Interpretation Strategy
for historic brick making site (Site 3, Central Precinct)
and
former Naval Radar Calibration Range (proposed Wianamatta Regional Park / Regional Open Space), St Marys Development, St Marys, NSW



prepared by

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for

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SPECIALISTS IN THE IDENTIFICATION, ASSESSMENT, MANAGEMENT AND INTERPRETATION OF CULTURAL HERITAGE

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Figure 1 (Front cover, left to right): Outline of brick kilns on ground, Site 3, Central Precinct; brick scatter at kilns site; hoop for radome at former Naval Radar Calibration Range. (Photos: Chris Betteridge, 18 November 2014)

1.0 Introduction

1.1 Background

The former Australian Defence Industries (ADI) site at St Marys was endorsed by the NSW Government for inclusion on the Urban Development Program (UDP) in 1993. The site is presently owned by Maryland Development and is being jointly developed by ComLand Limited and Delfin Lend Lease Development Pty Limited through their joint venture company, Maryland Development Company.

The site is located approximately 45 km west of the Sydney CBD, 5 km northeast of the Penrith City Centre and 12 km west of the Blacktown City Centre. The main western railway line is located approximately 2.5 km south of the site. The Great Western Highway is located another 1 km south and the M4 Motorway a further 1.5 km south.

One of the six development 'precincts' within the overall site, the 'Central Precinct' contains a brickmaking area associated with the building and development of 'Dunheved' homestead. This rare archaeological site on the Cumberland Plain, believed to have been in use intermittently from circa 1807 to the 1860s for brickmaking has been identified as being part of the State significance of the Dunheved estate. The archaeological remains on the brickmaking site are protected under the 'relics' provisions of the NSW Heritage Act 1977, as amended, and under State Regional Environmental Plan 30. The brickmaking site has been subject to an archaeological investigation carried out by Casey and Lowe Archaeology and Heritage Consultants.

Another interesting site, partially within the area proposed for Wianamatta Regional Park and partially within the proposed Regional Open Space, is the former Naval Radar Calibration Range, operated by ADI for testing radar defence systems. Due to its sensitive nature, little information is available on this site, but it retains a number of structures including an unusual steel and timber hoop with supporting cables and detached radome which is a prominent element in the local landscape. This site will be demolished, with parts salvaged for reuse where possible. Any potential reconstruction of the radar hoop antenna for interpretation / public art will be carried out with modern materials to ensure safety and longevity of the new structure.

Betteridge Consulting Pty Ltd t/a **MUSE***cape* Pty Ltd were engaged by JMD Design on behalf of Lend Lease to prepare an Interpretation Strategy for the brickmaking site as part of the public open space within the central Precinct and to provide advice on the interpretive potential of the former Radar Range, particularly the radar antenna hoop and radome.

1.2 Methodology

This strategy has been prepared in accordance with the Interpretation Policy & Guidelines published in 2005 by the former NSW Heritage Office (now Heritage Division, Office of Environment and Heritage).

Development of an interpretive strategy involves the following process.

1. Identification of place;
2. Assessment of significance;
3. Development of conservation policies, strategies and actions;
4. Identification of interpretation principles;
5. Identification of interpretation policy;
6. Identification of detailed objectives;

7. Identification of major and minor interpretive themes;
8. Identification of potential interpretive media;
9. Identification and profiling of audience groups, including multicultural and international audiences and preferred communication methods;
10. Identification of and commencement of dialogue with key stakeholders and communities;
11. Preparation of draft storyline, prioritized messages;
12. Linkage of messages to audiences to locations;
13. Linkage with the NSW Department of Education school curriculum and the NSW Environmental Education Plans;
14. Identification and evaluation of resources.

Steps 1 to 3 have been carried out as part of the archaeological investigations of Site 3. This report addresses steps 4 to 8. Steps 9 to 14 will require more detailed research and development for a comprehensive Interpretation Plan for the brick making site (Central Precinct) and the former naval radar calibration range (proposed Wianamatta Regional Park / Regional Open Space) and as part of an integrated plan for all the development precincts and public open space areas.

1.3 Authorship

This Interpretation strategy has been prepared by Chris Betteridge BSc (Sydney), MSc (Museum Studies) (Leicester), AMA (London), MICOMOS and Margaret Betteridge BA (NSW), Grad. Cert. (Museum Studies) (Leicester), AMA (London). The authors are directors of Betteridge Consulting Pty Ltd trading as **MUSE***cape*, specialists in the conservation and interpretation of cultural heritage for more than 23 years.

1.4 Acknowledgments

The authors would like to thank the following individuals for their kind assistance in the preparation of this document.

David Aynsley, former ADI employee;
Mary Casey, Casey and Lowe Archaeology and Heritage Consultants and the members of the archaeological investigation team;
Brian Conway, Thales;
James Grant, JMD Design;
Isabel Sanders, JMD Design;
Richard Ward, Lend Lease.

1.5 Definition of Terms

The following terms from the Burra Charter of Australia ICOMOS have been used in this report.

Place means site, area, land, landscape, building or other work, group of buildings or other works, and may include components, contents, spaces and views.

Cultural significance means aesthetic, historic, scientific, social or spiritual value for past, present or future generations. Cultural significance is embodied in the *place* itself, its *fabric*, *setting*, *use, associations*, *meanings*, records, *related places* and *related objects*. Places may have a range of values for different individuals or groups.

Fabric means all the physical material of the *place* including components, fixtures, contents, and objects.

Conservation means all the processes of looking after a *place* so as to retain its *cultural significance*.

Maintenance means the continuous protective care of the *fabric* and *setting* of a *place*, and is to be distinguished from repair. Repair involves restoration or reconstruction.

Preservation means maintaining the *fabric* of a *place* in its existing state and retarding deterioration.

Restoration means returning the existing *fabric* of a *place* to a known earlier state by removing accretions or by reassembling existing components without the introduction of new material.

Reconstruction means returning a *place* to a known earlier state and is distinguished from *restoration* by the introduction of new material into the *fabric*.

Adaptation means modifying a *place* to suit the existing use or a proposed use.

Use means the functions of a *place*, as well as the activities and practices that may occur at the *place.*

Compatible use means a use which respects the cultural significance of a *place*. Such a use involves no, or minimal, impact on cultural significance.

Setting means the area around a *place*, which may include the visual catchment.

Related place means a place that contributes to the *cultural significance* of another place.

1.6 Limitations

Research was limited to those sources available to the authors within the timeframe of the study. No physical intervention in the sites was carried out. Investigation of the brickmaking site and the former radar range and their settings was limited to visual inspection of built and natural fabric. Little detailed information on the history of the former radar calibration range was available within the timeframe of the study.

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2.0 The heritage resource

2.1 The brickmaking site

The following account of the history of the area and the brick making site is adapted from sections of the 'Archaeological Assessment, Site 3, Elizabeth Farm brickmaking Area, Central Precinct, St Marys Development, St Marys NSW' by Casey and Lowe, updated July 2014.

2.1.1 The Dunheved Estate and Elizabeth Farm

The brickmaking site is part of 'Elizabeth Farm' which was a section of the 'Dunheved' estate established by Governor King and created from grants made by Governor Bligh to King's wife and children. Occupation of the property by staff of the King family appears to date to c1807. Discussions of Dunheved typically include 'Elizabeth Farm'. Historical evidence indicates that it was used for grazing and there is no real historical evidence to say that the property was used for brickmaking although this is an expected typical activity within many early properties.

'Dunheved' homestead was probably built in the early 1820s as a brick-nogged structure[1]. John King Lethbridge and his family left 'Dunheved' about 1877 for their new house called 'Tregeare' ['Tregear'], a not dissimilar homestead which had brick chimneys, so bricks would have been required in 1876 and 1877.[2] Perhaps these were also from 'Dunheved', either newly made or from stocks held there, left over after some bricks were sent to 'Werrington' in 1871.

By 1941, when the Commonwealth was purchasing much of the former King estate, the old 'Dunheved' homestead buildings were said to be 'in such a state of dis-repair that only a conservative value can be attached to them'. The complex by the Commonwealth valuer was described as a:

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[1] Casey and Lowe, p32
[2] Ibid. p34

'Brick Cottage of about seven rooms, numerous out-buildings of weatherboard and large slab sheds'.[3]

2.1.2 Brick making at St Marys

The King family was staunchly Anglican and Governor King's widow, Anna Josepha, on her return to New South Wales, desired that a church be built for the use of her family, surrounding property owners and others in the area. To accommodate her wishes, her son, Phillip Parker King, donated land to allow the construction of the church of St Mary Magdalene beside the main western road near South Creek. This church was named after the church of the same name in Launceston, Cornwall.

On 22 November 1837 Bishop Broughton laid the foundation stone of a new church on the land given by the Kings and construction of St Mary Magdalene Church took place between this date and April 1840 when the church was consecrated by Broughton. The philanthropic King family donated the bricks for the church's construction and in the June 1920 obituary for a local identity, George Shadlow, who died at the age of 89 years, and who had talked of his father, Thomas Shadlow, he recalled how:

'He knew all about the building and opening of the Church of St Mary's Magdalene. The bricks used in the construction on the building were made on Dunheved Estate and donated by Mr King, and the carting of these was the contribution of the late Mr [Thomas] Shadlow.

The bricks were made on 'Dunheved' by a free immigrant tenant farmer, James Payne and where they are visible today under the present cement rendering are pale yellow in colour, as accords with the local clays. He made the bricks somewhere on Dunheved estate. Little is known of his activities as a brickmaker, although he is thought to have worked at some stage with a later local brickmaker named Potts.[4]

Much building took place on the five properties which constituted the King family's 'Dunheved' and acquisitions that were added to the original Concern over the years. Most of the structures that involved bricks in their fabric appear mostly to have been built on 'Phillip Farm' or on 'Elizabeth Farm' over a period of around 30 years, between 1806 and 1838. Many of these bricks were most likely made during the period that Phillip Parker King began taking an interest in the New South Wales properties at South Creek up to 1832, even though he spent little time in the colony during this period. The works were delegated to his agent Rowland Hassall to organize and his overseer on the property, William Hayes, to implement. Whilst she was in the colony, Phillip's wife Harriet was the catalyst for some of the work.

The records for the period 1807 up to 1820 are extant and so the works during this time are well-documented, although still somewhat ambiguous. During this time it is known that 2,600 bricks were ordered for use on 'Phillip Farm' for a variety of uses, mostly to repair and gentrify the earliest cottage on the site, the house of overseer William Hayes. A few of these may have been used on 'Elizabeth Farm' where the stockman's house was built in 1807 (seemingly the only building fabric apart from the two modern sheds on that farm) because the house probably had some brick fabric such as a hearth or a chimney.

