3.0 RESULTS OF ARCHAEOLOGICAL EXCAVATION

3.1 EXCAVATION METHODOLOGY

3.1.1 PROGRAM OF ARCHAEOLOGICAL WORKS

The archaeological excavation of 3 Parramatta Square (3PS), 153 Macquarie Street, Parramatta began on 6 October 2015, by which time the demolition of the Parramatta Post Office building was complete. The excavation ran until 6 March 2016. The Aboriginal archaeological excavation, undertaken by Comber Consultants, began at the level of the historic topsoil once the later fills were removed and continued throughout the historic excavation.

The site was divided into four excavation areas, Areas A, B, C and D, relating to the historical property boundaries (Figure 3.1, Figure 3.2). Overlays of the early historic plans provided basic data for the location of likely remains. Survey was undertaken by the site surveyor (Arcsurv) to mark the location of significant historical features identified on the historic plans. Excavation within each historic property was considered to be important in the way the archaeological program was managed and to aid our interpretation of these remains.

In response to the early works program, which included perimeter piling on the eastern boundary and the installation of an access ramp to 1 Parramatta Square, excavation initially concentrated at the northeast side of the site in Areas C and B. Concurrently, later architectural remains of Cranbrook in the northwest part of the site in Area A were exposed and recorded. Continued excavation of Area A, where substantial remains of the c.1822 cottage were found, was undertaken after Areas B and C were handed over to enable the civil contractor to begin the construction of an access ramp to the adjacent building. Excavation in Area D did not commence until 5 February 2016 when Areas A, B and C had been completed and the areas handed over to the civil contractor.

The site was excavated using an open area stratigraphic methodology. Twenty-eight archaeologists were involved in the excavation of the historical features in the area. This approach maximises the identification of temporal relationships in the archaeological record during excavation. Initial clearance of the site was expedited by the use of a 16-tonne and 5-tonne excavator to remove the concrete slab of the Post Office building, 20th-century levelling fills, demolition material and the tarmac and road base of Leigh Place and the Civic Place car park. Test trenches were used in several locations to better understand localised stratigraphy. A total of 35 test trenches were excavated throughout the site to assist with clarifying the stratigraphy at various stages of the excavation (Figure 3.1) Vol. 5, Appendix 5.1.6 summarises the location and purpose of each of these test trenches. Context numbers were allocated with reference to each archaeological area and individual features. Interpretive relationships between the features in each area were established and recorded during excavation. These associations form the basis of the archaeological analysis in this chapter. The relationships are displayed schematically in the Harris Matrices for the site (Vol. 4, Sec. 12).

Figure 3.1: Schematic plan of the study area showing the location of test trenches (shaded green) throughout the site. Note within Lot 28 and 1 (181) the large test trenches define the actual areas excavated below Leigh Place.

3.1.2 ARCHAEOLOGICAL AREAS

For excavation and recording purposes the site was divided into four areas (A, B, C and D) that followed the original 19th-century allotments (Figure 3.2). Overlays of the historic plans provided basic data for the location of predicted remains and property boundaries which in turn defined the archaeological areas.

- Area A was within the western half of Lot 30 – Cranbrook
- Area B was the eastern half of Lot 30 – Harleyville and Northiam
- Area C was the strip of land on the western edge of Lot 32
- Area D was Lot 28 & Lot 1 (181) forming the roadway Leigh Place

The largest area of the site was Lot 30, Area A and B, with Area C represented by a narrow strip of land on the western edge of Lot 32, to the east of Lot 30, and Area D within Lot 28 & Lot 1 situated to the west of Lot 30 (Table 3.1). The extent of Areas A and B were defined by the boundary between the 1884 terrace houses, Northiam and Harleyville and the 1888 villa Cranbrook within Lot 30 and Areas B and C were defined by the boundary of Lot 30 and Lot 32. These spatial divisions enabled the structures and phasing of each area to be associated with the ownership and occupation of individual properties. Therefore, Area A (Lot 30) was associated with the c.1822 cottage and the 1888 villa Cranbrook, and Area B (Lot 30) was associated with the yard of the c.1822 cottage and the later 1884 terraces, Northiam and Harleyville, built within its eastern yard. Area A and Area B (Lot 30) were re-developed as the Parramatta Post Office and the Civic Place car park in the 1960s. The structures found in Area C (Lot 32), were associated with the 1840s White Horse Inn, 1850-1860s Hilt's Coach Service and a pair of two to three-storey, brick houses from the early 1870s onwards, and a single-storey shop, all of which were separate from the structures on Lot 30. And Area D (Lot 28/Lot 1 (181)), was associated with early agricultural use of the allotment and formalisation of the creekline, the construction of the c.1840 Town Drain, the 1870s yards and outbuildings of Wyverne and the 20th-century Dalton's Plasterworks.

Table 3.1: Dimensions of historic property boundaries and 3PS excavation areas.

Lot Number 1823	Dimensions (metres)	Sq M	Excavation Area	Dimensions (metres)
28	31 x 22	682		
1 (181)	40 x 22	880		
			D	71 x 22
30	72 x 43	3096		
			A	72 x 23
			B	70 x 20
32	65 x 50	3250		
			C	65 x 6.5

The property boundary between Lot 30 and Lot 32 shifted in the late 20th century, when the building on the western narrow strip of land on Lot 32 was demolished. This coincided with the demolition of the semi-detached terraces on Lot 32 to make way for the Macquarie House office block, opened in 1981. The narrow strip of land on the western edge of Lot 32 then formed part of an open air carpark used by the post office until its demolition in 2015. This strip of land formed the excavation Area C (Figure 3.2).

During the excavation, Area A was further divided into A and A south, with the bulk of the archaeology found in the northern part in Area A and limited pits and postholes encountered in the rear yard Area A south. The detailed archaeological plans referred to in this report are found in Volume 4, Sections 9 and 10 of the main report and the Harris Matrices are in Volume 4, Section 12.

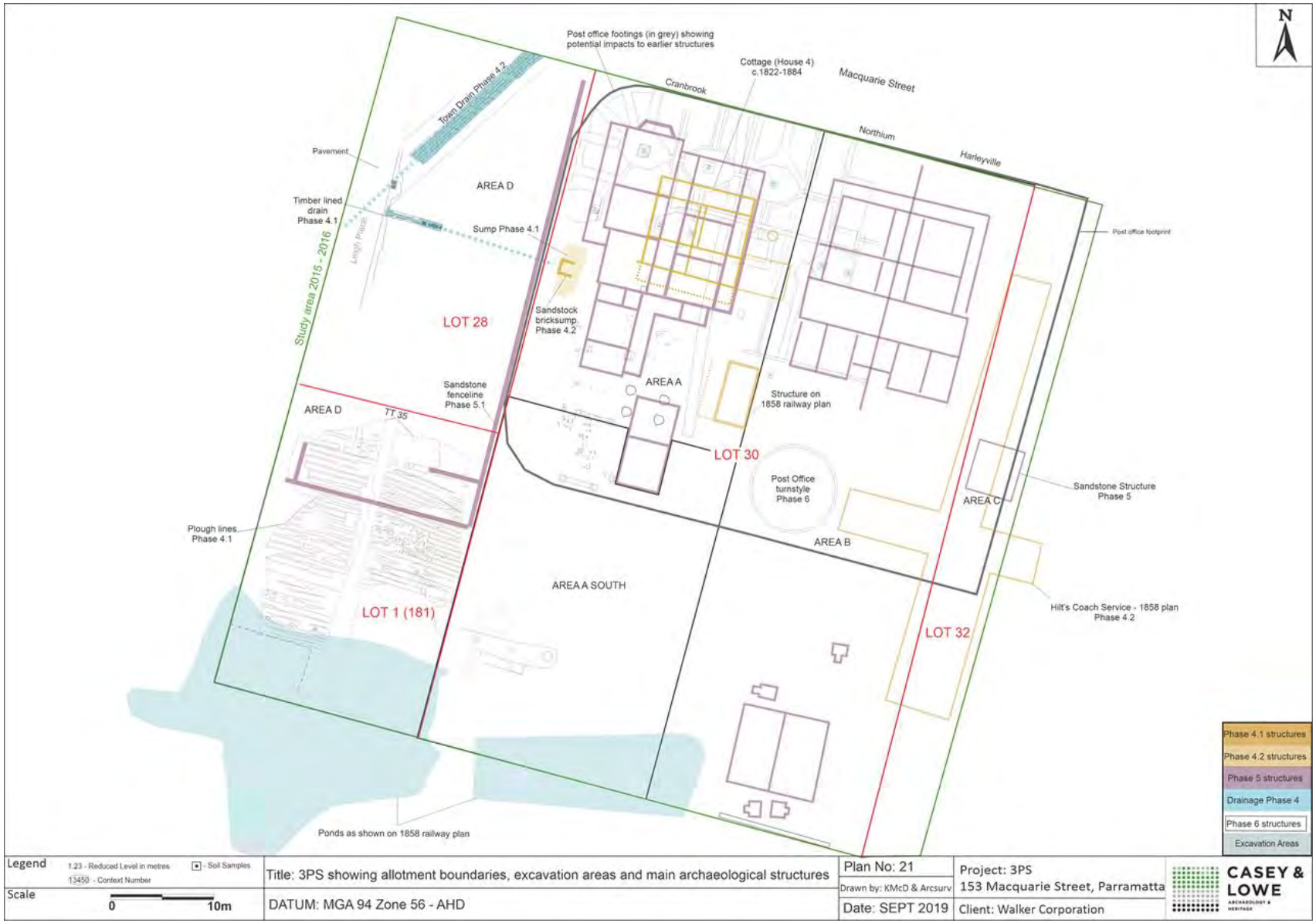

Figure 3.2: Plan of the site showing the excavated areas, Areas A, A South, B, C and D.

3.1.3 ARCHAEOLOGICAL PHASES

Historical research in the Archaeological Assessment provided baseline information for predicted phases of development and in general, these were consistent within each excavation area, with subphases identified by the stratified archaeology within lot boundaries. The following table describes the six phases and sub-phases, by allotment Table 3.2.

The detailed descriptions of the archaeological excavation (trench reports and site plans) are presented within this chronological framework. Further historical research and analysis undertaken has meant that this synthesis may not adhere strictly to the phasing developed during the course of the excavation and therefore some phasing may differ from that presented in the trench reports. Where possible, should any such divergence occur, it will be highlighted as a footnote in the relevant trench reports. As this section (Volume 1, Section 3) is a synthesis of the excavation results and analysis, it also considers the archaeology thematically, such as 'Agriculture and landscape modification' and 'early 19th-century residential and commercial development', 'late 19th-century Gentrification and development of the site'. The archaeology, will also be considered in relation to individual ownership and property boundaries.

Table 3.2:Archaeological phases across the site within lot boundaries.

Phase	Date	Phase Title	Lot 28 & Lot 1 (181)	Lot 30	Lot 32
1		Natural Landscape			
2		Aboriginal Occupation			
PHASE 3: BEGINNINGS OF BRITISH SETTLEMENT					
3.1	1788-1790	Government Farming: clearing and agriculture	Government Farming: clearing and agriculture	Government Farming: clearing and agriculture	Government Farming: clearing and agriculture
3.2	1790-c.1819	Land modification and early uses	Timber drain in creekline	Used for Fairs from 1814	
PHASE 4: EARLY OCCUPATION (c.1819-1870/80s)					
4.1	c.1819-1850s	Agriculture, construction, and early cottage occupation.	Plough Lines Lot 1(181) & 28 Town Drain, timber-lined drain, storage pit	House 4 construction by 1822 (levelling fills) – first sump, early occupation	Maughan's garden fenced in by 1819. White Horse Inn (from 1830) drains and outbuildings.
4.2	1850s-1870s	Later phase cottage occupation	Reconfiguration and extension of house - fences and outbuildings – levelling above the Town Drain	Extension to House 4 – construction of outbuilding on eastern part of Lot 30 -continued occupation until 1883.	Hilt's Coach Service (from 1851) outbuildings, occupation and rebuilding
4.3	1870s-1880s	Demolition (Lot 30)	Occupation of Wyverne	Demolition of House 4 (by 1884)	Demolition of former White Horse Inn and outbuildings
PHASE 5: REBUILDING AND OCCUPATION (1870S TO 1960s)					
5.1	1870s-1960s	Construction and occupation	Construction of plaster works (Lot 28). Continued occupation of Wyverne (Lot 27/8).	Levelling fills, construction & occupation of Cranbrook, Northiam and Harleyville (1880s).	Construction and occupation of 1870s houses -Late-19th century outbuilding. -Single storey shop (1950s)
5.2	Late 1950s-1960s	Demolition	Demolition of Plasterworks and Wyverne to make way for Civic Place (Lot 28)	Demolition of Cranbrook, Northiam and Harleyville to make way for the Post Office	Demolition of Macquarie flats in 1978
PHASE 6: MID TO LATE 20TH-CENTURY USES					
6	1960s-2015	Post Office & Civic Place	Civic Place construction and use	Post office construction occupation and demolition	Post office construction occupation and demolition

3.1.4 EXCAVATION METHODOLOGY

The programming of the archaeological excavation was linked with the demolition components of the early works. The excavation was divided into areas based on the mid-19th-century historical streetscape and property boundaries, Areas A–D. Each Area was excavated as it became available after demolition and removal of overburden. A 1m bund was maintained around the perimeter fronting on to the footpath of Macquarie Street and Civic/Leigh Place. Two 5-tonne and one 14-tonne machines were used to facilitate the removal of the concrete slab of the Post Office building and the excavation of the overburden.

The archaeological excavation methodology was a combination of 'open area' excavation and test trenching. Open-area excavation aims to expose, investigate and record archaeological features, fills and deposits in their entirety phase by phase. Test-trenching provides a detailed sample of archaeological features and fills, phases and events. A total of 35 test trenches were excavated across the site for this purpose.

The archaeological remains were excavated and recorded within a site grid. The site grid was established by the site surveyor, Guy Hazell (Arcsurv), in real world co-ordinates from a live grid in the format of GDA94 MGA56 with grid points set at intervals of 10m east and 10m north. When required, grid points were set at intervals of 5 x 5m or 10 x 10m accordingly. The grid was established and maintained by the site surveyor. Several datum points were also established throughout the excavation, and all levels (RLs) were calculated to Australian Height Datum (AHD). The second grid divided the site into 1m x 1m squares to facilitate the excavation of the Aboriginal archaeology by Comber Consultants. Each 1m grid square was given an alpha numeric coordinate which began in the northeast corner of the site (A1). Letters referred to the easting and the numeric value referred to the northings.

The 10m by 10m grid system facilitated the planning of the site at a scale of 1:50 using A3 sized sheets of permatrace drafting film. A series of 29 'top-plans' were produced for the site. The top-plans recorded multi-phase and multi-context archaeological remains at a 'start level', and a series of 142 overlays were produced as features and fills were excavated. Test-trenches were drawn on the main top-plans and were also recorded in section. A total of ten section drawings were produced at a scale of 1:20 and their location recorded on plan.

The physical excavation and recording of the archaeological remains were undertaken by professional archaeologists. A small number of Honours students were also employed to assist archaeologists during the excavation and to gain field experience. Archaeological excavation requires a great deal of manual labour. The tools used to excavate were mattocks, shovels, spades, hoes and of course, hand-held trowels. A small 5-tonne mechanical excavator was utilised as much as possible to expedite the excavation of fill layers and a 16-tonne mechanical excavator was utilised to excavate large test-trenches and facilitate the removal of concrete strip footings, concrete pits, bitumen and roadbase.

Archaeological structures, features and deposits were, for the most part, assigned a context number and were recorded on a context sheet that detailed general and specific context characteristics such as colour, soil matrix, stratigraphic and physical location, dimensions, building methods and materials, artefact quantity and type, and preliminary phase. Not all individual extensive fills or modern disturbances were given a context number. In some cases, one number was assigned to a group of fills or a general level. This practice was discretionary and was generally employed where bulk removal of fill layers between archaeological phases was carried out by machine, or where a group of deposits

with ill-defined boundaries existed, but were of the same general event, such as demolition material within a room displaying slightly different properties, but clearly relating to the same general event.

Along with the drawn and written record, the archaeological remains were also photographed. The photography was digital, with archival photographs saved as both RAW and JPEG files. For consistency, most of the photography was undertaken by the Site Supervisors or a dedicated site photographer, however due to the scale of the site, this was not always possible. In general, most investigated features were photographed. General area shots were also taken to provide context to the features. Some videography was also carried out during the excavation.

Artefacts were collected according to context number and processed on site. There was not a 100 per cent collection of artefacts from either machine or hand excavated fills and deposits, as this is unnecessary and unrealistic for historic sites of this type. For the most part, diagnostic items and a representative range of artefact category and type were kept. Items discarded were noted on the context sheet or a discard sheet. The processing of the artefacts on site included washing, drying, sorting by category and type, labelling and boxing.

A special methodology for the excavation of underfloor occupation deposits was employed. The system of excavation of underfloor spaces is linked with the artefact database designed by Casey & Lowe. In rooms where underfloor deposits were present, a 1m by 1m grid was set up and excavated by context and in 'spits' of 50mm. The material was 100 per cent wet sieved to guarantee the collection of the small artefacts and ecofacts expected in this deposit type, such as pins, buttons, beads, seeds, small mammal and fish bones. This system also allows for spatial and comparative analysis of the artefacts to be undertaken.

The sampling strategy for the excavation included the collection of environmental, timber, industrial waste material and building materials samples. Natural deposits were sampled to provide information on the soil matrix and properties, as well for as pollen analysis. Significant occupation deposits, historical accumulation layers and fills were also sampled, for both pollen and soil analysis. These samples provide additional environmental information, such as landscape and vegetation, to the archaeological results. A number of large timber-built structures were present on site. The timber elements of the structures were sampled to identify the wood species. Building materials that were sampled included bricks and mortar from structural remains, construction and demolition deposits. Other samples collected from the site include roofing slate, 19th-century ceramic service pipes, slag and other industrial waste material.

3.1.5 EXCAVATION TEAM

A large team of archaeologists were involved in the excavation at the 3PS site. Dr Mary Casey was the primary excavation director and Dr Amanda Dusting was the secondary excavation director, managing the on-site excavation program, assisted by trench supervisors: Jill Miskella, Sandra Kuiters and Rhian Slicer-Jones. Site planning was undertaken by Dr Iona McRae, James McGuinness and Sandra Kuiters. Survey was undertaken by Guy Hazell (Arcsurv). Machine excavation was undertaken by Messina South Excavation & Demolition and site management was by QMC.

The members of the excavation team were:

Name	Project Role
Dr Mary Casey	Primary Director
Dr Amanda Dusting	Secondary Director
Jill Miskella	Supervisor
Sandra Kuiters	Supervisor/Planner
Rhian Jones	Supervisor
Guy Hazell	Surveyor
Tony Lowe	Consultant
Dr Iona McRae	Planner/Archaeologist
James McGuinness	Planner
Robyn Stocks	Specialist Archaeologist
Mike Hincks	Archaeologist
Jane Rooke	Archaeologist
Maggie Butcher	Archaeologist
James Fraser	Archaeologist
Michael Spate	Archaeologist
Andrew Crisp	Archaeologist
Nick Harrop	Archaeologist
Kylie McDonald	Archaeologist
Luke Benbow	Archaeologist
Waleed Aziz	Archaeologist
Adam Carr	Archaeologist
Tristram Miller	Archaeologist
Adrian Dreyer	Archaeologist/Photographer
Susan Hearne	Archaeologist
Damien Tybussek	Archaeologist
Alba Mazzia	Archaeologist
Rebecka Hawkins	Student
Lara Tooby	Student

Comber Consultants undertook the Aboriginal testing and salvage excavation component of the project. Jillian Comber and Tory Stenning directed the Aboriginal archaeological program. Representatives from the Deerubbin Local Aboriginal Land Council, Darug Cultural Heritage Assessments, Darug Aboriginal Organisation, Darug Tribal Aboriginal Corporation, Dhinawan-Dhigaraa Culture and Heritage, Kamilaroi-Yankuntjatjara Working Group Tocomwall and Darug Land Observations also participated.

3.1.6 EXCAVATION LIMITATIONS

Asbestos was present in deposits and overburden associated with the 1960s construction and demolition of the Parramatta Post Office and mid-20th-century outbuildings. Asbestos pipes and lagging of installed Telstra pipes and junction pits were also present. Logistical and time constraints meant that different parts of the site had to be prioritised and therefore excavated in stages reducing our ability to have extensive areas of open plan excavation. Area specific limitations are summarised below (Figure 3.2). A large east west aligned sewer was present bisecting the area in the centre of the allotments.

AREA A – LOT 30 WEST

A challenge on site was the weather, which regularly caused interruptions particularly in the northern half of Area A which was highly susceptible to flooding after heavy rain. Flooding happened on a number of occasions (Figure 3.3). Despite the use of tarpaulins to cover and protect the archaeology, the northern portion of the site regularly had to be drained and allowed to dry out before excavation work could recommence. Finally, as with

most urban sites, each phase of archaeological activity was at least in part truncated by later activity. The c.1822 timber cottage (House 4) was severely impacted by the concrete pads, footings, lift pit and turntable of the 1960s Australia Post Office building (Figure 3.4). These footings were concentrated in the northwestern portion of the site. Some of the brick footings of the 1888 building, 'Cranbrook', also impacted the footprint of the earlier cottage although the impact was not as extensive as those from the Post Office building.

Figure 3.3: Flooding after heavy rain in the northwest corner of Area A. (Left) The bricks in the right mid-ground are the remains of the brick sump (16187). House 4 is below the blue tarpaulins. View southeast. Photo taken 22/1/2016. IMG_5040. (Right) Flooding after heavy rain, Room 5, House 4. After removing the water, the area needed time to dry before excavation could recommence. View southeast. Photo taken 8/1/2016. IMG_4622.

Figure 3.4: Concrete pads and beams from the foundations for the post office cutting through the archaeological remains of Cranbrook (House 1) and the early cottage (House 4). View to southwest, scale 1m. IMG_3222.

AREA B – LOT 30 EAST

A deep lift pit dug for the post office as shown on 1960s plans but not ever installed or used had removed much of Northiam (the western terrace house). A hotspot area of friable asbestos was found surrounding the lift pit. This required remediation and the footprint of the hotspot was therefore not available for excavation. The centre of the rear yard of Northiam had also been impacted by a large semi-subterranean turntable installed within the 1960s Post Office building, used as a 'modern' mail sorting mechanism and to turn around vehicles to exit the building once they had delivered or collected mail.

AREA C – EASTERN STRIP LOT 32

Prior to excavation, the majority of Area C was covered with asphalt or concrete from the driveway, carpark and roadway around the Post Office and Library buildings, and Civic Place. This meant there were a relatively small number of impacts from later uses of the site, these were mainly from services and shallow concrete strip footings or kerbs, particularly when compared to the large impacts from the Post Office footings in Areas A and B. There were, however, a number of small, shallow brick footings from the 1950s building on Lot 32 below the Post Office carpark that included a toilet/bathroom complex. There was also a north-south running service trench, most probably part of the same toilet system, that was a deep, but confined, impact to the archaeological resource in Area C.

AREA D – LOT 28 AND LOT 181

Logistical constraints meant that different parts of Area D had to be prioritised and therefore excavated in stages minimising the opportunity for extensive open plan excavation. Heavy rainfall severely impacted much of the fieldwork. The excavation in Area D was undertaken in a somewhat piecemeal fashion as the area was largely located within the existing roadway of Civic Place. This roadway was required to be kept open at all times as it was the main thoroughfare for construction and demolition works to the east and south, surrounding the study area. One side of the roadway was removed and excavation was undertaken, then the road was reinstated and another section was removed allowing excavation to be carried out in the other half. In order to identify the location and size of each area as it was released, Area D was divided into a series of large trenches, TT27–TT35 (see Plans 2 to 7, Vol. 4, Sec. 10). These trenches were positioned to avoid the many services running through the area and to target strategic locations. Aboriginal test pits were excavated concurrent with the historic excavation, within the historic test trench areas. As there was a great deal of modern levelling fill above the Town Drain much of the historic excavation was undertaken by digging large trenches through the fills by machine to reach the historic levels below. The test trenches to the north of the site were generally much deeper than those up-slope to the south of the site. The western edge of the site to the north was under a footpath full of services including a telecommunications line that had to be maintained, therefore it was not possible to excavate within the footpath.

3.1.7 REPORT METHODOLOGY FOR SECTION 3

This section presents a synthesis of results from the archaeological excavation. It provides a description and discussion of the main archaeological features and findings. Information from the detailed trench reports, field reports and matrices (Vol. 2, Section 7; Vol. 4, Section 12), detailed site plans (Vol. 4, Section 10), historical research and cartographic sources (Vol. 1, Section 2), interpretive plans and graphics (Vol. 4, Section 11), artefact specialists reports and environmental samples analysis (Vol. 3, Section 8), and the artefact catalogue (Vol. 6) have been utilised to write this section.

Excavation and recording of the site were undertaken within defined areas (Section 3.1.2) and within an overall framework of historical phases (Section 3.1.3). These area divisions and overall site phases determined the structure and framework for all the technical

reports, specialist analysis, data and plan production. However, the synthesis of results (Section 3) has not been presented within these parameters. The excavation areas are part of the excavation methodology and should never be allowed to dominate a wholistic interpretation of the archaeology. Therefore, the site has been considered as a whole, especially up to the 1880s and the archaeology of its transformation, development and use has been presented more thematically.

The research questions formulated for the archaeological investigation prior to the excavation have also been considered in the structure and presentation of the archaeology in this section (see Vol. 1, Sec. 1.4). The research questions: environment, climate, agriculture and water, early landscape use and residential housing and material culture have been addressed throughout Section 3.0. A separate section for the response and discussion of these is also presented in Volume 1, Section 5.0 of this report. The research questions were updated during the writing of this report.

It should be noted that this section focuses on the archaeology of the site up to the early to mid-20th century. A history of the site's development up to the 1960s can be found in the historical background of this report (Section 2).

It must also be noted that there may be some conflicts between the analysis and interpretations presented in this section and the descriptions and phasing presented in the various trench reports, matrices, plans and specialist reports, due to further research and post-excavation analysis undertaken. Every effort has been made during the final report writing stage to address these, and footnotes have been included in the trench reports to indicate where a re-interpretation has occurred. Not all archaeological features detailed in the trench reports or findings from the artefact and environmental samples have been presented Section 3.0.

3.2 PHASE 1: NATURAL ENVIRONMENT

Environmental changes occurred quickly following the establishment of the penal settlement at Parramatta in November 1788. Land was cleared of trees and agriculture commenced. Archaeological evidence of the natural environment was recorded across the site in the form of A2 horizon subsoils, sloping topography towards a creekline or water channel and tree boles. The underlying parent clays were also encountered within deep trenches. This section discusses the natural environment of the site and the surrounding area. The A1 horizon topsoil was only encountered intact in pockets as it had been heavily modified throughout the historic period. This section draws on the specialist reports, soil and pollen (Vol. 3, Sec. 8.5 and 8.6), and the geotechnical and hydrology reports for the project and the contour maps produced by Guy Hazell (Arcsurv) for the project.[1]

All of the Casey & Lowe Parramatta Square archaeological programs have a strong focus on being able to understand the complex nature of the pre-1788 landscape and its underlying geology, soils and plant communities. The focus relates to two key research themes for the project:

[1] Lawrie 2019 Vol. 3, Sec. 8.6, Macphail 2019 Vol. 3, Sec. 8.5; Douglas Partners, 2015.

ENVIRONMENT, CLIMATE, AGRICULTURE & WATER

- Description and analysis of site hydrology, geology and palynological evidence for native flora as a basis for understand the site and how and why it was extensively modified by the British settlers.
- Nature of early agricultural practices, evidence for Public or Government farming by early convicts, such as clearing and cultivation, as well as later dairying and cattle grazing. This issue is addressed through the analysis of archaeological features, pollen and soil samples, related artefacts and the landscape of the site had how it was modified. Consider the role of climate in understanding new evidence.
- Analysis of how water was managed on the site, especially the convict Town Drain, the creekline and how it was managed and modified during the 18th and 19th centuries.

LANDSCAPE OF COLONIAL PARRAMATTA

- How does the evidence from this site feed into the current perceptions of the convict-period landscape of Parramatta? Was it a landscape of control or more a result of Georgian design influences? Other issues to be considered are resistance to the way in which control may have manifested itself in the landscape and in daily life. Issues of power are central to the expression of landscapes of control.
- Evidence for the pre-European landscape, especially in relation to the placement of the drain, the presumed swampy ground in this area, the marked ponds on the 1858 map within the rear of this site. How was this landscape modified to make it useable?
- Nature and effect of modification of the pre-European landscape.
- Remaking of the landscape, the social, cultural and political context and how it was manifest in this landscape. Are many of the same issues influencing the way in which the landscape was formed similar to those which affected the Sydney Domain? This is much more likely due to the relationship of St John's church to the site and how Macquarie's remade the colonial landscape with the use of neo-classical architecture.
- Order and amenity; was the layout of houses and other structures the result of cultural and social practices? What was the role of these practices in changing the landscape and modifying people's behaviour?
- Was the pond at the southern side infilled and was it a short-term communal infilling or site-specific infilling? Does it contain quantities of artefacts associated with the lives of the surrounding residents?

This data which informs the basis for this analysis requires a focus on detailed recording (survey, description of soil and pollen, survey data) and how this informs our analysis of the landscape. This analysis provides a spotlight on different evidence, such as the predicted plant communities for Parramatta based on historical information in contrast to the actual evidence across different areas.

In recreating the pre-1788 landscape, underlying geology and soils can suggest the plant communities that once populated this area of Parramatta.[2] Historical records such as early accounts, paintings, etchings and surveys can also add to the description of the topography and natural environment at the start of British settlement. These early sources are not always accurate, but combined with modern scientific analysis, a model for a broad view of Parramatta prior to British settlement can be developed. Archaeological evidence of the prehistoric physical landscape and topography, soils, pollens and organic matter can test and further refine this model.

[2] Benson & Howell 1990.

The area of Parramatta is at the bottom of a water catchment feeding into the Parramatta River which empties into Sydney Harbour (Figure 3.5). The 3PS excavation uncovered and recorded in detail the physical remains of the original landform, gently sloping topography from the southeastern higher ground down to a natural drainage channel or creekline in the west, which may have been boggy or swampy at its northern extent close to the creekline. The northwest area was low lying ground. Environmental sampling allowed for analysis of the fossil pollens and soil properties in contexts predating the construction of the first housing on the site in the c.1822, providing further evidence and insight into the natural environment, of both the current study area and the broader Parramatta Square development site and wider Parramatta. Combining the geological, historical and archaeological evidence, the natural environment of the site may be tentatively reconstructed.

Such reconstruction of the natural environment is useful in demonstrating the environmental impacts of 19th-century development, including the establishment and formalisation of the creekline into the Town Drain and providing new insight into the nature of early agricultural practices.

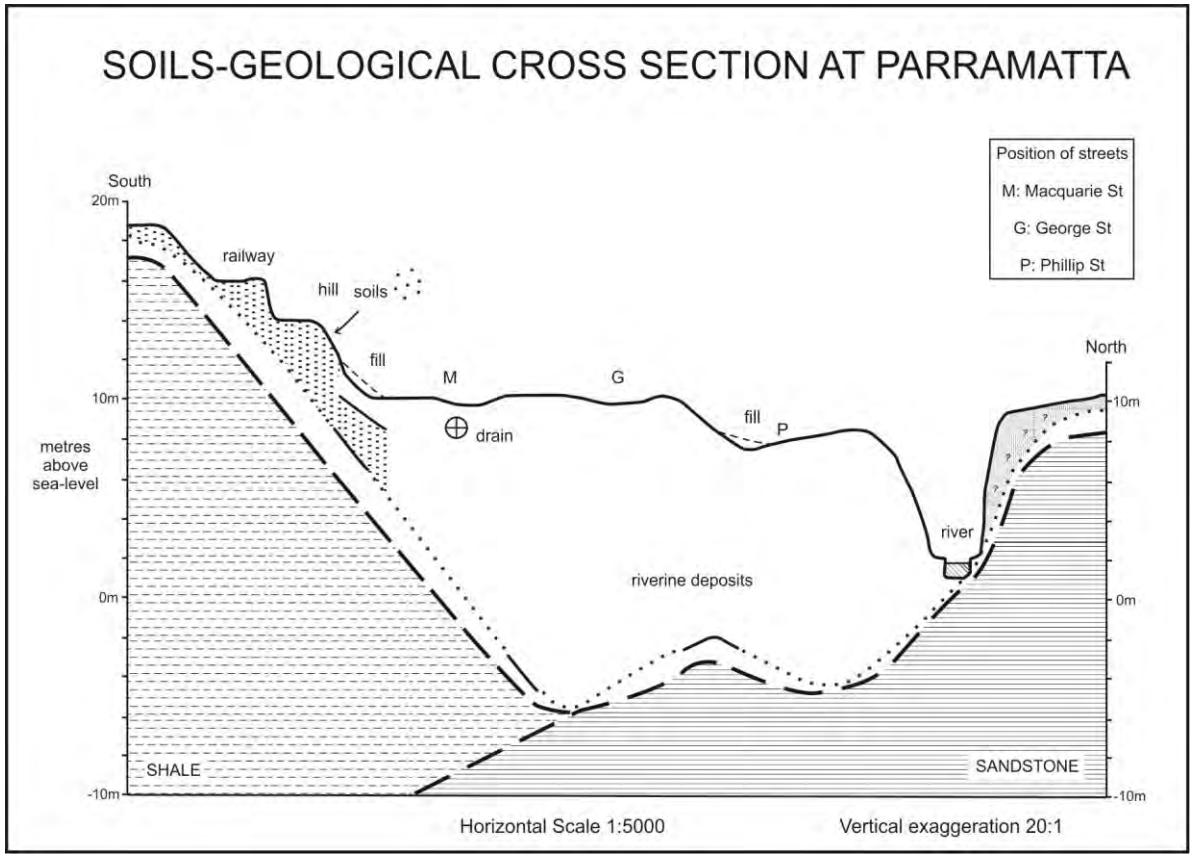

Figure 3.5: Indicative section through the Parramatta River catchment showing how the fall across the area to the north of the railway. Lawrie 1982.[3]

[3] After Figure 1 in Lawrie 2019, Soil Report, Vol. 3, Sec. 8.6.

3.2.1 PHYSICAL GEOGRAPHY AND PLANT COMMUNITIES

The physical geography of the site can be described in terms of its topography, geology, soils and vegetation.

3.2.1.1 TOPOGRAPHY

The study area is within the Cumberland Plain which is characterised by low, gently undulating slopes. The Cumberland Plain covers approximately 600 square kilometres. It is bordered on the west by the Blue Mountains and on the east by the Georges River and the headwaters of the Parramatta River. To the north is the Hornsby Plateau and to the south is the Woronora Plateau.[4] The study area is within the CBD of Parramatta. The site sits at the base of a small ridge line at the junction of an alluvial terrace of the Parramatta River which is about 480m to the north. A minor creekline, channelised in c.1840, ran diagonally downslope from the southwest of 3PS along the western edge of the study area. The drainage line followed the natural topography of the site which sloped down from the ridgeline at Darcy Street, in a northwest direction down toward Macquarie Street. A topographical survey following the top of the A2 horizon subsoil of 3PS shows the gentle slope down towards the creekline (Figure 3.6). The archaeological excavations revealed evidence of the former creek running diagonally across the northwest corner of the site under Leigh Place.

A shallow dip in the underlying topography indicated with a dashed blue line in Figure 3.6 represents a natural depression or drainage line from the southeast corner of the site down towards the creekline. During the excavation the northwest area, especially towards the centre of the site was perpetually waterlogged and ponding when it rained. This further supports the theory that the dip in the topography in the northwest corner related to a drainage line draining from the southeast as well.

[4] Smith LJ 1989, p. 8.

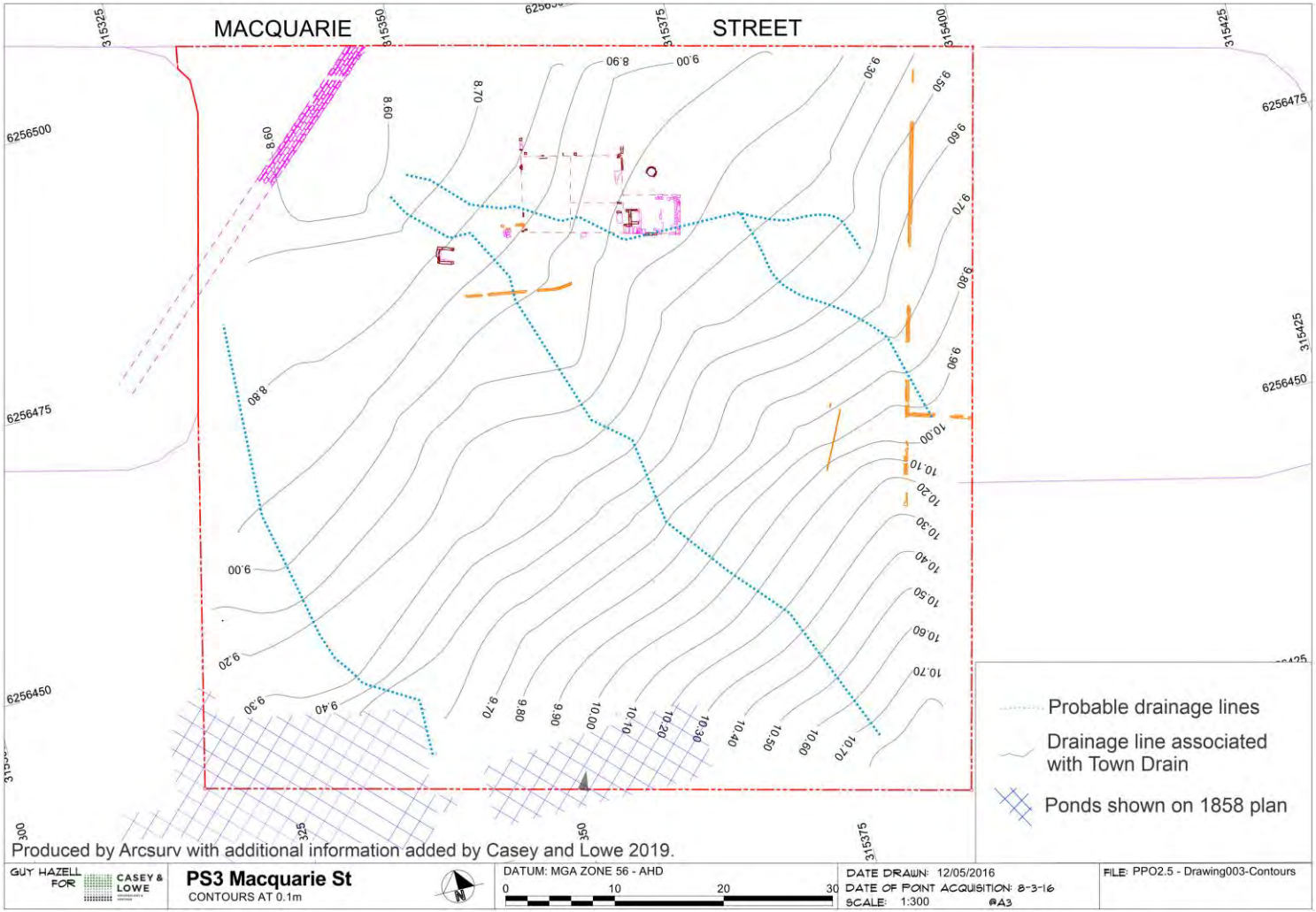

Figure 3.6: Contour plan of the top of A2 horizon subsoil (TOSS), across 3PS. The survey of the Town Drain within the creekline is shown in pink. Shallow seasonal drainage channels fall from the south and southeast through the site (blue dashed lines). These natural channels would have persisted until the land to the south was developed in the 1850/60s starting with the Parramatta railway station. The natural groundwater flow had to be managed prior to the 1850s/60s. The two ponds show an attempt to do this by capturing the water upslope and containing it. The presence of ancient impermeable clays at the base of the two ponds meant that ground water could not escape and needed to flow across the site.

3.2.1.2 GEOLOGY

The study area lies on the southern side of the fluvial valley of the eastward-draining Parramatta River. The valley developed in the Middle Triassic Ashfield Shale with its lowest part incised into the underlying Middle Triassic Hawksbury Sandstone.

The site is located close to the boundary between alluvial and estuarine sediments and is overlying Ashfield Shale and then Hawkesbury Sandstone. The alluvial or estuarine sediments typically include clays, silts and sands and were mostly deposited by rivers. In the local Parramatta area, the lower levels of the alluvial soils tend to be sandier and of higher permeability than the upper layers which include more clays. The Ashfield Shale unit is the lower member of the Wianamatta Formation of Triassic age. It typically comprises dark grey to black siltstone, shale, laminite (finely inter-bedded siltstone and sandstone) with some fine-grained sandstone beds. The Ashfield Shale unit is underlain at depth by the Mittagong Formation, comprising interbedded siltstone and sandstone, with the medium to coarse grained quartz sandstones of the Hawkesbury Sandstone at greater depths.[5]

An igneous dyke was identified as underlying the site at depth from the northwest corner at Church Street and down to Macquarie Street, running in a northeasterly direction It is noted that two of the boreholes drilled during this investigation intersected this dyke as it crossed the site. It is approximately 2 to 3m wide. Groundwater levels range from RL 2 m to RL 6 m (depths of 4–8 m below existing ground levels). The average groundwater level is at about RL 3 m. It is possible that some of the measured groundwater, particularly in the south-eastern part of the site, is associated with perched seepage flows along the clay surface and through fractures in the rock. The groundwater encountered within the deeper alluvial soils on the north-western part of the site, is probably associated with a regional groundwater table. It is possible that the dyke crossing the northwestern corner of the site acts as a dam to locally increase water levels on one side of the dyke. It is expected that groundwater levels may temporarily rise by at least 1–2 m during periods of prolonged and heavy rainfall.[6]

Previous geotechnical investigations on the alluvial terrace nearby (about 50m to north) revealed that, in the geological past, the bedrock below the alluvial sediments had been gouged out to below the current sea level (see Figure 3.5). There are two depressions in the bedrock, probably corresponding to older locations of the riverbed. Only 50m away from the study area, deep coring prior to the construction of the multi-level carpark in Horwood Place north of Macquarie Street, found 'extremely weathered' shale bedrock at a depth of 12m, 3.95m below sea level.[7] The downcutting of the bedrock occurred during the Pleistocene, a period when sea levels fluctuated and were often lower than at present.[8] Above the weathered shale are many layers of sandy and clayey alluvial sediments. These layers of younger alluvial sediments were deposited as the sea level rose, after the downcutting phase. In the southern part of 3PS the alluvial sediments gradually thin out and rest on a layer of ancient deeply weathered mottled clay which is of indeterminate origin. The soil profiles developed in the top 1.5m of these sediments were examined with the objective of understanding their depositional history, and how features of the profile might have been affected or modified by human activity.[9]

[5] Douglas Partners 2015:2, 8

[6] Douglas Partners 2015:2, 8.

[7] From Jeffrey and Katauskas 1978 see Lawrie 2019, Vol. 3, Sec. 8.6.

[8] Date of Pleistocene: 11,784 years ago to 2.58 million years ago http://www.stratigraphy.org/GSSP/index.html.

[9] Lawrie 2019, Vol. 3, Sec. 8.6: 2.

3.2.1.3 SOILS

The soil classification system is used to describe a set of characteristics of each stratigraphic unit (horizon) in the soil profile. These units are separated in to the A, B and C horizons. Broadly, the A-horizon occurs as the uppermost unit where biological activity is most frequent (topsoil), the B-horizon occurs below the A-horizon and is enriched in colouring agents or clay-sized particles that enter the horizon by the downward movement of water, the C-horizon occurs below the B-horizon and is composed of poorly or unweathered bedrock (the parent material). The A horizon can be further divided into three sub-groups: the A1 (topsoil) a characteristically darker soil which is high in organic content and displays higher evidence of bioturbation, the A2 (subsoil) which is generally paler than topsoil due to the lower levels of organic materials but can still show evidence of biological disturbance and A3, the transitional horizon between the A and B horizons. The B horizon clays can also be further subdivided as the clays vary with depth and depositional character B1, B2 etc.

The study area is located on the edge of the residual Blacktown soil landscape and the fluvial Birrong soil landscape. The Blacktown soil landscape is characterised by highly reactive plastic clays and by yellow podzolic[10] soils on lower slopes and in drainage lines and shallow to moderately deep red and brown podzolic soils on the crests, upper slopes and well drained areas. The dominant soil materials are a brownish black loam (A1 horizon), overlying a hard setting brown clay (A2 horizon). The B horizon is characterised by a mottled light to medium brown clay B and a light grey, plastic mottled clay C horizon parent material.[11]

The Birrong soil landscape occurs along drainage depressions and lower slopes of the Blacktown soil landscapes. The Birrong soil landscape is characterised by yellow podzolic soils and yellow solodic[12] soils on older alluvial terraces and deep solodic soils and yellow solonetzic[13] soils on the floodplain. The dominant soil materials are a bark brown silty clay loam occurring as a topsoil (A1 horizon), with a bleached hard setting clay loam occurring as an A2 horizon. An orange mottled silty clay subsoil (B horizon) and a brown mottled clay (C horizon) overlaid a light grey mottled clay (C horizon). A yellowish-brown light clay was found as subsoil on the lower slopes where the Birrong and Blacktown soil landscapes overlap.[14]

EVIDENCE FROM 3PS

In areas with a thin layer of remnant dark topsoil (A1 horizon), the soil profile was a dark grey silty loam with fine sand overlying a very pale grey clay A2 horizon. This in turn overlaid a light yellowish grey clay B1 horizon and a dark yellowish-grey brown clay with reddish brown mottles B2 horizon. This indicates that the study area is located on the

[10] Soil usually forming in a broadleaf forest and characterized by moderate leaching, which produces an accumulation of clay and, to some degree, iron that have been transported from another area by water. They are also the typical soils of eucalypt forests and heathlands in southern Australia. 19 July 2019 https://www.britannica.com/science/podzolic-soil.

[11] Chapman & Murphy 1989: 30-32.

[12] Leached, formerly saline soil, associated with semi-arid tropical environments, in which the A soil horizon has become slightly acid, and the B horizon is enriched with sodium-saturated clay. *A Dictionary of Earth Sciences.Encyclopedia.com.* 18 Jul. 2019 <https://www.encyclopedia.com>.

[13] Solonetzic soils are grassland or grassland-forest transition soils whose features reflect the influence of sodium on soil horizon formation. High sodium contents are inherited from incorporation of marine shale into the parent sediments and sodium can be further concentrated by groundwater flow. 19 July 2019 https://soilsofsask.ca/soil-classification/solonetzic.php.

[14] Chapman & Murphy 1989: 82-83.

boundary of the Blacktown and Birrong soil landscapes and there appears to be some overlapping of the soil profiles in places within the study area.[15]

The natural soil profile containing buried original historic topsoil was described as:

- Remnant topsoil A1 (16224), dark grey brown loam to grey silty light clay, with rusty mottles, many plant roots; moderately structured with firm, crumbly aggregates (Figure 3.7, Figure 3.8).
- Subsoil A2 horizon (16190, 16257) was pale grey silty light clay, with yellowish brown mottles along old root channels and occasional dark soft nodules (2-3mm diam.); weakly aggregated (Figure 3.7, Figure 3.8),
- Upper B1 (16949) - yellow brown – medium to heavy clay (Figure 3.9),
- B2 Horizon -dense thick layer of stiff red brown and grey mottled clay containing ironstone gravel (16256); physically undisturbed (Figure 3.9).

The lowest natural profile reached was a deeply weathered layer, c.2m thick, that is probably Pleistocene in age (it could be older), and may have formed either on the old colluvium or on a very old deposit of alluvial sediments. This dense impermeable mottled clay was exposed by excavation at the southeast corner of the site (Figure 3.9). The top of this ancient clay slopes down towards the site's northwest corner, where it is covered by an increasingly thick layer of younger alluvial sediments. This dense impermeable mottled clay was covered by a thick layer of younger alluvial sediments. The older clay had a major effect on profile drainage, impeding downwards movement causing perched water tables, especially where there maybe depressions in the upper surface.

The site's elevation is 10m to 12.5m AHD. Lawrie considerers that at the 'time of settlement and clearing the surface was about a metre lower and the drainage pattern on the lower northern part (below 1880s fill), across the wavy, undulating surface of the alluvial terrace, was erratic with several small, probably natural, depressions. Even though they no longer carry water (due to a succession of infilling activities which have raised the surface of the site), the wetter or poorly drained areas in the low-lying parts of the site have distinctive soil profile features. The soil around these former depressions may have a darker, thicker topsoil, with a grey or pallid subsoil, with mottling or dark iron/manganese-rich concretions (Figure 3.8). Modern drainage structures can alter the natural pattern of water movement, often drying out areas once frequently waterlogged, and making other previously dry areas wetter.[16]

[15] Lawrie 2019, Vol. 3, Sec. 8.6.

[16] Lawrie 2019, Vol. 3, Sec. 8.6: 2-3.

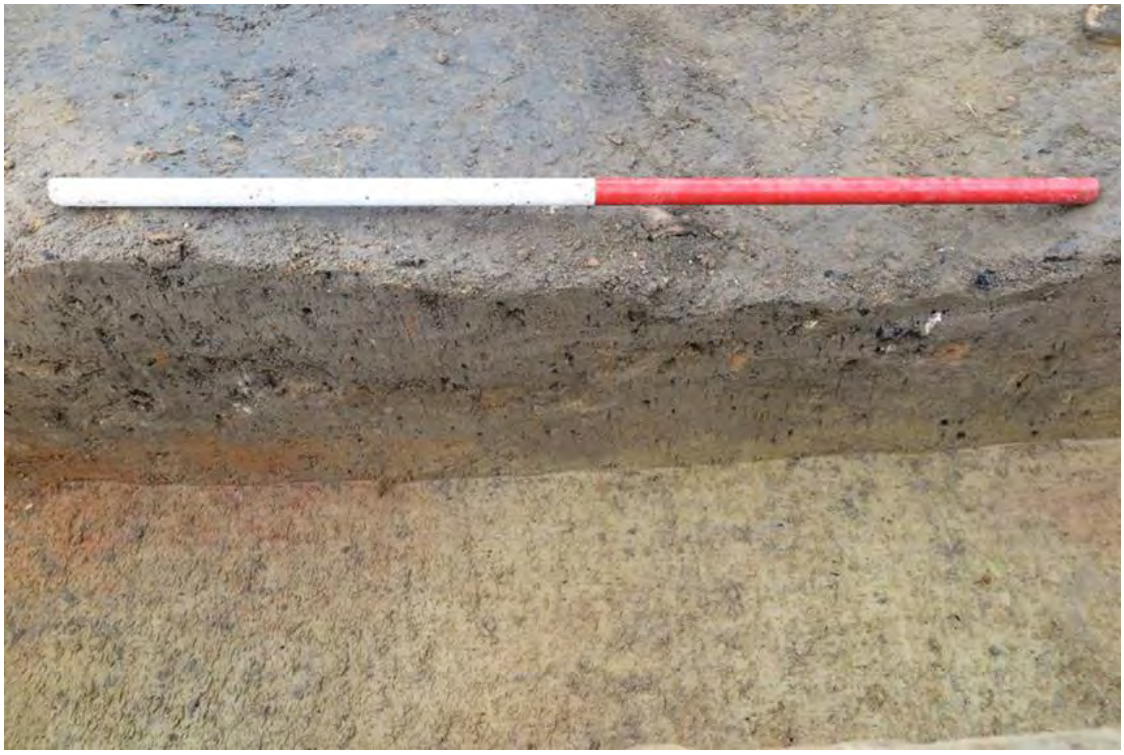

Figure 3.7: Area A South, the darker modified historic topsoil (A1, c 16318) above the lighter B1 subsoil (16257). The orange-red staining on the left side of the photo is burnt clay caused from burning of a tree root. View to south, scale 1m. IMG_4460.

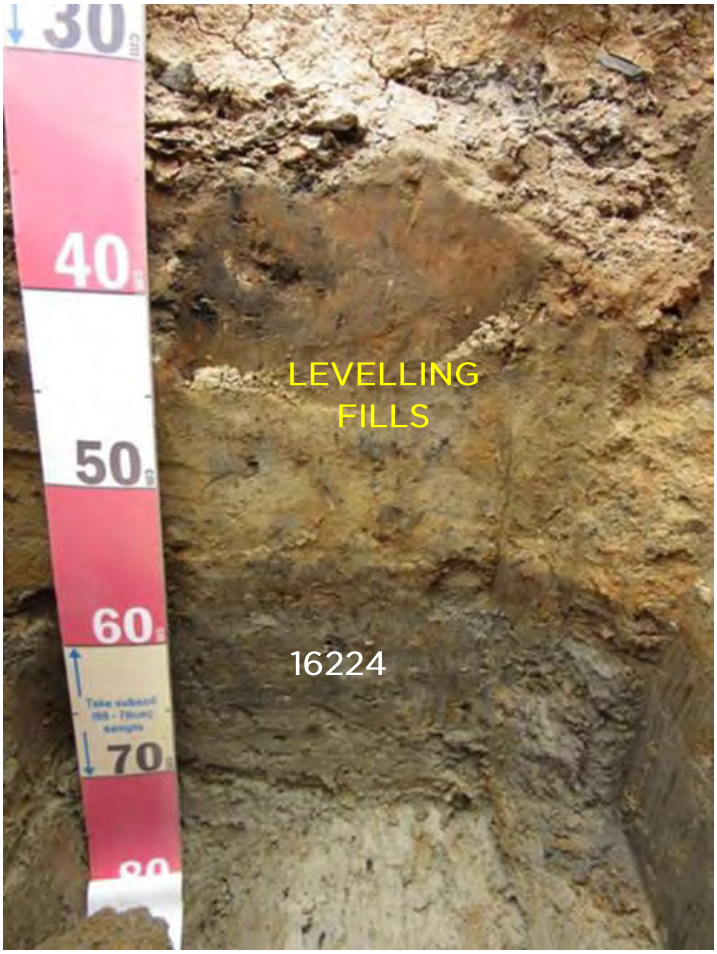

Figure 3.8: Buried original topsoil A1 (16224) with A2 subsoil (16190) at the base of TT18. Scale 100mm gradients. Roy Lawrie Soil Report, 2019, Vol. 3. Sec. 8.6.

Figure 3.9: Yellow brown B1 clay (16949) overlying the possible Pleistocene (16256) dense grey and pink mottled clay B2. This dense impermeable mottled clay was covered by a thick layer of younger alluvial sediments (yellow) (16949). Roy Lawrie Soil Report, 2019, Vol. 3. Sec. 8.6.

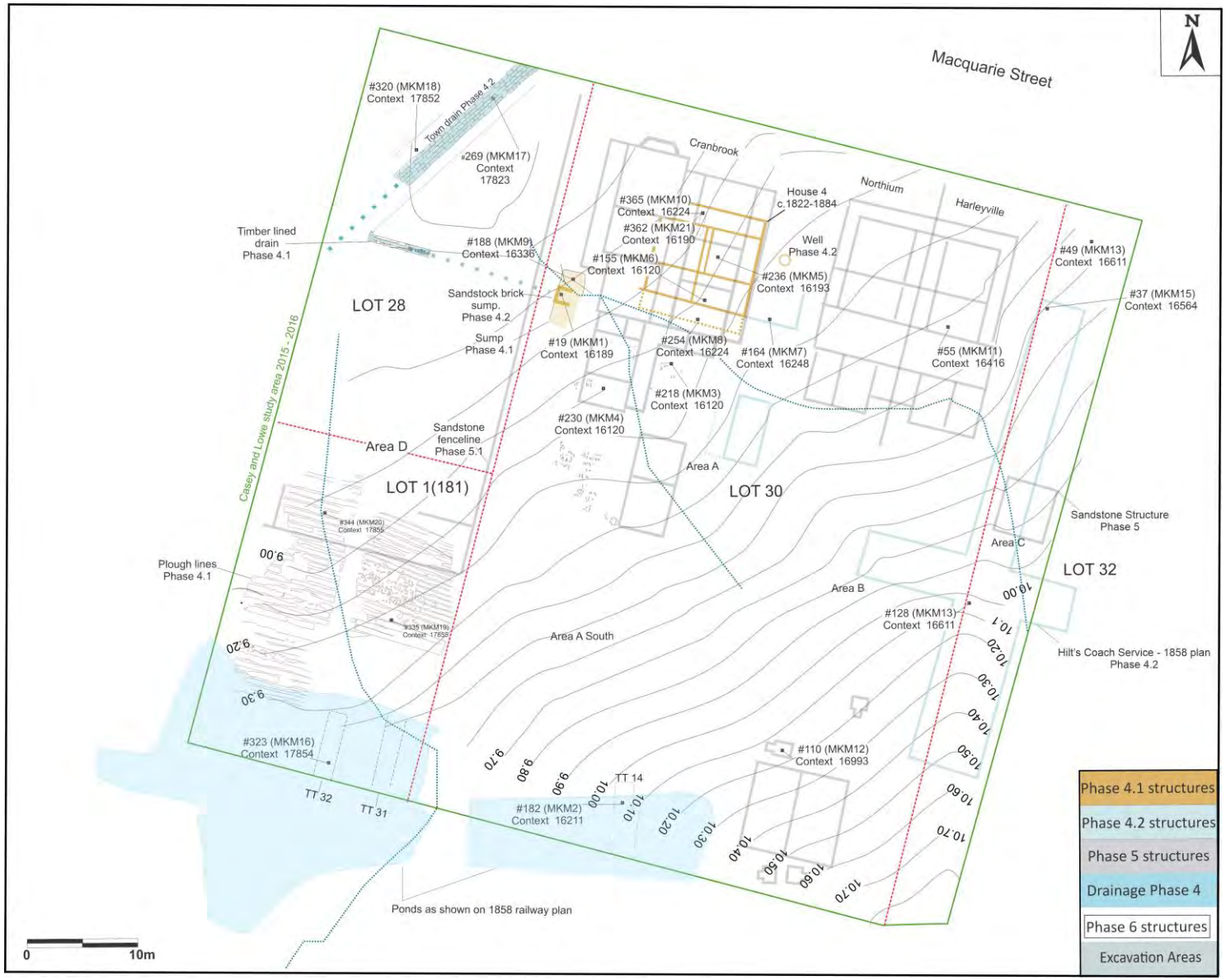

Figure 3.10: Site contour plan with location of soil and pollen samples. (Note the large ponds from an overlay of the 1858 plan. The actual northern edge of the ponds is the edge of the test trenches (TT31 and TT32) which was within 4PS. G. Hazell (Arcsurv) & Casey & Lowe.

3.2.1.4 RESULTS

The soil examined was exposed in several pits, 12 of which were sampled for chemical analysis. These included sites Lawrie 1, 2, 3, 5 and TT18 (Figure 3.10) and four within TT33, beneath the Town Drain. All samples were analysed at the Wollongbar laboratories of the NSW Department of Primary Industries for a range of major nutrients and trace metals. Phosphorus sorption testing was done at the Scone laboratory of the Soil Conservation Service. By comparing the results with similar soil test data from farmland around the state it may be possible to see if these early cropping soils have been changed by subsequent land uses; if not, the data can tell something about their fertility at the time when they were first cultivated.

The results of these tests showed that:

- The soils were particularly low in total phosphorus (hot acid extract), as well as in plant–available phosphorus that is normally tested to estimate fertiliser requirements. A low phosphorus content is strong evidence for the absence of any colonial dwelling in the near vicinity. Kitchen scraps, spilt stockfeed, stable bedding and backyard chicken coops, as well as human and animal waste, are all good sources of phosphorus likely to boost soil levels around the house.[17]
- On the Parramatta terrace the profiles at 3PS are more clayey than those taken elsewhere, such as at the Government Farm (Western Sydney Stadium), especially in the subsoil. While the topsoil at both sites is loamy and hence has a favourable water holding capacity, the Government Farm topsoil, a sandy loam, would store less water than the clay loam topsoil at Macquarie Street.[18]
- Subsoil conditions are generally favourable for root growth. The subsurface horizon is pale and structureless but not cemented. The underlying subsoil is pH-neutral to moderately acidic, and it is non-saline; it can set hard when dry but remains friable when moist, probably because it is non-sodic and not prone to soil structural breakdown. The nutrient content is extremely low. At 3PS there is dense, highly acidic clay in the deep subsoil but it is too far down to have a significant effect on growth.
- The well-preserved 3PS topsoil, 16224 found buried beneath the c.1822 cottage (House 4), for example has a phosphorus content (Colwell test) of only 6.3 mg/kg; a 1 tonne/ha wheat crop would use up half of this. On the positive side its pH is 5.7, not acidic enough to need lime or lock up any applied fertilizer phosphorus; there is also plenty of crop-available sulphur (15 mg/kg). This result with regards to fertilizer will be discussed further in Phase 3 cultivation (Section 3.4.3.4).
- Despite its roadside location (where topsoil lead contents are often elevated by 20th-century exhaust emissions), the topsoil (16224) has a very low content of lead and other heavy metals. It was protected by a shallow covering of sandy fill, and buried under the floor of the c.1822 cottage (House 4) and around 800mm of later fill. It therefore appears to be well buried and protected from modern contamination and the results from this deposit are some of the clearest supporting evidence for a relatively uncontained 18th-century topsoil.

The presence of low amounts of phosphorous supports similar findings at the Western Sydney Stadium (Figure 3.11). The importance of these low amounts is discussed in Phase 3.

[17] Lawrie 1999: 76-77.

[18] Lawrie 2019a; Casey & Lowe 2019.

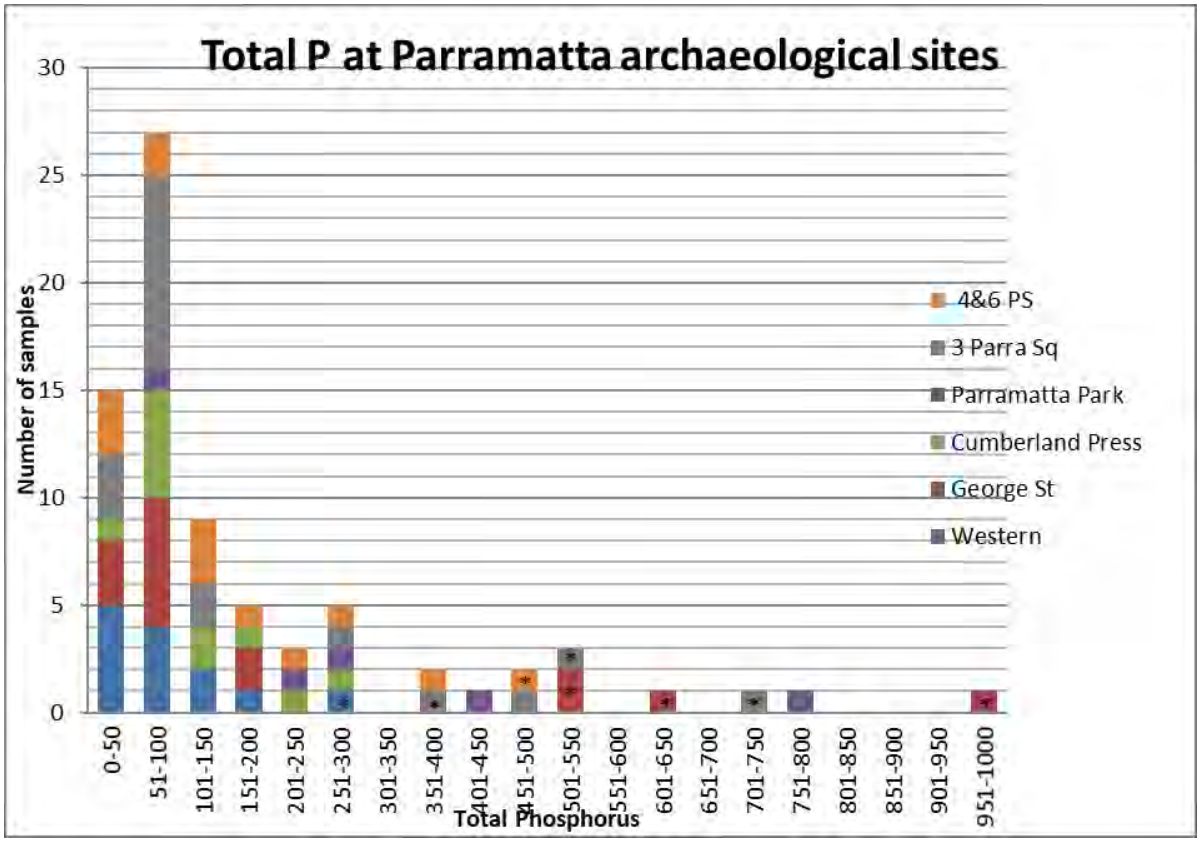

Figure 3.11: Total phosphorus concentrations (mg/kg) in 64 soil samples from six archaeological sites in Parramatta (4&6PS, 3PS, Parramatta Park, Cumberland Press, 184-188 George St and Western Sydney Stadium); * denotes samples which also had a high level of plant-available phosphorus (Colwell test >50 mg/kg) i.e. well above natural background, almost certainly boosted by phosphorus. Compared to many other nutrient-enriched archaeological sites of the historical period, where the Colwell phosphorus result is sometimes over 100 mg/kg, the nutrient levels found in the Stadium and 3PS are low. (from Lawrie Figure 2: Vol.3, Sec. 8.6).

3.2.1.5 VEGETATION[19]

The differing soil landscapes in the vicinity of the site would have supported several types of plant communities. Parramatta's river terraces were covered by woodlands dominated by eucalypts, in particular grey box (*Eucalyptus moluccana*) and forest red gum (*Eucalyptus tereticormis*), with an open grassy understorey. Mangroves (*Avicennia marina*) may have colonised the river margins up to the tidal limit, approximately below Charles Street. The common reed (*Phragmites australis*) and paperbarks (*Melaleuca linariifolia*) are predicted to have occupied wetter areas and rough-barked native apple (*Angophora floribunda*) the drier areas on the lower river terraces.[20] Stands of trees can be seen in historic images, often represented as encircling the settlement and illustrating the extent of clearing by the British (Figure 3.12, Figure 3.13).

The urgent need to ensure a reliable food supply for Sydney during the 1790s 'famines' resulted in only cursory documentation of the native vegetation at the time when the Pleistocene terraces at Parramatta were cleared for agriculture. For this reason, Benson & Howell[21] have used remnant native vegetation to propose that the higher (Pleistocene)

[19] The following information is based on Macphail, 2019 Pollen Report Vol. 3, Sec. 8.5.

[20] Casey. 2009:7-14.

[21] Benson & Howell 1990.

terraces were covered by woodlands dominated by grey box (*Eucalyptus moluccana*) and forest red gum (*Eucalyptus tereticormis*) with an open grass understorey, whilst the lower (Holocene) terraces were colonized by the common reed (*Phragmites communis*), paperbarks (*Melaleuca linariifolia*) and/or rough-barked native apple (*Angophora floribunda*) depending on soil drainage.

How closely these 'remnant' communities mirror the pre-1790s vegetation is unclear since they will have developed under a markedly different fire regime to those prevailing before European settlement. The pre-1790s so-called fire-stick farming[22] was an Aboriginal practice of burning off vegetation to facilitate hunting and change the composition of plant and animal species in an area. This differed from European land clearance and fire regime, as fire-stick farming targeted the grasslands and understorey rather than wholesale removal of mature trees and scrub to open up areas for crop cultivation. A stand that may have regenerated following the changed fire regime is the 'grove of mimosa or acacia trees' (*Acacia*) recorded by an early Parramatta settler [George Suttor (1774-1859)] growing 'near [the] parsonage house in Church Street' about 1800.[23]

Mangroves (*Avicennia marina*) are assumed to have colonized the river banks up to the tidal limit in 1790. As far as is known, early Colonial documents do not record if she-oaks (casuarinas) such as the black she-oak (*Allocasuarina littoralis),* river-oak (*Casuarina cunninghamiana*) or saltwater tolerant swamp-oak (*Casuarina glauca*) grew at Parramatta in the late 18th to early 19th century. However, there is an abundance of she-oak fossil *Allocasuarina/Casuarina* pollen recorded on historical archaeological sites in Parramatta.[24]

The combined data suggests the landscape being cleared for crops, was a savanna grassland with scattered eucalypts; sclerophyll shrubs and she-oaks that lined creeklines on the terraces and probably the sides of the river valley upstream of the tidal limit.[25] This was cleared using fire, allowing native grasses and liverwort populations to colonise exposed areas of damp mineral soils. 'Agricultural' weeds such as dandelions had become widely naturalised across the same area by the early 1800s.[26]

EVIDENCE FROM 3PS

Plant microfossils preserved in cultural deposits and buried topsoil, including the cultivated areas, on the 3PS site provide a discontinuous record of changes in the landscape between 1790 and the 1960s.

Analysis of samples taken across the site aimed to:

- Determine whether fossil miospore[27] are preserved in the samples, and, if so, to use the fossil assemblages (microfloras) to:
    - Reconstruct the natural and/or cultural environment prevailing at the times of deposition.
    - Test previous reconstructions of the pre-European landscape based on Colonial period documents and remnant native plants communities.

As part of broader research questions regarding:

- Current perceptions of the Aboriginal landscape at Parramatta.

[22] A term coined by Rhys Jones in 1969.

[23] Jervis 1978: 25.

[24] See Macphail 2015, Macphail & Casey 2008.

[25] Cf. Macphail 2015

[26] Macphail 2004.

[27] Miospore is a small spore or pollen grain, less than 200 microns in diameter.

- Modification of the Aboriginal landscape by convicts, including the impact of early agricultural practices (clearing, cropping and grazing) and residential occupation of poorly-drained areas.
- Cultural and social practices in colonial-period Parramatta.

A total of 21 samples were submitted for pollen analysis (see Figure 3.10 for location of samples). These samples represent various phases and context type across the site. All samples were processed for fossil miospores and other plant remains by Morgan Goodall Pty. Ltd. (Perth), using standard chemical and micro-sieving techniques to recover organic-walled microfossils (fossils only visible under a microscope). The complete results are presented in the Pollen Report, Vol. 3 Section 8.5.

All samples yielded abundant, well-preserved to strongly humified organic matter. Yields of fossil pollen, spores, miospores and other plant and animal microfossils varied from low to abundant but were adequate to make reconstructions of depositional environment, past vegetation and past cultural usage. In most (but not all) instances, the palynological[28] evidence supports the archaeological interpretation, including the inferred age of the deposits. The significant relative abundances of pine (*Pinus/Pinaceae*) pollen are potentially useful in distinguishing deposits dating to the mid-late 19th and 20th century from those deposited in the late 18th to early 19th century.

3.2.2 HISTORICAL ACCOUNTS

Historical documents are an important source of information on the natural environment of Parramatta. These include accounts and images (paintings and sketches) showing elements of the natural landscape. The maps and images are explored through the lens of government administration and its intentions and the need to grow crops successfully to sustain the purposes of British Imperialism in the Colony of New South Wales, with its associated needs for successful agriculture, convict accommodation and the eventual development of a free settlement occupied by emancipated convicts and settlers.[29]

Brambila's early view (1793) of the rows of convict huts also shows undulating cleared areas with stands of natural bush intact on the periphery (Figure 3.12). Evans', watercolour of c.1809 shows similar features, where the study area is shown as already cleared and probably under cultivation by this time (Figure 3.13). This would also agree with the c.1791 plan of Parramatta showing the study area as 'ground in cultivation' (Figure 2.2). The natural slope of the ground from the south down to the north can be seen in this view as can a grove of trees planted in rows that most likely represents an orchard of non-native trees. The house upslope on the right of frame is D'Arcy Wentworth's 'Wentworth Woodhouse' (completed in 1803)[30] and the orchard shown is part of the Wentworth estate. Later paintings of this area c.1819-1820 by Lycett show the trees in the orchard having grown considerably (Figures 2.6, 2.7, 2.8).

The natural environment of the study area is therefore depicted in sketches and paintings as gently sloping down to the north with a steeper gradient to the south up towards Wentworth's house. The land is generally shown as cleared so the natural vegetation is hard to detect, although the stand of trees shown in both the 1793 and 1804 pictures does appear to be close to the study area.

[28] The study of the forms of life existing in prehistoric or geologic times, as represented by the fossils of plants, animals, and other organisms.

[29] Casey 2009.

[30] Ritchie. 1999:93.

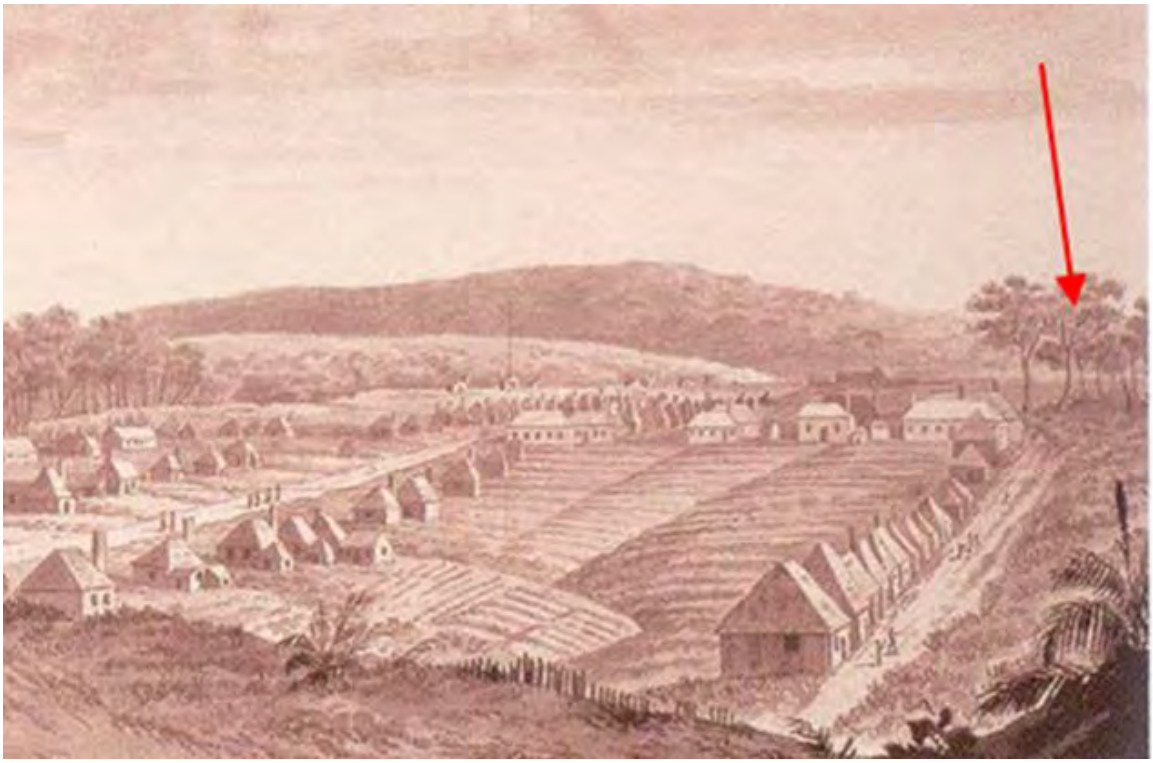

Figure 3.12: Detail of Fernando Brambila's (1793) view of Parramatta showing Macquarie (South) Street (right) and George (High) Street (left). Stands of bush remain on the periphery of the cleared areas (approximate location of the site is marked with a red arrow). Undulations in the middle ground topography were probably water channels amid areas of planting. The trees on the ring background right are possibly *Angophora floribunda*. British Library, MAPS T.TOP.124 SUPP F44.

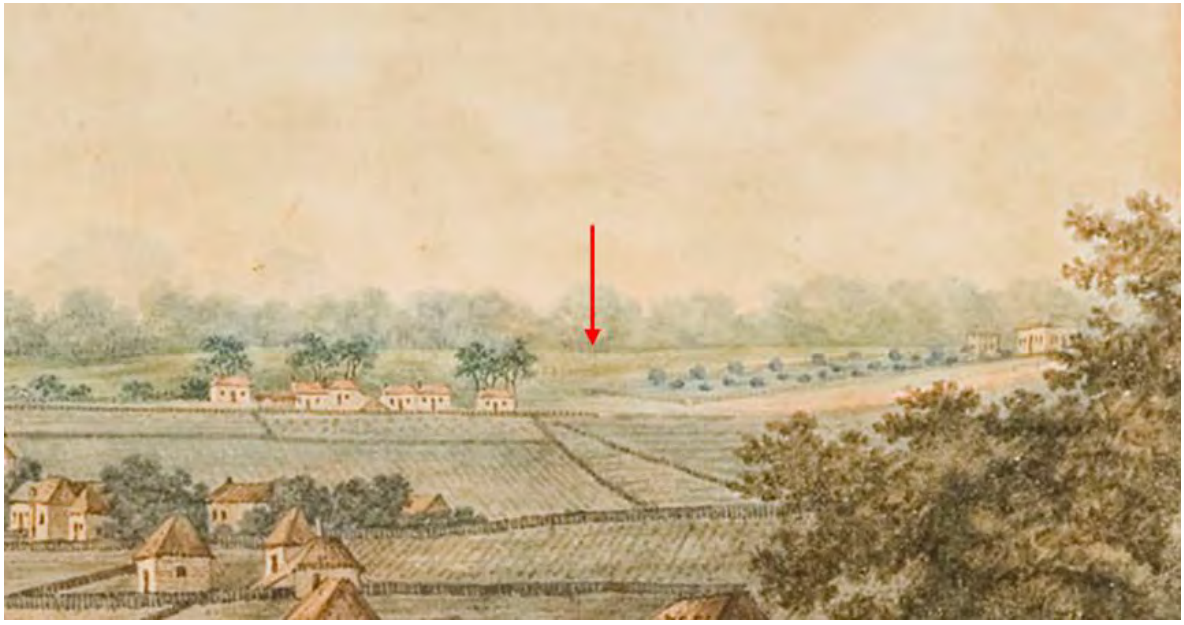

Figure 3.13: Detail of Evans' c.1809 painting of Parramatta. The study area (arrowed) is to the left (south) of the group of houses in the right midground (Church Street). D'Arcy Wentworth's Woodhouse can be seen to the right on the rise above a grove of trees, probably an orchard. The foreground shows rows of ploughed or sown fields and to the lower right appear to be rough barked native apple (*Angophora floribunda*) and possibly in the background on the horizon. Caroline Simpson collection. Sydney Living Museums Picture Collection, Museum of Sydney MOS2007/15.

3.2.3 CARTOGRAPHIC ANALYSIS

Historic surveys and plans also provide useful information regarding natural environment in the early years of settlement. Analysis of these sources can assist in tracing development and identify other possible changes and alterations to the physical landscape. However, it must be noted that these surveys are often indicative and present stylised information.

Historical plans of Parramatta date from 1791; these plans will often show features such as water courses and roadways as well as allotment boundaries, occasional topographic anomalies and annotations. Most of the earliest plans show the Parramatta Square study area.

- The November 1791 plan shows the study area as 'ground under cultivation' there are no water channels or other anomalies noted on the plan (Figure 2.2).
- The 1792 plan has a pencil line indicating the alignment of Macquarie Street to the east of Church Street but no lot boundaries or structures along the southern side of Macquarie Street to the east of Pitt Street nor any to the east of the study area (Figure 2.3).
- By 1804 there were allotments along the southern side of Macquarie Street but no houses (Figure 2.4). This plan also shows the land to the south was granted to Surgeon D'Arcy Wentworth (22) and Captain Piper (21). Portion 21 was later acquired by Wentworth.
- By 1814 Governor Macquarie had established a new and enlarged town plan and identified important places for local events, such as the 1813 market place (Town Hall site) and the use of the study area, 'reserved space for the fairs' (Figure 2.5).[31]
- By 1822, 1823 and 1836, plans show the new lots with houses on Lots 30 and 32 leading to the cessation of the use of Lot 30 as 'reserved for fairs' (Figures 2.9, 2.10, 2.13). The alignments shown on the 1822 and 1823 plans represents occupation by this date by which time the Agricultural Society of NSW was established and by 1823 it was operating from land nearby.[32]
- By 1844, a second building was on the western half of Lot 32 (Figure 2.14).
- By 1858, a drain or water course running diagonally across the northwest corner of Lot 28 from the southwest corner of the Parramatta Square site (8PS) and two ponds in the south of Lot 30 are shown (Figure 2.15).
- By 1895, the drain is not shown in Lot 28 as it is covered over but an uncovered section is visible within the 'Pound' area to the west (2PS) (Figure 2.22).

The mid-19th-century cartographic analysis suggests the natural environment included a drainage channel running across the northwest corner of the site, originating upslope to the southwest, near the corner of Church and Darcy Street. As shown in the archaeological evidence a version of this creekline was present prior to 1788, although it was not shown on plans earlier than 1858.

3.2.4 ARCHAEOLOGICAL EVIDENCE

The archaeological evidence for the natural environment across the study area was recorded within all lots. Therefore, the site as a whole will be discussed generally without reference to the historic allotment divisions except to locate specific features.

The underlying topography of the site was found to slope from the southeast corner, down to the north and northwest towards Macquarie Street and Civic Place (Figure 3.14, Figure 3.15, Figure 3.16). This topography sloped towards a natural creekline or drainage channel, which was later formalised into the Town Drain. Contour lines were generated following the top of the A2 subsoil horizon (Figure 3.6). The top of subsoil (TOSS), was seen to be

[31] Casey & Lowe 2016.

[32] Royal Agricultural Society of NSW, 2019.

a better indicator of the underlying topography as the A1 topsoil was mostly stripped away and patchy; being substantially modified while the top of the A2 horizon was only modified in isolated areas, such as basements, and not across the whole of the site. It could be therefore read as a layer across the site. Survey data, including RLs used to create contour plans, was collected across the site. This is the basis for the visualisations and analysis discussed below. This data and analysis are a key part of our response to the archaeological research design and the identified archaeological methodology and research questions.[33]

Evidence for the natural environment included the following:[34]

- The **original creek/drainage line** beneath the Town Drain on Lot 28. It was a channel of grey silty clay with occasional organic material, including remnant reeds.
- Pockets of the **topsoil** profile survived below House 4 on Lot 30. It was the only evidence of sealed buried topsoil, although the pollen analysis suggests there was modification by land clearance and early cultivation. This topsoil will be discussed further in Phase 3.
- **A2 horizon subsoil** was identified across the site. Many historic features were cut into this subsoil.
- An ochre-coloured clay **B1 horizon** identified in Lot 28 and test trenches along the southern boundary.
- Parent pink and grey **B2 horizon clays** below the subsoil were found in the base of test trenches dug into the bottom of the ponds at the south of the study area. This underlying ancient parent clay was also identified below some pits, below the creekline and at the base of the well. This Pleistocene clay dates between,11,784 years ago to 2.58 million years.[35]

[33] Casey & Lowe 2013b, 2015

[34] Lawrie 2019, Vol. 3, Sec. 8.6

[35] Pleistocene: 11,784 years ago, to 2.58 million years ago http://www.stratigraphy.org/GSSP/index.html

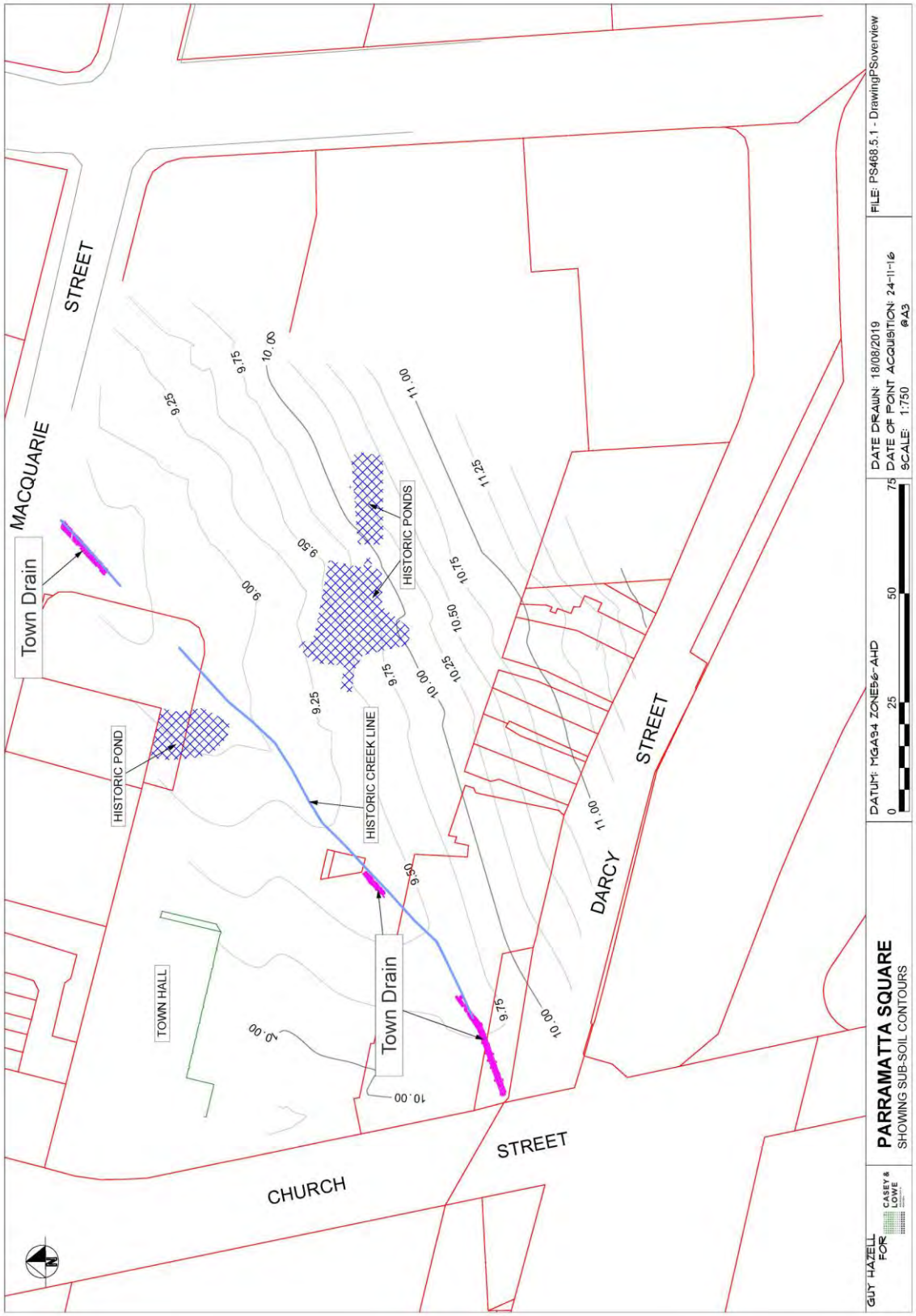

Figure 3.14: Contour plan of Parramatta Square with the two ponds in 3PS and 4&6PS and the approximate location of the pond within 5PS, the former pound and the creekline/drain through 3PS and 8PS. G. Hazell (Arcsurv) 2019.

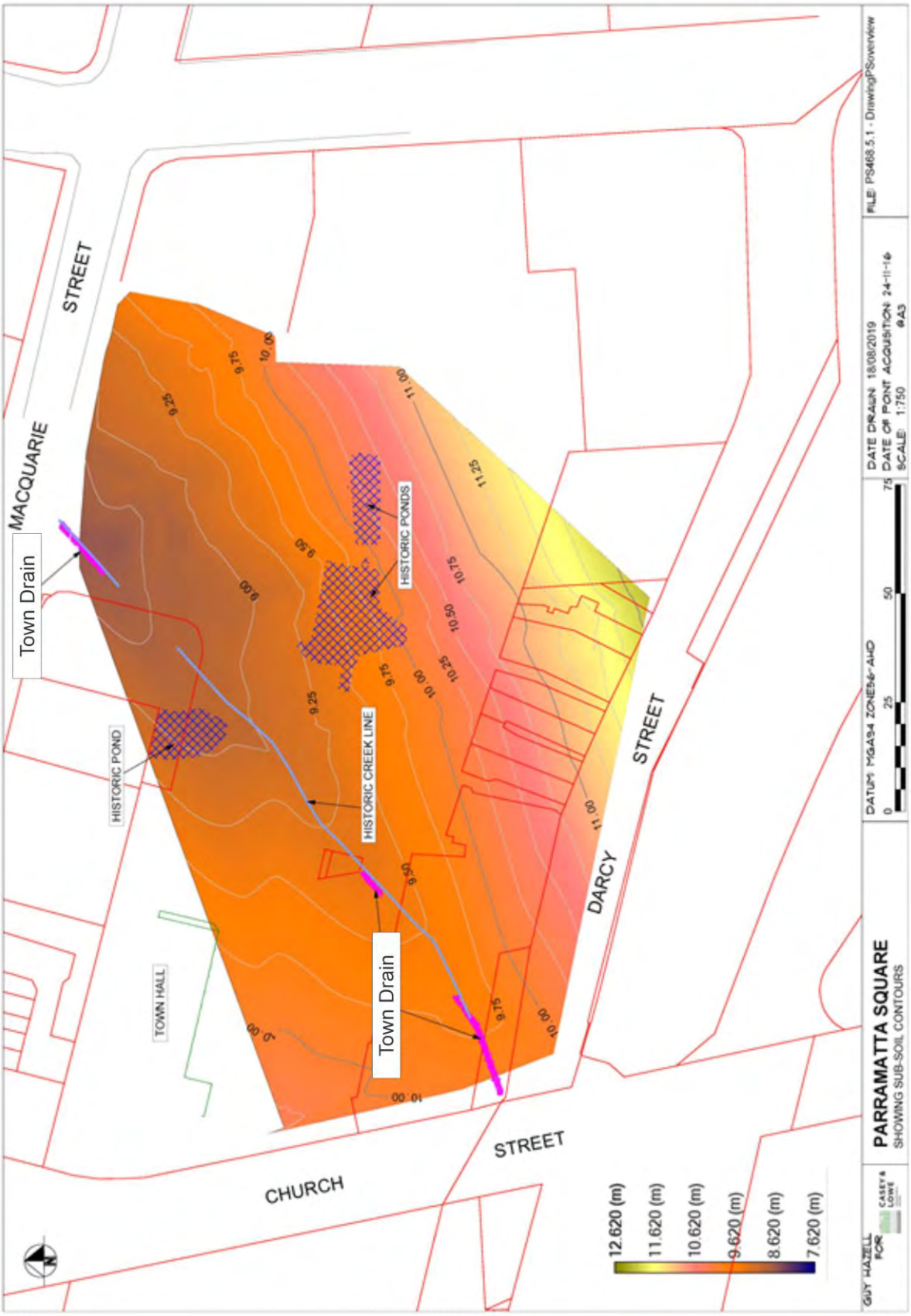

Figure 3.15: The contour plan (TOSS) for Parramatta Square showing the high ground to the southeast and southwest falling down to the main creekline and the other smaller channels to the east within 3PS. G. Hazell (Arcsurv) 2019.

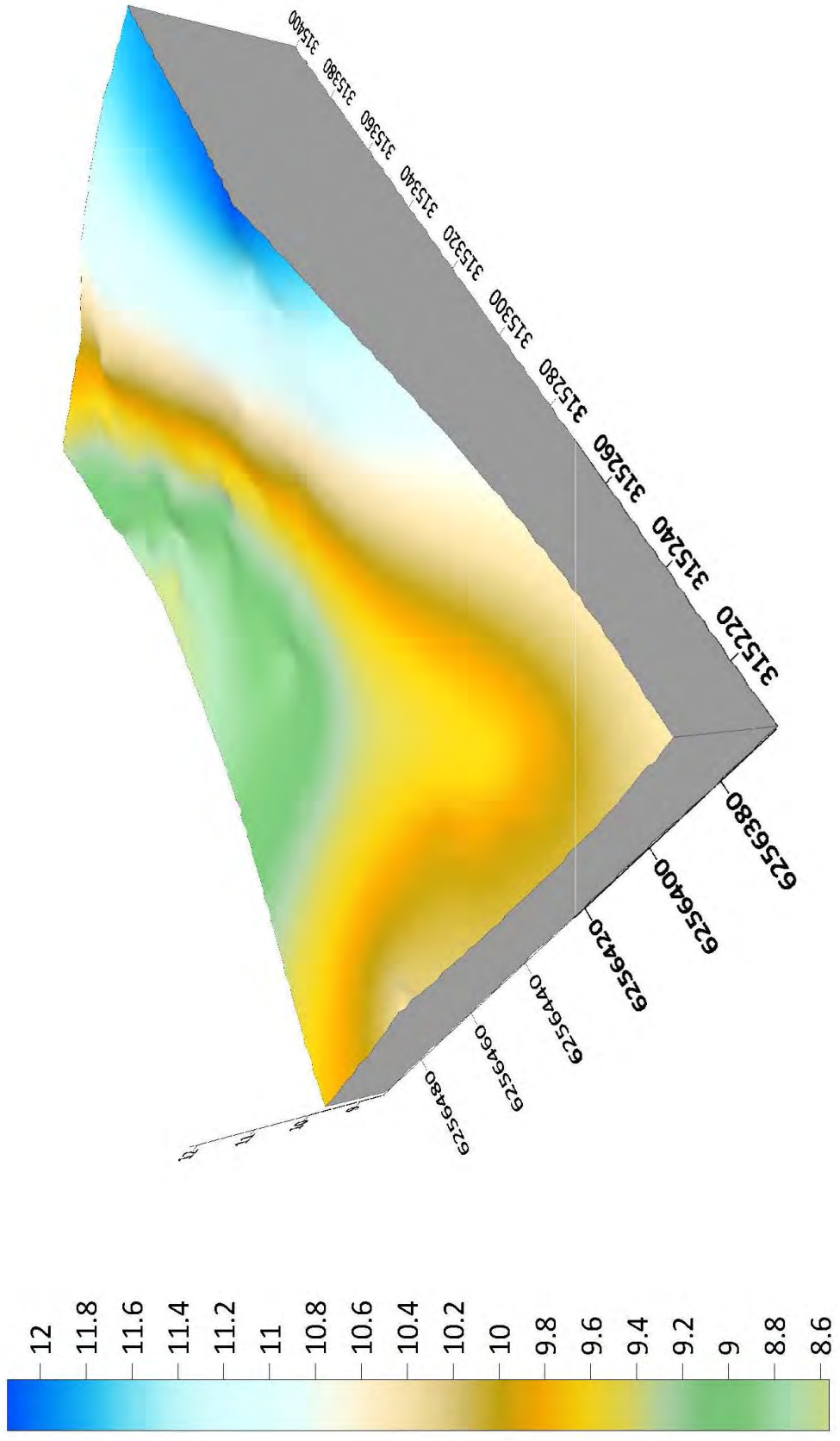

Figure 3.16: Contour block across Parramatta Square. The top of the yellow band relates to the 10m contour line which crossed through the site. G. Hazell (Arcsurv) 2019.

In the northwest of the site, where the ground sloped down towards the creek, the natural soil horizon and patches of historic topsoil were sealed by fills imported to raise the ground level prior to the construction of the c.1822 cottage (See Phase 3, Section 3.4.3.2). The natural soils were classified into types or units representing the natural development of the profile. The following table summarises these units and associated context numbers assigned to the natural soil profiles encountered across the site (Table 3.3).

3.2.4.1 TOPSOIL

Within the northern end of the site, some of the natural soil horizon was protected by a large-scale c.1822 sandy levelling fill. This fill event was a series of sandy levelling fills (Phase 4.1) which sealed patches of remnant original topsoil (16224) beneath the footprint of House 4 on Lot 30 (Figure 3.17, Figure 3.18).

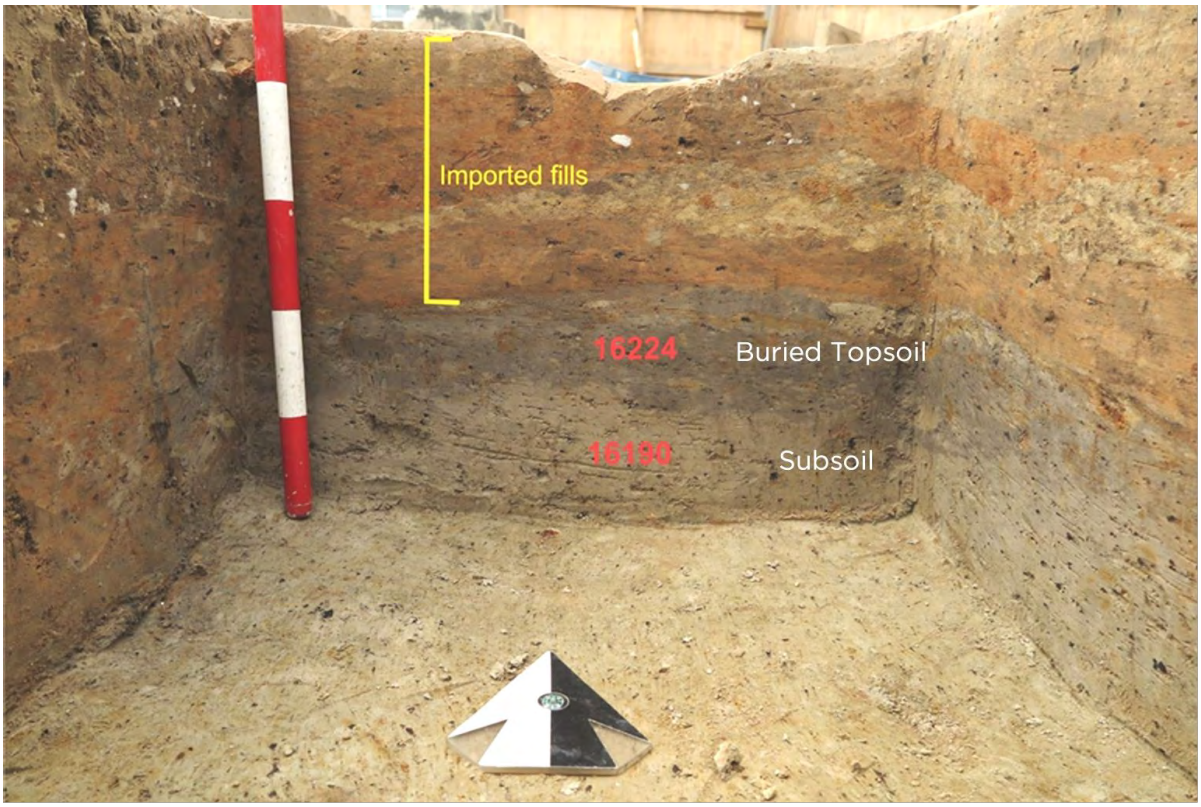

Figure 3.17: Section in TT18 below Room 3, House 4, showing imported sandy levelling fills above the surviving original topsoil (16224) and A2 subsoil (16190). View north, scale 500mm. IMG_4423.

Table 3.3: Context numbers assigned to the natural soil profile.

Unit	Type	Depth (mm)	Description	Context Numbers	Soil & pollen sample numbers	Munsell
1	Modified historic topsoil	130-360	dark greyish brown, fine, silty clay loam, frequent charcoal and ironstone nodules, common historic inclusions and artefacts	16120, 17219, 16222 (TT17) 16318 (A South) 16416 (Area B)	16120 = 161-163, 170-172, 194-202, 206-211, 215-220, 230-232, 248-253. 16318 = 143-145, 173-175. 16416 = 31-33, 55-57, 61-63, 85-87, 100-102	10YR 4/2-4/4
2	Original topsoil (A1 horizon	50-110	dark grey clayey silt with frequent red iron stained veins and occasional charcoal flecks	16224 (Area A)	16224: 140-142, 203-205, 254-265	10YR 4/1-4/2
3	Subsoil (A2 horizon)	100-unex	compact, yellowish brown clayey silt with traces of loam with inclusions of occasional small ironstone gravels and charcoal flecks	16190, (Area A) 16262 (Area A) 16257 (A South), 16351 (Area B)	16190 = 94-96, 221-229, 266-268. 16257 = 149-151 16351: 131-133	10YR 5/4 (moist) 10YR 6/4 (dry) 2.5Y 5/6 – light olive brown
	Natural clay B1 horizon	180-200	firm, light yellowish-brown clayey silt, occasional charcoal and ironstone inclusions	17893 Area D	17893: 330	2.5Y 5/6 – light olive brown
4	Natural clay B2 horizon	Unexcavated	compact, red-brown and red-grey mottled clay, occasional flecks of charcoal and small ironstone nodules	16256 Area A 16949 Area B/C 19919 Area D	91-93, 102	5YR 4/6 – yellowish red

This buried historical topsoil differed from the heavily modified topsoil associated with the occupation of the various buildings on the site which was mixed with historical inclusions and artefacts, and often mottled with the upper margins of the subsoil where it had been churned up or dug in to the subsoil layers below. The pollen evidence within the buried historic topsoil (16224) under House 4 illustrates that it was modified in Phase 3 when affected by land clearance and early agriculture but is not considered to represent post-c.1822 exposure to the environment. The significant representation of sedges and ferns in the pollen sample indicates this clay-rich topsoil was damp. This historically modified topsoil is discussed further in Phases 3 and 4.1.

The topsoil has a low phosphorus content (Colwell P 6.3 mg/kg, total P 80 mg/kg) which means that this is poor soil for growing imported crops, such as wheat, maize, and oats.[36]

Figure 3.18: Section showing lower remains of Phase 4 levelling fills (red), topsoil and the subsoil or A2 horizon, Area A. View to north, 1m scale. IMG_5352

3.2.4.2 SUBSOIL OR A2 HORIZON

The contour map shows this horizon falling from RL 11.00m in the southeast corner down to RL 8.45m in the northwest corner (Figure 3.13, Figure 3.14, Figure 3.15). The subsoil, was relatively intact across the whole site with most archaeological features cutting into it (Figure 3.19, Figure 3.21). Within an intact soil profile buried beneath the c.1822 cottage (House 4) soil and pollen analysis was undertaken for A2 subsoil samples taken from the section of TT18 (Figure 3.17).

The soil analysis of the A2 subsoil described it as, undisturbed weakly aggregated light grey silty light clay, with yellowish brown mottles along old root channels and occasional dark soft nodules (2-3mm diam.) with normal trace metal levels. It was pH-neutral to moderately acidic, and non-saline; it can set hard when dry but remains friable when moist,

[36] Lawrie Vol. 3, Sec. 8.6: 21.

probably because it is non-sodic and not prone to soil structural breakdown. The nutrient content is extremely low.[37]

Pollen analysis of sample #362 indicated that the subsoil supported a savanna grassland landscape where eucalypts and sclerophyll shrubs were uncommon and she-oaks and ferns lined the local creekline. Low exotic cereal pollen specimen (1%, sample 362) was identified, whereas no dandelion or other weeds were found supporting it was not substantially disturbed by post-1789 activities. The one exotic specimen present may be attributed to taphonomic processes such as bioturbation or contamination during collection and this subsoil should be seen as largely undisturbed. A high relative abundance of hornwort (89%) and fungal spores (104%) may reflect an Aboriginal burning regime of clearing the native woody vegetation, where these species quickly colonise recently burnt areas.

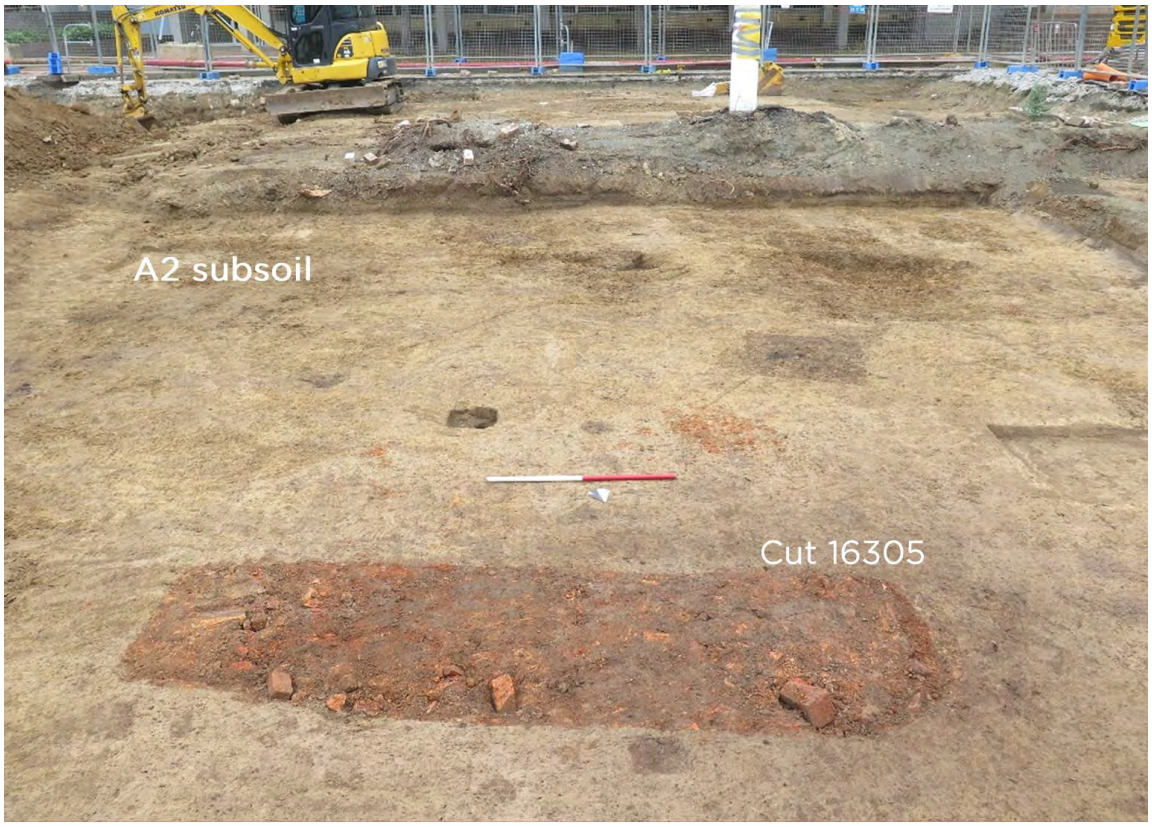

Figure 3.19: Pale A2 subsoil exposed within the rear yard of Lot 30 with features such as pit 16305 in the foreground. View to south, 1m scale. IMG_3291(2).

3.2.4.3 CLAYS – B HORIZON

The main B horizon clays within 3PS are pale yellowish grey light clay (B horizon). Immediately above the underlying B2 basal clay was a layer of ochre coloured silty, B horizon clay, context 17893 (Figure 3.20, Figure 3.21, Figure 3.22). This was identified in TT14, TT31 and TT32, either side of the drainage channel/drain in TT33 and in the section of a modern service trench that ran north-south through Area C[38], at the base of a large storage pit in TT28 (Figure 3.21) and within a pond (Figure 3.22). The top of this material

[37] Lawrie 2019 Vol. 3, Sec. 8.6.

[38] See Figure 4.1, Area C Trench Report, Vol. 2, Sec. 7.3

also showed a pronounced slope down to the northwest. This B2 horizon clay had chemical properties of a largely undisturbed acidic clay with slightly elevated sulphate levels.[39]

The lowest strata of the natural soil profile reached was the upper margins of a layer of dense mottled pink and grey basal clays, and there were also some B3 Pleistocene clays (Figure 3.9, Figure 3.21, Figure 3.22). This natural clay did not contain any cultural inclusions and was only exposed within test trenches or deep pits or ponds. The clay was identified within three test trenches TT14 (Figure 3.22, Figure 3.186 in the southern boundary of Lot 30 and TT31 (Figure 3.189) and TT32 on the southern boundary of Lot 1, dug to test for the existence of two ponds in this area as shown on the 1858 plan (Figure 2.15).[40]

Figure 3.20: Dense yellowish brown clay subsoil (from the IIB horizon) with reddish brown mottles, from a depth of 20-25 cm at site 1. Clay similar to this was seen at several locations, usually at shallow depths, across the whole site. Roy Lawrie Soil Report, 2019, Vol. 3. Sec. 8.6.

[39] Lawrie 2019, Vol. 3, Sec. 8.6: 19.

[40] The test trenches through the two ponds are discussed in detail in Section 3.7 (Phase 4.2)

Figure 3.21: View of natural soil profile at the base of TT28 in Area D. The pale yellowish clay is the upper B horizon with the red mottled basal clay. View to south, Scale 1m. IMG_5463.

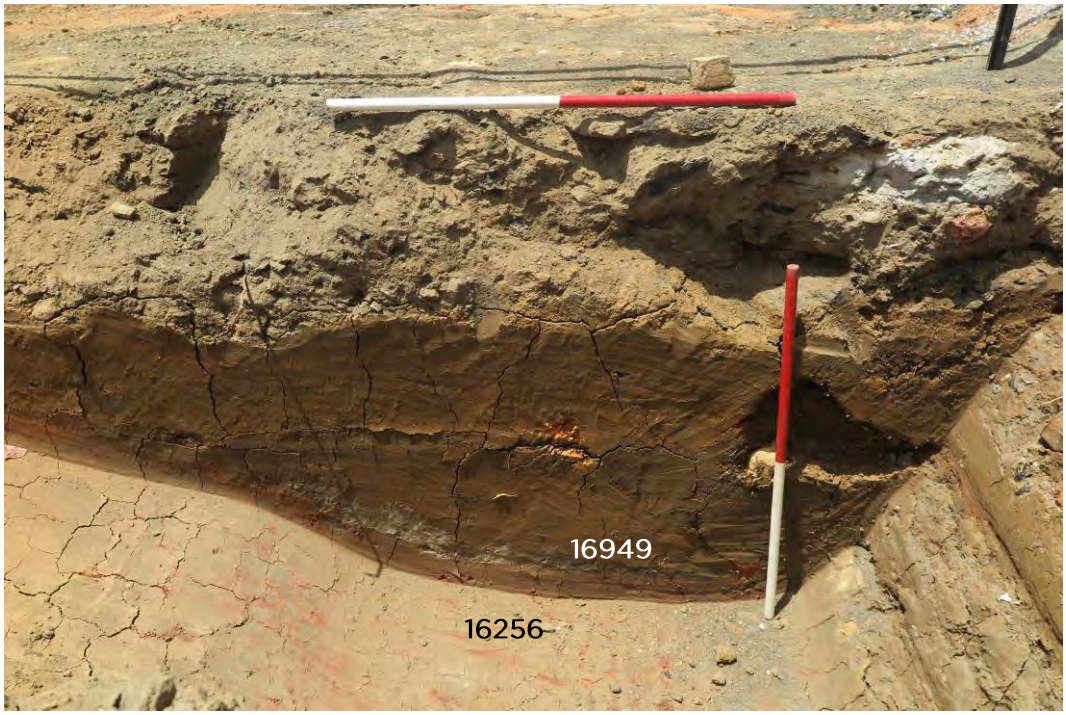

Figure 3.22: Section through the edge of the dam in the southwest corner of 3PS (TT14) exposed two layers of dense clay (16949 & 16256). Above the lower red and grey mottled zone (16256) was a gradual change to a yellow brown clay (16949. View to east, scale 1m. IMG_3704.

3.2.4.4 RESULTS OF POLLEN ANALYSIS

The pollen analysis generated some specific conclusions, those concerning the reconstruction of the pre-1788 natural environment across the study area include:

- The pre-British settlement vegetation was savanna grassland which supported scattered eucalypts and wattles.
- The grasslands included eucalypts but locally these trees were uncommon compared to she-oaks (casuarinas), which appear to have been confined to poorly drained areas such as the shallow gully/creekline crossing Lot 28. Species also included rice flower (*Pimelea*) and the rough tree-fern *Cyathea*.
- Sclerophyll shrubs were rare but included a banksia, native heath, native hops, ti-tree and wattles.
- Ferns grew on damp soils along the creekline as found in Lawrie Samples 1 and 2 within TT18.
- Bracken-like (*Pteridium*) spores – a fern that is typically colonizes sandy soils after fire (Sample 8).
- The same fossil pollen data confirm that the site of 3PS, like the Parramatta CBD in general, was poorly-drained, due to the varied topography of the Pleistocene terrace sands and the clay-rich alluvium.

Relevant samples associated with the natural environment were limited. One sample (sample # 362 (10)) analysed from the A2 horizon subsoil (16190) was taken from below the c.1822 cottage (House 4). The sample is characterised in (Table 3.4).

Table 3.4: Pollen analysis of the A2 subsoil, sample #362, context 16190.

Sample # 362 (21)	Description
Abundant taxa:	fungal spores, she-oak *(Alocasuarina/Casuarina),* hornwort *(Phaeoceros)*
Common taxa:	Native grasses (native Poaceae)
Frequent taxa:	*Eucalyptus* pollen and immature pollen aggregates, rainbow fern *(Calochlaen),* hornwort *(Anthoceros* (Cerelia?)
Exotics:	Cereal grasses *(Cerelia)* (1 definite specimen only)
Edible taxa	*Cerelia*
Sewage:	
Microfauna:	egg cases (10%)

In this sample the pollen of introduced or exotic plants are absent apart from one specimen of cereal pollen and low numbers (1%) of a small native grass (Poaceae) pollen type that might represent immature cereal pollen. Otherwise, the microflora is dominated by casuarina, she-oak (82%), eucalypts and other native species with a complete absence of dandelion (Liguliflorae). Dandelion weeds are frequently associated with early clearance and agriculture.

Whether or not the single specimen of cereal pollen is *in situ*, there is little doubt that (1) the absence of dandelion is compelling evidence the soil sample predates British settlement at Parramatta in 1790 and (2) the microflora is further evidence the site was located in savanna grassland where eucalypts and sclerophyll shrubs were uncommon and she-oaks and ferns lined the local creekline. In this instance, the high relative abundance of hornwort (89%) and fungal (104%) spores is more likely to reflect Aboriginal burning or firing stick

practices rather than extensive areas of exposed mineral soils occurring on the site. The absence of pollen from shrubs other than wattle (one specimen) is circumstantial evidence that 'extensive' stands of wattle on Church Street were established after British settlement at Parramatta.

The presence of abundant she-oak pollen samples strongly suggests that pre-1788 vegetation was a savannah woodland landscape that supported scattered eucalypts and wattles with she-oaks lining creeklines.[41]

3.2.4.5 CREEKLINE

A natural creekline or seasonal drainage channel diagonally bisected the northern end of Lot 28 (Figure 3.14, Figure 3.15, Figure 3.16). This creekline was later formalised as the Town Drain – first as a timber lined channel (Phase 3.1) then as a sandstone box drain (Phase 4.2), extending downslope from the southwest, corner of Church and Darcy Street (8PS), and falling northwards diagonally across and under Macquarie Street as part of a much larger drainage system. In order to identify any remnant creek fills and the original course of the creekline, a test trench (TT33), 1.2m wide, 6m in length and 1.3–c.2m deep was dug across a section of the channel. TT33 was excavated through the waterlogged fills encountered when the stone Town Drain was removed. The remnant creekline was revealed directly beneath the blocks of the Town Drain. The north facing section of TT33 exposed the edges of the natural soil profile indicating the location of the drainage channel/creekline (Figure 3.23). The subsoil, and underlying yellow clay B1 horizon, context 17893, were visible either side of the channel. The sediment within the base of the channel included grey silty clays, context 17852, with vegetation including reeds preserved in the anaerobic environment (Figure 3.24, Figure 3.25). Some historic artefacts were also recovered from within the silty clays including early 19th-century ceramics, glass and leather (discussed in Phase 3 below). The grey clay, was a wet fine-grained swampy silty clay. Pollen sample #320 was taken and analysed. The presence of historic artefacts and the analysis of the microflora from the sample indicates that the grey clay was modified in the period of early land clearance and cultivation. The pollen analysis characterised the sample as:

> Distinguished by the highest relative abundance of cereal pollen (14%) recorded in the study across 3PS, and that the diversity of 'weed' species including a clover (Trifolium) is against the infill primarily being 1790s or older topsoil. Nevertheless, the data are consistent with cereal crops being grown on Lot 28 during the 1790s despite the very high relative abundance of native grass pollen (52%). The low relative abundance of hornwort spores, hints that the area under cultivation was invaded by weeds but the agricultural activities did not cause extensive erosion of nearby creek banks (Macphail 2019, Vol. 3, Sec. 8.5: 44).

Therefore, the grey waterlogged fill in the drainage channel contained a mix of native grasses and historical imported species, which accords well with the presence of early 19th-century artefacts within the matrix. Also, the presence of quantities of native grass is likely to represent a mix of older and later pollen when land nearby was covered with grass. Perhaps suggesting that once the original one or two government crops were sown, this land quickly returned to grassland for a few years, until the area in Lot 28 was ploughed for a crop.

Soil sample #321 taken of the grey clay was found to be acidic and significantly, non-saline, suggesting that it was flushed regularly by the creek, with fresh water flows a regular occurrence. Other altered chemical properties (high carbon, nitrogen, phosphorus and potassium levels) are associated with additional organic matter, probably trapped by water plants like reeds and rushes (Figure 3.25). Manure dropped by livestock could also

[41] Macphail, M.K. & Casey, M. 2008: 45-66; Casey, M. 2009.

contribute to the increase. Surprisingly, eroded topsoil does not seem to be a contributor, because the total of exchangeable cations[42] is very similar to the level in the surrounding orange clay B1 horizon. The trace metal content is elevated, but not excessively, suggesting that the creek did receive waters well into the colonial period.[43]

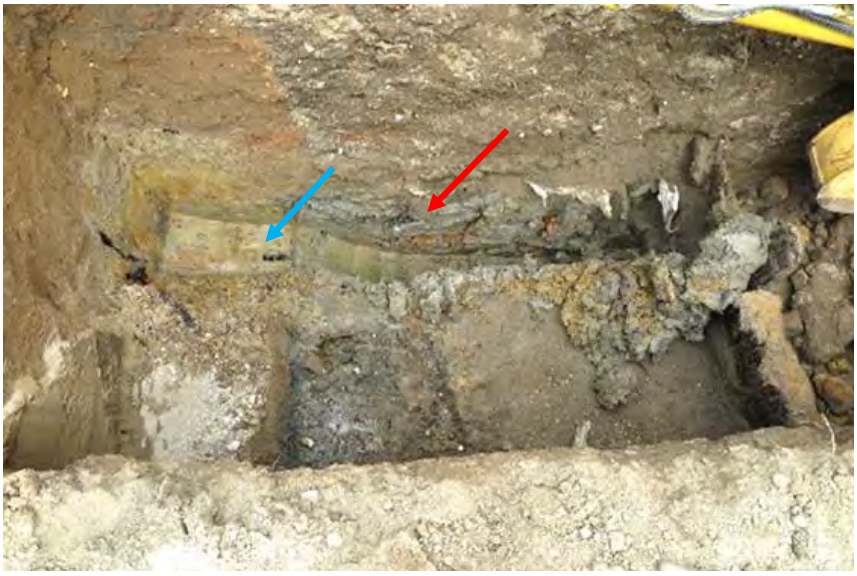

Figure 3.23: Grey creekline clays 17852 with sandstock brick fragments (red arrow) sitting above a mottled yellow 'natural' clay (blue arrow). A narrow trench was dug through the grey clay to expose the underlying yellow clay (17893) of the natural soil profile. View to south, IMG_5856.

Figure 3.24: The top of the creekline clays (below scale) with reed like vegetation visible arrowed within context 17852. View to south, 1m scale. IMG_5846.

[42] Positively charged ions (chemistry).

[43] Lawrie 2019, Vol. 3, Sec. 8.6: 19.

Figure 3.25: Photo of reeds recovered from the grey silty waterlogged clay. Scale 100mm. Disc_4271.

It is likely that the drainage channel originated to the southwest, on the southern side of Church Street and modern Darcy Street, perhaps on Lot 18 as a water feature is shown on that allotment on a plan of 1836 (Figure 3.26).

The creekline ran down from the higher ground to the southwest near the corner of Church and Darcy Street, where it was identified during the archaeological excavation of 8PS, and similar grey sediment was found below the stone drain. In the sediments found beneath the drain in 8PS the sample was characterised as:

- 1820s to? 1830s, based on *Polygonum aviculare* (26%), *Liguliflorae* (3%), Cerelia (1%) and *Cloacasporites* (2%) in a microflora lacking Pinus.
- The significant occurrence (2%) of *Cloacasporites* and *Mediaverrunites* (1%) dates the fill sample to the period when the creek draining Church Street had become a *de facto* sewer for the 8PS area (cf Fig. 12) but before the creek was converted into a stone drain.
- By this time (c.1820s) diverse populations of agricultural weeds, in particular the wireweed *Polygonum aviculare*, were well-established along the creek, whilst hornworts (*Anthoceros, Phaeoceros*) colonized the damp (clay?) banks. The fungal spore *Tetraploa* hints at the local presence of swampy grassland. The microflora includes ±abundant (19%) numbers of Triassic gymnosperm pollen, assumed to be reworked from quarrying of Ashfield Shale during the conversion of the creek into a drain.
- The depositional context and inferred age make the sample an important one given the relative abundance of casuarina pollen (47%) is still high despite being markedly lower than values recorded in samples on 3PS inferred to date to the 1790s. Whether this is evidence that casuarina species survived along the valley bottom into the 1820s or that the pollen have been reworked ('inherited') from older soils in the catchment is unclear.
- Due to poor drainage, the area fronting Church Street (8PS) was more likely to be polluted with human sewage than sites fronting on Darcy Street. Not surprisingly, the largest numbers of *Cloacasporites* (human sewage) specimens occurred in comparatively recent sediments infilling the creek.
- The source of cereal pollen in the creek infill is more likely to be from human sewage rather than from crops (if any) planted on 8PS.

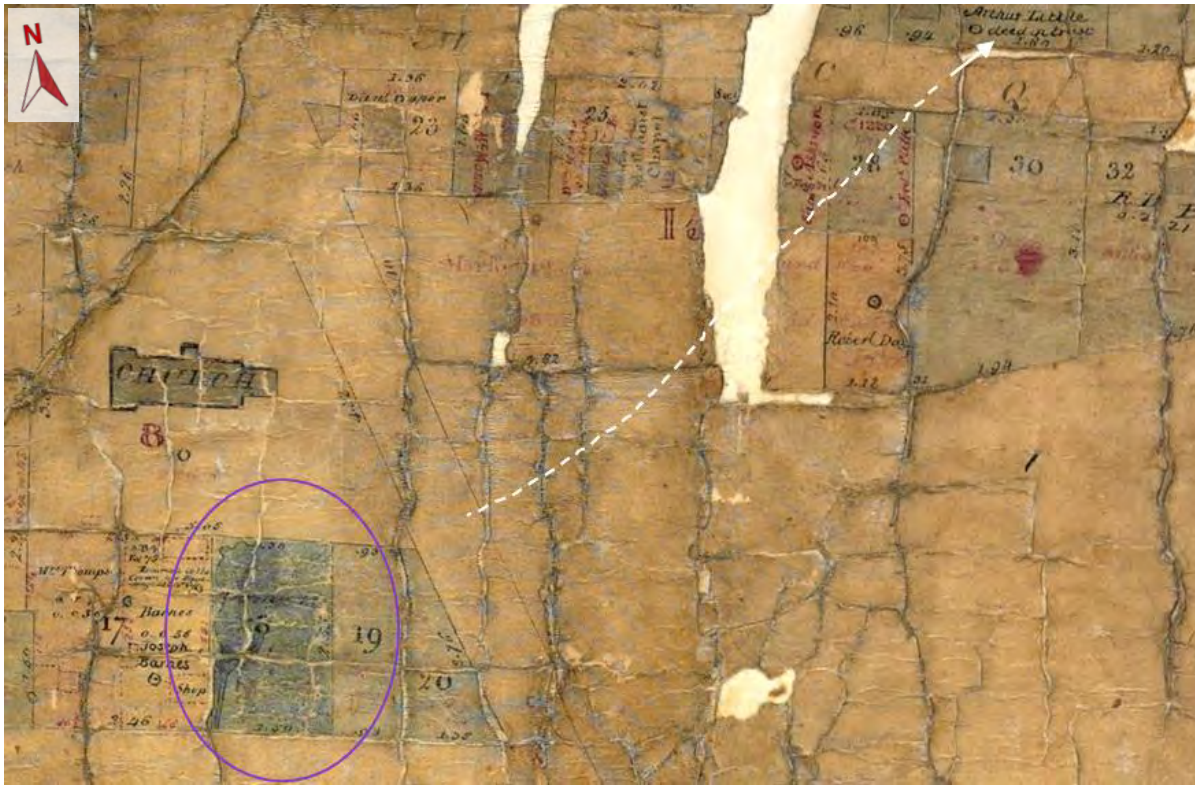

Figure 3.26: Water feature shown on Lot 18 (circled) on the eastern side of Church Street, may be the source of the water flowing down in the drainage channel or creekline which formed the Town Drain (dashed in white). Detail of the Plan of Parramatta, 1836 AO 4799.

3.2.4.6 SOIL ANALYSIS

In 3PS, soil sample #321 taken of the grey clay was found to be acidic and significantly, non-saline, suggesting that it was flushed regularly by the creek, indicating fresh water flows were a regular occurrence. Other altered chemical properties (high carbon, nitrogen, phosphorus and potassium levels) are associated with additional organic matter, probably trapped by water plants like reeds and rushes. Manure dropped by livestock could also contribute to the increase in the levels of these chemicals. Surprisingly, eroded topsoil does not seem to be a contributor, because the total of exchangeable cations[44] is very similar to the level in the surrounding yellow alluvial clay B1 horizon. The trace metal content is elevated, but not excessively, suggesting that the creek did receive waters well into the colonial period.[45]

In 8PS, soil sample #106b was characterised as:

> The clayey nature of the deeper subsoil has a strong influence on drainage. Low subsoil permeability tends to push water laterally, towards any nearby isolated shallow surface depressions, or to the old drainage line later occupied by the sandstone drain. This natural drainage feature must have been rather narrow because its impact on soil profile features does not extend very far from its course.

Significantly, both the humic sediment and the dark historic topsoil under the drain are weakly saline. This is an indication that water flow along the drainage line in 8PS was intermittent. Water in the bottom of the channel was allowed to dry out from time to time, concentrating to a limited extent the small amount of dissolved salts within it. The lack of

[44] Positively charged ions.

[45] Lawrie 2019, Vol. 3, Sec. 8.6: 19.

permanent waterlogging is reflected by the absence of black iron sulphides (which are indicators of anaerobic, waterlogged conditions, especially when the sulphate concentrations are as high as in these two samples).[46]

3.2.5 DISCUSSION

The excavation uncovered traces of the pre-1788 natural environment and landscape within the study area. These included a gently sloping topography from the southern higher ground down to a natural drainage channel. The soil profile indicated that the study area was located on the edge or boundary of the residual Blacktown and the fluvial Birrong soil landscapes. Silty and light clayey alluvial sediments once covered most of the site with a dense clay beneath. Much of the original dark surface topsoil was heavily disturbed or removed but the physical features of the subsurface layers appeared largely undisturbed. Testing revealed that at most places on the site subsoil chemical properties have been altered, mainly by the downward movement of nutrients and alkaline elements leached out of the surface soil. The clayey nature of the soil profiles has a strong influence on drainage. Low subsoil permeability tends to push water laterally, towards any nearby depressions or downslope to the drainage line on the western boundary. This natural drainage feature was rather narrow.[47]

Chemical properties of the creekline or drainage channel fill indicate that it was a dynamic environment, regularly flushed with fresh water. The creekline sediment was characterised by a high percentage (14%) of exotic cereal pollen suggesting that it was modified in the early period of post-contact cultivation rather than representing an undisturbed natural deposit, this was further confirmed the presence of historical artefacts in the matrix. Buried subsoils and remnant buried topsoil did not contain elevated trace metal levels and appeared largely undisturbed. Pollen analysis of the buried topsoil and subsoils indicated that the area was originally a savanna grassland landscape with frequent she-oaks and ferns lining the creekline with occasional eucalypts, wattle and sclerophyll shrubs.

Therefore, the natural environment was able to be reconstructed to a limited degree. It was originally modified by some form of Aboriginal fire technology and then by the wholesale land clearance undertaken by British settlers with the establishment of the settlement. Issues of phosphorus levels and nutrients available in the natural soils and their relationship with post-1790 land clearance and cultivation will be discussed further in Phases 3 and 4.1.

[46] Lawrie 2019, Vol. 3, Sec. 8.6: 21.

[47] Lawrie 2019, Vol. 3, Sec. 8.6: 21.

3.3 PHASE 2: ABORIGINAL OCCUPATION

Aboriginal people may have been in the area for over 30,000 years,[48] and certainly had a strong presence in the area after the flooding of the Parramatta River valley 7,000 years ago. Prior to 5000 years BP, stone tool assemblages suggest a highly mobile population with a general-use toolkit that used raw materials conservatively. Much more specialised and territorial behaviour has been argued for the complex stone tool assemblages found in the area after this period.[49]

Parramatta was occupied by the Darug Aboriginal people prior to the arrival of the British in 1788. The local clan group were the Burramatta and they spoke the Darug language. Parramatta is part of their traditional hunting and fishing grounds. Being near the river it would have been an important area for camping and fishing for 10,000 or more years. Fish were an important part of the diet of people living in the Sydney region in pre-colonial times. Ducks, mullet, crayfish, shellfish and turtles lived in the freshwater streams feeding into Parramatta River. Fish, shellfish, molluscs and eels lived in the saltwater parts of the river. Shellfish remains found in Aboriginal middens include: rock oysters, cockles, some mud whelks, mud oysters, winks and horn shells. Aboriginal people used canoes made from the bark of the bangalay (*E bitryoides*) or the stringybark tree (*E agglomerates*). The men used spears and the women shell hooks to catch food from the river. Food was cooked over a fire made at any convenient location.

Aboriginal occupation in Parramatta was documented by the British who set out from Sydney Cove to explore the Parramatta River and locate fertile land to grow the crops needed to sustain the new arrivals. Colonial observers saw the area as the exclusive territory of a single tribe, the Burramatta or Boromedegal of the Darug language group.[50] The need to name and territorialise stemmed from British concept of borders states and chiefdoms through which all Aboriginal behaviour was classified. Aboriginal society in the wider Sydney region was probably much more fluid, and interaction between groups much more dynamic than a territory-based tribal model might suggest. It is likely that members of more than one Aboriginal group used the resources at Parramatta, and although access would have been based on permission from the local group, boundaries between areas are likely to have operated on several different levels based on the context of the interaction, and were not simply the frontier lines of warring states.[51]

3.3.1 ANNUAL FEASTS & MARKET PLACE

Governor Macquarie tried to institute better relationships with Aboriginal people and established the annual meeting of the tribes and native feasts where Civic Place is today (Figure 3.27). These meetings were intended to encourage better relations with local Aboriginal groups. The government distributed blankets and awards to Aboriginal men and women who had given proofs of industry and inclination to be civilised. It was at this annual event that certain Aboriginal leaders received their breastplates.[52]

[48] McDonald CHM 2005: 155.
[49] McDonald CHM 2005: 157.
[50] Comber Consultants 2010: 17.
[51] Casey & Lowe 2019a.
[52] Casey 2009: 14

Figure 3.27: 'The annual meeting of the native tribes at Parramatta, New South Wales, the Governor meeting them', watercolour by Augustus Earle, 1826? NLA identifier: nla.pic-an2820681.

3.3.2 ARCHAEOLOGY OF ABORIGINAL OCCUPATION AT 3PS

Test and salvage excavations in accordance with the Research Design were undertaken by Comber Consultants[53] over a five-month period between 2 November 2015 and 4 March 2016 (see Figure 3.28 for testing locations). These excavations revealed the presence of an alluvial terrace across the entire site. The lithic analysis of the assemblage retrieved indicates that the site was occupied repeatedly from about 10,000 BP in the terminal Pleistocene. Evidence for occupation of the site fitted within the later Holocene interpretations of Aboriginal activity at Parramatta.

[53] The complete results of excavation and artefact analysis can be reviewed in Comber Consultants 2018. This summary is taken from that report.

Figure 3.28: Location of Comber Consultant's Aboriginal test trenches (pink squares) within 3PS and the main historical archaeology structures.

A total of 617 cultural lithics, of which 369 were artefacts were found from 90 of 134, test pits dug. 549 lithics were found by Comber Consultants and 68 were found by Casey & Lowe during the historic excavation (Figure 3.29). The lithics fell into two categories: artefacts and other lithics (or stone). The distinction between these artefact categories is defined as:

> artefacts are lithic objects that "have a flaked, ground or pitted surface attributable to an action undertaken by Aboriginal people. Other lithic items of the same raw material types as artefacts … such as blocks of unworked stone, heat shatters and fragments which lack diagnostic traits. These lithics are of raw material types not occurring naturally at PS3 and they and/or the materials from which they derive, must have been taken to the site by people. These are items referred to as 'other lithics. Cultural lithics are artefacts and other lithics combined.[54]

A variety of materials were used to make stone tools at the 3PS site, including indurated mudstone, silicified tuff and chert (IMSTC) which is the most commonly occurring raw material within this assemblage, comprising 321 of 617 cultural lithics (52%). Silcrete comprises the second most commonly occurring raw material with 267 of 617 of the total (43.3%). Quartz and silicified wood make up the third most commonly occurring raw material types with 10 each out of 617 cultural lithics (1.6% each); while unidentified raw materials comprise 0.6% of the total (four out of 617); quartzite comprises 0.5% (three out of 617); and chalcedony and sandstone are each represented by two of 617 (0.3% each). The artefact analysis also noted that a there were a total of 76 modern items of mostly glass, ceramic, bone and flint, of which some 'could potentially have been artefacts dating to the early historic/contact period'. And that while some of the glass objects within the assemblage could be artefacts of glass worked by Aboriginal people, microscopic use-wear and residue analysis would need to be undertaken to determine if they are Aboriginal artefacts.[55]

The stone assemblage represented tools and tool-making debitage associated with a complex and use-specific toolkit. Three backed blades, retouched tools, bipolar and platform debitage and seven cores were among the tools found on site. Two of the seven cores recovered were bi-polar silcrete (Figure 3.30). These tool types are suited to open woodland. The larger numbers of cores to backed artefacts suggests that on-site flaking was occurring at 3PS. A trend noted in other sites in Parramatta.

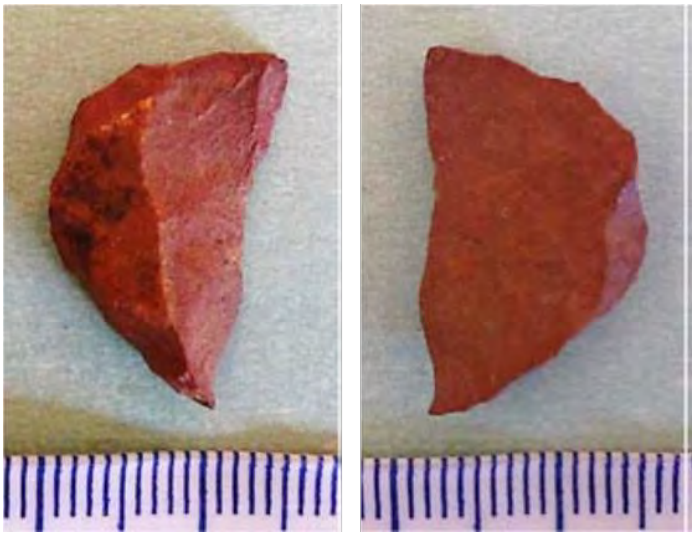

Figure 3.29: Silcrete backed artefact found in a historic context associated with House 4. Scale 1mm and 5mm increments. Comber Consultants 2018: 145 Plate 4.

[54] White 2015:1, in Comber Consultants 2018: 20.

[55] (White 2015:1) in Comber Consultants 2018: 20.

Figure 3.30: Large silcrete bifacial core found in Aboriginal test square P17 spit 5. Scale 1mm and 5mm increments. Comber Consultants 2018: 145 Plate 6.

3.4 PHASE 3: BEGINNINGS OF BRITISH SETTLEMENT & CHANGING THE LANDSCAPE

The first siting by the British, of what became known as Rose Hill, was in April 1788 when Governor Phillip and a party set out to explore the river at the head of the harbour (later Parramatta River) and surrounding land.

> 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 kind of grass just mentioned.[56]

Watkin Tench's report of this party and their findings noted:

> To reward their toils, our adventurers had, however, the pleasure of discovering and traversing an extensive tract of ground, which they had reason to believe, from observations they were enabled to make, capable of producing every thing which a happy soil and genial climate can bring forth. In addition to this flattering appearance, the face of the country is such, as to promise success whenever it shall be cultivated, the trees being a considerable distance from each other, and the intermediate space filled, not with underwood, but a thick rich grass, growing in the utmost luxuriancey.[57]

In September 1788 William Bradley noted:

> but none of considerable extent until near the head of it, from which, along by the flats & creeks it improves & near the fresh water at the top of the creek it is a fine open Country & good soil, to this part which is called Rose Hill & is about 12 Miles above Sydney Cove, it is intended early in the present Month to detach a Capt & Company of Marines with a proportion of Convicts for the purpose of clearing & cultivating that part of the Country.[58]

[56] White 1790: 22 April 1788.

[57] Tench 1979:58.

[58] Bradley, William c.1792 http://adc.library.usyd.edu.au/view?docId=ozlit/xml-main-texts/brajour.xml

On 19 May 1789 Bradley again observed:

> A party from the Sirius to Rose Hill, to which place a Company of Marines & considerable numbers of Convicts had been detached in October last for the purpose of cultivating that part of the Country, their situation is pleasant, the soil good, the Country open & promises much to the success of the Colony; It is 12 miles above Sydney Cove & 4 from the flatts from which a creek runs up Navigable for Barges or Lighters, observing the tides.

On 17 June 1790 the governor wrote to Under Secretary Nepean about his preference for Rose Hill as a settlement over Sydney Cove but circumstances and the need to remove from Botany Bay to Port Jackson did not allow for this choice:

> Had I seen the country near the head of the harbour I might have been induced to have made the settlement there, but we knew nothing of that part of the country until the creek which runs up to Rose Hill was discovered in a journey I made to the westward three months after we landed; and although I was then fully satisfied of the goodness of the soil, and saw the advantages of that situation, most of our stores and provisions were landed, and it required some little time to do away with the general opinion that such a situation could not be healthy, and which I was inclined to think myself until I had examined the country for some miles round, and was satisfied that there was a free circulation of air, in the goodness of which few places equal it.[59]

This visit was important for the decision Phillip made to establish the Rose Hill settlement. These reports from the early voyage present a view of Rose Hill as widely spaced trees, no undergrowth, lot of grass and fertile soil. It was this interpretation through British eyes and the outright failure of farming at Farm Cove and surrounds that saw the focus of farming remove inland to the tract of land that only needed the intermittent tree felled to allow for tilling of the soil and planting of grain to achieve a food supply for a colony quickly growing desperate.

On 3 November 1788, ten months after the arrival of the British at Sydney Cove, a settlement was established at the head of the estuary, modern Parramatta, 16 miles west of Sydney Cove. The soil conditions were considered much better for growing crops than at Farm Cove or Norfolk Island. The first crops at Farm Cove had failed in September 1788 where two attempts at sowing grain were undertaken but with insufficient yield to produce enough seed grain to sow a third crop. By May 1788 they had only sown eight acres of wheat and barley and there were problems caused by ants and field mice. Clearing of ground at Sydney Cove for growing crops was labour intensive and took considerable time away from other important activities.[60] In July 1788 Phillip noted:

> That the regular supply of provisions from England will be absolutely necessary for four or five years, as the crops for two years to come cannot be depended on for more than what will be necessary for seed, and what the Sirius may procure can only be to breed from.[61]

Phillip considered that in July 1788 it would take four years to establish regular cultivation.[62] Among his concerns were rats and other vermin which make the crops 'very uncertain' also there were issues with 'very heavy storms of thunder and lightning' which set trees on fire and killed animals.[63]

[59] HRNSW 1(2):348-49.

[60] Collins 1975, September 1788, p. 33; HRNSW vol 1: 22, 32; Tench 1979:136.

[61] HRA 1:46.

[62] HRNSW 1 (2):63.

[63] HRNSW 1(2):152

By September 1788 it was realised that the 'English wheat had not vegetated and a very considerable quantity of barley and many seeds had rotted in the ground' due to being over heated during the voyage to NSW and some was destroyed by weevil infestation. Weevils had also attacked the barley and wheat brought out on the *Supply*. This required sowing a second crop at Farm Cove in 1788 with seeds intended for the next season. A similar failure happened with the crops on Norfolk Island. The decision to seek new supplies of seed grain was prioritised over livestock, as there was insufficient grain to feed animals which would quickly be slaughtered for food and would therefore provide only a short-term benefit.[64]

Governor Phillip sent the *Sirius* to the Cape of Good Hope to obtain more grain for further crops and also for as much flour as the ship could hold.

> ...we now have not more than a year's bread in store,... On these considerations, but more immediately from the fear of not having grain to put into the ground next year, when we shall have a more considerable quantity of ground to sow, I have thought it necessary to order the *Sirius* to go to the Cape of Good Hope in order to procure grain.[65]

Phillip linked the sailing of the *Sirius* and seeking new seed grain to the establishment of the Rose Hill settlement in a letter to Lord Sydney on 28 September 1788. He saw the proposed clearing of land and farming at Rose Hill as central to his plan for planting a new crop as this land was more likely to provide a better yield then the attempts at Sydney.[66]

Governor Phillip repeated his concerns and the need for new seed grain in late October 1788 to Lord Sydney and noted that he had only one person (Henry Dodd) capable of managing the cultivation of the land and at this time they had 16 acres in public farming, presumably the 'farm' at Farm Cove. Most officers having their own gardens but only to feed themselves and not the wider colony.

3.4.1 PREPARING THE GROUND AT THE ROSE HILL SETTLEMENT

By this time Phillip had determined to locate a new settlement at Rose Hill, to clear land 'near the head of the harbour, where it is a fine open country, having very little timber, and perfectly free from underwood' and to cultivate the ground.[67] Collins noted:

> The soil at this spot was of a stiff clayey nature, free from that rock which every where covered the surface at Sydney Cove, well clothed with timber, and unobstructed by underwood.[68]

This contrasts to the sandy and rocky soil and the difficulty of clearing large gum trees at Sydney, where in September 1788 clearing of 'woods' surrounding Sydney Cove settlement still continued and soldiers and officers were making their own gardens. The colony had wheat (6 acres), barley (8 acres), and other grain (6 acres) growing at Sydney, Farm Cove.[69]

A military redoubt was dug on Rose Hill, to the west of the site and the early settlement was established in the vicinity in November 1788. In January 1789, 250 persons were employed in cultivation. In March it was noted that all people:

[64] HRA 1:72-73, 28 September 1788.

[65] HRA 1:73, Gov. Phillip to Lord Sydney, 28 September 1788.

[66] HRA 1:74, Gov. Phillip to Lord Sydney, 28 September 1788.

[67] Collins 1975, September 1788, p. 33; HRNSW Vol 1: 73-74, 97.

[68] Collins 1975, November 1788, p. 37.

[69] HRA Vol 1: 74.

> At Rose Hill were principally employed in clearing and cultivating land; but the labour of removing the timber off the ground when cut down very much retarded the best efforts of the people so employed.[70]

In late March 1789 Henry Edward Dodd replaced the previous overseer at Rose Hill as Phillip presumably decided the importance of the result at Rose Hill required his most experienced superintendent than the person previously working there.[71]
On 6 May 1789 the *Sirius* returned from its journey to Cape of Good Hope, six months and seven days after it left Sydney Cove. While the *Sirius* returned with 127,000 weight of flour for the settlement, this was only the equivalent of four months of supply for the colony. Among the supplies carried on the *Sirius* were:

- Sixty bushels of seed wheat.
- Twenty bushels of seed barley.
- Ten bushels of Indian corn for seed.
- Twelve baskets of garden seeds.[72]

Tench noted that 'the day of famine was at least procrastinated by the supply of flour and salt provision' transported by the *Sirius*.[73]

The farm buildings occupied by Dodd, the superintendent of public farming at Rose Hill, were completed by July 1789. By July, Dodd was managing the planting of wheat and barley which would soon be deposited in the newly built barn and granary. This is presumably the grain collected by the *Sirius* but Collins oddly does not mention it in his discussion of the return of the *Sirius*. It appears that ground was cleared and tilled between November 1788 and 6 May 1789 and shortly after this it was sown with wheat and barley. By August 1789 the corn was showing promise.[74] The first crops at Rose Hill were harvested in December 1789 and included:

- 200 bushels of wheat.
- c.35 bushels of barley.
- a small quantity of oats.
- Indian corn.

All of this first crop was to be reserved for feed, presumably for animals but it is not stated. At Farm Cove they produced 25 bushels of barley.[75] It was needed to provide seed grain for the next crop.[76] These early crops sowed in Rose Hill in 1789 were said a to produce a 4-fold yield. Re the growing of vegetables Fowell noted that:

> The ground abt. that part is much clearer of wood and the soil much richer than abt. Sidney Cove. Good gardens have been made there, and vegetables grow very fine.[77]

Particularly cabbages, on George III's birthday in 1789, a cabbage weighing 27 pounds (12.3k) was picked to be sent to the governor. Other cabbages weighted 15 to 20 pounds (6.8kg to 9kg). Potatoes did not grow well as this time while melons and pumpkins thrived.[78]

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[70] Collins 1975, March 1789, p. 46.

[71] Collins, 1975, March 1789, p.52.

[72] Collins, 1975, July 1789:54; HRA 1:88, 22 September 1788.

[73] Tench 1979:149.

[74] Collins, 1975, July 1789: 57-60, 67.

[75] Collins 1975:72.

[76] Collins 1975:88, though he noted 300 bushels was reserved for seed this was 100 bushels more than he had previously reported.

[77] HRNSW vol. 1 (2):376, Lieutenant Fowell to his Father, July 31, 1790.

[78] HRNSW vol. 1 (2):376, Lieutenant Fowell to his Father, July 31, 1790.

Shortly after this period the colonies rations were reduced again, perhaps suggesting that the first crop was not adequate in any substantial way and was not designed to feed the colony but to supply more good quality seed grain to raise future crops.
There was a further reduction of rations in October 1789. By January 1790, famine was still seen as approaching the colonists and by March 1790 with no sign of ships from Britain the *Sirius* was to sail to China but in the end travelled to Norfolk Island with marines and 200 convicts. There was a further reduction in rations on 1 April 1790 prior to the news of the wreck of the *Sirius* on Norfolk Island. The working day was shortened to allow convicts to work in their vegetable gardens.

As no solution to food shortages appeared to offer itself the ration was further reduced. The *Supply* soon sailed for Batavia. The attention of all the military and convicts became focused on sourcing local food supplies through hunting, fishing and the like and punishment of stealing food from gardens discontinued. At Rose Hill the garden area was expanded to provide more vegetables for the convicts and it was successful and staved off hunger as late as May 1790. Due to the low rations, labour was reduced but still ground was being prepared for the next season at Rose Hill and Sydney to plant wheat and barley, but reduced amounts were sown.

3.4.2 ARRIVAL OF THE SECOND FLEET & LAYING OUT THE TOWNSHIP

It was into this desperate circumstance that the *Lady Juliana*, a transport ship of the Second Fleet arrived on 3 June 1790 with 222 female convicts and two years of provisions for the colony. On 20 June the *Justinian* arrived, it was the storeship with the Second Fleet. Many of these new convicts were exceedingly ill, on 13 July 1790 there were 488 people in the newly erected portable hospital at Sydney. Even though many of the new convicts were weak, once recovered of their health, they were put to work clearing and preparing more ground for planting at Rose Hill.[79]

The terrace south of the river was cleared of woodland. Although the original purpose of the settlement was purely agricultural, in mid 1790, a decision was made to formally create a town at Rose Hill. The reasons for establishing the township at this time is likely to be associated the need to accommodate the convicts about to arrive on rest of the ships of the Second Fleet. It was not officially named Parramatta until June 1791. Land clearance and British agriculture changed the appearance of the alluvial terraces dramatically, and stripped the area of much of its native vegetation. By 1790, Dodd described the cleared land as 'grand and capacious', remarking that he had not 'seen an opening of such extent for the last three years'.[80]

The new township was laid out on flattish ground previously used for farming along the river. This ground suggests that by July 1790 it was no longer suitable for farming as it was not producing a sufficient yield to grown crops.

Governor Phillip wrote to Lord Sydney about Rose Hill:

> The land is good, and though there is none we can take possession of at present which can be cultivated without clearing the ground of the timber – for if the trees are at the distance of thirty or even fifty feet the roots spread--the labour there, nevertheless, will not exceed the fourth part of what is required in our present situation, and there the land appears to be the best I have seen in this country; and as far as I could examine, which

[79] Tench 1979:158,162, 163-169, 174. Collins 1975:81, 82, 91, 92, 97, April to June 1790; 103.

[80] Tench, W. 1979:196, November 16 1790; Collins 1975:90, June 1790.

> was for a couple of miles around the spot on which I have fixed, I think the country as fine as any I have seen in England.[81]

In July 1790 following the arrival of the Second Fleet, and the restoration of the new convicts to full health, they were employed in clearing new ground at Rose Hill.[82] In a letter to Lord Grenville, 17 June 1790, the governor noted that the 'first township' would be located near Rose Hill. Phillip discussed the need for settlers to farm the land by using James Ruse as an example of an experiment to test what time it would take for a 'settler' to establish private farming with limited assistance from government with only a year of supplies from government. In November 1789 Phillip had:

> ordered a hut to be built in a good situation, an acre of ground to be cleared, and once turned up it was put into the possession of a very industrious convict, who was told if he behaved well he should have 30 acres.[83]

This of course was Experiment Farm.

As noted by Phillip Gidley King in April 1790:

> The Soil is loam, Sand & Clay, & the trees are not so large here as lower down the harbour, but the large roots lying on the Ground renders it difficult to clear.[84]

A letter Governor Phillip wrote to 17 July 1790 provides considerable insight into early public farming, as Phillip responds to concerns from Lord Grenville about how long before the colony would be self-sufficient. Phillip sought to explain 'circumstances which may advance or retard that period'.[85] A key issue was the need to provide provisions for those who make no provision for themselves, the military and civilian officers, convicts working on non-agricultural labour such as building structures and necessary works (brickmakers and carters, carpenters, wood cutters, smithys, building roads and the like), those who were too old or infirm or sick or unable to do hard labour such as women and children.[86]

In July 1790 Governor Phillip noted that the public farm at Rose Hill 'goes on well'. He reiterated to Lord Grenville:

> The land at Rose Hill is very good, and in every respect well calculated for arable and pasture ground, though certainly loaded with timber, the removal of which requires great labour and time; but it is the same with the whole country as far as I have seen, particular spots excepted, and which, as they cannot at present be cultivated by us.[87]

Convict labour was reduced as had to send the 'best men' to Norfolk Island, due to the loss of the *Guardian* and at Rose Hill he was very reliant on Henry Dodd to every 'single bushel of grain into the public granary'. Other people had been trialled to see if they could supervisor the convicts but had failed to either understand the agriculture or manage the convict labour.[88] By July 1790 the convict labour remaining in Rose Hill was on a reduced ration which limited how much more land could be sown. The management of convict labour for public farming at this time was limited to Henry Dodd. For this reason, it was not advisable to set up settlements beyond Rose Hill due to the lack of suitable superintendents and storekeepers to manage provisions as well as convict labour. This

[81] HRNSW vol. 1, part 2:211, Governor Arthur Phillip to Lord Sydney, November 16, 1788.

[82] Tench 1979:174.

[83] HRA Vol 1:183.

[84] Philip Gidley King, fair copy of 'Remarks & Journal kept on the Expedition to form a Colony...',
with additional information, 1786-December 1790; compiled 1790, ML, SLNSW C 115, pp.384–387. Extract is April 1790.

[85] HRNSW vol. 1 (2):359, Governor Phillip to W W Grenville, July 17, 1790.

[86] HRNSW vol. 1 (2):362-64, July 17, 1790.

[87] HRNSW vol. 1 (2):360, Governor Phillip to W W Grenville, July 17, 1790.

[88] HRNSW vol. 1 (2):360, July 17, 1790.

reinforced the focus on cultivation at Rose Hill and the issues with expanding past this area to any great distance.[89]
Phillip observed that the public farm at Rose Hill 'goes on well' and noted:

> The land at Rose Hill is very good, and in every respect well calculated for arable and pasture ground, though certainly loaded with timber, the removal of which requires great labour and time; but it is the same with the whole country as far as I have seen, particular spots excepted, and which, as they cannot at present be cultivated by us.[90]

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It is for this reason he was keen on settlers coming out to the colony rather than convicts with no or little experience of agriculture. They would have the skills necessary to undertake unsupervised farming past Rose Hill. The presence of private farming would also ensure that if there was a failure of the public farming, they would have alternative supplies to support the colony. He reiterated the lack of industry among the convicts and 'many who are helpless and a deadweight on the settlement'. Among the convicts surviving in July 1790 more than 100:

> ...must ever be a burden to the settlement, not being able to do any kind of labour, from old age and chronical diseases of long standing... Such are the people sent from the different gaols and from the hulks, where it is said the healthy and the artificers are retained.[93]

The sending out of 'disordered and helpless' convicts clears the gaols but they are no help to the success of the settlement and are rather a burden to the 'mother country'. The condition of the male convicts sent on the Second Fleet were poor, with very few able-bodied convicts who could provide labour. Even with these conditions for farming Phillip predicted that they would be self-sufficient in flour within two years, except for accidents.[94]

The governor's description of the layout of the Rose Hill township immediately follows this discussion of the Second Fleet convicts. Huts were to be aligned along the main street to accommodate 'the convicts who came out last, and will form a street of one mile in length and two hundred feet in breadth'. The huts would accommodate 10 convicts and have their own gardens to encourage their 'industry'. Generally, the Second Fleet convicts living in the huts behaved well with few depredations other than 'robbing a garden'. After a few years the convicts residing in the Rose Hill huts will move out further to cultivate new land.

[89] HRNSW vol. 1 (2):360, July 17, 1790.
[90] HRNSW vol. 1 (2):360, July 17, 1790.
[91] HRNSW vol. 1 (2):360, July 17, 1790.
[92] HRNSW vol. 1 (2):360, July 17, 1790.
[93] HRNSW vol. 1 (2):361, July 1790.
[94] HRNSW vol. 1 (2):361, July 1790.

It is then that new settlers would 'be glad to build on the ground' currently occupied by the convicts.[95]

There were 90 convicts at Rose Hill on 23 July 1790 making bricks and tiles and transporting them for the new storehouse and who were to start farming in a few days. There were also 19 bricklayers and labourers and 8 carpenters building a store and huts. There were 113 clearing and cultivating ground and five men working the axe.[96] On 25 July there were 260 people (15% of people on the mainland) living in Rose Hill and on the stores. The majority of male and female convicts were in Sydney. The majority were male convicts (179), with 42 females, 27 military and the rest were convict women (42) with their children (6).[97]

Captain Hill, of the nearly arrived NSW Corps, sailed on the *Surprize*, Second Fleet provided some important information on Rose Hill:

> I have been once kangaroo-shooting, and lay in the woods for that purpose; the ground they generally feed on is, apparently very fine, and not quite so woody, and much to be preferred to that which surrounds our settlement [Port Jackson], which is little better than a sandy desert. There can be no doubt that some of this immense tract be free from wood, and has a diversity of soil and country equal to any; yet what we have already seen, even the best, such as the settlement at Rose Hill, that maiden land, will not produce the quantity that is sown after the first year without great quantities of manure, of which all the stock that is in the colony would not make so much as is covenanted to be put on all estate in England of thirty pounds annual value. I have heard (and I beg to remark it only as hearsay, being no politician) that above half a million has been expended already in planting and supporting this colony, and must lament that there are no means used, or even thought of, to remove the burthen from my native country. Had half that sum been laid out in the purchase of cattle this place had now been tenable, and we should have wanted ,very little, if any, assistance from the British Government; we might by this time have established a market, and improved the lands unincumbered with timber, by manure and culture; as it is, two 01' three thousand souls are continued to be fed with salt rations flour and every other necessary- provisions from England neither can it be otherwise till other steps are taken, and even then it will require great time. That is a melancholy truth, and galls on reflection, that so many should be subsisted without making the smallest return, or even a possibility of it while the same measures are pursued by our chief. All here, the officer, soldier, sailor, and convict, have the same ration allowed by the Governor; and to enter no farther into the detail of our miserable existence, I will give you a just account how I am situated, which is preferable to many by my being second captain in the regiment, consequently entitled to a second choice of quarters. Here I am, lying in a miserable thatched hut, without kitchen, without a garden, with an acrimonious blood by my haying been nearly six months at sea, and tho' little better than a1 leper, obliged to live on a scanty pittance of salt provision, without a vegetable, except when a good-natured neighbour robs his own stomach in compassion to me; not a mouthfull of fresh meat to be obtained, and if, rarely, such a thing should present itself, not to be purchase but at an exorbitant price (eighteen pence per lb).[98]
>
> ...I have been misled in the opinion of the land at Rose Hill, and here beg to rectify the mistake. It produces the first year nearly sevenfold, the second year not so much, and the third year rather better than the seed sown; afterwards, by sowing a bushel you may probably reap a quart or two.

By late September 1790 there had been little rain and the wheat for the season was thought to fail. There was a heavy rain at the end of the month, the first since in the last three months. This offered little respite and by October the 'gardens and corn grounds were

[95] HRNSW vol. 1 (2):362-363, July 1790.

[96] HRA Vol 1:198, 17 July 1790

[97] HRA Vol 1:203, 24 July 1790

[98] HRNSW vol. 1 (2):369-370, 26 July 1790, Captain Hill to Samuel Wathen.

again parching for want of moisture'.[99] Still a storehouse was completed in November at Rose Hill to hold the future harvest.[100]

The governor's observations in November 1791 of the failure of crops in 1790 were that:

> Our crops of last year greatly failed us from a long drought, very little rain falling from the beginning of July, 1790, to August, 1791; and the crops now in the ground, although they promise to be much better than we had reason to expect, have suffered very much from the seed having lain so long in the ground before it vegetated.[101]

Between June 1790 and March 1791, the 'brook is greatly reduced, the run is sufficient for any number of people'. The governor thought it was unlikely that 'so dry a season often occurs'. The corn crops had suffered badly from such dry weather but there was still some yield.[102]

This is possibly the first El Niño in the colony since the arrival of the British in January 1788. It is likely Sydney and Parramatta were caught up in an La Niña and El Niño cycle between 1788 and 1791. By 1791 the cycle had flipped to 'a very strong El Niño year'.[103] While the documentary records suggest this type of climate action the scientific evidence is not as clear cut.

Watkin Tench, while touring Parramatta in November 1790 with Henry Dodd and Rev. Richard Johnson, provided a detailed description of the state of public farming, he was guided by two men who knew farming and he also appeared to understand farming as well:

> Our survey commenced on the north side of the river. Dod says he expects this year's crop of wheat and barley from the fifty-five acres [22.3ha] to yield full 400 bushels. Appearances hitherto hardly indicate so much. He says he finds the beginning of May the best time to sow barley, but that it may continue to be sown until August. That sown in May is reaped in December; that of August in January. He sowed his wheat, part in June and part in July. He thinks June the best time, and says that he invariably finds that which is deepest sown, grows strongest and best, even as deep as three inches he has put it in, and found it to answer. T**he wheat sown in June is now turning yellow;** that of July is more backward. He has used only the broad-cast husbandry, and sowed two bushels per acre. T**he plough has never yet been tried here; all the ground is hoed, and** (as Dod confesses) very incompetently turned up. Each convict labourer was obliged to hoe sixteen rods a day, so that in some places the earth was but just scratched over. The ground was left open for some months, to receive benefit from the sun and air; and on that newly cleared the trees were burnt, and the ashes dug in. I do not find that a succession of crops has yet been attempted; surely it would help to meliorate and improve the soil. Dod recommends strongly the culture of potatoes, on a large scale, and says that were they planted even as late as January they would answer, but this I doubt. He is more than ever of opinion that **without a large supply of cattle nothing can be done**. They have not at this time either horse, cow, or sheep here. I asked him how the stock they had was coming on. The fowls he said multiplied exceedingly, but the hogs neither thrived or increased in number, for want of food. He pointed out to us his best wheat, which looks tolerable, and may perhaps yield 13 or 14 bushels per acre. Next came the oats which are in ear, though not more than six inches high: **they will not return as much seed as was sown.** The barley, except one patch in a corner of a field, little better than the oats. Crossed the river and inspected the south side. Found the little patch of wheat at the bottom of the crescent very bad. Proceeded and examined the large field on the ascent to the westward: here are about twenty-five acres [10ha] of wheat, which

[99] Collins 1975:113.

[100] Collins 1975:117.

[101] HRNSW 1(2): 533, 5 November 1791

[102] HRNSW 1(2): 470, 4 March 1791

[103] Gergis, Karoly and Allan 2009:95

> from its appearance we guessed would produce perhaps seven bushels an acre. The next patch to this is in maize, which looks not unpromising; some of the stems are stout, and beginning to throw out large broad leaves, the surest sign of vigour. The view from the top of the wheat field takes in, except a narrow slip, the whole of the cleared land at Rose Hill. From not having before seen an opening of such extent for the last three years, this struck us as grand and capacious. The beautiful diversity of the ground (gentle hill and dale) would certainly be reckoned pretty in any country. Continued our walk, **and crossed the old field, which is intended to form part of the main street of the projected town**. The wheat in this field is rather better, but not much, than in the large field before mentioned. The next field is maize, inferior to what we have seen, but not despicable. An acre [0.4] of maize, at the bottom of the marine garden, is equal in luxuriancy of promise to any I ever saw in any country.[104]

On the 28 January 1791, