

Attachment V

Archaeological Research Design

Canberra Brickworks Precinct

Archaeological Research Design

Report prepared for DOMA Group

April 2020



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Report Register

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Executive Summary

Doma Group is undertaking a project to redevelop the Canberra Brickworks Precinct site located in Yarralumla, ACT (the site). The proposed redevelopment includes new residential areas and associated infrastructure, as well as retail and office spaces which will be accessible to the public. Several historical structures at the site will be retained and adapted into these new facilities. Doma Group has commissioned GML Heritage Pty Ltd (GML) to provide heritage and archaeological services for the project.

An Archaeological Assessment (AA) of the site was previously prepared by Navin Officer in 2016. This report identified 12 areas of archaeological sensitivity and recommended that areas of moderate and high archaeological potential be subjected to an archaeological testing program prior to any works or development in these areas (BRW1–BRW12). This report presents the Archaeological Research Design (ARD) for a preliminary archaeological testing program at the site. The aim of this program is to determine the nature and extent of archaeological deposits within the site and to develop recommendations for any future management requirements for archaeological deposits.

Based on a review of the AA and an inspection of the site, GML determined that eight of the 12 areas of archaeological sensitivity identified in the AA should be subjected to further archaeological testing (BRW1, BRW2, BRW3, BRW7, BRW8, BRW10, BRW11 and BRW12). The proposed methodologies for archaeological testing at these areas are presented in this report and have been developed based on a review of the AA and relevant documents, as well as a site inspection undertaken by GML.

This ARD is required to be submitted with an Excavation Permit application under Section 61E of the *Heritage Act 2004* (ACT).

1.0 Introduction

1.1 Project Background

Doma Group is undertaking a project to redevelop the Canberra Brickworks Precinct site located in Yarralumla, ACT (the site/study area). The proposed redevelopment includes new residential areas and associated infrastructure, as well as retail and office spaces which will be accessible to the public. Several historical structures at the site will be retained and adapted into these new facilities.

Doma Group has commissioned GML Heritage Pty Ltd (GML) to provide heritage and archaeological services for the project. GML has recently prepared an updated Conservation Management Plan (CMP) for the site. An Archaeological Assessment (AA) was prepared for the study area by Navin Officer in 2016 to inform future works.

The proposed works have the potential to impact the study area's archaeological resource. This report builds on the AA prepared by Navin Officer in 2016 to provide an Archaeological Research Design (ARD) for the proposed development.

1.2 Study Area

The location of the Canberra Brickworks Precinct, the study area for this CMP, is shown in Figures 1.1 and 1.2.

The Canberra Brickworks Precinct comprises Blocks 1, 7 and 20, Section 102, which includes the heritage listed areas of the 'Yarralumla Brickworks' (located in Block 1, Section 102) and the 'Yarralumla Brickworks Railway Remnants' (located in part Block 7, Section 102) (refer to Figure 1.2).

The Precinct is located in the suburb of Yarralumla, to the west of central Canberra. The site is bordered to the north and east by low density residential development, to the west by the Royal Canberra Golf Course and Westbourne Woods, and to the south by open space.



Figure 1.1 Location of the Canberra Brickworks Precinct in the broader context of Canberra. (Source: Google Earth with GML overlay, 2017)

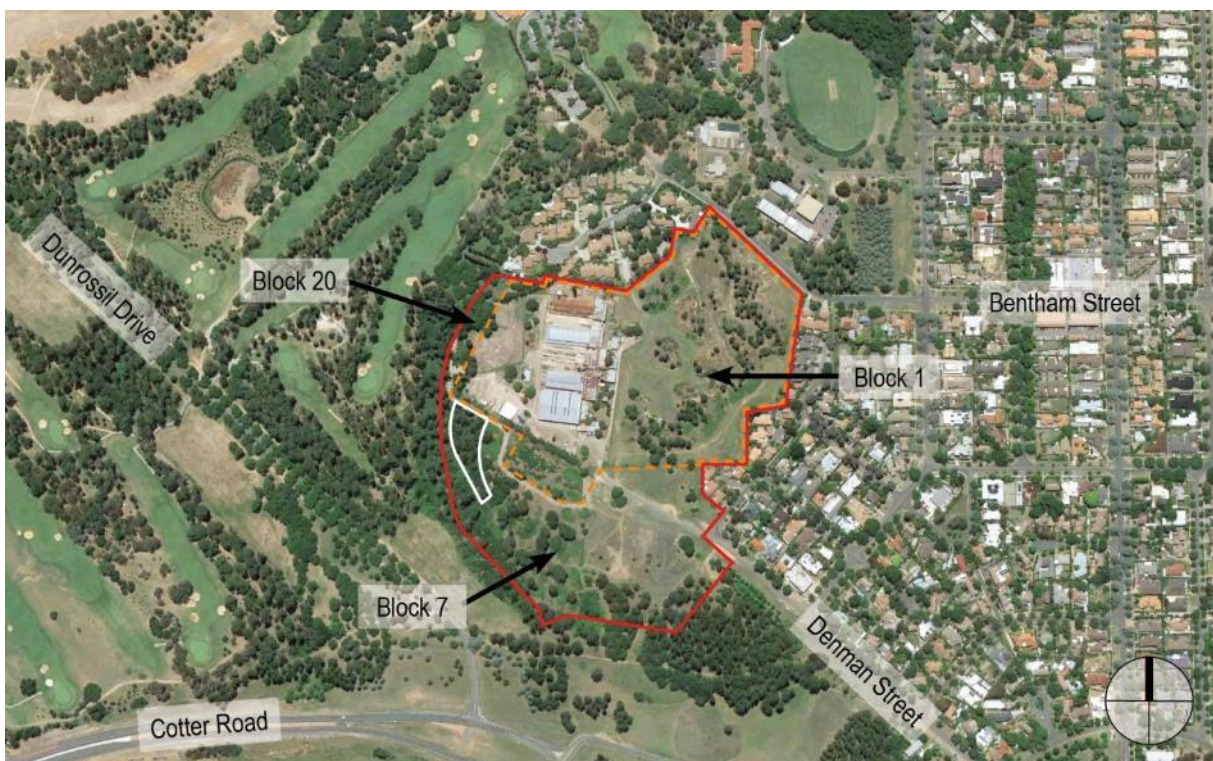


Figure 1.2 CMP study area—Canberra Brickworks Precinct is shown in the red boundary. The study area consists of Blocks 1, 7 and 20, Section 102 and includes the ACT heritage listed boundaries for the 'Yarralumla Brickworks' (Block 1) (orange dashed line) and the 'Yarralumla Brickworks Railway Remnants' (part Block 7) (white boundary). (Source: Google Earth with GML overlay, 2017)

1.3 Heritage Status

1.3.1 ACT Heritage Register

The *Heritage Act 2004* (ACT) (Heritage Act) aims to represent and protect the rich natural and cultural heritage of the ACT. The legislation establishes a system for the recognition, registration and conservation of natural and cultural heritage places and objects, including Aboriginal places and objects.

The 'Yarralumla Brickworks' (Block 1, Section 102 Yarralumla) and the 'Yarralumla Brickworks Railway Remnants' (Part Block 7, Section 102 Yarralumla) are recognised as having heritage significance by their inclusion in the ACT Heritage Register.

The heritage significance of the site is explained further in Section 4.0 of this report.

1.3.2 Non-Statutory Listings

The 'Yarralumla Brickworks' is listed on the Australian Institute of Architects (AIA) ACT Chapter Register of Significant Twentieth Century Architecture (RSTCA), item No. R063.

The 'Canberra Brickworks' was identified as a 'Classified' place by the National Trust of Australia (ACT) on 20 July 1981.

1.3.3 Heritage Places in the Vicinity

The site is also within close proximity to four heritage places that are included on the ACT Heritage Register and the Commonwealth Heritage List (CHL):

- Government House and Surrounds (CHL Place ID: 105381);
- the CSIRO Forestry Precinct (CHL Place ID: 105595);
- Westbourne Woods (ACT Heritage ID: 444); and
- Early Canberra Brickworks Housing Precinct (ACT Heritage ID: 1002).

1.4 Proposed Works

The proposed works involve the redevelopment of the study area into a residential area with associated infrastructure and retail and office spaces (Figure 1.1). Several of the remnant historical structures will be retained and utilised as infrastructure for the residents, and as retail and office spaces for the public. The site will be landscaped, and services and utilities will be installed. Structures are proposed to be constructed within areas found to have archaeological potential including BRW1, BRW2, BRW3, BRW4, BRW5, BRW6, BRW7, BRW8, BRW10 and BRW11. No structures are currently proposed for the BRW9 area. The quarry area will be landscaped, and a pool is proposed to be installed in the existing dam area. Several structures are proposed along the eastern boundary of the site, above the former quarry area.



Figure 1.3 Preliminary proposed development design over a current aerial. (Source: Google Earth with GML overlay)

1.5 Purpose of Report

This ARD has been prepared to guide the historical archaeological investigations required to manage and mitigate construction related impacts. It includes:

- a summary historical background based on the AA and CMP;
- an archaeological assessment of potential significance;
- an assessment of potential impacts of the proposed works; and
- an archaeological research design and excavation methodology to manage and mitigate impacts.

This ARD report will be submitted to the ACT Heritage Council to support an Excavation Permit application.

1.6 Authorship and Acknowledgements

This report has been prepared by Janene May (GML Heritage Consultant) and reviewed by Martin Rowney (GML Partner). GML wishes to acknowledge the assistance of personnel from Doma Group and the ACT Heritage Unit.

1.7 Limitations

This report presents the research design and methodology for historical archaeology. The methodology includes an initial testing stage to determine the nature and extent of the potential archaeological resource.

2.0 Historical Background

2.1 Introduction

This section provides a summary of the historical development of the Canberra Brickworks Precinct including a background history of Canberra, a contextual history of the Brickworks, and a comparative analysis of other Australian brickworks.

The history and comparative analysis has been drawn predominantly from the 2019 CMP, and revised and updated where necessary.

2.2 Background History of Canberra

2.2.1 Ngunnawal Country

The Brickworks is located on traditional lands held by the Indigenous people of the Ngunnawal group. The Ngunnawal people have occupied the land for thousands of years and their descendants continue to live in Canberra and the surrounding region. Several Indigenous groups, including the Ngunnawal and Ngambri, were recorded to have settled along the sandy banks of the Molonglo River. As an important resource, the Molonglo River corridor attracted a hunter-gatherer lifestyle and Aboriginal people set up shelter and camps throughout the area as they travelled in response to the availability of natural resources.¹

The Aboriginal people were displaced from their land following European settlement of the area and their numbers dwindled dramatically, possibly associated with a smallpox epidemic in 1830, influenza and a measles epidemic in the 1860s.² There are few records of Aboriginal people on the Limestone Plains after it was settled by pastoralists, perhaps because of Indigenous seasonal lifestyles, or because they retreated from settlers and their horses, and moved to the hills.³ The new settlers may also have simply failed to record their ongoing presence in any detail.

2.2.2 Colonial History

European colonisation of the area commenced in the 1820s with small and large estates for farming and grazing. The Brickworks site was established on part of a large sheep grazing property held by Frederick Campbell, a descendant of Robert Campbell who owned the early Canberra pastoral estate Duntroon.

During the late 1890s, there was much debate over the location of the seat of government for the new Commonwealth of Australia. It was eventually decided that the future capital's location would be selected by the new Parliament following Federation in 1901.⁴ On the recommendation of Commonwealth surveyor Charles Scrivener, the district of Yass–Canberra was chosen in 1908. Scrivener's specific choice was an elevated site straddling the Molonglo River with mountains and hills to the northwest, northeast and south.

2.2.3 Planning the National Capital

The Griffin Plan

In 1911, an international competition to design the new city was launched and 137 entries were received. After considerable debate, Chicago architect Walter Burley Griffin was announced as the winner of the competition in May 1912.

Griffin's 1911 plan for the national capital was based on a geometry dictated by the landscape rather than the principal points of the compass, with a water axis formed from the flow of the Molonglo River at right angles to a land axis between two hill summits. A municipal axis lay just to the north of, and parallel to, the water axis. The central land axis ran from Mount Ainslie through Camp Hill (the site of Old Parliament House) to Capital Hill (the site of New Parliament House) and then nearly 50 kilometres further inland to Mount Bimberi.⁵

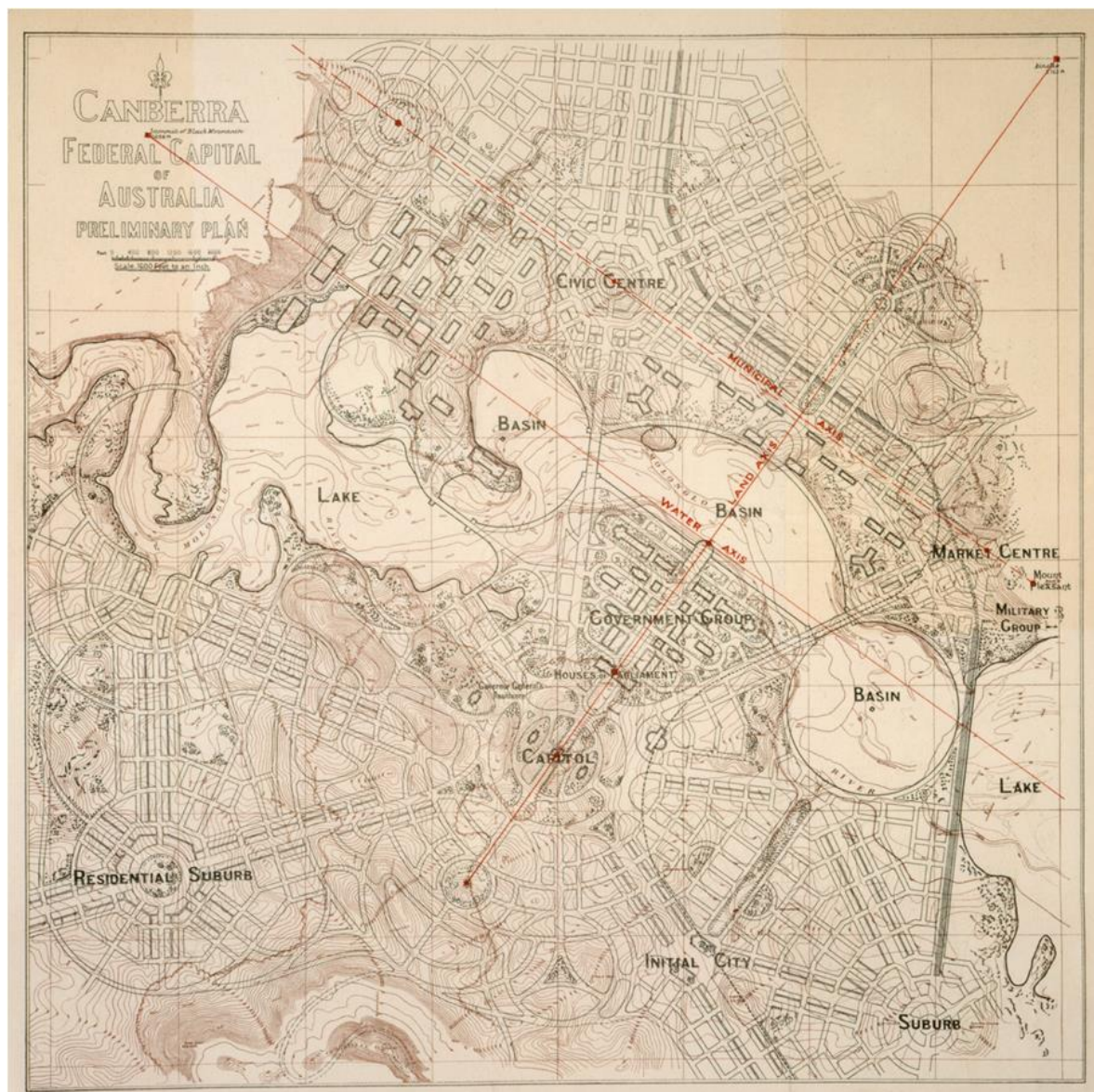


Figure 2.1 The Griffin Plan of Design for the federal capital showing the land, water and municipal axes, 1911. (Source: National Archives of Australia [NAA] A1, 1917/7242)

The Departmental Plan

Following the announcement of the top four winning entrants to the design competition, the Minister for Home Affairs, King O'Malley, appointed a Department Board to evaluate the winning proposals and create a plan for their practical implementation.

The Departmental Plan was completed by November 1912 and officially endorsed by King O'Malley in January 1913. Hearing of the Departmental Plan, Walter Burley Griffin visited Australia in an

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attempt to view the site, understand the proposed amendments and deter the government from changing his vision. Of note in the Departmental Plan was the allocation of a brickworks site, which had not been included in Griffin's plan. A compromise between Griffin and the Board could not be reached and in October 1913 the incoming Minister for Home Affairs, William Kelly, dismissed the Board. Griffin was appointed as Federal Capital Director of Design and Construction to implement his original plan.⁶

By 1918 Griffin had developed his scheme into a practical plan that could be implemented. In 1920, the Commonwealth Government established a Federal Capital Advisory Committee (FCAC) to ensure the plan's timely execution. Griffin did not approve of the Advisory Committee's appointment and this, along with other ongoing unease and tension between Griffin and other staff and governmental departments, led to him leaving Canberra in 1920 on the completion of his contract.⁷

While Griffin was no longer involved in the process, the 'Griffin Plan' for Canberra of 1925 (called the 'Statutory Plan for Canberra') was gazetted as a result of *Seat of Government (Administration) Act 1910* (Cwlth). This plan effectively set the agenda for city planning until the 1950s.

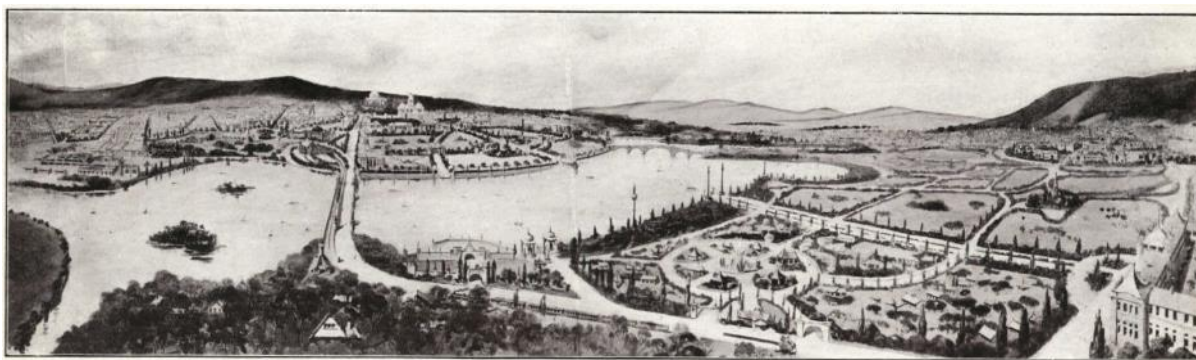


Figure 2.2 An artist's impression of the city's layout according to the Departmental Plan in Figure 2.3. (Source: NAA: M4071, 48, 1913, p 70)

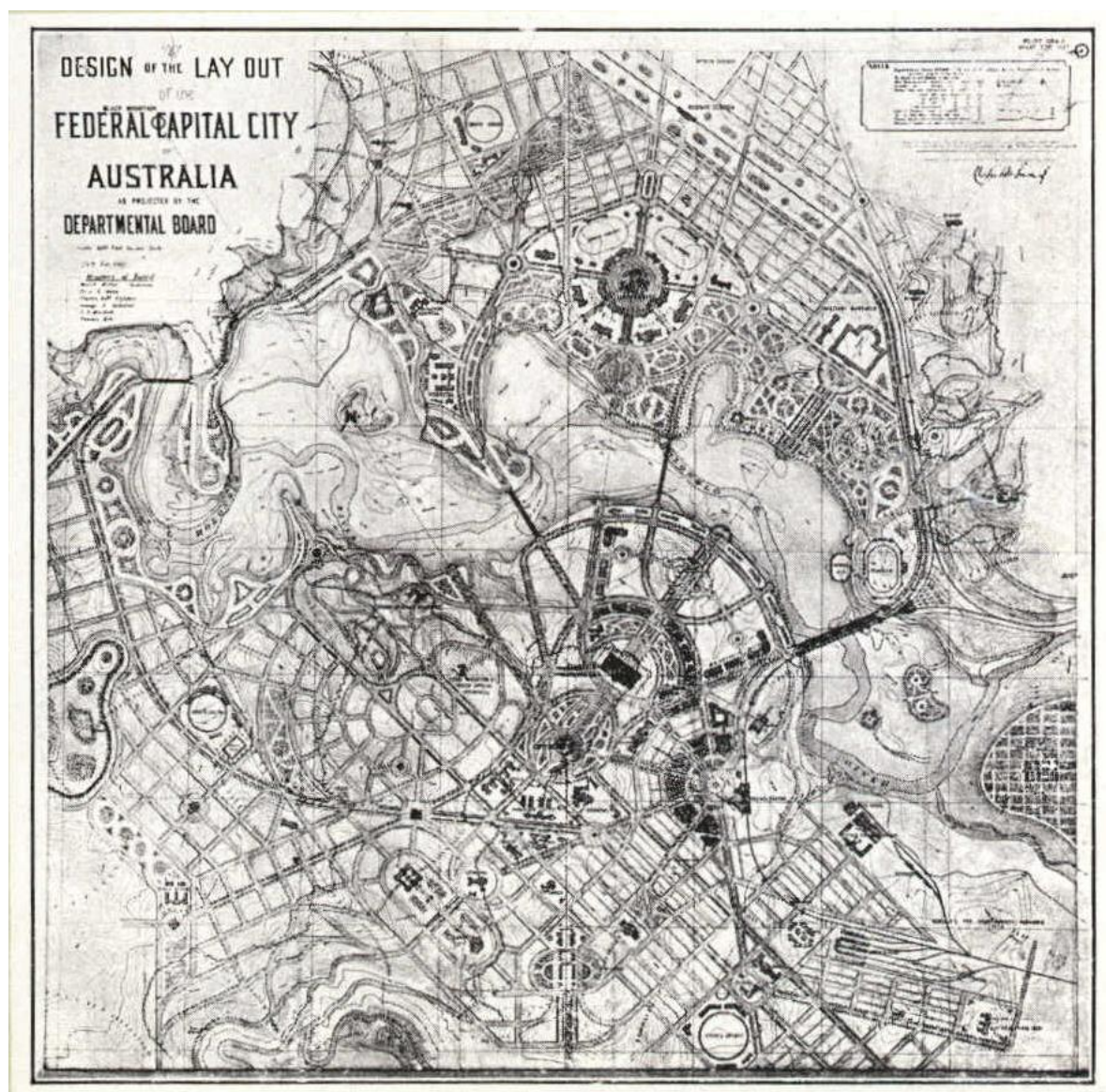


Figure 2.3 The 1913 Departmental Plan, of the Federal Capital Commission, was a combination of two of the winning designs and lacked the clarity and structured form of the Griffin Plan. (Source: NAA: M4071, 48, 1913, p 68)

2.3 Overview History of the Brickworks

2.3.1 Phases of Development

The Brickworks site contains evidence from each of its main phases of development: establishment, expansion, postwar, and post closure, when the site was permanently closed as a brick manufacturing facility.



Figure 2.5 Staffordshire kiln construction at the Brickworks, c1915. (Source: Canberra District Historical Society, ID15652)



Figure 2.6 Chimney stack under construction, c1926. (Source: NAA, A3560, 2455)



Figure 2.7 Scotch kilns were in operation at the Brickworks until the mid-1920s. (Source: NAA, A3560, 1968)



Figure 2.8 Hardy patent kiln 1 under construction, c1926. (Source: NAA, A3560, 2111)

2.3.2 Establishment Phase, 1911–1920

The Brickworks was established by the Commonwealth Government in the early days of Canberra's development as the federal capital. Due to the costs associated with transporting bricks outside of the Territory, it was decided that a local quarry and brickworks be established to support the construction of houses and government buildings, and the population growth in the new town. Of the two sites investigated, 38 acres of sheep grazing land on Frederick Campbell's property Yarralumla Station was selected for its potential to produce bricks of an excellent quality, equal to the best commercially produced bricks for hardness and porosity.⁸

Development of the Brickworks began in 1913 with initial infrastructure comprising a grinding pan, brick making machine and elevator, portable steam engine, and four open kilns. It was expected that much of this equipment would be temporary and that more permanent infrastructure would be established in 1914. A single 20-chamber Staffordshire kiln, the first to be built in Australia, was completed in 1915. The arrival of World War I led to a shift in government priorities and commitments, and resulted in restrictions on the works program for Canberra. This shift, together with a coal strike, caused the first closure of the Brickworks in December 1916. A 1916 contour and detail survey identified early Brickworks infrastructure including: a 'Machine Shop', 'No.1 Kiln', 'Fan Room', 'Stack', 'Office', and 'Power Station' (see Figure 2.4).

Many workers from the Brickworks were housed in two tent camps (single and married quarters) in an area popularly known as 'Westridge', part of Griffin's planned suburb of Westlake (now part of the contemporary suburb of Yarralumla). The first permanent dwellings for workers were constructed in the 1920s.

2.3.3 Expansion Phase, 1921–1942

With the end of World War I, the government proceeded with the construction of Canberra and formally reopened the Brickworks in 1921, which had undergone machinery repairs the previous year. A tile making plant was constructed in 1922 but it was reported in 1925 that the tiles were of a poor quality and the government invested £2000 into improving the product. The 1920s saw an increase in residential construction and major civic construction projects throughout Canberra in response to government plans to move public servants from Melbourne and the completion of the Provisional Parliament House in 1927 was a significant achievement for the fledgling capital. To cope with the increased demand, a Hardy patent kiln and two 'temporary' Downdraught kilns and associated stack were constructed, and the brick manufacturing Machine Shop established in c1916 near the quarry

was expanded by two bays to accommodate brick machines and grinding pans.