More bricks could have been used in ongoing expansion of the main homestead after 1827, until Phillip Parker King moved to Port Stephens in 1839, but this does not

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[3] Ibid.
[4] Casey and Lowe, p35

appear to relate to extensive works. Tough economic times leading into a depression in the early 1840s, did not favour home extensions, so as far as is known there was no building or renovating undertaken on the homestead or any other part of 'Dunheved' during the period from the late 1830s into the 1860s. Little change to the fabric was to be expected for the next 30 years as the Robert Copland Lethbridges farmed 'Phillip Farm', and then their son John King Lethbridge followed them as a temporary measure until he could commence his own farm 'Tregeare' ['Tregear'] on the eastern side of Ropes Creek. Other resident members of the family, like the Goldfinches, did not own the property and so are unlikely to have erected any substantial structures.

After 1840 the first direct reference to bricks on 'Dunheved' comes from John King Lethbridge. These bricks are referred to briefly in 1871 as being transported by Lethbridge from 'Dunheved' to 'Werrington'. Few bricks seem to have been carried and there were no repeat trips noted. They are most likely, therefore, to have been bricks left over from a previous phase of building on 'Dunheved'. Only those bricks made especially to construct the philanthropic donation of St Mary Magdalene Church to the community, between 1837 and 1840, are firmly and directly documented by a contemporary source, as actually made on 'Dunheved'. George Shadlow had made it well known locally before his death that he remembered the construction details, and knew the bricks to have been 'made on Dunheved Estate'.

Word of mouth recorded in the local newspaper from descriptions given by a man who remembered the church's erection, gives a firm basis for the belief that bricks were made on 'Dunheved' for the construction of the Church of St Mary Magdelene at St Marys. A site study of the bricks at the church confirm the compatibility of the bricks in their colour and size with those found at Site 3. No historical documentation has been found, however, to confirm that 'Elizabeth Farm' on 'Dunheved' was the site of this activity, however the bricks on Site 3 site on 'Elizabeth Farm' are consistent with the 1837–1840 bricks made on 'Dunheved' and used to build St Mary Magdalene church.

The likelihood of 'Elizabeth Farm' being a site for estate brickmaking is also suggested by the lack of agriculture and house sites there during the period in question, as well as its proximity to the 'Dunheved' homestead complex where the earliest bricks were mostly used. On the other hand, on the 1869 estate map, there is only one relevant annotation. To the southeast of 'Dunheved' homestead, close to the west bank of Ropes Creek, there is an area marked 'yellow clay'. Between this area of clay deposit and the creek there is a smallish enclosure.

The Ropes Creek site has the advantage of being close to a reliable water source and water was essential to puddle the clay. Site 3 is less well placed, some distance from South Creek, but it was not without a seasonal water supply in the 19th century. Two small tributary creeks running south and east through this sector of 'Elizabeth Farm' are shown in faint pencil on the 1869 estate map and their junction is close to Site 3.

Because of land movements after the Commonwealth acquired the land, the line of these original small watercourses is now obscured, and the ground modified by modern earthworks. No bricks can be brought to hand to offer additional confirmation of the use of bricks made on the property with regard to 'Dunheved' homestead, its outbuildings and the men's houses. Likewise, the identities of brickmakers employed by the King family in the period up to 1814 have proved elusive, although it is known there has always been an abundance of clay on 'Dunheved' and the surrounding areas suitable for brickmaking. The three

brickmakers known by name (Morgan, Webb and Payne), and the one brick-layer (Rope) who are associated with the building work on 'Dunheved' have no specific recorded location for the origin of their bricks.

The exact date that bricks were first used in chimneys on the estate is likely to have been during or soon after 1806 but nowhere has mention been found, at this time, of where the bricks were made. It is likely the bricks were manufactured on the 'Dunheved' property as the necessary clay existed on all the farms there including 'Elizabeth Farm', and self-sufficiency was usual on large Concerns. The contemporary dwellings built by John Stogdell and Andrew Thompson used bricks made nearby at Windsor.

This, however, does not rule out the possibility that the bricks were made elsewhere locally, for they would then have still been made from similar clays and could have been made by one of the brick makers at nearby Castlereagh. The sandstock bricks known to have been made in the St Marys district and surrounding areas, like Castlereagh, are pale yellow to yellowy-pink in colour, flecked with impurities like grass and small stones. The names of the early Castlereagh brick makers are unknown, but their handicraft survives, as, for example, at 'Minnaville'.

Brickmakers in the Castlereagh area or the adjoining district of Hawkesbury in private employ at that time were rare. Some of the houses on the nearby Castlereagh plain in the early Macquarie period were the brick-nogged 'Hadley Park' (circa 1812), the Reverend Samuel Marsden's house 'Mamre' nearby and William Cox's 'The Cottage' at Mulgoa. The last-mentioned were both built around the time of the renovations to Hayes' cottage at 'Dunheved', or possibly a little later.

Later, in the district, bricks with a frog shaped in the form of a 'P' (or possibly an 'R') were made in the St Marys district. In this form, a single initial usually indicates the brick maker's surname and it was a most common form of identification in the 1840–1850 period. Only two brick-makers have surnames beginning with 'P' and one of these is James Payne. The other is Potts, with whom Payne is thought to have worked for a time. These bricks are also the distinctive local colour.

Site 3 is therefore a possible site for local brickmaking from 1806 to 1840, and to a lesser degree after that. The lack of agriculture and the lack of houses on 'Elizabeth Farm', and particularly this low part of 'Elizabeth Farm', make it hard to postulate a residential site. For industrial purposes, it benefited from easy access to seasonal water nearby and the substantial remains of early bricks on the site are compatible with those known to have been made by James Payne in the late 1830s. It is also quite close to the 'Dunheved' homestead complex where most of the need for bricks was generated in the early period, and to the 'Elizabeth Farm' stockman's cottage of 1807 which likely had a brick chimney and hearth.

2.2 The former naval radar calibration range

2.2.1 Location of the radar range

The former Naval Radar Calibration Range (the Range) is located within the former Australian Defence Industries (ADI) site at St Marys, west of Links Road St Marys, on the western side of South / Wianamatta Creek and approximately 2 km west of the Ropes Crossing Shopping Centre. The remaining structures are located partially within the area designated for the proposed Wianamatta Regional Park to be managed by the NSW National Parks & Wildlife Service / Office of Environment and Heritage, and partially within the area designated as Regional Open Space to be managed by Penrith City Council.

Figure 2 Location of the former naval radar calibration range (edged blue). (Source: Google Maps / Eco Images Pty Ltd)

2.2.2 Function of the radar range

It appears that the former Naval Radar Calibration Range was operated by ADI's Technology Group, responsible for radar and signals. During the 1960s and '70s, the Royal Australian Navy calibrated the radars of Australian warships at the former range which employed cut-out brass or copper profiles or models of Australian naval ships to model their magnetic signatures.[5] These were then used to train radars to recognise Australian naval assets on radar screens. Other ancillary Defence activities carried out on the range included the environmental testing of items relating to temperature, weight, "shake, rattle and roll".[6]

It is understood that there are at least two model ships associated with the St Marys calibration facility thought to be in either private or public ownership. One may be held at the Royal Australian Navy Heritage Centre at Garden Island.[7] No model ships remain on site at the calibration facility.

It is understood that the National Parks and Wildlife Service intends to commission further historical research of the radar range and it is possible that archival material relating to the site survives in Lend Lease archives inherited from ADI.[8] No images of the hoop and radome in their original, intact condition have been located to date and precisely how the hoop antenna and the other structures surviving on the radar range site, including various sheds and towers, were interrelated requires further research.

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[5] NPWS 2001
[6] Npwas 2007
[7] NPWS 2011
[8] David Aynsley, pers.comm. 16 December 2014

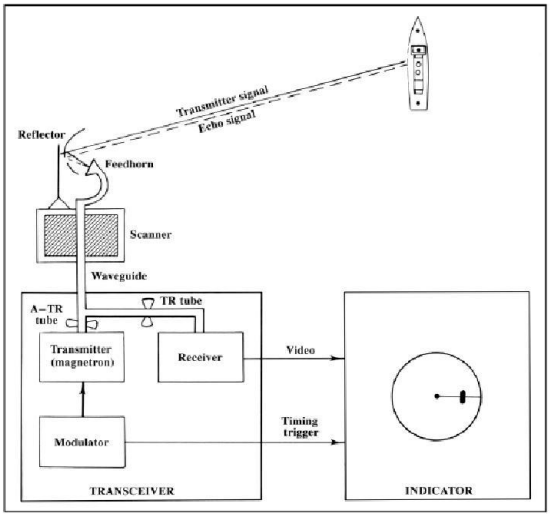


Figure 3 Diagram of a typical radar system. (Source: Wikipedia)

2.2.3 Archival photographic recording of the radar range

In May 2014 Eco Images Pty Ltd prepared an archival photographic record of the former Radar Calibration Range for NSW National Parks and Wildlife Service, Office of Environment and Heritage in accordance with the OEH Heritage Branch guidelines, *Photographic recording of Heritage Items Using Film or Digital Capture (2006)*.

Figure 4 Air photo showing the location of the surviving structures on the Naval Radar Calibration Range, with the concrete slab and hoop marked as W04. (Source: Google / Eco Images Pty Ltd)

Structure name[1]	Material / description	Dimensions[2]
W04 Hoop antenna	Concrete base, hoop antenna and cables attached to two anchor points, cable guide.	Concrete area Approximately 34m x 22m
W01 North	Metal platform tower on concrete base, with ladder to access platform.	Footprint area, Approximately 6m x 6m
W01 South	Metal platform tower on concrete base, with ladder to access two platform levels.	Footprint area, Approximately 4m x 4m
W02 North	Concrete base (ground and level one), tin sheeting (level two), stairs to level one and two.	Footprint area, Approximately 4m x 4m
W02 South	Concrete structure, (three levels), stairs/ladder to level one and two.	Footprint area, Approximately 2m x 2m
Electrical wiring pit	Stainless steel on concrete base, with electrical box.	Footprint area, Approximately 4m x 11m
East Tower	Metal tower on concrete footings, with electrical box.	Footprint area, Approximately 2m x 2m
West Tower	Metal platform tower on concrete footings, with ladder to access a platform.	Footprint area, Approximately 2m x 4m

Figure 5 Table showing the description and dimensions of surviving structures on the Naval Radar Calibration Range. (Source: Eco Images Pty Ltd)

2.2.4 Structural assessment of the radar hoop

In October 2014, at the request of Lend Lease, structural engineers Cardno conducted a structural condition assessment of the W04 Hoop Antenna at the former Naval Radar Calibration Range. Due to the height of the structure a trailer mounted boom crane was used to observe various structural elements of the W04 Hoop Antenna. It was observed that at various locations along the timber arch significant termite / borer damage was present and appears to pose a threat to the stability of the structure. Whilst the timber sections of the structure were heavily damaged and unsalvageable various other structural components such as the bracing cables, anchor blocks and steel connection gussets were in a reasonable condition and may be retained. Based on Cardno's observations they believe for the most part, the structure is generally beyond economical repair and they would recommend that the structure be dismantled.

