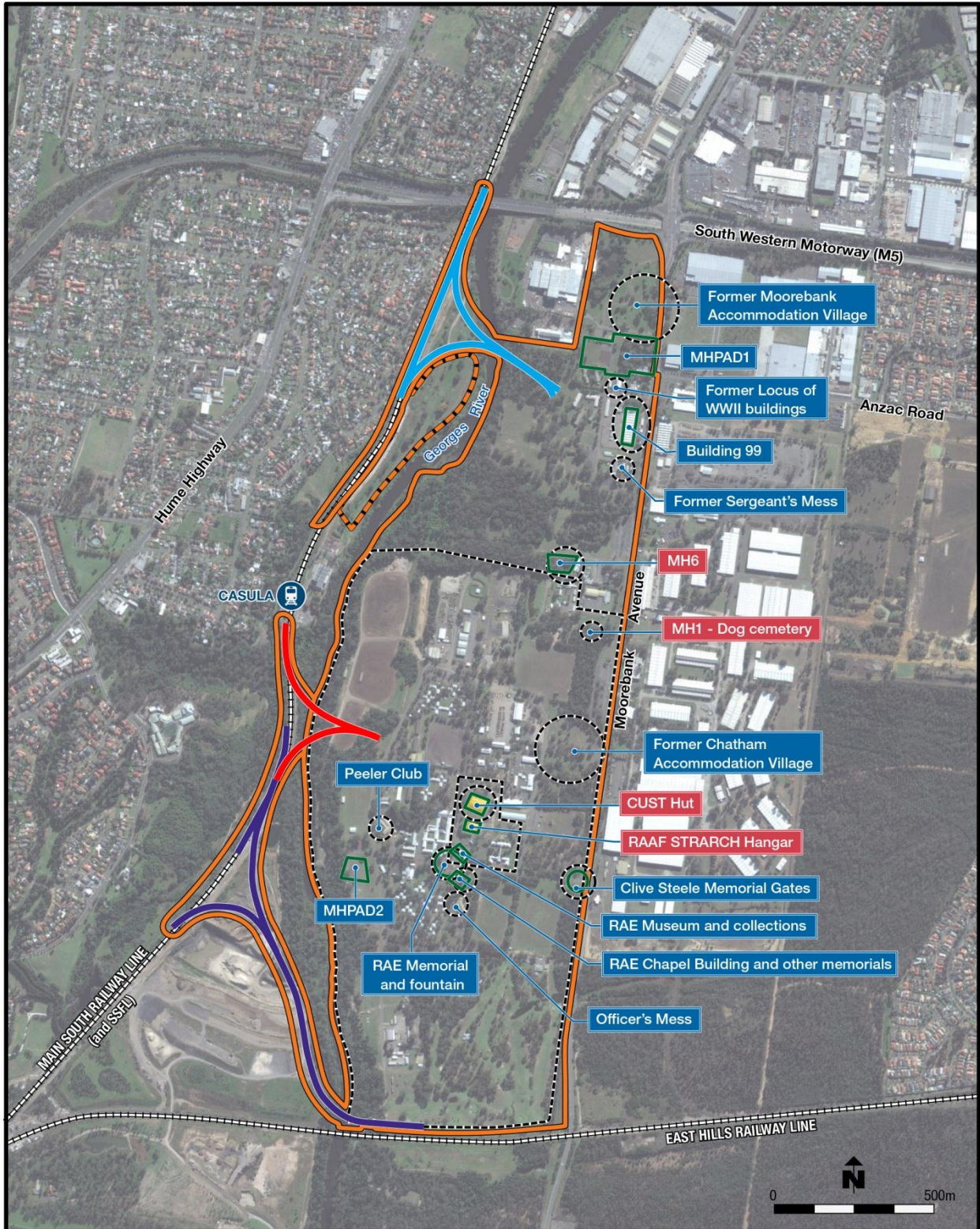


Figure 21.3 Location of items that meet local, State and Commonwealth heritage thresholds

- Project site boundary
- Proposed construction area for rail tie-in to SSFL
- Northern rail access option
- Central rail access option
- Southern rail access option
- Intangible heritage value
- Items of local and State significance
- Items of local significance

21.4 Impact assessment

The Project would have impacts on European heritage items within and adjacent to the proposed construction footprint.

The MUR Project and the site rehabilitation works as explained in section 8.1.1 and section 8.1.2 of Chapter 8 – *Project development phasing and construction*, are each the subject of a separate EPBC referral¹ and are not considered in this EIS. The site rehabilitation works include the removal of eight buildings, as further discussed in section 8.1.2.

All remaining buildings would be cleared as part of the Early Works development phase and therefore the impacts on heritage items would be associated with this phase. However, it is noted that earthworks during Phases A to C may impact on any remaining sites including archaeological deposits. The impacts during the Early Works and Phases A to C are discussed in the sections below.

Mitigation measures as outlined in section 21.5 are focused on investigating, documenting and archiving those deposits identified as having the greatest research potential. Additional investigations, historical research and a comprehensive salvage program would maximise information yielded from affected sites as well as ensuring retention of such information for future generations.

21.4.1 Direct impacts

The identified heritage items that would be directly affected by the Project's construction footprint are summarised in Table 21.9. Impacts have been based on the current indicative concept layouts for the Project. Appendix 5 of Technical Paper 11 – *European Heritage Assessment* (Volume 8) provides a Statement of Heritage Impact (SOHI) for each site.

The impacts of the Project need to be considered in the context of already identified impacts from the MUR Project (ERM 2013). As noted earlier, the MUR Project has identified several heritage items that would be relocated from the SME before construction of the Moorebank IMT Project. These include parts of the RAE Chapel and fittings, parts of the RAE Museum sandstone wall, the RAE Museum Collections and various other memorials. The relocation of the items as part of the MUR will have a dual impact on the historical context of the items remaining and the residual Moorebank Cultural Landscape.