During the 1920s, more permanent workers' accommodation was established in the form of timber tenements and brick cottages adjacent to the earlier accommodation camps. In 1927, additional married quarters and a single men's camp were constructed in response to the growing workforce.

To assist in the accelerated residential and civic construction of Canberra, a steam powered narrow-gauge railway was built in 1923 to improve the mass transportation of bricks. The bricks had previously been transported by steam traction engines, but this was a slow process unsuited to the capital's rapid growth and underdeveloped roads. A track leading from the Brickworks was constructed and branched out to the site of the new Hotel Canberra (now the Hyatt Hotel), the Provisional Parliament House, and the Kingston Powerhouse. A track was originally proposed to extend over the Molonglo River into Civic but the 1922 floods destroyed the connecting bridge. Eventually the Civic branch was established by narrowing an existing abandoned standard gauge track.⁹ From 1927 the railway infrastructure was gradually removed and transportation continued by motor lorry.¹⁰

The Depression curtailed production at the Brickworks and timber was used instead of the more expensive coal to operate the kilns. With significant reduction in demand, the Brickworks closed for a second time in 1931. It reopened in 1935, but this proved to be short-lived due to the arrival of World War II. The Brickworks closed for a third time in 1942 and staff were laid off with a caretaker instituted to issue bricks for essential works only.

2.3.4 Post-World War II Phase, 1944–1976

In 1944 the Brickworks reopened on a limited scale. This soon increased to respond to the postwar housing shortage, which led to major expansion and redevelopment works at the Brickworks. Efforts were made to seek out experienced and qualified workers to meet the increased demand on the Brickworks. However, recruitment proved challenging and in an effort to attract workers, a new amenities block was constructed, as was the 'Brickworks Hostel' which was positioned south of the site and completed in 1945.

In 1952, plans and equipment for a new 'Tunnel' kiln were purchased and foundations laid, but the project was soon abandoned amid spiralling costs. A second Hardy patent 20-chamber kiln was constructed c1954 on the foundations of the abandoned Tunnel kiln. It utilised natural draught for firing, as opposed to being fan-induced, which required a tall chimney stack.



Figure 2.9 The Brickworks quarry face with workers, c1920–30. (Source: NAA, A3650, 3315)



Figure 2.10 The Brickworks quarry and narrow gauge railway track, c1920–30. (Source: NAA, A3650, 3314)



Figure 2.11 View from Old Parliament House roof with the railway and carts that delivered the bricks in the top right. (Source: NAA, A3560, 1398)



Figure 2.12 Man loading a kiln, c1926. (Source: NAA, A3560, 1973)



Figure 2.13 Canberra Brickworks, c1927.
(Source: NAA, A3560, 2696)



Figure 2.14 Brick kilns and brick stacks,
c1926. (Source: NAA, A3560, 167)



Figure 2.15 View to the kilns, c1928.
(Source: NAA, A3560, 4557)



Figure 2.16 Stone crushing and screening
plant. (Source: NAA, A3560)

The 1950s saw a change in the brick making process and a series of new crushers and hoppers was introduced, as well as an elevator and a series of conveyor belts. New brick press buildings and a workshop replaced the early machine shop adjacent the Staffordshire kiln. Despite extensive upgrades and works, a 1959 report on the operations, management, equipment, and economics of the Brickworks addressed concerns over low productivity at the site and the quality of bricks being produced.

In 1958, the two 1925 Downdraught kilns were demolished to allow for the construction of three new Downdraught kilns from 1960–1963. The new kilns had the capacity to hold 120,000 bricks and were reputed to be the longest in Australia. At this time, oil replaced coal as the fuel for firing the kilns.

By 1973, the Brickworks was considered in need of extensive modernisation and proposals were prepared by Commonwealth Brickworks Pty Ltd for upgrade works. These proposals were rejected by the National Capital Development Commission (NCDC) on environmental grounds and a new brickworks site was released at Mitchell in Canberra's north. The allocation of a new brickworks site led to the final closure of the Brickworks and the kilns were unloaded for the last time in August 1976.

2.3.5 Post Closure Phase, 1976–2017

In 1976, local developer and businessman Alan Marr (A R Marr Pty Ltd) put forward a proposal to develop the Brickworks as an integrated tourist, recreation, and retail centre with medium density housing to the east and north of the site. Marr succeeded in having the land rezoned to accommodate his vision and carried out maintenance and reconstruction works to the kilns. Landscaping of the quarry, involving land fill and the creation of the reflection lake, proceeded in 1978. The redeveloped Brickworks was opened to the public as a tourist attraction in July 1979. However, limited income opportunities and high capital costs forced Marr's business into provisional liquidation. In the early 1980s, Marr was seriously injured in a fall at the site and later died of complications. The Commonwealth accepted the surrender of Marr's company's lease in 1984 and management of the site was transferred to caretaker Bruce McDonald. While many of Marr's tenants remained at the Brickworks, concerns about the safety of some of the buildings and potential redevelopment of the site led to the tenants being asked to leave and the caretaker role being abolished.

The 1988 *Canberra Brickworks South Canberra Policy Plan* suggested a range of potential uses for the site such as housing, commercial accommodation, and office and retail space. The

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government adopted the plan, despite it being poorly received by the community. Hooker Projects submitted the preferred EOI, which proposed a development that adapted the kilns and machine bays, and contained a sports precinct, museum, restaurant, hotel, and visitor attractions. A depressed economy led to Hooker Projects being placed in provisional liquidation and by 1992 their proposal was defunct. It is around this time that the Commonwealth handed the Brickworks site over to the ACT Government.

Further development proposals were investigated but none proceeded and during this phase the Brickworks continued to accommodate a range of tenants, including artists, designers, and manufacturers. In 1994 a timber recycling business, Thor's Hammer, was established at the site, and operated until 2019.

In 2001 the Brickworks was included on the ACT Heritage Register as the 'Yarralumla Brickworks'. In 2013, the remnants of the former 1920s narrow-gauge railway were individually listed as the 'Yarralumla Brickworks Railway Remnants'.

In September 2013, the ACT Government's Land Development Agency (LDA) (now the Suburban Land Agency) released the *Canberra Brickworks and Environs Planning and Development Strategy*, which sought to promote the adaptive re-use of the site and its surrounds with respect to its heritage significance. Following revision of the strategy in 2015, the LDA called for development proposals to be submitted and in 2017 it was announced that the preferred tenderer was local Canberra developer Doma Group with its submission for a mixed-use residential, commercial, and retail development that utilised much of the historic Brickworks infrastructure.

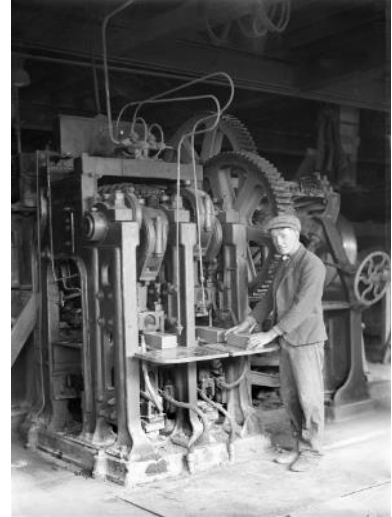


Figure 2.17 Brick pressing machine and operator, c1926. (Source: NAA, A3560, 1920)



Figure 2.18 Brick pressing machinery being installed at the Brickworks, c1925. (Source: NAA, A3560, 1210)

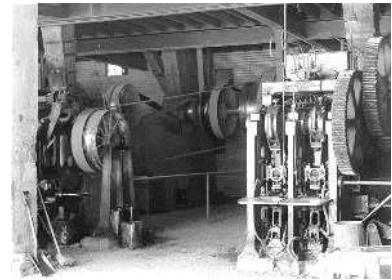


Figure 2.19 Brick presses for pressing clay bricks before firing, c1926. (Source: NAA, A3560, 159)

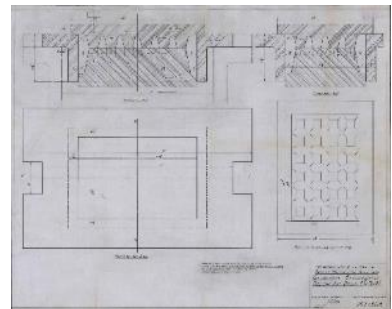


Figure 2.20 Dies for Air Brick, c1922. (Source: NAA, A2445, M2156B)

2.3.6 Chronology

The following table outlines the development phases and the construction dates of the remnant elements at the Canberra Brickworks Precinct.

Table 2.1 Chronology of the Development of the Remnant Elements On Site at the Canberra Brickworks Precinct.

Number	Element	Date
Establishment Phase: 1911–1920		
01	Quarry	1913–1940
02	Concrete Retaining Wall	c1913
03	Power House	1915–16
04	Staffordshire Kiln	1914–15
05	Fan House for Staffordshire Kiln	1914–15
06	Chimney Stack for Staffordshire Kiln	1914–15
36	Original brickyard area between Staffordshire Kiln, Hardy Patent Kiln 1, and fan houses	c1915, c1926
Expansion Phase: 1921–1942		
35	Narrow Gauge Railway (remnants)	1923
07	Offices	c1925
08	Hardy Patent Kiln 1	c1926–27 (rebuilt 1955)
09	Fan House for Hardy Patent Kiln 1	c1927 (second structure c1955)
10	Chimney Stack for Hardy Patent Kiln 1	c1926–27
Post World War II Phase: 1944–1976		
11	Amenities Block	c1950, c1977
12	Hardy Patent Kiln 2	c1954
13	Chimney Stack for Hardy Patent Kiln 2	c1953, c2005
14	Machine Bay 1 for Staffordshire Kiln and Downdraught Kilns	c1955
15	Machine Bay 2 for Hardy Patent Kiln 1	c1955
16	Machine Bay 3 for Hardy Patent Kiln 2	c1955
17	Workshop	c1955
18	Small Crusher House (Crusher House I)	c1958
19	White Pan Room (Large Crusher House/Crusher House II)	c1955
20	Primary Crusher House (Crusher House III)	c1955
21	Elevator/Conveyor	c1955
22	Downdraught Kilns	c1960–63

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Number	Element	Date
23	Downdraught Kilns Control Room	c1961
24	Chimney Stack for Downdraught Kilns	c1961
Post Closure Phase: 1976–2017		
33	Model Railway Workshop	c1979
34	Model Railway Storage Shed	c1979



Figure 2.21 Site plan showing the location and development phase of individual elements within the Canberra Brickworks Precinct. (Source: Google Earth with GML overlay, 2017)

3.0 Historical Archaeological Resources

Twelve areas of potential archaeological sensitivity were identified in the AA, with varying levels of archaeological potential (low, moderate, high) and potential significance. These areas have been previously surveyed and are described in the AA. GML undertook an inspection of the site on 15 January 2020 to re-inspect these features and identify any other areas of archaeological sensitivity, if present.

3.1 Site Inspection

An inspection of the site was undertaken by GML Principal Martin Rowney, GML Heritage Consultant Janene May and GML Intern Caitlin Harvey on 15 January 2020. This aimed to examine the presence and extent of physical features at the site and review areas of archaeological sensitivity previously identified in the AA. The inspection also aimed to examine each of the areas of archaeological sensitivity to determine appropriate investigation strategies. Results of this site inspection are provided in Section 3.2 below. The site inspection confirmed the results of the AA and has informed the methodology provided in Section 4 of this report.

3.2 Archaeological Resources

The 12 areas of archaeological sensitivity (BRW1-12) at the site which were identified in the AA were assigned varying levels of potential, as shown in Figure 3.1 below. These areas are discussed below, with more detailed descriptions for some of the areas provided in the AA at Appendix A of this report.

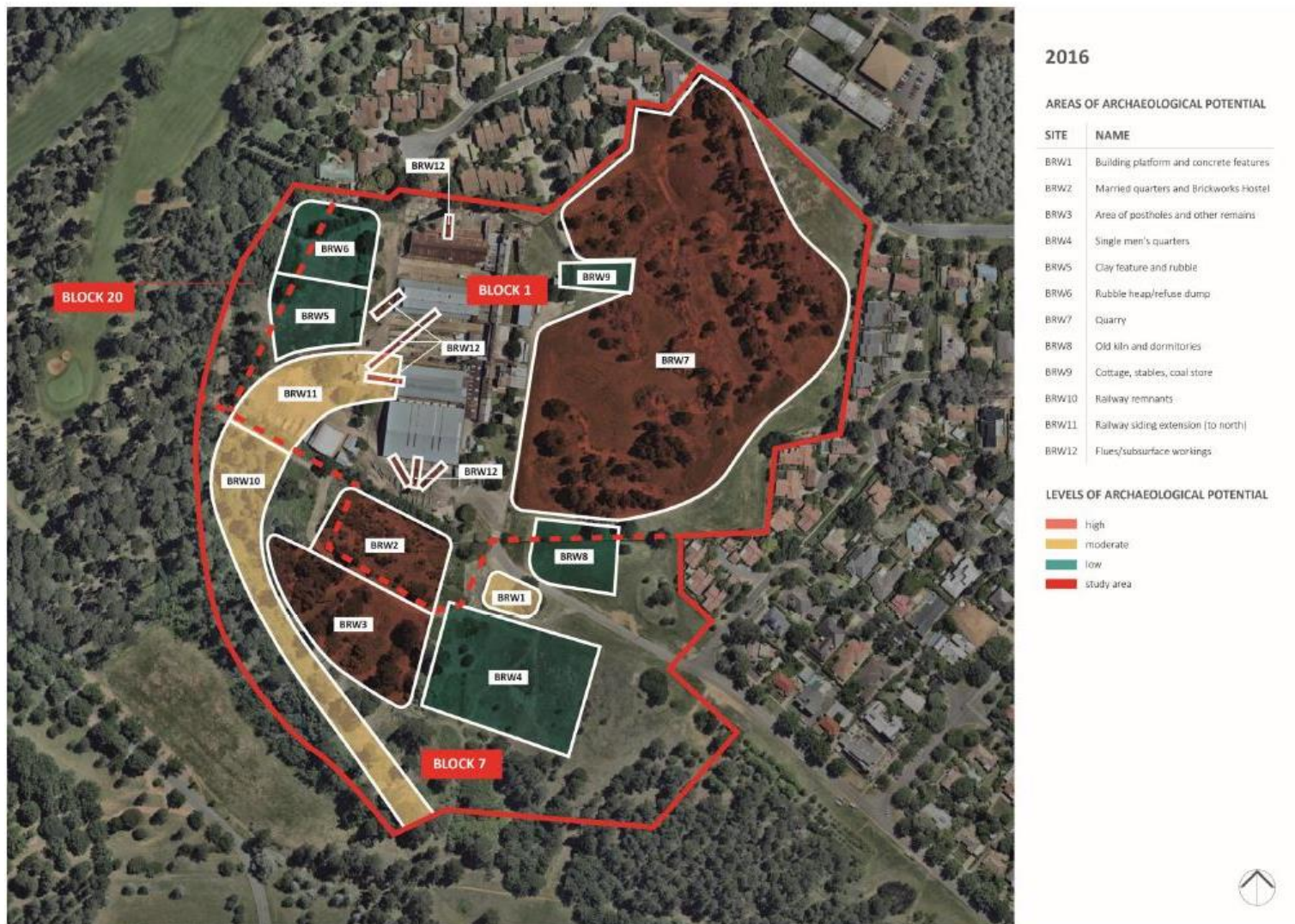


Figure 3.1 Areas of archaeological potential in the study area. (Source: Navin Officer, 2016)

BRW1: Possible Building Platform and Concrete Features

This archaeological site consists of several surface features and potential subsurface features including a square concrete feature and a visible line of grass die back. The AA report suggested that this feature had a function with water, either for storage or drainage (refer to Appendix A). Some disturbance from erosion was noted. Preliminary investigations in this area may reveal the function of features in this area and their relationship to the wider Canberra Brickworks site.

The site inspection undertaken by GML confirmed the moderate potential of this area. If intact archaeological features are identified they may provide some information on the running of the brickworks; however, the significance of these features would likely be low. A review of historical imagery shows that the area remained largely cleared without structures present. Some roads appear to have potentially intersected the area during the twentieth century. One structure in the eastern portion of the site is visible on a 1972 aerial.

The description for the BRW1 area provided in the AA is included in Appendix A.



Figure 3.2 View towards BRW1. (Source: GML 2020)



Figure 3.3 Modern services at BRW1. (Source: GML 2020)



Figure 3.4 Site BRW1 overlaying a 1958 aerial. (Source: ACT Planning & Land Authority [ACTPLA] Plan Room 1958-5-21, Run 7, Print 5061)



Figure 3.5 Site BRW1 overlaying a 1972 aerial. (Source: ACTPLA Plan Room 24-2-1972, Run 9, Print 047)

BRW2: Married Quarters and Brickworks Hostel

The AA describes this archaeological site as consisting of the brickworks accommodation village, which contains a complex of structural features including a brick feature and mound (BRW2-A), a metal spoil heap (BRW2-B), a concrete slab (BRW2-C) and a brick mound (BRW2-D). The AA report indicates that the area would have previously supported the former married quarters including a mess hall and smaller sleeping quarters which were built in the 1920s. The site would have also contained the Brickworks Hostel which appears to have been built on the site of the married quarters in the 1940s. This hostel was demolished in the 1970s and the area has remained relatively undisturbed since then.

Historical aerials from 1958 show several structures present at the site during this time. As indicated by the AA, historical aerials suggest that these structures were demolished by 1980.

The site inspection undertaken by GML confirmed the high potential of this area. The area is currently covered with dense grass and shrubs which limited the visibility. Archaeological deposits at this location may provide information about the nature and configuration of the structures, as well as the daily lives and living conditions of the workers who were employed at the brickworks.

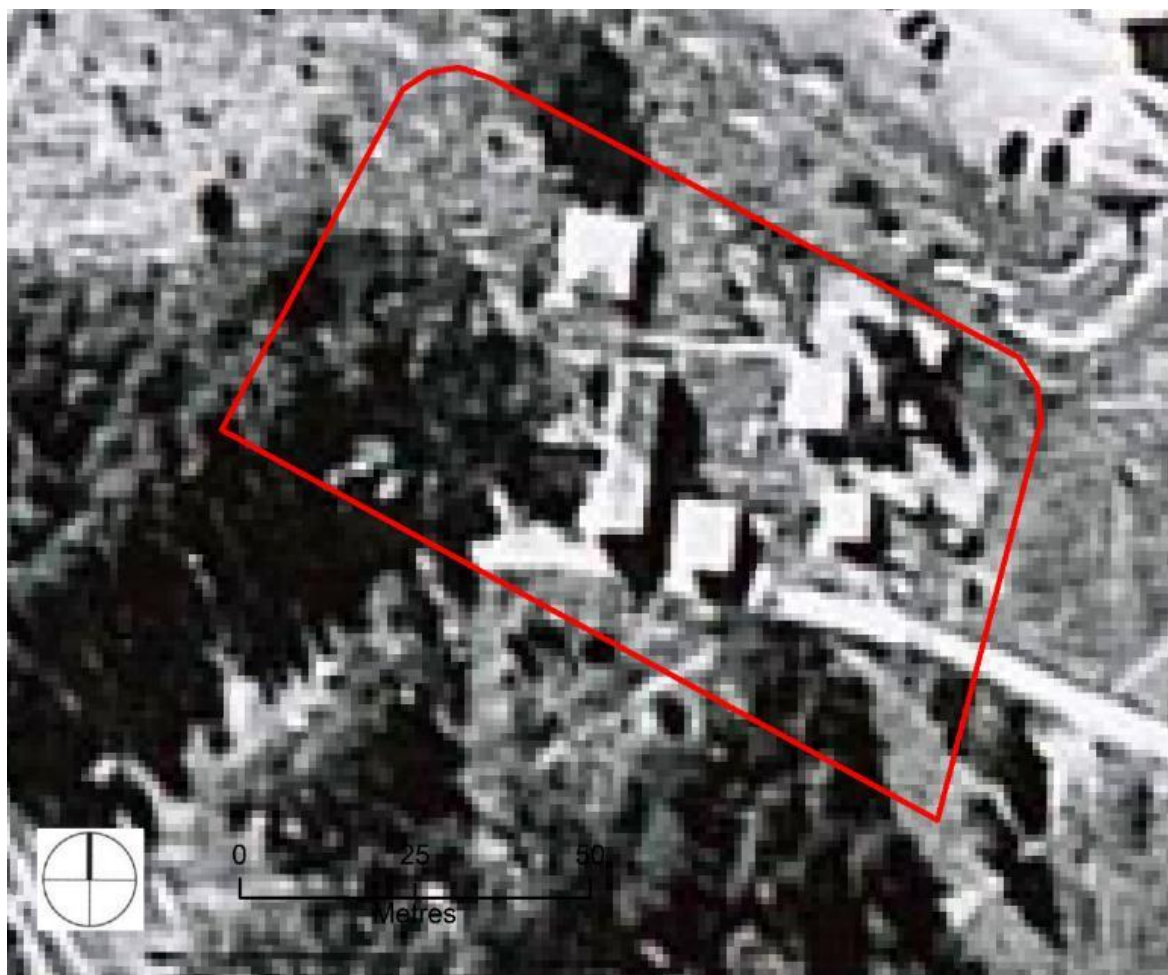


Figure 3.6 Site BRW2 overlaying a 1958 historical aerial. (Source: ACTPLA Plan Room 1958-5-21, Run 7, Print 5061)

BRW3: Area of Postholes and Other Remains

This archaeological site consists of a complex of features relating to various structures and infrastructure to the south of BRW2. The AA describes this site as containing evidence of a modern fringe dweller's camp including a hearth made of brick and concrete which appears to be recently used. Evidence of a camp or rough shelter has also been observed here with features including planks nailed to trees, pallets used for flooring, tin sheets and nylon rope tied around trees. A circular feature defined by postholes was also identified. Early plans indicate that this area was used as an ephemeral brickworks camp. Other features found here include brick and concrete spoil mounds, a rectangular clearing, a drainage line and a slab timber fence or yard post.

Historical aerials from 1950 show two large rectangular structures present in BRW3, south of the brickworks accommodation village identified as BRW2 in the AA. These structures appear to have been demolished by 1958. It is likely that these structures are the Brickworks Hostel built in the 1940s, which were included as BRW2 in the AA, but appear to be situated within BRW3.

The site inspection undertaken by GML confirmed the high potential of this area. Archaeological deposits at this location may provide information about the nature and extent of any structural features in this area, the nature of the various postholes, along with the daily lives and living conditions of the workers who were employed at the brickworks.

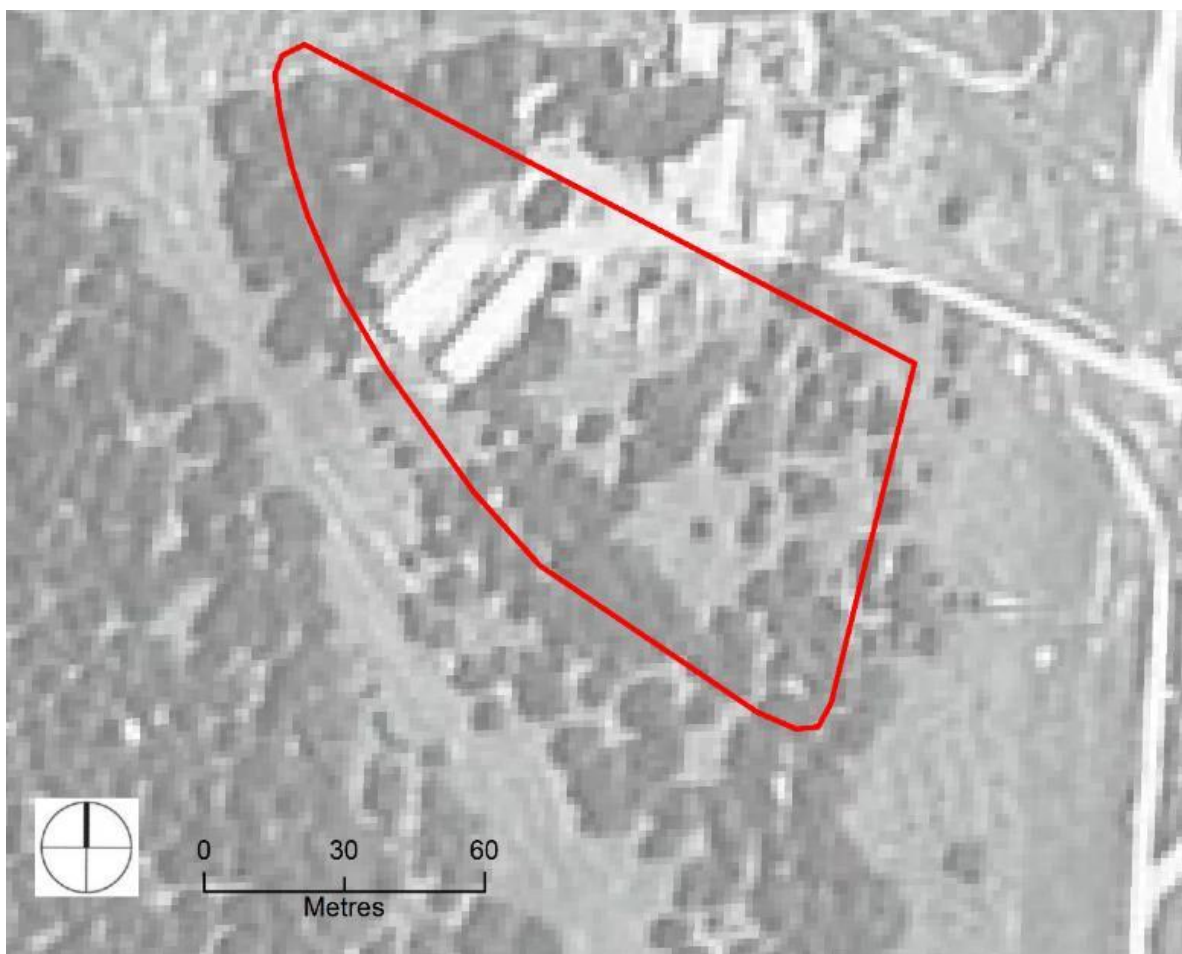


Figure 3.7 Site BRW23 overlaying a 1950 historical aerial. (Source: ACTPLA Plan Room 29-11-1950, Run 2, Print 5101)



Figure 3.8 A 1952 aerial showing the location of the Brickworks Hostel. (Source: ACT Heritage Library)

BRW4: Single Men's Quarters

This site was identified in the AA as the location of the former single men's quarters. The AA described the area as consisting of a fenced yard covering an area of about 80m x 80m. A layer of bitumen was found to cover a good portion of the site, and sits directly above a layer of bedrock. Only a thin layer of topsoil was present in patches throughout the yard. No other structural features were identified; however, fragments of window glass were found in the northern section of the site. The AA speculates that the single men's quarters was likely located within the area where a large square feature appears in 1961–1980 aerials (Figure 3.9). The AA concluded that the area has likely been subjected to significant disturbance, and potential for archaeological remnants is low.