JMD Design has been advised[9] that there has already been a DA approval for the removal of the Hoop Antenna (The Radar Range) Central Precinct, where the removal of the Antenna is dependent on the Interpretation Strategy.

The DA for the removal of the hoop antenna requires:

> *'Within 3 months of the commencement of works, an Interpretive Strategy for the re-use, relocation or adaption of the salvageable components of the Hoop Antenna, as identified in the Structural Assessment Report prepared by Cardno dated 23/10/14, is to be submitted to Council. The salvageable components should be reused elsewhere within the Central Precinct.'*

[9] Isabel Sanders pers. comm. 7 January 2015

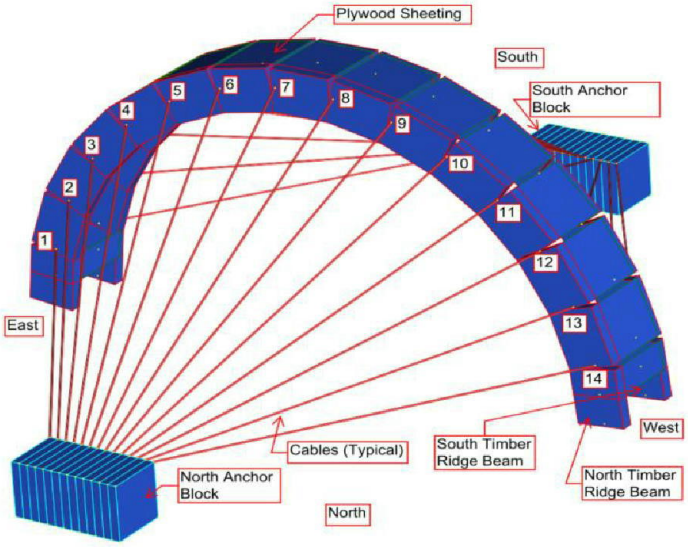


Figure A1. Northern face structure key diagram.

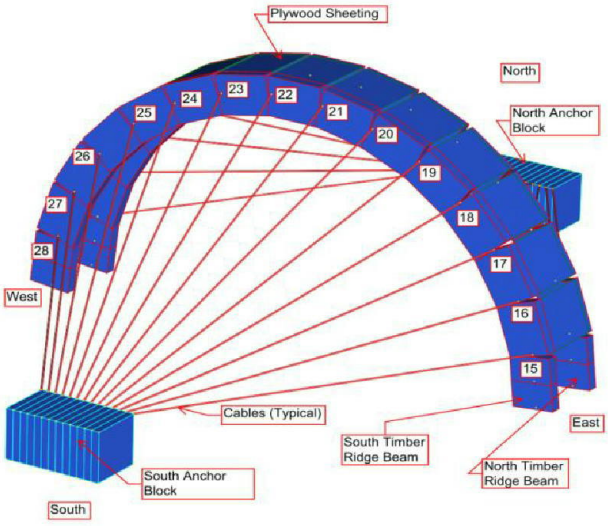


Figure A2. Southern face structure key diagram.

Figure 6 Key diagrams showing the northern (upper illustration) and southern (lower illustration) structural elements of the radar hoop W04. (Source: Cardno)

3.0 Interpretation opportunities

3.1 What is interpretation?

Interpretation has been defined by the NSW Heritage Office as:

> *"all the ways of presenting the significance of an item. Interpretation may be a combination of the treatment and fabric of the item; the use of the item; the use of interpretive media, such as events, activities, signs and publications, or activities, but is not limited to these".*

In its Heritage Information Series, the Heritage Office published *Interpreting Heritage Places and Items: Guidelines* and a *Heritage Interpretation Policy Statement.* Underpinning the Heritage Council's policy and the Australia ICOMOS Burra Charter is the acceptance that:

> *"heritage interpretation is an integral part of the conservation and management of heritage items and is relevant to other aspects of environmental and cultural management and policy".*

The Heritage Council policy adds that:

> *"heritage interpretation incorporates and provides broad access to historical research and analysis and provides opportunities to stimulate ideas and debate about Australian life and values, and the meaning of our history, culture and the environment".*

There is little point in conserving places or things if no-one is aware of why they're important and should be retained and protected. Interpretation to identified target audiences and the wider community should explain why a place is significant and why it should be conserved, in ways that are informative, stimulating and culturally appropriate. While all the heritage values of a place need to be interpreted, it is often the landscape elements and how built elements sit in the landscape that make it easier for people to be able to 'read the landscape' and understand how the place has evolved over time.

Existing material in various publications helps to explain the history of the St Marys Central Precinct but it is scattered and variable in extent and veracity. Community awareness and understanding of the significance of the place could be enhanced through implementation of this Interpretation Strategy and development of a more detailed Interpretation Plan which communicates the heritage significance of the place and its setting, in the context of the cultural landscape history of the Penrith City and Blacktown local government areas and NSW generally.

Revealing previously hidden elements and fabric as part of redevelopment of the Central Precinct can be part of interpretation in this context. Relocated fabric can demonstrate significant events / changes of practice, etc. over time. Where such occurs, interpretation on site can assist in the understanding of the original and later uses of the place.

Interpretation measures for the brick making site may include physical site elements (such as the archaeological remains of the brick kilns, bricks and brick fragments, the likely clay source in the banks of the nearby creek and other landscape features), which interpret past features as well as archival material such as historic maps, photographs and written accounts.

3.2 Interpretation Policies

The following policies are provided to guide the interpretation of the brick making site and the former Naval Radar Calibration Range.

1. Measures to interpret the cultural heritage significance of the brick making site (Site 3, Central Precinct) and the former Naval Radar Calibration Range (proposed Wianamatta Regional Park / Regional Open space) should be incorporated into any conservation and development proposals for the precincts.

2. An Interpretation Plan should be prepared ahead of any sale of land in accordance with Heritage Council policy and guidelines and submitted for approval by the Heritage Council, Penrith City Council and other stakeholders before any site or building works commence on the precincts.

3. The Interpretation Plan should be prepared by suitably qualified interpretation specialists experienced in significant heritage landscapes.

4. The communication of the significance of the sites to future residents, other specific audiences and the wider community should employ culturally appropriate mechanisms that do not detract from the heritage values of the place or offend cultural sensitivities. These may include but are not limited to the following:

- interpretation by design of new structures and their hard and soft landscaping;
- naming of internal roadways and buildings;
- printed and web-based publications;
- interpretive signage;
- inclusion on guided or self-guiding walking tours of the area;
- public artworks;
- applications for portable electronic media.

5. Way-finding, informational, interpretive and safety signage should be designed in accordance with a style guide that indicates appropriate types of signage for particular parts of the precincts and their settings, including sympathetic locations and fixing methods that result in minimal intervention in or impact on heritage values.

6. Preservation, restoration and reconstruction of key significant landscape views, elements, spaces and fabric are the preferred methods of meaningfully interpreting important attributes and associations of the place. Where adaptation is part of the conservation and redevelopment process, measures should be incorporated to show the location, character and / or role of removed or altered elements, where appropriate, so that all phases of the place's history can be readily understood.

7. Appropriate measures to interpret the history and significance of the precincts as a whole should be incorporated into any future proposals for the development of the precincts and adjoining lands.

8. The original and subsequent configurations of the places, where known, should be interpreted appropriately on the site. Any future alterations and additions should be designed and constructed in a way that preserves and preferably enhances the interpretation of the places. Deliberate differences in

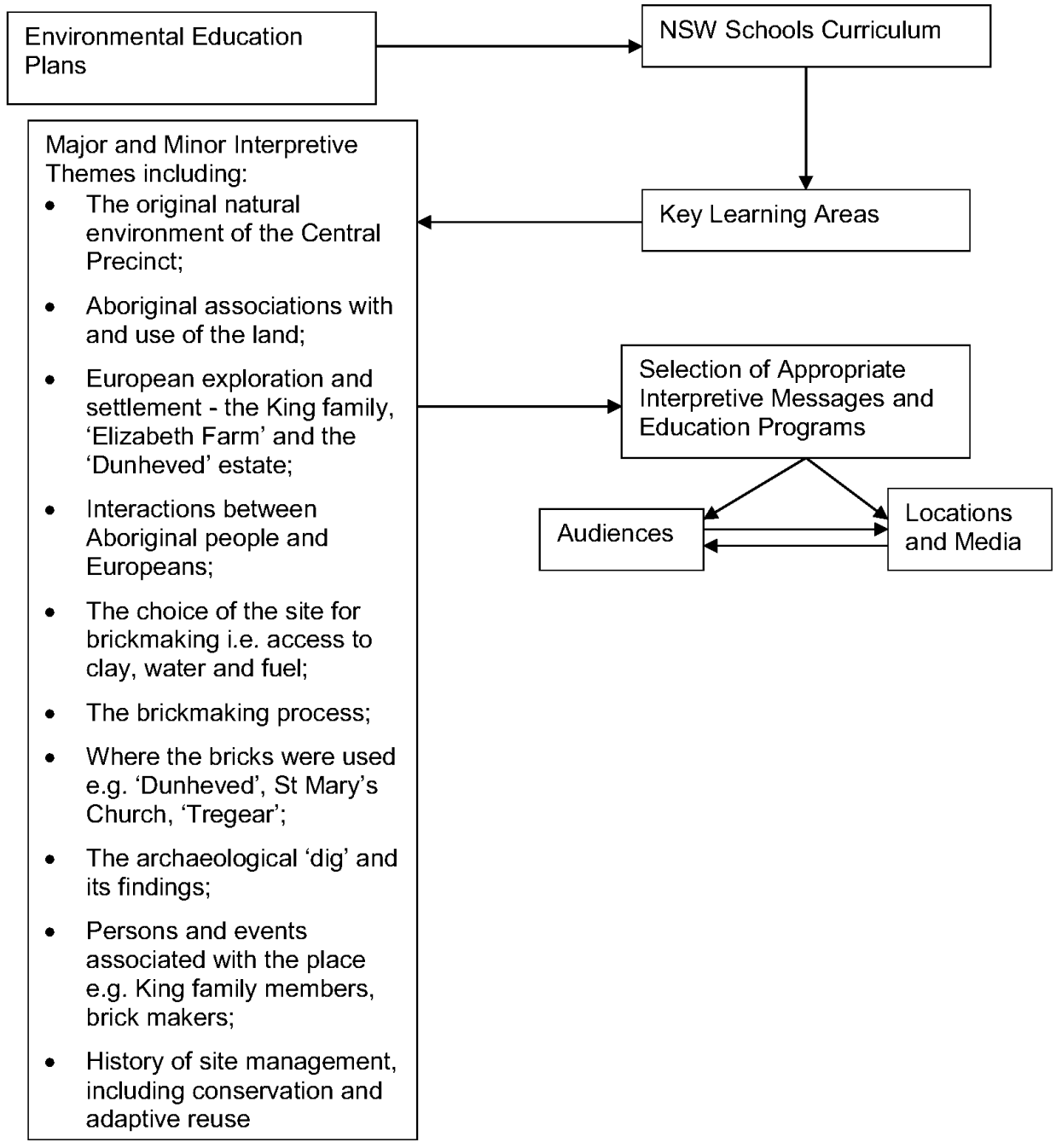
design and finish within the places that reflected developments and changing uses over time should be interpreted.

