Prince of Wales Medical Research Institute Project

Proposed Neuroscience Research Precinct

Concept Plan and Project Application

Aboriginal Archaeology - Preliminary Assessment

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Report to Winton Associates Pty Limited
on behalf of the Prince of Wales Medical Research Institute

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1.0 Introduction

1.1 Background to Project

This report has been prepared by Mary Dallas Consulting Archaeologists (MDCA) for Winton Associates Pty Limited on behalf of the Prince of Wales Medical Research Institute [POWMRI]. POWMRI propose to construct a Neuroscience Research facility within the Prince of Wales Hospital campus at Randwick. The study locality is shown on **Figure 1.** An Application for Major Project Status was submitted to the Department of Planning on 29th April 2008. The preliminary Aboriginal archaeological assessment has been prepared for the Part 3A Concept Plan & Project Application in accordance with the Director General's Requirements for the Project Application.

The proposed facility is located in the south western quadrant of the Prince of Wales Hospital campus along Barker Street between Hospital Road and Easy Street. The facility precinct ('the study area') is shown in **Figures 2 & 3**.

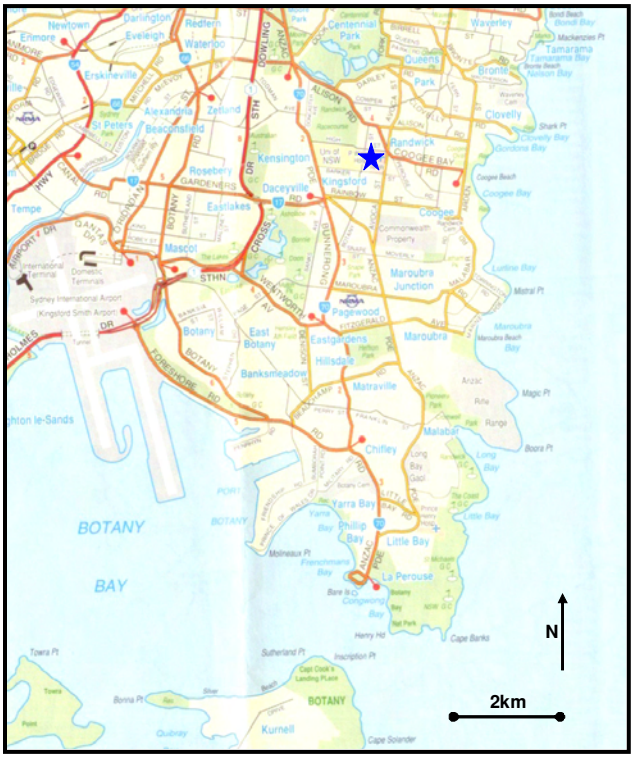


Figure 1. The Study Locality (NRMA 2000).

Figure 2. The Neuroscience Research Precinct

1.2 Scope of Works – Aboriginal Archaeology

Archaeological contextual information inclusive of excavated deposits at the Prince of Wales Hospital site [Dallas, Steele, Barton & Wright 1997] and the Long Bay Correctional Complex [MDCA 2007] have shown that buried Aboriginal cultural deposits reside in the elevated dune ridges adjacent to the coast in the eastern suburbs of Sydney [see **Section 3**]. These Aboriginal archaeological remains may be variously disturbed, post deposition, but can also be sealed beneath building foundations. It is considered that there is little or no potential for Aboriginal cultural material to be present on current surfaces given the degree of historic construction activity and that little if any original topsoil deposits remain within the study area. However the possibility for buried archaeological remains must be considered.

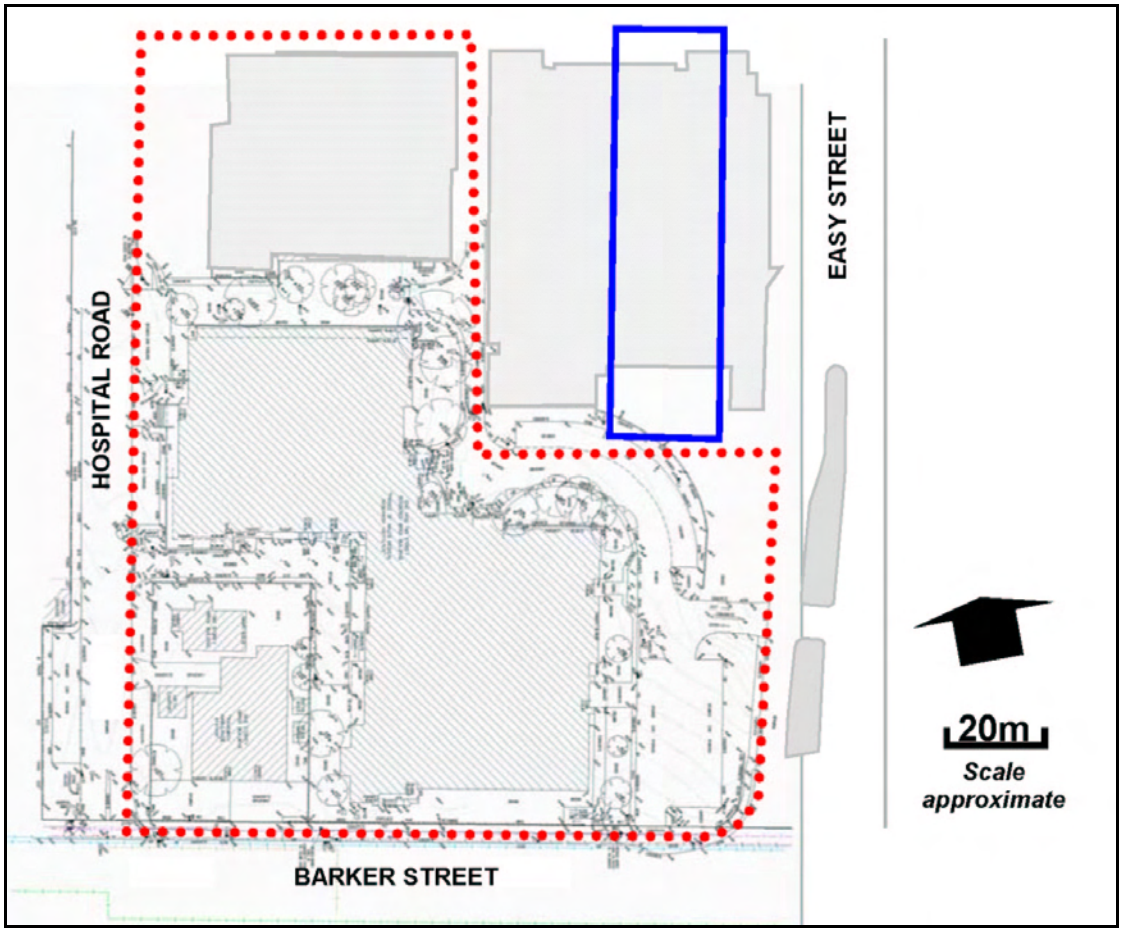


Figure 3. Indicative location of buildings within the study area (red outline) and location of the former Asylum Cemetery (blue outline) [Adapted from plan supplied by Cox Richardson].

The dune system in which the study area is situated comprises Quaternary wind-blown sands, locally and elsewhere dated to around 35,000 BP. Intact Aboriginal occupation deposits dated at 8,000 years ago have been identified within the A2 horizon [leached fine loose white dune sand] of the dune in the area which is now occupied by the Infectious Diseases Clinic immediately adjacent to the study area and which was formerly occupied by the Randwick Destitute Children's Asylum Cemetery (see **Section 3**). The Cemetery itself was the subject of an intensive historical archaeological assessment including a total salvage excavation. So it is

possible that Aboriginal archaeological deposit could remain in such layers (i.e. A2 dune horizon) wherever they survive across the study area. It is also possible that historic archaeological potential will also be identified for this site which may interface with the Aboriginal potential and which will require a co-ordinated response in order to determine the degree of constraint to the current proposal, if any.

The Aboriginal archaeological assessment aimed to identify and define the subsurface Aboriginal archaeological potential of the site by mapping the remaining stratigraphic profile of the dune system within the subject lands i.e., by identifying areas with the potential to contain buried Aboriginal sites and which areas retain no Aboriginal archaeological sensitivity. Therefore the assessment involved identifying and mapping which areas within the study area contain largely intact profiles or parts of the original dune stratigraphic sequence. The assessment has been made using most recent and past geotechnical data, mapping and aerial photography, land use history and building designs [indicative of subsurface or basement levels], data on elevations pre- and post- building construction or landscaping activity [where available]. In particular, the assessment is based on any current or older survey plans of the site showing elevations and historical plans of the area and dates of construction of the existing or previously demolished buildings.

The assessment has resulted in the production of archaeological sensitivity mapping and a proposed strategy for the archaeological investigation of the sensitive areas. The archaeological investigation will be possible following the staged removal of the existing buildings and should involve a combination of mechanical and manual excavation. The principal objective of the archaeological test excavation program would be to determine the presence/absence, nature, extent and archaeological significance of any Aboriginal cultural remains within the defined area of Aboriginal Archaeological Sensitivity that would be impacted upon by the proposed new Neuroscience Research facility. This would facilitate the formulation of recommendations for the appropriate management of Aboriginal remains if they were found to occur within this area.

1.3 Aboriginal Community Consultation

The Prince of Wales Hospital campus falls within the administrative boundaries of the La Perouse Local Aboriginal Land Council (LaPLALC), and also has traditional and historical associations to Dharawal people and the wider La Perouse community, who are represented by the Dharawal Elders.

Aboriginal community consultation should form part of the Statement of Commitments for this project as dictated by best practice. The archaeological test excavation program proposed within the defined area of Aboriginal Archaeological Sensitivity should be conducted in consultation with and include the participation of the relevant Aboriginal community groups.

An initial round of consultation has been commenced with the LaPLALC. Mr David Ingrey, Cultural Heritage Officer of the LaPLALC has been advised on the project and the current preliminary assessment. He has requested a copy of this report be forwarded to the LaPLALC and Mrs Boronia Williams of the Dharawal Elders c/o the LaPLALC. He has stated[1] that he supports the proposed archaeological excavations given that Sydney's 'most amazing' Aboriginal archaeological site was found next door even though the dune was greatly disturbed. He requested that consultation with the community continue throughout the course of the project, including any further planning studies relating to Aboriginal heritage and the proposed archaeological investigations in the sensitive area and finally, in the development of a Statement of Significance for the area.

1.4 Statutory Requirements

The Neuroscience Research facility project is to be assessed under Part 3A (Section 75C) of the Environmental Planning & Assessment Act (1979 as amended). Under Section 75U, approvals under s.87 and s.90 of the National Parks & Wildlife Act 1974 which would usually be sought for archaeological investigations, are not required for such projects.

The Department of Environment and Climate Change [DECC] has produced draft guidelines known as the DRAFT *NSW NPWS Aboriginal Cultural Heritage Standards & Guidelines Kit* (1997) to guide Aboriginal heritage investigations including excavations, in particular the "Standards Manual for Archaeological Practice in Aboriginal Heritage Management" section of that kit.

The DECC has also produced draft guidelines for the Department of Planning in relation to projects with an Aboriginal heritage component to be assessed under Part 3A of the Environmental Planning & Assessment Act (DEC 2005). These draft guidelines refer to another DECC draft policy document entitled "Interim Community Consultation Requirements for Applicants" [seeking Part 6 approvals] in which the process for community consultation [see Part B Consultation requirements p5] is set out (DEC 2004). Specifically, this involves a public notification process by which Aboriginal stakeholders are identified, and then have a right to comment on permit applications. This could be anticipated to take at least 5-6 weeks (from initial advertising to receipt of comments on proposed works), allowing for minimum recommended response times. This factor should be taken into account in the project timeframe and if required should therefore be undertaken as soon as practicable in the planning process.

[1] David Ingrey pers.com 1.12.08

Currently both of these draft policy documents are under review and it is not known what the outcomes of this will be, though it is unlikely that either will be significantly altered. It should also be pointed out that the DEC 2004 draft consultation policy is intended to apply specifically to the National Parks & Wildlife Act s87 and s90 Approvals which are 'turned off' by Part 3A of the Environmental Planning & Assessment Act, and should therefore be considered unnecessary (as the NPWS 1997 Draft policy manual already discusses Aboriginal consultation requirements). However in recent projects the Department of Planning has insisted that this public notification process be undertaken.

Statement of Commitments

The Aboriginal heritage assessment, inclusive of the recommended excavations in the Area of Aboriginal Archaeological Sensitivity should be undertaken following best archaeological practice as articulated in the DRAFT *NSW NPWS Aboriginal Cultural Heritage Standards & Guidelines Kit (1997),* in particular the "Standards Manual for Archaeological Practice in Aboriginal Heritage Management" section of that kit.

The work should be conducted under a research design which considers the site and the significance of any Aboriginal objects as may be found there in a local and regional context. Consultation with and the participation of relevant Aboriginal community groups should be maintained throughout the course of the planning process and the post-demolition archaeological investigation stage.

Any reporting on the Aboriginal heritage assessment should be made available to the Aboriginal community for review and for archival purposes.

1.5 Authorship, Sources and Acknowledgements

This report has been written by Mary Dallas and Paul Irish using information, mapping, aerial photography provided by Jeffery & Katouskas Pty Limited, Winton Associates Pty Limited, Cox Richardson, The Medical Illustrations Unit of Prince of Wales Hospital, Fisher Library (University of Sydney) and the DECC AHIMS database and catalogue of archaeological reports. We are grateful for additional information and clarification on reported analyses conducted on the human remains at the Randwick Destitute Children's Asylum Cemetery by Emeritus Professor RVS Wright. We have gained additional information from Peter Douglas on the Historical archaeological excavation of the POW Randwick Destitute Children's Asylum Cemetery. The staff of the Prince of Wales Hospital Medical Illustrations Unit assisted in locating relevant images for the assessment.