GML inspected the area and concurred with the findings of the AA which found the area to have a low level of archaeological potential. No further investigation in the area is proposed; however, protections for any archaeological finds during works should be developed at later stages in the project.



Figure 3.9 A 1972 aerial showing a large square feature. (Source: ACTPLA Plan Room 24-2-1972, Run 9, Print 047)

BRW5: Clay Feature and Rubble

This site was identified in the AA as having a low level of archaeological potential. The AA identified two features at the location of BRW5 and found that these may have been associated with former structures. These features included a clay feature and some brick and concrete rubble. The clay feature consists of a silty clay feature up to 50m in diameter, and 1m to 2m in height. It appears to be a flat topped mound or stockpile of this resource.

The rubble feature is described as a series of depressions scattered throughout the area with brick and concrete rubble. The AA suggests that this feature could be associated with a former structure which has been dumped from another location. GML concurs with the low level of archaeological potential assigned to this site in the AA. No further investigation in the area is proposed; however, protections for any archaeological finds during works should be developed at later stages in the project.

BRW6: Rubble Heap/Refuse Dump

This site was identified in the AA as an area that was used as a quarry prior to being converted into a rubble heap/refuse dump by the 1940s. The AA states that there is some potential for refuse of an industrial nature to remain subsurface in this area. The area was overlaid with concrete by the 1970s, which has since been removed. The AA notes that this may have disturbed any subsurface remains at this location.

GML concurs with the findings of the AA which found the area to have a low level of archaeological potential. No further investigation in the area is proposed; however, protections for any archaeological finds during works should be developed at later stages in the project.

BRW7: Quarry

The former quarry area is designated in the AA as having high archaeological potential; however, following review of previous documents and an inspection of the site, GML considered the archaeological potential of this area to be moderate to low. There were minimal structures present in the quarry area, and the area has been subjected to significant disturbance. The former quarry is a significant landscape in its own right with a number of documented significant geological features. Further investigation should include selective subsurface testing, along with a detailed recording of the landscape.

The AA identified two specific features at the southern end of the quarry—a bricked-over water tank (Figures 3.11–3.13) and a series of circular depressions. While the bricked-over water tank was found during the site inspection, there was no clear evidence of the circular depressions. In addition to those features, GML observed a small rise in the centre of the quarry area which may represent a structure visible in 1972 historical aerials (Figure 3.14).

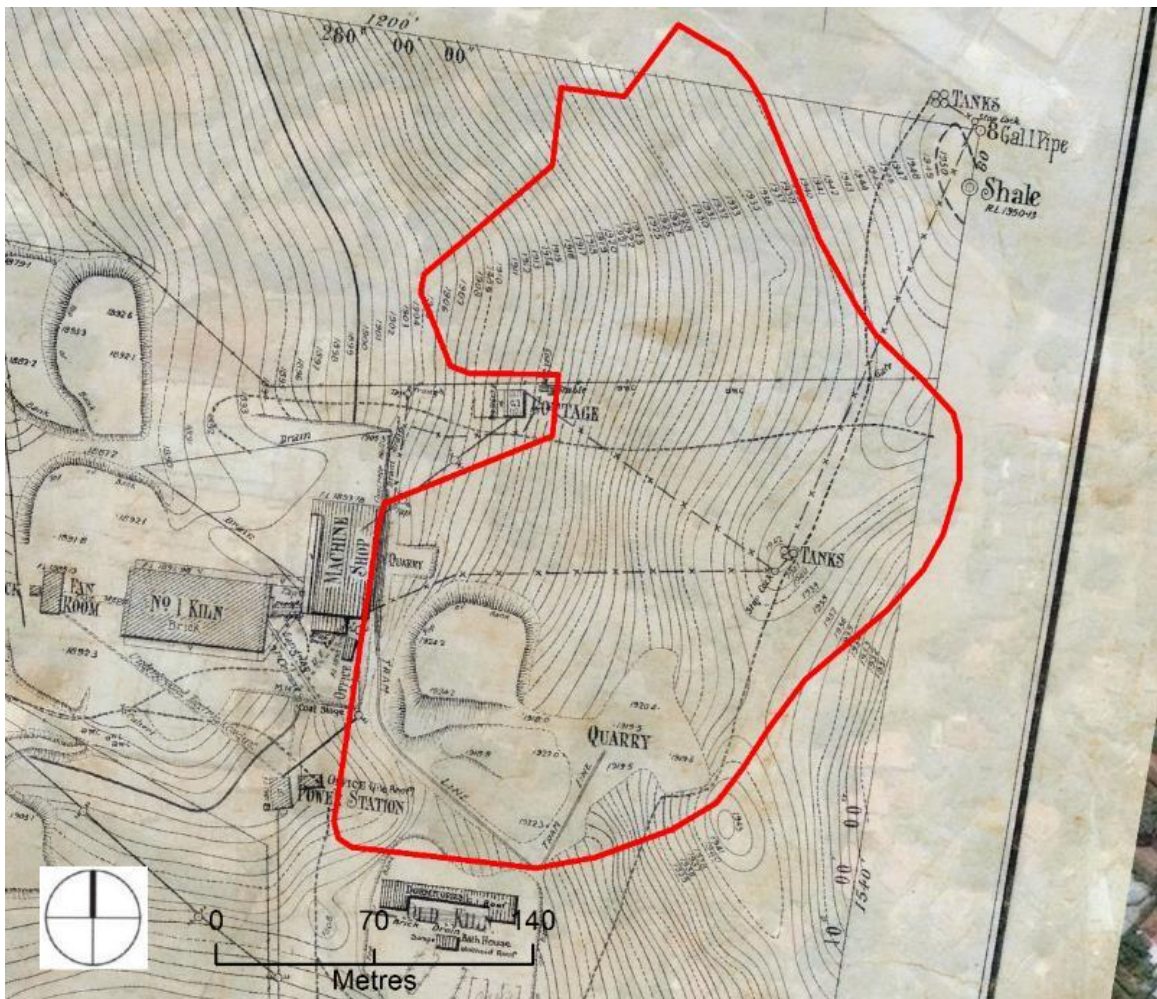


Figure 3.10 A 1916 site plan showing the BRW7 site. (Source: NAA: A6664, L165A, 1916)



Figure 3.11 Detail of the 1916 site plan showing the former tanks at the quarry. (Source: NAA: A6664, L165A, 1916)



Figure 3.12 Bricked-over water tank from AA report. (Source: GML)



Figure 3.13 Water tank during 2020 inspection of the site by GML. (Source: GML)



Figure 3.14 A 1972 aerial showing the location of BRW7 and the former structure. (Source: ACTPLA Plan Room 24-2-1972, Run 9, Print 047)

BRW8: Old Kiln and Dormitories

The BRW8 site was described in the AA as the site of the old kiln complex and dormitories, established in 1913. The dormitory building had been constructed directly to the north of the kilns. The AA states that these structures were likely demolished by the mid-1920s, and the area has undergone further disturbance since the demolition including the construction of a carpark in the area in the 1960s–1970s which involved the laying of concrete. This was removed by 1980.

The AA determined that the likelihood of subsurface features relating to the early kilns and dormitories would be low, and therefore the area of BRW8 was assessed to have low archaeological potential.

GML inspected this area on 15 January 2020 and confirmed that disturbances had occurred to the BRW8 site. A review of historical aerials and maps suggests that to the south of the old kiln and dormitories building was also a brick drain and bath house. While disturbance has occurred to this area, and the AA determined this area to have a low potential for archaeological remains, GML has found that, if present, archaeological features and artefacts could be of high significance. This area is therefore proposed to be tested as part of the methodology outlined in Sections 4 and 5 of this report.



Figure 3.15 A 1916 site plan aerial showing the location of BRW8 and former structures. (Source: NAA: A6664, L165A, 1916)



Figure 3.16 A 1958 aerial showing the location of BRW8. (Source: ACTPLA Plan Room 1958-5-21, Run 7, Print 5061)

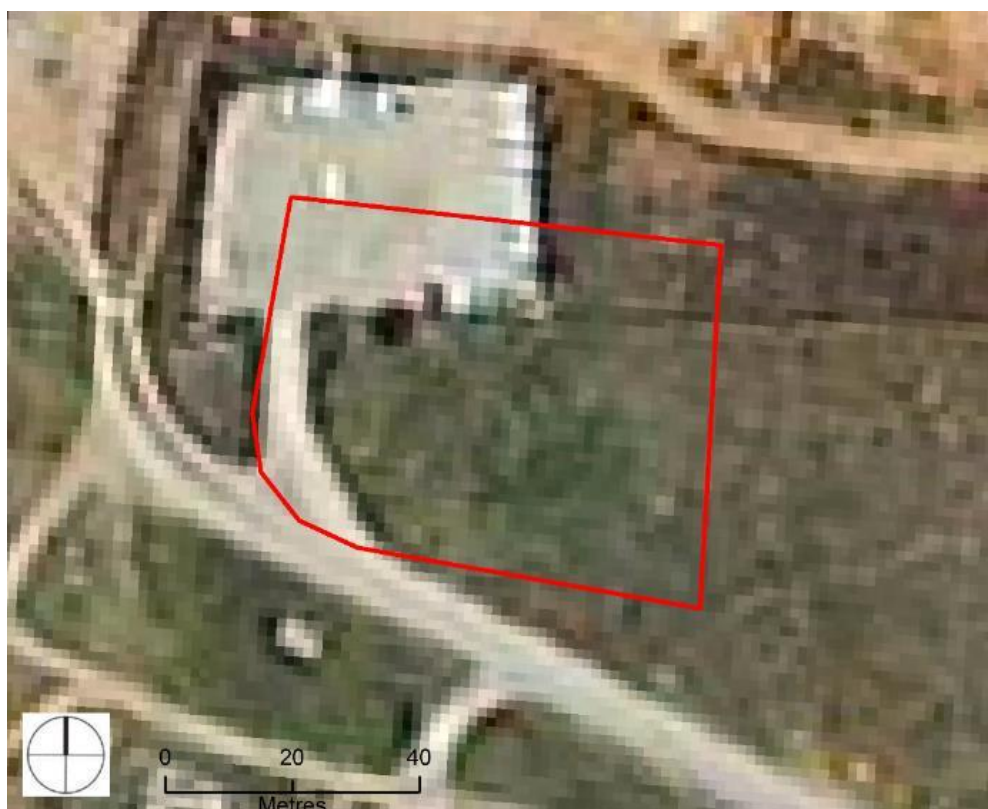


Figure 3.17 A 1972 aerial showing the location of BRW8. (Source: ACTPLA Plan Room 24-2-1972, Run 9, Print 047)

BRW9: Cottage, Stables, Coal Store

This site represents a cottage, stables and coal store which were built in 1913 to the northeast of the Brickworks site as part of the first stage of construction of the permanent brickworks. This cottage was demolished by 1947 and the location has likely been heavily disturbed by the introduction of roadways to the east of the kiln and the construction of machinery shops. The AA notes that this area has been heavily trafficked over time. Material discard in this area, if present, may be of a domestic and/or industrial nature. GML inspected the area and concurred with the findings of the AA which found the area to have a low level of archaeological potential. No further investigation in the area is proposed; however, protections for any archaeological finds during works should be developed at later stages in the project.

BRW10: Railway Remnants

The AA described the BRW10 site as consisting of evidence of the brickworks railway, which was constructed in 1923 and largely removed by 1929. Remnants of this railway are largely manifest in the evidence of the railway siding which is still present in the form of cuttings in the landscape.

The AA stated that, while all remnants of the track were removed in the 1920s, there is some limited potential for archaeological evidence that would enhance an understanding of the railway and its operation. Features still present (though unlikely) may include the timber sleepers, iron bolts and metal rails. The AA also notes a low potential for other remains relating to the railway including drainage channels. It was therefore described in the AA as an area of moderate archaeological potential.

GML observed these cuttings during the site inspection undertaken on 15 January 2020; however, based on the known history of the removal of this feature, consider that there is relatively low potential for archaeological material to be located here. That noted, if archaeological features are present, these would likely be of high significance. On that basis, further limited investigation is proposed for this area.

These remnants also constitute a landscape feature that warrant recording.



Figure 3.18 A 1958 aerial showing the location of BRW10. (Source: ACTPLA Plan Room 1958-5-21, Run 7, Print 5061)



Figure 3.19 A 1972 aerial showing the location of BRW10. (Source: ACTPLA Plan Room 24-2-1972, Run 9, Print 047)

BRW11: Railway Siding Extension

The AA describes this site as the former railway siding which extended into the Brickworks site and terminated to the north and south of the original Staffordshire kiln. The area was later covered by a concrete slab for the extrusion plant, but the AA notes that there is still some archaeological potential for remnants of the railway siding to exist. The potential archaeological features may include the railway cutting, timber sleepers, iron bolts and metal rails.

GML inspected the area and noted that the area currently consists of a concrete slab, as well as the remaining fan room structure to the east. GML concurs that there may be potential for archaeological remnants of the former railway siding extension below the existing concrete slab. Further investigation is warranted in this area. Historical aerials demonstrate several changes to the area—including the construction of a large square structure to the south of the fan room by 1972 (since demolished). The area has been largely paved by 1972 and the fan room is the only building present in the area in current aerial photographs.

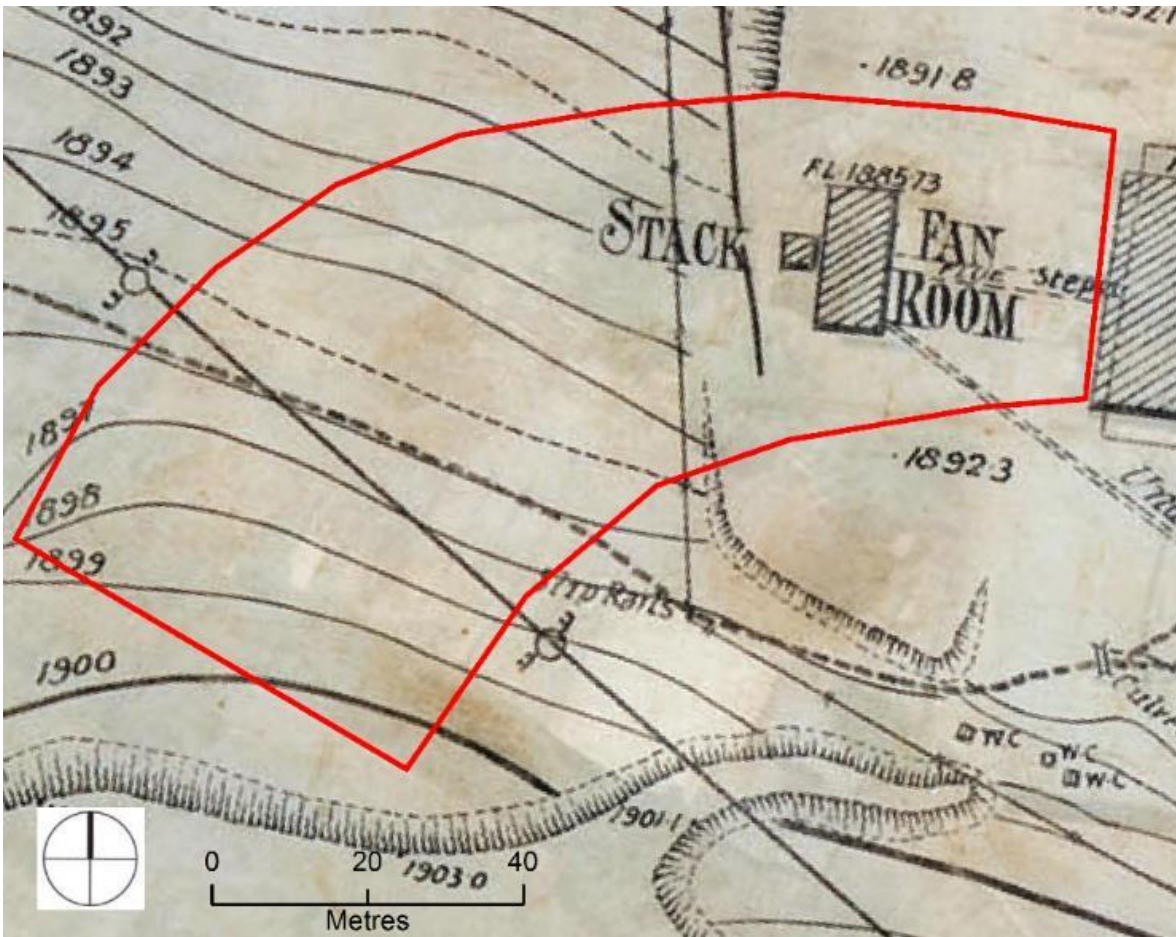


Figure 3.20 A 1916 site map showing the location of BRW11. (Source: NAA: A6664, L165A, 1916)

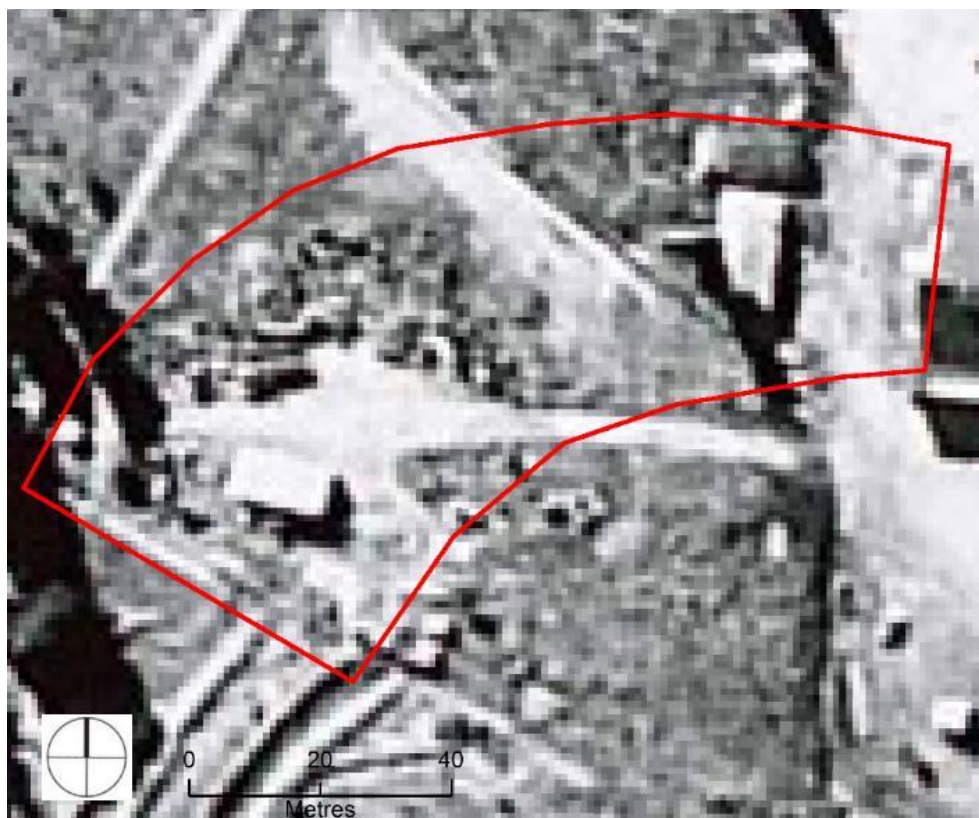


Figure 3.21 A 1958 aerial showing the location of BRW11. (Source: ACT Planning & Land Authority [ACTPLA] Plan Room 1958-5-21, Run 7, Print 5061)



Figure 3.22 A 1972 aerial showing the location of BRW11. (Source: ACTPLA Plan Room 24-2-1972, Run 9, Print 047)



Figure 3.23 A 1980 aerial showing the location of BRW11. (Source: ACTPLA Plan Room 9-2-1980, Run 15, Print 188)



Figure 3.24 A current aerial showing the location of BRW10. (Source: ESRI Basemaps and GML Overlay)

BRW12: Flues/Subsurface Workings

The AA describes this site as consisting of underground flues and workings which connected the kilns to their associated fan stacks. These features were understood at that time to still remain in situ and were unlikely to have been disturbed.

GML observed some evidence of these features during the site inspection undertaken on 15 January 2020. Further investigation to refine the understanding of these features, their depths, extent and nature is warranted.

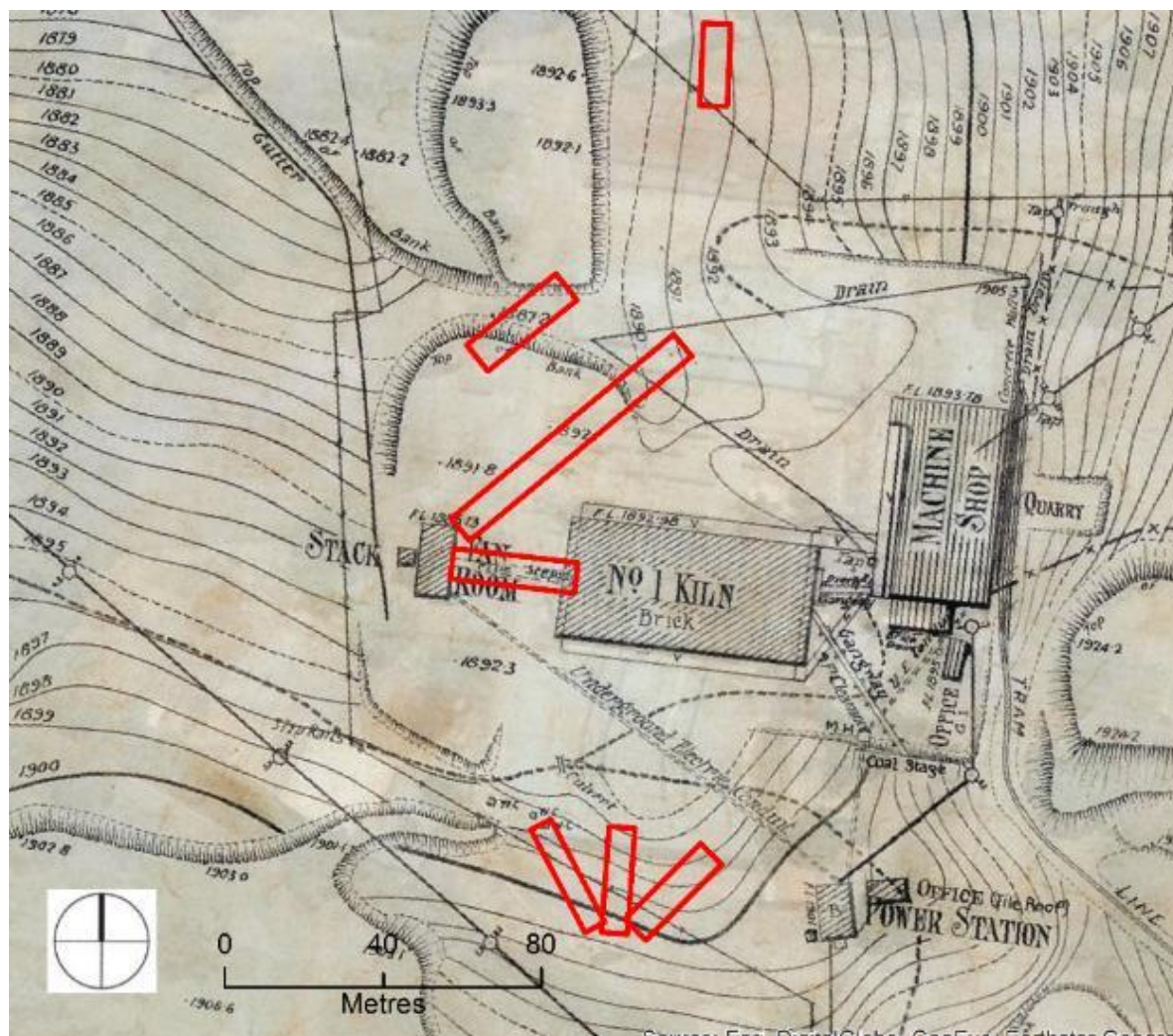


Figure 3.25 A 1916 site plan showing the location of BRW12. (Source: NAA: A6664, L165A, 1916)



Figure 3.26 A current aerial showing the location of BRW12. (Source: ESRI Basemaps and GML Overlay)

3.3 Summary of Archaeological Resources

Table 3.1 provides a summary of archaeological resources identified at the Canberra Brickworks site, including the level of archaeological potential identified at each area of sensitivity identified in the AA, the potential archaeological significance and whether further investigation is required.

Table 3.1 Summary of Archaeological Resources at Canberra Brickworks.

Area ID	Level of Archaeological Potential (AA)	Level of Archaeological Potential (GML)	Potential Significance	Further Investigation Required?
BRW1	Moderate	Moderate	Low	Yes
BRW2	High	High	High	Yes
BRW3	High	High	High	Yes
BRW4	Low	Low	Moderate	No
BRW5	Low	Low	Low	No
BRW6	Low	Low	Low	No

Area ID	Level of Archaeological Potential (AA)	Level of Archaeological Potential (GML)	Potential Significance	Further Investigation Required?
BRW7	High	Low–moderate	High	Yes
BRW8	Low	Low	High	Yes
BRW9	Low	Low	Low	No
BRW10	Moderate	Moderate	High	Yes
BRW11	Moderate	Moderate	High	Yes
BRW12	High	High	High	Yes

4.0 Research Design

4.1 Overview

The development of a research framework assists in understanding an archaeological site's significance and informs how it should be investigated and managed. The questions that archaeological investigations could address are framed in the context of the site history, physical condition and significance.

