

SummitCare Penrith

Aboriginal Archaeological Research Design Report

October 2025



Acknowledgement of Country

We respect and acknowledge the First Nations peoples of the lands and waterways on which we live and work, their rich cultural heritage and their deep connection to Country, and we acknowledge their Elders past and present. We are committed to truth-telling and to engaging with First Nations to support the protection of their culture and heritage. We strongly advocate social, cultural and political justice and support the Uluru Statement from the Heart.

Cultural warning

Aboriginal and Torres Strait Islander readers are advised that this report may contain images or names of First Nations people who have passed away.

Report register

The following report register documents the development of this report, in accordance with the GML Heritage Pty Ltd (GML) Quality Management System.

Job No.	Issue No.	Notes/Description	Issue Date
24-0100	1	Draft Report	7 August 2024
24-0100	2	Final Report	17 March 2025
24-0100	3	Minor edits for Final Report	30 October 2025

Quality management

The report has been reviewed and approved for issue in accordance with the GML quality management policy and procedures.

It aligns with best-practice heritage conservation and management, *The Burra Charter: the Australia ICOMOS Charter for Places of Cultural Significance, 2013* and heritage and environmental legislation and guidelines relevant to the subject place.

Indigenous cultural and intellectual property

We acknowledge and respect the inherent rights and interests of the First Nations peoples in Indigenous cultural and intellectual property. We recognise that Aboriginal and Torres Strait Islander people have the right to be acknowledged and attributed for their contribution to knowledge but also respect their rights to confidentiality. We recognise our ongoing obligations to respect, protect and uphold the continuation of First Nations rights in the materials contributed as part of this project.

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1 Introduction

1 Introduction

Centurion Project Management, on behalf of The Trustee for Peter Wohl Family Trust & The Trustee for Wohlen Family Trust, has engaged GML Heritage Pty Ltd (GML) to prepare an Aboriginal cultural heritage assessment report (ACHAR) for the SummitCare Penrith Aged Care Home redevelopment. This report will form part of the environmental impact statement (EIS) for the project, prepared under Division 5.2 of the *Environmental Planning and Assessment Act 1979* (NSW). Under Section 5.16 (4) of the Act, the Department of Planning, Housing and Infrastructure has issued Secretary's Environmental Assessment Requirements (SEARs; SSD-68603709). SEARs key issue 18 (Aboriginal Cultural Heritage) requires the preparation of an ACHAR.

To understand Aboriginal connections to the study area, a program of Aboriginal archaeological excavations is proposed. This archaeological research design (ARD) provides a succinct overview of the study area's formation history and establishes the area's Aboriginal archaeological potential. It provides a sampling methodology based on our current understanding of the need to investigate the study area. The sampling methodology is proposed to be enacted following project approval and the demolition of standing structures. This ARD forms an appendix to the ACHAR that will be used to support the project's EIS.

1.1 Study area

The study area is SummitCare Penrith Aged Care Home, located at 366 Jamison Road, Jamisontown (Figure 1.1 and Figure 1.2). It is within the City of Penrith local government area (LGA) and lies within the Deerubbin Local Aboriginal Land Council (LALC) boundary. The study area encompasses Lot 10, DP804382.

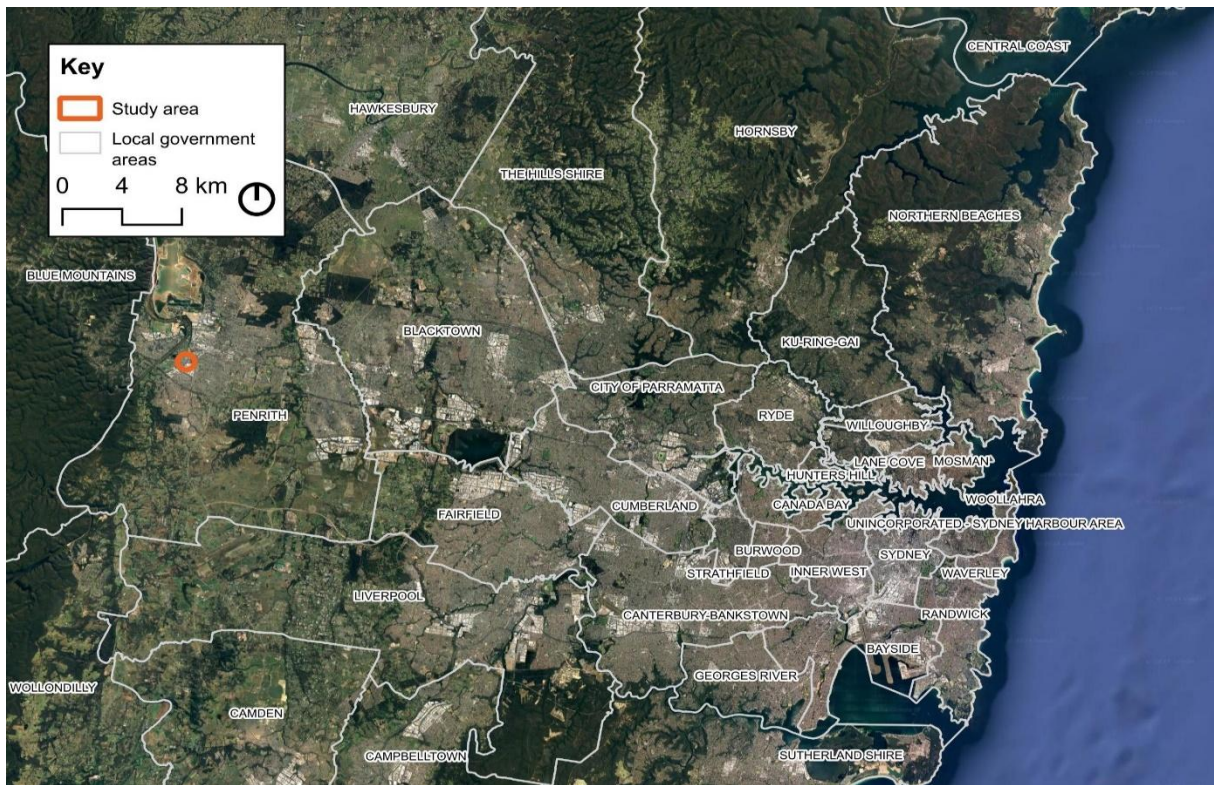


Figure 1.1 Location of the study area in the Sydney region. (Source: Google Earth with GML overlay)



Figure 1.2 The study area in its landscape context. (Source: Google Earth with GML overlay)

1.2 Proposed works

The proponent proposes to redevelop SummitCare Penrith (Figure 1.3). This will involve the demolition of all existing buildings within the study area and the construction of:

- four multistorey apartment buildings (Buildings A, B, C and D) for residential aged care;
- a central administration building; and
- a one-level basement carpark beneath Buildings A, B, C and the central administration building.

