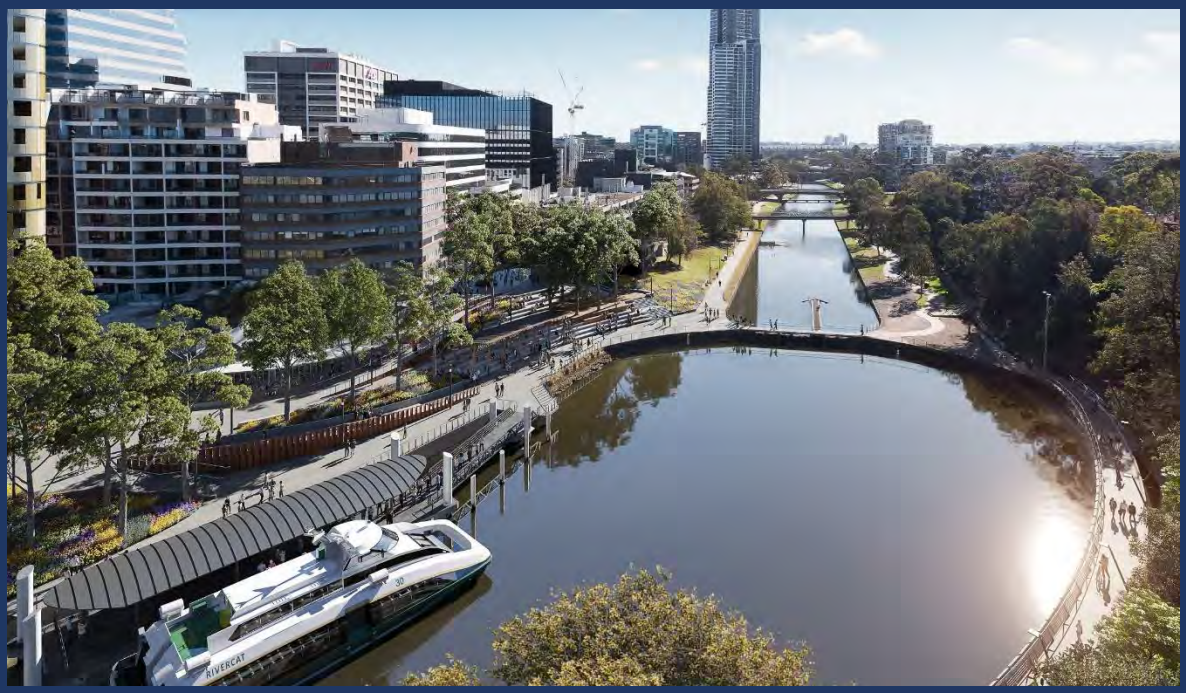
Aboriginal Archaeological Technical Report

CHARLES STREET SQUARE UPGRADE,
38 CHARLES ST, PARRAMATTA



MAY 2020
Prepared for Spackman Mossop Michaels & City of Parramatta Council
by Curio Projects

info@curioprojects.com.au | P (02) 8014 9800 |Suite 9, 17 Thurlow Street, Redfern NSW 2016 | ABN 79139184035
Curio *noun* cu·rio \kyur-ē-ˌō\: any unusual article, object of art, etc., valued as a curiosity

Document Information

Citation

Curio Projects 2020, *Charles Street Square Upgrade, Parramatta—Archaeological Technical Report,* prepared for SMM/City of Parramatta Council.

Local Government Area

City of Parramatta Council

Cover Image

Charles Street Square Concept Design Site Plan (City of Parramatta)

ISSUE No.	ISSUE DATE	VERSION	NOTES/COMMENTS	AUTHOR	REVIEWED
1	30.10.2019	Draft Report	For client review	Sam Cooling	Adam Fowler, Bene Fernandez
2	February 2020	Draft Report	For RAP Review	Sam Cooling	Natalie Vinton
3	15 May 2020	Final Report	For AHIP Issue	Sam Cooling	Kim Bazeley

This report has been prepared based on research by Curio Projects specialists. Historical sources and reference material used in the preparation of this report are acknowledged and referenced at the end of each section and/or in figure captions.

Curio Projects Pty Ltd
Suite 9/17 Thurlow Street
Redfern NSW 2016
Australia

Contents

Executive Summary

Curio Projects Pty Ltd was commissioned by Spackman Mossop Michaels (SMM) to prepare an Aboriginal Archaeological Technical Report (ATR) for the Charles St Square Development, located across six (6) parcels of community land zoned RE1, including a section of Charles Street (a public road zoned B4), at the corner of Charles and Phillip Streets, Parramatta (the study area).

The purpose of this ATR is to be a standalone technical document, providing evidence of material traces of Aboriginal land use within the study area, and will feed into and support the conclusions and recommendations of Aboriginal Cultural Heritage Assessment Report (ACHAR), to which this ATR serves as an appendix.

This report has been prepared following the requirements for reporting as established in DECCW *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (24 September 2010) (Code of Practice), and OEH 2011a *Guide to Investigating, assessing and reporting on Aboriginal Cultural Heritage in NSW* (Guide to Investigating).

The following recommendations are made regarding Aboriginal archaeological context and potential in relation to the Charles Street Square Upgrade study area:

- The study area has been assessed to have moderate to high potential for a Potential Archaeological Deposit (PAD), associated with the Parramatta Sand Body in this area of the southern foreshore of the Parramatta River.
- Proposed development impacts have potential to encounter the PSB and associated PAD, and therefore will require archaeological mitigation to reduce and/or manage potential impacts to Aboriginal archaeology.
- The extent of the Aboriginal PAD within the study area relates to the demonstrated archaeological landscape in the immediate vicinity of the study area- i.e. it is considered to be a potential extension of the archaeological landscape of AHIMS Site 45-6-2648 (Charles/George 1) and Site 45-6-2673 (RTA-G1).
- Rather than registering an additional site with AHIMS for the PAD associated with the Charles Street Square study area, the site card for AHIMS Site 45-6-2648, Charles/George 1 (CG1) should be revised to include the study area within its extent- reflecting the association and distribution of this connected archaeological landscape, and avoiding unnecessary duplication of sites.
- An application for an Aboriginal Heritage Impact Permit (AHIP) under Section 90 of the *NSW National Parks and Wildlife Act 1974* should be submitted to the Aboriginal Heritage Planning Section of the Environment, Energy and Science (EES) division, of the NSW Department of Planning, Industry and Environment (DPIE) to allow Aboriginal archaeological investigation of the study area in relation to the proposed development impacts.

- The AHIP Application should allow for potential impact to the Potential Archaeological Deposit (PAD) associated within AHIMS Site 45-6-2648 (Charles/George 1).

- Aboriginal archaeological investigation at the site should be undertaken in accordance with the methodology and research design developed and presented in Section 5.2 of this ATR.

1. Introduction

1.1. Purpose of this Report

Curio Projects Pty Ltd was commissioned by Spackman Mossop Michaels (SMM) on behalf of the City of Parramatta Council (Council) to prepare an Aboriginal Archaeological Technical Report (ATR) for the Charles St Square Development, located across six (6) parcels of community land zoned RE1, including a section of Charles Street (a public road zoned B4), at the corner of Charles and Phillip Streets, Parramatta (the study area).

The purpose of this ATR is to be a standalone technical document, providing evidence of material traces of Aboriginal land use within the study area, and will feed into and support the conclusions and recommendations of the Aboriginal Cultural Heritage Assessment Report (ACHAR) for the study area, to which this ATR serves as an appendix.

This report has been prepared following the requirements for reporting as established in DECCW *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (24 September 2010) (Code of Practice), and OEH 2011a *Guide to Investigating, assessing and reporting on Aboriginal Cultural Heritage in NSW* (Guide to Investigating).

1.2. Project Area

The Charles Street Square Development study area is located across six (6) parcels of community land zoned RE1, including a section of Charles Street (a public road zoned B4), at the corner of Charles and Phillip Streets (Figure 1.1), defined as the lots below:

Project Site

Square
38 Charles Street - Lot 2, DP 869186
38 Charles Street - Lot 1, DP 869820

Road
Charles Street

Park
340A Church Street - Lot 1, DP 1172250
21 Charles Street - Lot 2, DP 532539
182C George Street - Lot 1, DP 506760 (CBD Foreshore Reserve)

Figure 1.1: Lot 2 DP 869816 (Study Area) (Source: Curio 2019)

1.3. Relevant Statutory Context

Aboriginal cultural heritage is governed in NSW by two principal pieces of legislation:

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

1.3.1. National Parks and Wildlife Act 1974

The NPW Act, administered by the Aboriginal Heritage Planning Section of the Environment, Energy and Science (EES) division, of the NSW Department of Planning, Industry and

Environment (DPIE) (formerly known as the Office of Environment and Heritage [OEH]), is the primary legislation that provides statutory protection for all 'Aboriginal objects' (Part 6, Section 90) and 'Aboriginal places' (Part 6, Section 84) within NSW.

An Aboriginal object is defined through the NPW Act as:

> *"any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area that comprises New South Wales, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction, and includes Aboriginal remains."*

The NPW Act provides the definition of 'harm' to Aboriginal objects and places as:

> *"...any act or omission that:*
>
> *(a) destroys, defaces or damages the object or place, or*
>
> *(b) in relation to an object-moves the object from the land on which it had been situated, or*
>
> *(c) is specified by the regulations, or*
>
> *(d) causes or permits the object or place to be harmed in a manner referred to in paragraph (a), (b) or (c), (NPW Act 1974).*

The NPW Act also establishes penalties for 'harm' to Aboriginal objects and declared Aboriginal places, as well as defences and exemptions for harm. One of the main defences against the harming of Aboriginal objects and cultural material is to seek an Aboriginal Heritage Impact Permit (AHIP) under Section 90 of the NPW Act, under which disturbance to Aboriginal objects could be undertaken, in accordance with the requirements of an approved AHIP.

1.3.2. Environmental Planning and Assessment Act 1979

The EP&A Act is an 'Act to institute a system of environmental planning and assessment for the state of NSW'. Dependent upon which Part of the EP&A Act a project is to be assessed under, differing requirements and protocols for the assessment of associated Aboriginal cultural heritage may apply.

Part 4, Division 4.1 of the EP&A Act identifies and defines State Significant Development projects (SSD) as those declared under Section 89C of the EP&A Act. SSD and State Significant Infrastructure projects (SSI), replace 'Concept Plan' project approvals, in accordance with Part 3A of this Act, which was repealed in 2011.

Where a project is assessed to be an SSD, the process of development approval differs, with certain approvals and legislation no longer applicable to the project. Of relevance to the assessment of Aboriginal heritage for a development, the requirement for an AHIP in accordance with Section 90 of the NPW Act is removed for SSD projects (EP&A Act, Section 89J).

The Charles St Square project will not meet the criteria for SSDA, and therefore will be subject as normal to the provisions of the NPW Act.

1.3.3. Native Title Act 1993

The Native Title Act 1993 provides the legislative framework to recognise and protect native title, which recognises the traditional rights and interests to land and waters of Aboriginal and Torres Strait Islander people. Under the Native Title Act, native title claimants can make an application to the Federal Court to have their native title recognised by Australian law.

There are currently no native title claims or determinations in place for the Charles St Square Development study area.

1.3.4. OEH Guidelines

In order to best implement and administer the protection afforded to Aboriginal objects and places as through the NPW Act, and EP&A Act, the [former] OEH have prepared a series of best practice statutory guidelines with regards to Aboriginal heritage. These guidelines are designed to assist developers, landowners and archaeologists to better understand their statutory obligations with regards to Aboriginal heritage in NSW and implement best practice policies into their investigation of Aboriginal heritage values and archaeology in relation to their land and/or development. This report has been prepared in accordance with these guidelines, including:

- DECCW 2010a, *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW*. (the Due Diligence Code of Practice)
- OEH 2011a, *Guide to Investigating, assessing and reporting on Aboriginal Cultural Heritage in NSW*. (the Guide to Investigating)
- DECCW 2010b, *Code of Practice for the Archaeological Investigation of Aboriginal Objects in New South Wales*. (the Code of Practice)
- DECCW 2010c, *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010.* (the Consultation Guidelines)
- OEH 2011b, *Aboriginal Heritage Impact Permits, a Guide for Applicants*.

1.4. Objectives of ATR

The objectives of the assessment process presented in this Aboriginal Archaeological Technical report were to:

- Conduct and present background research (environmental and archaeological) in order to identify any Aboriginal site location and distribution trends and potential influence of landscape and environment features on potential sites;
- Search statutory registers to identify registered Aboriginal sites within the study area and surrounds;
- Present an archaeological predictive model for the study area, based on background research and assessment;
- Identify the Aboriginal archaeological potential of the study area;

- Develop a methodology for Aboriginal archaeological test excavation within the study area in order to locate and investigate potential Aboriginal archaeological deposits, their location, nature, and frequency- in relation to the proposed development impacts;
- Identify impacts the proposed activity may have to identified Aboriginal sites, values and significance;
- Identify opportunities for conservation management (i.e. avoidance of sites) where possible; and
- Recommend strategies for management of potential Aboriginal archaeological deposits that may be present within the study area, and to feed these archaeological-focused strategies into the Aboriginal Cultural Heritage Assessment Report, along with cultural assessment, to manage and mitigate impact to Aboriginal cultural heritage within the study area.

1.5. Investigators, Contributors and Acknowledgements

This report has been prepared by Sam Cooling, Senior Archaeologist of Curio Projects, with review by Natalie Vinton, Director of Curio Projects. Table 1.1 presents a complete list of the project team, including qualifications, affiliation and role in the project.

Table 1.1: Investigators and Contributors

PERSON (QUALIFICATION)	AFFILIATION	ROLE
Sam Cooling, Senior Archaeologist (BA, M Archaeological Science)	Curio Projects	Project Manager, Report Author
Natalie Vinton, Director (BA (Hons) Archaeology and Palaeoanthropology)	Curio Projects	Report Reviewer
Andre Fleury, Archaeologist (B. Hist, M Archaeological Science)	Curio Projects	GIS and Mapping

2. Environmental and Archaeological Context

2.1. Environmental Context

2.1.1. Soils and Geology

The geology and soils of a locale can provide information for the prediction and modelling of the nature and positioning of potential Aboriginal sites. For example, soil types capable of supporting vegetation/flora resources of importance to Aboriginal people (and the corresponding faunal resources that would utilise the vegetation), may provide clues to indicate Aboriginal use and occupation across a landscape.

Parramatta falls within the Cumberland Basin, which is a low-lying plain located in the west of the greater Sydney Basin. The land along the Parramatta River is mostly made up of Bringelly Shale of the Wianamatta Group, which is primarily made up of shale with inclusions of carbonaceous claystone, laminite, lithic sandstone, and rare coal. This shale formation is generally overlaid by alluvial materials derived from Bringelly Shale and other flood event deposits (Chapman & Murphy 1989).

Chapman & Murphy map the study area as being located on disturbed terrain, across the Birrong soil landscape (a landscape characterised by fluvial deposits marked by high clay content), near the boundary with the Blacktown soil landscape (Figure 2.1). The profile of the Birrong soil landscape generally presents as: 10-40cm of dark brown silty clay loam; 35cm of hard setting clay loam; over 100cm of orange mottled silty clay and brown mottled clay. The Blacktown soil landscape is generally defined by undulating depths, however commonly presents as 30cm of topsoil overlying a hard setting B-horizon clay subsoil (Extent 2017: 34).

However, local soil mapping across the Parramatta CBD, undertaken by geomorphologist Peter Mitchell (Mitchell 2008), has identified that soils across the region have generally been subjected to lower levels of disturbance than predicted by Chapman & Murphy. The study area is situated across the interface/approximate boundary between the Holocene (modern) floodplain of the Parramatta River, and the Parramatta Sand Body (PSB- see following section for further details on this geomorphological feature).

Located directly along the Parramatta River, the study area would have experienced high levels of soil erosion, especially prior to the development of flood mitigation strategies in the 1970s. The area is known to be greatly fluvial, as seen by the soil profiles outlined above.