1.6 Summary of Conclusions and Recommendations

The Aboriginal archaeological assessment of the proposed Neuroscience facility has identified an Area of Aboriginal Archaeological Sensitivity which will require archaeological investigation. The investigation could be undertaken in 2 Stages. Areas which are currently available for investigation such as most of the street frontages and the existing building courtyards could be tested in Stage 1. Stage 2 would involve the investigation of the deposits below the existing buildings following their demolition. The aim of the investigation would be to determine, in the first instance by broad scale mechanical testing, whether any surviving Potential Archaeological Deposit (i.e. original dune A Horizon) contains Aboriginal archaeological remains, including within buried former land surfaces, and if so, by more detailed manual investigation to fully assess the remains and determine appropriate management or conservation requirements. Aboriginal cultural remains in the current context, if present, would be restricted to stone artefacts (including hearth stones and other manuports) due to the highly acidic nature of the sand deposits.

The archaeological record would be limited to those remains capable of surviving in the dune environment. It has been shown[2] that such remains occur within the dune system and that they have high Aboriginal and archaeological significance. It has also been shown that the management of their significance by salvage archaeology and retention for display and interpretation is acceptable to the Aboriginal community in the context of a major infrastructure project. The Aboriginal community consultation initiated as part of the current project should be maintained and expanded as necessary throughout the course of the development project.

The following recommendations are based upon the legal requirements and automatic statutory protection provided under the terms of the *National Parks and Wildlife Act of 1974 (as amended),* where;

> *it is an offence to knowingly damage, deface or destroy Aboriginal sites or relics without the prior consent of the Director General of the National Parks and Wildlife Service,*

in conjunction with;

the results of the preliminary assessment of the Neuroscience Research precinct which is documented in this report and the initial Aboriginal community consultation undertaken for this stage of the project.

It is recommended that:

[2] Austral/Godden Mackay 1997 Vol 2 Part 3

A program of archaeological excavation be conducted within the defined area of Archaeological Sensitivity as shown on **Figure 14**, following the demolition of the buildings presently existing within the Neuroscience Research Precinct, in accordance with the archaeological investigation strategy as described in **Sections 4.3 - 4.5.** The archaeological investigations commence where areas are immediately available for investigation and/or follow the staging as proposed for the redevelopment of the Precinct and be factored into the overall re-development program.

The archaeological investigations be conducted in partnership with the La Perouse LALC and the Daharawal Elders and in consultation with the wider local Aboriginal community.

2.0 Environmental Context

The following sections briefly outline the environmental context and land use history of the Neuroscience Research Precinct. Geology and geography are strong determinants of why and how Aboriginal people may have used the local landscape and what kinds of archaeological evidence may have been created, just as subsequent geomorphological and historical changes will affect how and what of this evidence may survive. It is therefore necessary to consider all of these factors to accurately gauge the type, nature and location of Aboriginal archaeological remains which may be present within the study area.

Note: The vast majority of environmental information comes from historical records, plans and images which represent the landscape as it was around the time of first European contact. It is not known how far back in time this can be projected, but it is worth considering that the Aboriginal archaeology which has so far been found at Prince of Wales Hospital dates to a period (ca. 8,000 years ago) of great landscape change at the end of the last ice age, prior to the stabilisation of sea levels at around their current level. The landscape as seen by Aboriginal people at that time may have been considerably different to that which we can recreate from historical records, especially with respect to the location of ephemeral freshwater swamps (which would have been important sources of fresh water and other resources). The extent of major topographical change to the dunes is also unclear. Caution should therefore be applied in relating this information to likely Aboriginal use of this changing landscape.

2.1 Landform/Landscape

The study area currently lies along the western and southern slope and lower slopes of a dune extending across much of the remainder of the hospital complex. Until recent times (the 1970s) the placement of buildings around and adjacent to what is now the hospital site was dictated by the topography and sandy substrate, whereby buildings (and the former Destitute Children's Asylum cemetery) were generally sited at the top or base of the dune (see **Figure 6** and **Section 2.4**).

The topography of the surrounding area is defined by this dune and others, broadly aligned southeast to northwest and up to 20-30m in height. A sense of the height and parallel nature of these dune ridges can be gained by traveling along the undulating terrain on Barker or High Streets between Avoca Street and Anzac Parade. Due to their substantial nature, the dunes have survived broadly in their original (i.e. 1788) form, though often with significant impacts to their uppermost units from historical land use.

Between the dunes were swales sometimes filled with small freshwater swamps. Historical plans indicate that the dune on which the study area is located formed a spur between two arms of a freshwater sedge swamp system known as 'Bird's Gully' which drained southwest into the Lachlan Swamp system and into Botany Bay (**Figures 4 & 5**). The southern of these two arms was channelised in the 1930s, confirming the accuracy of its location on earlier plans[3].

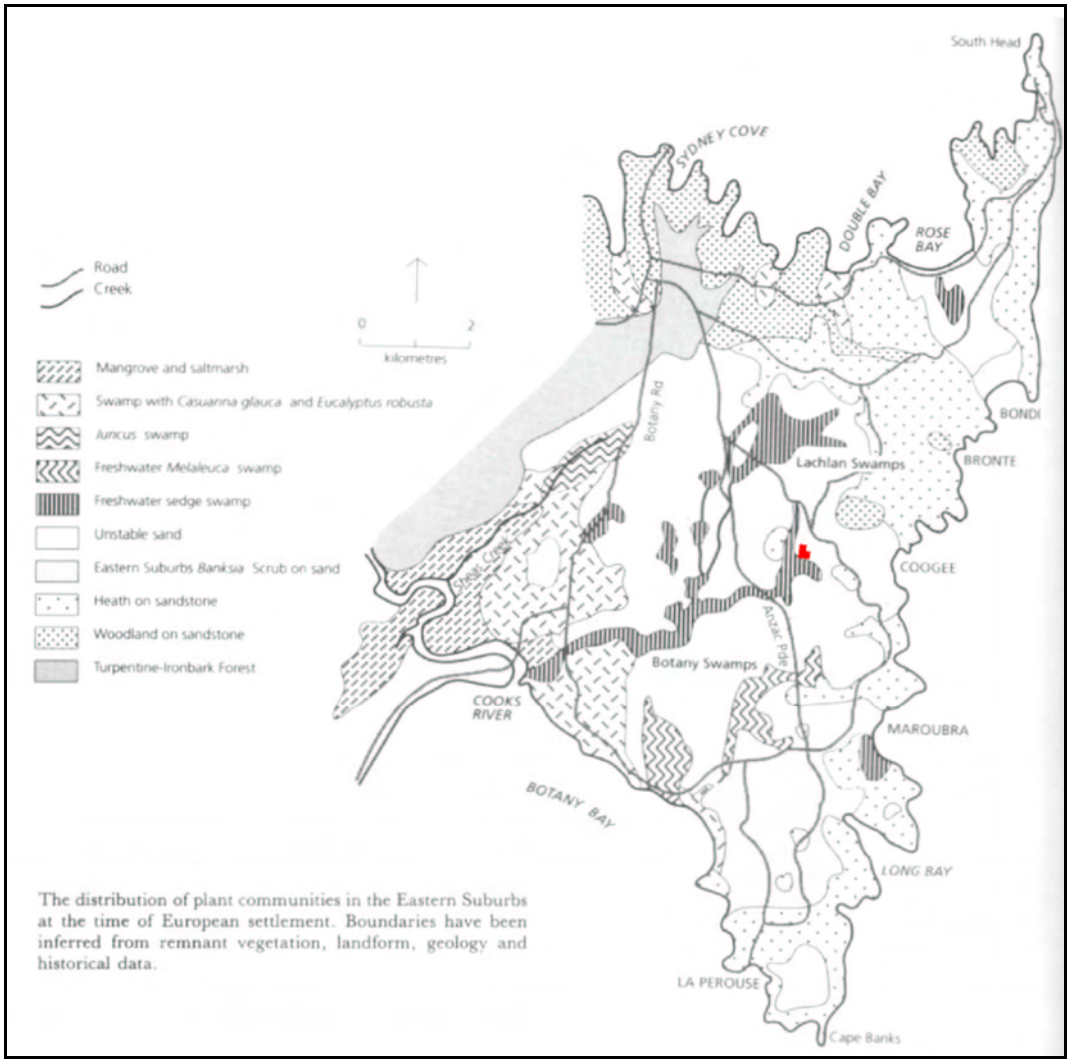


Figure 4. Study area (red) in relation to the recreated contact era vegetation and swamp systems of the eastern suburbs [Adapted from Benson & Howell 1995:90].

[3] see plan at http://www.sydneywater.com.au/whoweare/OurHeritageAssets/_ImageView.cfm?hi=4574209&image=4570826

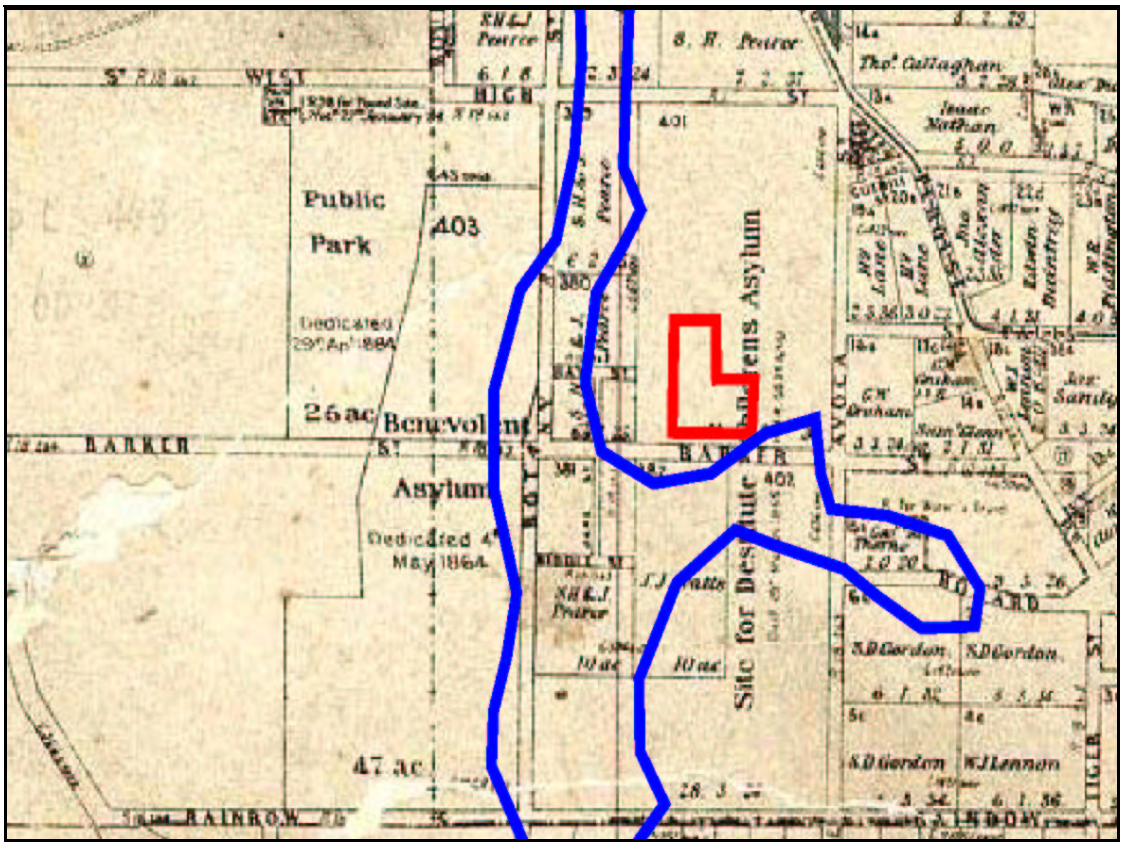


Figure 5. Approximate location of the upper reaches of the freshwater Bird's Gully swamps in relation to the study area.

Note implied form of dune within Prince of Wales Hospital in the center of the two arms of the swamp. Created using undated Alexandria parish map (Department of Lands Parish Map Preservation Project) overlain with details from 1866 Water Board plan as adapted and reproduced in Benson & Howell 1995:91.

No historical descriptions of the landscape setting of the precise study area or the adjacent swamps have been located. The Asylum period farm, located west of Botany Street about 100m west of the study area is described as being "a sandy portion at the foot of a sand hill" (Coulter 1916:28), though this may refer to the base of the eastern slope of the parallel dune to the west. The farm was located in this vicinity due to the "poor quality" of the land south of Barker Street from the study area which was originally granted for this purpose (Graham Brooks & Associates 1997:10). The maps above suggest that this may have been due to the swampy nature of the ground in this area, though the ground is also described as being "very rocky" in parts (Graham Brooks & Associates 1997:10) suggesting sandstone high in the

profile. In fact sandstone does outcrop roughly 100m east of the study area, where it was quarried historically (see **Figure 6**).

An oblique photographic view over the study area from 1917/18 reproduced by Austral/Godden Mackay (1997 Volume 2 Part 1:12) confirms the picture of a dune sloping down to the west into lower lying (and potentially swampy) ground. This is also confirmed by later aerial photographs from 1943 (see **Figure 6**) and 1958[4]. The latter image gives a clear indication of the gentle to moderate slope of the dune to the south and west. This slope can also be seen in **Figure 6** as approximated by a vehicular track. The sandy nature of the top of the dune (in the vicinity of the Blacket building northeast of the study area) after initial tree clearance, is shown in **Figure 7**.

Figure 6. The study area (blue) within the broader hospital complex (red).

Note the sandstone quarry to the east and the yellow dotted line which follows a vehicular track around the toe of the dune [Adapted from Department of Planning SIX Viewer].

[4] Panorama view from around Barker Street east to the study area [Prince of Wales Hospital Medical Illustrations Unit photograph file 90169.jpg].