The residual Moorebank Cultural Landscape will be a fragmented one, with a further loss of historical and social connection through the cessation of occupation and use. While many of the intangible values (e.g. associations with the memorials, Chapel and Museum) would be transferred to the new SME site at Holsworthy, there would be residual values associated with the broader landscape setting, as well as more tangible elements of the landscape such as the archaeological deposits, the CUST Hut, the Transport Compound Workshop (B99), the RAAF STRARCH Hangar, the dog cemetery and the commemorative garden. These items display many of the heritage values which are characteristic of the entire Moorebank Cultural Landscape, which includes:

- components of the natural environment, albeit altered, with references to the garden/parkland that characterise the Moorebank landscape setting;
- key elements of the built environment that reference the military history of the location and technical achievements in engineering;
- items that have served a memorial function, commemorating military service and significant events such as Gallipoli, as well as recognition of earlier local historical patterns through incorporation of materials from a local vineyard (refer to description of MH1);

¹ Referral 2012/6462 and Referral 2014/7152 respectively.

- aspects of the street layout and associated names; and
- archaeological deposits that relate primarily to military occupation through the early to mid 20th century.

The location of the post-MUR, tangible and intangible heritage values are shown in Figures 21.4, 21.5 and 21.6 relative to the indicative concept layout for each of the rail access options. Anticipated impacts within the residual landscape consist of building, garden and memorial demolition, disturbance of archaeological deposits, destruction of the landscape setting and vistas, loss of and/or reduced historical associations, loss of existing internal street layouts and associated names, and loss of access to these items. All remaining heritage items would be directly affected by the Project, along with all remaining intangible heritage values. It is expected that the majority of these impacts would take place during the Early Works phase.

Table 21.9 Direct impacts associated with the development of the main IMT site

Site ID	Location relative to indicative concept layouts	Aspects of the Project that respect or enhance the item's heritage significance	Aspects that could detrimentally affect the item's heritage significance	Resultant impact on the item's heritage significance
Moorebank Cultural Landscape	Within construction footprint	Retention of elements of the landscape such as Moorebank Avenue (road alignment and name) and portions of regrowth bushland respect some aspects of heritage values associated with the cultural landscape.	The Project would detrimentally affect the residual Moorebank Cultural Landscape; it would result in disturbance to archaeological deposits, removal of remaining landscape elements, loss of the existing landscape setting, historical associations and loss of access to items. The Moorebank Cultural Landscape has been assessed to be of local and Commonwealth significance in terms of historical associations, research potential, technological characteristics, uniqueness, and Aboriginal cultural values.	Disturbance of archaeological deposits, demolition of remaining landscape elements, loss of the existing landscape setting and loss of access to items would result in loss of research potential. It would also result in the loss of the site's uniqueness and technological significance.
MHPAD1	Within construction footprint	Not applicable/none	The Project would result in archaeological disturbance of locally significant deposits and in situ building remains at the site. These deposits have also been assessed to be of significance against Commonwealth criteria.	The archaeological disturbance would result in the loss of the research potential associated with these deposits.
MHPAD2	Within construction footprint	Not applicable/none	The Project would result in archaeological disturbance of locally significant deposits and in situ building remains at the site. These deposits have also been assessed to be of significance against Commonwealth criteria.	The archaeological disturbance would result in the loss of the research potential associated with these deposits.
CUST Hut	Within construction footprint	Not applicable/none	The Project would require relocation or demolition of the CUST Hut, as well as disturbance of potential archaeological deposits associated with the building. The CUST Hut and associated archaeological deposits have been assessed to be of local and Commonwealth significance and potentially to have State significance.	The archaeological disturbance would result in the loss of the research potential associated with these deposits. The demolition of the building would result in a total loss of significance in terms of rarity and representativeness, as well as the loss of technical and aesthetic significance. Historical associations with this building will also be lost.
Building 99	Within construction footprint	Not applicable/none	The Project would result in demolition of the building. The workshop has been assessed to be of significance in terms of its rarity in a local context. It also contributes to the overall historical significance of the Moorebank Cultural Landscape at local and Commonwealth levels.	The demolition of the building would result in a total loss of significance in terms of rarity.

Site ID	Location relative to indicative concept layouts	Aspects of the Project that respect or enhance the item's heritage significance	Aspects that could detrimentally affect the item's heritage significance	Resultant impact on the item's heritage significance
Dog Cemetery (MH1)	Within construction footprint	Not applicable/none	The Project would have a detrimental impact on the dog cemetery at MH1; it would result in subsurface/ archaeological disturbance to the graves. The cemetery has been assessed to be of local and Commonwealth significance in terms of its historical importance.	The archaeological disturbance would result in the loss of significance in terms of its historical association.
Commemorative Garden (MH6)	Within construction footprint	Not applicable/none	<p>Post-MUR the site as a memorial would lose some social value, as it would lose the immediate and ongoing connection with the members of the SME community and a functioning military establishment. The place would retain local significance as a memorial to SME personnel and their actions.</p> <p>The Project would result in disturbance across the entire area. The garden has been assessed to be of local and Commonwealth significance in terms of its historical value.</p>	The ground disturbance would result in the loss of significance in terms of its historical association.
Remaining elements of the RAE Chapel	Within construction footprint	Not applicable/none	<p>This item has been identified for partial relocation as part of the MUR Project. The remaining architectural elements of the site would serve as a historical marker of the location and former function of the chapel.</p> <p>The Moorebank IMT Project would require demolition and/or relocation of the remaining parts of the RAE Chapel. This site has been assessed to be of local and Commonwealth significance in terms of its historical associations.</p>	The demolition of the remaining items will result in the loss of the remaining elements of historical significance.
RAAF STRARCH Hangar	Within construction footprint	Not applicable/none	The Project would have a detrimental impact on the RAAF STRARCH Hangar; it would require the demolition or relocation of the STRARCH Hangar. This building has been assessed to be of local, State and Commonwealth significance in terms of its technical value.	The demolition would result in the loss of significance in terms of technical value.

Site ID	Location relative to indicative concept layouts	Aspects of the Project that respect or enhance the item's heritage significance	Aspects that could detrimentally affect the item's heritage significance	Resultant impact on the item's heritage significance
Remaining elements of the RAE Museum Sandstone Wall	Within construction footprint	Not applicable/none	This item has been identified for partial relocation as part of the MUR Project. Given that a majority of the stone will be recovered and reused in a commemorative context the heritage values of the stone will be maintained and the remaining stone at this location does not retain significance as a consequence.	None.