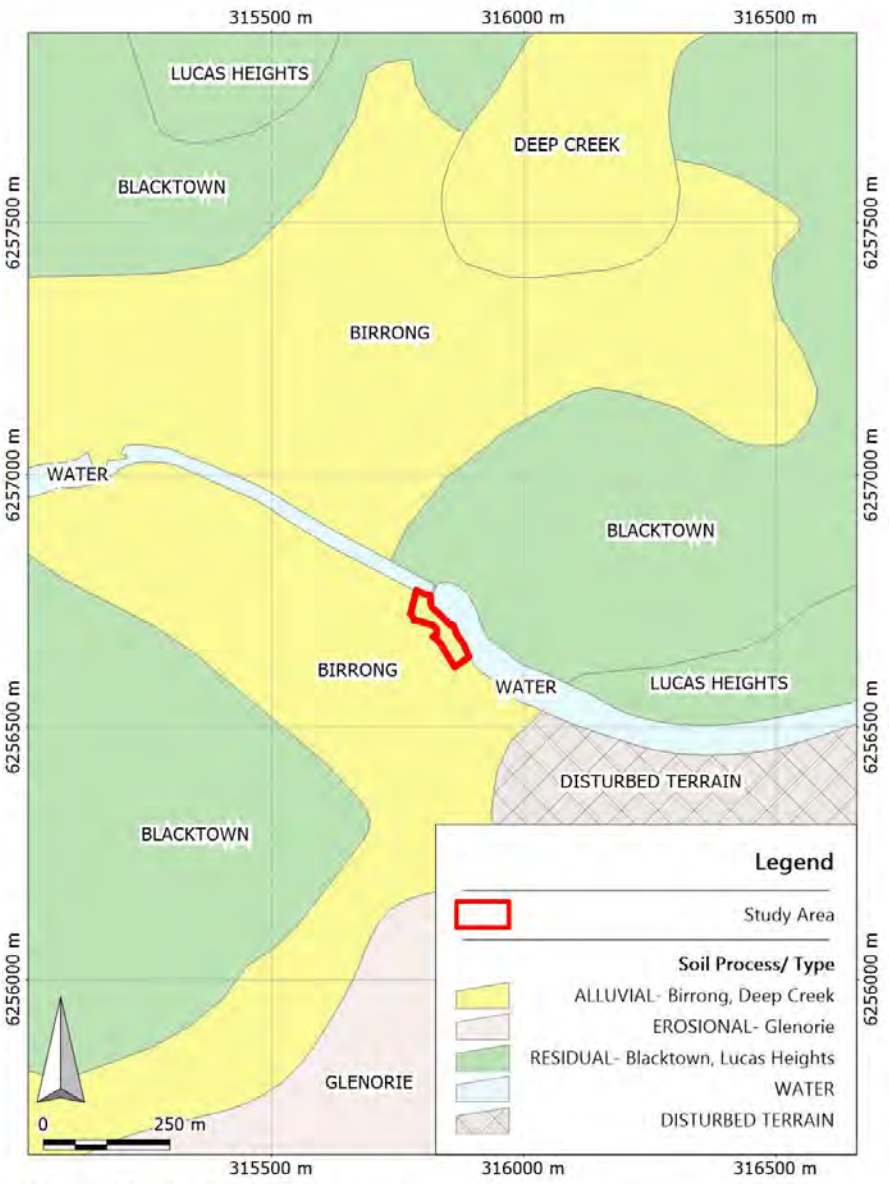


Figure 2.1: Soil Landscapes (Source: Curio 2019)

Parramatta Sand Body (PSB)

The Parramatta Sand Body (PSB) is a Pleistocene era deposit that holds significant archaeological, environmental and geological importance to understanding the Cumberland Basin pre-European settlement. As the name suggests, it is a fluvial sand profile that has been demonstrated to contain stratified Aboriginal archaeological materials (dating to the Pleistocene period, i.e. >10,000 years BP)[1]. The extent of the PSB is thought to be between George Street to the north, Harris Street to the west, 'Ellangowan' to the east, and Robin Thomas Reserve to the south. This means that the study area falls within the potential zone for finding this soil formation (Mitchell 2008), although indicative mapping developed for the extent of the Sheet suggests that the study area may be on the northern edge of the sand (Figure 2.3).

[1] See Section 2.5 below for further archaeological context.

The PSB has been typically described through previous archaeological investigations as presenting as:

- c. 25-30cm of brown to brownish grey loamy sand A1 topsoil (this soil unit was often found to be missing/truncated through historical activities);
- A bleached A2-horizon of greyish yellow brown to light grey fine sand extending to a depth of c.50-60cm; and
- Compact reddish brown to dull orange fine sand B-horizon with well-developed porous earthy fabric to c.120cm.

Relatively little concrete information is actually known about the PSB except that it was formed through fluvial process and was later reworked by both aeolian and colluvial processes (Steele 2017: 33). It is thought that the lower terraces of the PSB- those close to the river- were deposited over the last 10,000 years. Older deposits would then be located at higher elevations and would be the most disturbed from development throughout Parramatta CBD (Steele 2017: 34). Due to the aggrading nature of this deposit, it is thought that it was formed through multiple large events interspersed with smaller processes, however more research is required to better understand the extent and formation process of the PSB. Previous archaeological investigations on the PSB have demonstrated that Aboriginal artefacts may occur within the sand body at depths of up to 2m.

Archaeological excavations undertaken on the PSB in recent years have consistently demonstrated that the uppermost levels have been mostly removed by historical land use activities, truncating the PSB in most locations. This is discussed further in Section 2.2.2 below, with reference to the results of relevant archaeological investigations previously undertaken in Parramatta.

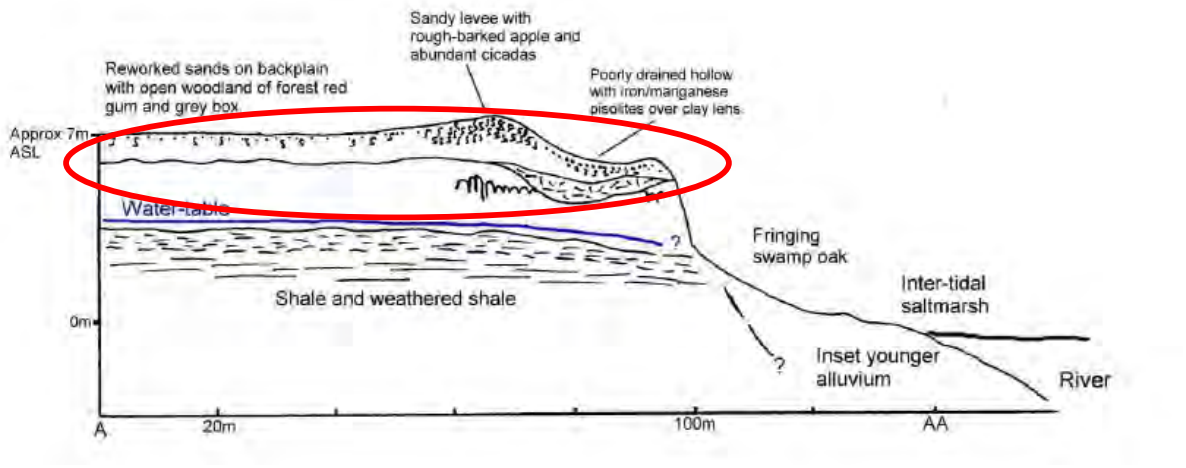


Figure 2.2: Sketch Section of interpreted pre-European geomorphology, sediments and vegetation along the Parramatta River. PSB terrace area indicated (Source: JMcDCHM 2005: 12)

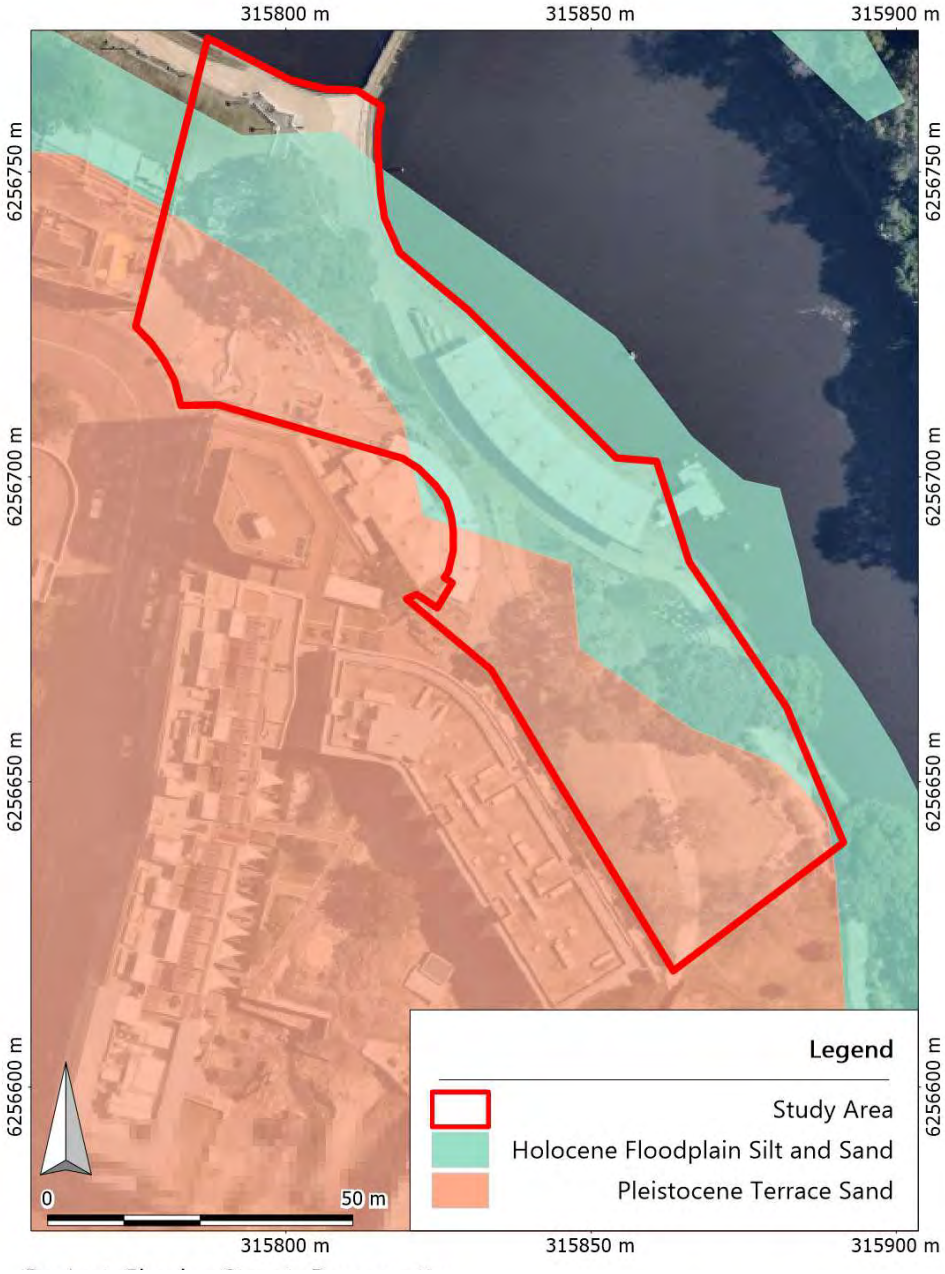


Figure 2.3: Indicative area of Parramatta Sand Body over Study Area (Source: Curio 2019, after Mitchell 2007)

2.1.2. Hydrology

The hydrology of an area plays an important role in identifying not only areas of occupational, environmental, and archaeological potential, but also in understanding how deposits are formed on sites. The effects of hydrology range from the availability of water to flooding, which impacts both occupation and deposition.

The study area, like the majority of the Parramatta River foreshore, is susceptible to major flood events. After the 1970s, flooding was mitigated through the development of strategies and upgrades to the foreshore. Despite this, flooding still occurs during bouts of heavy rainfall (Extent 2017: 35). As the study area is positioned directly along the Parramatta River it is

important to note that the site would have been directly impacted by flooding in the past, which is vital in understanding how archaeological materials may have been deposited.

As can be seen in the hydrology map below (Figure 2.4) the closest water source in the Parramatta River, a 3rd order stream, formed by the confluence of the Lane Cove and Duck Rivers. Clay Cliff Creek, a 1st order stream, is located to the south-east of the study area and Vineyard Creek, also a 1st order stream, is located to the north-west. Due to their distance from the study area and relative size to the Parramatta River, it is assessed that Parramatta River is far more impactful in understanding the hydrology and nature of the study area than these 1st order streams.

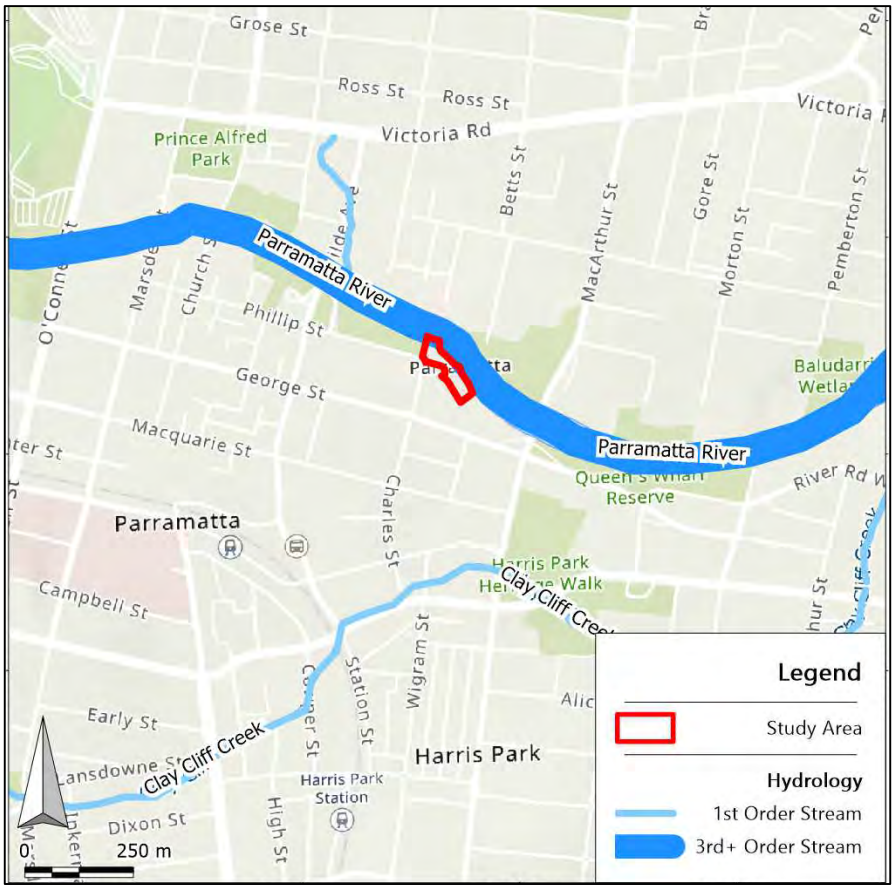


Figure 2.4: Hydrology Map (Source: NSW Dept of Industry, Lands and Water, with Curio Additions 2019)

2.1.3. Landscape and Landforms

Understanding the past landscape and landforms of the study area is important for the identification of zones of high archaeological potential. Based on the initial descriptions of the Parramatta River by Governor Phillip and Surgeon John White, during early years of European colonial expansion, an impression of the landscape can be established. A short distance down the river, at what is currently Lennox Bridge, there is description of the environment, stating:

> *'the banks of it were now pleasant, the trees immensely large, and at a considerable distance from each other; and the land around us flat and rather low, but well covered with the grass just mentioned.'* (Benson & Howell 1990: 68)

From this it can be gathered that the study area was most likely a slight bank with open grassland containing large trees that were a considerable distance from each other. The open nature of the area would have enabled Aboriginal people to camp on the river bank with easy access to the Parramatta River. There is also potential that the lack of underbrush described may have meant that burning along the banks may have been occurring in the area (Extent 2017: 34).

2.1.4. Vegetation

Knowing the original vegetation for the area and subsequent change is important for understanding site formation process and also how sites may have been used over time. As has been stated previously, the environment surrounding area consisted of open grassland and large dispersed trees. It has been suggested that this vegetation would have been grey box and forest red gum. Other vegetation that may have been present would have been mangroves, paperbark and swamp oak along with common reed (Extent 2017: 35). It is known that native vegetation along the Parramatta River foreshore has been extensively disturbed during the development of Parramatta CBD.

Past fauna is also important for understanding potential food sources for the local Aboriginal peoples. Parramatta would have provided Aboriginal people with access to rich freshwater and saltwater resources such as fish, shellfish, molluscs, eels, ducks, mullet, crayfish and turtles. Faunal resources would have included mammals such as possums, flying foxes, goannas, wallabies and kangaroos.

2.1.5. Raw Material Resources

No known sources for stone tool materials are located within the bounds of Parramatta City. Therefore, it is assumed that raw materials used by local people for manufacture of stone tools would have been imported from the surrounding area or possibly from St Marys, Marsden Park, or other areas of Western Sydney, across the Cumberland Plain, where silcrete is known to be sourced (Artefact 2018: 9; MDCA 2003: 36). Other, less certain, sources of stone tools, basalt and other volcanic materials may have been sourced from the Toongabbie area (MDCA 2003: 37).

2.1.6. Geotechnical Investigation

Geotechnical investigation was undertaken in May 2019 by Alliance Geotechnical (Alliance Geotechnical 2019) in the form of five boreholes across the site (Figure 2.6). Of these boreholes, two indicated the presence of an alluvial soil profile potentially indicative of the presence of the PSB (Boreholes 1 and 4- see table below).

While limited in scope (consisting of only five boreholes), this subsurface soil profile information can be used to inform the archaeological predictive modelling for the site.