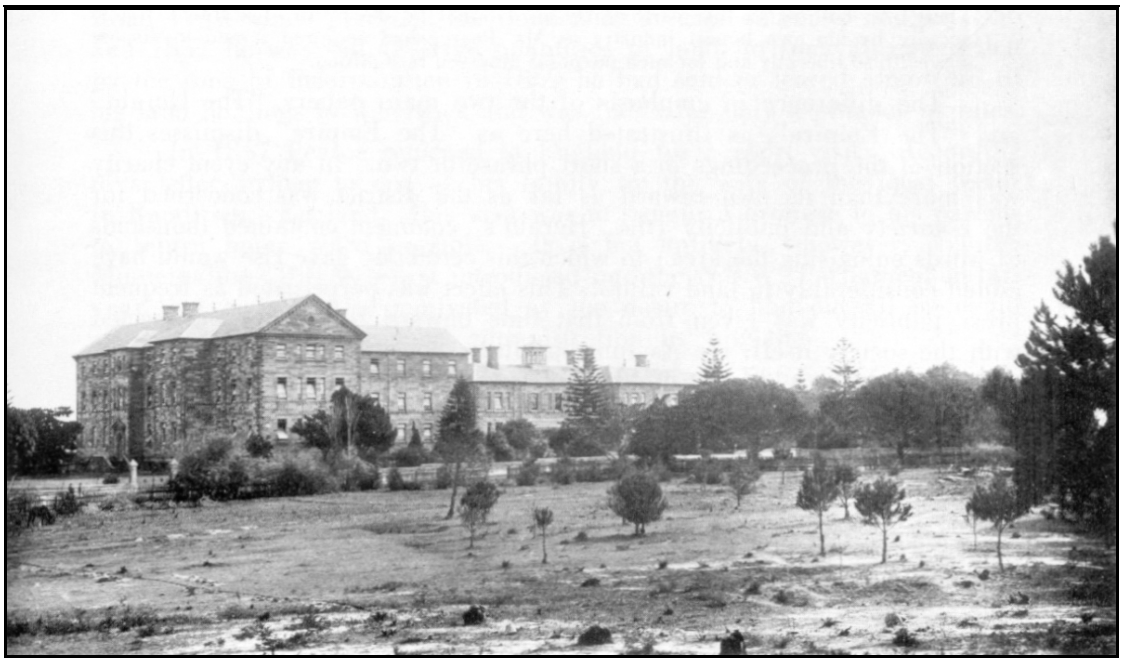


Figure 7. Bare sandy landscape at the top of the dune northeast of the study area after initial tree clearance [Lynch and Larcombe 1976:43].

2.2 Vegetation and Resources

The vegetation present on the dune in early historic times was a mixture of 'heath, scrub and low forest vegetation with a rich variety of shrubs' including banksias and grass trees (Benson & Howell 1995:90-91), known collectively as Eastern Suburbs Banksia Scrub. The dune drained into the freshwater sedge swamplands of Bird's Gully. These swamps would have supplied fresh water and a range of valuable plant resources for food and equipment (e.g. fibres) as well as being a magnet for local fauna and birds. The dunes themselves would also have provided an array of plant foods including fruits, nectar, tubers and roots (Benson & Howell 1995:12ff] and probably also freshwater fish, eels and freshwater mussels. Freshwater was also available from rock holes in the general area, as Cook found in 1770 (Navin Officer 2003:11).

The extent to which these resources (or others) were available (and exploited) in the more distant past is not known, though lipid analysis of one of the hearth stones excavated immediately adjacent to the study area from the dune underneath the Asylum cemetery, indicated that freshwater fish were cooked on the fire (Austral/Godden Mackay 1997 Volume 2 Part 3:30). As the rich resources of the ocean shore and Botany Bay were always at least several kilometres away from the study area, and even further away during the Pleistocene,

they are unlikely to have been exploited by Aboriginal people based at a campsite here, within the dune system. These factors, and the low densities of stone artefact evidence from the site, suggest that Aboriginal occupation was of relatively short duration and focussed on the exploitation of local resources. However the nature of Aboriginal occupation in this period is poorly understood due to a lack of archaeological data.

2.3 Geology/Geomorphology

The Prince of Wales Hospital Campus is underlain by Sydney Hawkesbury sandstone above which a Quaternary aged aeolian dune ridge has developed. The dune is part of an extensive system of dune ridges and swales lying between the Lachlan and Botany Swamps and the eastern Sydney coast.

The background radiocarbon ages of >35,000 years for the dune indicate its initial formation in the Last Glacial, prior to the formation of Botany Bay and with the ocean edge a number of kilometres further east than at present. The dunes contain discontinuous peat and mud lenses formed where terrestrial swamps once existed and which were subsequently buried by wind deposited sand. Subsequent induration of the dune formed a precipitation zone also known as Waterloo rock or coffee rock.

Over the last 10,000 years the dune sands above the coffee rock have also been reworked (scoured and added to) by wind. Shifting dunes and associated swales have also lead to the development of ephemeral swamps in this period, evidenced as peaty layers within the dune above the coffee rock layer. Such layers have not been found within the study area to date but are known from areas nearby (Austral/Godden Mackay 1997 Volume 2 Part 3:5).

The dune profile comprises white or grey sands (A horizon) above this precipitation zone of hard orange brown to dark brown to black sand (B1 Horizon) and unweathered yellow sands (B2 Horizon) below it and overlying the sandstone bedrock (see **Section 2.4**). The dune profile does not contain a weathered bedrock layer (C Horizon) suggesting that the sandstone was exposed at the time of dune formation. As noted above, sandstone was historically exposed about 100m east of the study area and was quarried (see **Figure 6**). There is also reference to "rocky" ground south of Barker Street (Graham Brooks & Associates 1997:10) which may indicate bedrock was exposed or at shallow depth there.

Dallas *et. al.* (Austral/Godden Mackay 1997 Vol. 2 Part 3:5) provides a summary of the dating history of the Aeolian dune in the eastern Sydney. Ages for the upper dune units in the region have been obtained from sediments within a cross-section of the Banksmeadow area. A date of >35,000 years was obtained on peat beneath coffee rock [from the B2 horizon] and a Holocene date was obtained for freshwater peat above the coffee rock (Smart: 1974). The

Holocene date is likely to be the result of reworking of the older dune surface during times of devegetation and erosion.

The dated dune sequence and Aboriginal occupation deposit within it from the Prince of Wales Destitute Children's Asylum Cemetery excavations confirms this range of dates for the region. These Aboriginal archaeological deposits were only located within the A Horizon and date to around 8,000 years ago. Soil analysis from across the site of the former Asylum cemetery (immediately northeast of the current study area) show that the dune sands are highly acidic (pH 3-5) and therefore survival of any organic materials in an archaeological context is highly unlikely (Austral/Godden Mackay 1997 Volume 2 Part 5 Soil Analysis). In fact, unless embedded within substantial shell midden (ie alkaline matrix) bone or wood artefacts or human remains are unlikely to be present unless deposited in the last 200-300 years.

2.4 Stratigraphy and Historical Impacts

A range of archaeological and geotechnical investigations have shown that the dune within the study area consists of the stratigraphic sequence common to the whole dune system of eastern Sydney. The thickness and specific composition of the horizons (particularly the 'coffee rock') within these dunes varies, which are described either as the Newport or Tuggerah Soil Landscape according to soil classification mapping for the region (Chapman *et. al.* 1989).

A typical stratigraphic sequence is outlined in **Table 1** and illustrated in **Figure 8**. The varying presence/absence and thickness of the horizons in relation to historical disturbance is discussed in **Section 4.2**. In general though, the study area dune profiles show the presence of overlying imported fill (sand and/or rubble) on a truncated natural horizon usually lacking an A1 horizon and the upper portion of the A2 horizon.

Table 1. Typical eastern Sydney dune stratigraphy.

Horizon	Typical Thickness	Description
A1	0 - 0.3/0.4m	Thin upper humic topsoil
A2	1.0 – 1.5m	Leached white aeolian sands
B1	0.5 – 1m	[Precipitation Zone]. Heavily indurated mottled sands described as Waterloo or coffee rock
B2	Various	Unweathered yellow sand
Bedrock		Sandstone bedrock

This truncation is due to a range of historical land use impacts which are documented for the study area as summarised in **Table 2** and shown in **Figure 9**. The table and map were compiled from a review of historical plans, aerial photography and oblique photographic views of the area as listed in **Section 6.0**.

Figure 8. Typical Eastern Sydney dune profile missing A1 Horizon as documented in recent excavations by MDCA at Long Bay Correctional Complex.

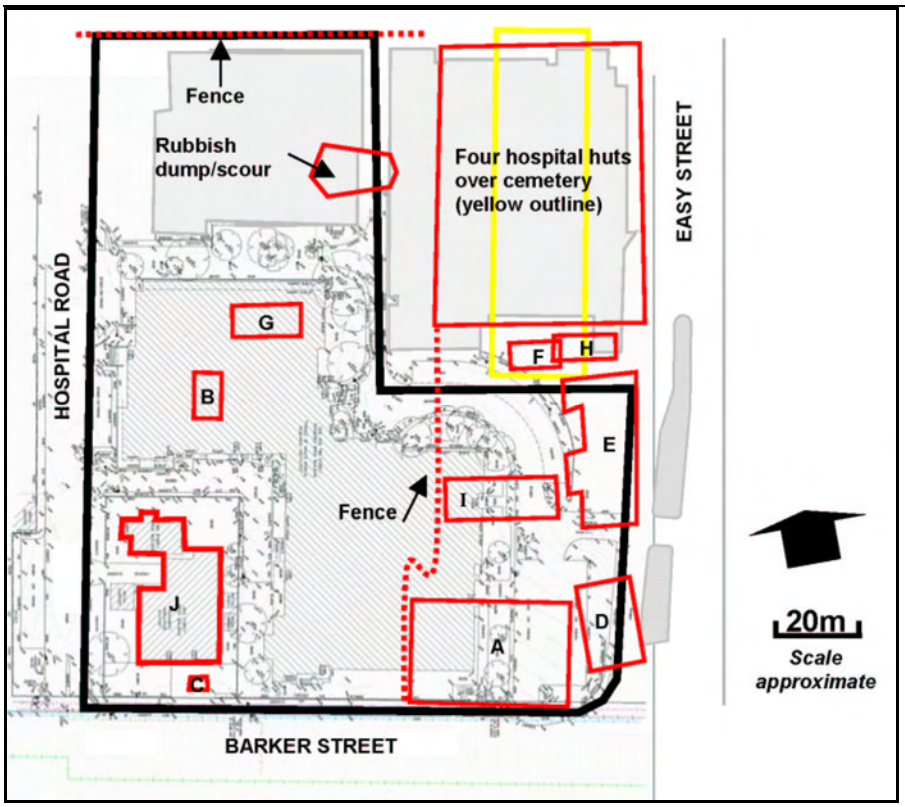


Figure 9. Range of historical impacts documented for the study area in relation to current main building layout. See Table 2 for details of buildings

[Adapted from historical plans and base plan supplied by Cox Richardson].

Figure 10. The workmen's cottages on Barker Street some time before 1916 [Coulter 1916:64].

Table 2. Summary of historical impacts to the study area.

Year/Period	Description (see Figure 9 for location of coded buildings)
1788-1850	Use unknown. Possible tree clearance and grazing.
1850s	Lands granted as part of Destitute Children's Asylum. Some land cleared, fences erected and ten outbuildings constructed but it is not clear if any of this occurred within the study area.
By 1890	Construction of Buildings **A** (Barker Street Cottages – see **Figure 10**), **B** and **C.** Establishment of Asylum cemetery (outside study area). The Barker Street cottages are described in 1905 as four cottages in "two semi-detached blocks with a single cottage behind in its own fenced piece of ground" (Graham Brooks & Associates 1997:17). This latter "cottage" may be Building **D.**
1914	4000 soldiers are described as being camped in the paddocks of the Asylum – possibly including the study area.
By 1918	Establishment of military hospital on and beyond the study area including construction of Buildings **D** (that later photos show to be two storeys), **E** (Hospital kitchen), **F** (Dispensary) and four hospital huts immediately northeast of the study area. Removal of Buildings **B** and **C**. An unsealed track is also visible by this time extending west and northwest from Easy Street between Buildings **D** and **E**.
By 1942	Building **F** removed, Building **G** constructed (later photos suggest it to be a storage shed), fence across northern boundary of study area erected, earlier track shown to extend to Building **G.** A grove of trees is present immediately west of Building G and the western dune slope appears to be largely unmodified.
By 1953	Construction of Building **H**.
By 1958	Construction of Building **I** which later photos show to be a one storey building with a fence to the west. There is also a possible rubbish dump/disturbed area immediately west of several of the hospital huts.
By 1966	Construction of Building **J** (ambulance station).
By 1970	Removal of Buildings **A** (Barker Street Cottages), **G** and **I**. Construction of three villas and associated roadways as currently present within the study area.
By 1982	Removal of Building **D**.
By 1995	Removal of Buildings **E** and **H** and four hospital huts.
1995/1996	Historical and Aboriginal archaeological excavations within, under and adjacent to the former Asylum cemetery. These excavations did not extend within the current study area.

From the above review it can be seen that the majority of historical impacts within the study area, prior to the construction of the current villas, were of a relatively superficial nature in terms of subsurface penetration. For example none appear to have had basement levels. There is a clear avoidance of construction along the moderately steep western slope on which a vehicle track was instead established. Buildings were constructed on the flatter ground at the base of slope or further towards the top of slope. This emphasises the minimally invasive nature of these early buildings and in addition, the archaeological investigations of the former Asylum cemetery have shown that sand horizons with Aboriginal archaeological potential can survive in previously impacted ground due to their potentially substantial thickness (up to 1.5m).

Some information has been provided on the likely level of subsurface impact created by the construction of Villas 1 and 2 in the southern half of the study area[5]. This indicates that both villas contain basement levels of around 2.5m in depth beneath the square building forms, but not underneath the central courtyard areas of both villas. Photographs suggest that these basements contain a mixture of slab floors and footings and concrete piers, with some sandy deposit between them. It seems likely that any such sand immediately adjacent to the basement levels will be completely disturbed and that the basement levels will have removed any remaining A Horizon of the original dune. However it also seems possible that the courtyard areas of both villas may not be substantially disturbed. Villa 3 also contains basement levels and a central courtyard, though details of its construction have not been obtained. The implications of this for archaeological sensitivity assessment are discussed further in **Section 4.2**.

It is not currently clear what service lines may have run across the study area. The previous archaeological investigations (Austral-GM 1997 Vol 4 Service Trench Plan) demonstrated the presence of gas and sewer pipe trenches under the former military hospital huts. If also present within the current study area, such service trenches could be expected to have limited, linear impacts of relatively shallow depth such that deposit with Aboriginal archaeological potential may still survive beneath them.

[5] Leanne Mitchell (of Cox Richardson), email and unreferenced plans to Mary Dallas 4 December 2008; Rod Winton (of Winton Associates), basement photos;.