Source: Tables 10.2 and 11.1, Technical Paper 11 – *European Heritage Assessment* (Volume 8)

If these impacts were left unmitigated, the Project would have a significant impact on the heritage environment, including the residual Moorebank Cultural Landscape (i.e. post-MUR Project) and the items of heritage value that it comprises.

However, as described in section 21.5, a number of mitigation measures and strategies have been proposed to minimise these heritage impacts. One of the measures would involve developing a European Heritage Interpretation Strategy in order to address impacts on both tangible and intangible heritage values on the Project site. Together, implementation of these measures and strategies would reduce the overall heritage impacts to an acceptable level. These strategies would combine to ensure the long-term maintenance of the heritage values associated with the Moorebank Cultural Landscape, and the items that it comprises.

21.4.2 Indirect impacts

There are five items adjacent to the Project site that are listed on the LCC LEP (Section 4.5.3):

- Kitchener House;
- Glenfield Farm;
- the former Casula Power Station, located on the western side of the Georges River;
- Railway viaduct, Main South Railway Line (*Item 12*), located adjacent to Woodbrook Road, Casula; and
- Railway viaduct, Main South Railway Line (*Item 11*), located approximately 200 m south of the former Casula Power Station.

The potential impacts of the Project on each of these items relate to the erection of buildings or structures within sightlines, and alteration of the setting of the place. Impacts may include:

- visual impact from the increase in scale, height and bulk of structures within the site; and
- noise and vibration associated with demolition, construction and operation of the Project.

Kitchener House

Kitchener House is located on Moorebank Avenue, on the north-eastern side of the Project site. The potential impacts of the Project on Kitchener House relate to the erection of buildings or structures within the sightline of the place, and alteration of the setting of the place. Views from Kitchener House have greatly altered over time; an industrial estate currently borders the place on three sides. Once the Project is fully constructed, Kitchener House would be located immediately adjacent to the proposed warehousing and car parking, and away from the main freight hub.

Overall the potential indirect impacts from any of the Project phases on Kitchener House are insubstantial, particularly when taken into context with the current surrounding landscape.

Glenfield Farm

Glenfield Farm is located on the western side of the newly constructed SSFL and the Main South Railway Line, at the connection point for the southern rail access option. The southern rail connection would head directly towards Glenfield Farm from the Moorebank IMT and connect onto the SSFL. As with Kitchener House, any impact from the Project phases would be visual, associated with trains approaching the site from a different direction (moving towards the site, rather than passing by the site). There is vegetation between the farm and the rail line that serves to reduce the current visual impact of the railway line; any additional impact from the Moorebank IMT would be negligible.

Railway viaducts and Casula Power Station

The main Project site is located on the opposite side of the Georges River from the Railway viaduct, Main Southern Railway Line (Item 11), the Railway viaduct, Main Southern Railway Line (Item 12) and the former Casula Power Station. Any impacts from the main Project site would be visual, associated with the increase in height, scale and bulk of structures within the site. This is particularly pertinent to the Casula Powerhouse Arts Centre. The visual assessment report (Clouston Associates 2014) assessed the impact as moderate to low, stating that:

The Powerhouse Arts Centre and surrounding land sit at a similar elevation to the Project site, with views towards the development heavily screened by riparian vegetation along both sides of the Georges River.

The visual impact of the Project on the heritage significance of the Casula Powerhouse Arts Centre is considered to be negligible.

The impact of the Project on the railway viaducts is also considered to be negligible.

21.4.3 Impacts associated with the rail access options

The impacts within the main IMT site are assumed to be the same for all rail access options and will result in the loss of all heritage items and values, with the exception of the degree of impact on MHPAD2, which varies with each rail access option. However, the footprint and associated impacts of each of the rail access options will be clearly different in each case as described below.

Northern rail access option

The indicative Project site layout associated with the northern rail access option would have a direct impact on all heritage items. Approximately 30% of MHPAD2 is within a conservation zone and would therefore be protected.

The northern rail access option tie-in lines would run across this area and link into the bridge across the Georges River. Bridge construction would include pylons and abutments. Potential impacts in this area would include substantial surface modifications, construction of abutments and excavation for the bridge pylons. The pylons and abutments would have the potential to cause disturbance to MAPAD2 (Unit 1 and Unit 2) deposits. The extent of potential disturbance will not be known until the detailed design has been completed.

The Aboriginal test excavation program within the Northern Powerhouse Land has demonstrated that, while the archaeological significance of the upper 120–150 cm of deposits is generally low, these deposits are likely to have significance as a representative example of environmental changes resulting from European settlement, in particular the construction of the Liverpool Weir. The MAPAD2 (Unit 1 and Unit 2) deposits are potentially significant in terms of their scientific value, natural value, educational value, representativeness and social value (importance to the Aboriginal community and the broader Australian community) at local, state and national levels.

The construction area to the south of the construction footprint would be used as a laydown and stockpile area as well as for vehicle parking during Project Phase A. There is the potential for disturbance of MAPAD2 (Unit 2) deposits across this area, and also of some sections of the MAPAD2 (Unit 1) deposits, depending upon the nature of site preparation works.

The northern rail access option would connect with the SSFL directly adjacent to heritage item Railway viaduct, Main South Railway Line (Item 12). The Project would not result in any additional direct impacts on this item beyond those associated with construction of the SSFL.

Central rail access option

The indicative Project site layout associated with the central rail access option would have a direct impact on all heritage items.

Surface survey indicates that flood deposits on the western bank of the Georges River are likely to be similar to those found during the Northern Powerhouse Land testing. The central rail access option tie-in lines would run across this area and link into the bridge across the Georges River. Bridge construction would include pylons and abutments. Potential impacts in this area would include substantial surface modifications, construction of abutments and excavation for the bridge pylons. The central rail access option would therefore have an impact on areas of predicted archaeological sensitivity that may have relevance in terms of historical heritage values.

The construction areas associated with this option would be used as a laydown and stockpile area as well as for vehicle parking. There is the potential to disturb sensitive archaeological deposits across this area. Depending upon the nature of site preparation works, some sections of the deposits in this area may also be disturbed.

The central rail access option would also connect to the SSFL directly adjacent to the Main South Railway Line (passenger line). The connection is directly adjacent to heritage item Railway viaduct, Main South Railway Line (Item 11). The Project would not result in any additional direct impacts on this item beyond those associated with construction of the SSFL.