Soil Profile	BH1	BH2	BH3	BH4	BH5
Termination Depth (m)	4. 6	4.8	2.9	3.3	2.8
Pavers (mm)	50	--	--	--	--
Concrete Hardstand (mm)	70	220	140	550	--
Fill/Topsoil: Clay/ Silty clay/ poorly graded sand/ silty sandy clay/ sandy clay/ silty sand/ crushed sandstone, poorly to moderately compacted.	0.12 – 0.2	0.22 – 2.5	0.14 – 2.9+	0.55 – 1.2	0.0 – 2.8+
Alluvial: CLAY, firm to stiff/ Clayey SAND/ SAND/ Gravelly silty SAND, loose to medium dense.	0.2 – 4.2	--	--	1.2 – 2.4	--
Residual soil: CLAY, stiff to hard/ Clayey SAND, loose to medium dense/	--	2.5 – 2.9	--	--	--
BEDROCK					
Interbedded clay and shale layers/ extremely weathered very low strength shale (Class V)	4.2 – 4.6	2.9 – 4.8	--	2.4 – 3.3	--
Highly weathered, low strength shale (Class IV)	4.6+	4.8+	--	3.3+	--

Table 2.1: Borehole Soil Profile Descriptions (Source: Alliance Geotechnical, Table 1, p.5)

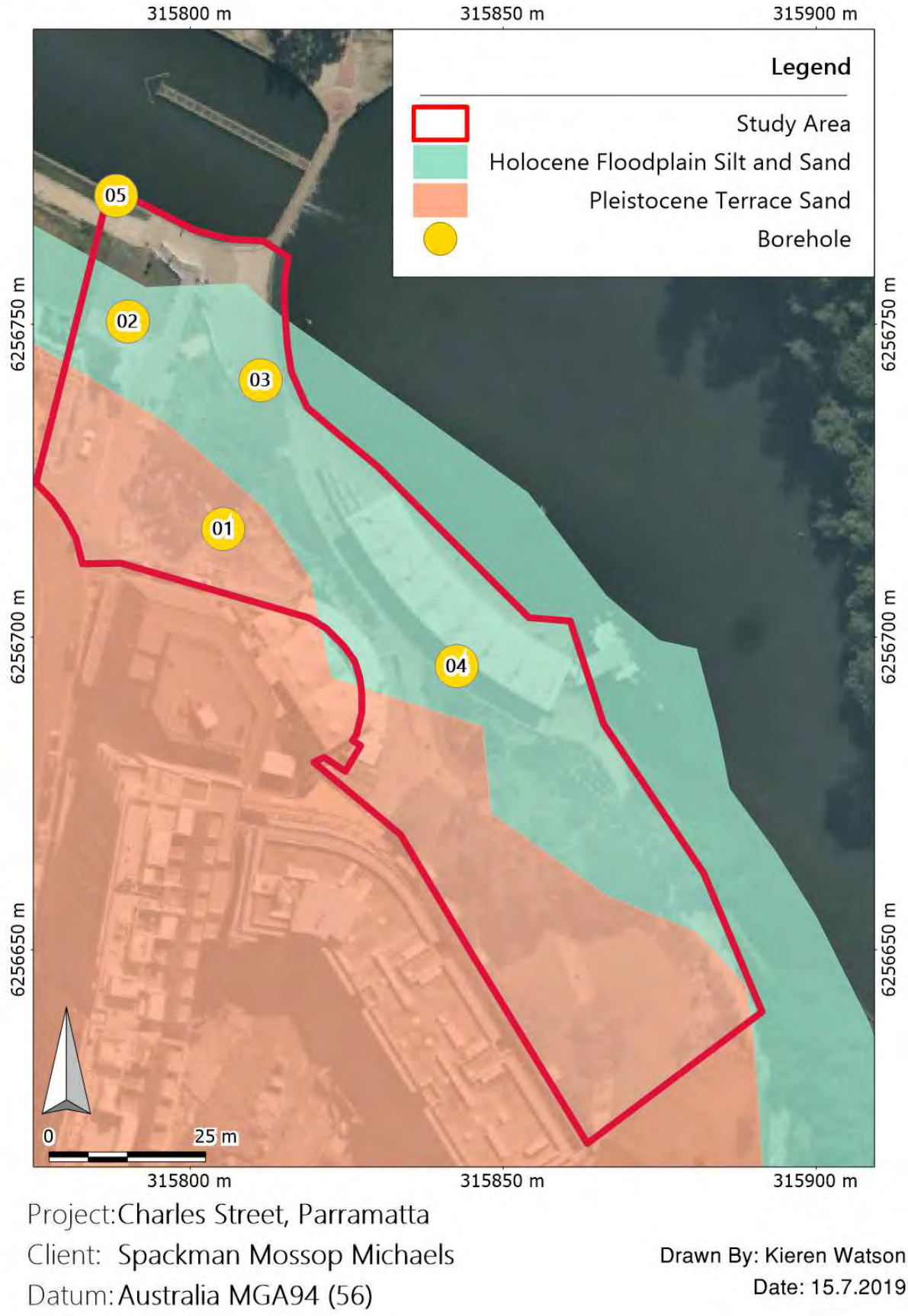


Figure 2.5: Geotechnical Boreholes over PSB Mapping (Source: Curio 2019)

2.1.7. Modern Land Use and Disturbance

The Parramatta foreshore and surrounding areas have been heavily disturbed by both modern development and from historical flood events. These flood events would have caused major erosion and scouring with the mitigation strategies also causing ground disturbances through the implementation of sea walls and land reclamation. There are specific signs that the foreshore has been affected by these processes through the historical paintings and writings about Parramatta (Extent 2017: 35).

Modern development in the study area includes construction of the Parramatta ferry wharf, adjacent access ways, surrounding building development and infrastructure. This would have impacted directly on the study area at least superficially with potential for deeper deposits to remain intact, dependent on discrete levels of below ground impact across the area.

2.1.8. Summary of Environmental Context

The environmental context of an area is an important asset when it comes to understanding formation processes and archaeological potential. The key points for the Charles Street Square study area are summarised as:

- The site falls within the Cumberland Plain, located within the Sydney Basin.
- The site sits on the Birrong soil landscape and is directly adjacent to the Blacktown soil landscape.
- There is potential for remains of the Parramatta Sand Body (PSB) to be present within the study area.
- The study area is directly adjacent to the Parramatta River subjecting it to numerous flood events.
- In the past the study area was most likely open grassland with large spaced out trees.
    - This area could have been subject to burning by past Aboriginal peoples.
- The original vegetation communities would have be dominated by grey box and forest red gum with potential for mangroves and paperbark trees.
- Native fauna that would have been used as food resources by the original Aboriginal inhabitants of the area would have included fresh and saltwater marine life, as well as native mammals such as kangaroos.
- This study area had undergone major disturbance through both flooding and modern development.
    - This would heavily impact on the intact deposits within the study area.

2.2. Archaeological Context

2.2.1. AHIMS Search

The NSW statutory guidelines for Aboriginal cultural heritage management and assessment require a current extensive search of the Aboriginal Heritage Information Management System

(AHIMS) database (i.e. current within the last 12 months). The AHIMS search was undertaken on 4 April 2019, centred on the study area with a buffer of 1km, and returned 87 results. The extensive AHIMS search is attached as Appendix B to this report. While the search returned no results directly within the study area, the closest registered site is located only c.40m to the south, and consists of an artefact site (#45-6-2648, Charles/George 1).

AHIMS search results always require a certain amount of scrutiny in order to acknowledge and accommodate for things such as inconsistencies in the coordinates (differing datums between years of recording), the existence of, and impact to, registered sites (impact to a registered site technically requires the submission of an Aboriginal Site Impact Recording form, however these forms are not always submitted), and other database related difficulties. It should also be noted that AHIMS database is a record of archaeological work that has been undertaken, and registered with OEH in the region. The AHIMS database is therefore a reflection of recorded archaeological work, the need for which has likely been predominantly triggered by development, and not a representation of the actual archaeological potential of the search area. AHIMS searches should be used as a starting point for further research and not as a definitive, final set of data.

Therefore, the above AHIMS search result has been synthesized as best possible within the scope of this current report to determine the most likely nature and location of previously registered sites in proximity to the current study area.

Summary descriptions of Aboriginal site features as identified by OEH, and as relevant to this report are presented in Table 2.2. The 87 results from the current AHIMS search included 4 different main site types, some in combination with each other. These sites are summarised in

Table 2.3. The locations of these sites can be seen in Figure 2.6 below. The most common site types in the area are artefact sites (n=37), followed by Potential Archaeological Deposits (PADs) (n=32), and Potential Archaeological Deposits (PADs) in relation to a number of other site types (n=14). While two modified trees and one grinding groove were located by this AHIMS search, neither of these sites are in close proximity to the current study area.

The AHIMS sites 45-6-2648 (Charles/George 1) and 45-6-2673 (RTA-G1) are registered as being located c.50m and c.150m south and southeast respectively of the current study area. While these two sites are registered individually, archaeological excavations at both sites (JMcDCHM 2005a; 2005b) has shown that these sites are components of the same archaeological feature, both in relation to the PSB terrace in this location.

Table 2.2: Aboriginal site features referred to in this report

SITE FEATURE	DESCRIPTION/DEFINITION BY OEH (2012)
Artefact Site (Open Camp Sites/artefact scatters/isolated finds)	Artefact sites consist of objects such as stone tools, and associated flaked material, spears, manuports, grindstones, discarded stone flakes, modified glass or shell demonstrating physical evidence of use of the area by Aboriginal people.

SITE FEATURE	DESCRIPTION/DEFINITION BY OEH (2012)
	Registered artefact sites can range from isolated finds, to large extensive open camp sites and artefact scatters. Artefacts can be located either on the ground surface or in a subsurface archaeological context.
Grinding Groove	Grinding grooves are a groove in a rock surface resulting from manufacture of stone tools such as ground edge hatchets and spears, may also include rounded depressions resulting from grinding of seeds and grains.
Modified Tree	Trees which show the marks of modification as a result of cutting of bark from the trunk for use in the production of shields, canoes, boomerangs, burials shrouds, for medicinal purposes, foot holds etc, or alternately intentional carving of the heartwood of the tree to form a permanent marker to indicate ceremonial use/significance of a nearby area, again these carvings may also act as territorial or burial markers.
Potential Archaeological Deposit (PAD)	An area where Aboriginal cultural material such as stone artefacts, hearths, middens etc, may be present in a subsurface capacity. Evidence for Aboriginal cultural material may not be present on the ground surface, but still may be present at a location.

Table 2.3: AHIMS Sites in the Vicinity of the Study Area

SITE TYPE	NUMBER OF SITES	% OF SITES
Artefact	37	42.5
Artefact and Modified Tree	1	1.1
Artefact and Hearth	1	1.1
Potential Archaeological Deposit (PAD)	32	36.8
Potential Archaeological Deposit (PAD) and Artefact	14	16.1
Modified Tree	1	1.1
Grinding Groove	1	1.1
TOTAL	**87**	**100**

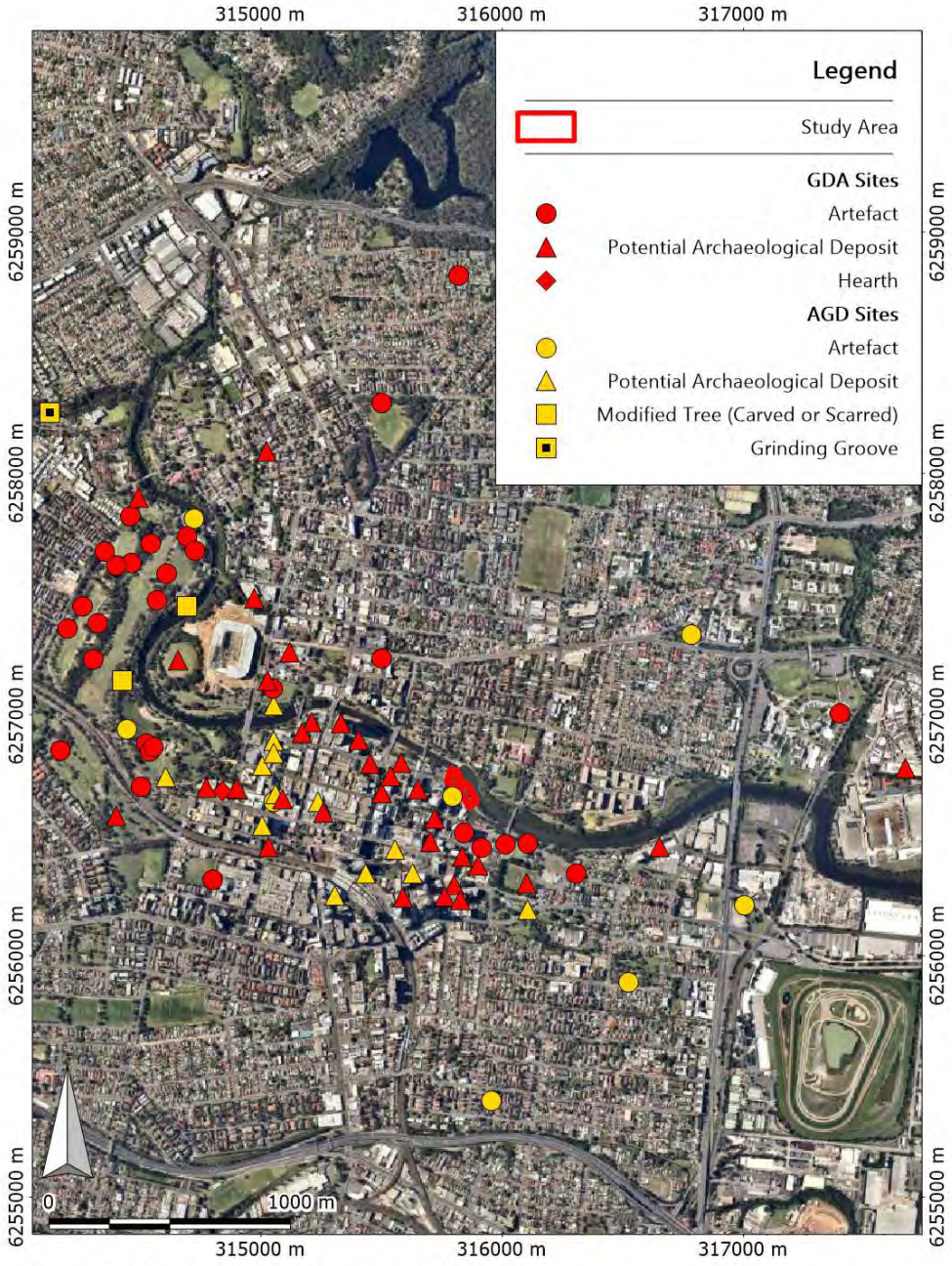


Figure 2.6: AHIMS Sites. Study Area in Red (Source: Curio 2019)

2.2.2. Previous Archaeological Investigations and Assessment

Aboriginal archaeological excavations have often been undertaken in conjunction with historical archaeological excavations across Parramatta. Numerous Aboriginal archaeological excavations have successfully demonstrated that regardless of level of supposed development and ground impact at a site within Parramatta, there often remains the potential for Aboriginal archaeological deposits and stone artefact assemblages to remain intact within remnant natural soil profiles, as well as in a post-contact context.

The following section presents a brief summary of relevant Aboriginal archaeological studies and investigations that have been undertaken in the vicinity of the study area to provide

archaeological context- with particular focus on investigations undertaken on the south bank of the Parramatta River. The location of sites discussed below are presented in Figure 2.8.

Parramatta Aboriginal Heritage Study and Review (MDCA, 2003; 2014 Review)

Mary Dallas Consulting Archaeologists (MDCA) was commissioned by Parramatta City Council to prepare the Parramatta Aboriginal Heritage Study, 'in order to inform future land planning and development control processes and to ensure ongoing protection and management of Aboriginal heritage places'. This study focused on the entire Parramatta LGA and developed an Aboriginal cultural heritage planning and management strategy. Notably, this study included the compilation of a database of known Aboriginal sites within the Parramatta LGA, which along with the mapping of areas of Aboriginal archaeology and cultural heritage sensitivity, which was the basis for the Aboriginal Sensitivity Map, which now functions as Appendix 11 of the Parramatta DCP.

The Aboriginal Sensitivity Map essentially predicts potential areas within the LGA that may contain unrecorded and unregistered Aboriginal sites. It is not a rating of potential significance, but rather an indication of the potential for Aboriginal sites to be present. Aboriginal sensitivity was zoned across the Parramatta LGA as:

- High Sensitivity= known sites (within 50m radius +)/high archaeological potential/undisturbed natural landscape.
- Medium Sensitivity= some archaeological potential/partially disturbed landscape.
- Low Sensitivity= largely disturbed landscape.
- No Sensitivity= totally disturbed landscape/reclaimed land.
- Areas of Social/Historical Association= areas identified as having some degree of significant to present day Aboriginal people through current social or historical connections.

The current study area is included within an area of 'High Sensitivity' on the Parramatta Aboriginal Sensitivity map.

Parramatta CBD Foreshore Strategic Archaeological Management Strategy (Extent 2017)

An Archaeological Management Strategy (AMS) has been prepared for the Parramatta River CBD Foreshore, a study area defined as extending from the Queens Wharf Reserve to Rings Bridge, in order to consider the overall archaeological and cultural heritage impacts of the Parramatta City River Strategy (City of Parramatta 2015).

The AMS divides the river foreshore into 20 different precincts, of which, Charles Street Square is addressed as Precinct 14. The AMS assesses Charles Street Square to have an overall Moderate Archaeological Potential, more specifically as having Moderate Aboriginal and Historical Archaeological Potential, and Low Maritime Archaeological Potential. Part of the Charles Street Square precinct was assessed to have High Aboriginal archaeological sensitivity, due to the moderate distribution of Parramatta Sand Body within the precinct; low disturbance; location within 200m of a watercourse; and primarily situated on modern floodplain.