3.0 Archaeological Context

3.1 Local Site Distribution and Occupation Patterns

A search of the DECC Aboriginal Heritage Information Management System [AHIMS] database showed that no previously recorded Aboriginal sites are located within the study area. The nearest known site was a significant open camp site containing a series of hearths and a small number of stone artefacts and manuports. This site [see below] was located in an Aeolian sand ridge within and along the western boundary of the former Prince of Wales Destitute Children Asylum Cemetery which lay immediately to the east of the Neuroscience Research Precinct, in the area now occupied by the Kiloh Centre.

Most recorded Aboriginal archaeological sites in the local area appear to be middens and rock engravings. This is broadly typical of the eastern Sydney coastline between the harbour and Botany Bay, due to the prevalence of sandstone shelters and platforms, sandy embayments and rocky headlands. Considerable concentrations of sites (rock engravings in particular) occur (and partially survive) at La Perouse, Long Bay, Maroubra, Coogee and Bondi. There are a number of sites containing human burials, whereas open campsites, apart from open shell middens, are not well represented in the local area. The extant sites are mostly located in bushland reserve, national park, golf courses and other lands containing minimally disrupted land surfaces and sub surfaces.

The preliminary assessment also considered the place as important to the contemporary Aboriginal community and their remembered history as discussed in **Section 3.3**.

3.2 Aboriginal Site Investigations

There have been only a handful of subsurface archaeological investigations within the inland dune system of eastern Sydney near the current study area (e.g. MDCA 2007, DSCA 2003, Haglund 2006), none of which have yet located a definite older land surface with archaeological remains. Only the Long Bay Correctional Complex archaeological excavations retrieved any Aboriginal cultural remains associated with this type of landform. However it is likely that further targeted excavation will yield more evidence of Aboriginal occupation (such as that found at Prince of Wales Hospital) and/or lead to better definition of the environment available for exploitation at various times in the past.

3.2.1 Prince of Wales Godden Mackay-Austral Investigations 1995-7

The Randwick Destitute Children's Asylum Cemetery at Prince of Wales Hospital was the subject of a series of investigations prior to the construction of the infectious diseases clinic known as the Kiloh Centre. Initial investigations were conducted by Bickford (1994a,b,c), followed by the Austral/Godden Mackay survey and archaeological salvage of the Cemetery. The aim of the latter investigation was to retrieve maximum information concerning the Cemetery, the burials and the Cemetery context. The work is documented in a series of published reports (Austral/GM 1995; June and May 1996; Dec 1997: Final Report 4 Vols.) [6]. The latter investigation was undertaken following the demolition of the WW1 Hospital Huts and on exposure of bone across parts of the post-demolition surfaces.

The excavations of the Cemetery were planned and executed as an exhumation of the remaining children's graves for the future re-interment, consecration and commemoration at an appropriate site within the Prince of Wales Hospital grounds.

The northern extent of the site, or its surviving extent, was defined by the limit of immediately prior major excavations through bedrock for the new Hospital car park, under the Capital Works Program. Sands from the dune were removed and on sold as bunker sand to local golf courses. Most of the eastern portion of the Cemetery including its eastern boundary fence had been removed during the excavation/levelling of the dune for the construction of the WW1 Hospital Huts. The levelling[7] had removed and may have pushed at least some of the original top soils and the upper portion of the A2 Horizon white sands from east to west. These disturbed [but local] sands were then made to form a short steep batter on the western and southern boundary of the site under which was found the remaining truncated dune containing the remaining burials and also the southern and western side slopes of the dune under the batter material (see Austral/Godden Mackay 1997: Vol. 2, Pt 1, Figure 6.36, p.128). The removal of the northern portion and eastern side of the Cemetery during the earlier construction phases described above accounts for the discrepancy between the number of burials identified by the archaeological excavations and the Asylum Cemetery records.

The boundary of the Destitute Children's Asylum Cemetery was identified by the field investigation on exposure of a number of post holes of the western and southern boundary fence, placed by land survey and map overlay relative to the Asylum Building and Easy Street. In addition, the empirical data derived from the analysis for the identification of the individual children provided firm evidence of the southern and western boundary. Using a technique similar to dendro-chronology, the Austral/Godden Mackay team Physical

[6] There are also the original records of the investigation including an extensive photographic record and weekly reports made by the Field Supervisor, Peter Douglas pers comm. 3.12.08 The unpublished field records, reports, site plans and section drawings are the subject of a confidentiality agreement between the consultants and the SEAHS.
[7] Peter Douglas pers. comm.. 3.12.08

Anthropologist, Emeritus Professor RVS Wright, found a coherent correlation between the age of each child at death (from Cemetery records) and the age of the teeth of an individual burial (dental eruption). The analysis (Austral/Godden Mackay 1997: Vol. 3, Section 9.7, p.179-190)[8] could show the sequence of interment within the remaining rows along the western boundary and this proved that the last [southernmost] body from the [westernmost] row had been recovered, effectively defining the south western limit of the interments. This analysis was done on the south western section of the cemetery comprising the Roman Catholic area where the burial records were complete and where enough of the individual plots had survived. In this area it was shown that the burials took place from the north western corner of the Roman Catholic Section in a row to the south then commenced again at the top and adjacent [east of] to the first row. There was an interval of only three days between burial 64 (at the end of Row 1) and burial 47 (at the start of Row 2). There are no intervening records that would allow burial 64 to be interpreted as anything other than the last burial in Row 1. In the case of Row 2, the records show that there are two burials that had been destroyed by land clearing at the southern end. The interval of time between burial 65 and burial 46 is about 10 months. Obviously these destroyed burials in Row 2 were comfortably fitted into the known cemetery boundary.

Only one burial was found to be located outside this pattern. A neo-nate, not identified in the burial records was uncovered abutting the western boundary between the Roman Catholic area and the Church of England area. All other burials were located 5m to the east of the western boundary. The position of the neo-nate accords to the burial of babies born out of wedlock at that time, namely in an unconsecrated area of the Cemetery. It also indicates a deliberate practice of interment within the designated Cemetery area.

The broader Cemetery context was also investigated by a series of mechanical trenches through the dune side slopes. On the western side these trenches run between Villa 3 and the dune top and on the southern side they ran from the southern boundary of the Cemetery down the batter and side slope to a flat area now occupied by a car park. These were found to be archaeologically sterile.

[8] Richard Wright pers comm..27.11.08; 3.12.08

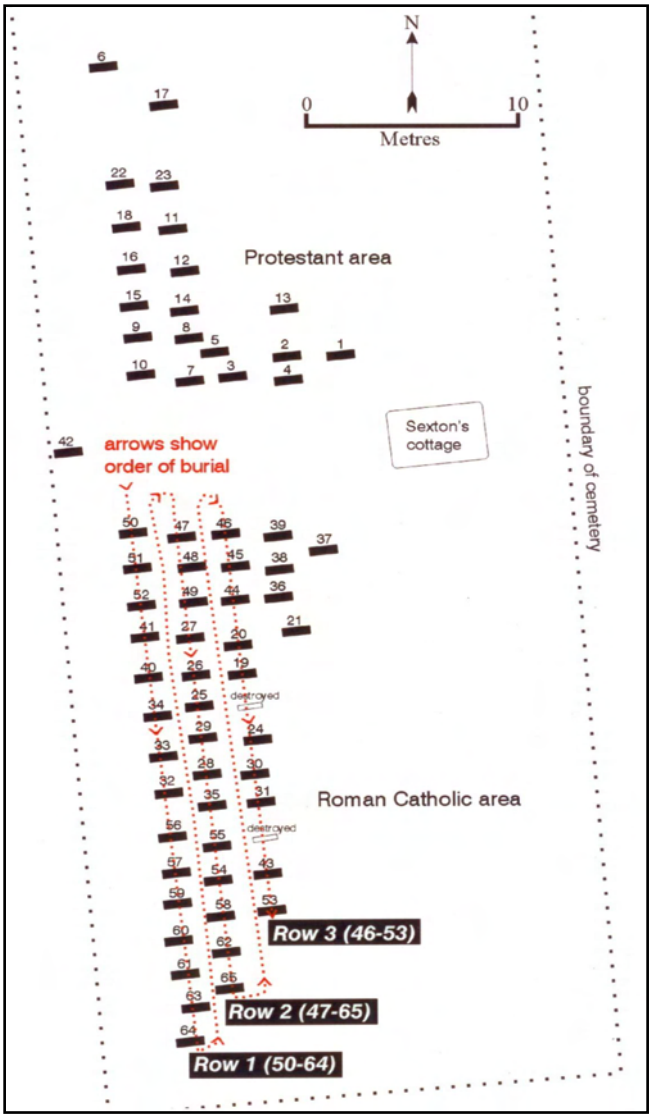


Figure 11. Plan of Interment Sequence at Asylum Cemetery

Map created/ supplied by RVS Wright 4.12.08 for the current .assessment

Aboriginal Archaeological Evidence.

During the course of the Cemetery investigations and series of deflated stone hearths (Austral/Godden Mackay 1997 Vol. 2, Part 3) of Aboriginal origin was located beneath the children burials and within the Cemetery boundaries towards its western boundary. The hearths were identified within the A 2 Horizon below the children burials. The hearths had not been disturbed by the graves, but showed signs of having been subject to localised

displacement by prevailing winds for a time and subsequent covering by wind blown sands. The hearths comprised a series of small sandstone cobbles brought into this particular location for the specific purpose of creating fireplaces on which there is firm evidence that at least one freshwater fish meal was cooked.

Carbon attached to one of the hearth stones was dated to about 8,000 years ago. A Thermoluminesence date on one of the hearth stones confirmed this date as the time the time the hearth was last exposed to sunlight, and others throughout the dune profile confirmed this date in terms of its relative positioning in the A2 Horizon. A lipid analysis on one of the hearthstones showed what type of animal had been cooked at the hearth.

The evidence for the early Aboriginal occupation at this place also included a small number of stone artefacts, the paucity of which was thought to represent a reliance on wooden implements, such as digging sticks, fishing nets or lines, boomerangs, spears, coolamons etc, or those of a type commonly associated with resource extraction in swamp or wetland environments which do not rely on stone artefacts. The highly acidic nature of the dune sands had destroyed any such evidence. The rate of decay of the human remains within the Cemetery above this Aboriginal site strongly suggest that animal or fish bone or human remains would not survive beyond about 300 years ago. No shell remains were found in or near the hearth site, or elsewhere throughout the excavated dune. Unless thick shell midden deposits had been laid down by the Aborigines in the past, within which organic remains may also have been deposited and preserved in this highly alkaline context, there is little or no likelihood that organic remains can survive in the acidic sands.

The management outcomes for the Aboriginal site was total salvage and storage until suitable reconstruction and interpretation could be arranged within the La Perouse Community or at the La Perouse LALC offices at Yarra Bay.

3.2.2 Long Bay Correctional Complex (MDCA 2007)

The archaeological investigation of the site of a new 85 bed Prison Hospital within the Long Bay Correctional Complex [MDCA 2007] aimed to investigate potentially undisturbed subsurface sand dune deposits following the demolition of prison industry and store buildings and exposure of deposits below the footings and concrete slab foundations. In this respect it was similar to the investigation proposed for the post demolition investigation of the Neuroscience Research Precinct.

The Aboriginal archaeological assessment of the prison complex found that the construction of the new Prison Hospital could impact upon potentially artefact bearing dune deposits typical of eastern Sydney and similar to those found at the Prince of Wales Hospital site. The area of sensitivity was identified [Dallas & Tuck 2005; Figure 2] on the basis of its locational suitability (on the eastern end of an elevated ridge along the northern portion of the Long Bay

Correctional Complex) as an Aboriginal campsite (in contrast to adjacent boggy areas) and the possibility for the sandy deposits underlying existing structures to retain undisturbed evidence of Aboriginal occupation. The assessment recommended that archaeological test excavations of the area of Archaeological Sensitivity be undertaken following demolition of the industry and store buildings at the site.

This demolition work involved removal of all extant structures as well as underground fuel storage tanks. It also included extensive fuel contamination remediation works and asbestos removal. This reduced the extent of the area of Archaeological Sensitivity. Exposure of post demolition deposits showed that the south eastern half to two thirds of the site were in an area subject to past excavation/levelling to a depth of a metre or more compared to the adjacent area to the northwest. Deposits exposed in this area included basal yellow sands which have been shown to be archaeologically sterile (Dallas, Steele, Barton & Wright 1997). The foundations and footings and underground services of the existing buildings were found to have disturbed subsurface deposits to varying degrees. Some areas had relatively undisturbed natural soil profiles underlying fill of variable thickness and others in which that profile had been truncated by past activities. One area approximately 10m x 15m appeared to also retain original topsoil under about 10cm of recent sand and rubble. There was also an area of level sandstone platform close to the ground surface identified as a potential engraving site which may have been exposed in the past. The archaeological testing program included manual and mechanical sub-surface excavations which sampled all areas not subject to major disturbance through past and recent activities.

Two stone artefacts were uncovered from both the A2 horizon and from disturbed upper/fill layers. They were not considered indicative of intact or *in situ* archaeological deposit, but rather derived from deposits which have been removed, churned or totally disturbed by the building construction phase. Secure carbon suitable for radio carbon dating were not retrieved and the stone artefacts could not be relatively dated on typological grounds. All bone retrieved was found to be of recent introduced animal species.

The paucity of Aboriginal cultural remains at this site was considered to be a factor of site disturbance coupled with the likely low intensity usage of the area by Aboriginal people, generating low densities of cultural material susceptible to disturbance by natural erosion and historical activities (MDCA 2007:45).

3.2.3 Randwick Racecourse (Dominic Steele Consulting Archaeology 2006)

In 2006 Donimic Steele Consulting Archaeology conducted a desktop assessment of proposed works associated with the Royal Randwick Racecourse. The study identified a remnant portion of a sand dune which was part of the eastern Sydney dune system in the south eastern corner of the racetrack. This remnant dune was assessed as having

archaeological potential in the same way that other remnant portions of the dune system are being assessed following the discovery of the hearths at the Prince of Wales Hospital Aboriginal site (Dominic Steele Consulting Archaeology 2006).