9. Original, early and more recent elements within and around the precincts should be interpreted in such a way that the historical phases of the places' evolution from natural environment through Aboriginal occupation and European settlement to the present day can be readily understood.

10. Information about the places, including this report and the progressive records of information derived from intervention in the fabric should be deposited in a public archive where it can be accessed by the community.

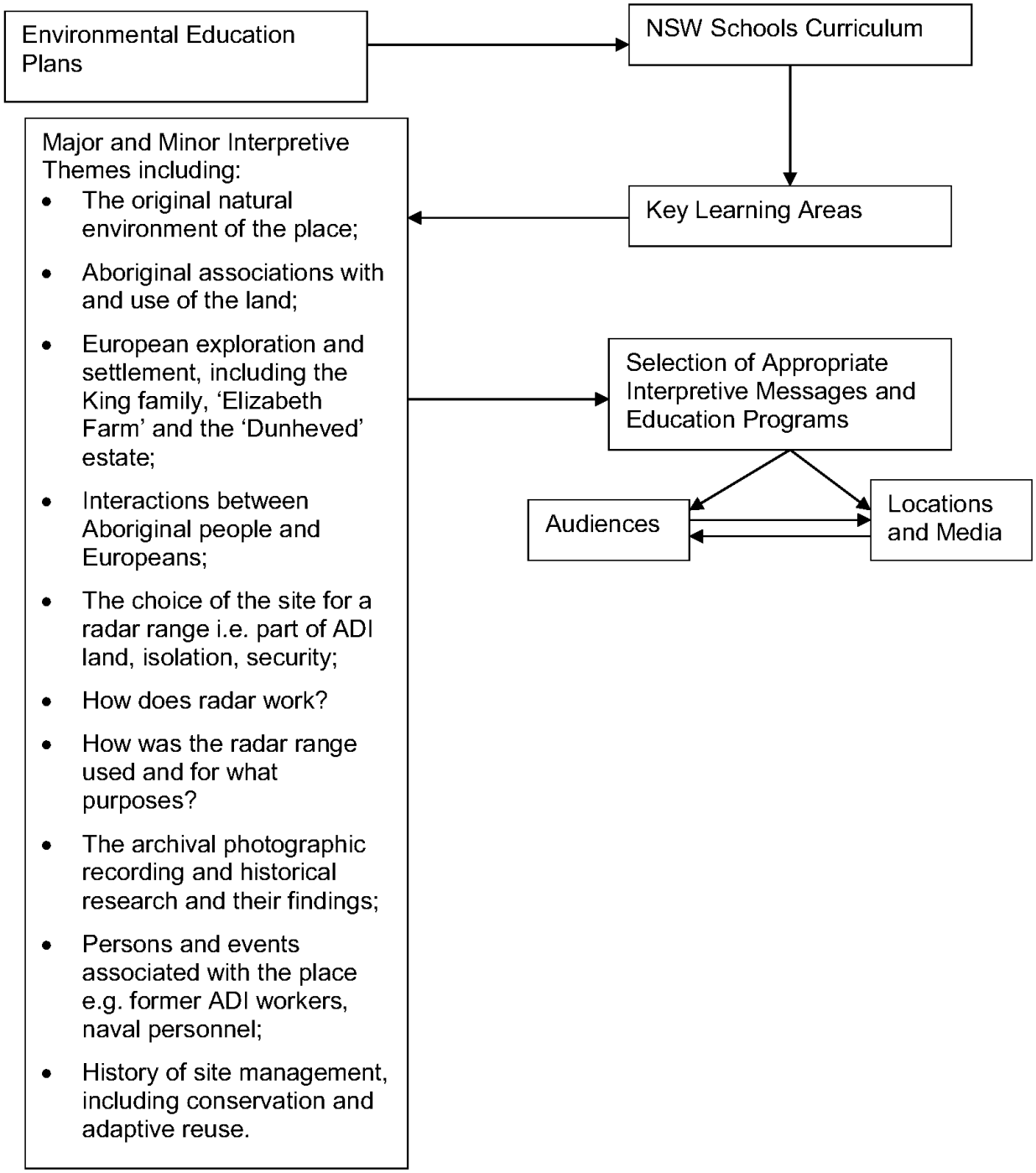
3.3 A suggested framework for the brickmaking site

A suggested framework for the Interpretation Plan for the brick making site is shown in the diagram below.



3.4 A suggested framework for the radar range site

A suggested framework for the Interpretation Plan for the radar range site is shown in the diagram below.



4.0 Some interpretive options for the brickmaking site

This section provides some options for the interpretation of the brick making site.

4.1 The brick making process

The following summary of the likely brick making process used at the St Marys brick making site is adapted from Ringer (2008, pp13 et seq.).

4.1.1 Pugging the clay

The sodden mass of raw clay would have been won from the banks of the nearby creek and crushed and kneaded into a lumpy texture using the ends of small tree trunks or bare feet. Settling pits may have been created to catch any slurry arising from this process. Stones and plant material would have been removed from the clay to reduce the risk of the bricks cracking during drying or firing. The 'puddled' or 'pugged' clay was left to stand or 'prove' for up to five days. While hand pugging was used in country areas until the late 1840s in NSW and possibly throughout the years of operation of the St Marys site, in urban areas and larger country brick making sites, pug mills driven by horses were used to speed up the pugging process.

4.1.2 Moulding the clay

When the pugged clay was ready for moulding, the heavy, water-staurated mass was carted a short distance to a bench known as a stool, probably made of wood and about 2 metres x 1 metre in size, standing about 1 metre above the ground. Some moulding tables had wheels attached to two of the four legs to make it easier to move the table closer to the source of the clay.

Brick moulding was usually carried out under a rough open-sided timber shelter about 5 metres square, supported on wooden posts and clad with thatching of reeds or covered with bark. Safely under cover and shielded by matting hung from the eaves, the brick maker was protected from the harsh summer sun and was able to work through rainy periods. The matting also helped to prevent hot winds from drying out the clay during the summer months. Small heaps of sand were placed at opposite ends of the moulding table, next to which stood a barrel or water in which a strip of timber, the 'strike' was kept.

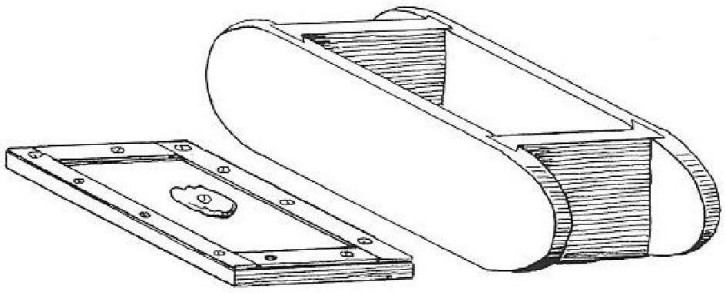


Figure 7 A wooden mould (right) and stock board (left) of a type widely used by hand brick moulders in NSW into the 20th century. (Source: Ringer p14)

The brick mould was a bottomless box slightly deeper than the height of a finished brick. The extra depth allowed for a removable base about 25 mm thick, called the 'stock board', to be fitted snugly into the bottom of the mould. Slightly larger than the base of a finished brick, the stock board was often fitted with a 'kick' which was used to form a depression or 'frog' in the brick. The frog served to identify the brick maker

and also enabled the mortar to bind more effectively with the brick during brick laying. The top edges of the mould were lined with metal strips to prevent wear when the strike was scraped across them during moulding.