The AMS assessed the Charles Street Square to have the following constraints with respect to archaeology:

- *Development resulting in ground disturbance may require monitoring or formal salvage excavation.*
- *Modifications to structural elements and ground disturbance may require development approval and/or OEH approval.*
- *The depth of the artefact bearing deposits within the sandsheet in this precinct is unknown. However, based on other studies in the region, these deposits typically represent the upper 1.5-2m below the existing land surface.* (Extent 2017, Vol. 2: 91)

The AMS identified the following opportunities for the Charles Street Square:

- *Implementation of a coordinated interpretation scheme across the corridor*
- *Interpretation should consider all aspects of the previous uses, including the Chinese market garden, and the relationship to Parramatta River.*
- *To determine the extent of the Parramatta Terrace Sand Sheet.* (Extent 2017, Vol. 2: 91)

The AMS recommended that any works within the Precinct that will impact potential Aboriginal heritage would require an Aboriginal Cultural Heritage Assessment, which would be likely to be complex and require sub-surface investigation.

The Conservation Recommendations for the Charles Street Square Precinct 14 state:

1. *The extent of the Parramatta Terrace Sand Sheet should be investigated and mapped throughout the precinct.*
2. *Further research is required in relation to the previous uses, and the extent of remains within precinct.*
3. *A major development application for the precinct should be accompanied by a Heritage Interpretation Plan with details on implementation. The interpretation plan should include, but not restricted to the following themes:*
    - *Harrisford, agricultural properties and contribution to the survival of the colony.*
    - *Parramatta River*
    - *Aboriginal Local History*
4. *Works within this precinct will require the preparation of the following:*
    - *Aboriginal Cultural Heritage Assessment* (Extent 2017, Vol. 2: 92)

1 Smith Street (Site SSP1) (Jo McDonald CHM, 2004)

Aboriginal archaeological excavation was undertaken across 1 Smith Street (Sydney Water Site) in conjunction with Casey & Lowe's historical excavation. Test excavation of the area recovered a total of 198 artefacts from 79m^2. Two of these squares demonstrated a moderate density of artefacts (>25 artefacts/m^2) and were consequently expanded for a total of 169 artefacts from the expanded area, believed to have intercepted a location in which Aboriginal people manufactured stone tools from quartz.

While the excavation concluded that the presence of the Aboriginal archaeological deposit in this location was a result of relatively sparse occupation related to peripheral or transitory activity, it

was demonstrated that a significant amount of the site presented with an intact natural soil profile (c. 40%), regardless of the level of historical development and use that the site had undergone since 1788. Most of the contemporary and historic construction at the site had been built on top of the natural ground surface, effectively protecting the archaeological integrity of the deposit.

Cnr Charles and George Streets (Site CG1) (Jo McDonald CHM 2005a)

Archaeological excavations in Parramatta in 2004, identified the presence of a deep sand body, now known as the Parramatta Sand Body (PSB) (State Heritage Register #1862), which consists of a fluvial sand body deposited along the Parramatta River during periods of flooding, with the main body of sand forming a levee along the south bank of the river. Geomorphological analysis, as well as archaeological excavation and scientific dating has determined this sand sheet to be likely of late Pleistocene age.

Aboriginal archaeological excavation of CG1 was located on the PSB, and represented multiple periods of Aboriginal occupation of the area, from those of considerable antiquity, to more recent deposits. Excavation encountered several occupation/living floors at the site, containing both artefacts as well as hearth arrangements. Over 6,500 artefacts were recovered from CG1, with relative dating suggesting that the older assemblage could date to between 10,000 and 20,000 years BP.

Due to the general depth and antiquity of the PSB, Aboriginal archaeological excavations on the sand body have the potential to provide significant new information about timing and patterns of Aboriginal occupation of the Parramatta area.

109–113 George Street (Site RTA-G1) (Jo McDonald CHM, 2005b)

Archaeological salvage excavation at RTA-G1 recovered >4,500 Aboriginal stone artefacts from within the PSB, a site identified to be a continuation of the archaeological landscape investigated at the nearby site of CG1. Radiocarbon dating of the site recovered some of the earliest dates recovered from the greater Sydney region for Aboriginal archaeological sites, indicating repeated occupation of the PSB in this location from c.30,000 years BP. At the time this date was recovered, this more than doubled the previously accepted scientifically dated timeframe for Aboriginal occupation of the Sydney region.

101-110A George Street ('CG3') (Jo McDonald CHM 2006)

Archaeological test and salvage excavation of 101-110A George Street in 2005 encountered further evidence of Aboriginal occupation of the PSB, identified as being a continuation of the archaeological landscape identified at CG-1 and RTA-G1. Archaeological excavation at CG3 recovered <1,000 artefacts, dominated by silcrete and silicified tuff, along with clear evidence for change in preferential use of raw material types and stone tool production technologies over time.

184-188 George St- 'GSP 2013' Site (Dominic Steele Consulting, 2013, 2017)

An archaeological and cultural heritage assessment of the 184-188 George St site found it was likely to preserve at least some PSB soil profile deposits, even though the upper levels would be most likely missing or dispersed from past demolitions and site levelling. Aboriginal archaeology

had already been salvaged during redevelopment of blocks surrounding the site. Across about three-quarters of the site, multiple building and demolition phases had removed and truncated the upper archaeological levels, but 'natural' soil profiles with potential to contain Aboriginal objects existed below the disturbance.

A drainage 'gully' that emptied into the river was found through the centre of the 'GSP 2013' site. This contained about 2.0m+ of post 1890s fill covering original PSB ground surfaces and associated archaeological filling and 'yard' deposits. These yard deposits represent the earliest attempts by the colonists to modify the landscape for their use.

This 'gully' created greater preservation of the PSB stratigraphic sequence, which appeared in some respects to differ from that seen in previous studies. This sequence extended from around the time of the stabilization of sea-levels, the mid Holocene, through to the colonial settlement. Palynological evidence from the gully indicated the presence of freshwater lagoons or ponds on the lower river terraces bordering the town, and that the surrounding vegetation was shrub-fernland dominated by rainbow fern. Furthermore, there was evidence for previously unrecorded vegetation, and confirmation of the presence of she-oaks and/or river oaks on the lower terraces.

Aboriginal excavations recovered 114 stone artefacts sourced primarily from silicified tuff and silcrete. The objects are likely to reflect that the site was consistently a river landscape on the periphery of more favourable terrace positions. Here, the low numbers of stone artefacts were likely to represent limited *in situ* knapping activities and the possibly that the use of non-durable tools was favoured. Aboriginal objects were also identified which could be dated to the late eighteenth and early nineteenth century, firmly supporting historical records for the continued Aboriginal occupation of Parramatta.

330 Church Street, Parramatta (AHMS 2011, 2014)

Archaeological test excavation at 330 Church Street, Parramatta in 2011 on the Pleistocene PSB, recovered 43 Aboriginal objects, and an additional 32 non-diagnostic fragments of stone suitable for working. Natural soils encountered during excavation were predominantly sand, with varying clay and silt components, with basal deposits (120 cm below ground surface) dated to the terminal Pleistocene (~20-10,000 years BP). The investigation found that historical excavation across the site had previously truncated the majority of the natural soil profile across the site, with Aboriginal objects only recovered from areas where historical disturbance had been minimal. The high levels of disturbance and the low number of Aboriginal objects recovered from the excavation meant that test excavation was considered sufficient to understand the nature of the archaeology at the site, and no further archaeological work was necessary.

Riverbank Square Redevelopment, 30b-46 Phillip Street, 338 Church Street and 46/47 Smith Street, Parramatta (AHMS 2015)

Assessment of the Riverbank Square Redevelopment site identified the potential for archaeological material to be present in portions of the sites where prior disturbance had not extended more than 2m below the ground surface. Similar to the Charles Street Square study area, the Riverbank Square Redevelopment site was located across the interface of the Holocene

Flood Plain and the PSB Pleistocene terrace. The site was registered as a PAD with AHIMS (#45-6-3193).

Parramatta River Foreshore, Charles and Macarthur Streets, Parramatta- Proposed regional cycleway (Stedinger Associates Pty Ltd 2008, 2009)

Geotechnical testing and archaeological assessment for a proposed regional cycleway between Charles and Macarthur Streets, Parramatta (southern bank of the river, coinciding with a portion of the Charles Street Square current study area, as well as extending to adjacent lots further to the east) was undertaken in 2008, including a strategy for the investigation of the nature of the PSB in this location (Stedinger 2008). Historical archaeological excavation of the site was subsequently undertaken (Stedinger 2009), in the form of an archaeological monitoring program through four targeted archaeological trenches during the construction of the cycleway. However, the archaeological works for the cycleway were concentrated further to the east (and almost wholly along the River foreshore) than the current Charles Street Square study area, in addition, it is unclear to what extent these archaeological works included Aboriginal archaeological excavation, with only the historical archaeological post excavation report available (Stedinger 2009, which provides little information with respect to the process of results of any Aboriginal archaeological investigation undertaken at the site).

The Aboriginal Archaeological Assessment (Stedinger 2008) assessed the western side of the Cycleway study area to have low Aboriginal archaeological potential due to disturbance and fill associated with the construction of the Parramatta Ferry terminal. However, the 2008 assessment focused on the cycleway impact zone, mainly adjacent to the River and further to the east, and did not appropriately capture the main area of proposed development works for the current Charles Street Square project.

Geotechnical testing undertaken for the cycleway project on the corner of Charles and Macarthur Streets (further to the east from the current Charles Street Square project study area) identified a soil profile of c.65cm of fill overlying the PSB (in the east of the site). The PSB in this location was identified as having potential for Aboriginal archaeological material to be present in areas where previous disturbance was limited.

The Aboriginal archaeological research design for the cycleway (Stedinger 2008) proposed the excavation of two trenches alongside the path of the cycleway in less disturbed locations, to 'allow retrieval of scientific information', i.e. to explore the potential extent of the PSB within the project area. Results of this proposed excavation have not been able to be readily located through a search of available reports.

2.2.3. Discussion of Archaeology within Parramatta Sand Body

The concentration, nature, and extent of Aboriginal archaeological deposits encountered within the PSB, particularly on the southern bank of the Parramatta River, is of particular relevance to the archaeological predictive modelling for the Charles Street Square study area. Therefore, a base level analysis of the nature of the deposits encountered on the PSB on the southern bank, including artefact counts, general vertical and horizontal distribution, and levels of disturbance has been undertaken. This provides additional data to inform predictive modelling of the

current study area, and to help develop the most appropriate methodology for future archaeological investigation of the study area where necessary.

The seven sites included in this analysis are: the three Jo McDonald PSB George St sites (CG1, CG3 & RTA-G1); 95-101 George St; 'GSP 2013' (184-188 George St); 142-154 Macquarie Street; 140 Macquarie Street; and Harris Street Road Reserve (Robin Thomas Reserve) (see table below).

As can be seen in the following table and figure that accompanies it, the concentration of highest artefact densities in the immediate vicinity of the current study area seem to be focused around CG1 and RTA-G1 (i.e. around the corner of Charles and George Streets), with average densities dropping off rather steeply on each side of those sites.

Table 2.4: P SB Sites on south bank of Parramatta River

SITE	OVERALL AVERAGE ARTEFACT DENSITY (TESTING & SALVAGE COMBINED) (M2)
CG1 (Cnr George & Charles St) (JMcDCHM 2005)	24
CG3 (101A-105 George St) (JMcDCHM 2006)	6
RTA-G1 (109-113 George St) (JMcDCHM 2004)	38.2
95-101 George St (Austral 2007)	8-9
142-154 Macquarie Street (Comber 2010)	3.5
140 Macquarie Street (Comber 2010)	3.5
184-188 George St ('GSP 2013') (Steele 2017)	Not calculated by author. ~3-5
Harris St Road Reserve (adj. Robin Thomas Reserve) (Comber 2013)	6.5

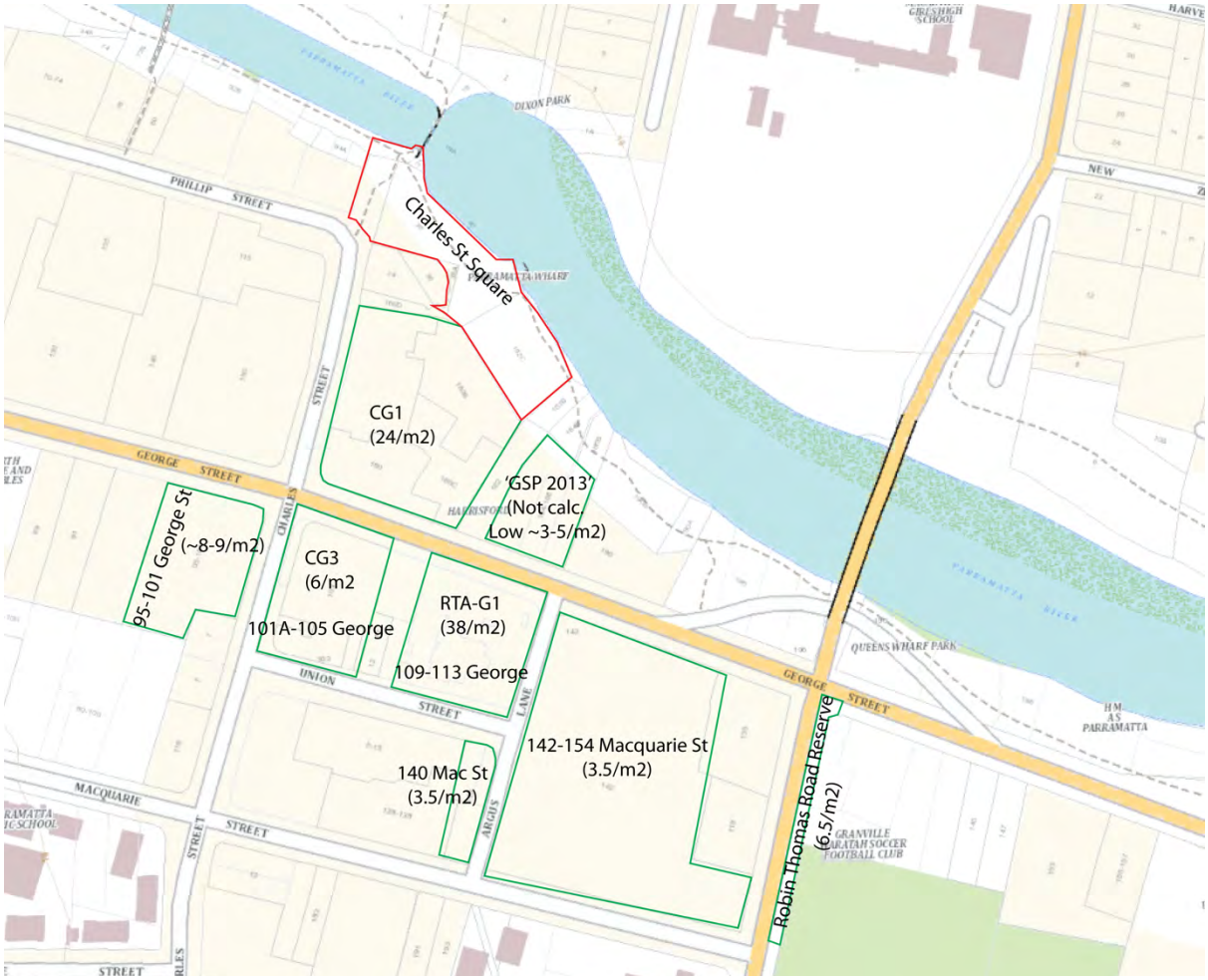


Figure 2.7: Location of PSB South Bank Sites and artefact densities. N.B. Figure oriented to north (Curio 2020)

2.2.4. Summary of Previous Archaeological Investigation

Previous Aboriginal archaeological excavations along the Parramatta River—particularly the southern bank—have consistently identified the presence of multiple phases of occupation and use of the PSB by Aboriginal people in the region- dating from the Pleistocene (c.30,000 BP) through until the mid to late Holocene (c.2,500 BP). These investigations have been sufficient to allow categorisation of the archaeological evidence recovered from the PSB along the southern side of the Parramatta River as part of the same archaeological landscape, particularly sites in proximity to the study area: e.g. CG1; RTA-G1; CG3; GSP 2013.