Southern rail access option

The indicative Project site layout associated with the southern rail access option would have a direct impact on all heritage items. Approximately 15% of MHPAD2 is within a conservation zone and would therefore be protected.

The southern rail access option would not have a direct impact upon any areas of archaeological sensitivity; however, this option is adjacent to an item on the State Heritage Register (Glenfield Farm) and may have indirect impacts on this site. If constructed, the southern rail option connection would have a visual impact on the site, both during construction of the new rail access and as a result of trains approaching the site from a different direction (moving towards the site, rather than passing by the site). These views have already been considerably affected by the Glenfield Landfill site and the construction of the SSFL, particularly in relation to the Glenfield flyover that carries the SSFL over the Main South Railway Line.

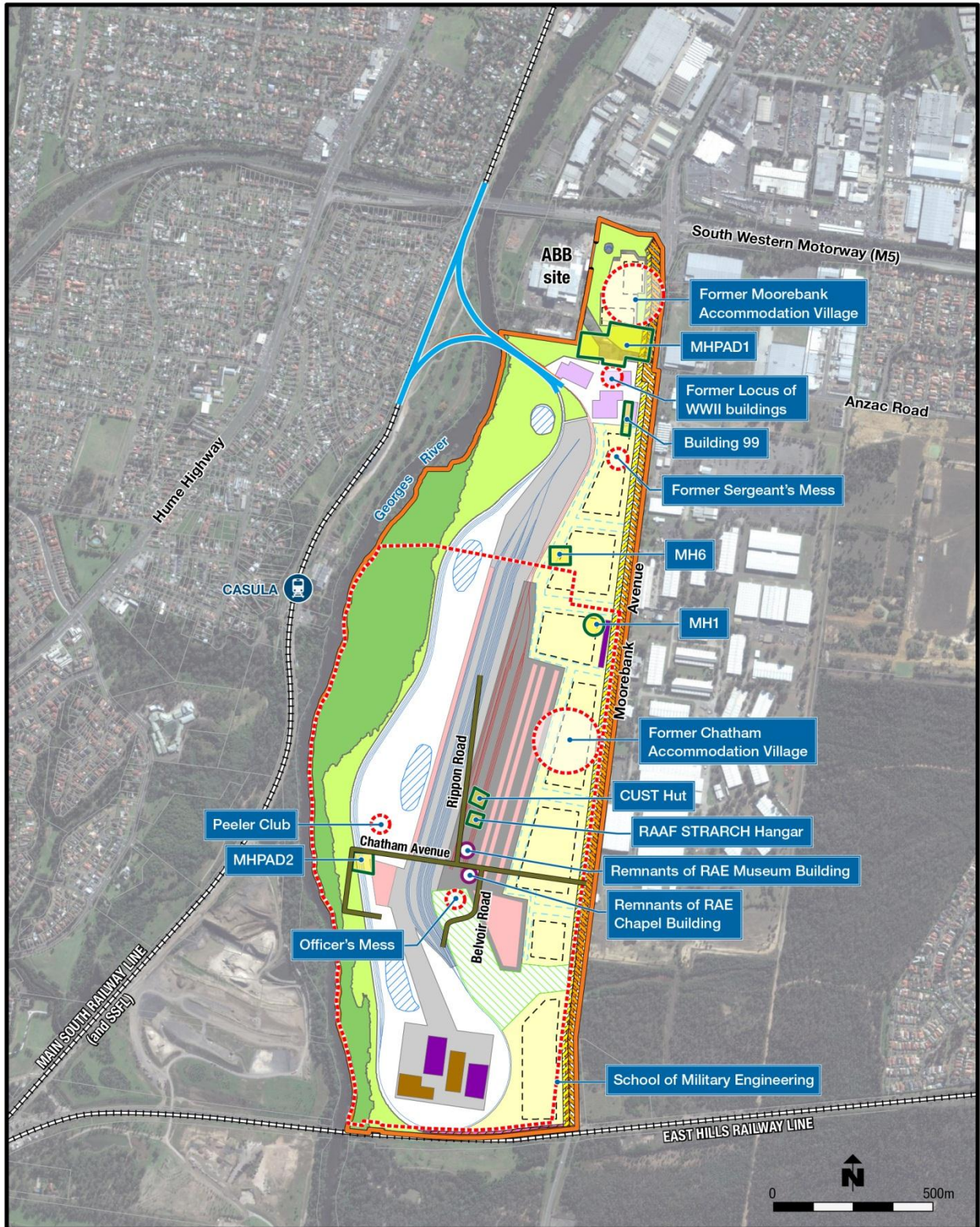


Figure 21.4 Post-MUR Project, tangible and intangible heritage values relative to the Project concept (based on the northern rail access option)

- Project site boundary
- Northern rail access option
- Physical heritage items
- Remnant items - Post MUR
- Intangible values
- Road alignments