The construction of the basement carpark involves significant subsurface excavations up to 3m below current ground levels across most of the study area (Figures 1.4 and 1.5).



Figure 1.3 Site plan showing proposed building locations. (Source: Jackson Teece 2024)

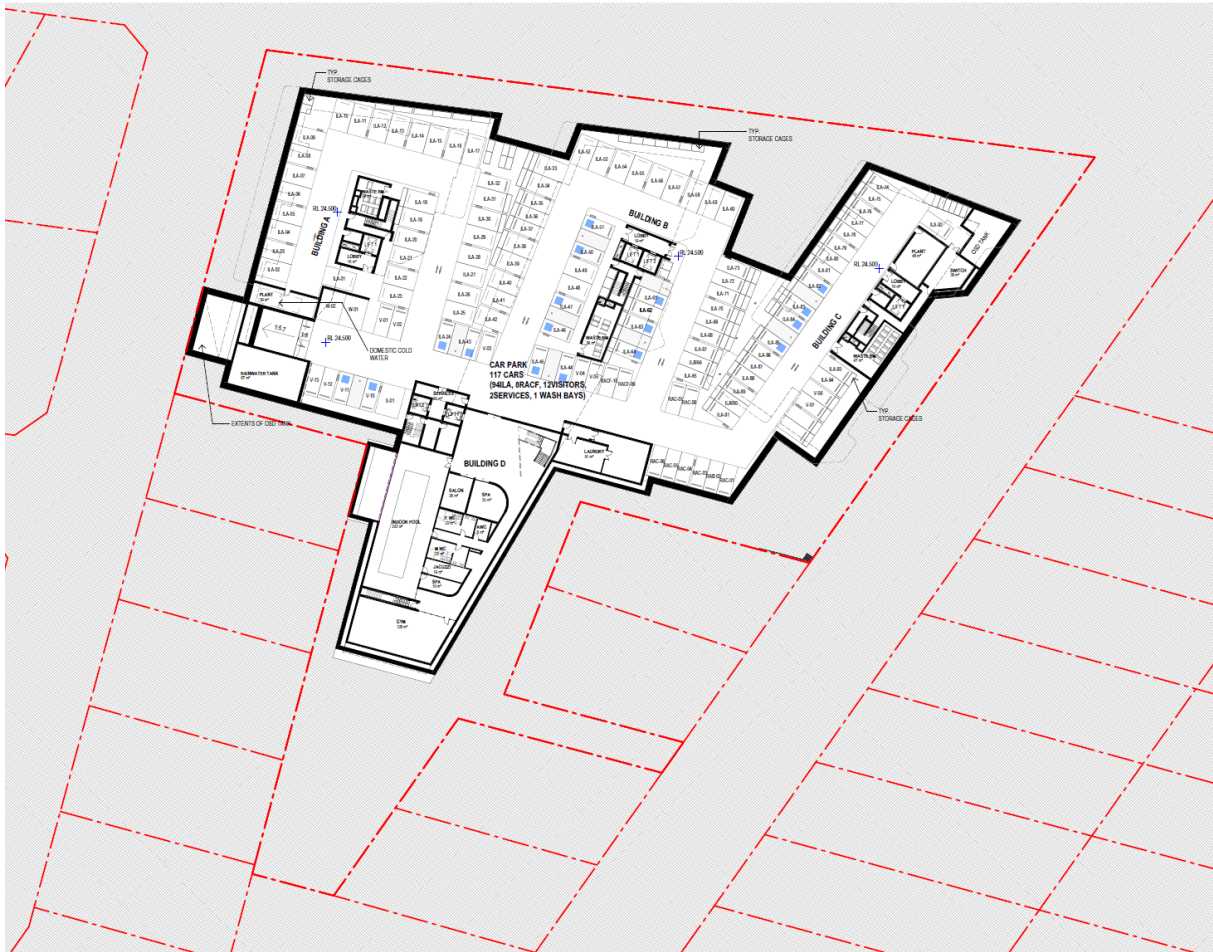


Figure 1.4 Site plan showing extent of proposed basement carpark. (Source: Jackson Teece 2024)

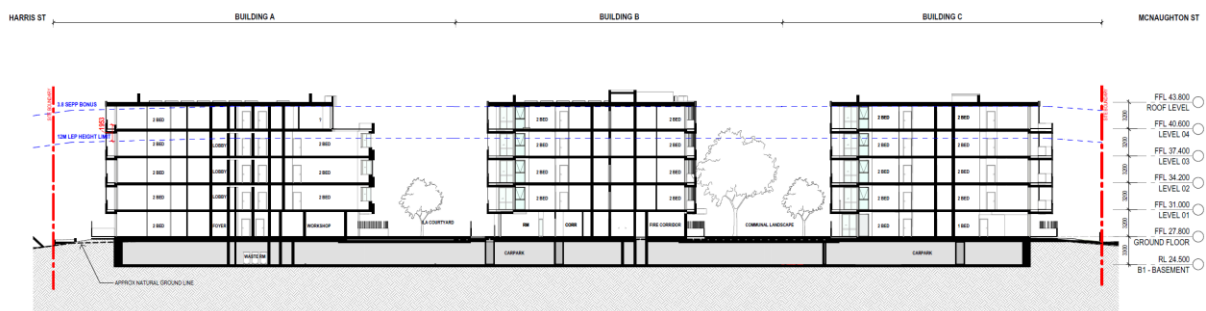


Figure 1.5 East-west site section showing depth and extent of proposed basement carpark underneath Buildings A, B and C. (Source: Jackson Teece 2024)

1.3 Statutory context

The following statutory controls are relevant to the study area and therefore this report (detailed in Appendix A):

- *National Parks and Wildlife Act 1974* (NSW) (NPW Act); and
- *Environmental Planning and Assessment Act 1979* (NSW).