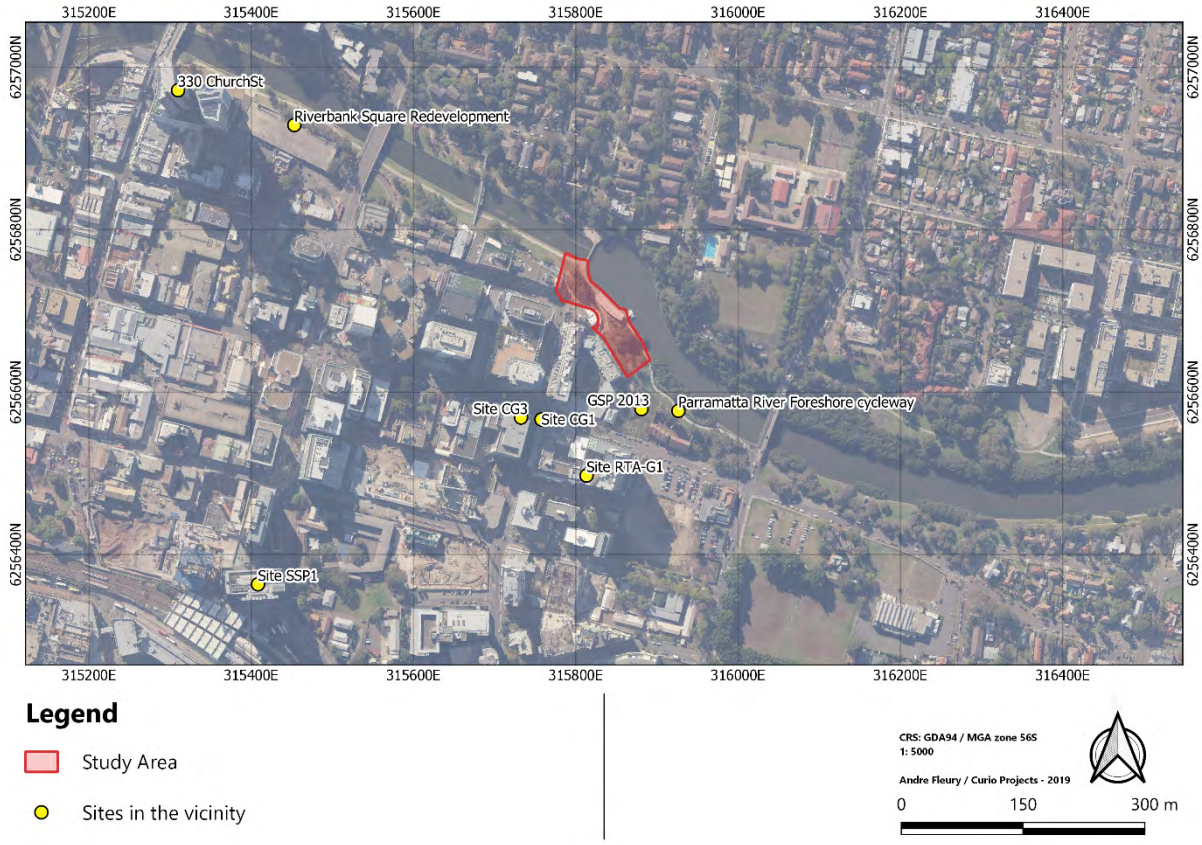


Figure 2.8: Location of Sites referenced Above (Source: Curio 2019)

2.3. Regional Character and Archaeological Predictive Model

Aboriginal Predictive Modelling plays an important role in understanding the potential within a study area and thus provides insight into management recommendations. An archaeological predictive model utilises the environmental context, previous historical context and AHIMS to assess the potential for remaining archaeological materials to be present. In the case of this study area generally it can be described as having **moderate to high potential** for the presence of Aboriginal archaeological objects. The reasoning for this assessment will be detailed below.

The environmental context suggests that given the proximity of the study area to water, its fairly open access, and its deep alluvial deposits (i.e. potential to contain part of the PSB), the site would be a prime location for past Aboriginal use. Furthermore, the site may have preserved these deposits intact below the current ground surface. While it is known that the area would have been frequently impacted by flood events from the Parramatta River, and that this would have caused erosion and scouring, there is no reason to believe that this would have removed all potential archaeological remains. The known past landscape suggests similarity to the current incline to the riverbanks.

It is also known that potentially this site would hold remains of the Parramatta Sand Body, which is significant on a State level due to its high potential for stratified archaeological material. The PSB is thought to occur up to depths of 1.5m to 2m below the ground surface. Previous

geotechnical investigation indicated the presence of an alluvial soil profile within the study area, which is potentially indicative of the PSB.

From the AHIMS results it can be seen that the most common Aboriginal site types in Parramatta are single artefacts, PADs or some combination of the two. There are modified trees and grinding grooves, but these are rare and are located within areas of low development, and so are unlikely to be found within the study area. From this data it can be seen that most sites are found on the southern side or Parramatta river and within 500m of a permanent water source. There are many sites positioned within the Birrong Soil Landscape, which the study area primarily sits within. Using this information, it can be seen that the potential for PADs or artefacts within the current study area is relatively high.

Historically the study area has been underdeveloped, with only minor disturbance occurring prior to construction of the wharf, such as the site of a Chinese market garden and potentially part of the Rosehill settlement during convict and colonial periods. Historical activities would most likely have disturbed upper deposits of Aboriginal significance. However, modern development is likely to have left deeper Aboriginal deposits intact. The extent of erosion and modern disturbance from the wharf within the study area is currently unknown.

Previous studies in close proximity to the study area have shown that the PSB is present in the vicinity and has the potential to contain Aboriginal artefactual material and sites. However, a number of previous archaeological excavations undertaken in the Parramatta area have indicated that while the PSB was commonly subject to ephemeral occupation by Aboriginal people over the past 20-30,000 years, only very localised areas appear to have been used more intensively, with the majority of excavated sites reflecting a low intensity use of the landscape. This would suggest that similar findings may be present within the study area.

It has also been found that Aboriginal objects can be found within disturbed contexts, and the exact nature of how they came to be deposited still holds scientific value and research potential. It can be assumed that more intact deposits would be located a small distance from the river, being free from constant erosion. This means that upslope from the wharf would hold the highest potential for intact archaeological deposits, with the deposits being more affected by re-deposition from the river. This does not lessen the probability that material would survive but would make it less useful from a research perspective.

AHIMS Site #45-6-2648, Charles/George 1 (CG1) is located only c.50m to the south of the Charles Street Square study area. While this site is registered as an individual point, it has been widely accepted as being part of a wider Aboriginal archaeological landscape in this location, including other sites such as RTA-G1 and CG3. The proximity of the current study area to these three sites, located along the boundary of the same sand body, means that any potential Aboriginal archaeological deposits located within the Charles St Square study area would be considered to be part of the same archaeological landscape as sites CG1, RTA-G1 and CG3.

Therefore, it is recommended that rather than registering an additional site with AHIMS for the PAD associated with the study area, that the site card for AHIMS Site 45-6-2648, Charles/George 1 (CG1) be revised to include the study area within its extent, reflecting the association and

distribution of this connected archaeological landscape, and avoiding unnecessary duplication of sites.

While tangible evidence is important (and the focus of this ATR as a technical report) it is acknowledged that there is also potential for Aboriginal intangible values to be associated with the study area and its landscape context. For example, the riverbank of the Parramatta River has been identified through previous investigations as being of high significance to Aboriginal people. Intangible values of the study area (i.e. social, spiritual and cultural values of significance to the local Aboriginal community) has been further investigated and presented within the ACHAR (to which this ATR functions as an appendix).

Aboriginal archaeological potential for the study area is generally consistent with the mapping of the PSB, and is depicted in Figure 2.9.

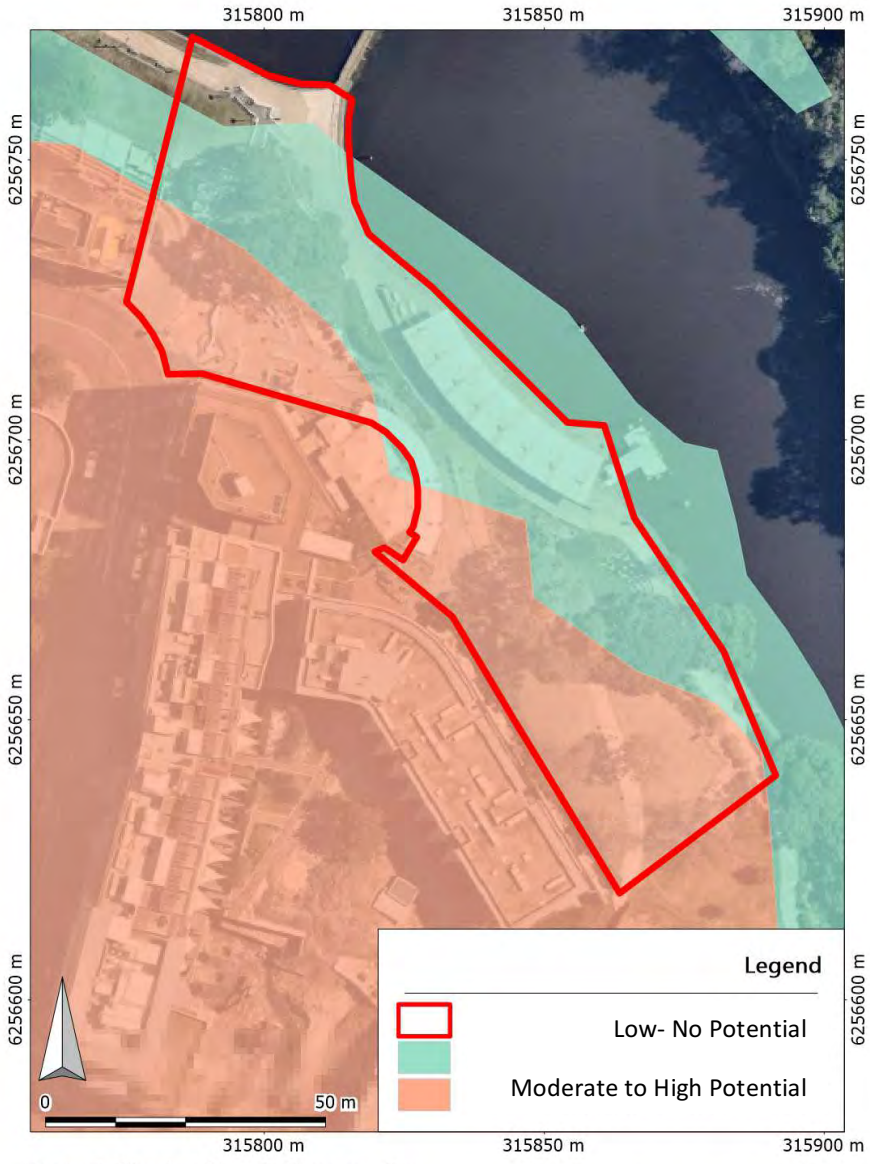


Figure 2.9: Potential for Parramatta Sand Body across study area, with potential to retain Aboriginal archaeological deposit (Source: Curio 2019)

3. Site Analysis

3.1. Due Diligence Visual Inspection

A site inspection was undertaken by Curio Projects in March 2019 in order to gain a better understanding of physical and landform context of the study area proposed for the development, i.e. the redevelopment of the wharf and surrounding landscape. The site inspection revealed high levels of modern construction and landscaping, mixed with open reserves with moderate landscaping. The extent of development may have had some impact on the subsurface remains, but is also likely to have largely protected the alluvial deposits below.

The study area is located along the southern foreshore of the Parramatta River, to the north of the Parramatta CBD. The majority of the site is located on Lot 2 DP869816. The site is bounded to the north by the Parramatta River, with the Charles St Weir at its very northern extent. The western corner of the study area is located at the intersection of Phillip and Charles Streets, while the southwestern edge bounds a reserve along the southern foreshore.

The study area is approximately 160m in length, running northwest to southeast. At the time of the site inspection, the central area of the site was characterised by tiered concrete areas connected by stairs, with concrete pathways and access areas (Figure 3.1). There were some areas of vegetation in landscaping, and the existing wharf extends out into the river (Figure 3.2).

The original moderate slope from the present-day road level to the river bank has been formalised in a series of paved and concreted terraces, with concrete retaining walls and connecting stairs and ramps. None of the natural soil profile is evident in this area of the modern site. This is in contrast to the opposing northern bank, where large areas of eroded shale bedrock can be seen, clearly demonstrating the high level of erosion that has occurred to the deposits above the bedrock (Figure 3.3).

Between the terraced area above the immediate foreshore and the paved foreshore area are a number of garden beds. While the majority of the vegetation is introduced, a few specimens, such as the red gums seen in Figure 3.4, may be naturally occurring. The entire area of the immediate foreshore is paved, and the riverbank itself has been solidified. While this may have cut back and impacted some of the natural soil profile, it will have protected the encased deposits from further erosion (Figure 3.5).

The north-western edge contains a gentle grassed slope showing typical top soil deposits. This may represent remnant historical landforms, but is more likely a modified and landscaped area, with residual natural soils at depth. There is evidence of services, such as storm water, sewerage and high voltage power lines (Figure 3.6), which would have likely also impacted the integrity of the natural soil profiles in this location.

The southeast of the site is a landscaped reserve that imitates the descriptions of the natural environment. It is open and grassed, with soil deposits visible at the surface, and trees well-spaced throughout. These trees, which feature many of those described in the natural environment, may represent both planted vegetation and remnant natural vegetation.

The site inspection demonstrated that the study area is a developed urban site with 0% ground visibility.

Figure 3.1: View of the Site showing the terracing, garden beds and wharf structure (Source: Curio 2019)

Figure 3.2: View of the Site showing the terracing leading to the wharf (Source: Curio 2019)

Figure 3.3: View of the opposing bank showing the exposed shale and minimal overlying deposits (Source: Curio 2019)

Figure 3.4: View of the Site showing a garden bed showing both introduced vegetation and possible natural redgum (Source: Curio 2019)

Figure 3.5: View of the Site showing the reinforced riverbank (Source: Curio 2019)

Figure 3.6: View of the Site showing the northwestern grassed slope, with stormwater services evident throughout (Source: Curio 2019)

3.2. Site Inspection and Consultation Meeting

Due to the nature of the study area (i.e. developed and covered in hard surfaces) it was not possible to undertake an archaeological survey of the Charles Street Square development study area, as no artefacts or areas of potential archaeological deposit were visible on the surface. Therefore, in lieu of an archaeological survey a site inspection and on-site Aboriginal consultation meeting was held. This inspection and meeting was held in the Square, to familiarise project RAPs with the study area, current conditions, levels of disturbance and topography, and to present to them the concept plan for the redevelopment of Charles Street Square. All project RAPs were invited to attend.

The site inspection and on-site consultation meeting was held on 20 September 2019, attended by Sam Cooling (Curio Projects), Steve Randall (DLALC), Jamie Eastwood (DACHA), Lana Wedgwood (DCAC), and representatives from the City of Parramatta Council; Elizabeth Sandoval, Paul Graham and Julia Gauci. During the site visit and meeting, Curio Projects presented an overview of the proposed project and results of the due diligence assessment, including a summary of the proposed cultural heritage assessment methodology, after which Elizabeth Sandoval presented more detail about the proposed development via presentation of photomontages and an on-site walkthrough.

Topics presented and discussed at the meeting included the archaeological potential of the site, likely development impacts and proposed methodology for the project. This consultation informed the development of the archaeological research design (Section 5.2.6 of this ATR), as well as informing the understanding of the social and cultural value and significance of the site to project RAPs. All feedback and discussion undertaken at this meeting was recorded, and is summarised in the ACHAR (to which this ATR functions as an appendix). Community consultation is discussed in more detail in the ACHAR report.

At the time of the site inspection, the proposed development impacts were understood to be minor in nature, and therefore it had been assessed that there would be no potential for development works to impact natural soil profiles (as below ground works were minimal- with the majority being located in close proximity to the River- i.e. in areas of disturbance/foreshore modification). Therefore at the time of the site inspection, Aboriginal archaeological investigation and mitigation was not proposed for the study area. However, further development of the project design in late September 2019 made apparent required impacts, indicating that archaeological test excavation would be appropriate for the site. Therefore, a test excavation methodology has been developed, presented in the following section.

4. Archaeological Impact Assessment

As noted by the OEH, it is important that an impact assessment directly addresses the potential harm that an activity may pose, specific to an Aboriginal place, objects, site or archaeological deposit (OEH 2011: 12).

4.1. Proposed Activity

The Charles Street Square Stage 1 Renewal development proposes to deliver a substantial upgrade of the existing Charles Street Square, improving amenity, access, legibility and identity at this important gateway to Parramatta City. The project will be delivered in coordination with a major public artwork, and will complement the RMS upgrade of the ferry wharf infrastructure.

A high quality river foreshore is a major opportunity identified in the Parramatta 2038 Community Strategic Plan for the Parramatta CBD, supported by the adoption of the Parramatta City River Strategy.

The key components of the project design as per the preferred concept design will include:

- Circulation system of ramps and walkways that provides universal access between the street and the riverfront
- Generous seating terraces and steps that integrate with the ramps and walkways to create more direct access to the riverfront, and also to create a space that can be inhabited for events as well as everyday activities (rest, viewing the river, waiting for the ferry etc)
- Landscaping including removal of some existing trees and addition of new trees
- New shade structure integrated with seating terraces
- Preservation of existing means of access to adjacent land uses (driveway to 94 Phillip St, right of carriageway to 36 Charles St)

Development activities associated with the construction of the Upgrade will include:

- Demolition of existing terraces and replacement with new walkways and ramps, installation of new seating terraces and seating around existing trees;
- Relocation of existing automated toilets (Exeloo 'Orbit');
- Construction of several new structures (i.e. new shade structure, new ferry shed);
- Cutting and filling to achieve required levels;
- Installation of new traffic bollards at the corner of Charles and Phillip Streets;
- Excavations for new and revised service routes, stormwater lines and pits; and
- Retention of existing trees, planting of new trees and general landscaping.

The detail of the design is currently under refinement, and may be subject to minor revisions, such as the final detailed design of the terraces, ramps and walkways. However, this has been

allowed for within this impact assessment, with below ground impacts assessed for their potential to impact archaeology more generally.

Figure 4.1 presents the general arrangement plan for the development, while Figure 4.2 summarises the indicative locations and extent of below ground impacts/excavation required for the development.

4.1.1. Activities with Potential to Impact Aboriginal Sites

Development activities with the potential to impact Aboriginal sites and/or potential archaeology are those that extend below the ground surface within the zone of mapped Aboriginal archaeological potential. These development impacts include:

- Cutting and filling to achieve required levels;
- Installation of new traffic bollards at the corner of Charles and Phillip Streets;
- Local trenching for new and amended services (e.g. electrical conduits, stormwater lines and pits);
- Other minor excavation for site features such as light pole footings, bike hoops, signage etc; and
- Planting of new trees and general landscaping.