The study area's historical archaeology has the potential to answer site specific questions and contribute to a range of broader historical and archaeological research. The development program provides an opportunity to undertake archaeological investigations. The ability to answer the research questions will vary as the scale of archaeological excavation is linked to managing the construction impacts.

4.2 Research Themes

Historical themes assist in linking heritage places to broader patterns and subjects in our national and state histories. Themes provide an organising framework for understanding the connections and relationships between places that may be geographically dispersed. Historical thematic frameworks have been developed at national, state and territory levels for use in heritage assessment and management.

The ACT Heritage Council's *Heritage Assessment Policy*¹¹ outlines a number of overarching themes relating to the broad historical patterns and evolution of the ACT. These are outlined in Table 4.1 below.

Table 4.1 Themes from the *Heritage Assessment Policy*.

Themes	Sub-themes
The evolution of the natural environment	
Aboriginal life in the area	
Aboriginal associations with place	
European settlement pre-Federal Capital Territory (FCT) (1911)	<ul style="list-style-type: none"> • Exploration. • Rural settlement.
Canberra as the nation's capital	<ul style="list-style-type: none"> • Exploring, surveying and mapping. • The transfer of the seat of government. • Feeding and farming the region post 1911. • Developing ACT and regional economies.

Themes	Sub-themes
Canberra as a planned environment	<ul style="list-style-type: none"> • Griffin's Canberra. • Early federal government landscape and urban planning: <ul style="list-style-type: none"> – Garden City and City Beautiful; and – notions of the bush capital. • National Capital Development Commission (NCDC) and the Y-Plan. • Self-government and post-NCDC Commonwealth Government landscape and urban planning.
Lodging and educating people and the provision of government housing and schools	

In 2001, the then Australian Heritage Commission developed the Australian Historic Themes Framework. This set of themes is more broadly encompassing but includes themes relating to developing local, regional and national economies, building settlements, towns and cities, working and labour, and developing Australia's cultural life, among many others.

The research framework for excavation at the Canberra Brickworks can be formulated with regard to both of these thematic frameworks.

As the Brickworks site is a historic place that was established after the declaration of the federal capital territory in 1911, and it has previously been assessed having no Aboriginal cultural values, the following themes are central to the framing of the research direction for any historical investigation of the site.

Table 4.2 Themes from the Australian Historic Themes Framework and GML Comment.

ACT Theme	GML Comment
Canberra as the nation's capital: <ul style="list-style-type: none"> • exploring, surveying and mapping [building / developing]; and • developing ACT and regional economies 	The history of the Brickworks is integral to the establishment and building of Canberra. The Brickworks was a key material resource for the construction of public institutions and private houses. It contributed to the economy through reducing more expensive imported materials and provided employment for local people. It was an early example of disagreement over Griffin's plans and contributed the materials for the shaping of Canberra's landscape. Archaeological evidence on site has the potential to shed further light on the processes of the physical development of early Canberra, on the way bricks were manufactured, stored and transported, and about the lifestyles of the people who lived on, and worked at the site.
Canberra as a planned environment: <ul style="list-style-type: none"> • Griffin's Canberra; and • early federal government landscape and urban planning. 	

GML Heritage

Australian Theme	Sub Theme	Notes	GML Comment
3 Developing local, regional and national economies	Industry, Mining and Transport	Activities associated with the manufacture, production and distribution of goods. As well as the identification, extraction, processing and distribution of mineral ores. Activities also associated with the moving of goods from one place to another, and systems for the provision of such movements	The study area has the potential for archaeological deposits associated with the manufacture of bricks, such as industrial equipment and quarrying activities. Evidence of the former rail network connecting the Brickworks to the remainder of Canberra may also be present and provide information into the distribution of bricks to the city. Evidence associated with quarrying activities at the Canberra Brickworks site is present, and further information relating to the extraction of materials to produce bricks may be provided through archaeological deposits at the site.
4 Building settlements, towns and cities	Accommodation	Activities associated with the provision of accommodation, and particular types of accommodation—does not include architectural styles (use the theme of Creative Endeavour for such activities)	There were several accommodation phases at the Canberra Brickworks site, such as the married quarters and the Brickworks hostel. Evidence of activities associated with these accommodations may be present in archaeological features and artefacts at the site.
5 Working	Labour	Activities associated with work practices and organised and unorganised labour	The Canberra Brickworks site included accommodations for people working at the site. It employed people who worked at the site manufacturing, producing and distributing bricks. Evidence associated with these labour activities may be present at the site.
8 Developing Australia's cultural life	Domestic life	Activities associated with creating, maintaining, living in and working around houses and institutions	The Canberra Brickworks site included accommodation areas for its workers, such as a married quarters and a later hostel. Earlier dormitories were also present near the 'old kiln' from the earliest phase of the site. These areas may contain evidence of domestic life of people working and living at the Brickworks site.

4.3 Research Questions

The following research questions could be asked of the potential archaeological resources within the study area.

- What is the nature and extent of the archaeological resources within each of the nominated zones of sensitivity (all BRW zones)?
- Is there any remaining archaeological evidence of the early phase operation of the site (BRW1 and 8)? What light can be shed on the operation of the site in its early years from those

remains? Can technological change be determined / mapped / investigated further through those remains?

- Is there any remaining archaeological evidence of the extraction processes used in the quarry? Can we see phases of change in those processes? How likely is the survival of clay extraction processes in this quarry and other quarries?
- What evidence remains of the accommodation structures on site? What was their nature and configuration (BRW2, 3 and 8)?
- Can we find out anything about the people who worked at the site and how they lived (BRW2, 3 and 8)? Is there a material culture difference apparent in the artefacts that show status/living conditions between living quarters? Can phases of occupation be found in the archaeological remains?
- Is there any remaining archaeological evidence of the railway system used to connect the brickworks to Canberra? What can we deduce about its nature and function? Can this information be used to build a picture of the railway and similar railway remains for elsewhere in Canberra such as Old Parliament House (BRW10 and 11)?
- Do the underground flues show evidence of change over time and modification? Do they exhibit signs of 'usewear'—vitrification of the brick surfaces from hot gases? Can they tell us more about the operation of the place than is apparent from the surface remains?

5.0 Methodology

5.1 Overview

The following methodology will guide the archaeological program for preliminary investigations at the Canberra Brickworks site. The aim of the preliminary archaeological investigations is to determine the nature and extent of archaeological deposits present and identify their significance. These investigations will inform a Statement of Heritage Effects (SHE) report in accordance with the ACT Heritage Council's Cultural Heritage Reporting Policy. This SHE will provide an assessment of potential impacts of the proposed works to the archaeological resources identified. It will also provide mitigation strategies to reduce the risk of diminishing the heritage significance of the Canberra Brickworks site and provide recommendations for any future work and/or reporting that will be required. This may include salvage excavation or monitoring of construction works, for example.

5.2 Archaeological Team

Key members of the archaeological team include the GML personnel listed below.

- Martin Rowney (Principal)—responsible for the overall archaeological program and the nominated excavation director;
- Janene May (Heritage Consultant, Archaeologist)—archaeological excavation team; and
- Lara Tooby (Heritage Consultant, Archaeologist)—archaeological excavation team.

5.3 Overall Methodology

This ARD provides a methodology for the preliminary investigation of archaeological resources at the site. A SHE report will be prepared based on results of the preliminary investigation to assess potential impacts to significant archaeological resources at the site. The SHE report may recommend further works, such as salvage excavation of significant archaeological resources or monitoring of works in areas found to have low archaeological potential or low significance. This ARD is limited to presenting the methodology and research design for preliminary testing of archaeological resources at the site.

Various methods will be utilised to confirm the nature, extent and significance of archaeological resources in the study area. These methods have been developed to respond to the varied nature of archaeological features at the site and attempt to further define these with as little impact as possible. These methods will include archaeological survey, detailed contour survey, subsurface survey of flues using remote camera and archaeological test excavation.

A total of eight of the 12 areas of archaeological potential identified in the AA will be subjected to preliminary investigation, as described in Table 5.1 below. The methodologies for investigation are further described by each area of sensitivity below. The areas selected for investigation are based on levels of archaeological potential identified in the AA, results of the site inspection undertaken by GML in January 2020, and the initial development design documentation.

Table 5.1 Summary of Preliminary Investigation Methods for Archaeological Resources.

Feature ID	Will it be Subject to Preliminary Investigations?	What Type of Preliminary Investigation Will Be Undertaken?
BRW1	Yes	<ul style="list-style-type: none"> • Detailed archaeological survey and plan of features. • Two archaeological test trenches.
BRW2	Yes	<ul style="list-style-type: none"> • Vegetation clearance of trees and grasses (may be targeted around proposed test trenches and identified features). • Detailed archaeological survey and plan of remnant visible features. • Archaeological test trenches using machine and hand excavation to reveal structures and deposits.
BRW3	Yes	<ul style="list-style-type: none"> • Vegetation clearance of trees and grasses (may be targeted around proposed test trenches and identified features). • Detailed archaeological survey and plan of remnant visible features. • Archaeological test trenches using machine and hand excavation to reveal structures and deposits.
BRW4	No	The AA described this area as having low archaeological potential. The recent site inspection undertaken by GML confirmed this finding. No further investigation is required; however, an unanticipated finds protocol will be required for future works within this area.
BRW5	No	This area has been found to have a low potential for archaeological deposits. If deposits are present, it is not likely that they will be of high significance or yield meaningful information.
BRW6	No	This area has been found to have a low potential for archaeological deposits. If deposits are present, it is not likely that they will be of high significance or yield meaningful information.
BRW7	Yes	<ul style="list-style-type: none"> • Updated detailed targeted archaeological survey and plan of remnant visible features. • Archaeological testing combining machine and hand excavation to reveal tank feature, and other features identified during the updated survey.
BRW8	Yes	<ul style="list-style-type: none"> • Archaeological test trenches using machine and hand excavation to reveal structures and deposits.
BRW9	No	The AA described this area as having low archaeological potential. The recent site inspection undertaken by GML confirmed this finding. No further investigation is required; however, an unanticipated finds protocol will be required for future works within this area.

Feature ID	Will it be Subject to Preliminary Investigations?	What Type of Preliminary Investigation Will Be Undertaken?
BRW10	Yes	<ul style="list-style-type: none"> • Vegetation clearance. • A detailed contour survey with a surveyor. • Three archaeological 'test trenches' which will be limited to manual clean-up to identify remnant features. • Potential additional machine trench, if possible, and if deemed necessary. • Further historical research into any features identified and geo-referencing of historical images with the location of any features identified.
BRW11	Yes	<ul style="list-style-type: none"> • Archaeological test trenches if required to determine the nature and extent of the deposits.
BRW12	Yes	<ul style="list-style-type: none"> • Subsurface survey with surveyor and/or plumber using GPS and camera within flues to map depth, extent and nature of features. • Archaeological test trenches if required to determine the nature and extent of the deposits.

5.4 Detailed Methodologies for Archaeological Resources

A detailed description of the methodologies for archaeological investigations at BRW1, BRW2, BRW3, BRW7, BRW8, BRW10, BRW11 and BRW12 is provided below. Where test trenches are nominated for features and areas, all trenches will be excavated in accordance with the methodology provided in Section 5.5 of this report.

BRW1: Building Platform and Concrete Features

This archaeological site consists of several surface features and potential subsurface features including a square concrete feature and a visible line of grass die back. The AA report suggested that this feature had a function with water, either for storage or drainage. Some disturbance from erosion was noted. Preliminary investigations in this area may reveal the function of features in this area and their relationship to the wider Canberra Brickworks site. At present, the development designs propose to construct several new structures in this area. This would likely result in heavy disturbance to any archaeological features which are present.

Preliminary investigations in this area will involve the steps listed below.

- A detailed archaeological survey and plan of the features. Key points will be located with GPS, and a plan of any features identified will be prepared.
- Following the detailed archaeological survey, two machine test trenches will be excavated to determine the nature and extent of any deposits present in this area. The location and size of the trenches will be determined following the archaeological survey.

BRW2: Married Quarters and Brickworks Hostel

This archaeological site consists of the brickworks accommodation village which contains a complex of structural features including a brick feature and mound (BRW2-A), a metal spoil heap (BRW2-B), a concrete slab (BRW2-C) and a brick mound (BRW2-D). The AA report indicates that the area would have previously supported the former married quarters including a mess hall and smaller sleeping quarters which were built in the 1920s. The site would have also contained the Brickworks Hostel which appears to have been built on the site of the married quarters in the 1940s. This hostel was demolished in the 1970s and the area has remained relatively undisturbed since then. Archaeological deposits at this location may provide information about the nature and configuration of the structures, the daily lives and living conditions of the workers who were employed at the brickworks. At present, the development designs propose to construct several new structures in this area. This would likely result in heavy disturbance to any archaeological features which are present.

Preliminary investigations in this area will involve the steps outlined below.

- Vegetation clearance of shrubs and grasses. This area is substantially overgrown so vegetation clearance will need to be the first step taken. Clearance could be targeted to areas of proposed test trenches.
- A detailed archaeological survey and plan of visible features. This will include undertaking systematic transects across the area and recording all features identified using GPS. A plan of any features identified will then be prepared.
- Following the detailed archaeological survey, five archaeological test trenches will be excavated to determine the nature and extent of any deposits present in this area. Trenches will be located to target known features from aerial photography but also to test areas of unknown archaeological potential to the southeast. The proposed location of the trenches is shown in Figures 5.1 and 5.2; however, these may be refined following the detailed archaeological survey and planning.



Figure 5.1 View of proposed test unit locations at BRW2 overlaid on a 1958 aerial. (Source: ACTPLA Plan Room 1958-5-21, Run 7, Print 5061)



Figure 5.2 View of proposed test unit locations at BRW2 overlaid on a current aerial. (Source: ESRI Basemaps with GML Overlay)

BRW3: Area of Postholes and Other Remains

This archaeological site consists of a complex of features relating to various structures and infrastructure to the south of BRW2. The site contains evidence of a modern fringe dweller's camp including a hearth made of brick and concrete which appears to be recently used. Evidence of a camp or rough shelter has also been observed here with features including planks nailed to trees, pallets used for flooring, tin sheets and nylon rope tied around trees. A circular feature defined by postholes was also identified. Early plans indicate that this area was used as an ephemeral brickworks camp. Other features found here include brick and concrete spoil mounds, a rectangular clearing, a drainage line and a slab timber fence or yard post.

Historical aerials from 1950 show two large rectangular structures present in BRW3, south of the brickworks accommodation village identified as BRW2 in the AA. These structures appear to have been demolished by 1958. It is likely that these structures are the Brickworks Hostel built in the 1940s, which were included as BRW2 in the AA, but appear to be situated within BRW3.

Archaeological deposits at this location may provide insight into the daily lives and living conditions of workers who were employed at the brickworks. At present, the development designs propose to construct several new structures in this area. This would likely result in heavy disturbance to any archaeological features which are present.

Preliminary investigations in this area will involve the steps outlined below.

- Vegetation clearance of shrubs and grasses. This area is substantially overgrown so vegetation clearance will need to be the first step taken. Clearance could be targeted to areas of proposed test trenches.
- A detailed archaeological survey and plan of visible features. This will include undertaking systematic transects across the area and recording all features identified using GPS. A plan of any features identified will then be prepared.
- Following the detailed archaeological survey, five machine test trenches will be excavated to determine the nature and extent of any deposits present in this area, targeting locations from aerial photographs and early site plans. The location and size of the proposed trenches are shown in Figure 5.3 and 5.4; however, these may be refined following the detailed archaeological survey and planning.



Figure 5.3 View of proposed test unit locations at BRW3 overlaid on a 1950 aerial. (Source: ACTPLA Plan Room 29-11-1950, Run 2, Print 5101)



Figure 5.4 View of proposed test unit locations at BRW3 overlaid on a current aerial. (Source: ESRI Basemaps with GML Overlay)

BRW7: Quarry

As described in Section 3.2, the former quarry area is designated in the AA as having high archaeological potential, yet following review of previous documents and an inspection of the site GML considered the archaeological potential of this area to be low. The main point of interest at BRW7 was the bricked-over water tank as shown in the AA. The circular depressions discussed in the AA did not appear to be of high archaeological potential. At present, the development designs propose to undertake landscaping in the former quarry area. Several structures are proposed to be constructed in the eastern and southeast portion of the area. These would likely result in heavy disturbance to areas where the structures are built, and moderate disturbance to the remainder of the area.

Preliminary investigations in this area will involve the steps outlined below.

- Updated archaeological survey of areas proposed for landscaping works in the new development. Newly identified features will be recorded, as will areas considered for targeted test excavation.
- Planning targeted test excavation will be undertaken at:
 - the location of the tank identified during the site inspection, and previously in the AA; and

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- the location of the low relief mound in the centre of the quarry area.

The location of these excavations will be refined on site.

BRW8: Old Kiln and Dormitories

While the AA and GML have designated this area as being of low archaeological potential, it is important to confirm this. If any archaeological deposits are present, they would likely be of high significance. Historical site plans indicate that the old kiln was located in this area, as well as a dormitory building, a brick drain and a bath house building. While there has been disturbance to this area, GML proposes to excavate four test trenches to confirm the low potential of the site. At present, the development designs propose to construct several new structures in this area. This would likely result in heavy disturbance to any archaeological features which are present.

Preliminary investigations in this area will involve the following steps.

- Archaeological test excavation at the location of the former old kiln, dormitory, brick drain and bath house. The location of this excavation will be refined following the detailed archaeological survey and plan of the site.



Figure 5.5 View of proposed test unit locations at BRW8. (Source: NAA: A6664, L165A, 1916)

BRW10: Railway Remnants

GML has formulated the view that there is relatively low potential for archaeological material to be located in the area of the railway remnants. However, if archaeological features are present, they would likely be of high significance, and therefore confirmation of the archaeological potential of this area is warranted.

The railway remnants survive as a landscape feature that warrants recording.

Preliminary investigations in this area will involve the steps outlined below.

- Vegetation clearance.
- A detailed contour survey undertaken with a qualified surveyor.
- Between two and four archaeological test trenches, which will be limited to manual clean-up to identify remnant features.
- Limited additional machine trenches, if possible, and if considered necessary. The location of this trench will be determined following the detailed contour survey and excavation of manual trenches.

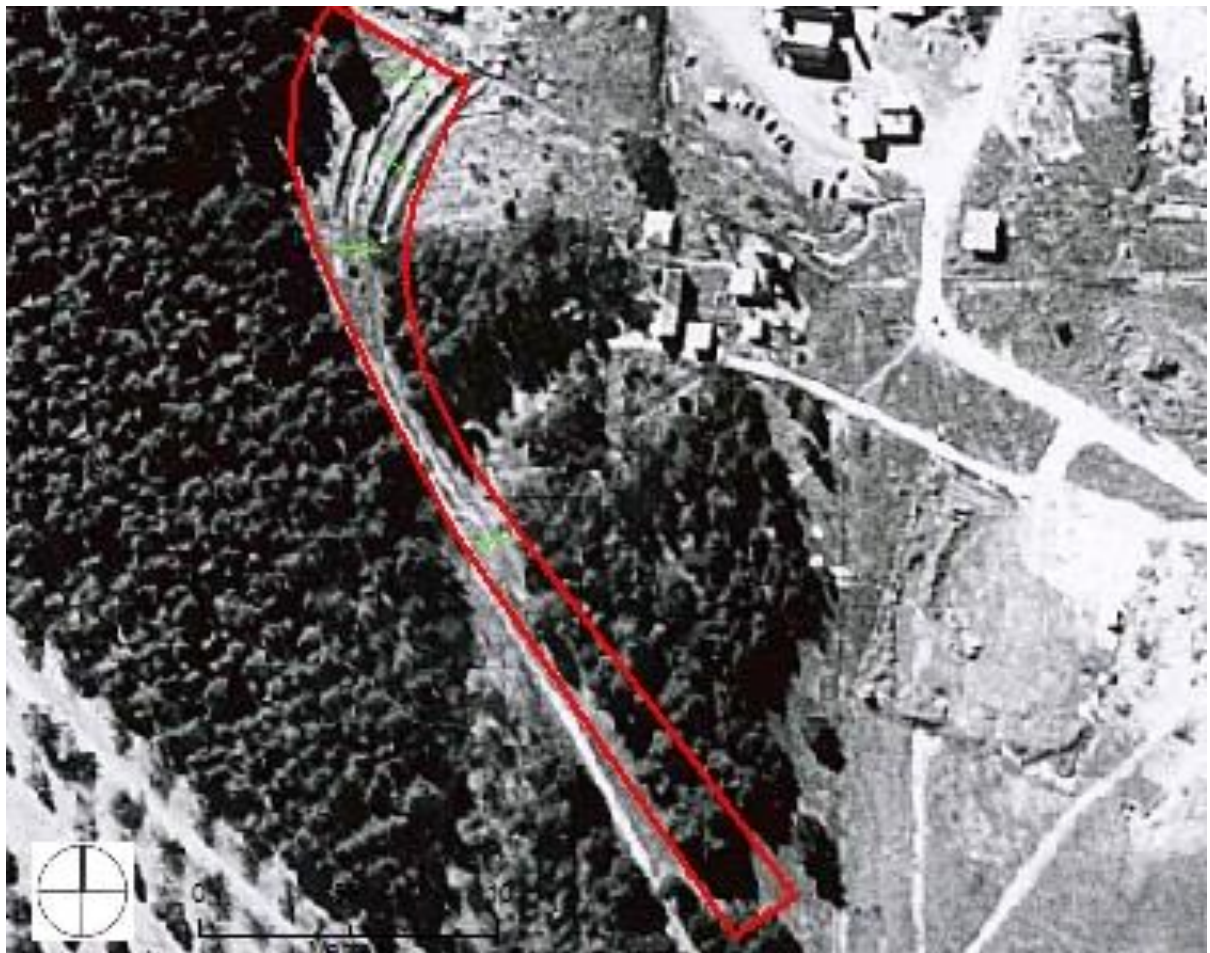


Figure 5.6 View of proposed manual test excavation locations at BRW10 overlying a 1958 aerial. (Source: ACTPLA Plan Room 1958-5-21, Run 7, Print 5061)



Figure 5.7 View of proposed manual test excavation locations at BRW10 overlying a current aerial. (Source: ESRI Basemaps with GML Overlay)

BRW11: Railway Siding Extension (To North)

The AA describes this site as the former railway siding which extended into the Brickworks site and terminated to the north and south of the original Staffordshire kiln. The AA notes that potential archaeological features may include the railway cutting, timber sleepers, iron bolts and metal rails.

Archaeological test excavation will be undertaken at the location of the former railway lines and sidings within the existing concrete pad location. Between two and four archaeological test trenches are proposed to be excavated to identify potential archaeological deposits. The concrete slab surface will be cut in the specific areas of the test excavations to facilitate access without the demolition and removal of large areas of the slab.

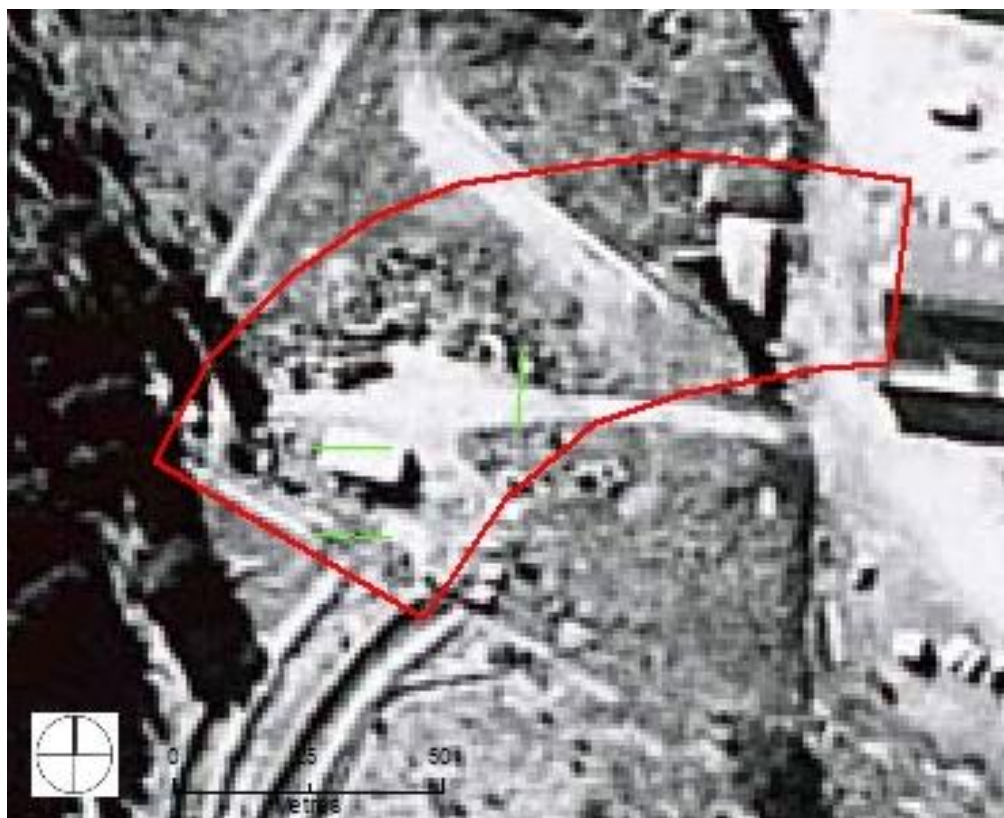


Figure 5.8 View of proposed manual test excavation locations at BRW11 overlying a 1958 aerial. (Source: ACTPLA Plan Room 1958-5-21, Run 7, Print 5061)



Figure 5.9 View of proposed test excavation locations at BRW11 overlying a current aerial. (Source: ESRI Basemaps with GML Overlay)

BRW12: Flues/Subsurface Workings

Preliminary archaeological investigations will aim to confirm the depths and nature of these features. Initial exploratory investigation utilising underground surveys with cameras and GPS units are proposed to determine the depths and nature of these features. This task will involve working with a surveyor to move a GPS and camera unit through the remnant flue structures.