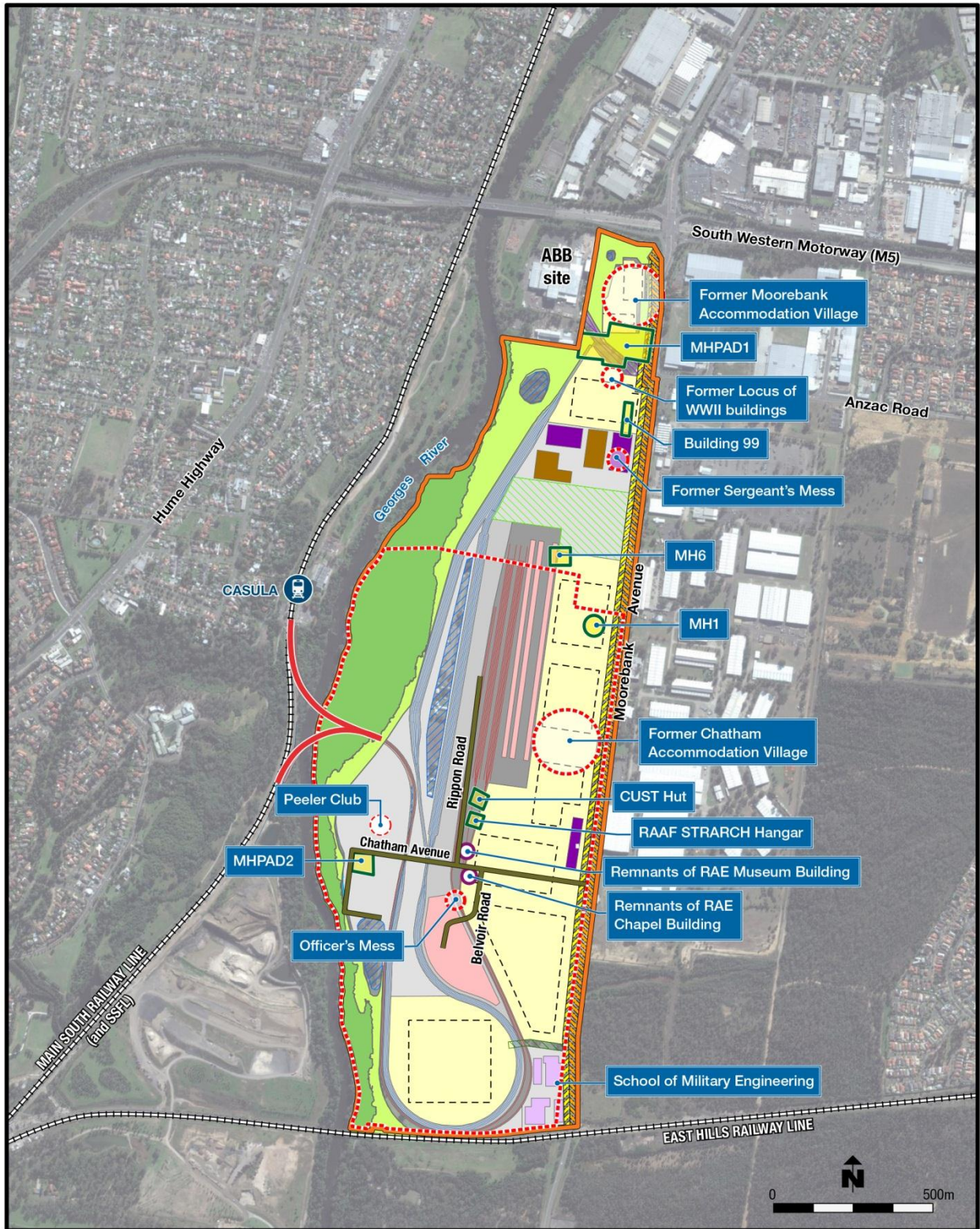
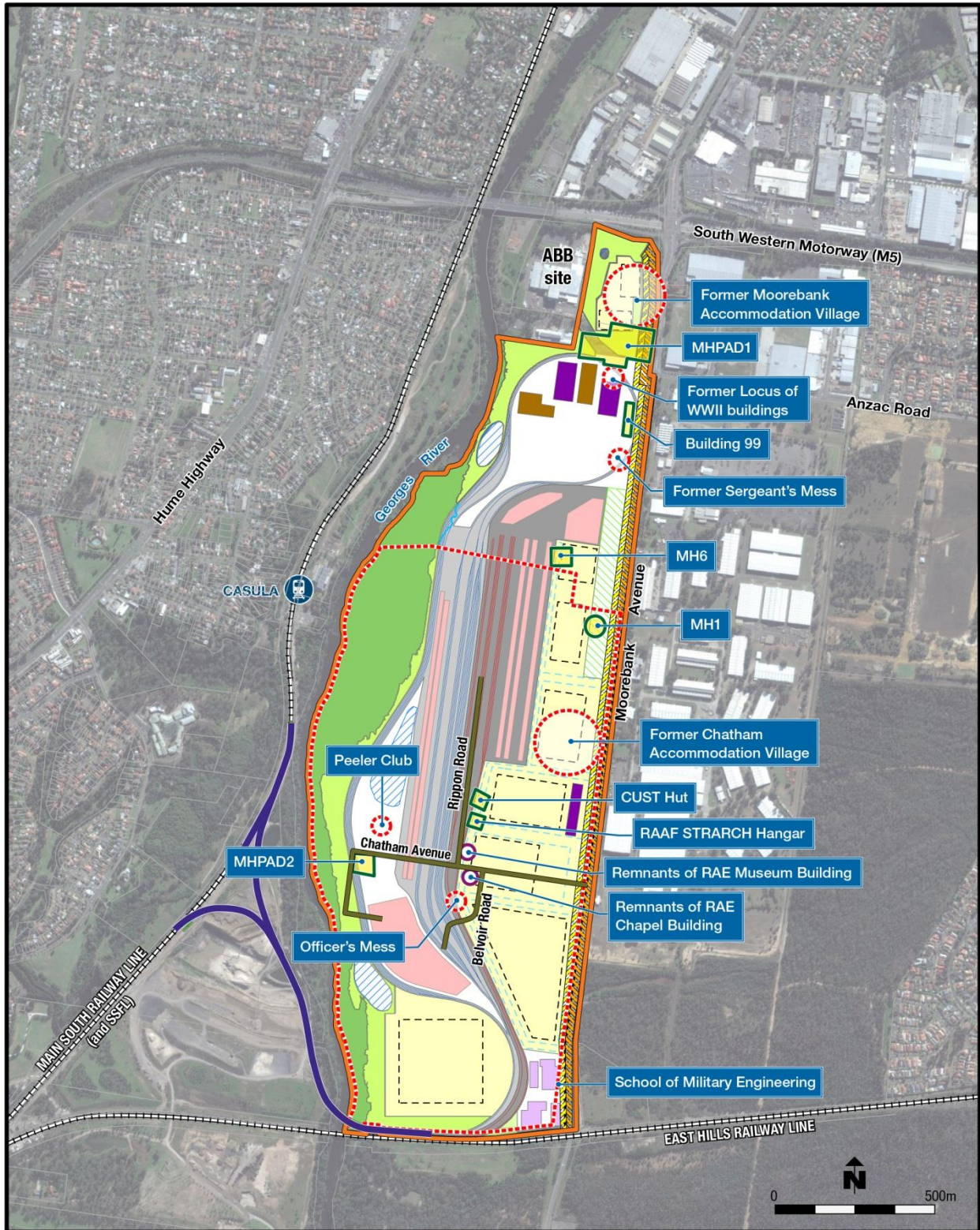


Figure 21.5 Post-MUR Project, tangible and intangible heritage values relative to the Project concept (based on the central rail access option)

- Project site boundary
- Central rail access option
- Physical heritage items
- Remnant items - Post MUR
- Intangible values
- Road alignments



- Project site boundary
- Southern rail access option
- Physical heritage items
- Remnant items - Post MUR
- Intangible values
- Road alignments

Figure 21.6 Post-MUR Project, tangible and intangible heritage values relative to the Project concept (based on the southern rail access option)

21.5 Management and mitigation

As part of the MUR Project Defence activities will be relocated to Holsworthy Barracks. The MUR Project will also involve the relocation of 18 items of heritage value associated with the existing Defence activities at the Moorebank IMT Project site and is planned to be completed by mid-2015.