Below ground impacts of the development are generally confined to the western side of the study area, with minimal to no below ground impacts proposed for the southeastern extent of the area (i.e. the southeastern part of the study area consists mainly of new gardens and landscaping with minimal development).

Figure 4.3 presents a sketch of the below ground development impacts with reference to the mapped extent of the PSB within the study area (i.e. the area of potential Aboriginal archaeology).

Figure 4.1: General Arrangement Plan (SMM, April 2020)

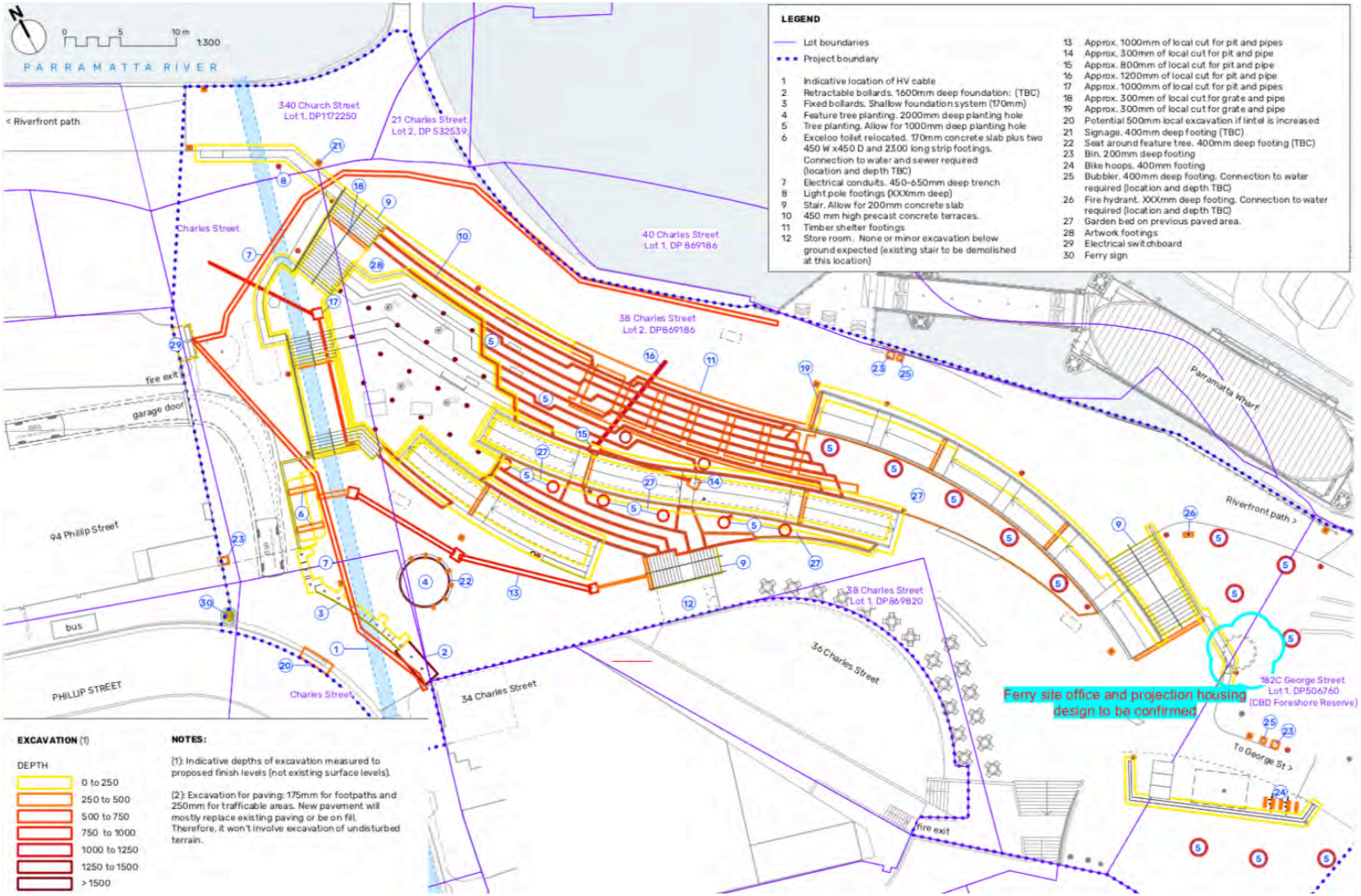


Figure 4.2: Indicative Extent of Excavation, Preferred Concept Design (SMM + Lahznimmo, 19.3.2020)

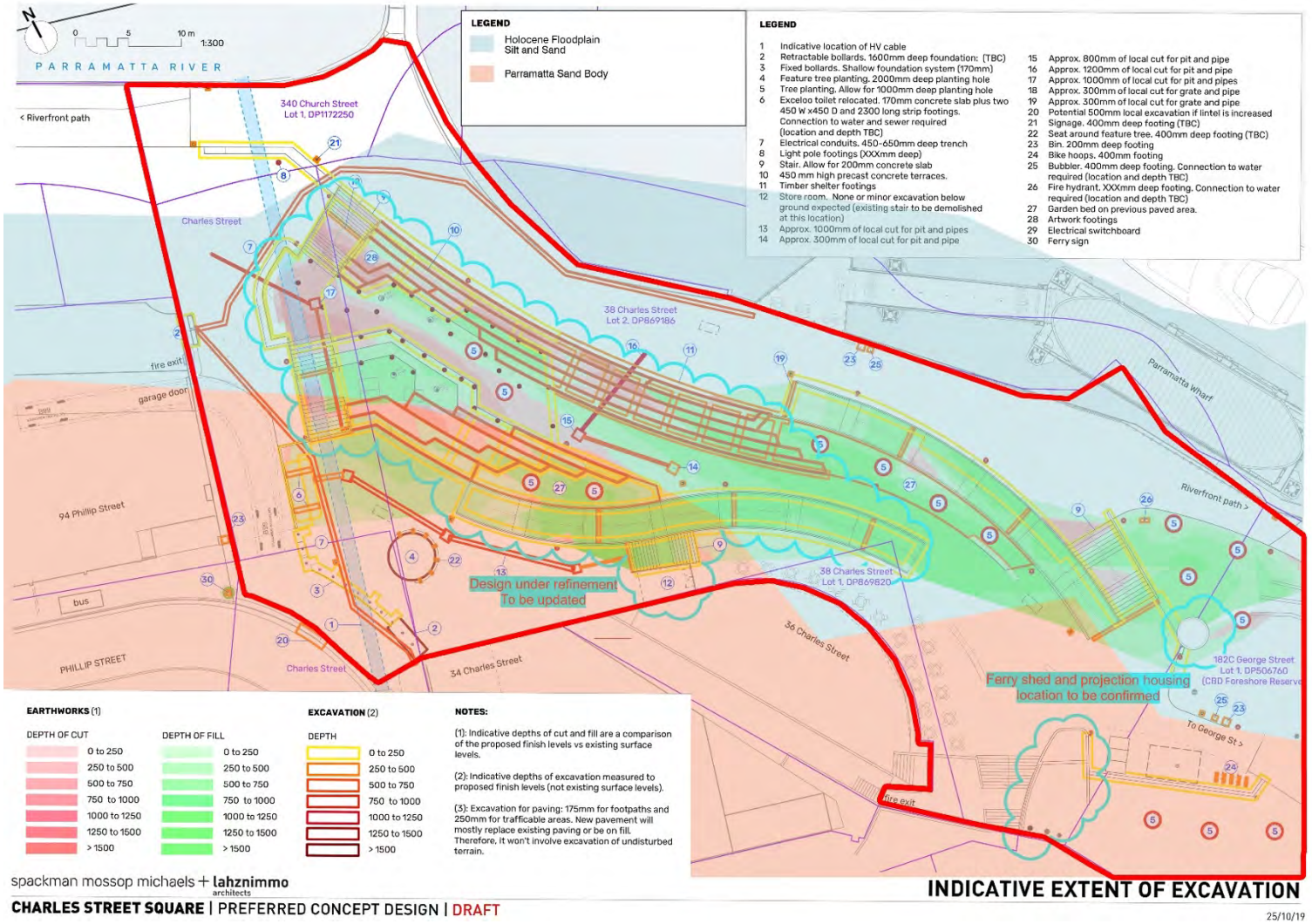


Figure 4.3: Indicative Extent of Excavation with Aboriginal Archaeology (Source: SMM with Curio Additions 2019)

4.2. Potential Impacts

4.2.1. Aboriginal Sites and Archaeology

Archaeological potential within the Charles Street Square study area is directly related to the possible presence of the PSB, and the Aboriginal archaeological potential associated with this feature. Therefore, the archaeological potential within the study area is directly related to that of registered AHIMS sites 45-6-2648 (Charles/George 1) and 45-6-2673 (RTA-G1).

While the site card for AHIMS site 45-6-2648 (Charles/George 1) was not available to request from AHIMS, an assessment of the 45-6-2673 (RTA-G1) card, as well as the results of the archaeological excavations undertaken at both sites (JMcDCHM 2005a; 2005b) indicates that it is appropriate to treat the potential within the current study area as a component of these two registered sites (regardless of the nature of AHIMS sites that require an individual coordinate location be registered).

Therefore, below ground impacts for the Charles Street Square Development are considered to have potential to impact on the extent of the PAD associated with AHIMS site 45-6-2648 (Charles/George 1).

Table 4.1: Type and Degree of Impact and Harm that Development Activities may cause to Aboriginal sites

ACTIVITY	TYPE OF HARM	DEGREE OF HARM	CONSEQUENCE OF HARM
Cutting to achieve required site levels	Direct	Partial	Partial loss of value (dependent on nature of PAD present within the study area)
Installation of new traffic bollards	Direct	Partial	Partial loss of value (dependent on nature of PAD present within the study area)
Excavation for new services/stormwater lines and pits	Direct	Partial	Partial loss of value (dependent on nature of PAD present within the study area)
Excavation of new tree pit	Direct	Partial	Partial loss of value (dependent on nature of PAD present within the study area)
Other general landscaping and minor works	Direct	Partial	Partial loss of value (dependent on nature of PAD present within the study area)

4.3. Proposed Conservation (Avoidance)

Curio Projects have been working closely with SMM and City of Parramatta Council through the development of the Concept Plan for the Charles Street Square upgrade in order to provide advice regarding the potential of the development to impact Aboriginal archaeology. Following from this advice, below ground development impacts have been located as much as possible to the north of the study area (i.e. within areas of highly disturbed soils adjacent to the river

foreshore with low to no potential to contain Aboriginal archaeological deposits), with the concept design making a concerted effort to reduce impacts within the mapped extent of the PSB.

4.4. Harm to Aboriginal Sites and Archaeological Potential

Table 4.2 presents a summary of the Aboriginal sites that have the potential to be harmed through the proposed development works, and summarises the type and degree of physical harm the proposed development may present. N.B. The potential harm proposed to this site is dependent on the results of Aboriginal archaeological investigation to confirm whether the PAD associated with the study area actually contains an intact Aboriginal archaeological deposit, or not.

Table 4.2: Physical Harm to Aboriginal Sites

SITE	TYPE OF HARM	DEGREE OF HARM	CONSEQUENCE OF HARM
Charles/George 1 AHIMS #45-6-2648	Direct	Partial	Partial loss of value (TBC following test excavation to confirm nature of PAD in this location)

5. Archaeological Management, Mitigation and Recommendations

This section presents the proposed strategies for the management and mitigation of identified impacts to the potential Aboriginal archaeological resource within the study area. The strategies presented here relate to archaeological impacts only (i.e. Aboriginal objects and tangible sites), and have been incorporated into the wider management recommendations for Aboriginal cultural heritage management for the Charles Street Square development area, as presented in full within the ACHAR (to which this ATR functions as an appendix).

This ATR has identified several options for the management of potential impacts of the proposed development to the potential Aboriginal archaeology within the study area. Options for archaeological management include:

- Avoidance and Protection; and
- Archaeological Investigation.

5.1. Avoidance and Protection

Curio Projects have been working closely with SMM and City of Parramatta Council through the development of the Concept Plan for the Charles Street Square upgrade in order to provide advice regarding the potential of the development to impact Aboriginal archaeology. Following from this advice, below ground development impacts have been located as much as possible to the north of the study area (i.e. within areas of highly disturbed soils adjacent to the river foreshore with low to no potential to contain Aboriginal archaeological deposits), with the concept design making a concerted effort to reduce impacts within the mapped extent of the PSB.

Therefore, development impacts to the potential area of the PSB have been reduced as much as possible, affording some conservation of potential natural soil profiles and the archaeology that may be contained within them.

The remaining areas of the study area with the potential to contain the PSB that will require impact will require further archaeological management, described in the following section.

5.2. Aboriginal Archaeological Investigation

Based on the results of the archaeological predictive modelling for the study area, an archaeological excavation methodology and research design has been developed to investigate the nature and extent of any subsurface Aboriginal archaeological potential within the impact zones of the proposed development.

Aboriginal archaeological test excavation under the OEH *Code of Practice* is not possible at the Charles St Square study area for the following reasons:

- The study area is in a highly developed urban environment, covered by a layer of historical fill

- A historical archaeological deposit has the potential to be present across the study area, and would overlay the potential remnant soil profiles with the potential to contain in situ Aboriginal archaeological deposits, and will require investigation/removal in accordance with a S140/S60 consent (NSW Heritage Act), prior to the commencement of any Aboriginal test excavation.
- The nature of the PSB profile provides complications for archaeological excavations- due to the instability of the sands and relative depth at which the PSB extends- making the excavation methodology as allowed under the *Code of Practice* not able to be applied to the current study area.

Therefore, the following test excavation methodology and research design has been developed to investigate the nature of the potential natural soil profiles within the study area- to be undertaken under an approved AHIP.

5.2.1. Aims

The aims of archaeological test excavation within the Charles Street Square study area are to:

- Identify the boundary, extent and intactness of the PSB within the main impact zones of the study area.
- Determine the nature, depth, extent, and significance of any potential Aboriginal archaeological deposits within the study area.
- Identify any locations with Aboriginal stone objects (or other sites) within the study area, for which impact via the proposed works will be unavoidable, and develop management strategies to minimise or mitigate these potential impacts.
- Salvage a reasonable sample of any Aboriginal archaeological deposits that may be present within the footprint of the development impacts, prior to commencement of development works.
- Provide data for the overall archaeological record to help refine future archaeological predictive modelling across the Parramatta region (if possible).

5.2.2. Methodology Rationale

An important consideration in the development of an archaeological methodology is the ability for comparison of excavation data with other regional archaeological sites, to enable examination of wider regional archaeological patterns. As summarised in Section 2 of this ATR, numerous Aboriginal archaeological sites have been (and continue to be) excavated within the Parramatta CBD area, with respective methodologies requiring consideration to maximise data comparison between sites. One key factor for deliberation relates to trigger points for further investigation and expansion between testing and salvage excavations- a brief discussion of which follows, particularly in relation to artefact density in test excavations, and what can be extrapolated about the wider distribution in the vicinity of a single test unit.

Artefact density recovered from an archaeological excavation will unavoidably vary depending on the type of excavation being undertaken: i.e. testing vs salvage. As one of the base level aims

of archaeological test excavation is investigating presence/absence of a resource, archaeologists will generally aim for maximum coverage of the investigation area in question, with test pits placed on a regularly established grid with the aim of recovering the most information from a wider area, balanced with minimum physical intervention.

Conversely, salvage excavation targets a known archaeological deposit and therefore aims to recover the maximum extent of the identified deposit as a mitigation to impact/harm to this deposit required through development works (or whatever activity is acting as a predicate to the development).

While test excavation is guided by predictive modelling (developed by knowledge of previous archaeological works, geotechnical information, environmental context etc), this process is still usually the first step of physical investigation of a site, attempting to find evidence of a deposit if present, and if so, to attempt to get an idea of the extent of the deposit via regularly spaced pits.

Numerous excavations have proven that artefact density at a site can change significantly from metre to metre across a site (albeit influenced by many contributing factors). Simply put, it is not accurate to infer potential artefact density of a site based on the overall (testing + salvage) artefact density from a neighbouring site, particularly in relation to the PSB, where artefact density varies significantly depending on the local geomorphological conditions.

For example, the figures below depict artefact densities from two open areas at CG1 (Corner of Charles and George St). While the higher artefact densities from this salvage excavation are quite large (90-100 artefacts/m^2), the excavation squares towards the edges of the salvaged deposits have much lower numbers (2-10 artefacts/m^2)- with the artefact density ranging from 6 to 96 artefacts/m2 across an area of only around 7m wide in the first plan, and a range of 2 to 128 artefacts in the second. Of further import is the top of the second plan where two artefacts were found in $1m^2$ immediately adjacent to $1m^2$ that recovered 34 artefacts.