If the depths and nature of these features cannot be confirmed using these less invasive methods, small machine trenches will be excavated at several of the flue structures to determine their depth, nature and extent. The location of these trenches will be determined following results of the initial exploratory investigation.

5.5 Archaeological Test Excavation Methodology

The methodology for undertaking archaeological test excavation is outlined in the steps below.

- Test trench locations will be established based on the investigation objectives for each area, and with respect to dial-before-you-dig results and other safety or logistical factors.
- Vegetation clearance will be undertaken as required and will be specified to avoid ground surface disturbance, while affording adequate access for both manual and machine excavations.
- Testing will be undertaken using a combination of mechanical and hand excavation. Modern surface material and fills will be mechanically removed to the top of archaeological layers.
- Mechanical investigation will use a flat-edged bucket and will aim only to reveal features and deposits.
- The team will clean and investigate the archaeological remains by hand.
- Significant archaeology within trenches will not be removed during the testing program. Small sondages and localised areas may be hand excavated to confirm the nature of the archaeology, to determine if there are multiple phases and verify archaeological significance.
- Recording will be undertaken in accordance with the methodology outlined in Section 5.6. Artefacts recovered will be managed in accordance with the strategy set out in Section 5.7. Samples will be taken in accordance with the strategy set out in Section 5.8.
- Test excavation locations and archaeological features will be surveyed by a surveyor.
- Excavated fills will be sample sieved to test for artefacts associated with the running of the Canberra Brickworks and domestic life. More extensive sieving will be undertaken if significant artefacts are found.
- Test trenches will be backfilled on completion of the testing program. Any archaeological remains will be protected with geofabric prior to backfilling.

5.6 Recording

The recording of archaeological data will be based on the single context recording system. Phasing and interpretation of the archaeological features in relation to the entire site will also be included in the record sheets and survey.

The following outlines the recording process:

- Test excavation locations, and main findings (features and deposits) will be archaeologically recorded and surveyed.
- Archaeological layers, structural remains, features, deposits and fills will be recorded on context sheets.
- A digital (JPEG file) photographic record of the archaeological program will be made. Significant archaeological remains will be recorded using both JPEG and RAW digital captures. All photographs will include a scale and north arrow.
- Measured drawings detailing the archaeological remains and stratigraphic relationships will be prepared. These will include the location of significant archaeological remains within the overall site.
- A surveyor will take georeferenced survey data to prepare survey drawings and orthophotographs of the archaeological remains.
- Registers of contexts, photographs, building material, environmental samples and drawings will be kept.

5.7 Artefact Retrieval Strategy

Artefacts are likely to be retrieved from archaeological test excavations. Artefacts may consist of representations of both domestic life at the site and the running of the brickworks. They may consist of machinery parts, bricks and brick fragments, ceramic and glass sherds or vessels, leather scraps or shoes, buttons, coins, nails and metal objects, animal bone and shell. Artefacts are an important part of the archaeological resource and will inform post-excavation analysis, research and interpretation.

The following general principles apply to the artefact retrieval strategy:

- Artefacts recovered will be collected according to their context. They will be cleaned, dried, bagged by context and temporarily stored on site. Significant metal and organic artefacts will be kept in appropriate storage conditions.
- All artefacts will be collected from sondages and selected surface areas such that the research potential and significance of the specific archaeological deposits can be determined.
- Context and deposit 'types' will be designated as having high, moderate or low research potential based on analyses of artefacts sampled from the testing program.

5.8 Sample Collection Strategy

Samples will be selectively collected from significant archaeological features and deposits for further analysis, to inform the response to the research questions. Samples will be collected by context and included in the sample register, then bagged and temporarily stored until needed for the post-excavation analysis.

Samples of the following archaeological material may be collected as deemed appropriate to the research objectives for each area:

- Building material samples such as brick, structural timber and mortar. Photographs of dimension stone examples will be taken but physical samples will not be kept.
- Organic material such as wood, seeds or pips and shell. Animal bone may also be sampled depending on the nature or significance of its context.
- Environmental material such as soil with potential for fossil pollens.

5.9 Post-Excavation Analysis

The post-excavation analysis will commence on completion of the fieldwork. It will include:

- All paper archive, digital photographs, survey data, artefacts and samples will be moved and temporarily stored at the GML office for the post-excavation analysis phase.
- Site registers and context sheets will be collated and digitised for analysis, and inclusion in the final report.
- Artefacts will be photographed by context and then sorted into type—ceramic, glass, metal, animal bone, shell, organics, miscellaneous small finds—in preparation for specialist artefact cataloguing and analysis.
- Building material and environmental samples will be selected for analysis. Samples will be selected based on the potential to contribute to further archaeological analysis and research.
- Artefacts will be identified and catalogued by type—ceramic, glass, metal, organics, animal bone and shell, building materials and miscellaneous small finds.
- The data will be entered in a database that reflects current methods for archaeological data recording.
- The artefact assemblage will be analysed, and a succinct artefact analysis will be included in the final report.
- Technical information with detailed descriptions and photographs of archaeological features, deposits and fills, and stratigraphic analysis will be prepared for the final report.
- Detailed site plans and illustrations based on the measured drawings prepared during the fieldwork will be prepared. The plans will be prepared in conjunction with the technical reports and include key context identification, stratigraphic relationships and archaeological phasing.

- Survey data and orthophotographs will be collated to inform the technical reporting and detailed plan preparation.

5.10 Final Report

Following the preliminary investigation, a SHE report will be prepared that will:

- provide a description of the place (including results of the preliminary investigation);
- provide a description of the proposed activity;
- discuss the potential impacts on the heritage significance of the site by the proposed works;
- present a consideration of alternatives if available;
- present mitigation strategies to reduce potential impacts to the heritage significance of the site; and
- provide recommendations for any future works and/or reporting requirements, including (as appropriate):
 - salvage excavations;
 - on-site interpretation of the results;
 - presentation, curation and storage of artefacts.

6.0 Conclusions and Recommendations

6.1 Conclusions

- Doma Group is undertaking a project to redevelop the Canberra Brickworks Precinct site. The proposed redevelopment includes new residential areas and associated infrastructure, as well as retail and office spaces which will be accessible to the public. Several historical structures at the site will be retained and adapted into these new facilities.
- An AA of the site was previously prepared by Navin Officer in 2016. This report identified 12 areas of archaeological sensitivity and recommended that areas of moderate and high archaeological potential be subjected to an archaeological testing program prior to any works or development in these areas (BRW1–BRW12).
- Based on a review of the AA and an inspection of the site, GML determined that eight of the 12 areas of archaeological potential identified in the AA should be subjected to further archaeological testing (BRW1, BRW2, BRW3, BRW7, BRW8, BRW10, BRW11 and BRW12). These are all areas of moderate and high archaeological potential, as outlined in the AA, with the addition of BRW8 which GML proposed to test due to the potential significance of deposits in this location.
- Following preliminary investigations, a SHE report will be prepared and will assess the potential impacts of the proposed development to archaeological resources. The SHE report will include mitigation measures to reduce potential impacts to archaeological resources and recommendations for any further works or reporting requirements.
- Impacts to historical archaeological remains require appropriate approval under the ACT *Heritage Act 2004*.
- This research design and methodology provides the framework for preliminary archaeological investigations of the study area. It will support the application for an Excavation Permit under Section 61E of the *Heritage Act 2004*.

6.2 Recommendations

- This ARD should be submitted with an Excavation Permit application under Section 61E of the *Heritage Act 2004*.
- The preliminary archaeological excavations should be undertaken in accordance with the research design and methodology presented in this report and any conditions imposed by the ACT Heritage Council.
- Post-excavation analysis and reporting should be undertaken on completion of the fieldwork. A SHE report should be prepared and submitted to the ACT Heritage Council.

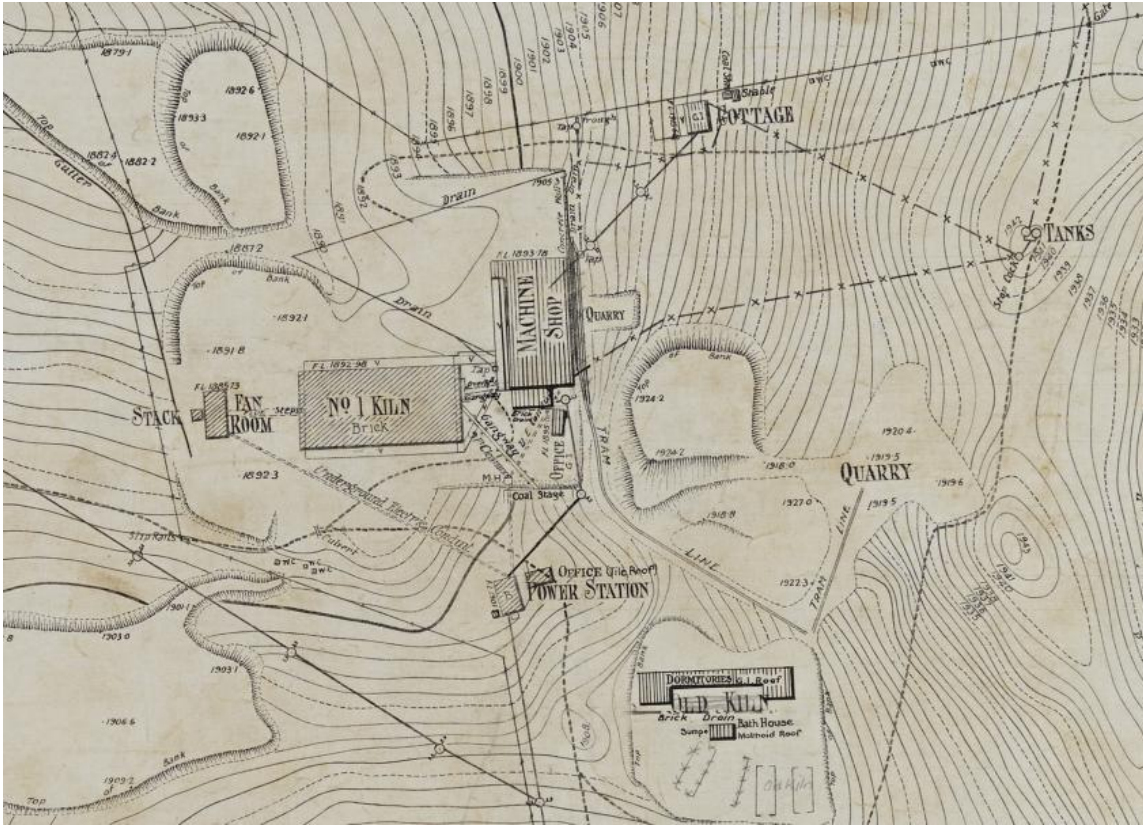
7.0 Endnotes

- ¹ Wright, WD 1923, *Canberra*, John Andrew & Co, Sydney, p 58.
- ² CAB Consulting Pty Ltd, Context Pty Ltd, University of NSW and Rowell A, *Parliament House Vista Area Heritage Management Plan, Volume 1*, prepared for the National Capital Authority, 2010, p 47.
- ³ Gillespie, L 1984, *Aborigines of the Canberra Region*, L Gillespie, Campbell, ACT, p 29.
- ⁴ The National Capital Development Commission, *Tomorrow's Canberra: Planning for Growth and Change*, Australian National University Press, Canberra, 1970, pp 3–7; and Lovell Chen, *Nomination of Canberra to the National Heritage List: An examination of the merits*, prepared for the National Capital Authority, April 2008, pp 42–43.
- ⁵ Griffin, WB 1955 [1912], 'Original Report', reprinted with corrections in 'Parliament of the Commonwealth of Australia, Senate, Report from the Select Committee appointed to inquire into and report upon the development of Canberra, September 1955, Appendix B', cited in Marshall, D, Butler, G, Context Pty Ltd, Firth, D and Ross, M, *Parkes Place and the National Rose Garden Heritage Management Plan, Volume 1*, prepared for the National Capital Authority, 2011, p 52.
- ⁶ Rowe, DJ 1997, *Building a national image: the architecture of John Smith Murdoch, Australia's first Commonwealth Government architect*, Ph.D. (Arch) thesis, School of Architecture and Building, Deakin University, pp 139–140.
- ⁷ Rowe, DJ 1997, *Building a national image: the architecture of John Smith Murdoch, Australia's first Commonwealth Government architect*, Ph.D. (Arch) thesis, School of Architecture and Building, Deakin University, p 157.
- ⁸ National Archives of Australia, Series A110/FC 1913/1055, in Ian Carnell, 'Canberra's Cornerstone', *Canberra Historical Journal*, No. 5, March 1990, cited by Lester Firth Associates, 1986, Section 2.2.1.
- ⁹ ACT Heritage Council 2013, 'Yarralumla Brickworks Railway Remnants', pp 6–7.
- ¹⁰ ACT Heritage Council 2013, 'Yarralumla Brickworks Railway Remnants', viewed 4 July 2017 <http://www.environment.act.gov.au/_data/assets/pdf_file/0011/348680/249.pdf>, p 7.
- ¹¹ ACT Government, *Heritage Assessment Policy*, February 2015, pp 5–6.

8.0 Appendices

Appendix A

Archaeological Assessment



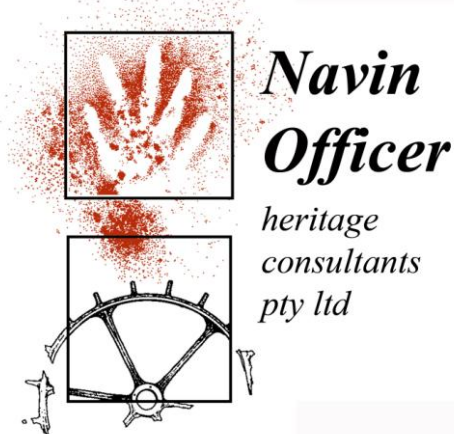
ARCHAEOLOGICAL ASSESSMENT

CANBERRA BRICKWORKS & ENVIRONS
Denman Street, Yarralumla,
South Canberra

Prepared for
Land Development Agency

September 2016

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with

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1.0 EXECUTIVE SUMMARY

This archaeological assessment for the former Canberra Brickworks (Block 1, Section 102) and its environs (Blocks 7 and 20, Section 102) has been prepared for the Land Development Agency (LDA) to inform any future works within the three blocks in Yarralumla. The Canberra Brickworks site is not designated land (areas specified in the National Capital Plan as having 'special characteristics of the National Capital') and is subject to the provisions of the Territory Plan. The Canberra Brickworks and associated Railway Remnants are also included in the ACT Heritage Register and are protected under the *Heritage Act 2004*.

The Commonwealth Government established the Canberra Brickworks in order to support the development of Canberra as the new Federal Capital. The project was announced in 1910 and work began on the development of the complex in 1913. The brickworks supplied materials for the construction of buildings in Canberra in the early period of the capital's development. Bricks and other specialty lines were produced at the site from this time until the closure of the complex in 1976. Production capacity at the site varied in response to fluctuations in demand for bricks and the brickworks was expanded in a number of key phases, notably in the 1920s and the 1950s.

Following closure of the plant, the site was adapted for a range of uses (of varying duration) but other than for the subdivision of land and associated residential development on the perimeter of the site, relatively little physical change has occurred since this time. The surviving complex includes brick manufacturing infrastructure including kilns, stacks and ancillary buildings, with a quarry to the east. Part of the complex is occupied by a timber recycling company.

This Archaeological Assessment has been prepared in response to Policy 15 of the Canberra Brickworks Conservation Management Plan by Lovell Chen, dated April 2010, which states that:

A predictive archaeological assessment should be undertaken for the study area and abutting sites. This study should identify the relative potential for sub-surface remains on the site and their likely nature and significance. Depending on the outcome of such a study, an Archaeological Management Plan should be prepared prior to any development or disturbance of the site.

As such, the purpose of this document has been to:

- Identify areas of historical archaeological sensitivity at the study area with potential sub-surface features
- consider the likely nature and potential of the sub-surface remains
- provide guidance on the management of any archaeological remains

Areas of potential archaeological sensitivity

Twelve sites of potential archaeological significance were identified during the preparation of this report, with varying levels of potential (low, moderate, high).

The principal areas of archaeological potential include:

BRW1: Building platform and concrete features

BRW2: Married quarters and Brickworks Hostel

BRW3: Area of postholes and other remains

BRW4: Single men's quarters

BRW5: Clay feature and rubble

BRW6: Rubble heap/refuse dump

BRW7: Quarry

BRW8: Old kiln and dormitories

BRW9: Cottage, stables, coal store

BRW10: Railway remnants

BRW11: Railway siding extension (to north)

BRW12: Flues/subsurface workings

Other works

Prior to the completion of this report, a Statement of Heritage Effects (SHE) was granted by ACT Heritage for Phase 2 contamination and geotechnical testing. The LDA undertook sub-surface testing, which was overseen by NOHC. This work took place within the identified areas of high, medium and low archaeological potential. A summary of results is included at Appendix B.

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2.0 Introduction

This Archaeological Assessment for the former Canberra Brickworks (Block 1, Section 102) and its environs (Blocks 7 and 20, Section 102) has been prepared for the Land Development Agency (LDA). The purpose of the document is to:

- Identify areas of historical archaeological sensitivity at the study area with potential sub-surface features
- consider the likely nature and potential of the sub-surface remains
- provide guidance on the management of any archaeological remains

The Cultural Heritage Reporting Policy prepared by the ACT Heritage Council (dated 1 July 2015) has been referenced in the preparation of this document.¹ An assessment of significance and assessment of potential impacts are included as an appendix to this report (Appendix A).

This report does not address Aboriginal archaeology. The Aboriginal archaeological potential of the study area was considered as part of an Aboriginal Cultural Heritage Assessment (Stage 1) in August 2014. The assessment, prepared by Navin Officer Heritage Consultants Pty Ltd (NOHC), concludes that the brickworks and its environs contain no known Aboriginal places or objects and is of low Aboriginal archaeological potential. Further, any archaeological deposits would have been disturbed as a consequence of past land use practices.² As an outcome of the Cultural Heritage Assessment, no statutory implications regarding cultural heritage apply to the study area. The Cultural Heritage Assessment was approved by the ACT Heritage Council on 11 September 2014.³

Canberra Brickworks CMP

This Assessment has been prepared in response to Policy 15 of the Canberra Brickworks Conservation Management Plan by Lovell Chen, dated April 2010. The policy is as follows:

A predictive archaeological assessment should be undertaken for the study area and abutting sites. This study should identify the relative potential for sub-surface remains on the site and their likely nature and significance. Depending on the outcome of such a study, an Archaeological Management Plan should be prepared prior to any development or disturbance of the site.

The CMP provides an assessment of the site's heritage values, and sets out policies to guide the conservation and management of those values. It was endorsed by the ACT Heritage Council on 20 May 2010. The CMP notes that archaeological remnants are likely to survive at the site and comments that, '[these artefacts are unlikely] to be of a level of significance that ... would warrant retention in situ, or ... preclude development on the site'.⁴ Subsurface artefacts located at the site would however have the potential to enhance an understanding of the history and operation of the site.

Canberra Brickworks Railway Remnants

While the Canberra Brickworks CMP has regard for issues of setting and curtilage, it does not provide a detailed analysis of land adjacent to the former brickworks, including the Canberra Brickworks Railway Remnants, which is the subject of a separate entry in the ACT Heritage Register. The registered area for the railway remnants extends south from the brickworks and forms part of Block 7, Section 102, Yarralumla (Figure 1).

2.1 Study area

The study area for this archaeological assessment includes Blocks 1, 7 and 20 Section 102 in Yarralumla. The total area is approximately 16ha. There is an elevated ridge to the south and east of the study area, and lower ground to the north and west. A water course originally ran to the north-west of the site. The study site is located approximately 5km west of the Parliamentary Triangle. It is bounded to the north and east by low density residential development (Woolls, Schomburgk and Bentham streets, and

Lane-Poole Place). To the west, the site is bordered by Territory land (Block 1, Section 127), and to the south by Block 3 Section 94 (Figure 1). Access to the study area is from Denman Street only.



Figure 1 Aerial photograph of the study area (solid red line) and environs, 20 November 2015: Block 1 is the registered extent of the Canberra Brickworks
Source: www.nearmap.com (base photograph), accessed 16 December 2015

3.0 Project description

The nature of future works within the study area is yet to be determined. Based on criteria and land uses defined in the current Territory Plan and Yarralumla Precinct Map and Code, the study area could be subject to future commercial and/or residential development..

4.0 Statutory context

The *Australian Capital Territory (Planning and Land Management) Act 1988* established the National Capital Planning Authority, which was required to prepare a National Capital Plan (NCP). The Act also required the preparation of a Territory Plan, which was not to be inconsistent with the NCP. The Territory Plan is the document that informs and guides planning and development in the ACT, with the exception of 'Designated Areas' (an area specified in the NCP as having 'the special characteristics of the National Capital'). The study area is not designated land and as such is subject to the provisions of the Territory Plan. However, land to the south, north and west (Sections 103, 113, 119 and 123) is designated, and forms part of the National Capital Open Space system.

Development approval processes within the ACT can be summarised as follows:

- Work carried out on National Land in Designated Areas is subject to the approval of the National Capital Authority (NCA);
- Work carried out on Territory Land in Designated Areas is generally subject to approval by the NCA but Territory requirements may also apply to development where the Territory is the approving Authority;
- Work carried out on National Land outside of Designated Areas must be in accordance with a Development Control Plan (if applicable) agreed by the NCA that reflects the requirements of the Territory Plan; and
- Work carried out on Territory Land outside Designated Areas is subject to the Territory Plan and Territory Approval processes.

4.1 *Heritage Act 2004 (ACT)*

The Canberra Brickworks (Section 102, Block 1) and the Brickworks Railway Remnants (Section 102, Block 7 – part) are included in the ACT Heritage Register and are protected under the *Heritage Act 2004*. This Act provides for the protection, management and conservation of heritage places and objects in the ACT. Under the Act, the ACT Heritage Council is to be responsible for the Heritage Register and the heritage registration process.

Under s.74 of the *Heritage Act*, it is an offence to engage in conduct that diminishes the heritage significance of a place or object. An object is defined as 'a natural or manufactured object, but does not include a building or any other man-made structure' and a place is defined as 'a site, precinct or parcel of land; a building or structure; or part of a building or structure; the curtilage, or setting, of a building or structure, or part of a building or structure; an object or feature historically associated with, and located at, the place'.⁵

Under the Act, penalties apply where other works diminish the heritage significance of a registered or nominated place or object or damages an Aboriginal place or object. The reporting and offence provisions of the Act apply irrespective of land status, or whether the site is listed in the Heritage Register or not.

The only provisions for legally sanctioned disturbance to a place or object, or the diminution of the heritage value of a Heritage Place or Object is to conform to one of the exceptions listed in s76 of the Act (see also Section 13.0).⁶ According to this section, the offence provisions of the Act (s74 and s75) do not apply if conduct is engaged in accordance with the following:

- (i) a heritage guideline;
- (ii) a heritage direction;
- (iii) a heritage agreement;
- (iv) a conservation management plan approved by the council;
- (v) development approval under the Planning and Development Act 2007, chapter 7;
- (vi) an excavation permit;
- (vii) a statement of heritage effect approved by the council.

4.2 Elements of significance

The features associated with the brickworks are divided between two schedules – elements of exceptional significance, and elements of moderate significance (ACT Heritage Register Item 20068, Figure 2).