The indicative concept layout plans for the IMT have the potential to directly affect all of the remaining identified heritage items within the Project area. As previously discussed in section 21.4, all remaining buildings will be cleared as part of the Early Works phase of the Project; therefore most impacts on Sites will be associated with this phase. Therefore, all of the mitigation measures as detailed in section 21.5.3 would be undertaken either prior to or during Early Works. In particular, a detailed archaeological salvage program would be developed and completed prior the commencement of construction on the Project site.

Further assessment of the potential impacts of the Project, and more detailed development of mitigation measures, would be conducted during the detailed design phase and Stage 2 SSD approval(s) assessments.

21.5.1 Basis for mitigation measures

The following mitigation measures are considered appropriate to manage the impacts of the Project:

- archival recording;
- interpretation;
- salvage of archaeological deposits;
- relocation; and
- adaptive reuse.

Effectiveness of mitigation measures

Various measures to avoid and mitigate impacts have been considered, within the very limited options for altering the Project impact area.

The majority of the Project site has been identified as not having items of heritage significance; however, there is evidence of land use from pre-contact through to the present day (refer to Section 4 of Technical Paper 11 – *European Heritage Assessment* in Volume 8). The MUR Project has identified items with intangible values within this landscape that are to be relocated to Holsworthy as part of that project, thus mitigating impacts on social values by transferring them to a more secure and permanent location (under a separate approval process). These elements are not considered further here. The archival recording and European interpretation strategy will also serve to commemorate and document these intangible values.

The proposed mitigation measures for the identified archaeological deposits are focused on investigating, documenting and archiving those deposits identified as having the greatest research potential. Additional investigations, historical research and a comprehensive salvage program would maximise information yielded from affected sites, as well as ensuring retention of such information for future generations.

The proposed mitigation strategies outlined below would yield varied outcomes. All archaeological deposits identified as having research potential (i.e. those in MHPAD 1 and MHPAD2) would be salvaged.

The Dog Cemetery (MH1), Commemorative Garden (MH6), CUST Hut, Transport Compound Workshop (B99) and RAAF STRARCH Hangar all meet the criteria for inclusion on the CHL as well as local and/or State levels of significance against NSW criteria. The loss of the cultural landscape context in which these items exist, and the loss of the physical structures and garden, cannot be avoided. The adaptive reuse or relocation of these items to another location is the next preferred option, and would be explored further during detailed design. As a minimum, archival recording of these items would be undertaken, partially offsetting the loss of some heritage significance.

Archival recording

Archival recording would be applied to items of Commonwealth, State and local significance affected by the Project and not already included in a program of archival recording for the MUR Project. Archival recording would be undertaken prior to Early Works. The items that warrant archival recording are:

- CUST Hut;
- RAAF STRARCH Hangar;
- RAE Museum and Australian Army Museum of Military Engineering Collections;
- Transport Compound Workshop (Building 99);
- Dog Cemetery (MH1);
- Commemorative Gardens (MH6); and
- remaining elements of the RAE Chapel.

Interpretation strategy

A European heritage interpretation strategy would be developed for the Project to address the tangible and intangible values of the Project site. Key aspects of heritage within the Project site that would be incorporated into the interpretation strategy are values associated with:

- pre-European land use;
- 19th century settlement;
- military use and land tenure prior to World War II, including the archaeological evidence relating to this period;
- expansion/intensification of military use during World War II, including the archaeological evidence and physical structures relating to this period; and
- later 20th century military use, including memorials, landscape elements and place names.

The strategy may consider the inclusion of commemorative signage within the Project area, and/or the development of a visitor's pamphlet detailing the past European use of the area. The interpretation strategy would be developed in close consultation with local historical societies, former and current staff, and military personnel. The strategy could consider combining both European and Aboriginal interpretation within the Project site.

Salvage of archaeological deposits

An archaeological salvage program would be carried out for archaeological deposits that are directly affected by the Project. MHPAD1 and MHPAD2 contain archaeological deposits assessed to be of local significance in the context of the history of military housing and training at Moorebank. Salvage of these archaeological deposits would be undertaken during Early Works, prior to any impacts in these areas.

Potential archaeological deposits have been identified at the CUST Hut; however, access to these deposits was not available at the time of this investigation as the building is still extant. When access is available the same mitigation measures would apply as for MHPAD1 and MHPAD2, pending confirmation of the existence of such deposits at this site.

Relocation

Upon completion of the MUR Project, the following elements of heritage significance would remain at the beginning of construction of the proposed Moorebank IMT:

- portions of the RAE Chapel and fittings;
- CUST Hut;
- RAAF STRARCH Hangar;
- Dog Cemetery (MH1);
- Commemorative Garden (MH6); and
- the broader cultural landscape, including intangible elements such as street names.

Given that these items are assessed to have heritage value against both NSW and CHL significance criteria, and include items of Commonwealth, State and local significance, consideration needs to be given to whether archival recording of the physical sites and features would be sufficient to mitigate the impacts of the Project.

Other options for these items include adaptive reuse (discussed below) and/or relocation. Relocation of some of these items may be an option for the Project; however, the age, scale and cost of relocating the large structures such as the CUST Hut and RAAF STRARCH Hangar may mean this is not possible. Options for their relocation would be considered during the Early Works and detailed design phases of the Project.