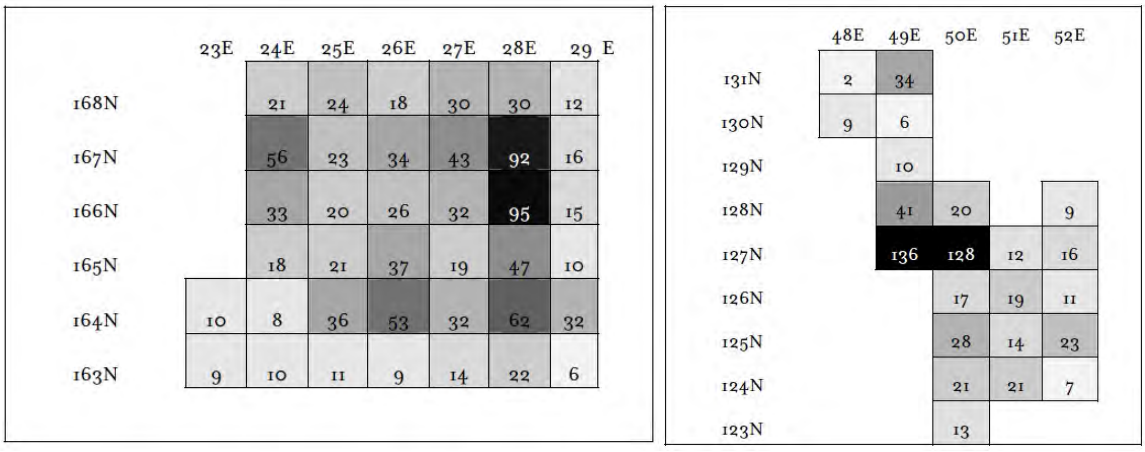


Figure 5.1: Artefact Densities by m2 from CG1. Left: Open Area B, Right: Open Area C (Source: JMcDCHM 2004)

That is to say, for a test excavation sampling strategy with test units at 10-20m spacing, a 1m2 test area that recovers only 2 artefacts, could possibly represent an isolated low density artefact scatter, *or* could possibly have encountered the very edge of a localised/concentrated

deposit/density of artefacts, which might not even still be present within the next spaced test pit 10m away.

This has significance for the development of artefact 'trigger numbers' in a methodology, to help dictate when a location warrants further investigation. It obviously follows that the higher that 'trigger numbers' are stated before requiring test unit expansion, the higher chance there is of missing or ignoring a concentrated deposit that the initial test pit might not have hit the centre of, but could still be present right next to it.

Therefore, the average density of artefacts/m2 on the Parramatta Sand Body (as found by previous archaeological excavations) is not directly comparable between what has been found in salvage excavations in Parramatta, and what should be proposed as trigger points for test excavations.

Considering the above complexities, the methodology developed for the test excavation of the Charles Street Square study area has been developed on the basis of selection of a 'trigger number' of artefacts/m^2 loosely based on the average density of previous sites *located at similar landscape positioning* as the Charles St Square study area, to be assessed in combination with additional contributing parameters of other factors that would affect decisions to expand or further investigate a test unit, including factors such as:

- presence of Parramatta Sand Body encountered
- presence of formal stone tool types identified
- indication of possible/likely presence of other sub-surface features such as hearths, heat treatment pits etc

The archaeological sites discussed in Section 2.2.3, on the southern bank of the Parramatta River, on the PSB, in immediate proximity to the current study area, have been used as a proxy for potential artefact densities at Charles St Square study area (should the local conditions allow for the survival of an intact Aboriginal archaeological deposit).

Therefore, this methodology proposes a 'trigger number' artefact density for further investigation/pit expansion of somewhere in the vicinity of 3-5 artefacts/m^2 (in combination with other factors- discussed further in the relevant section below), based on the average densities of the nearby sites with lower densities, located on potentially more similar landforms to CSS than that of the sites on the corner of Charles & George.

5.2.3. Locations of Test Trenches

In the interest of best practice principles for archaeological investigation (i.e. the concept of archaeology as a finite resource which should be retained without disturbance where possible), the proposed locations of archaeological test trenches are focused only in areas with potential for development activities to encounter (and therefore impact) the PSB and the potential Aboriginal archaeology contained within it, and has avoided areas where below ground development impact is not required.

While the opportunity presented by these sub-surface investigations to further our understanding of the nature and location of the PSB in this location is acknowledged (and therefore addressed within the sampling strategy and excavation methodology proposed here), it is inappropriate and unnecessary to disturb soil profiles more than necessary, solely in the interest of archaeological research. It is believed that the archaeological investigation of development impact areas (i.e. focused mainly in the northwest of the study area) will be sufficient both to understand the nature of the potential impact of the development, as well as to further the archaeological record and understanding for the locality, without additional impact.

Further, the Aboriginal archaeological investigation will be coordinated with a program of historical archaeological test excavation (see following section), the locations of which are also predicated on development impact locations in comparison with potential historical archaeology. Therefore, unnecessary Aboriginal archaeological excavation in areas not proposed to be subject to development impact, would potentially cause impact to historical archaeological resources- which otherwise would be able to be retained without disturbance.

The proposed test trench grid for the Phase 1 Aboriginal archaeological investigation within the Charles Street Square Upgrade study area has been focused on the northwest of the study area, primarily responding to the location of the new stormwater drain required in this location.

Consideration of Historical Archaeology

The study area also has potential for historical archaeological deposits to be present (Curio Projects 2019a), as depicted in Figure 5.2. A Historical Archaeological Research Design (HARD) has been developed for the Charles Street Square study area, in relation to the proposed development impacts. As both historical and Aboriginal archaeological potential occurs in combination within the study area- particularly in the southwest of the site, in proximity to the corner of Charles and Phillip Streets (see Figure 5.5)- any Aboriginal archaeological investigation within the study area will be undertaken in tandem and/or coordinated with the historical archaeological investigation.

Should historical archaeological excavation as guided by the HARD (in preparation, and subject to an approved Section 140 Excavation Permit from the NSW Heritage Division) encounter any displaced Aboriginal objects within historical archaeological deposits, the Aboriginal archaeology Excavation Director, and project RAPs would be informed. Any displaced Aboriginal objects within historical contexts would be recorded in their location, and removed, to be catalogued and analysed in accordance with the Aboriginal archaeological methodology outlined below.

The key location within the study area that is likely to require historical archaeological investigation/mitigation, is the path of a proposed stormwater line in the southwest, which intersects early potential archaeology relating to the position of the Barber house/structure (1823-1844) (Figure 5.3).

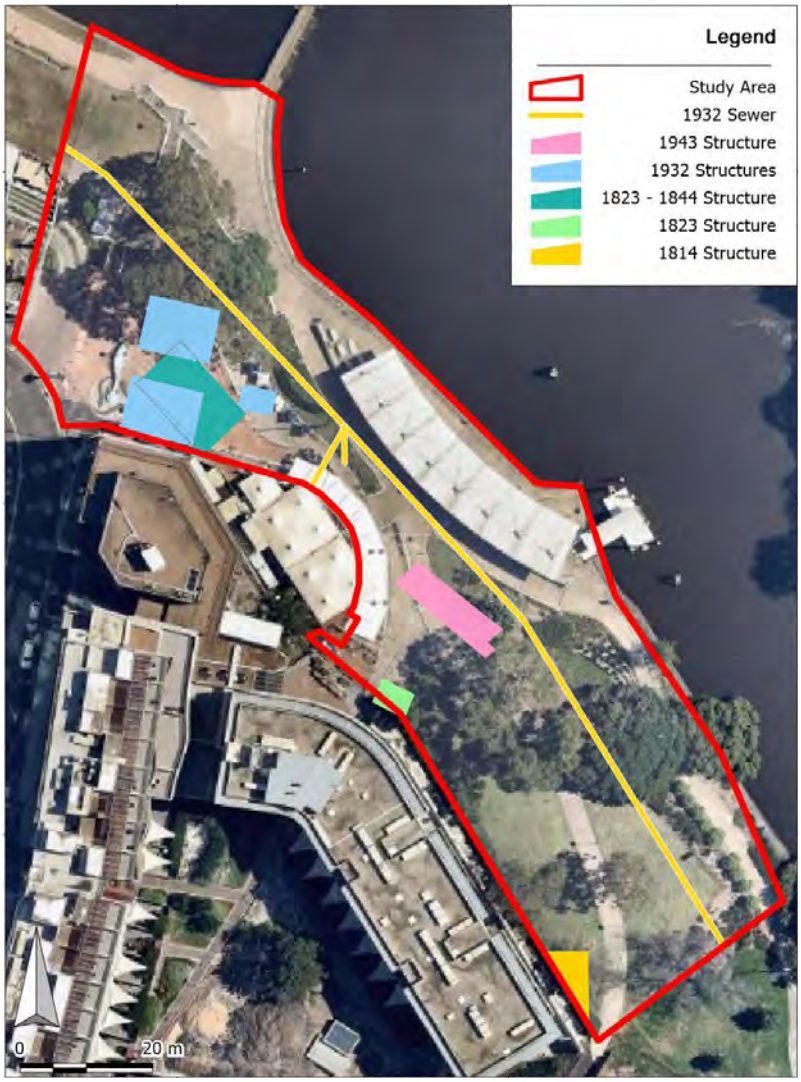


Figure 5.2: Historical Archaeological Potential (Source Curio Projects 2019)

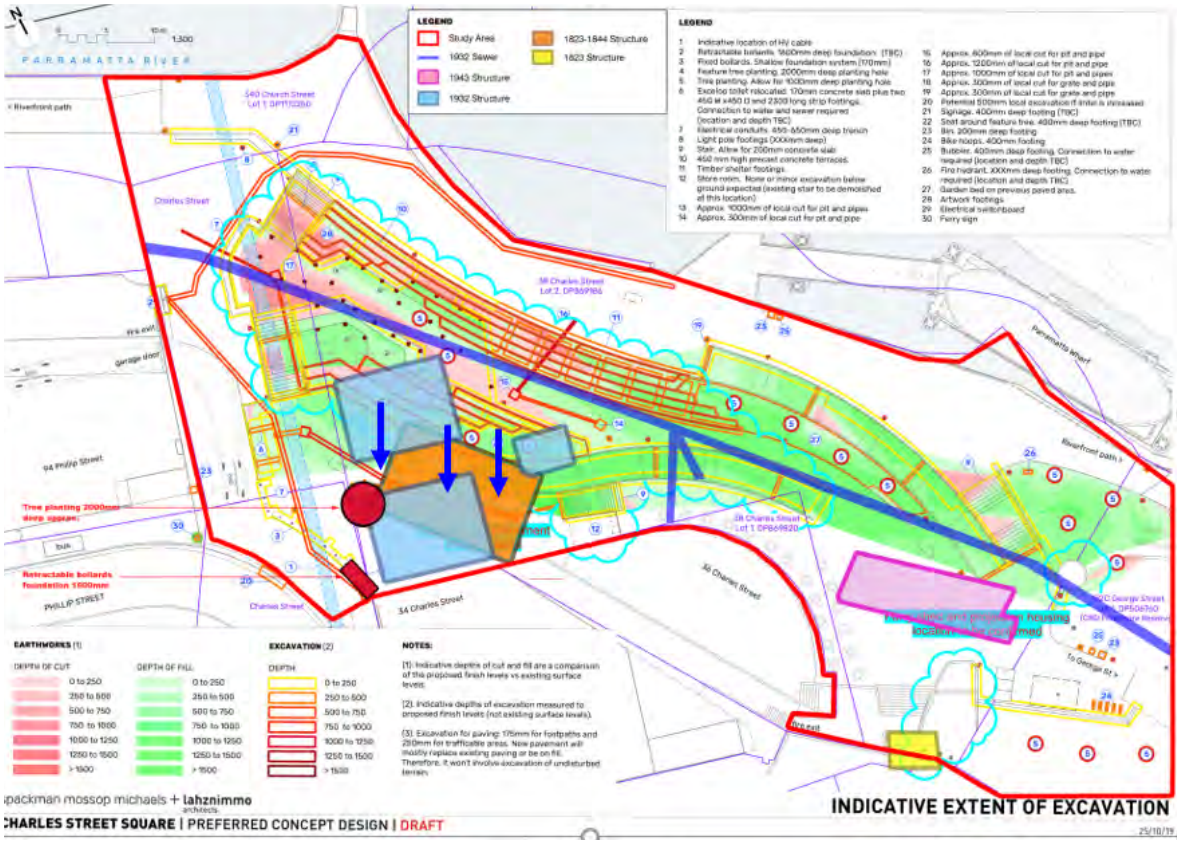


Figure 5.3: Area of Excavation with overlay of historical structures. Note stormwater line and pits indicated by blue arrows, and large tree planting (red circle) that intersect with early Barber structure, likely requiring historical archaeological investigation

5.2.4. Archaeological Sampling Strategy

The Aboriginal archaeological sampling strategy for the Charles Street Square study area has been developed, where possible, to be in accordance with the OEH *Code of Practice*, as well as relatively consistent or at least comparable with sampling strategies for previous excavations in the vicinity, in order to facilitate comparative analysis of results.

Aboriginal archaeological investigation of the Charles Street Square study area is proposed to be undertaken in two phases:

1. Initial testing of the Aboriginal archaeological potential of the main impact zones of the study area (Phase 1) with an aim to identify the presence or absence of intact subsurface profiles of the PSB and any associated Aboriginal archaeological deposit that may be present; and

2. Guided by the results of the initial testing (Phase 1), Phase 2 (salvage excavation) is proposed to be undertaken within development impact zones in order to recover the entirety of any Aboriginal archaeological deposit within the study area that requires impact through the proposed development works.

Phase 1 investigation would be undertaken via excavation of a series of test pits, directly located in the field to target development excavation locations, and historical archaeological excavation

trenches. Figure 5.4 indicates the target zone of Phase 1 Aboriginal archaeological excavation test pits, with the exact location of test pits to be laid out in the field.

Phase 1 test excavation would proceed as the excavation of a series of 1m x 1m test pits, to be positioned along a linear transect within the zone of impact at 10m intervals, or, where development impacts do not require a transect, as individual test pits, spaced and located to correspond with development impacts. The exact locations of the test pits will be determined in the field, in consideration of the physical parameters of the study area and impact works. Phase 1 test excavation would focus on investigating the nature and extent of the PSB within the impact zone of the study area, including investigation of the mapped boundary between the PSB and Holocene soils where location of development impact allows for such investigation.

However, due to the potential for instability and considerable depths of the natural sand profiles within the study area (i.e. the PSB- where present), it is acknowledged that excavation of $1m^2$ test trenches may prove impractical due to WHS conditions. Therefore, it is also proposed that an allowance for contiguous test pits be made as necessary, to ensure that deeper deposits (if encountered) could be logistically and safely investigated in areas where the Pleistocene sand sheet is encountered (e.g. establishment of a 2m x 2m test trench would allow for safe excavation to depth of 1.2m below the ground surface). Additional $1m^2$ test trenches may be added to the Phase 1 excavation program in locations nominated by the Excavation Director if determined to be warranted based upon the results of the excavation noted during the program.

The exact trench locations and number of test trenches would be finalised in the field, subject to some flexibility at the time of excavation as necessary in order to respond to local landscape features (i.e. stability of the soil profiles encountered, presence of previous disturbance within the study area such as existing services, location in combination with historical archaeological investigations etc).

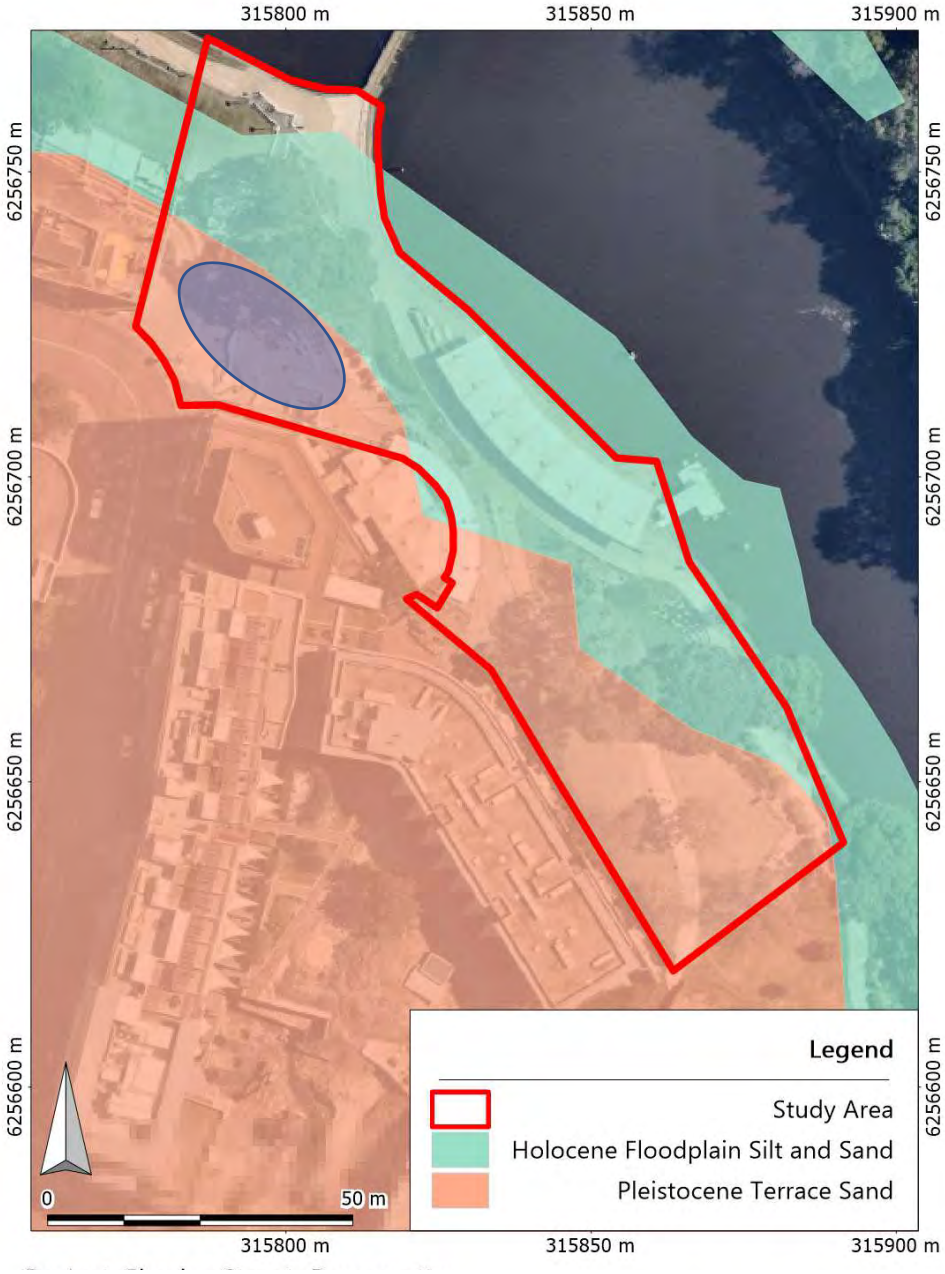


Figure 5.4: Location of Target area Phase 1 Testing Zones. Test Pits to be laid out in field at 10m spacing, corresponding with development impact locations and historical archaeological trenches.