Schedule 1 Elements of Exceptional Significance

- 1) Kiln - Staffordshire (1915)
- 2) Fan House for Staffordshire Kiln (1915)
- 3) Kiln - Hardy-Patent (1927)
- 4) Fan House for Hardy Patent Kiln (1953)
- 5) Kiln - Hardy-Patent (1953)
- 6) Kilns - Downdraft a, b, c (1963)
- 7) Chimney Stacks for Staffordshire Kiln (1915)
- 8) Chimney Stack for Hardy Patent Kiln (1927)
- 9) Chimney Stack for Hardy Patent Kiln (1953)
- 10) Chimney Stack for Downdraft Kiln (1963)
- 11) Quarry
- 12) Geological features A, B, C, D

Schedule 2 Elements of Moderate Significance

- 13) Office (1916)
- 14) Power House (1915)
- 15) Machine Bay for Staffordshire and Downdraft Kilns (1955)
- 16) Machine Bay for Hardy-Patent (1955)
- 17) Machine Bay for Hardy-Patent (1955)
- 18) Workshop (1955)
- 19) Large Crusher House (1955)
- 20) Primary Crusher House (1955)
- 21) Small Crusher House

- 22) Elevator Conveyor (1955)
- 23) Remains of the Brickworks Accommodation Village

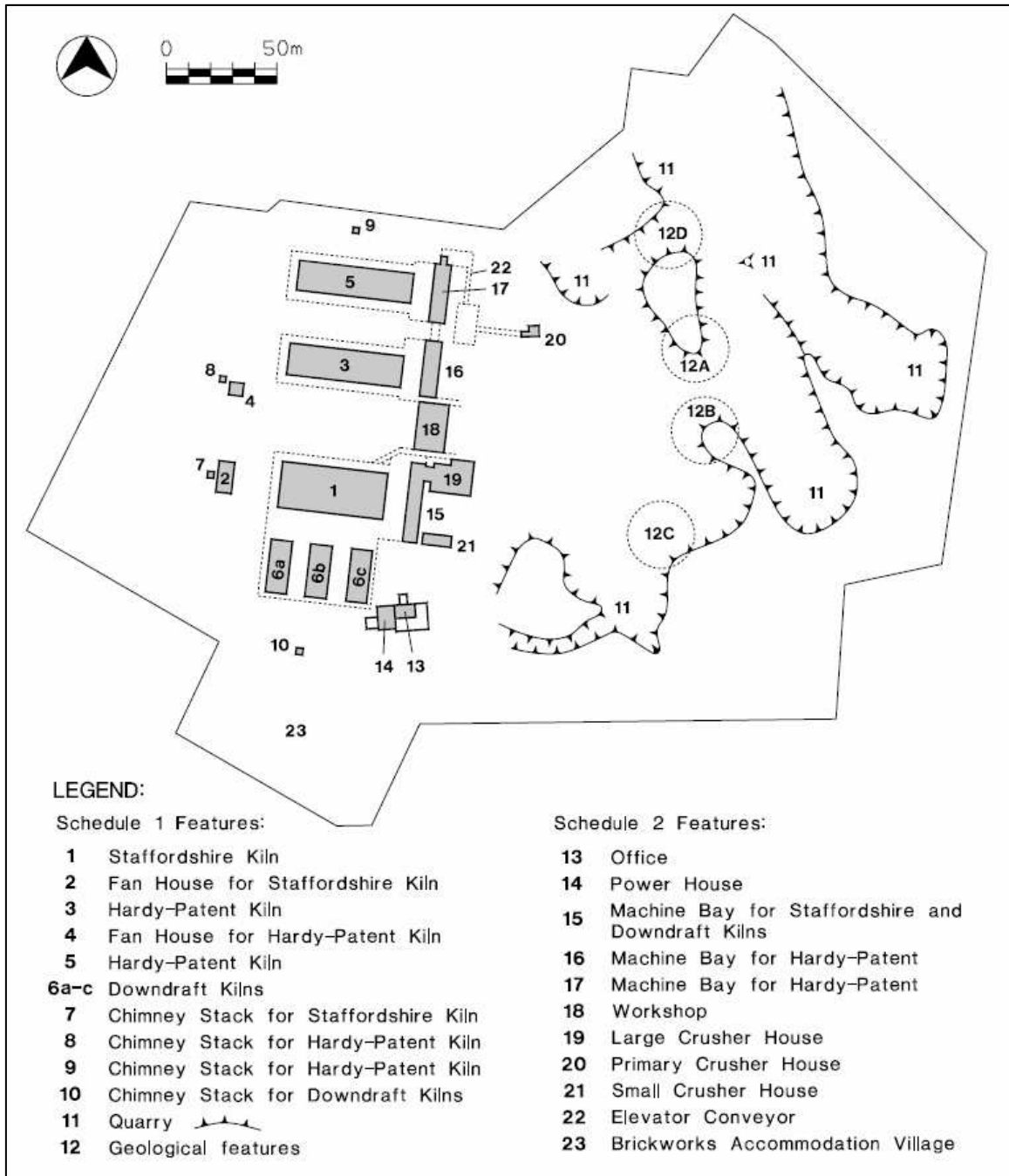


Figure 2 Canberra Brickworks significant features
Source: ACT Heritage Register

5.0 Environmental context

The Canberra brickworks is located within two distinct geological regions: the Deakin Volcanics, which consists of Rhyodacitic ignimbrite and minor volcanoclastic and argillaceous sediments; and the Yarralumla Formation, which consists of calcareous and tuffaceous mudstone and siltstone with minor limestone, calc-silicate hornfels and quartz sandstone.⁷

The area is situated on the Williamsdale soil landscape, characterised by undulating rises with elevation between the highest and lowest points locally being below 10% in natural terrain. The soil landscape consists of moderately deep, moderately well-drained Yellow Chromosols, Red Kandosols and Brown Kandosols. There are elevated ridges to the south and east of the study area, and lower ground to the north and west. A former watercourse ran through the brickworks site in the north-west, at which point alluvial soils are present. The brickworks is located on a minor local topographic high, with a sloping ground surface outside the study area to the south and south-west heading towards Yarralumla Creek, a tributary of the Molonglo River. Topography and drainage in some areas of the study area have been significantly modified due to the brickworks itself, the associated quarry and road infrastructure.⁸

The study area is largely dominated by exotic vegetation. The areas of tree plantings contain an exotic understorey. The areas of exotic pasture surrounding the entrance road to the study area are dominated by Chilean needlegrass, a noxious weed. The predominant tree species within the study area is *Pinus radiata* (weed species), *Pinus ponderosa*, *Pinus sylvestris* and *Ulmus procera* and various tree and shrub weed species. A number of planted trees are located along the eastern boundary and a copse of oak trees is located on the south-east corner of Block 7. Generally the landscape is unmanaged, and weed species (trees, blackberry shrubs and grasses) are prevalent.⁹

6.0 Social context

Investigation of the social context of the brickworks site has not been undertaken for this current assessment. However, a study was undertaken in late 2010 with past employees or their family members to explore their memories and experience of the Brickworks. This study revealed an attachment for people who have worked at the site during its operational life as a brickworks.

Unsurprisingly, given its scale, heritage values and location, the brickworks is a place which has been the focus of major interest for the local community concentrating largely on the issue of potential future development. Significant community sentiment and interest and consultation workshops have taken place with the LDA to provide an opportunity for residents to express opinions regarding the future use and development of the site.

7.0 Archaeological context

The Aboriginal archaeological potential of the study area was considered as part of a Cultural Heritage Assessment undertaken by Navin Officer Heritage Consultants (NOHC) in August 2014. As noted, this report concluded that the brickworks and its environs contained no known Aboriginal places or objects, and any potential deposits would have been disturbed as a consequence of the extensive land use.

No previous historical archaeological assessments of the study area came to light during the preparation of this report.

Site visits undertaken for this Archaeological Assessment, and previously, suggest that there is some above-ground evidence of archaeological features within the study area. This is described in detail in Section 11.3. Some evidence for potential archaeological features is also visible in the form of the landscape. The quarry itself is a highly intact feature and the brickworks railway, which operated between 1923 and 1927, remains partly evident in the form of cuttings in the landscape that follow the original alignment of the siding. Self-seeded vegetation has reclaimed much of this area in recent years. Evidence of man-made intervention is also apparent in the refuse dump to the west of the brickworks.

8.0 Research design and methodology

Historical research

Historical research using primary and secondary sources formed a significant component of this assessment of archaeological potential. The principal objective of this research was to establish and document the historic development of built form at the study area.

The 2010 CMP prepared by Lovell Chen was a key reference. It is based upon a range of sources, including survey and site plans and historic photography. This report is also informed by the following primary sources:

- Photographic collection, National Library of Australia
- Photographic collection, ACT Heritage Library
- Aerial photography, ACT Planning and Land Authority

Additional research was also undertaken using secondary sources and online databases including published histories, the Canberra Heritage Register, and Nearmap aerial photography.

The historical development of the Canberra Brickworks is presented in this report in four key phases:

- Establishment (1913-1920)
- Reactivation (1920s-1930s)
- Expansion (1940-1970s)
- Closure and Redevelopment (1970s – current)

Archaeological fieldwork

Archaeological fieldwork was conducted to examine the presence and extent of physical features at the site, including their location and potential purpose; confirm the location and archaeological potential of any previously identified features; identify any areas of archaeological potential not recognised through historical research; and where possible, use the results of the above examinations and analyses to identify the potential for these areas to yield further information.

Research questions which were posed included:

- Are there identifiable remains and features that would provide information on the course of the development and use of the study area; and
- Are there areas of archaeological potential, with no surface remains, within the study area that may be able to provide information on its development and use?

A predictive archaeological model was also developed to indicate the types of potential archaeological features, and likely areas of subsurface remains. This model is outlined in Section 11.1.

Site visit

Three site visits were undertaken throughout the duration of this study.

Lovell Chen undertook an inspection on 24 November 2015, to 'ground truth' the outcomes of the historical research and identify any archaeological evidence relating to historic land use. The site visit was undertaken by Adam Mornement, Senior Associate, and he was accompanied by a staff member from the Land Development Agency. The survey covered the quarry, and land to the west and south of the kilns including remnants of the railway siding extending into Block 7.

The focus of this visit was on six locations which had been identified as being of archaeological potential during the review of historical documentary material. Lovell Chen established that one of the locations had been developed, and confirmed that archaeological evidence of previous land use remained

possible at the other five locations. Underground flues linking the kilns to their respective fan houses and chimney stacks were not inspected during this visit. However, documentary and above-ground evidence (in the form of the kilns, stacks and fan houses) suggests that these flues survive.

A second investigation was undertaken by Travis Gottschutzke and Dr Rebecca Parkes of NOHC in the afternoon of 20 May 2016. This involved a walk over of the area to the south of the brickworks itself, and the quarry. Staff were accompanied by three officers from the Land Development Agency (LDA). The inspection was an opportunity to familiarise NOHC staff with the nature of the brickworks site.

Following this investigation, a detailed survey of sites within the brickworks area was undertaken by Travis Gottschutzke and Julia Maskell (NOHC) on 9 June 2016. Over the course of the survey, contributions were sought from other NOHC staff (Dr. Rebecca Parkes and Dr. Antony Barham).

8.1 Limitations

Access to the entire study area was limited due to a number of factors. The centre of the precinct, the brickworks, is a partially active environment, licensed by the Territory to a joinery business involving processing and recycling of reclaimed timber. Access to this zone was therefore restricted to short windows of time during staff breaks. Fortunately, the built environment of this part of the precinct has been sufficiently analysed in the 2010 CMP, and visible archaeological remains were predicted to be minimal in these areas.

Historical research has largely relied on material in the 2010 CMP, which in turn relied in part on material from the 1986 Lester Firth Associates' *Conservation Management Plan*, with additional research undertaken by Lovell Chen where required. While there is clearly scope to undertake further historical research in relation to the study area, it was considered that sufficient research had been undertaken to inform the analysis and assessment of this report.

9.0 Related reports

The Canberra brickworks site, as well as the surrounding environs, has been the subject of a number of previous studies. These include:

- Lester Firth Associates Pty Ltd, *Old Canberra Brickworks Conservation Plan*, 1986
- National Capital Development Commission, *Canberra Brickworks, South Canberra, Policy Plan*, October 1988
- Connell Wagner Pty Ltd, *The Old Canberra Brickworks and Environs Development Control Plan*, February 2001
- Susan Conroy & Munns Sly Architects, *The Yarralumla Brickworks & Environs Planning Review*, March 2005
- Lovell Chen, *Canberra Brickworks Conservation Management Plan*, April 2010
- Navin Officer Heritage Consultants, *Canberra Brickworks, Yarralumla ACT Aboriginal Cultural Heritage Assessment (Stage 1)*, August 2014

10.0 Historical background and analysis

The following historical overview of the former Canberra Brickworks is derived largely from the CMP prepared by Lovell Chen in 2010. Full reference details are contained in the CMP. The results of any additional research are referenced below.

10.1 Pre-brickworks

In 1910, King O'Malley announced Government plans for the construction of a brickworks to serve the Federal Capital. Various experiments on shale in the region were carried out in early 1911. One potential site was Frederick Campbell's Yarralumla property. Samples from the site were sent for testing and reports concluded that samples from Yarralumla produced bricks of excellent quality. Yarralumla was thus chosen and Frederick Campbell agreed to the acquisition of approximately 38 acres (15ha) of his land holding. The area was gazetted on 27 July 1912, and development of the site began in 1913.

The map at Figure 3 shows the location of the study area prior to the development of the Federal Capital.

10.1.1 Analysis and conclusion

There is unlikely to be any archaeological features or deposits relating to this period.

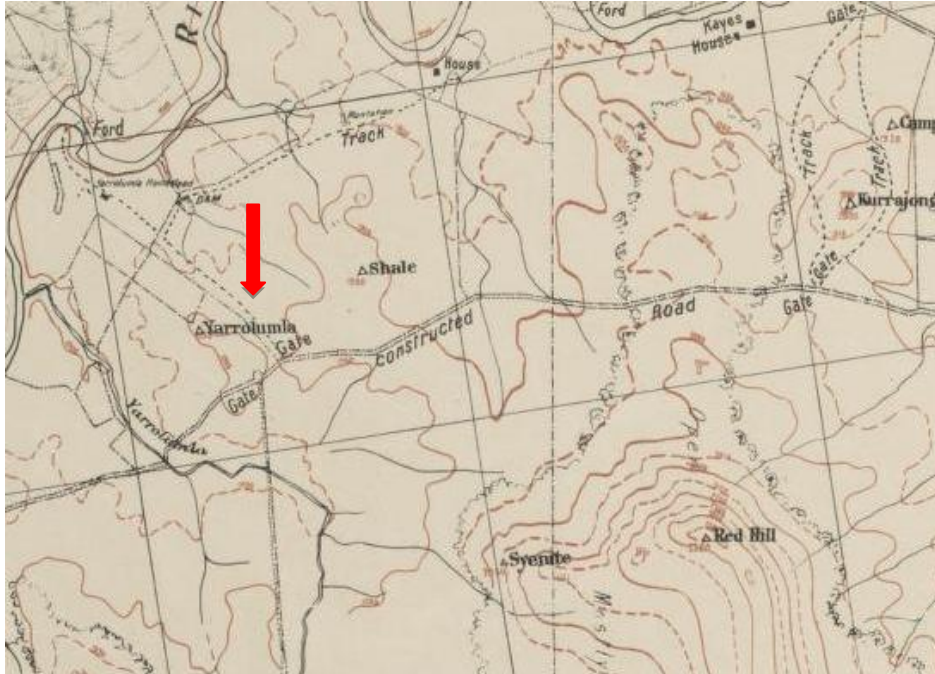


Figure 3 Map of Federal Capital, 1912: the approximate location of the former Canberra Brickworks is indicated
Source: National Library of Australia

10.2 Establishment (1913-1920)

A temporary brick making plant was operational by 19 June 1913. This comprised a grinding pan, brick making machine and elevator made by Geo. Foster and Sons, Sydney, and a portable steam engine. By August 1913, four open kilns were in use at the temporary plant, with plans for a fifth. During this period, workers were accommodated in two camps of tents – one for married couples, the other for single men. The camps were located on Banks Street, near the present Forestry School. This area has been developed for housing.

The first stage of the permanent brickworks, which included a Staffordshire kiln, was approved on 1 December 1913 by P T Owen, the Director-General of Works. It was proposed to use this kiln to produce bricks for the construction of two further kilns. In September 1915, the brickwork for a 20-chamber Staffordshire kiln was nearing completion. This kiln, together with crushing, processing equipment and brick presses was ready for production by early 1916.

A Survey Plan of the site (Figure 4), dated 20 December 1916, shows the layout of the permanent brickworks. A small galvanised iron office building is located close to the 'Machine Shop', and a galvanised iron 'Cottage' with associated coal store and stable is located to the north-east of the site. Other features include a coal stage, a concrete retaining wall separating the quarry pit and the working areas, water storage tanks on a high knoll, a remote powder depot, three detached WCs south of the kiln, an elevated gangway connecting the coal stage to the kiln and overhead electrical connections linking the power station to the fan room, machine shop and the cottage. The Staffordshire kiln was connected to the fan house and stack by means of flues and underground workings. A tram line is indicated linking the quarry to the machine shop – these tram lines could be relocated as the quarry face advanced.

The plan also provides details about the temporary brickworks. The temporary 'Old Kiln' area, shown in outline on the plan, comprises four kilns located to the south-east of the permanent brickworks. There is also a 'Dormitories' building located to the immediate north.

The plan indicates that the land to the immediate north of the Staffordshire kiln and associated fan room was on a rise, and a gutter was developed to the west of this to allow water to flow from the nearby creek to the site. This land later became a rubble heap and refuse dump.

The land to the north-west, west and south of the brickworks was established in 1914 as a designed landscape 'Westbourne Woods' (Figure 5). This land, together with Weston Park and the Yarralumla Nursery, was nursery and arboretum to test the suitability of plantings throughout Canberra.

The commitments of World War I, and consequent restrictions on the works program for Canberra, together with a coal strike, saw the brickworks close in December 1916.

10.2.1 Analysis and conclusion

All structures relating to the temporary brickworks have been demolished.

Elements of the permanent brickworks, as indicated on the 1916 survey plan, that survive include the power station, Staffordshire kiln, the fan room, stack and the concrete retaining wall. It is assumed that the underground workings connecting the kiln to the fan house and stack also survive as intact subsurface remains. Other elements from this period have been demolished. As was the case for the cottage, associated coal store and the office building close to the machine shop, the majority of the demolished buildings are likely to have been constructed of sheet metal.

Archaeological deposits pertaining to built form from this era are expected to comprise footings and machinery remnants. The material discard is expected to be items of an industrial nature. As can be seen from the survey plan (1916), most of the development in this period was located on the flat land to the west of the quarry pit. This area has been heavily disturbed as a result of the expansion of the brickworks, and it is unlikely that archaeological remains will be uncovered here.

The site of the temporary kilns to the south-east of the power station is the most likely location for archaeological deposits dating to this era. This area has not subsequently been developed, although part of it was covered with a concrete slab (see Section 10.4).

The cottage to the north-east may also yield some archaeological remains, although this site is likely to have been disturbed by quarrying activities. The location of the cottage and outbuildings has been heavily trafficked over time, being located on a key route between the quarry pit and kilns and in close proximity to the primary crusher house and the elevator/conveyor. Archaeological deposits or features relating to this area may include timber post holes and/or domestic discard.

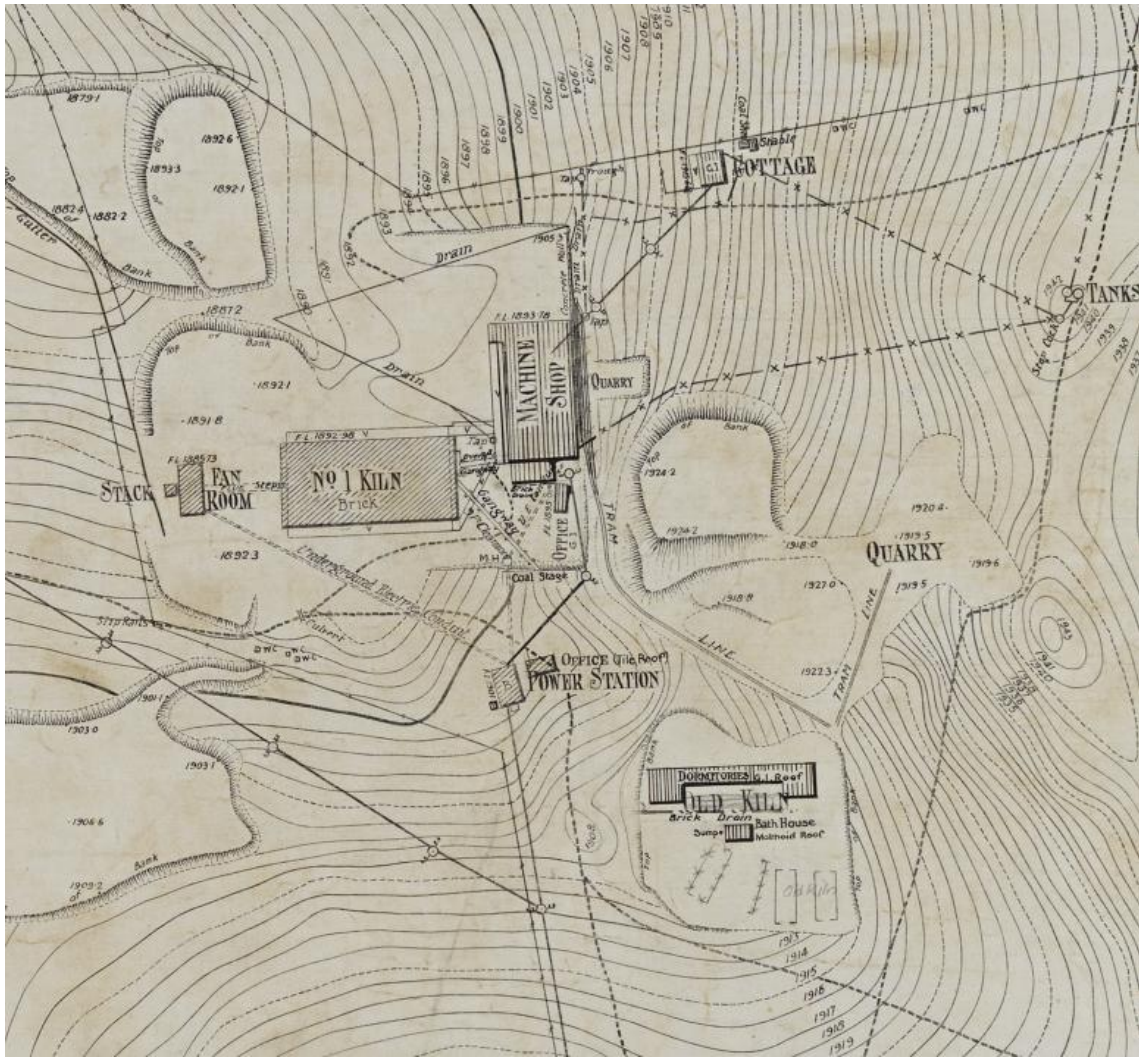


Figure 4 Contour and detail survey of Brick Yards, Canberra, 1916. North is at top
 Source: National Archives of Canberra



Figure 5 Detail of Plan of City and Environs, 1918 showing the Brickworks (indicated) in relation to Westbourne Woods
Source: National Library of Australia

10.3 Reactivation (1920s – 1930s)

The Canberra Brickworks re-opened in 1921 to meet the demands of a developing city. By the end of 1923, 5,000,000 bricks and 50,000 tiles had been produced at the plant.

Bricks were initially transported from the brickworks to construction sites in the emerging city centre by traction engine. However, the machines were able to make only two daily round trips. To speed the process a light railway was constructed. This led from the south-west of the brickworks site, before aligning with the present Denman Street and heading east to the construction sites. The ‘branch lines’ of the light railway were removed prior to the opening of the Provisional Parliament Building in May 1927 and the remaining sections of the railway were removed in 1929. From the late 1920s, bricks were transported by truck. The only remaining evidence of the light rail network is the formation between Denman Street and the west side of the brickworks (the Canberra Brickworks Railway Remnants).

To cope with increased demand during the 1920s, two ‘temporary’ downdraught kilns and an associated stack were constructed at the brickworks in October 1925. These were oriented east-west and located to the south of the Staffordshire kiln. They were replaced in the 1960s by three kilns that survive today. In 1926 the existing machine shed was also expanded by two bays.

A 1926 site plan of the brickworks (Figure 6) indicates the changes that occurred following the re-opening of the site after World War I. The old dormitory block and iron cottage with associated stable are still present, but the temporary kilns have been demolished by this stage. The machine shop has

been expanded to the north and a new kiln constructed to the north of the Staffordshire kiln. The location of the two downdraught kilns is also outlined. There was an amusement hall, possibly associated with the Brickworks Camp, to the east of the quarry pit. The quarry itself has altered in shape significantly from the earlier 1916 plan and the tramways follow a different alignment. The plan also provides an indication of the arrangement of the railway siding, just prior to its closure the following year.

Further development took place in 1927. A Hardy patent kiln was built, located to the north of and parallel to the Staffordshire kiln. Today, this kiln has its own fan house and stack, presumably with underground flues, but a 1927 site plan showing the proposed location of this kiln, suggests that it may originally have been supported by the fan house and stack of the Staffordshire kiln. This kiln remains today, albeit in extensively modified form. A 'Scotch' kiln was also in operation to the north of the Staffordshire kiln, and the original section of the present office building was constructed. Single men's quarters were constructed on the south side of Denman Street, close to the entrance to the study area – the location of these quarters is not recorded in historic plans or photographs – and new married quarters were located to the south of the brickworks in the same year. These married quarters can be seen in Figure 7 and Figure 8. They comprised a large two storey building (mess hall) and a number of simple single storey sleeping quarters. The photographs suggest that they were of timber construction.

By the end of the 1920s, the brickworks comprised:

- Staffordshire kiln, fan house and stack
- Hardy patent kiln, fan house and stack
- Two downdraught kilns
- Machine shed
- Amusement hall
- Cottage and associated stables/coal store
- Power house (brick)
- Office (brick)
- Accommodation units to south west and south
- Railway siding remnants

The works closed in February 1931 as a result of the 1929 Depression before reopening again in 1935. However, World War II diverted peace time activity to works associated with the war effort, and the brickworks closed once again. In April 1942 staff were laid off and a caretaker retained to issue bricks for essential works.

10.3.1 Analysis and conclusion

The reactivation phase saw the expansion of the brickworks to something close to its present dimensions. The industrial buildings built during this period were generally constructed of brick with corrugated sheet metal roofs. It is anticipated that accommodation buildings of this era were constructed of timber.

The only buildings that survive from this period were those associated with the industrial workings of the brickworks itself. All accommodation, including the sheet metal cottage, the original dormitories, the single men's camp and the married quarters have been demolished, as has the amusement hall.

The form and location of the single men's quarters constructed to the south of Denman Street, close to the site entrance, is not known. As noted, it is probable that the building (or buildings) were of timber construction. The land to the south of Denman Street, close to the entrance, has not subsequently been

developed. Archaeological deposits relating to these quarters may include post holes and underfloor refuse deposits. Any material discard is expected to be of a domestic nature.

The married quarters, south of the brickworks, were replaced with a hostel in 1945. As a result, there is limited potential for archaeological deposits relating to the 1920s married quarters. Any deposits are likely to be of a domestic nature.

There are unlikely to be any remains of the quarry pit tramways. These were of an ephemeral nature, being readily relocatable. The floor of the quarry pit has also been modified through quarrying operations, and (in the 1970s) through the adaptation of the pit to a landscaped park and model railway.

Evidence of the railway siding remains in the form of cuttings in the landscape that follow the original alignment of the siding. The potential for subsurface remains relating to the railway, including drainage channels, is low, but cannot be discounted. The railway siding extended right to the brickworks and, although part of this area was later covered with the slab of the extrusion plant, there is potential for the evidence of tracks extending to the north and south of the Staffordshire kiln. Potential archaeological features related to the railway may include timber sleepers, iron bolts and metal rails.