With regard to the Dog Cemetery at MH1, the indicative concept layouts would result in destruction and loss of the physical graves, as well as the intangible values associated with them. Options for a relocated cemetery would help mitigate these impacts. Requirements and options for repositioning and reinterment of the individual graves, in accordance with the wishes of the SME's Explosive Detection Dogs unit, would be explored during the detailed design stage of the Project.

The remaining items – portions of the RAE Chapel and fittings and MH6 (Commemorative Garden) – also provide an opportunity for relocation or celebration in another location within the Project area; this would also be explored during detailed design.

Adaptive reuse

For the items that remain at the SME (following the completion of the MUR Project), mitigation measures beyond archival recording could be considered where practicable. The MUR Project provides mitigation for impacts on the RAE Chapel, the RAE Museum and Collection and various other memorials, but it does not address impacts on the remaining items (such as the CUST Hut, B99, RAAF STRACH Hangar and MH6), nor the loss of cultural context for those items or impacts on the residual cultural landscape.

Adaptive reuse of the CUST Hut, Transport Compound Workshop (B99) and the RAAF STRARCH Hangar would mitigate impacts on heritage values associated with the loss of their broader cultural landscape context. More importantly, it would provide an alternative to the potential destruction and loss of the structures themselves. As the Moorebank Cultural Landscape has been extensively affected by the MUR Project, any remaining elements are a tangible link to that landscape and there is an increased value in keeping these elements within the landscape.

The indicative concept layouts for the Project do not currently provide for retention and reuse of any element of the existing cultural landscape. However, subject to considerations such as condition of structures, safety and identification of a commercially viable use, opportunities may exist during the detailed design phase to consider adaptive reuse of key components of the Moorebank Cultural Landscape (either on site or elsewhere).

For example, the Commemorative Garden at MH6 displays both tangible and intangible heritage values associated with the garden itself and the broader Moorebank Cultural Landscape. The Project would result in the destruction of the physical plantings and memorials, and the loss of the intangible values associated with them. Options for an adapted form of garden would help mitigate these impacts. The requirements and options for continuation of the garden, either in situ or at a new location within the Project site, would be explored during the detailed design stage of the Project.

21.5.2 Rail access options

Northern rail access option

No additional individual heritage items would be affected by this option.

The archaeological deposits associated with the Northern Powerhouse Land have been assessed to be of Commonwealth significance; the Unit 1 and Unit 2 deposits are potentially significant in terms of their scientific value, natural value, educational value, representativeness and social value (importance to the Aboriginal community and the broader Australian community) at local, state and national levels. Further investigation through a program of archaeological subsurface testing is required to effectively assess the nature, extent and significance of any deposits that may be affected by this option. However, it should be noted that the impacts on the Unit 1 and Unit 2 deposits in this area would not be extensive, so any impacts on historical heritage values could be managed through monitoring and/or salvage excavation as part of the broader Aboriginal archaeological investigations.

The full mitigation measures for this area are outlined in (Addendum Report) of Technical Paper 11 – *Aboriginal Heritage Assessment* (Volume 8).

Central rail access option

No additional individual heritage items would be affected by this option.

Surface survey indicates that flood deposits on the western bank of the Georges River are likely to be similar to those found during the Northern Powerhouse Land testing (NOHC 2014b). Further investigation through a program of archaeological subsurface testing would be required to effectively assess the nature, extent and significance of any deposits that may be affected by this option. However, it should be noted that the impacts on any Unit 1 and Unit 2 deposits that may be present in this area would not be extensive, so any impacts on historical heritage values could be managed through monitoring and/or salvage excavation as part of the broader Aboriginal archaeological investigations (NOHC 2014b).

Although unlikely, indirect impacts from the construction of the rail connection may occur to site Railway viaduct, Main Southern Railway Line (Item 11). This site should be noted on all plans and maps during construction and all care taken to avoid this item.

Southern rail access option

While the southern rail access option is unlikely to have direct impacts on any areas of historical heritage significance, potential does exist for indirect impacts on the State Heritage Register listed site, Glenfield Farm. A visual assessment of the site (Clouston Associates 2014) identified that the impact on the Glenfield Farm area was moderate to high. However, views from this site have already been considerably affected by the Glenfield Landfill and the construction of the SSFL. Screen plantings should be maintained within the Glenfield Farm site and rehabilitation works will provide into the future.

Although unlikely, indirect impacts from the construction of the rail connection may occur to site Railway viaduct, Main Southern Railway Line (Item 12). This site should be noted on all plans and maps during construction and all care taken to avoid this item.

21.5.3 Proposed mitigation strategies

The following strategies and mitigation measures are proposed to mitigate potential impacts of the Project on European heritage:

- Road names within the SME would be retained, where appropriate, through their transfer to roads created at the new SME complex.
- Continued commemoration of significant events and individuals would be considered through the naming of buildings, streets and the rail bridge proposed for construction as part of the Project.
- Where practicable options exist for avoiding impacts on one or more identified heritage items, preference would be given to conserving items of Commonwealth or State significance.
- Where avoidance of impacts to a heritage item is not practicable, mitigation works inclusive of archival recordings, salvage of archaeological deposits, relocation of significant elements of the built environment and/or adaptive reuse would be undertaken.
- The European heritage interpretation strategy would be developed in close consultation with local historical societies, former and current staff and military personnel. The strategy could consider combining both European and Aboriginal interpretation within the Project site.