Because the project is classified as State Significant Development, impacts to Aboriginal objects arising from the proposed works do not require approvals under the NPW Act. All future management, works and impacts will be guided and approved under the project's conditions of approval.

1.4 Objectives of this Aboriginal archaeological research design

The objectives for this ARD are specific for the redevelopment project, as follows:

- to investigate and confirm the Aboriginal archaeological potential of the study area; and
- to collect new information that informs the assessment of Aboriginal cultural heritage.

1.5 Limitations

This report assesses Aboriginal heritage only.

1.6 Authorship

This report has been prepared by Jacob Kiefel (Heritage Consultant) and Dr Tim Owen (Principal). Sophie Jennings (Associate) reviewed the report.

2 Archaeological background

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2.1 Analysis of extant site information

To inform a research investigation methodology for Aboriginal cultural heritage, this section presents an overview of existing environmental and archaeological information for the study area. Archaeological interpretation of this data has determined that the study area holds Aboriginal archaeological potential. A detailed review of the study area's environmental and archaeological context is provided in the ACHAR.

2.1.1 Geology and soil landscapes

The study area is situated atop the Cranebrook Formation, a Pleistocene-aged alluvial terrace mapped along the Nepean River from Castlereagh to Mulgoa (Figure 2.1).¹ Geomorphological studies have demonstrated this terrace formed across three primary phases (Figure 2.2).² Each phase is closely related to the effects of regional-scale environmental changes on the hydrology of the Nepean River:

- Penrith Unit—consists of a basal gravel layer formed between 110,000 and 75,000 years ago when the Nepean River was a large, braided channel. These gravels are overlain by several metres of sandy clays deposited between 100,000 and 50,000 years ago. This change in depositional regime is likely related to restriction of the Nepean River channel and/or reduced flood-event energy.
- Richmond Unit—comprises an almost identical stratigraphy to the Penrith Unit (basal gravels overlain by sandy clay deposits) but formed between 50,000 and 15,000 years ago. This unit formed as the Nepean River, and its floodplain, adjusted eastwards. Continued flooding simultaneously eroded the Penrith Unit and deposited new, or reworked, material along a new floodplain.
- Holocene-aged (11,700 years ago to present) 'overburden'—consists of sandy clay alluvial sediments deposited along the floodplains of various watercourses that flow across the terrace surface. These sediments are also present along the modern Nepean River floodplain as 'levee bank' deposits. They are deposited atop either the Richmond or Penrith units depending on their location on the terrace. The sediment sources of these watercourses are similar to the Nepean River, which means these layers are often indistinguishable from the earlier Penrith and Richmond units.

During the Holocene, soil formation processes operating within the upper terrace layers resulted in the formation of deep soil profiles characteristic of the Richmond soil landscape.

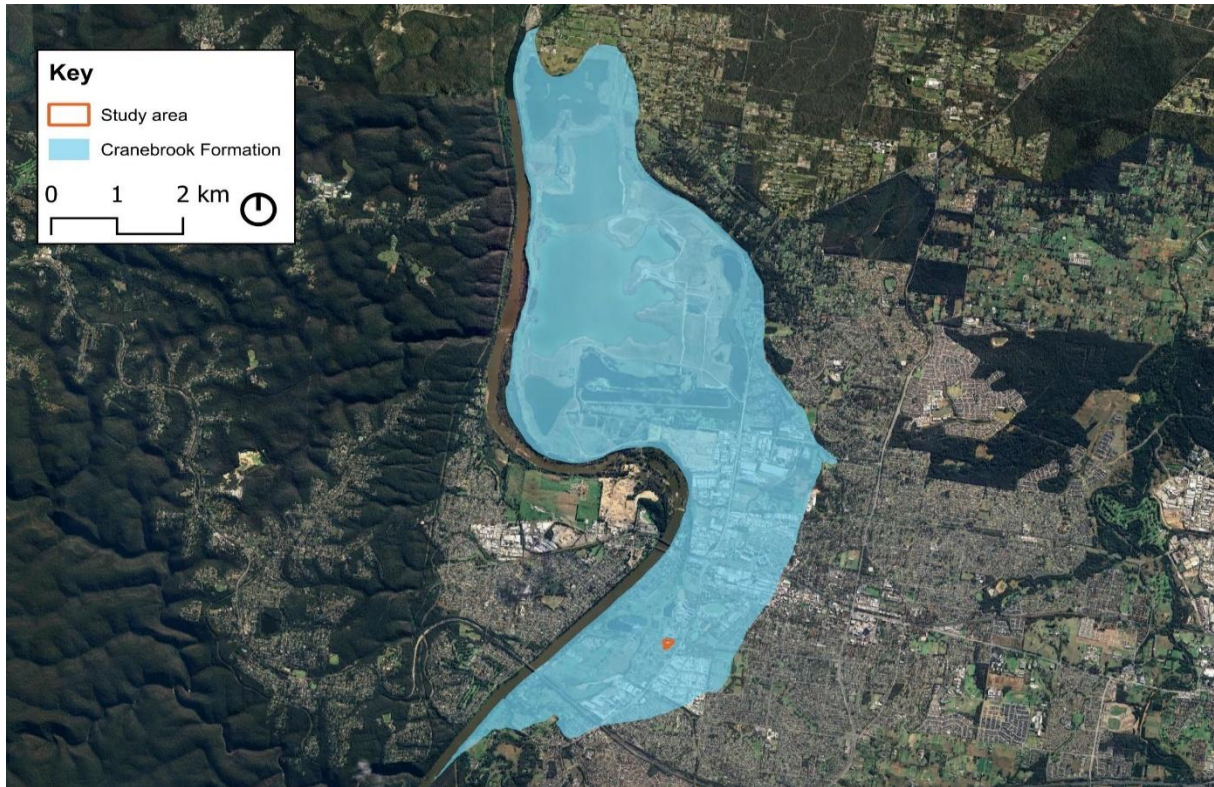


Figure 2.1 Approximate boundary of the Cranebrook Formation. (Source: Troedson, AL 2015, Sydney Area 1:100 000 and 1:25 000, Coastal Quaternary Geology Map Series, Geological Survey of New South Wales, Maitland, with Google Earth basemap and GML overlay)