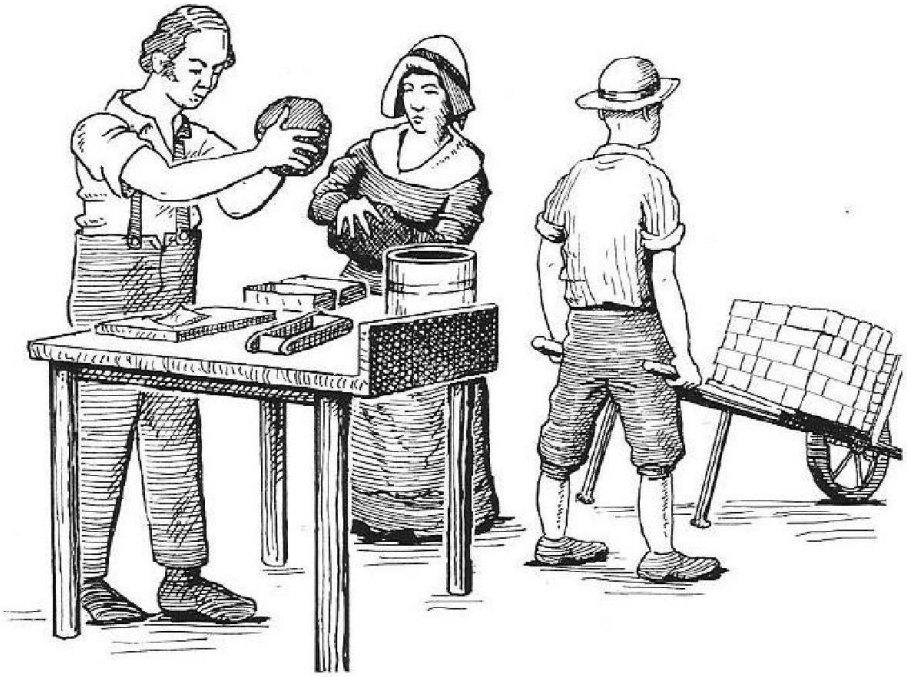


Figure 8 A family at work moulding sandstock bricks at a timber bench and delivering them on a barrow to the hack for drying. (Source: Ringer p14)

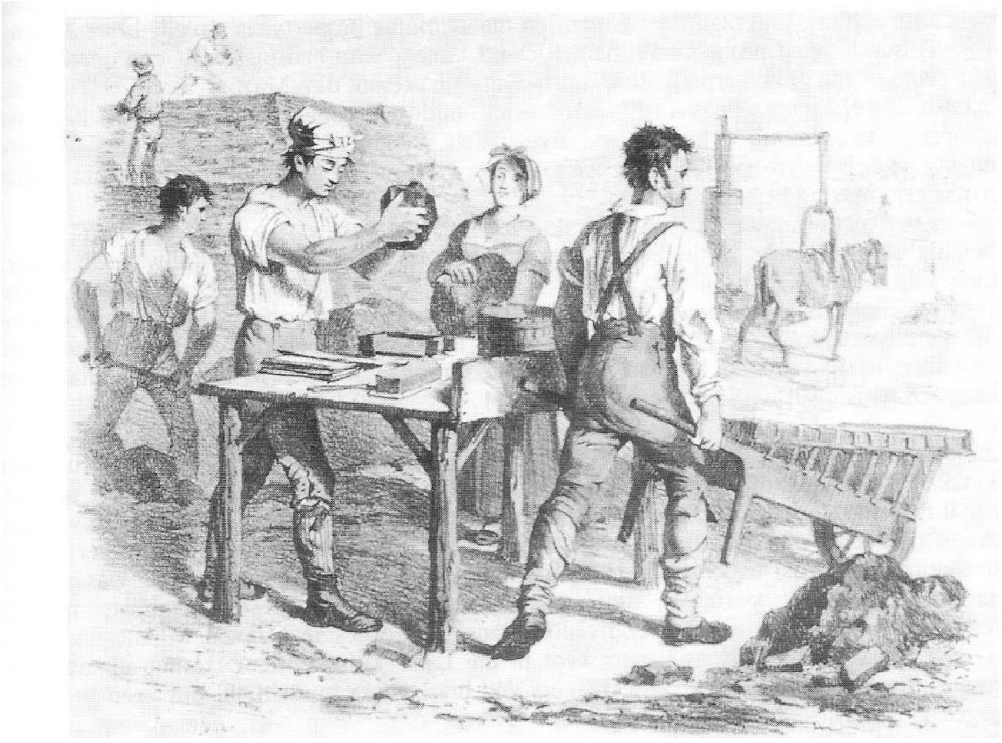


Figure 9 Brick makers at work in England in the early 19th century. The woman is 'rolling the walk' (carrying a load of clay from the horse-driven pug mill in the background); the brick maker is about to throw a clot of clay into the mould and green bricks are being wheeled to the hack for drying. (Source: Peek and Pratten p1, from Woodforde 1976, *Bricks to build a house*).

4.1.3 Sandstock bricks

The process for brick moulding used at St Marys used sand as a lubricant to slip the formed clay from the mould, hence the term 'sandstock bricks'. The brick maker sprinkled the stock board and mould with sand before positioning the mould over the stock board. The clot moulder then dusted the table with sand a picked up a 'clot', a piece of clay slightly larger than the finished brick. Kneading the clay into the rough shape of a brick before rolling it in sand, the moulder passed the doughy lump to the brick maker who threw it forcefully into the mould. The clot was pressed deep into each corner of the mould to ensure a straight edge, later referred to as an 'arris(s)' with the advent of dry pressed bricks.

Any superfluous clay was removed by drawing the strike across the top of the mould, the residue being thrown back onto the heap of clay ready for re-use. The mould and its contents – the un-fired brick – were taken from the stock and placed on a pallet with the frog facing downwards. A sharp tap was sufficient to detach the formed brick, leaving the mould free to receive another clot of pugged clay. Unfired or 'green' bricks as they were called, were left to dry until they could be handled without the loss of shape. A simple test was performed by pressing upon them with the finger which, in theory, left no marks. Occasionally, a brick would fail to slide ut, requiring the brick maker to push it free, leaving thumb, finger and hand impressions in the bed and head of the bricks. Thumbprints in particular may also have been made deliberately as tally marks by the overseer to record the number of bricks produced by a convict worker in the course of the day.

4.1.4 Drying the green bricks

At the St Marys site, after they were moulded into shape, the green bricks were then probably loaded directly onto a barrow and taken by the 'wheeler' to the drying area, or 'hack'. Brick barrows fitted with a wheel made of iron or steel were in continuous use from the earliest days of the colony of NSW to the 1930s. At the hack, bricks were unloaded and placed on the ground using two wooden paddles – 'clappers' – intended to avoid damage to the arrisses of the soft brick. Bricks warped through frequent handling were re-shaped using the paddles. Each brick was then laid at an angle ('skintled') to the run of the hack, with a small space left between each brick to aid the drying process. The first row of bricks was skintled in one direction and the second in another to stabilise the structure and to ensure the bricks had equal distribution of weight.

Once the load of bricks on the hack had reached eight courses it was covered by reeds to protect against rain and the sun. Depending on the season, bricks were left to dry for anything up to a fortnight, or until they were ready for burning. In the summer heat two or three days were sufficient. During their time in the hack, bricks were often marked by the paw prints of domestic animals or local fauna such as possums.

4.1.5 Clamp kilns

In the early days of the colony of NSW and in isolated sites such as that at St Marys, the traditional method of building one-off kilns – 'clamps' – was used, although it was greatly modified by individual brick makers. Clamps are the oldest and most basic method of firing bricks are still in use today around the world, especially in third world countries. Clamp kilns were cheap and easy to construct although it took great skill to build an efficient clamp kiln. Clamps were built on slightly higher ground to allow for adequate drainage. The base was compacted into the shape of a dish, so that

when burning the clamp would tend to lean inwards, which maintained structural integrity.

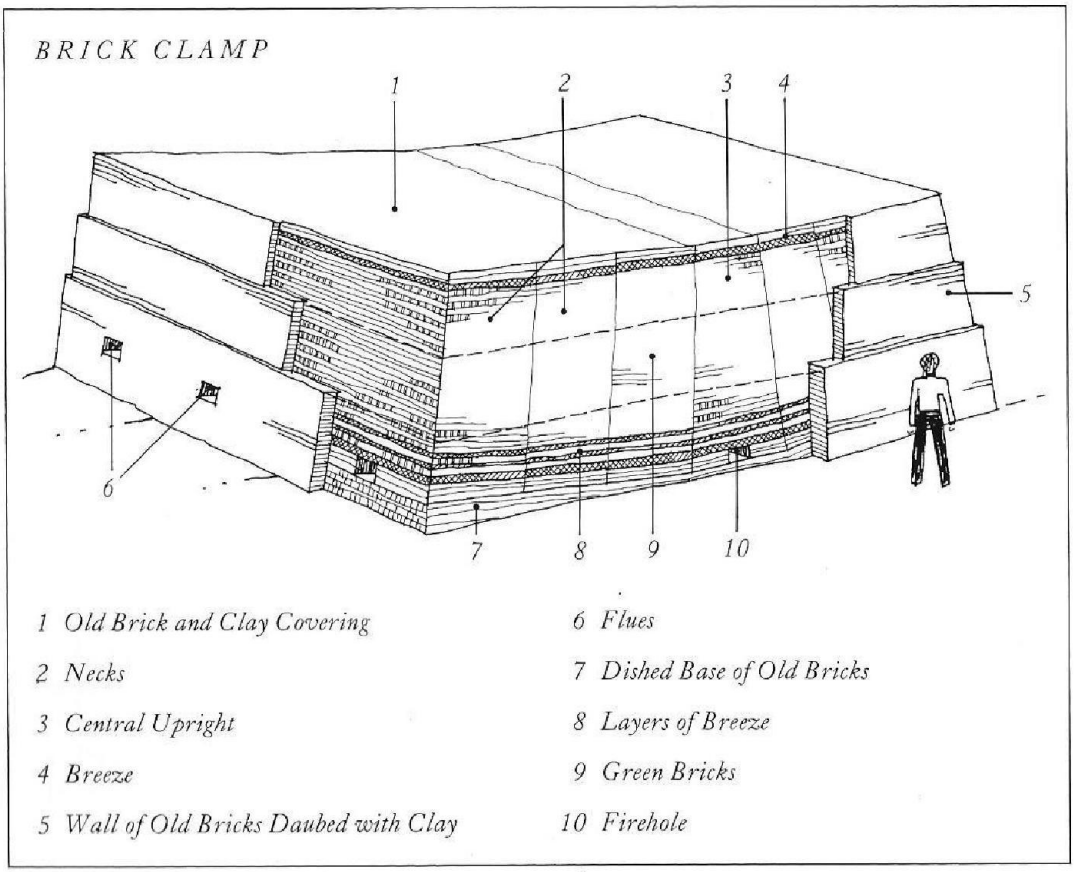


Figure 10 Sketch of a clamp kiln showing the various components. (Source: Plumridge and Meulenkamp, p167).

Generally, a solid foundation of fired bricks was laid, placed diagonally and on edge. The next two courses were made up entirely of green bricks on edge, laid parallel to the sides to form a heat seal. In the lower part of the kiln stoking tunnels ('flues') were created at regular intervals from one to three metres apart. Packed with timber fuel, charcoal and cinders, the flues were used to light the fires in the clamp as well as replenish the fuel supply. Air for combustion also entered through these holes at the base of the clamp. As the clamp evolved, combustible material was scattered between the individual brick courses. Soon the clamp began to assume its familiar shape as rows of green bricks took shape, alternating as headers and stretchers in regular intersecting rows, and sealing the flues in the interior. At the base, a clamp could measure about 8 metres in length by 6 metres wide. At the top, allowing for the tapered effect, the clamp was slightly smaller at 7 x 5 metres, the finished clamp standing three to four metres high. Sometimes an external covering of daubed clay was applied to the clamp to conserve heat, in which case the structure was referred to as a 'scove' clamp or kiln.