3.2.4 Prince of Wales Hospital Conservation Management Plan (GBA 1997)

The Conservation Management Plan (Graham Brooks & Associates 1997: 7.2.3, p.102) broadly considered the Aboriginal archaeological potential of the hospital campus and noted that subsurface deposits across the campus could potentially contain Aboriginal relics. One area in particular was identified as having potential to the east of Easy Street on the basis of least past impacts. The current assessment has refined the identified sensitivity to include parts of the Neuroscience Precinct on the basis of more recent data on subsurface conditions.

3.3 Contact and Post – Contact Period Occupation

It was noted above (**Section 2.0**) that caution should be exercised in projecting the early historical landscape too far back in time (especially to the period of environmental change in which archaeological evidence has so far been documented). This applies even more so to the use of early historical and relatively recent archaeological data on how Aboriginal people used the Sydney region. Firstly, we currently know very little about how Aboriginal people used the Sydney area prior to the stabilisation of sea levels to roughly modern levels by the end of the last ice age (around 6,000 years ago), with the Prince of Wales Hospital Aboriginal archaeological site and a handful of others providing the only direct evidence. Secondly we know that the period in which these sites were used was one of significant environmental change which, amongst, other things, is evidenced by the subsequent burial of the Prince of Wales Aboriginal hearths by drifting, wind blown sands. Lastly, we know from archaeological evidence that use of stone and other raw materials and the type of finished implements changed markedly over the last 10,000 years, but we have little archaeological evidence of any organic materials for food extraction or implements prior to around 4,000 years ago.

The Prince of Wales Destitute Children's Asylum Cemetery Aboriginal archaeological excavations concluded that models of Aboriginal movement and subsistence based on historical and recent archaeological records did not adequately explain the nature of the evidence uncovered, and suggested alternate explanations (see above). If further archaeological evidence is found within the study area it is likely to greatly advance our understanding of the nature of early Aboriginal occupation of the area.

Aboriginal people continued to use the general area after the arrival of Europeans. No direct references to the use of the specific study area by Aboriginal people after this time have been located to date. It is likely that, at least until the mid-nineteenth century, Aboriginal people

continued to use the resources of the swamp and dunes, though after this time movement became more restricted by advancing European rural and suburban subdivision.

Research is currently being undertaken by one of the current report authors, Paul Irish, into post-European contact Aboriginal sites within the Sydney region[9]. The research database currently contains records for over 250 places, amalgamated from previous and current archival and archaeological research, none of which are within or immediately adjacent to the study area. The major post-contact settlement in the area was in the La Perouse area. Other focii of post-contact Aboriginal occupation appear to have been along the ocean and bay coasts (e.g. Bondi, Long Bay, Little Bay, Banksmeadow). For example, there are records of a major camp near Long Bay for Aboriginal people occupied before and for some time after the arrival of Europeans (MDCA 2005:59). A shelter with midden in Long Bay may also have been used by Aboriginal people in the historic period for smallpox victims (MDCA 2005:46). It can be assumed an unknown number of Aboriginal prehistoric and historic sites have been destroyed by the intense development across the eastern and south eastern Sydney area.

Aboriginal people were also associated with many of the early industries and recreational sites in the area such as Centennial Park and Randwick Racecourse (Centennial Park and Moore Park Trust 2003, Dominic Steele Consulting Archaeology 2006). It is therefore possible that Aboriginal people worked in the Destitute Asylum or Military Hospital in some capacity. It is also possible that Aboriginal servicemen were among those treated at the hospital in the First and Second World Wars.

Although this has not been the focus of specific research, previous discussions with Aboriginal community representatives during the Prince of Wales Hospital Destitute Children's Asylum Cemetery investigations showed that while the archaeological site there was very important and especially significant to the community as very early occupation data, the area itself was not of special significance, despite the aforementioned nearby places known to be of considerable importance to the Aboriginal community in the post-invasion period.

However any additional investigations within the study area will provide an opportunity to examine further any possible historical Aboriginal associations with the site, which might be incorporated into site interpretation.

3.4 Summary

The Aboriginal archaeological potential of the Neuroscience precinct is assessed as follows: Archaeological evidence likely to be restricted to stone artefacts and remains of fireplaces. There is unlikely to be any organic remains surviving older than 2-300 years, unless a deep

[9] The Sydney Aboriginal Historical Places Project.

shell midden deposit is present. There is no likelihood of rock engravings as sandstone does not outcrop in the study area. Archaeological evidence for Aboriginal occupation is likely to reflect sporadic or seasonal use of the swamp margins and is likely to be sparse, given the high proportion of wooden implements used in swamp and wetland resource extraction in the Aboriginal tool kit known from ethnographic recordings.

Archaeological evidence is likely to be restricted to the A horizon. There is a likelihood of finding old stable land surfaces upon which Aboriginal people in the past may have camped, but it is considered unlikely that this would remain totally intact or undisturbed given the amount of natural reworking.

The area has been impacted by historical activity over the last 150 years, however major subsurface impacts appear to be restricted to the last 35-40 years with the construction of the current buildings at the site.

4.0 Aboriginal Archaeological Sensitivity

4.1 Overview

The preliminary Aboriginal archaeological assessment of the proposed Neuroscience Research facility precinct has identified an area of Aboriginal Archaeological Sensitivity. (see **Figure 14**).

The Area of Aboriginal Archaeological Sensitivity has been defined using:

1. Contextual information on the archaeology and stratigraphy of the dune system at the site;
2. Aerial photography and historical plans showing the development of structures and other ground disturbances on the site over time;
3. The results of Geotechnical drilling over the precinct between 1993 and 1999, and most recently, November 2008, showing which parts of the site retain remnant dune and the nature of the deposit; and
4. Building plans showing sub floor or basement layers analysed in conjunction with the profiles identified by the drill holes and available RL data for the site.

The sensitivity is defined by the presence of remnant sections of the dune profile, namely part or most of the A2 horizon [upper dune layer] on an intact B1 horizon [Waterloo or coffee rock layer]. The absence of sensitivity is defined by the total truncation or mixing of the dune deposits to bedrock.

Predicted site types/cultural remains

While it is unlikely any of the topsoil identified across the site is original i.e., surviving pre-construction surfaces, and that no older land surfaces have been identified by the geotechnical drilling, it is possible the remains of camp sites may be found throughout the A2 horizon (the leached white sand layer) of the dune. The camp sites could contain the remains of hearths, or cooking events, midden deposits and/or stone tool maintenance.

Given the acidic nature of the dune deposits and the empirical data from the adjacent Destitute Children's Asylum Cemetery where the process of the loss of calcium phosphate was well underway, it is unlikely buried human remains older than 200-300 years will have survived, unless they were buried in relatively deep [highly alkaline] shell deposit.

4.2 Stratigraphic Evidence for the Survival of Dune Horizons

Geotechnical investigations provide the only available information about the likely nature of surviving natural dune horizons within the study area. To a degree these can be supplemented by further geotechnical records from areas immediately adjacent, and archaeological records from the Asylum cemetery excavations (see **Figure 12**). Borelogs from 31 geotechnical boreholes excavated between 1993 and 1999 (Jeffrey & Katauskas 2008) and draft borelogs of a further 11 boreholes excavated in November 2008 (as supplied by Jeffrey & Katauskas) were examined in detail. Of these 42 boreholes, 25 are within or immediately adjacent to the current study area. In addition, a range of section drawings from the adjacent Asylum cemetery archaeological investigations (Austral/Godden Mackay 1997 Volume 4) were examined in detail. Measurements were taken every 10m or less along the recorded sections, avoiding clear evidence of disturbance. Although outside of the current study area, and higher up the dune slope, these data provide valuable evidence of the thickness of A2 deposits, in which archaeological material was located.

Data Limitations

The locations of the initial 31 boreholes are recorded on a plan without contours, and the surface elevations for some of these are not recorded (and cannot be accurately determined from their location on the plan). Therefore they cannot be used to predict the absolute elevations of natural sand horizons (i.e. relevant to current topography). However they have still been of use in determining the average thickness of sand horizons and, in some cases, can be broadly matched with adjacent geotechnical pits with recorded elevations. Other boreholes were not excavated to bedrock and therefore the extent of survival of natural sand horizons is unclear. A further general limitation is in the matching and interpretation of written borelogs to natural dune horizons, given that the boreholes were not excavated with archaeological interpretation in mind. With respect to the Asylum cemetery excavation records, original field data was unavailable for the current study[10]. Sand horizon depth and thickness were therefore obtained from the section drawings by scaling off original plans and should therefore only be considered accurate to within 0.1m-0.2m.

For these reasons, a cautious interpretation of the data has been employed. For example, indicative sections showing approximate natural sand horizon levels across the site have not been able to be produced.

[10] This data subject to a confidentiality agreement between SEAHS and Austral/Godden Mackay (Peter Douglas, Field Supervisor for project archaeological consultant team, pers. Comm.3.12.08).

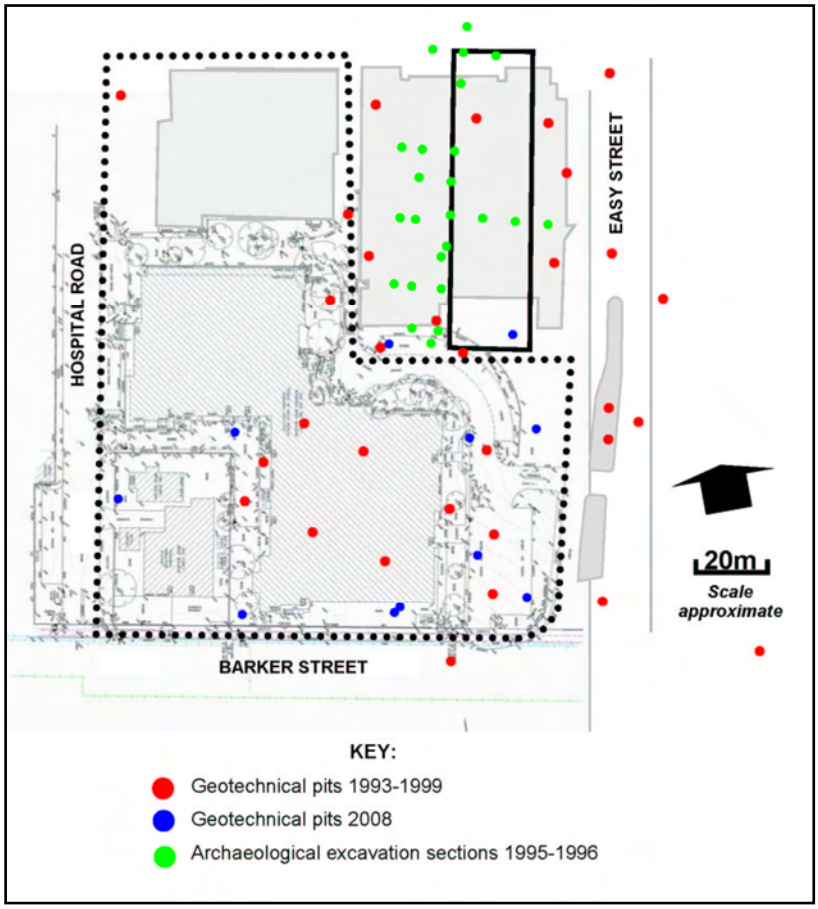


Figure 12. Location of consulted geotechnical boreholes and archaeological sections consulted in relation to the study area (black dotted line) and approximate cemetery location (black outline)

[Adapted from Plan supplied by Cox Richardson].

Interpretation

The geotechnical data suggest that an A2 dune horizon may be present in 12-15 of the boreholes within and immediately adjacent to the study area (see **Figure 13**). This horizon is always overlain by varying quantities of introduced fill and/or mixed sands, and no original topsoil (A1 horizon) could definitively be discerned. It seems likely that the A2 horizon is at least partly truncated by historical activities across the entire study area, and in some cases has been mixed with underlying B horizon indurated or unweathered sands. Where the A2 horizon is present it is between 0.4m and 1.6m under the surface[11] and an average of around 0.95m in thickness (but ranging from 0.4m to 1.5m). This tallies well with data from the Asylum Cemetery excavations where the A2 horizon was of a similar thickness with a range of 0.1m to 1.7m.

[11] In the case of the 1993-1999 boreholes, this may not equate to current surface levels.

It can be seen in **Figure 13** that A2 horizon sands appear to have survived largely in the southern portion of the study area, though this is merely a factor of more intensive investigations there. Based on the known thickness of the A2 horizon (at most around 1.5m), it could be surmised that where existing buildings in the study area contain basement levels, the A2 horizon will not be present, unless it was covered by a substantial amount of fill (at least 1m) prior to construction, which seems unlikely given the lack of major disturbance prior to construction. This does not discount the possibility for A2 horizon sands to survive immediately adjacent to these buildings, as appears to be the case in the southern half of the study area and at the western edge of Villa 3.

The northernmost villa [Villa 3] appears built on fill down to sandstone bedrock and A2 horizon sands are likely to have been completely removed within the building footprint, though they do appear to survive between the building and Hospital Road. However it is not currently clear whether a courtyard area in this building contains less disturbed subsurface deposit (and hence some archaeological sensitivity).

A2 Horizon sands have survived around the southern three buildings including in the footprint of former buildings, adding weight to the conclusion that subsurface impacts until the 1960s/70s were not substantial (see **Section 2.4**). In particular, A2 Horizon sands have survived the construction and demolition of the Barker Street cottages (Building A) and subsequent carpark construction. The Ambulance Centre has been constructed on concrete slab foundations possibly without major surface disruption to the dune deposits so it is also likely that A2 Horizon sands are present to a degree under the centre.

As noted above, Villas 1 and 2 contain basement levels up to 2.5m below the current surface, which are likely to have destroyed or significantly disturbed any original A2 dune horizon sands within the immediate vicinity. However it also appears that courtyards within both buildings are not underlain by basement levels, and in one case (Villa 1) appear to retain A2 Horizon sands. Therefore these courtyard areas should be considered to retain Aboriginal archaeological sensitivity.

The borelog for BH8 along Easy Street mentions the presence of ‘sea shells’ in whitish yellow sand (possible A2 Horizon) about 1.3m under the then surface. This was not recorded in any other pits, including several in close proximity. Without further information it is not possible to interpret their possible Aboriginal origin or significance other than that the highly acidic nature of the soil suggests that anything other than substantial midden deposits would not have survived long in the dune sands. Therefore, on the balance of probabilities, the sands may be disturbed and the shells of modern origin.