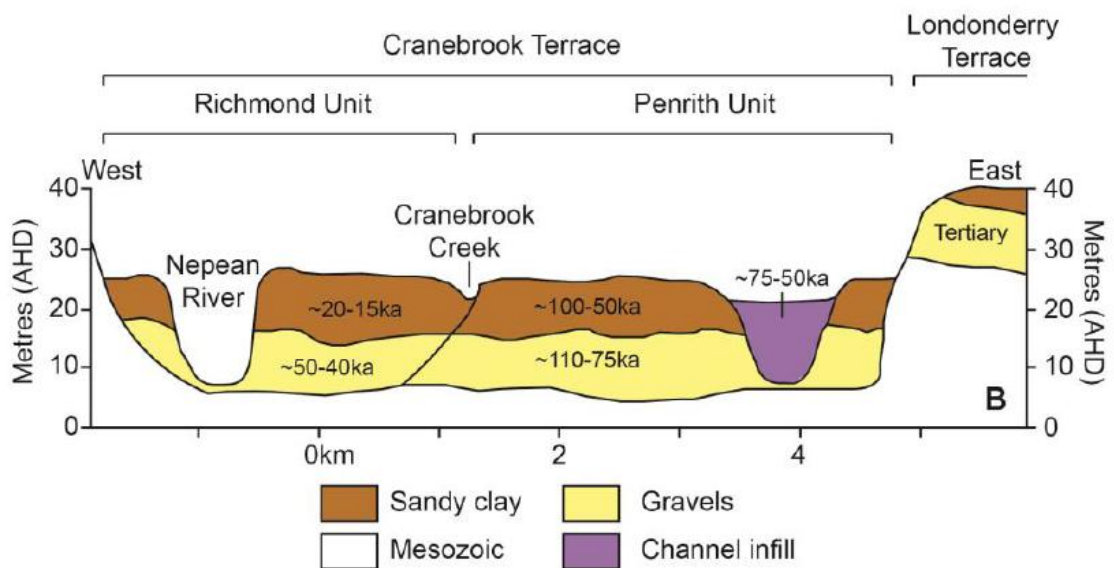


Figure 2.2 Cross-section of the Cranebrook Formation at Cranebrook, showing the spatial relationships between the Penrith and Richmond units. This figure does not include Holocene-aged deposits that can overlie these units. (Source: Williams et al. 2017, Figure 2B,³ adapted from Stockton and Nanson 2004)

2.1.2 Previous archaeological investigations

The Nepean River terraces have been subject to many prior archaeological excavations. These have identified extensive assemblages of Aboriginal archaeological material, primarily flaked-stone artefacts (Figure 2.3). The Aboriginal Heritage Information Management System (AHIMS) database search results show a strong spatial relationship between Aboriginal sites and Holocene-aged floodplains. Artefacts have been recovered from the upper layers of these floodplains, where soil formation processes have resulted in the creation of alluvial soils, like the Richmond soil landscape. Archaeological investigations have recovered Aboriginal artefacts from A and/or B horizons within the Richmond soil landscape.⁴ Deeper Holocene-aged alluvial overburden deposits do not retain Aboriginal archaeological material.

The Richmond Unit holds potential for stratified archaeological deposits dating back thousands of years.⁵ Archaeological deposits dating to 9,500 years ago, and potentially up to 40,000 years ago, have been recovered at depths exceeding 3.5m below current ground levels.⁶ Very few Aboriginal archaeological excavations have been undertaken within the Richmond Unit, which means that spatial relationships between specific depths or locations and artefactual deposits have not been confirmed. Some archaeologists have suggested that the entire unit should be considered archaeologically sensitive until such relationships can be confirmed.⁷

The study area's position in a similar landform and soil context to previously recorded Aboriginal sites indicates that it holds similar potential.