4.1.6 Firing the clamp

Initially fire in the clamp was kept low by careful control of the draught, which brought the mass of green bricks slowly up to firing temperature. When the fuel was well alight, the entrances were sealed with bricks and plastered with clay. Fissures would form in the clay plaster as it dried, permitting the entry of air necessary for

combustion. If the fire appeared to dampen in part of the clamp, then flues could be re-opened and additional fuel poked into the heart of the clamp.

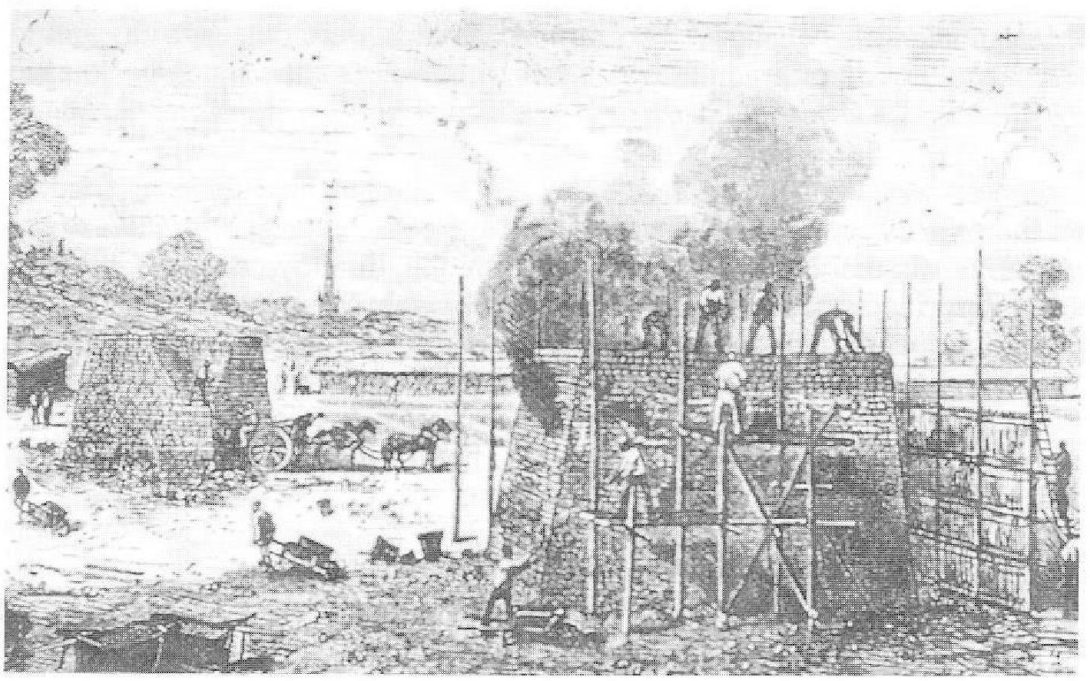


Figure 11 Bricks being fired in clamp kilns in northern France. (Source: Peek and Pratten p. 6, from Woodforde 1976, *Bricks to build a house*).

A pall of dense white vapour would often settle over the brick making site at this stage of the firing process, due to the evaporation of moisture from the green bricks via the top of the clamp. After about three or four days clear air would issue, indicating the bricks were dry and that firing at full heat could proceed. After about a fortnight, or when the brick maker judged the bricks to be properly burned, the fire was quenched and the clamp allowed to cool for a week or more.

4.1.7 Limitations of clamp kiln brick making

Each clamp was a one-off kiln, which had to be demolished to enable removal of the fired bricks. Also, clamp burning tended to produce bricks of extremely variable quality and colour, so that with the exception of bricks fired at the centre of the clamp (which could have vitrified surfaces due to the higher temperature), few bricks were uniform. Due to temperature variations within the clamp, up to 20 per cent of bricks produced by a basic clamp were either over- or under-fired. Over-firing fused the clay and sand sprinkled between the wet bricks to prevent them from sticking between the wet bricks to prevent them from sticking to each other. The result was that these bricks were glass-like or vitrified on the outside but brittle on the inside. Bricks stacked nearer the flues and fuel supply were often distorted, which produced ‘clinkers’. On the other hand, bricks from the outer face of the clamp were soft and underburnt, creating the pleasant light-brown or salmon-coloured bricks, termed ‘callows’ or doughboys’. Since brick makers could exercise no control over the rate of burn during the actual firing, clamps were extremely inefficient users of energy and heat quickly dissipated into the atmosphere during firing and cooling. By about the 1850s in NSW, clamp kilns were being replaced by more efficient Scotch kilns (also known as updraught or open kilns) in which green bricks were loaded inside permanent walls and intense heat could be applied more uniformly for a certain length of time, producing much more uniform bricks.

4.2 Conservation and interpretation in situ

The archaeological resource at the brickmaking site is restricted to the outlines of the former clamp kilns on the ground, with some remnant bricks and soil colour variations indicating the locations of the fires and temperature variations. Numerous bricks lie in scatters, in an area where bricks were stored and on palettes used for sorting various brick types recovered from the site. In one location, wheel ruts indicate where a wagon or barrow was used to transport material to or from a kiln. The likely source of clay for the brick making is in the banks of the nearby creek but the landform has been altered by earthworks, floods and erosion. Trees would have been cut down to provide fuel for the kilns and the current vegetation on site is relatively recent regrowth.

Figure 12 Panorama of the part of the brick making site showing the terrain and vegetation cover. High voltage power lines are visible at right. The blue tarpaulins are used to protect the archaeological excavation sites from rain. (Photo: Chris Betteridge, 18 November 2014)

Conservation of one or more of the kiln sites in situ with appropriate interpretive devices would be desirable but the fragile nature of the archaeological remains and their susceptibility to surface erosion militates against this option. The sites would need to be stabilised and covered with some form of structure, enabling visitors to observe the kiln remains but not walk on them. A simple protective cover could be in the form of a tent, shade structure or marquee but a structure that marks the significance of the site may need to be more substantial in form and materials. Prevention of vandalism would be a major management issue.

Figure 13 Archaeologists recording an excavated area of the brick making site. (Photo: Chris Betteridge, 7 November 2014)

Figure 14 Excavation to show potential source of clay for the brick making site. The archaeologists engaged a soil scientist to advise on the soil profiles of nearby sites and the likelihood of them being the source of the clay for the brick making. (Photo: Chris Betteridge, 7 November 2014)

Figure 15 One of the clamp kiln sites showing the black smudges indicating the locations of the fires. (Photo: Chris Betteridge, 18 November 2014)

Figure 16 Some of the brick fragments excavated from the brick making site. (Photo: Chris Betteridge, 7 November 2014)

Figure 17 Stanford University archaeologists work under an arched canopy at Catalhoyuk, Turkey. An arched structure such as this could be used to protect one or more kiln sites and allow them to be conserved and interpreted in situ.
(Source:
https://www.google.com.au/search?q=canopies+over+archaeological+sites&biw=1024&bih=672&tbm=isch&tbo=u&source=univ&sa=X&ei=vlRuVJHiFYG3mgXwoIDQBg&ved=0CDQQ7Ak#facrc=_&imgdii=_&imgrc=Tjy5PZA45huAIM%253A%3BB2hFxy-WSyMnGM%3Bhttp%253A%252F%252Fcdn.phys.org%252Fnewman%252Fgfx%252Fnews%252Fhires%252F2012%252Fstanfordarch.jpg%3Bhttp%253A%252F%252Fphys.org%252Fnews%252F2012-01-stanford-archaeologist-role-human-rights.html%3B414%3B275)

Figure 18 A Roman archaeological site (thermal baths, forum and domus) in Molinete Park at Cartagena, Spain, protected under a canopy designed by ACM Arquitectura and within a fenced area, allowing visitors to observe the remains without intruding on them. The timber boardwalk is suspended from the canopy. Perforated steel plates sandwich the long-span structure to create a solid white cover during the day and a glowing lantern-like cover at night. This is another example of conservation of an archaeological site under a canopy. (Source: https://www.google.com.au/search?q=canopies+over+archaeological+sites&biw=1024&bih=672&tbm=isch&tbo=u&source=univ&sa=X&ei=vlRuVJHiFYG3mgXwoIDQBg&ved=0CDQQ7Ak#facrc=_&imgdii=_&imgrc=2ueTfGIs3mj03M%253A%3BZdSmxYKXk3rT_M%3Bhttp%253A%252F%252Fwww.bdonline.co.uk%252FPictures%252Fweb%252Fz%252Ff%252Fn%252FCartagena-047DFRwe_590.jpg%3Bhttp%253A%252F%252Fwww.bdonline.co.uk%252Fcanopy-for-roman-site-cartagena-spain-by-amann-c%2525C3%2525A1novas-maruri-architects%252F5033819.article%3B590%3B463

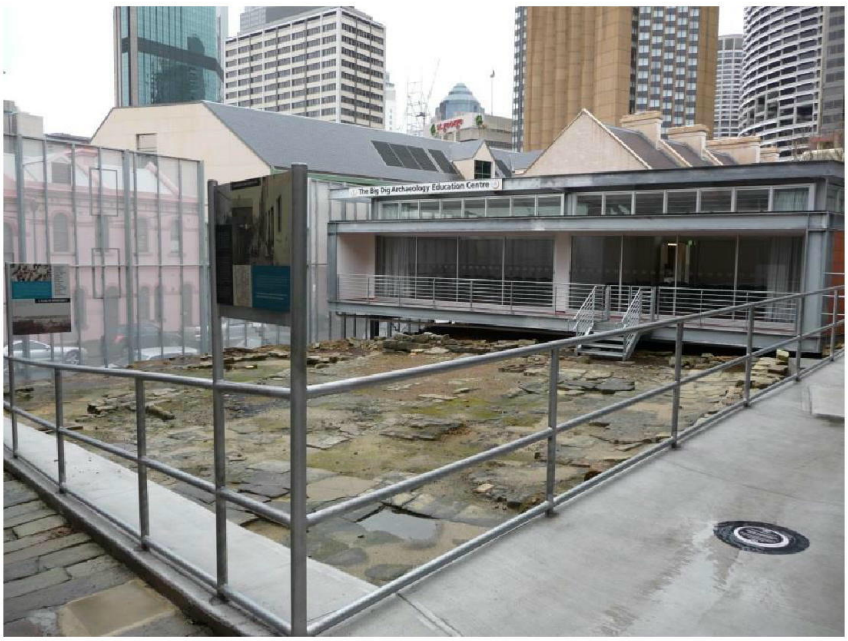


Figure 19 The Big Dig Archaeology Education Centre, The Rocks, Sydney. Excavated footings have been retained in situ and artefacts won from the site are displayed indoors. (Photo: Chris Betteridge, 10 august 2010.