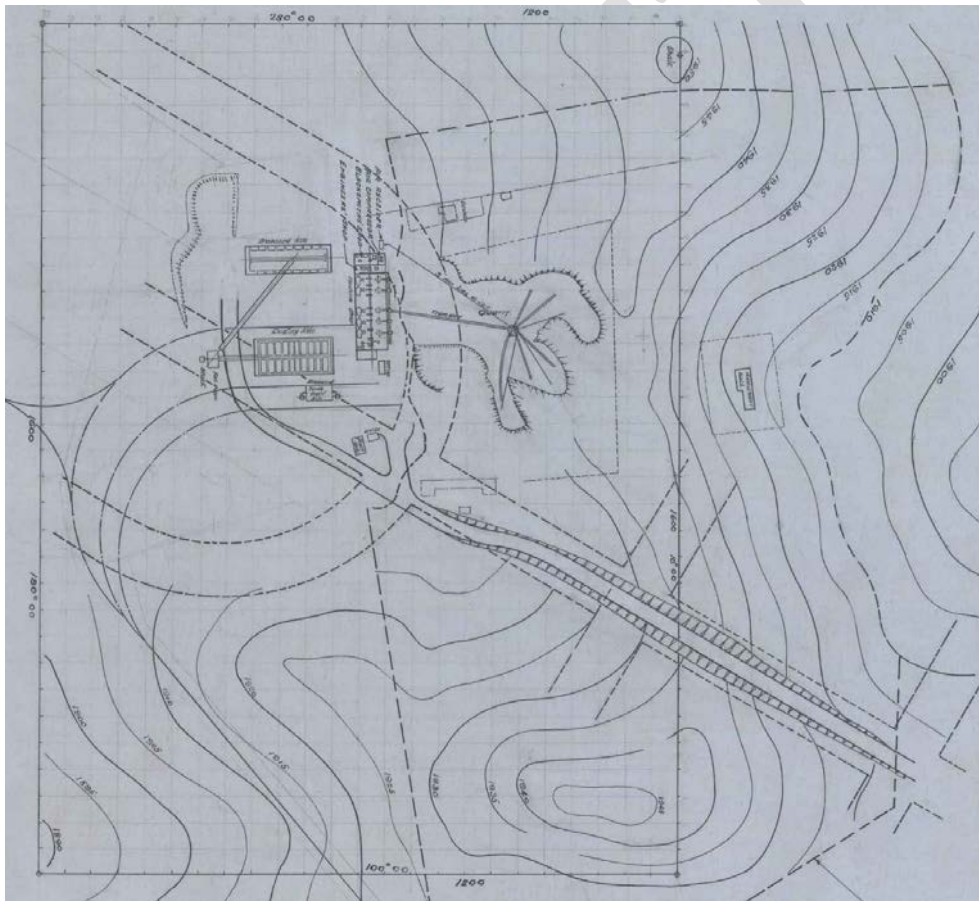


Figure 6 Canberra Brickworks site plan, 1926. North is at top
Source: National Archives of Australia



Figure 7 View of Brickworks, 1929 with married quarters to the left of the image
Source: National Archives of Australia



Figure 8 Brickworks looking south to married quarters buildings, 1929
Source: National Archives of Australia

10.4 Expansion (1940s – 1960s)

With the end of World War II in sight, the Canberra Brickworks reopened in September 1944, with production on a limited scale. From the late-1940s and into the 1950s output was stepped up to provide material to address the post-war housing shortage, resulting in a major expansion and redevelopment of the brickworks.

Among the first post-war construction projects was the replacement of the married quarters at the south-west of the site, built during the 1920s. The new 'Brickworks Hostel' was ready for occupation in 1945 and was located on the site of, and in close proximity, to the former married quarters. The hostel was demolished c.1970.

The expansion of the brickworks in the 1950s saw a change in the process of brick making and in the machinery required for production. While the major brick kilns on the site were retained, other early plant and buildings were replaced. The early machine shop, adjacent to the Staffordshire kiln, was replaced with a series of brick press buildings and a workshop. The brickworks was also equipped with a series of new crushers and hoppers, an elevator and a 'Pan Building'; and a sequence of conveyor belts. The two 'temporary' downdraught kilns that had been built c. 1925 were demolished to make way for three new downdraught kilns. These were constructed on the site of the former 'temporary' kilns in 1960-63.

Westbourne Woods, which surrounded the Brickworks also witnessed change during this period. To solve problems of tree damage as a result of drought, a golf course within the Woods was proposed in 1945. From 1949-1954, fairways were cleared and grassed and in 1962 the Royal Canberra Golf Club was granted a lease that included most of Westbourne Woods.¹⁰ The land to the north-west and west of the brickworks has thus retained a designed landscape character since 1914, with no evidence of development.

This phase of development of the brickworks is reasonably well documented. A site plan dated 1947 (Figure 9) shows the layout of the site at the time, which is substantiated by a 1950 aerial photograph (Figure 10). A 1961 aerial shows further development that took place during this period (Figure 12).

The cottage to the north-west of the quarry pit had been demolished by 1947, with the introduction of roadways to the east side of the machinery shops and kilns likely to have disturbed any material related to the building. A new house had been constructed directly to the north of the brickworks, with an associated garage. As noted above, the Brickworks Hostel replaced the former married quarters in 1945. This new accommodation comprised two buildings with rectangular footprints to the south-west of this area, and a number of smaller buildings to the north and north-east (Figure 11). The amusement hall was extant in 1950 and an explosives store had been erected to the west of the railway siding.

The 1961 aerial shows development to the east and south-east of the brickworks. Residential development to the north-east was also progressing at this stage.

The 1961 aerial also demonstrates the extensive remodelling of the brickworks during the 1950s. A new kiln, constructed c.1953, is located to the north of the older kilns and in close proximity to the residence, presumably with its own sub-surface flue connections; a clay storage shed had been erected to the east of the brickworks; and the machine shop had been remodelled into a series of smaller buildings. The Brickworks Hostel was extant, although it appears to have been modified by this time. A large square expanse is also evident to the south of Denman Street. It is possible this was used as a brick stacking or storage area for the brickworks.

10.4.1 Analysis and conclusion

This period saw the major expansion and redevelopment of the Brickworks, with a mix of residential and industrial buildings being constructed, which generally replaced earlier structures.

The residence to the north of the brickworks was demolished by the 1970s, with the area later incorporated into the Lane Poole Place development (see Section 10.5). This site now lies outside the study area.

The principal site of archaeological potential relating to this era is the former Brickworks Hostel (built 1945, demolished c. 1970). Footings and concrete slabs were not visible during the first study area visit (due to the extent of vegetation). However, above-ground evidence of built form in this location was visible during the survey conducted by NOHC in June 2016 (Figure 13). Any material discard in proximity to the former hostel is likely to be of a domestic nature.

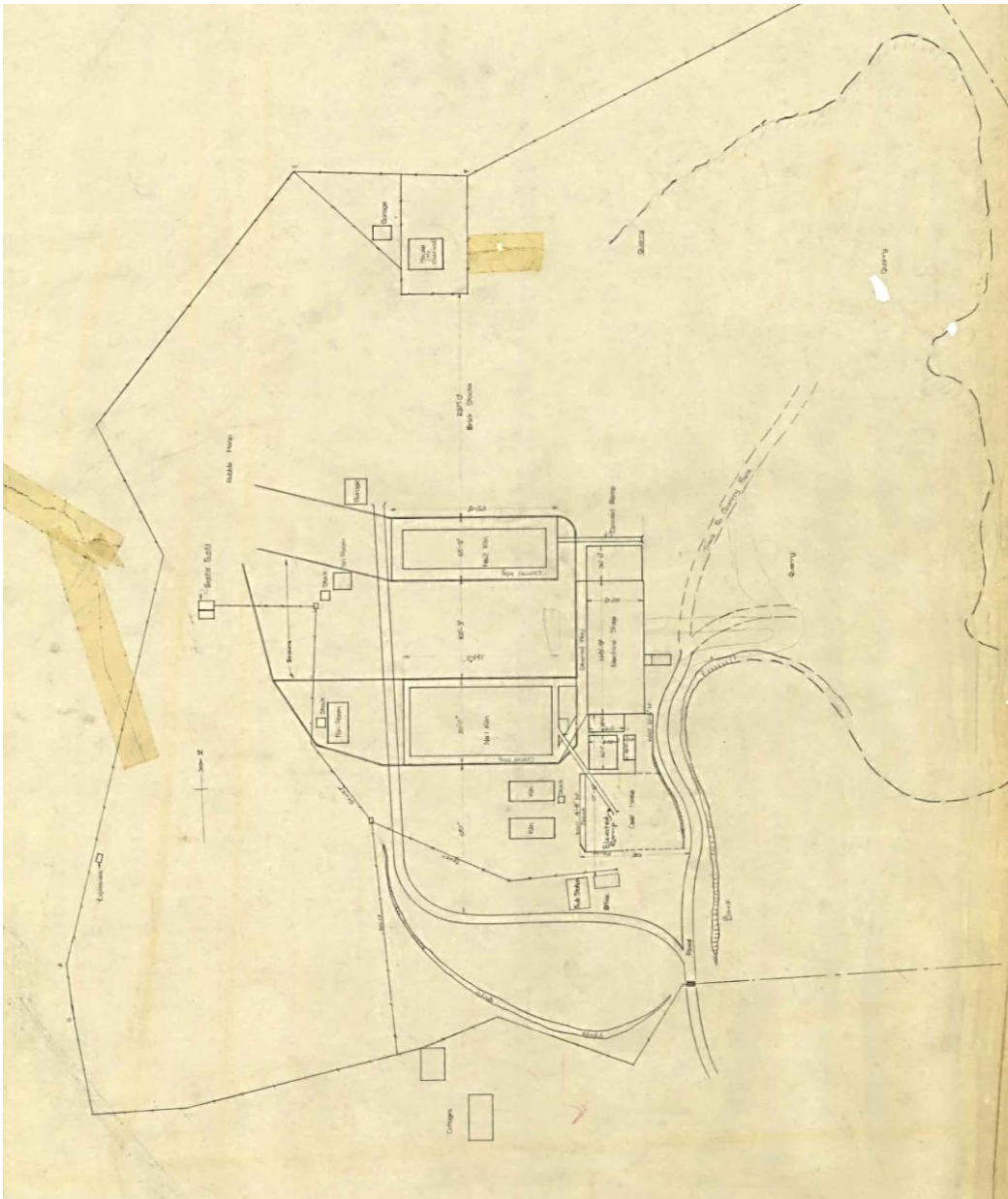


Figure 9 Brickworks site plan, 1947. North is at top
Source: National Archives of Australia

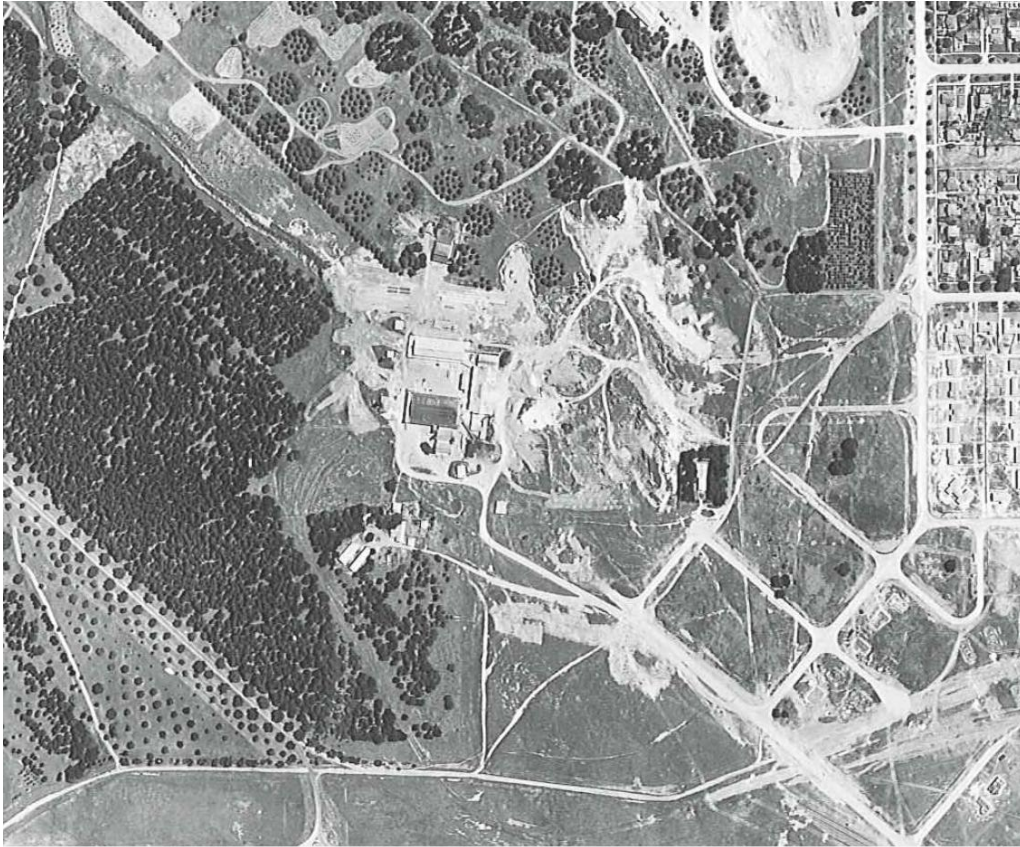


Figure 10 Aerial view of the Brickworks site, 1950
Source: ACTPLA



Figure 11 Aerial view of Yarralumla looking east, with the Brickworks at the lower left showing the Brickworks Hostel (indicated), 1952
Source: ACT Library

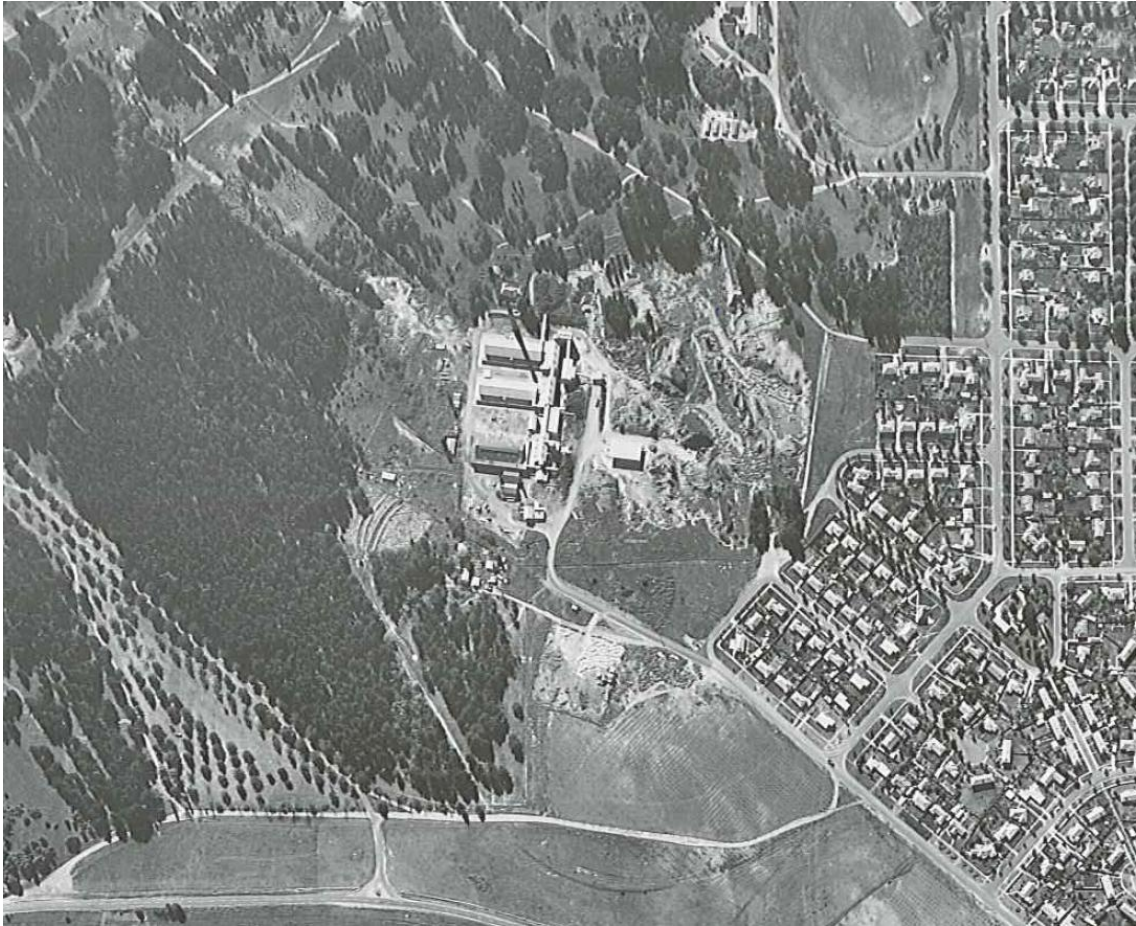


Figure 12 Aerial view of the brickworks site, 1961: note the square fenced area to the south of Denman Street
Source: ACTPLA



Figure 13 Walls/footings of the former Brickworks Hostel, 2010

10.5 Closure and redevelopment (1970s – current)

In 1967, the ACT Health Services Branch inspected the Brickworks Hostel and reported that the buildings were in a state of disrepair. Late in 1970 it was reported that the hostel was to be demolished. The 1972 aerial photograph (Figure 14) shows the site of the hostel as cleared land. The amusement hall had also been demolished by this time, although the associated landscaping (trees) survived. Further residential development had occurred to the north-east and east of the study area and to the north, the Royal Canberra Golf Course had been established.

The three downdraught kilns built in the 1960s can be seen to the south of the Staffordshire kiln, with a large square extrusion plant to its west – part of this large concrete slab was located on top of the rail sidings that extended to the north and south of the Staffordshire kiln. A comparison of the 1960s and 1970s aerial shows that new structures were constructed to the immediate east of the kilns, the latest iteration of development in this location. The c. 1940s residence to the north of the brickworks had been demolished by this time. This area has since been developed as part of the Lane Poole Place housing complex. The area of the old kilns and dormitories had been partly covered by a concrete slab for a car park by the 1970s.

By 1973, the Canberra Brickworks was considered to be in need of extensive modernisation and proposals were prepared by Commonwealth Brickworks Pty Ltd for upgrading. These proposals were rejected on environmental grounds and a new site for a brickworks was released at Mitchell, north of Canberra. The kilns at the Canberra Brickworks were unloaded for the last time in August 1976.

Also in 1976, local developer and businessman Alan Marr (A R Marr Pty Ltd) made a proposal to the NCDC to develop the brickworks and adjacent land as a tourist, recreation and retail destination, with associated housing to the east and north of the study area. Under Marr's scheme, the quarry was to be landscaped to include picnic areas, walking trails and a miniature railway (Figure 15). Marr succeeded in having the land re-zoned, and redevelopment works on the quarry commenced towards the end of 1978. This involved land fill and the creation of a reflection lake. The redeveloped brickworks was opened to the public as a tourist attraction in July 1979. A 1980 aerial photograph shows the study area at this time (Figure 16).

Marr also held an option to develop up to 212 townhouses on parts of the brickworks site. In 1980 the first stage, comprising 20 houses on the eastern side of the study area (along Woolls and Schomburgk Street), was commenced. Work on 45 houses to the north-west of the study area (now Lane Poole Place) began the following year. At this time, the railway remnants were not recognised or registered as a heritage site.

A R Marr Pty Ltd was placed in provisional liquidation in January 1980, and in 1984 the Commonwealth Government accepted the surrender of the lease for the brickworks from the lessee, A R Marr Pty, and paid \$1.1 million for its interests.¹¹

10.5.1 Analysis

This phase relates to the use of the study area after it ceased operations as a brickworks. The post-operational phase of the Canberra Brickworks makes a limited contribution to the identified values of the place. There are no sites of archaeological potential related to this phase.



Figure 16 Aerial view of the brickworks site, 1980

11.0 Physical investigations

The historical analysis identified five areas of potential archaeological sensitivity within the study area. Physical investigations undertaken by NOHC confirmed these areas and also identified a further seven archaeological sites. All twelve sites are discussed below.

11.1 Predictive archaeological model

The core function of brick making in an industrial complex such as the Canberra Brickworks requires a network of interrelated sites and features that include domestic as well as industrial elements. Working from the core to the periphery, archaeological sites and features of heritage significance that may occur within the study area were predicted to include:

- Remains of the brickwork making process including kilns, flues, chimney stacks, conveyors, fan houses and raw material stockpiles;
- Remains of former dwellings including worker's camps, dormitories, houses and huts and associated infrastructure such as drainage;
- Remains of other buildings and structures such as stores, tanks for liquid storage (both above and underground), offices and workshops;
- Old fence lines, such as post and rail fencing; these may occur along inter- and outer-site boundaries;
- Transport infrastructure such as road and railway sites and features;

- Vegetation defining location of sites and features either as introduced plantings or clearings with vegetated borders

Structures of historical interest and heritage significance may be standing, ruined, buried, abandoned or still in use.

11.2 Survey coverage and visibility variables

The effectiveness of archaeological field survey is, to a large degree, related to the obtrusiveness of the sites being looked for and the quality of ground surface visibility. Ground surface visibility is a measure of the bare ground visible to the archaeologist during the survey. There are two main variables used to assess ground surface visibility - the frequency of exposure encountered by the surveyor, and the quality of visibility within those exposures. The predominant factors affecting the quality of ground surface visibility within an exposure are the extent of vegetation and ground litter, the depth and origin of exposure, the extent of recent sedimentary deposition, and the level of visual interference from surface gravels.

Visibility variables were estimated for all areas of survey within the study area. These estimates provide a measure with which to gauge the effectiveness of the survey and level of sampling conducted. They can also be used to gauge the number and type of sites that may not have been detected by the survey.

Visibility across the Canberra Brickworks site was of mixed quality. Vegetation growth and leaf litter across sites was the single largest contributing factor to poor visibility. Growth was either in the form of high growing grasses and weeds, or clusters of bushes and young trees, which at times impeded access as well as visibility. Visibility was low at those sites which have not been maintained (e.g. BRW6 and BRW2), and high at those which have been manicured (e.g. quarry and BRW1).

The built environment which forms the core of the complex was also a key contributor to poor visibility. It is assumed that any archaeology that may have survived the later construction of kilns and other structures in the precinct has been disturbed.

Overall, visibility was moderate, and the survey was able to obtain a comprehensive recording of archaeological sites and features. The individual sites have been described below.

11.3 Surface features

Twelve archaeological sites were identified within the brickworks site during the archaeological investigations. These sites comprised surface features and are described in detail below.

11.3.1 BRW1: Possible building platform and concrete features

A platform and a number of features including concrete and spoil are located on the south side of Denman Street, approximately 25m from the entrance to the brickworks. A vehicular track runs north-east to south-west on the western extremity of the site, and a fence line consisting of star pickets/pine posts and wire netting combined with barbed wire delineates the southern extremity. A small grove of trees are situated at the eastern end of the site. The site measures approximately 20m x 15m.

At the western end of the site there is a square concrete feature, approximately 1m x 1m, with an exposed top (Figure 17). This feature suggests a function associated with water, either for storage or drainage. Approximately 5m to the east of this square concrete feature is a visible line of grass die back, which suggests the presence of subsurface features. This line extends from north to south across the building platform that comprises the bulk of this site (Figure 18).

Site conditions are poor to fair. Two depressions identified within the platform suggest erosion or disturbance has occurred, while the in situ concrete features suggest a level of intactness. Visibility of this area was good, with only some low grass.



Figure 17 View of BRW1 concrete feature, looking north
Source: NOHC



Figure 18 View looking north across BRW1, showing line of grass die off (centre left)
Source: NOHC

11.3.2 BRW2: Married quarters and Brickworks Hostel

This site is within an area that has been designated through historical records as the brickworks accommodation village.

A complex of structural features is located south of the brickworks fence line, and approximately 40m west of BRW1. The area is approximately 80m x 35m and extends southwards up a gentle slope to a road cutting that transects the southern portion of the site on an east-west alignment. A less formal vehicular track is situated along the same alignment as the more formal road, immediately to the south.

Site visibility was generally poor in this area with thick groves of blackberry bushes to the east, which also spread intermittently towards the west. This was interspersed with moderately dense patches of small saplings/trees, with dense grass throughout. A limited area had enhanced visibility due to a cleared path which ran through parts of the site and around a number of features. Occasional sawn off medium sized tree stumps were visible throughout the site.

The site is defined by a number of highly visible mounds of spoil and a platform. These mounds of spoil, if related to former structures on the site, suggest heavy disturbance and a poor to fair condition across the site generally. Various items of artefactual material are scattered throughout the area, such as sheets of tin, brick and tile fragments, concrete and bottle fragments. Some of the material is relatively modern, including old car parts and even a bicycle frame, suggesting dumping of rubbish not necessarily associated with the site.

Descriptions of identified individual features are provided below:

BRW2-A: Brick Feature and Mound

Situated at the western end of BRW2 and approximately 15m north of the road cutting, is a large mound of brick and concrete rubble covered in grassed topsoil atop a large rectangular brick feature. It measures approximately 6m x 2m, and up to 1 metre in height.

This brick feature is a substantial structural element of a former building and remains in situ unlike many of the other elements at this site. At the northern end of this structural feature is a large concrete lined drain or water trap, with remains of an iron grate (Figure 19). Brickwork around this feature, particularly the southern portion, shows signs of having been covered in tar or bitumen. Along the western side of the feature is a rectangular stall that is reminiscent of a fireplace or hearth recess (Figure 19). A piece of iron flue or furnace was identified as part of the spoil on this site, along with what appears to be a crumpled washtub (Figure 21). The bricks show a combination of different stamps and frog marks on their surface, including the early "CANBERRA C'WEALTH" stamp.

Slabs of brick and concrete are located around the feature, which are suggestive of walls or flooring remains, sheets of tin, iron girders and rods. A linear mound of rubble extends easterly from this main structural feature and is made up of cemented brick segments and other structural detritus.

This feature appears to correspond with the brickworks mess hall which was depicted in images from at least 1929.