- Archival recording of all items of Commonwealth, State and local significance would be required prior to any impact. This would include recording of salient physical aspects of the Moorebank Cultural Landscape.
- No impacts would occur within the PAD boundaries of MHPAD1 and MHPAD2 without prior archaeological salvage, as these sites contain archaeological deposits, inclusive of in situ building remains, that are assessed to be of local significance in the context of the history of military housing and training at Moorebank.
- In addition to archival recording of the Transport Compound Workshop (B99), consideration would be given during the detailed design stage to the in situ conservation or adaptive reuse of this structure within the Project site. This would assist with mitigation of heritage impacts on the structure itself and the Moorebank Cultural Landscape as a whole.
- In addition to archival recording, the Dog Cemetery (MH1) would be repositioned and the individual graves reinterred. This would be carried out in accordance with the wishes of the SME's Explosive Detection Dogs unit and respecting the social value of the site.
- In addition to archival recording, consideration would be given during the detailed design stage to the in situ conservation of the Commemorative Garden (MH6). If in situ conservation is not possible, the plaques and planting should be relocated to an alternate location on public display within the Project.
- If the central rail access option proceeds, Heritage item Railway viaduct, Main Southern Railway Line (Item 11) should be noted on all plans and maps during construction and all care taken to avoid this item.
- If the southern rail access option proceeds, Railway viaduct, Main Southern Railway Line (Item 12) should be noted on all plans and maps during construction and all care taken to avoid this item.
- The Unanticipated Discoveries Protocol (detailed in Appendix 7 of Technical Paper 11 – *European Heritage Assessment* (Volume 8)) would be followed in the event that historical items, relics or suspected burials are encountered during excavation works.
- The Unanticipated Discoveries Protocol (detailed in Appendix 7 of Technical Paper 11 – *European Heritage Assessment* (in Volume 8)) would be followed in the event that historical maritime items or relics are encountered during bridge works within the Georges River.
- Further consideration would be given to options for the retention and/or relocation and adaptive reuse of the CUST Hut and the RAAF STRARCH Hangar to mitigate impacts on heritage values associated with these structures and their broader cultural landscape context. Options considered for mitigation in order of preference are:
 - > Relocation (either offsite or onsite) and conserve/adaptive reuse – it is not yet known if this can be implemented and would be investigated further as part of the detailed design and Project approval processes;
 - > Interpretive commemoration utilising materials/elements from the building – this may be required but would be determined by the findings from investigations in option 1 above; and
 - > Demolition – may be required but would be determined by the findings from investigations in option 1 above.

- The first preference would be to retain and adaptively reuse these items on the redeveloped Project site (within the precinct but outside the secure area, as part of the administrative facilities or similar). If this is not feasible or practicable, the second preference would be for relocation to another appropriate location, potentially with adaptive reuse.
- No further archaeological investigations are warranted at MHPAD3. MH3, MH5 and MH7 were not assessed to be of heritage significance; therefore, there are no heritage impacts to mitigate.

Mitigation of indirect impacts

Indirect impacts are anticipated for five items outside the Project area. The items are Kitchener House, Glenfield Farm, Casula Power Station and two railway viaducts (Items 11 and 12) on the Main South Railway Line. All five of these items are listed on the LCC LEP.

The Project would have an indirect impact on the view from Kitchener House; however, this impact has been assessed as 'negligible' given that the house is set back from Moorebank Avenue and the views from this site have already been altered by surrounding developments. While further alterations of the views from Kitchener House cannot effectively be avoided, the proposed European heritage interpretation strategy would help to offset the limited indirect impacts of the Project.

The Project would have an indirect impact on Glenfield Farm through increased rail traffic, and in the case of the southern rail access option, changes to the angle at which some trains approach the site. However, the additional impact from the Moorebank IMT is assessed as being negligible in terms of the site's modern context adjacent an existing rail corridor. The proposed interpretation strategy will help to offset the limited indirect impacts of the Project.

The conservation zone located between the Project site and the former Casula Power Station and Railway viaduct, Main South Railway Line (Item 11) would reduce any impact to negligible. Furthermore, the Project would not result in any additional impacts on the Railway viaduct, Main South Railway Line (Item 12).

In summary, the indirect impacts of the Project do not warrant any additional mitigation measures that are not already proposed in relation to other items.

21.6 Summary of key findings

In summary, the key findings of the European heritage assessment are as follows:

- As part of Defence's MUR Project, the majority of existing heritage items would be relocated from the current SME site prior to construction of the Project.
- While many of the intangible values (e.g. associations with the memorials, Chapel and Museum) would be transferred to the new SME site at Holsworthy as part of the MUR Project, there would be residual values associated with the broader landscape setting, as well as more tangible elements of the landscape such as the archaeological deposits, the CUST Hut, the Transport Compound Workshop (B99), the RAAF STRARCH Hangar, the dog cemetery and the commemorative garden.
- Anticipated impacts within the residual landscape and its elements would include building, garden and memorial demolition, disturbance of archaeological deposits, destruction of the landscape setting and vistas, loss of and/or reduced historical associations, loss of existing internal street layouts and associated names, and loss of access to these items.

- All remaining heritage items would be directly impacted by the Project, along with all remaining intangible heritage values.
- All remaining buildings would be cleared as part of the Early Works development phase and therefore most impacts to heritage items and heritage sites would be associated with this phase. However, earthworks during Project Phases A to C may impact on any remaining sites including archaeological deposits.
- Works within the main IMT site would result in the loss of all European heritage items and values, with similar impacts for all rail access options. The northern rail access connection to the SSFL could also disturb MAPAD2 deposits and the central access connection would impact on areas of potential archaeological sensitivity on the western bank of the Georges River. The southern option would not directly affect any areas of archaeological sensitivity.
- Any indirect impacts of the Project on adjacent European heritage items (i.e. impacts on the visual context and landscape setting) are considered to be negligible.

Table 21.10 summarises the European heritage impacts for each rail access option, without mitigation.

Table 21.10 Summary of European heritage impacts associated with the Project for the development footprint, without mitigation, for each rail access option

Impact	IMT layout and associated rail access connection option		
	Northern	Central	Southern
Main IMT site			
Detrimental impacts on the residual Moorebank Cultural Landscape (including disturbance to archaeological deposits, removal of remaining landscape elements, loss of the existing landscape setting, historical associations and loss of access to items)	•	•	•
Disturbance to archaeological deposits (MHPAD1 and MHPAD2)	•	•	•
Loss of, or relocation of heritage buildings including the CUST hut, Building 99 and remaining parts of the RAE Chapel and the RAFF STRARCH Hanger	•	•	•
Disturbance to Dog Cemetery (MH1)	•	•	•
Disturbance and loss of social value of Commemorative Garden (MH6)	•	•	•
Rail access connection			
Potential disturbance/impact to MAPAD2	•	-	-
Potential disturbance/impact to archaeological sensitive areas on the western bank of the Georges River	•	•	-

Key: • = impact, - = no impact

Key measures proposed to manage and/or mitigate European heritage impacts of the Project include:

- investigating, documenting and archiving those deposits identified as having the greatest research potential;
- a European heritage interpretation strategy and a comprehensive salvage program; and
- further consideration of adaptive re-use and relocation options for key items, with archival recording as a minimum.