Figure 20 Display at The Hills Council offices, Bella Vista of early sandstock bricks from various historic sites in NSW including Elizabeth Farm House and St Johns Cemetery, Parramatta. This exhibit demonstrates the range of colours, frogs and other marks found in early colonial bricks. (Photo: Chris Betteridge, 12 January 2015)

4.3 Incorporation of interpretation into park design

An alternative to conservation of the archaeological resource in situ would be interpretation by design. The outlines of kilns could be interpreted by hard landscaping in the form of different paving materials, with remnant bricks and brick fragments contained in gabions, subject to conservation advice on their long-term survival, and used as seating or as locations for interpretive signs. The form of a clamp kiln could be constructed as a frame to give visitors an understanding of such structures. Examples of different paving materials to indicate the locations of former structures and the use of gabions to contain brick fragments are shown in the images below.

Figure 21 At the abandoned Mediaeval village of Wharram Percy in North Yorkshire, United Kingdom, pebbles and kerbs have been used to illustrate the layout of an archaeologically excavated building. (Source: *Ideas for interpreting heritage places: Bored of boards*)

Figure 22 Variety of paving materials used to interpret former structures within one of the yards at the Cascades Female factory, Hobart, Tasmania. (Photo: Chris Betteridge, 30 November 2014)

Figure 23 Use of Corten steel plate and gravel to interpret the locations of former structures within one of the yards at the Cascades Female Factory, Hobart. (Photo: Chris Betteridge, 30 November 2014)

Figure 24 Brick fragments encased in gabions to interpret the walls of a former privy at the Cascades Female Factory, Hobart. (Photo: Chris Betteridge, 30 November 2014)

Figure 25 Public art / interpretive installation comprising the year '1833' in Helvetica font, made of bricks within shoulder-high stainless steel gabions, Salamanca Place, Hobart, Tasmania. This work marks the start of Hobart City Council's Battery Point Sculpture Walk and the date marks the year when the New Wharf was constructed. (Photo: Chris Betteridge, 27 November 2014)

Figure 26 Corten steel and photo-metal interpretive sign about John Prince, one of the convict workers on the Archer estate 'Woolmers', Longford, Tasmania. John used to take people across the Macquarie River from 'Woolmers' to the adjoining Archer property 'Brickendon'. Similar signs could be used at Site 3 to tell the story of the brick makers and the brick making process. (Photo: Chris Betteridge, 5 December 2014)

Figure 27 This interpretive panel at Vindolanda, Hadrian's Wall, United Kingdom, has three layers of text. It is dominated by a recreation drawing, with summaries in three languages other than English. This allows a broader audience to understand the significance of the site. The design is simple, elegant and contemporary. Pastiche is avoided. The sign is fitted onto a concrete tray which means that site insulation does not require excavation. Such an archaeologically non-invasive approach is only suitable in areas with no livestock. In places where sheep or cattle are present a more durable solution is necessary. A similar approach could be used at St Marys with a recreation of a typical sandstock moulding bench. (Source: *Bored of boards*, p26)

5.0 Interpretive options for the radar range site

The structural integrity of the radar hoop antenna has been assessed and its retention in its current location is not possible. The radar range site structures will be demolished, with parts salvaged for reuse where possible. However, the unusual hoop antenna is a striking element in the cultural landscape and its reconstruction or recreation at a nearby site is considered desirable although it would need to be reproduced with modern materials to ensure safety and longevity of the new structure. The hoop could lend itself to being used as a 'gateway' marker for a residential area or a local park, with appropriate interpretation of its original use and that of the radar range generally. If feasible the fibreglass shell of the radome should be repaired or recreated and attached in its original form.

The *Wianamatta Regional Park Conservation Management Plan* 2011 identified that the Radar calibration facility and ships have an interpretation potential. Interpretation could include:

- Locating radar calibration facility moveable heritage items (e.g. model ships) and displaying them within the Wianamatta Regional Park to enhance appreciation and understanding of site history and heritage.
- Installation of public art (e.g. replicas of model ships) may be an appropriate medium.
- Installation of a children's climbing structure.

Figure 28 The steel and timber antenna hoop at the former Naval Radar Calibration Range. The figures at right indicate the large scale of this structure. An associated tower is visible in the background at left. Although the hoop is to be demolished, its form could be reproduced in new materials at an appropriate location. (Photo: Chris Betteridge, 18 November 2014)

Figure 29 One of two structures holding the supporting cables for the hoop antenna. (Photo: Chris Betteridge, 18 November 2014)

Figure 30 The fibreglass 'Seatel' radome which it is assumed was previously attached to the hoop antenna or one of the other structures on site. (Photo; Chris Betteridge, 18 November 2014)

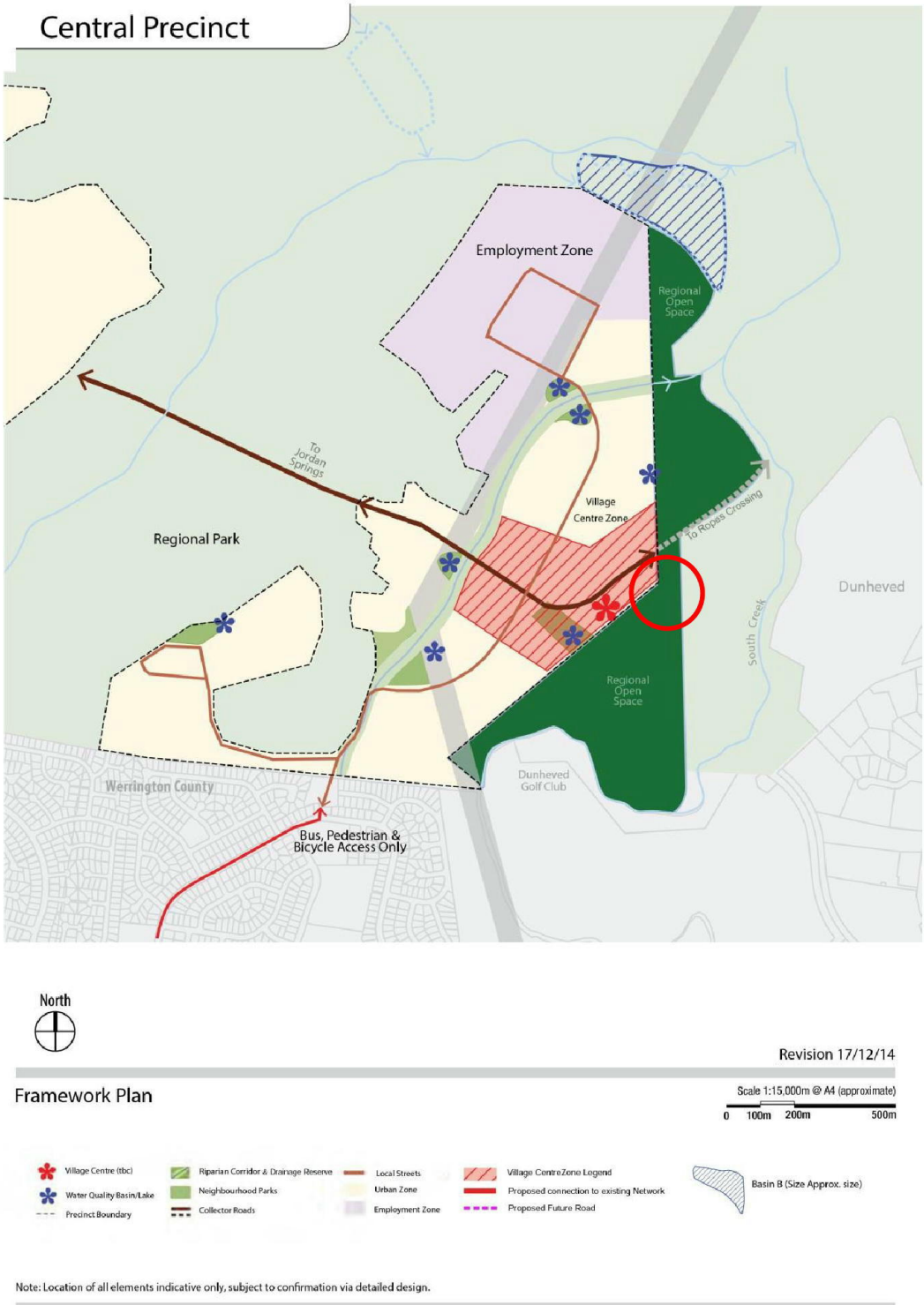


Figure 31 Framework Plan for Central Precinct, with a potential site for relocation, recreation and interpretation of some elements from the former Naval Radar Calibration Range circled in red. (Source: JMD Design / **MUSE***cape*)

Salvageable elements from the radar range may be able to be reused and interpreted as street furniture or sculptural elements in a local park.

Re-used or adapted elements should be relocated to sites as close as possible to their original location to retain their environmental context and make their interpretation more easily achievable.

The forms of the hoop antenna and other structures within the radar range may be incorporated into a local park / playground, possibly as a shade area.

Some examples of public art and playground equipment that could be adapted for use at the radar range are shown below.

Figure 32 'Bureaucratic Tank' sculpture by Edward Horne made from recycled office furniture and other materials, Sculpture by the Sea 2010, Marks Park, Bondi. Public art works of ship forms could be used to interpret the former use of the radar range. (Photo: Chris Betteridge, 11 November 2010)

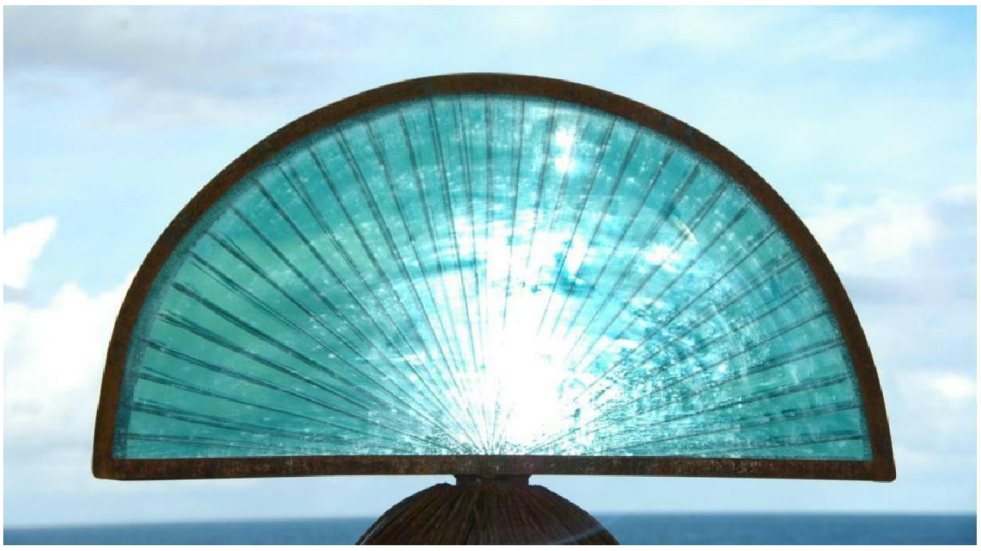


Figure 33 Glass and metal artwork, part of 'Guardian Figure' by Mike McGregor, Sculpture by the Sea 2007. The form of the radar hoop antenna could be interpreted in a public art work or sculptural element. (Photo: Chris Betteridge, 8 November 2007

Figure 34 'Life boat / Thuyen cuu roi' by Nerine Martini, Sculpture by the Sea 2007. Replicas of the naval ship forms used at the radar range could be used as sculptural elements in a local park and to interpret the former use of the site. (Photo: Chris Betteridge 8 November 2007

Figure 35 Whimsical stainless steel sculpture of helicopter cum whale, 'Humpback Gunship', by Benjamin Gilbert, Sculpture by the Sea 2008. A sculpture of a naval ship could be used as part of playground equipment to help interpret the history and use of the radar range. (Photo: Chris Betteridge, 30 October 2008)

Figure 36 'Fat Albert', a piece of playground equipment built in 1995 in the park opposite RAAF Base Richmond and created as a community project between Tourism Hawkesbury, Hawkesbury Shire Council, local schools and businesses and the *Hawkesbury Gazette* and RAAF Richmond in recognition of the close relationship between thye personnel of RAAF Base Richmond and the broader Hawkesbury community. A naval ship form could be created as playground equipment as a joint venture by Lend Lease and the new community in Central Precinct. (Photo: Chris Betteridge, 12 January 2015)

Figure 37 Playground equipment in the form of a sailing ship, waterfront park, Oamaru, South Island, New Zealand. Although most such similar items in playgrounds are based on pirate ships, a similar item in the form of a modern naval vessel such as a destroyer or patrol boat could be installed in a playground in the Central Precinct. (Photo: Chris Betteridge, 7 May 2014)

Figure 38 This support for swings in the Friendly Bay waterfront park at Oamaru, South Island, New Zealand features a whimsical giant penny farthing bicycle and rockets which tie in with the fact that Oamaru is the home of the Steampunk movement in New Zealand. Swings in the playground at Central Precinct could feature a stylised radar hoop antenna as part of their supporting structure. (Photo: Chris Betteridge, 7 May 2014)

Figure 39 This item of playground equipment at Malmo, Sweden features a radome-like central housing from which the slides emanate. A similar form could be used to interpret the radome from the Naval Radar Calibration Range. (Photo: Chris Betteridge 14 May 2009)

Figure 40 This playground equipment at a recent Stockland development could be adapted to a ship form. (Source: https://www.google.com.au/search?q=playground+equipment+%2B+ship&biw=768&bih=928&source=lnms&tbm=isch&sa=X&ei=7h22VLrgCIPn8AXT4oKoCw&ved=0CAYQ_AUoAQ#tbm=isch&q=stockland+playground+&imgdii=_&imgrc=IXJcsbT4vRt1IM%253A%3BJRrlr6zwWPU1sM%3Bhttp%253A%252F%252Fwww.outdoordesign.com.au%252Fimages%252Fuploads%252F20130423136667587 94764.jpg%3Bhttp%253A%252F%252Fwww.outdoordesign.com.au%252Flandscape-supplies-hard%252Fplayground-equipment-suppliers%252FNew-adventure-playground-challenges-kids-with-innovative-play%252F158.htm%3B470%3B313

Figure 41 Public art installation by Ecoscape identifying Stockland's Corimbia Estate land development, East Landsdale in the northern suburbs of Perth, Western Australia. The radar towers at the former radar range could be used as inspiration for a similar work in the Central Precinct. (Source: https://www.google.com.au/search?q=playground+equipment+%2B+ship&biw=768&bih=928&source=lnms&tbm=isch&sa=X&ei=7h22VLrgCIPn8AXT4oKoCw&ved=0CAYQ_AUoAQ#tbm=isch&q=stockland+playground+&imgdii=_&imgrc=1rCxL-jZiR4HWM%253A%3BApe7mvdF6nalPM%3Bhttp%253A%252F%252Fecoscape.com.au%252Fwp-development%252Fwp-content%252Fuploads%252F2013%252F10%252F0495_corimbia_estate_s1_screen.jpg%3Bhttp%253A%252F%252Fecoscape.com.au%252Fportfolio%252Fcorimbia-estate-land-development-east-landsdale-wa%252F%3B1100%3B550

Figure 42 Eero Saarinen's iconic Gateway Arch at St Louis, Missouri. The radar hoop antenna could be reconstructed or recreated in a slightly different form to create a gateway to residential development or a public park / playground. The combination of arch and cables in the hoop antenna have high aesthetic value. (Source: Wikipedia)

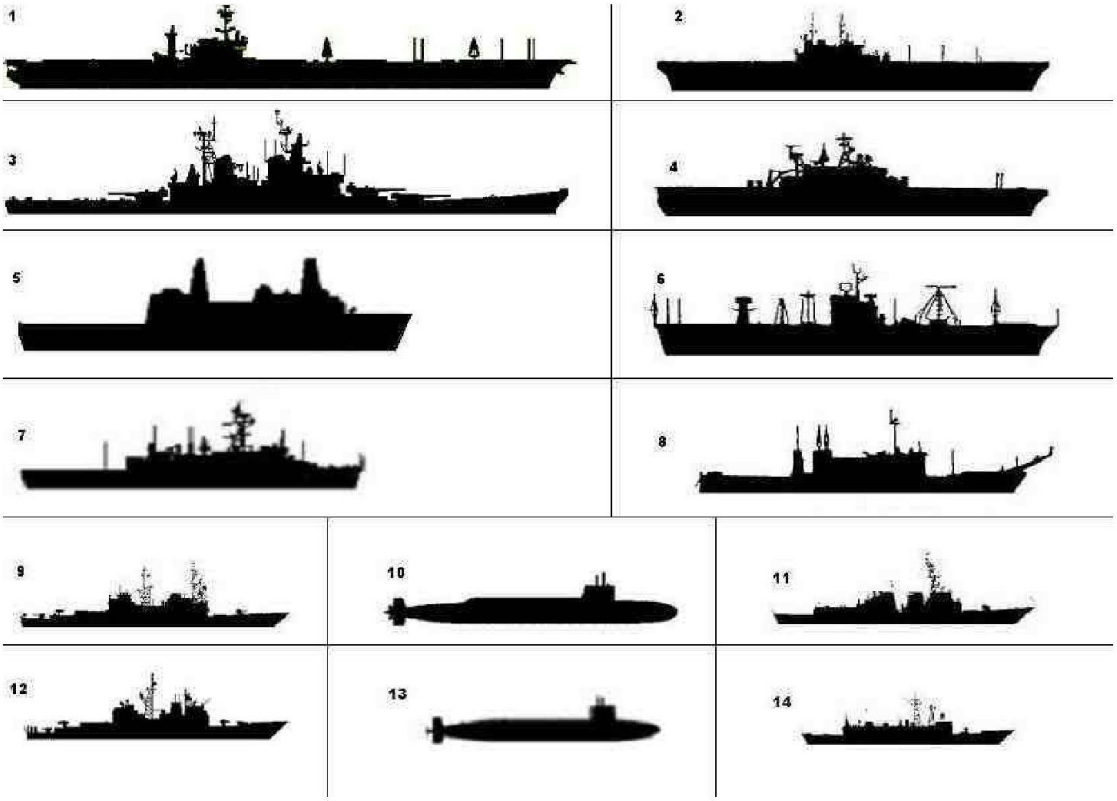


Figure 43 Silhouettes of US Navy ships. Such forms could be used in public art works or profiles could be laser cut in Corten steel. (Source: https://www.google.com.au/search?q=silhouettes+of+navy+ships&espv=2&biw=1920&bih=955&tbm=isch&imgil=7RUzylgBE7WUaM%253A%253BZ4ypiXZJVCztYM%253Bhttp%25253A%25252F%25252Fwww.blulana.com%25252Ftag%25252Fus-navy-silhouettes&source=iu&pf=m&fir=7RUzylgBE7WUaM%253A%252CZ4ypiXZJVCztYM%252C_&usg=__sex3SuiLF4aZQuccqaKMl0QgrKI%3D&ved=0CCgQyjc&ei=KS63VPnVFqTKmAXV5ILIDQ#imgdii=_&imgrc=7RUzylgBE7WUaM%253A%3BZ4ypiXZJVCztYM%3Bhttp%253A%252F%252Fnavyadministration.tpub.com%252F12968a%252Fimg%252F12968a_61_1.jpg%3Bhttp%253A%252F%252Fwww.blulana.com%252Ftag%252Fus-navy-silhouettes%3B614%3B262)

6.0 The next steps

This section outlines the steps to be taken to implement the interpretation strategies for the brick making and radar range sites identified in this report.

1. Detailed interpretation plans and designs for construction need to be developed for the former brick making site and the former Naval Radar Calibration Range.

2. During the design process consultation should be held with those stakeholders responsible for development consent and ultimate site management. This consultation should include but is not necessarily limited to Penrith City Council, Office of Environment and Heritage and the NSW Government agency which will manage the Regional Open Space.

3. Opportunities to incorporate interpretive elements relating to the brick making site and radar range into the broader Central Precinct Public Art Strategy will be pursued.

4. Possible locations for interpretive elements and public art are captured in Chapter 6 of the current Central Precinct Indicative Landscape Masterplan.

7.0 References

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