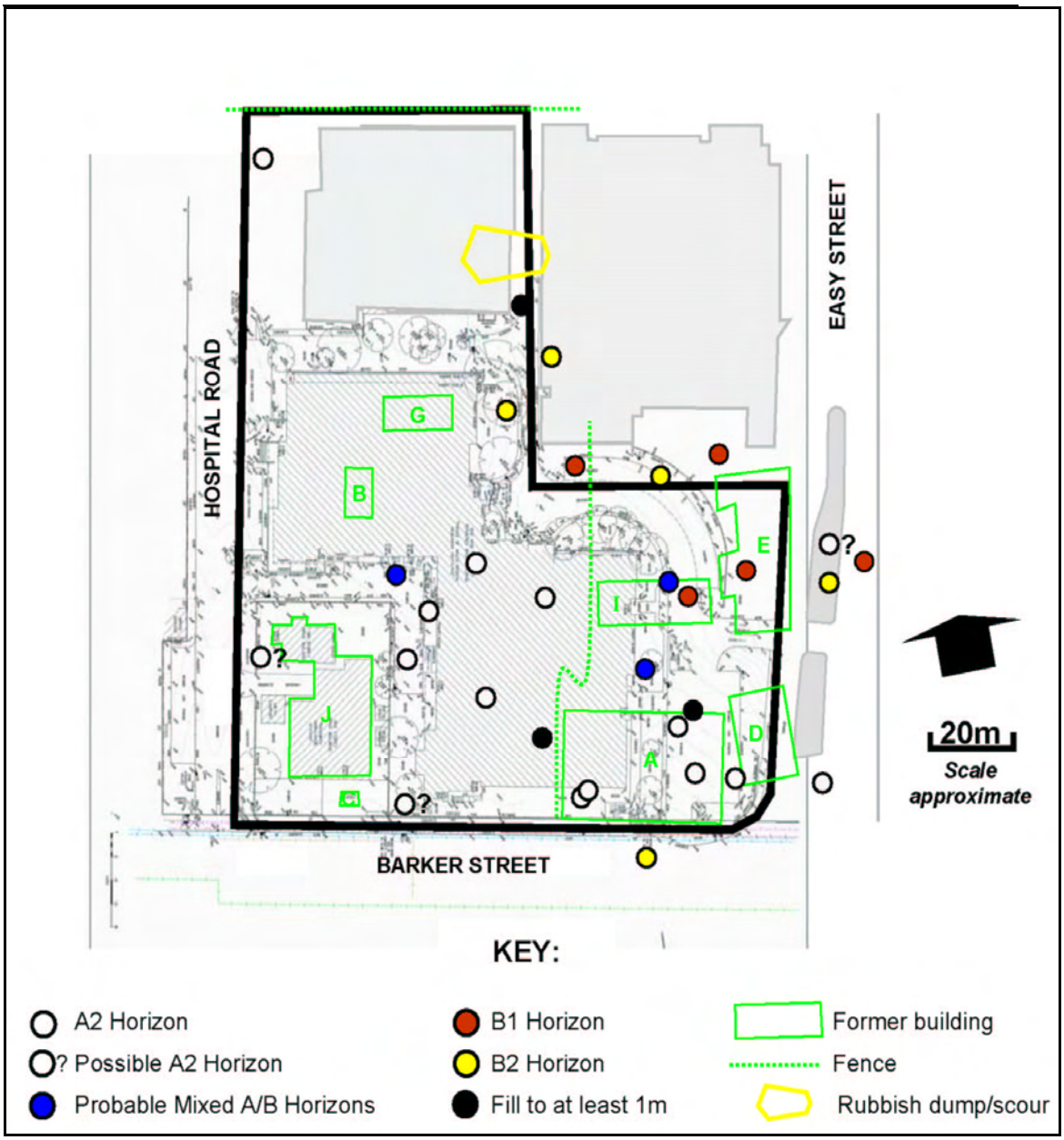


Figure 13. Uppermost natural dune horizon present within the study area (black line) as deduced from geotechnical data.

[Adapted from plan supplied by Cox Richardson. Pit locations approximate and not to scale].

4.3 Archaeological Sensitivity Mapping

The northern portion of the study area including the footprint of Villa 3 (the Black Dog Institute) and the small portions of land north to the internal access road/study area boundary and east to the study area boundary retain no archaeological sensitivity due to the presence of a basement level in this building which will have removed any natural sand horizons with archaeological potential. Boreholes to the immediate east of this show variously fill to bedrock level or basal dune horizons (B2) only. West of Villa 3, adjacent to Hospital Road, a borehole suggest that up to 0.75m of original A2 horizon may survive under about a half metre of fill. This area therefore retains archaeological potential.

Villas 1 and 2 also contain basement levels and no archaeological sensitivity is likely to be retained within their building footprint. However, some original A2 horizon with archaeological potential may survive within the courtyard of Villa 1 (under at least 1.5m of fill). The courtyard of Villa 2 may also retain similar deposit. It is not currently known whether the Villa 3 courtyard is underlain by basement. The potential of all three courtyards to retain deposit with archaeological potential could be investigated immediately, subject to logistical considerations, or in the post-demolition stage as discussed below.

The northern end of the eastern portion of the study area, along Easy Street and immediately south of the Memorial Garden, also appears to be devoid of A2 horizon. This area contains a significant cut into the original dune, represented by a large curved retaining wall on the northern edge of the internal roadway. Geotechnical data suggest that this has removed the upper profile of the original dune, as has demolition and construction works above this adjacent to Easy Street.

With these exceptions, the remainder of the study area is considered to retain Aboriginal archaeological potential. There are numerous occurrences of A2 horizon across this area, as well as some possibly mixed deposit, and other occurrences of considerable quantities of fill under which some A2 horizon may remain. A cautious interpretation of the geotechnical data (given the limitations previously discussed) suggest that, with the exceptions above, the possibility of surviving A2 horizon, and therefore Aboriginal archaeological potential, cannot be discounted for the majority of the study area. The thickness of this horizon no doubt varies, but given that Aboriginal archaeological remains may occur anywhere within it, any amount of this horizon which survives should be considered to have archaeological potential due to the high potential significance of any archaeological remains recovered.

The resultant area of Aboriginal Archaeological Sensitivity is mapped in **Figure 14** and the implications for further archaeological works are discussed in **Section 4.4**.

Figure 14. Area of Aboriginal Archaeological Sensitivity within the Neuroscience Research Precinct.

All areas shaded in green may retain some amount of original A2 dune horizon and therefore retain Aboriginal archaeological potential. The area marked with "?" in Villa 3 is the courtyard of that building, as discussed in text.

4.4 Excavation Strategy

The Area of Aboriginal Archaeological Sensitivity is defined as the portion of the study area that may contain surviving A2 Horizon sands which have the potential to contain Aboriginal cultural remains. It is not known nor can it be accurately predicted on the current evidence that significant intact Aboriginal remains will be located in the designated sensitive area, however we can predict that any remains present are likely to be restricted to stone artefacts and that there is little likelihood relatively recent or even contact or post-contact archaeological evidence will have survived the historic disruption to the surface and upper levels of the dune system. There is the potential for the A2 sands to contain prehistoric evidence of Aboriginal occupation, similar to that found beneath the Asylum cemetery. Older Aboriginal archaeological sites are rare in the Sydney area, particularly in the urban and suburban areas, and would be assessed having archaeological and Aboriginal significance and would require detailed investigation.

Finding such archaeological evidence will require a program of excavation staged according the phases of building demolition within the Precinct. Some of the areas could be investigated immediately. These include the Villa courtyards (noting that Villa 3 courtyard may be built up over an excavated area), and the narrow strip between the buildings and the street. The remainder, in particular, the Ambulance Centre (Stage 2B) and the Medical Research Institute carpark (Stage 2A) will require the removal of concrete slabs and pavers etc before an archaeological investigation could take place.

The archaeological investigation could be undertaken using mechanical excavation. This would be limited to narrow trenching if the courtyards and the road frontages were investigated immediately.

Investigation following demolition of the existing buildings according to the staged development of the precinct could be broader in scale, but also include wide trenching and open area excavation and mechanical sieves. . The latter investigations would have to be built into the construction phase time schedules, construction tenderers advised on this requirement and contracts drawn up accordingly. The immediate investigation of the more accessible areas would not present the same constraint and could potentially refine the area of sensitivity.

The investigation should be undertaken under a Research Design (see below) which recognises that there may be potentially historical archaeological considerations and an integrated approach required.

4.5 The Archaeological Research Design

As discussed above, Aboriginal archaeological remains are associated with A Horizon deposits of the original dune in eastern Sydney. These remains may occur anywhere within that horizon or may be associated with former land surfaces which are now buried within the dune. Elsewhere in eastern Sydney excavation strategies for the dunefield have involved preliminary archaeological or geotechnical investigations to determine the presence/absence of such land surfaces, such as via a series of gridded mechanical test trenches (see for example DSCA 2003, MDCA 2007). This is an acknowledgement that, in the absence of such a former land surface, location of any archaeological remains within the dune deposits would essentially be a 'needle in a haystack' exercise, unless total excavation of the area could be achieved (which is rarely possible or justified). In other words, if preliminary excavations do not locate such former land surfaces (or retrieve archaeological remains in another context), further archaeological investigation would be unlikely to be warranted or recommended.

In the current case, the discovery of Aboriginal archaeological remains (hearths, artefacts and manuports) within the dune immediately adjacent to the current study area during the excavation of the former Asylum cemetery suggests that the occupation which these remains represent may extend into the current study area. Therefore those portions of the study area which retain some of the original A Horizon of the dune are archaeologically sensitive, and the A Horizon sand they retain should be considered to be Potential Archaeological Deposit and investigated accordingly. Specifically this means that, whilst not advocating total excavation of all original A Horizon deposits across the study area, archaeological investigations would not be restricted to locating former buried land surfaces, but to sampling the dune A2 Horizon deposits as a whole.

4.5.1 Aims of the Proposed Archaeological Testing Program

The archaeological testing program could be undertaken in two stages. Stage 1 could involve the investigation of areas which are available such as the street frontages and courtyards and this could refine the sensitivity mapping. Stage 2 would be informed by Stage 1 results and would involve sampling in the remaining areas following staged demolition as areas become available for investigation. Stage 2 investigations should also include provision for archaeological monitoring of demolition works as described above and this may also serve to further refine the area requiring archaeological investigation from that assessed by the current study (see **Figure 14**).

The principal objective of the subsurface testing program would be to determine if Aboriginal cultural remains are located within the defined area of Aboriginal Archaeological Sensitivity that would be impacted upon by the proposed new medical research facility. Specifically the testing program would aim to determine, through adequate sampling, whether any Aboriginal

cultural remains exist within the area of Aboriginal Archaeological Sensitivity, or whether any former buried land surfaces are present which could be explored archaeologically in a more systematic (and/or contiguous) manner. The testing program would also determine the need and extent of any further archaeological requirements (e.g. salvage or collection).

4.5.2 Research Questions

The following questions, necessarily broad in nature at this preliminary stage, are proposed to structure the excavation methodology and post excavation analysis and reporting.

How long have Aboriginal people used the land? Radiometric dating (of materials such as charcoal from hearths, thermoluminescence dating of buried sands) and recovery of certain artefact types (such as backed blades) would provide an indication of how long Aboriginal people have used this landscape.

How did Aboriginal people use the area? Analysis of the stone tools, site formation processes, location of specific activity areas would seek to retrieve the maximum possible information about how the area was used in the past, particularly in relation to freshwater swamps which may have existed in relatively close proximity.

What stone materials were chosen and how were they worked? The stone artefact analysis would attempt to source the raw materials used and to determine their relative proportions amongst the excavated samples. Technological information regarding possible raw material reduction would be sought. Evidence for silcrete minimal decortication and possibly heat treatment may be expected, whilst evidence for primary and secondary flaking and bipolar knapping using anvils may also be revealed.

What types of artefacts were produced? Adherence to standard procedures and protocols in quantifying and classifying the recovered stone artefacts would provide a means to determining what artefact types were produced and/or discarded on-site.

What were different artefact types used for? Functional analysis of potential residue/use-wear evidence on selected samples of stone and or shell artefacts may provide an indication of what different artefacts were used for.

How does this place compare to other Aboriginal sites in the surrounding region? Inter-site comparison of the excavated stone artefact assemblage (and their component parts)

4.5.3 Field Methodology

The following archaeological testing methodology is proposed. Archaeological investigations would utilise a combination of mechanical and manual testing methods. Manual testing would be specifically employed in the event of the discovery of archaeological features or buried former land surfaces.

Initially, a mechanical excavator would be used to remove obvious overlying introduced material (sand and rubble fill) to expose potentially remnant A2 dune horizon (the sands with archaeological potential). A mechanical excavator with batter bucket would then be used to excavated a series of archaeologically monitored test trenches on a 10m grid across the area of Aboriginal Archaeological Sensitivity. These trenches would be approximately 1m in width and 2-3m in length. Maximum depth is anticipated to be less than 1.5m but if greater (and therefore in excess of Occupational Health and Safety Act limits), stepped /benched trenches or shoring would be used.

The trenches would be excavated in 0.1m-0.2m spits through the A2 horizon until any archaeological features (including burial cuts) or buried former land surfaces are located, or else until archaeological sterile sand horizons (coffee rock B1 horizon or yellow massive sand B2 horizon) are reached. Any archaeological features (excepting burials) would be recorded and potentially manually excavated using standard archaeological techniques and recording methods (e.g. where appropriate arbitrary 5cm-10cm spits or following stratigraphy). Any buried former land surfaces would be manually test excavated using techniques/sampling strategies appropriate to their size and mindful of the archaeological potential of dune deposits above and below them. This could be expected to involve the manual excavation of a series of 0.5m or 1m squares on a grid across the extent of the identified land surface.

All excavated deposit would be sieved onsite using nested 2.5 and 5mm mechanical sieves (due to the expected large quantities of excavated material). Manual sieving may be undertaken in certain circumstances (e.g. if faunal remains are detected, or if discrete archaeological features are excavated).

All cultural material and samples of matrix deposit will be bagged and labelled. Soil profiles will be recorded and pH tests will taken at intervals throughout the stratigraphic profile.

This is considered sufficient to determine the presence/absence of any Aboriginal cultural remains and to characterise the nature and extent of any such remains if located.