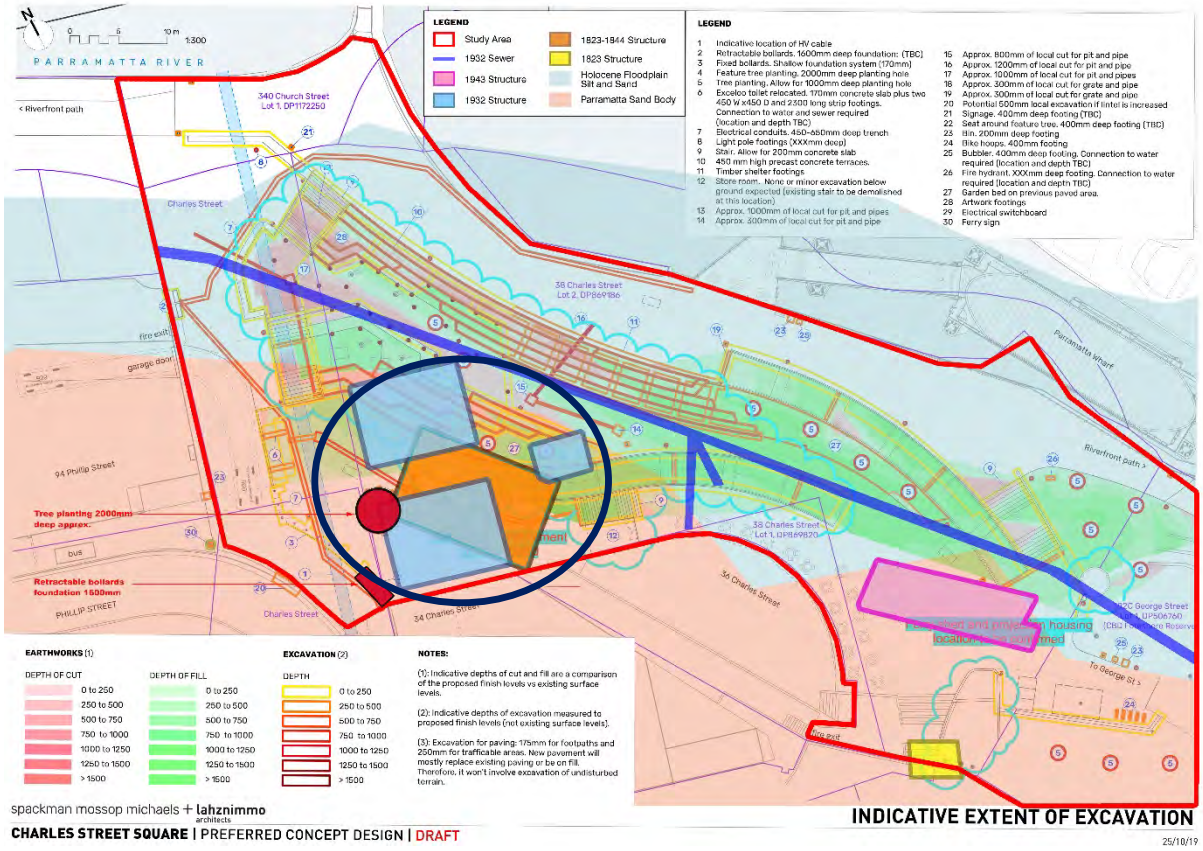


Figure 5.5: Example where potential historical archaeological features occur in combination with Aboriginal archaeological potential (indicated). PSB mapped in pink along the southern of the study area. (Source: Curio 2019)

5.2.5. Excavation Methodology

All Aboriginal archaeological works would be undertaken by a suitably qualified and experienced archaeologist as Excavation Director, to be assisted in the field by archaeologists and representatives from the project RAPs.

Phase 1 archaeological investigation would be undertaken as per the following methodology:

- Careful removal of any imported materials (e.g. gravel road base, concrete slab) or historical fill on top of the natural soil/sand deposits from the area of the excavation pit without disturbing the surface of the underlying natural deposits prior to the start of the excavation works. Removal of historical fill could be undertaken with the assistance of a small mechanical excavator, to be supervised by a suitably qualified archaeologist to avoid mechanical impact below the layer of historical fill.
- Following the removal of imported materials/fill, archaeological excavation of natural soil profiles within the parameters of each identified test trench would proceed using hand excavation techniques (hand tools only).
- Excavation of 1m^2 test trenches would proceed in 0.5m x 0.5m quadrants in 100mm spits, unless a shallower depth is defined by natural soil profiles or other stratigraphy/features identified.

- Where necessary to meet WHS conditions, excavation of contiguous test trenches would be undertaken, with maximum continuous surface area to be no greater than 3m2.
- Undertake shoring of pits as necessary to support trench walls and ensure safe conditions for archaeological team.
- Excavation of each test trench would continue until it is determined that the soil profile in the location is archaeologically sterile.

Should Phase 1 excavation encounter a significant Aboriginal archaeological deposit in any location that requires impact through the proposed development works, archaeological works would progress to Phase 2 salvage excavation within the development impact footprint. A significant Aboriginal archaeological deposit is defined for these purposes as:

- Higher relative number of Aboriginal artefacts (densities in the vicinity of ≥3-5 artefacts/m^2);
- Evidence of the Parramatta Sand Body;
- Potential hearths or heat treatment pits;
- Presence of significant, rare or unusual artefact types (e.g. backed blades, axe heads);
- Material potentially appropriate for scientific dating; or
- Any other unusual or unique archaeological, cultural, and/or geomorphological features, as identified by the Excavation Director.

Phase 2 archaeological works would include the expansion of the Phase 1 test trench via the excavation of one adjoining 1m x 1m excavation pit in order to investigate and salvage the full extent of the feature encountered, to the extent of the footprint of the development impact zone.

All archaeological deposits recovered from either phase of the Aboriginal archaeological investigation would be subject to the following procedures:

- All deposits excavated will be individually sieved through a 5mm aperture wire-mesh sieve, and any archaeological material recovered, retained by provenance.
- The location of each test trench (or salvage area) will be recorded by GPS, and recorded in detail including stratigraphic/soil profile description and drawings, description of any relevant features, artefacts etc, and photographed using a DSLR camera and appropriate photoscale.
- If carbon or other features suitable for scientific dating are identified, these would be sampled for possible further analysis (e.g. C-14 dating or OSL dating).
- Sampling of representative soil horizons from each archaeological excavation location.
- Stone artefact analysis will be undertaken in accordance with OEH *Code of Practice* requirements, and current accepted academic texts for stone artefact analysis and recording in southeast Australia, i.e. Holdaway and Stern 2004.

- A post-excavation report detailing the results of the Aboriginal archaeological investigation works within the study area would be prepared and submitted to OEH, consistent with best practice for preparation of post-excavation reporting, as per the requirements of the OEH *Code of Practice* and any relevant conditions of the approved AHIP. The report would be provided to all project RAPs for their information.
- Following completion of Aboriginal archaeological excavation within the Charles St Square study area, should an Aboriginal archaeological deposit be identified, an Aboriginal Site Impact Recording Form with the results of the excavation would be completed and submitted to the AHIMS Registrar for AHIMS Site 45-6-2648, Charles/George 1 (CG1).

Aboriginal Artefact Analysis

Any Aboriginal artefactual material recovered from the excavation works would be subject to a descriptive and functional recording and analysis by appropriately qualified and experienced specialists (lithic and/or shell specialist, depending on the nature of any archaeological deposit encountered). Recorded attributes and features of all archaeological material would consider analysis methodologies from previous archaeological investigations on the PSB to allow comparative analysis of deposits (as much as possible).

Geomorphology

A suitably qualified geomorphologist and/or geo-archaeologist may be engaged as a specialist if necessary in order to examine and analyse the nature of the PSB soils (if encountered) and to report on site formation processes and any implications for potential age and integrity of archaeological deposits encountered.

5.2.6. Research Design

Several research questions have been developed in order to inform the primary aims of the Aboriginal archaeological investigation within the Charles Street Square study area: namely to 1) investigate the presence of the PSB within the study area (and the boundary, extent and intactness if found to be present); 2) to identify any locations with Aboriginal stone objects (or other sites) within the study area; 3) to salvage a reasonable sample of any Aboriginal archaeological deposits that may be present within the footprint of the development impacts, prior to commencement of development works; and 4) to contribute to the archaeological record for Aboriginal occupation of the Parramatta Sand Body.

Key research questions for the proposed archaeological investigation of the study area include:

- What is the nature, extent, integrity and intactness of the PSB across the study area (if present)?
- Does the Charles Street Square study area represent an intact stratified Aboriginal archaeological deposit within the alluvial sand profiles of the PSB along the southern bank of the Parramatta River?
    - If so, to what nature and extent is this deposit present? What is the condition and integrity of this deposit? Can this deposit be dated? How does it compare with

other deposits recovered from previous nearby archaeological excavations (i.e. RTA-G1/CG1)?

- Is there any evidence for long term occupation of the PSB by Aboriginal people in this location (i.e. Pleistocene deposits)?

- Can the natural soil profiles inform a geomorphological context of the study area? If so, how?
- How can the Aboriginal archaeological deposit (if recovered) be interpreted in a local and regional context?
- Is the archaeological deposit (if encountered) culturally and/or publicly significant? To what extent?

5.3. Recommendations

The following recommendations are made with respect to archaeological management and mitigation of development impacts within the Charles Street Square study area. These recommendations should be incorporated within the ACHAR to which this ATR functions as a technical appendix.

- The Charles Street Square Upgrade study area has been assessed to have moderate to high potential for a Potential Archaeological Deposit (PAD) associated with the Parramatta Sand Body in this area of the southern foreshore of the Parramatta River.
- Proposed development impacts have potential to encounter the PSB and associated PAD, and therefore will require archaeological mitigation to reduce and/or manage potential impacts to Aboriginal archaeology.
- The extent of the Aboriginal PAD within the study area relates to the demonstrated archaeological landscape in the immediate vicinity of the study area- i.e. it is considered to be a potential extension of the archaeological landscape of AHIMS Site 45-6-2648 (Charles/George 1) and Site 45-6-2673 (RTA-G1).
- Rather than registering an additional site with AHIMS for the PAD associated with the Charles Street Square study area, the site card for AHIMS Site 45-6-2648, Charles/George 1 (CG1) should be revised to include the study area within its extent- reflecting the association and distribution of this connected archaeological landscape, and avoiding unnecessary duplication of sites.
- An application for an Aboriginal Heritage Impact Permit (AHIP) under Section 90 of the NSW National Parks and Wildlife Act 1974 should be submitted to the Aboriginal Heritage Planning Section of the Environment, Energy and Science (EES) division, of the NSW Department of Planning, Industry and Environment (DPIE) to allow Aboriginal archaeological investigation of the study area in relation to the proposed development impacts.

- The AHIP Application should allow for potential impact to the Potential Archaeological Deposit (PAD) associated within AHIMS Site 45-6-2648 (Charles/George 1).

- Aboriginal archaeological investigation at the site should be undertaken in accordance with the methodology and research design developed and presented in Section 5.2 of this ATR.

6. References

Alliance Geotechnical 2019, *Geotechnical Investigation Report- Charles Street Square Upgrade,* 27th June 2019

Archaeological & Heritage Management Solutions (AHMS) 2015, *Aboriginal Cultural Heritage Assessment: Riverbank Square, Phillip Street, Parramatta LGA.* Prepared for Parramatta City Council.

AHMS 2011, *Aboriginal and Historical Preliminary Archaeological Impact Assessment, 330 Church Street, Parramatta*. Prepared for Meriton Apartments Pty Ltd.

Attenbrow, V. 2010, *Sydney's Aboriginal Past: Investigating the archaeological and historical records*, 2nd ed. University of New South Wales Press Ltd, Sydney.

Artefact Heritage 2018, *North West Growth Centre: Marsden Park North Precinct: Aboriginal Heritage Assessment*. Prepared for Marsden Park North Release Group.

Austral Archaeology 2007, *95-101 George Street, Parramatta: Archaeological Salvage Excavations (Section 90 Consent 2176).* Unpublished report to Meriton.

Benson, DH & Howell, J 1990, *Taken for Granted: the bushland of Sydney and its suburbs*, Kangaroo Press, Sydney.

Comber 2010a, *Aboriginal Archaeological Interim Excavation Report s87 Permit 1099230: 15 Macquarie Street*, Parramatta. Unpublished report to Endeavour Energy.

Comber J 2010b, *Excavation Report AHIP: 1117090 – Cumberland Newspaper Site – 142-154 Macquarie Street*, Parramatta. Unpublished report to EGO Group on behalf of News Limited.

CRM 2017, *Report of Aboriginal and Historic Period Archaeology and GPR Survey, Robin Thomas Reserve, Parramatta*. Report to City of Parramatta.

Curio Projects 2019a, *Archaeological Assessment for Charles Street Square Development,* prepared for Spackman Mossop Michaels

Curio Projects 2017, *Archaeological Study for St John's Anglican Cathedral, and Surrounding Land, Parramatta.* Prepared for St John's Anglican Church.

Dominic Steele Consulting Archaeology (DSCA) 2017, *Aboriginal Archaeological Test & Salvage Excavation Report: 184-188 George Street, Parramatta, NSW*. Prepared for Wizcorp Pty Ltd.

DSCA 2013, *Aboriginal Archaeological Heritage Assessment & AHIP Application, AHIMS Site #45-5-3068, 184-188 George Street, Parramatta, NSW*. Prepared for Wizcorp Pty Ltd.

Extent Heritage 2017a, *Parramatta River CBD Foreshore Archaeological Management Strategy: Volume I.* Prepared for City of Parramatta.

Extent Heritage 2017b, *Parramatta River CBD Foreshore Archaeological Management Strategy: Volume II.* Prepared for City of Parramatta.

Extent Heritage 2017c, *Aboriginal Archaeological Report- 330 Church Street, Parramatta.* Prepared for Meriton Apartments.

GML Heritage 2015, *143–169 Macquarie Street, Parramatta, Aboriginal Archaeological Two-staged Salvage Post Excavation Report.* Report prepared for Leighton Properties.

Jo McDonald CHM (JMcDCHM) 2004a, *Archaeological Test Excavation at 1 Smith Street (Site SSP1), Parramatta, NSW.* Report prepared for Casey & Lowe on behalf of Sydney Water.

Jo McDonald CHM 2004b, *Archaeological Test Excavation for Indigenous Sites Civic Place, Parramatta: Final Report*, prepared for Parramatta City Council.

Jo McDonald CHM 2005a, *Archaeological Salvage Excavation of Site RTA-G1, 109-113 George Street, Parramatta, NSW*. Report prepared for Landcom.

Jo McDonald CHM 2005b, *Archaeological Salvage Excavation of Site CG1 (NPWS 45-5-2648) at the corner of Charles & George Streets, Parramatta*. Report prepared for Meriton Apartments.

Jo McDonald CHM 2006, *Archaeological Salvage Excavation Of Site CG3, 101A-105 George Street, Parramatta, NSW,* Prepared for Rahi Development Pty Ltd.

Kayandel Archaeological Services 2015, *Parramatta River Darug Cultural Value Mapping Parramatta*. Prepared for Parramatta City Council

Mary Dallas Consulting Archaeologists (MDCA) 2003, *Parramatta City Council Aboriginal Heritage Study*, prepared for Parramatta City Council

MDCA 2014, *Parramatta Aboriginal Cultural Heritage Study Review*, prepared for Parramatta City Council.

Mitchell, P 2008, 'Nature and distribution of Parramatta Terrace Sand', Parramatta City Council.

Stedinger Associates Pty Ltd 2008, *Proposed Regional Cycleway along the Parramatta River Foreshore. An Aboriginal Archaeological Site Assessment and S87/90 Excavation Permit Applicatio*n. Prepared for Parramatta City Council.

Stedinger Associates 2009, *Excavations along the Foreshore of the Parramatta River- Archaeological monitoring of the construction of a Regional Cycleway- Charles Street to Macarthur Street*. Prepared for Parramatta City Council.

APPENDIX A—Extensive AHIMS Search Results