BRW2-B: Metal spoil heap

A spoil made up largely of metal remains including tin, iron girders and rods, galvanized and non-galvanized pipes is situated approximately 15m east of BRW2-A (Figure 22). There is some brick material within this spoil, including what appears to be an in situ brick footing. There is also the occasional plank of milled timber. The northern side of this mound is bordered by a blackberry bush cluster.



Figure 19 Detail of drain at northern end of BRW2-A
Source: NOHC



Figure 20 Detail of brick stall at BRW2-A
Source: NOHC



Figure 21 View looking west across BRW2; note the washtub and brick stall to the west and rubble to the north
Source: NOHC



Figure 22 View looking east across BRW2-B
Source: NOHC

BRW2-C: Concrete slab

A concrete slab approximately 4m x 6m is located just south of the southern fence line of the brickworks at the western end of the site (Figure 23). The rendering is coloured red and has the remains of four toilet fittings running down the centre of the slab. The toilet bowls have been removed from the platform, although fragments of broken bowl and earthenware plumbing pipe exist around the slab (Figure 24). The alignment of the toilets suggest that the stalls were accessible from the northern side of the slab. A possible step or entrance way extends from the northern part of the slab in the centre. A stamped feature is evident in the north east corner of the slab suggesting a small closet, room or feature for what appears to be an ablutions block. The slab appears to be on the same alignment as BRW2-A, which is just further south. This structural feature appears to correspond with the brickworks ablution block which is depicted in images of this area from at least 1929. The ablution block suggests that it was more to do with the brickworks than it was to do with the accommodation of employees.

BRW2-D: Brick mound

Positioned just east of BRW2-C is a small mound made up largely of brick and brick fragments, along with rendered red brick (Figure 25). There are also segments or clusters of concrete blocks with broken red tile as aggregate. There is also the occasional piece of tin sheeting. It is possible, due to the red rendered brick, that this mound is a spoil heap for structural remains from BRW2-C.



Figure 24 Remnant of one of the toilet fitting
Source: NOHC



Figure 23 The concrete slab at
Source:
NOHC



Figure 25 Looking south-west towards BRW2-D
Source: NOHC

11.3.3 BRW3: Area of postholes and other remains

A complex of features that relate to various structures and infrastructure are located to the south of BRW2. This site covers approximately 100m x 50m. Visibility was fair to good due to patchiness of vegetation ranging from dense to light.

At the western extremity of the site is evidence of a modern “fringe dwellers” camp, with a hearth constructed of brick and concrete remains from structural features such as those encountered at BRW2. The hearth had been in recent use as evidenced by the condition of the fire remains within and the rubbish surrounding this feature. Evidence for a camp or rough shelter was also observed, with various planks nailed to trees and pallets repurposed for flooring or other means amongst a grove of young trees. Sheets of tin were also present and nylon rope tied around trunks in strategic places possibly for the use of attaching a tarpaulin or other such item for shelter purposes. Within the grove of saplings a circular feature with a diameter of approximately 10m was defined by postholes surrounding a large pallet like item in the centre (Figure 26). It is unclear whether the postholes predate the modern fringe camp. Early maps and plans suggest that this area to the west was originally a more ephemeral brickworks camp and then later into the twentieth century the location for dormitories or hostel like accommodation.

In proximity to the hearth and camp are mounds of structural spoil, consisting of brick and concrete, iron rods and metal sheeting, bottles and tin cans. To the east of the modern camp, and almost directly south from BRW2, a rectangular clearing was encountered. At the top of the slope to the south of the clearing a drainage line has been excavated, which runs approximately on an east-west alignment (Figure 27). No other structural features or remains were identified within this clearing between the drainage line and the northern border of the site. However, a slab timber fence or yard post is located at the northern end. The post itself appears to be early in origin, but has had modifications made to it by the addition of another slab bolted to the upright, and use of galvanized wire and nails, as opposed to non-galvanized iron nuts and bolts for other modifications (Figure 28). No other posts or holes were

identified in the immediate vicinity. This clearing could have been the location of one of the hostels or dormitories.



Figure 26 Circle of post holes (indicated by pink flags), looking north
Source: NOHC



Figure 27 Drainage line at BRW3, looking west
Source: NOHC



Figure 28 Detail of slab post at BRW3
Source: NOHC

11.3.4 BRW4: Single men's quarters

A fenced yard area measuring approximately 80m x 80m is located to the south of BRW1. Defined by a star picket fence line with wire netting along the bottom portion and barbed wire on the upper portion, the yard is accessed by gates at the northern end from Denman Street and a gate in the south-west corner. Visibility was very good as the area is relatively clear of vegetation, with the exception of a light covering of low growing grass across parts, and the occasional low growing shrub and small tree. The yard rises up a gentle slope to the south. A layer of bitumen such as that used for road surfaces covers a good portion of the site (Figure 29) and this sits directly above a layer of bedrock, with only a thin layer of topsoil present in patches throughout the yard. No structural features were identified, although fragments of window glass were found near the northern entrance to the site (Figure 30). The condition of this area is good.



Figure 29 Asphalted area at BRW4, looking east
Source: NOHC



Figure 30 Window glass at BRW4
Source: NOHC

11.3.5 BRW5: Clay feature and rubble

To the immediate west of the brickworks kilns is a silty clay feature up to 50m in diameter and 1 to 2m high, which appears to be a flat topped mound or stockpile of this resource (Figure 31). It is possible that it is a feature that has been created from earthworks in this area, however it does not sit on the same horizon as other surrounding features, such as the brickworks kilns. The location of this site is close to the former creek that fed into the precinct from its north-west corner. The silty clay material is different to any of the top soils and sediments around the rest of the precinct. Visibility of this area was good and the condition of this feature is good.

To the west of the mound is a series of depressions scattered throughout with brick and concrete rubble (Figure 32). These depressions are located between the mound to the east, and the railway remnants to the west. They could be associated with a former structure in the vicinity or rubble that has been

dumped from another location. An aerial image from 1950 (Figure 33) shows that a rectangular structure was once located in this vicinity. The overall condition of this element is generally fair and visibility is good.



Figure 31 Clay mound feature at BRW5, looking west
Source: NOHC



Figure 32 Rubble and depressions at BRW5
Source: NOHC



Figure 33 Aerial photograph of the Brickworks, 1950; the rectangular feature is indicated
Source: ACTPLA

11.3.6 BRW6: Rubble heap/refuse dump

This site is located at the north-west section of the precinct and consists of a mix of brick and concrete rubble located within a depression at the base of trees (Figure 34). The remains could be associated with a former structure in the vicinity or rubble that has been dumped from another location. An aerial photograph from the 1960s shows that a rectangular structure was once located in this vicinity. Visibility was poor in this area due to high growing vegetation in the form of grasses and weeds. Condition is fair.



Figure 34 Brick and concrete rubble surrounding trees at BRW6, looking north
Source: NOHC

11.3.7 BRW7: Quarry

The brickworks quarry is a large site located to the east of the brickworks buildings. Visibility is generally good across the quarry zone with features and elements able to be clearly identified through the low growing and manicured grass coverage.

Further east and up an incline, there are a number of depressions amongst a grove of pines along the edge of the quarry cliff (Figure 35). These depressions are uniform in size, approximately 1m in diameter and appear to be in a sequence. The historic aerial dating to 1950 (Figure 33) shows a series of circular features similar to these depressions extending west to east up the slope in a double row. The function or purpose of these depressions is unknown. On the eastern side of the quarry zone to the north is an example of an in ground circular tank that has been back filled with brick rubble, approximately 3 metres in diameter (Figure 36). This tank does not resemble the depressions in the south of the quarry in scale and known purpose.

At various locations along the quarry wall, particularly the eastern side, brick rubble has been back-filled against the face (Figure 37). This is either an example of disposing of seconds and damaged bricks, or to provide something of a retaining wall for the cliff face. The exactness of the placement suggests the latter.

A number of features and elements exist within the quarry floor itself. Starting at the south end of the quarry floor, a raised embankment of earth runs along the eastern contour of the quarry wall. This

feature belongs to a much later use of the brickworks as a tourist destination in the form of a model railway.

In the middle of the quarry floor are two mounds that have been covered with topsoil and grassy vegetation. Aerial imagery from the 1960s (Figure 38) shows a structure in the form of a large shelter or shed in the same location. These mounds could be evidence of this structure and its contents. This also confirms that there is likely to be intact subsurface material beneath these mounds dating to the original quarrying.

Along the north eastern edge of the quarry, the floor has been further excavated to create a pond or lake. This excavation dates to the time the brickworks precinct was a tourism facility. The quarry face to the west of this pond or lake in the north, shows stratigraphy that depicts a disposal event that has subsequently been capped by spoil from either the excavation of the pond/lake or from other areas. A layer of brick, concrete, glass, and iron exists along with a line of charcoal and burnt material approximately a metre below the surface (Figure 39).

The condition of the quarry is very good and its level of intactness is the highest standard when compared with other archaeological sites within the precinct.



Figure 35 Depression on south side of quarry edge
Source: NOHC



Figure 36 Tank at north-eastern edge of quarry, looking south
Source: NOHC



Figure 37 Rubble backfill along north-eastern edge of quarry face, looking east
Source: NOHC

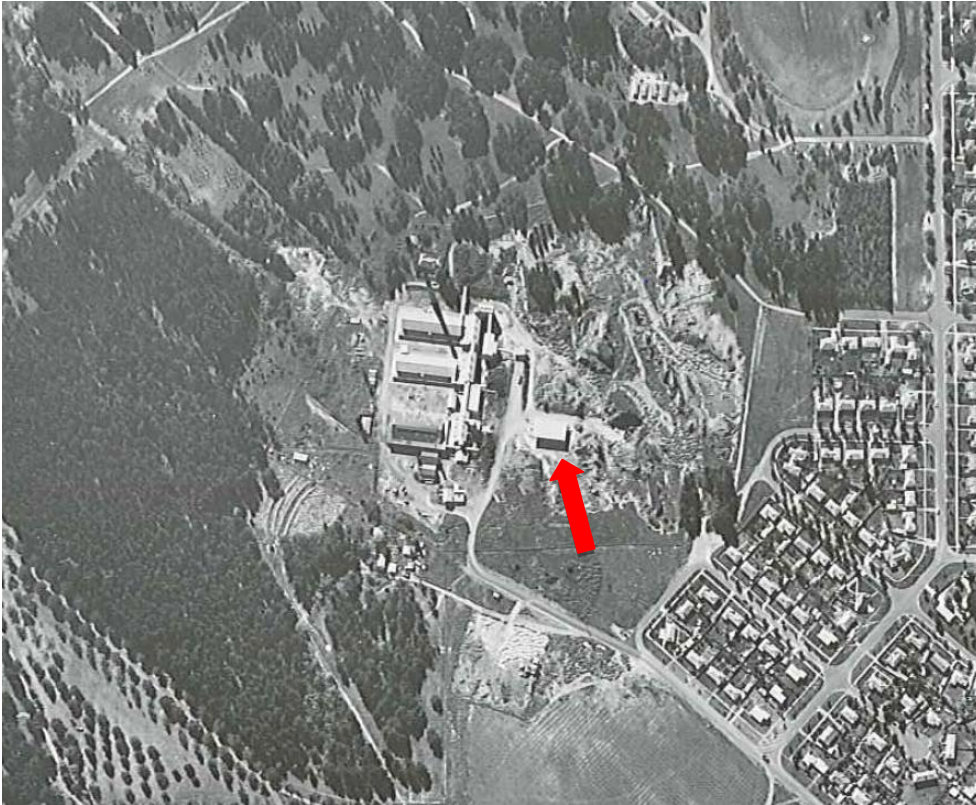


Figure 38 Aerial photograph of the Brickworks, 1961; the shelter is indicated
Source: ACTPLA



Figure 39 Quarry face showing layer of rubble and charcoal at northern end of quarry
Source: NOHC

11.3.8 BRW8: Old kiln and dormitories

The temporary brickworks was established in 1913. By August of that year, four open kilns were in use. This 'Old Kiln' area was located to the south-east of the permanent brickworks and a dormitories building was also located to the immediate north of the temporary kilns. These structures are likely to have been demolished by the mid-1920s.

Analysis of site plans and aerial photography demonstrates that this area has undergone some disturbance since the demolition of the temporary kilns and dormitory. Buildings can be seen in aerial images from the 1950s and car parking was introduced in the vicinity in the 1960s-70s, which involved the laying of concrete. This was removed by 1980. Along with the vehicular track that exists now, there are also occasional fragments of in situ concrete slab that are possibly associated with structures postdating the early kilns. The condition is assessed as poor to fair and likelihood of subsurface features for early kilns is low.

Archaeological deposits pertaining to built form from this era would be expected to comprise footings and machinery remnants. Material discard would be expected to be items of an industrial nature with the potential for some domestic material related to the dormitories (Figure 40).

11.3.9 BRW9: Cottage, stables, coal store

A cottage, with associated stable and coal store, was built c. 1913 to the north-east of the brickworks as part of the first stage of construction of the permanent brickworks. This cottage was demolished by 1947. The location of the cottage and outbuildings has been heavily trafficked over time, being located on a key route between the quarry pit and kilns and in close proximity to the primary crusher house and the elevator/conveyor. The site of the cottage and its outbuildings is therefore likely to have been disturbed by the introduction of roadways to the east of the kiln and machinery shops as a result of successive remodelling of the brickworks.

Material discard would generally be expected to be of a domestic nature, though there may be some industrial materials related to the stables and coal store. There may also be evidence of timber post holes or footings.



Figure 40 Location of the old kiln and dormitories looking east
Source: Lovell Chen

11.3.10 BRW10: Railway remnants

The brickworks railway operated between 1923 and 1927, and all tracks had been removed by 1929. Evidence of the railway siding, in the form of cuttings in the landscape located to the south-west of the brickworks, could be seen in aerial views of the site well into the 1970s and are still evident (Figure 41 and Figure 42). Self-seeded vegetation has since reclaimed much of the area. Although all remnants of the track were removed in the 1920s, and a period of 90 years has elapsed since then, there is some limited potential for archaeological evidence that would enhance an understanding of the railway and its operation.

The potential for subsurface remains relating to the railway, including drainage channels, is low, but cannot be discounted. Potential archaeological features related to the railway may include the railway cutting, timber sleepers, iron bolts and metal rails.



Figure 41 Cutting in landscape showing the original alignment of the brickworks railway
Source: Lovell Chen



Figure 42 Cutting in landscape showing the original alignment of the brickworks railway
Source: Lovell Chen

11.3.11 BRW11: Railway siding (extension to the north)

The railway siding extended into the brickworks site and terminated to the north and south of the original Staffordshire kiln. Aerials indicate that part of this land was later covered by the concrete slab for the extrusion plant, however there is some potential for archaeological evidence.

There is some potential for the evidence of tracks extending to the north and south of the Staffordshire kiln. Potential archaeological features related to the railway may include the railway cutting, timber sleepers, iron bolts and metal rails.

11.3.12 BRW12: Flues/subsurface workings

Underground flues and workings connected the kilns to their associated fan stacks. These are understood to still remain in situ and are unlikely to have been disturbed.



Figure 43 View looking east over the extrusion plant, part of the northern extension to the railway reserve
Source: Lovell Chen

12.0 Findings

Based on the research and archaeological investigations conducted for this report, 12 areas of archaeological potential have been identified (Figure 44):

BRW1: Building platform and concrete features

BRW2: Married quarters and Brickworks Hostel

BRW3: Area of postholes and other remains

BRW4: Single men's quarters

BRW5: Clay feature and rubble

BRW6: Rubble heap/refuse dump

BRW7: Quarry

BRW8: Old kiln and dormitories

BRW9: Cottage, stables, coal store

BRW10: Railway remnants

BRW11: Railway siding extension (to north)

BRW12: Flues/subsurface workings

The archaeological potential of each area is discussed below.

Area	Comment	Archaeological potential
BRW1 Building platform and concrete features	This feature suggests a function associated with water, either for storage or drainage. The bulk of the feature remains below ground. Site condition is poor to fair, with two depressions within the platform suggesting a level of erosion or disturbance. Even so, the in situ features of concrete, including the square feature and the platform remnants, suggest a level of intactness.	Moderate archaeological potential
BRW2 Married quarters and Brickworks Hostel	The married quarters, comprising a mess hall and a number of smaller sleeping quarters, was built to the south-west of the brickworks in the 1920s. This was replaced in the 1940s by the Brickworks Hostel, at least part of which appears to have been built on the site of the married quarters. The hostel was demolished in the 1970s. This area has remained undisturbed since the demolition of the hostel, and above-ground footings/physical evidence were located at the site in 2010 and 2016. Finds have the potential to inform an understanding of the daily lives and living conditions of the workers who were employed at the brickworks.	High archaeological potential.
BRW3 Area of postholes and other remains	Early maps and plans suggest that this area to the west was originally a more ephemeral brickworks camp and then later into the twentieth century the location for dormitories or hostel like accommodation. Condition of site is good.	High archaeological potential

Area	Comment	Archaeological potential
BRW4 Single men's quarters	The single men's quarters was located on the south side of Denman Street in close proximity to the entrance of the brickworks site. While the exact location has not been determined, it is possible that it was in the same location as the square expanse identified in the 1961 - 1980 aerials. If so, there is limited potential for archaeological remains as the site has been relatively disturbed.	Low archaeological potential
BRW5 Clay feature and rubble	<p>Clay feature: It is possible that it has been a feature created from earthworks in this area, however, it does not sit on the same horizon as other features surrounding, such as the Brickworks kilns themselves. The condition of this feature is good.</p> <p>Rubble: The remains could be associated with a former structure in the vicinity or rubble that has been dumped from another location. An aerial image from 1950 shows that a rectangular structure stood in this vicinity. The overall condition of this element is generally fair</p>	Low archaeological potential
BRW6 Rubble heap/refuse dump (including clay feature)	The land to the west of the kilns was quarried before being converted into a rubble heap/refuse dump by the 1940s. The man-made modification of this area is discernible in the aerial photography of the site. The use of this area as a rubble heap/rubbish dump means that there is potential for some refuse of an industrial nature to remain sub-surface. This area was overlaid with concrete by the 1970s, which has since been removed. It is possible that these works disturbed any sub-surface remains.	Low archaeological potential
BRW7 Quarry	<p>In 1910, King O'Malley announced Government plans for the construction of a brickworks to serve the Federal Capital. In July 1912, the area at Yarralumla was gazetted and development of the site began in 1913. A detail survey plan of 1916 shows the early configuration of the quarry to the east of the brickworks buildings. Unsurprisingly, this area developed and changed throughout the operation of the site.</p> <p>The condition of the quarry site today ranges from poor to fair and comprises fragments of in situ concrete slab and a number of depressions along the edge of the quarry cliff.</p>	High archaeological potential
BRW8 Old kiln and	The temporary brickworks was established in 1913. By August of that year, four open kilns were in use. This 'Old Kiln' area was located to the south-east of	Low archaeological potential.

Area	Comment	Archaeological potential
dormitories	<p>the permanent brickworks and a dormitories building was also located to the immediate north of the temporary kilns. These structures are likely to have been demolished by the mid-1920s.</p> <p>Analysis of site plans and aerial photography demonstrates that this area has remained relatively undisturbed since the demolition of the temporary kilns and dormitory. Some car parking was introduced in the vicinity in the 1960s-70s, which involved the laying of concrete. This was removed by 1980. The area is located in close proximity to the main access road leading to the brickworks, and as a result, there may have been some disturbance through vehicle movement. No other land disturbance appears to have occurred here.</p>	
BRW9 Cottage, stables, coal store	A cottage, with associated stable and coal store, was built c. 1913 to the north-east of the brickworks as part of the first stage of construction of the permanent brickworks. This cottage was demolished by 1947. The site of the cottage and its outbuildings is likely to have been disturbed by the introduction of roadways to the east of the kiln and machinery shops as a result of successive remodelling of the brickworks.	Low archaeological potential
BRW10 Railway remnants	The brickworks railway operated between 1923 and 1927, and all tracks had been removed by 1929. Evidence of the railway siding, in the form of cuttings in the landscape located to the south-west of the brickworks, could be seen in aerial views of the site well into the 1970s. Self-seeded vegetation has since reclaimed much of the area. Although all remnants of the track were removed in the 1920s, and a period of 90 years has elapsed since then, there is some limited potential for archaeological evidence that would enhance an understanding of the railway and its operation.	Moderate archaeological potential
BRW11 Railway siding extension (to north)	The railway siding extended into the brickworks site and terminated to the north and south of the original Staffordshire kiln. Aerials indicate that part of this land was later covered by the concrete slab for the extrusion plant, however there is some potential for archaeological evidence.	Moderate archaeological potential
BRW12 Flues/subsurface workings	Underground flues and workings connected the kilns to their associated fan stacks. These are understood to still remain in situ and are unlikely to have been disturbed.	High archaeological potential



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AREAS OF ARCHAEOLOGICAL POTENTIAL

SITE	NAME
BRW1	Building platform and concrete features
BRW2	Married quarters and Brickworks Hostel
BRW3	Area of postholes and other remains
BRW4	Single men's quarters
BRW5	Clay feature and rubble
BRW6	Rubble heap/refuse dump
BRW7	Quarry
BRW8	Old kiln and dormitories
BRW9	Cottage, stables, coal store
BRW10	Railway remnants
BRW11	Railway siding extension (to north)
BRW12	Flues/subsurface workings

LEVELS OF ARCHAEOLOGICAL POTENTIAL

- high
- moderate
- low
- study area

Figure 44 Areas of archaeological potential at the study area: the Canberra Brickworks and environs is indicated by the solid red line

13.0 Next steps

This report has identified areas where historical archaeological remains may be present at the study area and satisfies the conditions of Policy 15, as outlined in the Canberra Brickworks Conservation Management Plan (2010).

In order to manage the potential archaeological sensitivity of the site, and the consequent possibility of archaeological remains being disturbed during future sub-surface works within the study area, archaeological management protocols are recommended. This is in accordance with the *Heritage Act 2004*, which states that, under Section 74 it is an offence to engage in conduct that diminishes the heritage significance of a place or object. Section 76 provides exceptions to Section 74 where the person engages in conduct in accordance with a number of listed processes. This includes obtaining an Excavation Permit, which must be approved by ACT Heritage. While different methods of archaeological management are proposed according to their level of archaeological potential, one Excavation Permit will be required which will cover all archaeological works, including monitoring. This Excavation Permit will set out the proposed archaeological methods (outlined below) for when the archaeological material is encountered and these methods are to be agreed by ACT Heritage.

Areas of moderate-high potential

Areas of moderate to high archaeological potential comprise those parts of the study area which have not been subject to extensive and intensive demolition, site preparation and construction works which have occurred elsewhere within the site during the development of the Brickworks. It is recommended that, prior to any works or development in these areas, a programme of subsurface archaeological testing be implemented for the purposes of determining the actual archaeological values of these areas. As well as identifying the actual level of archaeological sensitivity, testing will also assist in defining the extent of areas which may require further investigation after the completion of the testing programme. As mentioned above, an Excavation Permit will be required for these works.

There are two potential outcomes of the testing programme:

- Areas of moderate to high archaeological significance are identified which will require further investigation through controlled open area excavation
- The actual values of the zone or parts thereof of the area are determined to be of low archaeological significance

In the case of the first outcome consultation and negotiation with ACT Heritage will determine the extent of the area to be subject to detailed manual excavation.

In the second case, areas determined to be of low archaeological significance may either not be subject to further investigation or may be incorporated within the area subject to monitoring (see below).

Areas of low archaeological potential

Areas of low archaeological potential within the site have been subject to significant disturbance through the extensive development and remodelling of the Brickworks site during its operation. No archaeological testing programme is recommended for these areas. Rather a programme of monitoring is recommended for the purposes of providing an assessment of the actual archaeological values of these areas. As mentioned above, an Excavation Permit will be required for these works.

Where the monitoring programme reveals that no or a low potential for historical archaeological remains exists it is recommended that the monitoring programme be replaced by a watching brief, whereby a suitably qualified archaeologist will attend the site as and when archaeological materials are encountered for the purposes of documentation and assessment. This, or a similar, protocol will be agreed upon in consultation with ACT Heritage during the application and approval of the Excavation Permit.

In the event that the monitoring programme identifies that the archaeological potential of these areas is greater than first predicted or where isolated pockets of relatively intact archaeological materials are present these occurrences will be dealt with as per the requirements outlined above for areas of moderate to high potential.

It is recommended that any works to the railway siding area, whether archaeological or future development, are minimal and do not alter the legibility of the modified landscape as it remains evident today. It is noted however that this area falls within a bushfire prone area, and for bushfire management reasons, removal of some vegetation may be necessary to allow for land management.

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- 1 ACT Heritage Council, Cultural Heritage Reporting Policy, 1 July 2015, accessed via www.environment.act.gov.au, 6 January 2016.
 - 2 Navin Officer Heritage Consultants Pty Ltd, Canberra Brickworks, Yarralumla, ACT, Stage 1: Aboriginal Cultural Heritage Assessment, 14 August 2014, Executive Summary.
 - 3 ACT Heritage Council, Heritage Advice to Navin Officer Heritage Consultants, 10 September 2014.
 - 4 Lovell Chen, Canberra Brickworks Conservation Management Plan, April 2010, p. 240.
 - 5 ACT Heritage Council, *Heritage Act 2004*, p.6.
 - 6 ACT Heritage Council, *Cultural Heritage Reporting Policy*, July 2015, p.8.
 - 7 SMEC, *Preliminary Geotechnical Site Investigation for the Canberra Brickworks*, prepared for Land Development Agency, 2013.
 - 8 SMEC, *Preliminary Geotechnical Site Investigation for the Canberra Brickworks*, prepared for Land Development Agency, 2013.
 - 9 AECOM, *Stage 1 Site Investigation Report for Canberra Brickworks Precinct*, prepared for Land Development Agency, 2016.
 - 10 ACT Heritage Council, *Heritage (Decision about Registration for Westbourne Woods, Yarralumla) Notice 2011*, p.5.
 - 11 Lester Firth Associates Pty Ltd, Old Canberra Brickworks Conservation Plan, June 1986, Section 2.1.5.