4.5.4 Burial Protocol

It has been noted that the sands in the dune system are highly acidic and that animal or human bone buried 200 years ago or older are unlikely to have survived. The possibility of recent remains is highly unlikely, but if found, may need to be treated as a crime scene. A

bone or burial recovery protocol has been developed and is attached in **Appendix 1.** The protocol should apply to all construction workers as well as the archaeologists.

5.0 Conclusions and Recommendations

5.1 Discussion

The proposed POWMRI Concept Plan and Project Application for Stages 1 and 2 has been assessed in terms of the Aboriginal archaeological potential of the site. Stage 1 entails the erection of temporary additions to the eastern side of Villa 2 and the western side of Villa 3. Stage 2A entails the demolition of part of Villa 3 and the construction of a new building in the south eastern corner of the Precinct. Stage 2B entails development along most of Barker Street, including the demolition of the Ambulance Centre. The areas within the Precinct underlain by A2 Horizon sands with the potential to contain Aboriginal relics are shown on the Aboriginal Archaeological Sensitivity Plan (see **Figure 14).**

The surviving A2 white sands of the dune system underlying the Neuroscience Research Precinct should be the subject of an archaeological testing program which could include investigations immediately of available ground and/or investigation following the demolition of the existing buildings according the development staging and growth.

An archaeological investigation strategy has been developed which includes initial testing of available ground, demolition monitoring, followed by broad mechanical sub-surface investigations, followed by manual excavation if required. The aim is to mechanically sample all parts of the archaeological sensitive area following demolition and to identify the presence or absence of any older land surface and/or Aboriginal relics. Where the monitoring identifies B horizon

Archaeological remains as may be identified in the current context are likely to be archaeologically significant and of special importance to the Aboriginal community as has been shown to be the case at the Aboriginal archaeological site in the adjacent Randwick Destitute Children Asylum Cemetery. It has also been shown that the management of their significance by salvage archaeology and retention for display and interpretation is acceptable to the Aboriginal community in the context of a major infrastructure project.

The Aboriginal community consultation initiated as part of the current project should be maintained and expanded as necessary throughout the course of the development project. The archaeological investigations should be conducted in partnership with the La PLALC In addition the La PLALC, the Dharawal Elders Group and the wider local Aboriginal community should be consulted on their interest in the project and any associations documented as part of the project.

Recommendations

The following recommendations are based upon the legal requirements and automatic statutory protection provided under the terms of the *National Parks and Wildlife Act of 1974 (as amended),* where;

> *it is an offence to knowingly damage, deface or destroy Aboriginal sites or relics without the prior consent of the Director General of the National Parks and Wildlife Service,*

in conjunction with;

the results of the preliminary assessment of the Neuroscience Research precinct which is documented in this report and the initial Aboriginal community consultation undertaken for this stage of the project.

It is recommended that:

A program of archaeological excavation be conducted within the defined area of Archaeological Sensitivity as shown on **Figure 14**, following the demolition of the buildings presently existing within the Neuroscience Research Precinct, in accordance with the archaeological investigation strategy as described in **Sections 4.3 - 4.5.** The archaeological investigations commence where areas are immediately available for investigation and/or follow the staging as proposed for the redevelopment of the Precinct and be factored into the overall re-development program. The archaeological investigations be conducted in partnership with the La Perouse LALC and the Daharawal Elders and in consultation with the wider local Aboriginal community.

6.0 References

Albani, A.D. Rickwood, P.C. Johnson, B.D.& Tayton, J.W. 1976 The Ancient River Systems of Botany Bay. Sutherland Shire Studies # 8. The Council of the Sutherland Shire.

Attenbrow, V. 2002. *Sydney's Aboriginal Past: Investigating the Archaeological & Historical Records* (University of NSW Press, Sydney).

Attenbrow, V. 1990 The Port Jackson Archaeological project: Report on Stage 1. Unpublished report to AIATSIS and LALC's.

Attenbrow, V. 1994 Port Jackson Archaeological Project - Stage II [1993]. Final report to A.I.A.T.S.I.S. on work undertaken between January 1993 and March 1993.

Attenbrow, V. J. 1992 Shell Bed or Shell Midden. Australian Archaeology 34:3-21

Austral - Godden Mackay Pty Limited 1995 Randwick Destitute Children's Asylum Cemetery: Archaeological Investigation - *Research Design*. Prepared for South Eastern Sydney Area Health Service, NSW Heritage Council, Department of Urban Affairs and Planning.

Austral-Godden Mackay Pty Limited June 1996 Randwick Destitute Children's Asylum Cemetery. *Interpretation Guidelines*. Prepared for South Eastern Sydney Area Health Service.

Austral-Godden Mackay Pty Limited May 1996 Randwick Destitute Children's Asylum Cemetery. *Interim Report*. Prepared for South Eastern Sydney Area Health Service, Heritage Council of NSW, NSW Department of Health

Austral-Godden Mackay Pty Limited May 1995 Randwick Destitute Children's Asylum Cemetery. *Statement of Significance*. Report prepared for Eastern Sydney Area Health Service

Austral-Godden Mackay Pty Limited December 1997 Randwick Destitute Children's Asylum Cemetery Archaeological Investigation. *Volume 1. Main Report; Volume 2. Archaeology; Volume 3. Physical Anthropology; and Volume 4. Plans.* Prepared for the South Eastern Sydney Area Health Service, Heritage Council of NSW and the NSW Department of Health.

Australia ICOMOS. 1987. *The Australia Icomos Charter for the Conservation of Places of Cultural Significance (The Burra Charter), Guidelines to the Burra Charter: Cultural Significance and Conservation Policy* (Pamphlet, Australia ICOMOS Inc).

Benson, D. & Howell, J. 1995. *Taken for Granted: The Bushland of Sydney and Its Suburbs* (Kangaroo Press in association with the Royal Botanic Gardens Sydney).

Bickford, A. 1993, Destitute Children's Asylum Randwick 1852-1916. Archaeological Assessment of the Site of the Cemetery, Prepared for Eastern Sydney Area Health Service.

Bickford, A. 1994a Destitute Children's Asylum Randwick 1852-1916. Excavation of the Site of the Cemetery, Prepared for Eastern Sydney Area Health Service.

Bickford, A. 1994b Destitute Children's Asylum Randwick 1852-1916. Archaeological Management Strategy for the Prince of Wales Hospital Redevelopment, Prepared for Eastern Sydney Area Health Service.

Bickford, A. 1994c Destitute Children's Asylum Randwick 1852-1916. Background Information for the ESAHS, Report about the Site of the Cemetery and the Human Bones Found, Prepared for Eastern Sydney Area Health Service.

Bowdler, S. [ed] 1982 Coastal Archaeology in Eastern Australia. Proceedings of the Valla Conference on Australian Prehistory. ANU Canberra.

Brayshaw, H. 1982. *Survey for Aboriginal Relics at Malabar, Bondi, Manly and North Head Water Pollution Control Plants* (Report to the Metropolitan Water Sewerage and Drainage Board).

Campbell, W. 1898. *Aboriginal Carvings of Port Jackson & Botany Bay* (NSW Department of Mines & Agriculture, Ethnological Series, No.1).

Centennial Park and Moore Park Trust 2003. *Centennial Parklands Conservation Management Plan 2003*

Chapman, D. M. Cleary, M. Roy, P.S. Chapman, G & Murphy, C. 1989. *Soil Landscapes of the Sydney 1: 100 000 Sheet* (Soil Conservation Service of NSW, Sydney).

Chapman, D.M. & Thom, B.G. 1982 Coastal Evolution and Coastal Erosion. Coastal Council of New South Wales, Sydney 341pp

Chapman, G.A. and Murphy, C.L. 1989. *Soil Landscapes of the Sydney 1:100 000 Sheet* (Soil Conservation Service of NSW, Sydney).

Coulter, J. 1916. *Randwick Asylum. An Historical Review of the Society for the Relief of Destitute Children from the Year 1852 up to the time of the Requisitioning of the Society's Buildings and Lands in 1915, by the Federal Authorities for Military Hospital Purposes* (Sydney; Society for the Relief of Destitute Children)

Crew, D. 1991. *Archaeological Survey for Aboriginal Sites of the Botany Wetlands* (Report to The Federal Airports Corporation and the NSW Water Board).

Dallas, M 2004. *Facility Management Plan Anzac Rifle Range, Randwick, NSW, Aboriginal Heritage* (Report to Coffey Geosciences Pty Limited).

Dallas, M. 1996 *Coast Golf Club – Archaeological Inspection* (Letter report to Barry Kerr, Architects, Planners and Interior Design).

Dallas, M., Steele, D. Barton, H. & Wright, R.V.S. 1997. *POW Project 1995. Randwick Destitute Children's Asylum Cemetery, Archaeological Investigation. Volume 2 Archaeology Part 3 Aboriginal Archaeology* (Report to South Eastern Sydney Area Health Service, Heritage Council of NSW and NSW Department of Health).

Dallas, M. & Tuck, D. 2005. *Aboriginal Heritage Assessment, Long Bay Correctional Complex* (Report to BBC Consulting Planners Pty Limited on behalf of the Department of Commerce).

David, T. & Etheridge, R (Jnr). 1889. 'Report on the discovery of human remains in the sand and pumice bed at Long Bay' in *Records of the Geological Society of NSW*. 1(1): 9-15.

Department of Environment & Conservation 2004. *National Parks And Wildlife Act 1974: Part 6 Approvals. Interim Community Consultation Requirements for Applicants*.

Department of Environment & Conservation 2005. *Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation* (Report to the Department of Planning).

Dickson, F.P. 1979. *Archaeological Report: Aboriginal Midden at Phillip Monument Site, Yarra Bay* (Report to Randwick Municipal Council and the National Parks & Wildlife Service).

Dominic Steele Consulting Archaeology 2006. *Aboriginal Archaeological Heritage Impact Assessment: Randwick Racecourse* (Report to Godden Mackay Logan).

Donlon, D. 1991. *The La Perouse Skeletons. Report on 32 skeletons from within the boundaries of the La Perouse LALC* (Report to the Australian Museum).

Douglas, P. & Wilson, G. 1997 Stratigraphic Report on Archaeological Investigations at the Randwick Destitute Children's Asylum Cemetery. The Prince of Wales Project 1995-1996.

Doyle, F. & Storey, J. 1991. *Destitute Children's Asylum Randwick 1852-1916* (Randwick; Randwick and District Historical Society).

Etheridge, R. & Whitelegge, 1907. 'Aboriginal Workshops on the Coast of NSW and their Contents' in *Records of the Australian Museum*, Volume 6.

Fairley, A. & Moore, P. 1989 Native Plants of the Sydney District. An identification Guide. Kangaroo Press. Sydney

Godden Mackay Logan Pty Limited. 2002a. *Prince Henry Site, Little Bay. Conservation Management Plan* (Report to Landcom).

Godden Mackay Logan Pty Limited. 2002b. *Prince Henry Site, Little Bay. Archaeological Management Plan* (Report to Landcom).

Godden Mackay Logan Pty Limited. 2003. *Prince Henry Site at Little Bay. Infrastructure and Streetscape North DA (DA3). Heritage Impact Statement* (Report to Landcom).

Goodall, H. 1996. *Invasion to Embassy: Land in Aboriginal Politics in New South Wales, 1770 1972* (Allen & Unwin in association with Black Books, St Leonards).

Graham Brooks and Associates Pty Ltd 1997. *The Prince of Wales Hospital Campus Randwick Conservation Management Plan* (Report to NSW Department of Health)

Haglund, L. 1989. *Assessment of the Prehistoric Heritage of Bare Island and the La Perouse Headland* (Report to NSW NPWS & NSW PWD).

Haglund, L. 2006. *Report on test excavation at Cape Banks, La Perouse, within area to be used as a base for the Southern Region Life Saver Rescue Helicopter Service* (Report to Landcom).

Haglund, L. 2007. *Report on monitoring of the excavation of a service trench (DEC Consent #2586) leading to the newly established base for the Southern Region Life Saver Rescue Helicopter Service* (Report to Landcom).

Herbert, C. (ed.). 1980. *Geology of the Sydney 1:100,00 Sheet* (Geological Survey of NSW).

HLA Envirosciences 2004. *Archaeology and Heritage Due Diligence Report for Bunnerong Road, Chifley* (Report to Urban Partnership Pty Ltd).

Jeffery & Katauskas Pty Ltd 2008. *Geotechnical Assessment for Proposed Master Planning and Concept Design at Prince of Wales Hospital Cnr Barker Street & Hospital Road Randwick, NSW* (Report to Prince of Wales Medical Research Institute).

Jill Sheppard Heritage Consultants 2007 *La Perouse Headland Conservation Management Plan Stage 1. Significance Assessment* (Report to NSW Department of Environment and Climate Change).

Kate Sullivan & Associates 1995 Conservation Policy for The Cemetery. Randwick Desitute Children's Asylum 1853-1915.

Lynch, W.B. & Larcombe, F.A. 1976. *Randwick 1859-1976* (Randwick; Council of the Municipality of Randwick).

Mary Dallas Consulting Archaeologists 2007. *Aboriginal Archaeological Test Excavation Report Long Bay Correctional Complex, Malabar, NSW* (Report to NSW Health Department [Justice Health] & The Department of Corrective Services).

Mary Dallas Consulting Archaeologists 2008 South Randwick Urban Renewal Opportunity Pre-Feasibility Study. Report to Landcom.

McIntyre, S. 1985. *A Report on Protection Works Carried out by the Randwick Municipal Council on an Eroded Campsite/Midden at La Perouse* (Report to Randwick Municipal Council).

McKenzie, P & Stephen, A. 1987 'La Perouse: An Urban Aboriginal Community' in Kelly, M. (ed). *Sydney: City of Suburbs* (Kensington).

Mills Archaeological and Heritage Management Services Pty Ltd. 2004 *Indigenous Heritage Perspective for inclusion in the Conservation Plan for Long Bay Gaol* (Report to Clive Lucas Stapleton & Partners Pty Ltd).

Mills Archaeological and Heritage Management Services Pty Ltd. 2006. *An Archaeological Survey for the Proposed Malabar Landfill Remediation and Rehabilitation Project*.

Navin Officer Heritage Consultants 2000 *The Cultural Heritage of Frenchmans Bay, La Perouse, NSW: Information and management recommendations contributed toward the development of a Plan of Management* (Report to GHD).

Navin Officer Heritage Consultants 2002 *Port Botany - Aboriginal Community Issues and Social Values. A Preliminary Overview* (Report to Manidis Roberts Pty Ltd).

Navin Officer Heritage Consultants 2003. *Cultural Heritage Assessment of the Proposed Port Botany Expansion. An assessment of maritime and terrestrial archaeological potential* (Report to Sydney Ports Corporation).

Navin Officer Heritage Consultants 2006a. *Botany Bay 132kV Electricity Cable Project Cultural Heritage Assessment* (Report to Molino Stewart Pty Ltd).

NSW National Parks and Wildlife Service. 1997a DRAFT. "Guidelines for Archaeological Survey Reporting" in the *Aboriginal Cultural Heritage: Standards and Guidelines Kit*. (Sydney; NSW NPWS).

NSW National Parks and Wildlife Service. 1997b. "Standards Manual for Archaeological Practice in Aboriginal Heritage Management" in the DRAFT *Aboriginal Cultural Heritage: Standards and Guidelines Kit*. (Sydney; NSW NPWS).

Nugent, M. 2005. *Botany Bay: Where Histories Meet* (Allen & Unwin, Sydney).

O'Brien, L. 1986. *Phillip's Landing – Yarra Bay Bi-centennial Project: Heritage Study Report.* (Report to Land Systems Pty Ltd and Randwick Municipal Council).

Rich, E. 1986 *Yarra Point Site #45-6-292: Archaeological Investigation* (Report to the Randwick Municipal Council).

Rich, E. 1990. *Aboriginal Component of the Prince Henry Hospital Conservation* (Report to Dawson Brown Partnership Pty Limited).

Ross, A. 1976 What the First Fleet Saw. BA Hons Thesis. Sydney University.

Ross, B. 1979. *Archaeological Resource Assessment, Botany Bay Submarine Pipeline* (Report to Dames & Moore).

Roy, P. 1983 Notes Accompanying the Sydney 1:100,000 Geology Sheets

Steele, D. 2002. *Aboriginal Archaeological Assessment and Application for a Preliminary Research Permit for an area of Potential Archaeological Deposits (PAD) at 1-81Little Bay Road, Little Bay, NSW* (Report to CPG Developers Pty Ltd).

Steele, D. 2003. *Aboriginal Archaeological Test Excavation Report, NPWS #45-6-2658, 1-81 Little Bay Road, Little Bay, NSW* (Report to CPG Developers Pty Ltd).

Sullivan, K.M. 1992a. *Archaeological Survey of Dept of Housing Project 12933 Leichhardt St, Chifley, near La Perouse* (Report to Cassidy & Partners Pty Ltd).

Sullivan, K.M. 1992b. *Archaeological Survey of a Borrow Area at Hill 60, Phillip Bay, La Perouse* (Report to Lyle Marshall and Associates for the Department of Housing).

Thom, B.G. 1978 Coastal Sand Deposition in southeast Australia during the Holocene. in J.L. Davies and M.A.J. Williams [eds] Landform Evolution in Australasia : 197-214 ANU Press Canberra.

Tuck, D. 2006. *La Perouse Headland – A Shared History* (Report to NSW Department of Environment and Climate Change).

Waugh, J (ed). 2001. *Aboriginal People of the Eastern Coast of Sydney: Source Documents* (Randwick & District Historical Society).

Maps Plans Aerials and Illustrations consulted for the Assessment

1881 Survey plan of the area incorporating the Randwick Destitute Children's Asylum Site (as reproduced in Austral/Godden Mackay 1997 Volume 2 Part 1 Page 15 from original plan by Major T.F. Parrott)

1890 Destitute Childrens Asylum Plan (as reproduced in Graham Brooks & Associates 1997 derived from original plans and historical data)

1891 Metropolitan Water Board Plan (as reproduced in Austral/Godden Mackay 1997 Volume 2 Part 1 Page 16)

1917 (ca) aerial photograph (as reproduced in Dallas et. al 1997:28)

1917-18 Photograph entitled "View to the Southeast across the Subject Area: No. 4 AGH 1917-18 (as reproduced in Austral/Godden Mackay 1997 Volume 2 Part 1 Page 12)

1918 General Hospital [Military] Plan (as reproduced in Graham Brooks & Associates 1997 derived from original plans and historical data)

1918 Plan of Military Hospital (as reproduced in Austral/Godden Mackay 1997 Volume 2 Part 1 Page 23)

1942 Plan of the Hospital (as reproduced in Austral/Godden Mackay 1997 Volume 2 Part 1 Page 24)

1943 aerial photograph (Department of Lands SIX Viewer)

1945 Repatriation Hospital Plan (as reproduced in Graham Brooks & Associates 1997 derived from original plans and historical data)

1953 aerial photograph (as reproduced in Dallas et. al 1997:29)

1958 Photograph looking east towards current study area (Prince of Wales Hospital Medical Illustrations Unit photograph file 90169.jpg)

1960s Prince of Wales Hospital Plan (as reproduced in Graham Brooks & Associates 1997 derived from original plans and historical data)

1966 Oblique aerial photographs of the hospital site (Prince of Wales Hospital Medical Illustrations Unit photograph files 98584H_05_July 1966.tif & 98584H_06_July 1966.tif)

1970 Aerial photograph of the hospital site (Prince of Wales Hospital Medical Illustrations Unit photograph file 98584H_10_1970.tif)

1986 Oblique aerial photographs of the hospital site (Prince of Wales Hospital Medical Illustrations Unit photograph files 092-01v.jpg, 092-02v.jpg & 092-06v.jpg)

1987 Botany Bay 1:25,000 topographic map (based on 1982 aerial photography)

1993 Prince of Wales Hospital Plan (as reproduced in Graham Brooks & Associates 1997 derived from original plans and historical data)

1995/6 Construction period oblique aerial photographs of the hospital site (Prince of Wales Hospital Medical Illustrations Unit photograph files 107-02v.jpg, 117-04v.jpg, 117-10v.jpg, 117-18v.jpg, 80907-03v.jpg & 80907-103v.jpg).

1996 Prince of Wales Hospital Plan (as reproduced in Graham Brooks & Associates 1997 derived from original plans and historical data)

2005 aerial photograph (Department of Lands SIX Viewer)

Asylum Cemetery Excavation Plan. Area 1 (Hut N): North south and east west profiles showing location and extent of test-pit excavations and deposits (Austral/Godden Mackay 1997 Volume 4 Drawings)

Asylum Cemetery Excavation Plan. Area 2 (Hut P): North south profile showing extent of deposits present within the Area (Austral/Godden Mackay 1997 Volume 4 Drawings)

Asylum Cemetery Excavation Plan. Area 3 (Hut R): North/south profile showing extent of deposits present within the Area (Austral/Godden Mackay 1997 Volume 4 Drawings)

Asylum Cemetery Excavation Plan. Area 3 (Hut R): West/east profile showing extent of deposits present within the Area (Austral/Godden Mackay 1997 Volume 4 Drawings)

Asylum Cemetery Excavation Plan. Area 6 (The Western Margin): Plan and cross-section of Machine Trench 9 (Austral/Godden Mackay 1997 Volume 4 Drawings)

Asylum Cemetery Excavation Plan. Area 6 (The Western Margin): Plan and cross-section of Machine Trench 10 (Austral/Godden Mackay 1997 Volume 4 Drawings)

Asylum Cemetery Excavation Plan. Area 6 (The Western Margin): Plan and cross-section of Machine Trench 11 (Austral/Godden Mackay 1997 Volume 4 Drawings)

Asylum Cemetery Excavation Plan. Area 6 (The Western Margin): Plan and cross-section of Machine Trench 12 (Austral/Godden Mackay 1997 Volume 4 Drawings)

Asylum Cemetery Excavation Plan. Area 6 (The Western Margin): Plan and cross-section of Machine Trench 13 (Austral/Godden Mackay 1997 Volume 4 Drawings)

Asylum Cemetery Excavation Plan. Area 6 (The Western Margin): Plan and cross-section of Machine Trench 14 (Austral/Godden Mackay 1997 Volume 4 Drawings)

Asylum Cemetery Excavation Plan. Area 6 (The Western Margin): Plan and cross-section of Machine Trench 15 (Austral/Godden Mackay 1997 Volume 4 Drawings)

Asylum Cemetery Excavation Plan. Excavation Plan showing location of service trenches (Austral/Godden Mackay 1997 Volume 4 Drawings)

Appendix 1 : Burial Protocol on the discovery of Human skeletal remains.

Burial Protocol

In the event a modern or ancient grave cut or burial is identified the excavation will cease and the procedure outlined in Figure 1 will be applied to ensure appropriate management of human skeletal material.

These protocols are based on the following legislative provisions:

Aboriginal skeletal remains are protected by the NSW National Parks & Wildlife Act 1974 as amended. It is an offence to disturb or damage or destroy Aboriginal skeletal remains.

The Coroner's Act 1980 [s13B and s13C] applies to deaths in NSW which have occurred over the last 100 years. This Act takes precedence over the NPWS Act. However, if Police believe that an Aboriginal site was a crime scene and that the skeletal remains are less than 100 years old, they will work with NPWS [now Department of Environment and Conservation (DEC)], to ensure Aboriginal sites are not needlessly disturbed.

A suitably qualified Physical Anthropologist should be on site throughout the course of subsurface test excavations to determine :

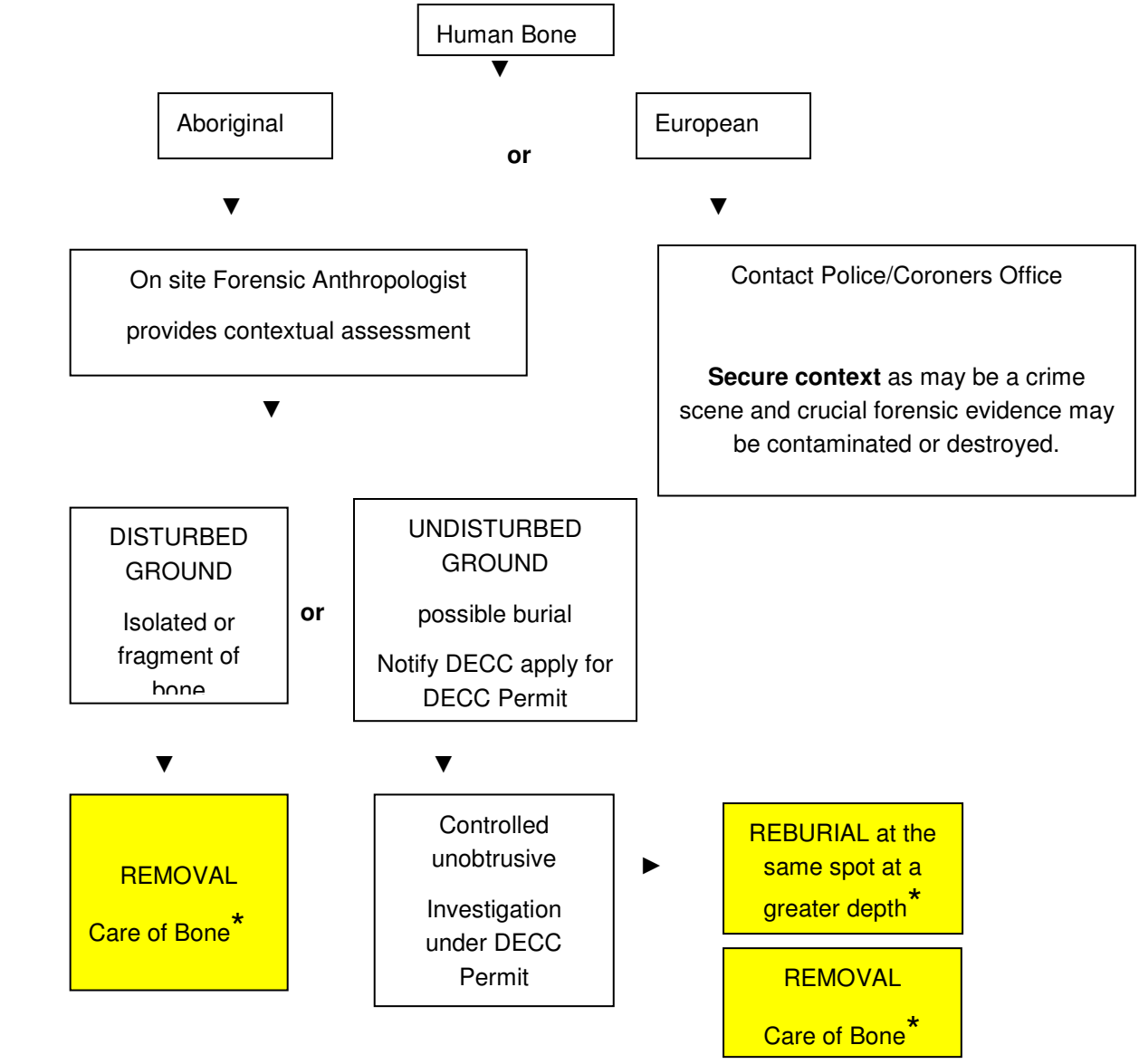
1. whether the bone is human or animal, and

2. if human, whether the bone is Aboriginal or European.

If the bones are determined to be European or young or relatively recent Aboriginal bones showing signs of a suspicious or violent death, the Coroner's Office has jurisdiction over such remains. Further investigation must be done under that Office's direction.

The discovery of Aboriginal skeletal material is regarded as an exceptional circumstance In archaeological investigations. While under Part 3A projects DECC s.87 or s.90 AHIPermits are not required. However, the discovery of Aboriginal burials in the circumstance of a Part 3A development project, should involve consultation with DECC and the Aboriginal community. A s90 AHIP, if required, will include a Burial Discovery Protocol detailing agreed and permissible actions in the field and possibly also a DECC Care and Control Agreement for the handling of excavated material during and after any archaeological investigation should be in place with the relevant Aboriginal Community representatives and stakeholders as soon as cultural remains are uncovered.

Figure 1 : Burial/Human Bone Discovery Procedure.



*** These procedures to be determined by La Perouse LALC and community representatives**