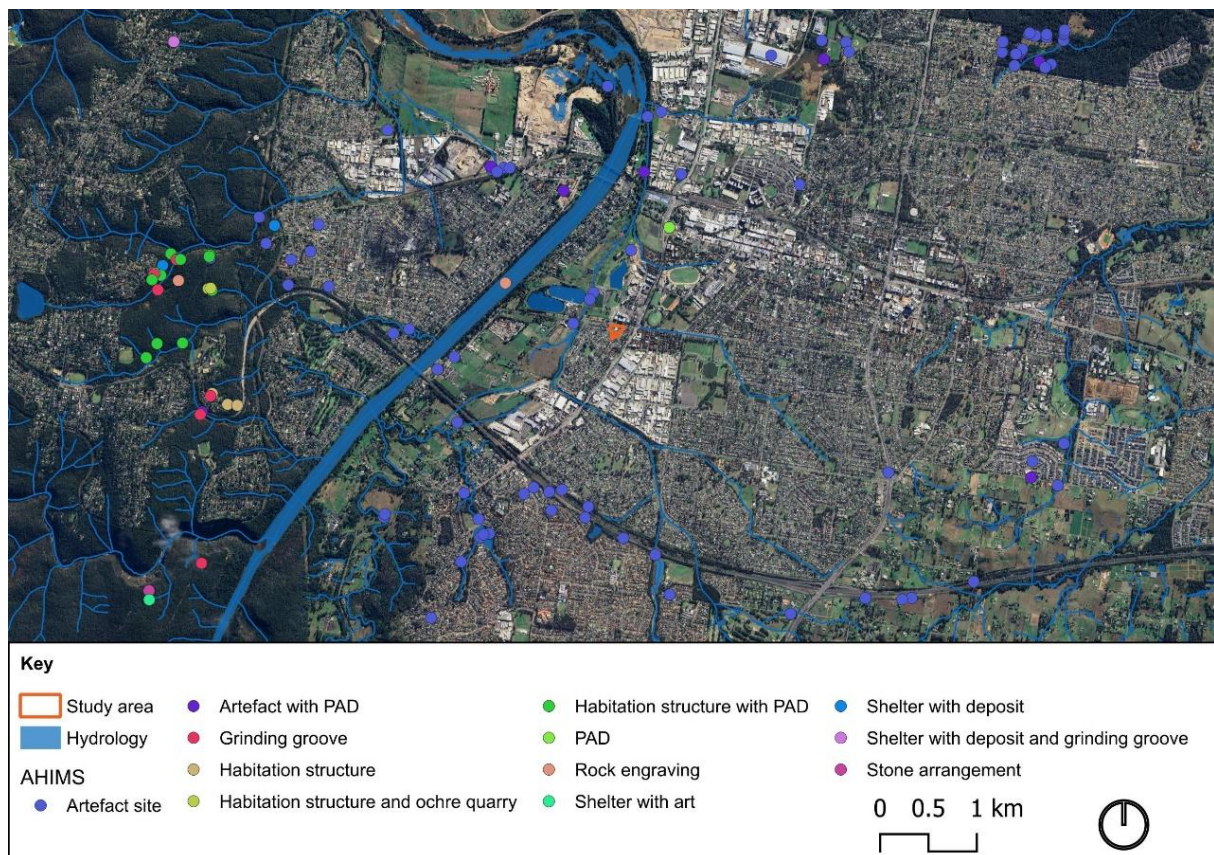


Figure 2.3 AHIMS search results overlaid on modern-day hydrology. (Source: Six Maps basemap, with Heritage NSW AHIMS data and GML overlay)

2.1.3 Previous impacts

Historical land uses within the study area have resulted in minor disturbance of natural soils and sediments. Until the 1960s, grazing and market gardening were the primary land uses within the study area. Land clearing, ploughing and construction works will have resulted in partial truncation of natural soils and sediments. The construction of Jamison Private Hospital (now SummitCare Penrith) in the 1960s required extensive landscaping, excavation and infilling, altering the landforms and soils throughout the study area.

However, these impacts have not completely removed deposits with Aboriginal archaeological potential. Geotechnical investigations undertaken to inform the project have recorded a subsurface stratigraphy composed of imported fills/topsoils overlying up to 7.5m of natural alluvial sandy clays, clayey sands and/or sands with a basal gravel layer.⁸ This stratigraphic profile is consistent with both the Penrith and Richmond units and, most importantly, those encountered during nearby archaeological investigations of the Cranebrook Formation.⁹

Variation in sedimentary texture could indicate the presence of Holocene-aged alluvial 'overburden', although whether these are A or B horizons of the Richmond soil landscape is difficult to verify.

2.2 Archaeological potential

Geotechnical investigations have confirmed the presence of approximately 7.5m of natural alluvial deposits across the entire study area. These results indicate the subsurface profile consists of Holocene-aged alluvial 'overburden' unconformably overlying either the Richmond or Penrith units. The Aboriginal archaeological potential of these deposits is largely dependent on whether they include expressions of the Richmond Unit and/or A or B horizons of the Richmond soil landscape. Both hold potential for stratified archaeological deposits dating back thousands of years, potentially to the time of Aboriginal people's arrival in the Sydney Basin.

However, expressions of the Penrith Unit would hold no Aboriginal archaeological potential. This is because the unit formed prior to the generally accepted date for Aboriginal occupation within the Sydney Basin.¹⁰ Similarly, Holocene-aged alluvial sediments that are not part of a soil profile (i.e. were too deep for soil formation processes) hold limited archaeological potential.¹¹

Archaeological excavation is required to validate the nature of the underlying alluvial sediments, coupled with the presence or absence of Aboriginal objects.

2.3 Endnotes

- ¹ Walker, PH and Hawkins, CA 1957, 'A study of river terraces and soil development on the Nepean River, NSW', *Journal and Proceedings of Royal Society of New South Wales* 91, pp 67–84.
- ² Nanson, GC, Young, RW, and Stockton, ED 1987, 'Chronology and palaeoenvironment of the Cranebrook Terrace, near Sydney, containing artefacts more than 40,000 years old', *Archaeology in Oceania* 22 (2), pp 72–78.
Stockton, ED and Nanson, GC 2004, 'Cranebrook Terrace revisited', *Archaeology in Oceania* 39 (1), pp 59–61.
Mitchell, P 2010, *Geomorphology and soils in relation to archaeological investigations on the Cranebrook Terrace, Penrith Lakes, NSW*, unpublished report for Comber Consultants Pty Ltd.
- ³ Williams, AN, Burrow, A, Toms, PS, Brown, O, Richards, M and Bryant, T 2017, 'The Cranebrook Terrace Revisited: Recent Excavations of an Early Holocene Alluvial Deposit on the banks of the Nepean River, NSW, and their Implications for Future Work in the Region', *Australian Archaeology* 83 (3), pp 100–109, Figure 2B.
- ⁴ Dean-Jones, P 1989, *Report of an Archaeological Survey of a 20ha site proposed as a Mobile Home Village, near Penrith, NSW*, unpublished report for P and J Projects.

- ⁵ Stockton, ED and Holland, W 1974, 'Cultural sites and their environment in the Blue Mountains', *Archaeology and Physical Anthropology in Oceania* 9 (1), pp 36–61.
 Nanson, GC, Young, RW and Stockton, ED 1987, 'Chronology and palaeoenvironment of the Cranebrook Terrace, near Sydney, containing artefacts more than 40,000 years old', *Archaeology in Oceania* 22 (2), pp 72–78.
 Williams, AN, Burrow, A, Toms, PS, Brown, O, Richards, M and Bryant, T 2017, 'The Cranebrook Terrace Revisited: Recent Excavations of an Early Holocene Alluvial Deposit on the banks of the Nepean River, NSW, and their Implications for Future Work in the Region', *Australian Archaeology* 83 (3), pp 100–109.
- ⁶ Stockton, ED and Holland, W 1974, 'Cultural sites and their environment in the Blue Mountains', *Archaeology and Physical Anthropology in Oceania* 9 (1), pp 36–61.
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 Williams, AN, Burrow, A, Toms, PS, Brown, O, Richards, M and Bryant, T 2017, 'The Cranebrook Terrace Revisited: Recent Excavations of an Early Holocene Alluvial Deposit on the banks of the Nepean River, NSW, and their Implications for Future Work in the Region', *Australian Archaeology* 83 (3), pp 100–109.
- ⁷ Williams, AN, Burrow, A, Toms, PS, Brown, O, Richards, M and Bryant, T 2017, 'The Cranebrook Terrace Revisited: Recent Excavations of an Early Holocene Alluvial Deposit on the banks of the Nepean River, NSW, and their Implications for Future Work in the Region', *Australian Archaeology* 83 (3), pp 100–109.
- ⁸ Martens Consulting Engineers 2021, Preliminary Geotechnical Investigation: Proposed Aged Care Facility at 366 Jamison Road, Jamisontown, NSW, unpublished report for The Trustee for Peter Wohl Family Trust & The Trustee for Wohlen Family Trust C/ - Centurion Group Pty Ltd.
- ⁹ Stockton, ED and Nanson, GC 2004, 'Cranebrook Terrace revisited', *Archaeology in Oceania* 39 (1), pp 59–61.
 Mitchell, P 2010, Geomorphology and soils in relation to archaeological investigations on the Cranebrook Terrace, Penrith Lakes, NSW, unpublished report for Comber Consultants Pty Ltd.
- ¹⁰ Quinn, M, Owen, TD, Flanagan, J and Westaway, KE 2023, 'An Aboriginal presence in the Sydney Basin prior to the LGM; further investigations into the age and formation of the Parramatta Sand Body', *Journal of Archaeological Science Reports* 51 (2), pp 104–195.
- ¹¹ Williams, AN, Burrow, A, Toms, PS, Brown, O, Richards, M and Bryant, T 2017, 'The Cranebrook Terrace Revisited: Recent Excavations of an Early Holocene Alluvial Deposit on the banks of the Nepean River, NSW, and their Implications for Future Work in the Region', *Australian Archaeology* 83 (3), pp 100–109.

3 Aboriginal archaeological research design and excavation methodology

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This section provides a proposed research design and excavation methodology for the investigation of potential Aboriginal archaeological resources within the study area. Within the study area, buried alluvial sediments have the potential to retain Aboriginal objects in the form of archaeological deposits. A program of archaeological test and salvage excavations is proposed to help clarify, determine and characterise the Aboriginal archaeological potential of the soils and sediments within the study area.

3.1 Research questions

Research questions have been established to guide the archaeological process and provide the basis for questioning the data collected. Relevant research questions include the following:

- What are the characteristics of the sediments and soils within the study area?
 - Is the nature of the alluvial sediments consistent with the Richmond or Penrith units? What variation occurs?
 - How has the land use history impacted the study area and survival of intact sediments or soils? Are soils characteristic of the Richmond soil landscape present?
 - Do these deposits possess characteristics that indicate different depositional or formation events? Does this have any implications for the preservation of archaeological material within these soils?
 - Can we distinguish climatic, geomorphic or environmental conditions from individual stratigraphic units and features within the alluvial deposits?
- Is there an Aboriginal archaeological deposit present?
 - If so, where is the Aboriginal archaeological deposit? What is its nature? How does this correlate with the assessment of archaeological potential?
 - Is there archaeological evidence that can be dated (by optically stimulated luminescence (OSL), carbon dating or relative dating)?
 - What does the archaeological deposit tell us about how Aboriginal people used the landscape and specific places within it?
 - Does the deposit represent a continuation of cultural landscape use, as identified in regional studies?

- Is the Aboriginal archaeological deposit culturally significant?
 - What is the heritage value of the deposit, both scientifically and culturally?
 - How does the Aboriginal community view and value the deposit identified?
 - Can the deposit be interpreted through future public outreach relating to the proposed works in the study area?

3.2 Aboriginal archaeological excavation methodology

In the study area, intact expressions of the Richmond Unit and/or A/B horizons of the Richmond soil landscape have the potential to retain Aboriginal objects in the form of archaeological deposits. Geotechnical results demonstrate the study area is underlain by approximately 7.5m of natural alluvial deposits, which could include expressions of both units.

Archaeological sampling must respond to the known depth of pre-1788 alluvial deposits and proposed depth of subsurface excavations. The proposed development will require subsurface excavation to approximately 3m to accommodate basement carparking construction. This will require the wholesale removal of alluvial sediments within the excavation footprint. We therefore propose an excavation methodology like that employed on nearby sites along the Hawkesbury-Nepean terraces, and in contexts with similar depths of potential archaeological deposits, such as the Botany Sands and Parramatta Sand Body.¹ We have applied learnings from these excavation outcomes.

3.2.1 Test excavation

Demolition of existing structures would occur prior to excavation. Demolition works that could potentially impact intact pre-1788 sediments would be supervised by a qualified archaeologist. Removal of historical fills would be required prior to commencement of Aboriginal archaeological test excavations.

We propose a program in which 11 machine-excavated test units (TUs) would be placed within the proposed basement excavation area. Each TU would have an indicative extent of 1.2m in width (the width of the excavator bucket) by a minimum 3m in length. TUs may be lengthened up to 20m depending on the sediment and/or archaeology being uncovered. The requirement and extent of lengthening would be determined through onsite consultation between the archaeologists and onsite RAPs. Factors which may affect the length of each TU include prior disturbances (eg fill, existing services, contamination, built features, or other prior impacts), WHS requirements for shoring/benching to access deeper deposits, or spatially extensive archaeological deposits. This flexibility is required

due to the currently unknown subsurface conditions and archaeological resource across the site.

These TUs will target areas that can be shown to have intact pre-European sediments, and that do not pose a danger to the fieldworkers (e.g. through contaminated deposits). An indicative 20m grid is proposed; these locations are shown in Figure 3.1. This grid is limited to the proposed basement excavation area as subsurface excavations will largely be confined to it. The TU layout is indicative, and the location of each TU may be moved to avoid existing services, contamination, built features, or other prior impacts. The final location of all excavated TUs would be recorded by a surveyor following excavation.



Figure 3.1 Indicative 20m x 20m sampling grid. (Source: Six Maps with GML overlay)

Each TU would be machine-excavated in 10cm spits to the depth of basement excavation (~3m below ground level), using a flat bucket 1.2m wide. The removal of a spit would be archaeologically controlled, to ensure the slow progressive removal of sediment in linear scrapes.

In order to access the deeper deposits, the trench would be excavated in 1m vertical 'units'. Once the first 1m of sediment has been archaeologically excavated and sieved, the ground surface surrounding the whole trench would be lowered by 1m, allowing safe access for excavation of the second vertical unit. This method will prevent trench

collapse, allow for a safe work environment, and allow archaeologists to enter the trench to both hand-excavate any features and record the trench's stratigraphy. Where the salvage methodology has been enacted for a vertical unit in a TU, sediments removed through the trench lowering activity would also be subject to salvage excavation following the methodology outlined in Section 3.2.2 below.

If salvage excavation has not been triggered, sediments removed through the trench lowering activity would be monitored for Aboriginal objects, but the sediments would not be sieved. Should Aboriginal objects be observed in removed sediments, these would be retained with a note on the approximate location and depth. Should removal of sediment reveal a surface with dense evidence of an Aboriginal object/Aboriginal cultural feature (e.g. hearths), this would be subject to salvage excavation, following the appropriate methodology below.

Surface lowering and/or benching actions would be undertaken around all TU to provide a safe working environment. The mechanism of sediment/sand/soil removal would be monitored, and should Aboriginal archaeological objects/features be present, the lowering work would cease and archaeological methods for recovery enacted (in accordance with 3.2.1 and 3.2.2). Benching around a trench may require wider areas than 1m to be excavated if a safe workspace is to be maintained, however the archaeological clearance process would mean these areas have been 'cleared' as part of the excavation process.

Excavation of a TU may cease if agreed, by the archaeologist and RAPs present on site, that excavations have continued past the depth of deposits that could contain cultural materials. It is possible that initial TUs could confirm, through sedimentological analysis, the study area is underlain by the Penrith Unit, in which case excavations would be limited to any overlying alluvial deposits.

Twenty per cent (one-fifth) of each spit will be wet sieved through a 3mm mesh. If Aboriginal objects (above a background scatter/density) are recovered during sieving the remaining material from the spit would be sieved. Wet sieving would be undertaken into skips or other appropriate containers to prevent the accumulation of water at the ground surface and potential overland flow beyond the study area boundaries. Skip contents could be transported off-site or emptied on site at strategic locations.

All Aboriginal objects from test excavation can be assessed on or off site. All objects should be assessed in line with the standards of Holdaway and Stern.²

3.2.2 Salvage (manual) excavation

Salvage (manual) excavation would occur at locations shown to consist of intact strata with an archaeological signature of five or more Aboriginal objects per 1m of each excavated 100mm spit or an Aboriginal cultural feature. Prior to salvage excavation

commencing, the site area would be prepared through stripping and benching of the deposit to allow access. It is intended that all salvage excavation would be manual, that is by hand. Machine salvage would only occur if conditions are unsafe, and/or necessitate the use of a machine.

If benching is required, machine preparation would occur in accordance with the methodology outlined in Section 3.2.1. It is therefore possible that a TU would be initially excavated to a depth of 1m, a salvage exercise undertaken, followed by reversion to the test excavation methodology to again sample deeper sediments.

Salvage excavations would employ an initial grid pattern of exploratory 1m squares, to be immediately expanded laterally if cultural materials (sufficient to warrant further investigation) are identified. Excavation would occur in 10cm spits or natural stratigraphy (whichever is smaller) until archaeologically sterile layers or the maximum depth of impacts is reached. Excavations would also be limited by safety requirements (i.e. no excavation below 1.5m into a trench without benching). All excavated material would be wet sieved through a 3mm mesh. Any cultural features would be exposed fully and excavated stratigraphically.

3.2.3 Registered Aboriginal Parties' involvement

Representatives of the RAPs with suitable relevant experience should be engaged by the proponent to collaborate in the Aboriginal archaeological investigations. The numbers of representatives engaged should be appropriate to the workload on site.

3.2.4 Recording

All fieldwork recording would be undertaken by a qualified archaeologist. For each TU and/or salvage excavation area, all identified soils and sediments would be photographed and recorded. The following data would be collected for each TU and salvage excavation area:

- recording (by surveyor) of the location of each borehole, trench, section and/or feature sampled;
- description of all stratigraphic units, including a detailed photographic record; and
- environmental, archaeological and dating (if applicable) sampling of individual stratigraphic units.

The description of deposits will involve recording the following attributes:

- recording stratigraphic unit and sample numbers and keeping a central register for stratigraphic units and environmental samples;
- recording depth, thickness and extent (if applicable);
- describing the nature of boundary changes (if possible);

- identifying colour using the Munsell soil colour chart, noting the moisture content of the deposit (moist being the preferred standard);
- describing field texture using sedimentary and/or soil profile terminology, where applicable;
- describing inclusions such as gravels, contaminants, roots and archaeological artefacts;
- describing soil (ped) structure or sedimentary (facies) features, where applicable; and
- providing a preliminary field interpretation of the deposit.

3.2.5 Environmental and radiometric sampling

A variety of environmental and geoarchaeological sampling techniques is proposed depending on the method of extraction and the objective and nature of the analysis. An environmental sample register would be kept to assess and control the sampling and subsampling of individual stratigraphic units and to record which environmental or radiometric samples have been submitted. A photographic archive of environmental and sedimentary sample locations would be prepared.

Samples would be collected for a variety of post-excavation analyses, including the following:

- Absolute dating (if present in stratified lenses or archaeological features)—this will allow for the development of the chronology of the soil and sedimentary record.
- Particle size analysis—identifies how sedimentary bodies are formed and reworked by analysing the size of individual sedimentary grains. This analysis is important for establishing whether a sedimentary layer is in situ or disturbed.
- Geochemical analysis—investigates climatic signatures within sedimentary units or soil profiles in addition to identifying anthropogenic signatures of contamination.
- Pollen analysis—allows for the reconstruction of historical vegetation and investigates how it has changed over time. It also provides the opportunity to investigate potential Aboriginal botanical sources.

Samples would be collected from targeted deposits or features that are considered suitable for environmental analysis or dating purposes. These would be extracted from specific stratigraphic units, or lenses or features within these units, or from geotechnical cores. Sample size will vary depending on the laboratory technique being sampled for, but for most types of analysis around 100g to 200g is required for each application. Should charcoal be identified within a distinct stratigraphic unit or within an archaeological feature such as a hearth, at least 5g to 10g of charcoal will be sampled for C14 radiometric dating, but it must come from a sample area no thicker than 10mm.

3.3 Unexpected finds procedure

If, during the course of construction works, a worker identifies what could be an Aboriginal artefact or object, an unexpected finds procedure would be employed.

Any Aboriginal object would be recorded in terms of its context, placed in a plastic artefact bag, and held in an archival box in a safe location (i.e. on-site lockable storage, or GML's office). Any potential post-1788 (Phase 3) artefacts should be set aside for immediate analysis by the Aboriginal archaeology Excavation Director. The context of those artefacts should be considered, and discussion between the Excavation Directors would determine how work proceeds around the find.

All Aboriginal artefacts recovered during demolition works would be included in the Aboriginal site record and post-excavation reporting.

3.3.1 Human remains

In the unlikely event that human skeletal remains are identified, work would cease and the NSW Coroner's Office and/or NSW Police would be notified immediately.

If the remains are suspected to be Aboriginal, the local Aboriginal community and Heritage NSW would be informed, and a specialist forensic anthropologist contacted to determine the nature of the remains.

If the remains are suspected to be Aboriginal, all investigation should be undertaken in accordance with *Skeletal Remains: Guidelines for Management of Human Skeletal Remains*.³ Works would not recommence in the area unless authorised by the NSW Coroner's Office and/or the NSW Police.

3.4 Reporting

The final stage would involve the preparation of a report that details the results of the archaeological program. This would be provided as the project's archaeological technical report (ATR). The report would include the following components:

- A plain English summary of the archaeological, geomorphic, environmental and climatic results.
- A stratigraphic framework detailing the chronology of archaeological signatures and their interpretation based on the nature of site formation processes responsible for their creation, against the background of the prevailing environmental and climatic conditions of the time. This will include illustrations of cross-sections and

archaeological features, as well as trench profiles and geographic information system (GIS) plans of relevant datasets.

- A detailed summary of each stratigraphic unit and phase identifying the nature, interpretation and significance of any natural or archaeological features. This will include details and a discussion of any paleoenvironmental/environmental remains processed within a chronological framework.
- A statement of significance detailing the archaeological, geomorphic, environmental and climatic results.

Post-excavation analysis

A stratigraphic framework and stratigraphic model would be produced to inform the analysis of any recovered Aboriginal archaeological remains. All the site records would be digitised and digital records appropriately archived.

Any samples recovered will be sent to the relevant specialists who will prepare results detailing their findings. This will also involve preparing a generic summary report for the specialists that will contain stratigraphic data and specific archaeological questions driven by contextual considerations.

Aboriginal artefact analysis

All Aboriginal artefacts recovered during the excavation program would be subject to specialist lithics analysis. A standard recording approach would note all relevant attributes in a comparable manner to other regional lithic studies, and in accordance with Holdaway and Stern.⁴ The ATR would assess the stone materials against other recent excavations in the region would be prepared.

The analysis may identify that some artefacts have been used, and these should be subject to specialist use-wear analysis.

Contact-period artefacts (glass, ceramic and flint) require a three-stage process of investigation. This has been applied to other assemblages in Western Sydney and is the only method suitable for confirming whether non-traditional contact-period materials have been made or used by Aboriginal people. The stages are as follows:

- assessment by a specialist in historical artefacts to confirm the material type and phasing of the item;
- classical analysis adhering to standards for stone artefacts; and
- microscopic analysis to identify use-wear and manufacturing processes.

3.5 Long-term artefact management

Any Aboriginal object(s) would be stored in a secure location within GML's office. Future management of Aboriginal objects would be discussed with project RAPs and included as a management requirement under the future ACHAR.

Possible options for long-term storage include:

- reburial on Country—potentially within landscaped portions of the development boundary; or
- a Care and Control Agreement with the Deerubbin LALC for research and caretaking purposes (specific parameters around what the object can be used for must occur for this option to be viable).

3.6 Endnotes

¹ Archaeological & Heritage Management Solutions 2014, Peach Tree Creek Stabilisation Works, Penrith, NSW (Penrith LGA), Archaeological Technical Report, unpublished report for Penrith City Council.

GML Heritage 2020, Investigations of Aboriginal Site RSY1, Randwick, Post-Excavation Report, unpublished report prepared for Acciona & Transport for NSW.

GML Heritage 2020, Doncaster Avenue Aboriginal Archaeology, Post-Excavation Report, unpublished report prepared for Blue Sky Estate.

GML Heritage 2022, Parramatta Light Rail, Aboriginal Archaeology Post-Excavation Report, unpublished report prepared for Parramatta Connect.

GML Heritage 2024, Newmarket, Randwick Stage 3, Aboriginal Cultural Heritage Assessment Report, unpublished report prepared for Cbus Property.

² Holdaway, S and Stern, N 2004, *A Record in Stone: The Study of Australia's Flaked Stone Artefacts*, Museum Victoria and Aboriginal Studies Press, Melbourne.

³ NSW Heritage Office, 1998, *Skeletal Remains: Guidelines for management of Human Skeletal Remains*, NSW Heritage Office.

⁴ Holdaway, S and Stern, N 2004, *A Record in Stone: The Study of Australia's Flaked Stone Artefacts*, Museum Victoria and Aboriginal Studies Press, Melbourne.

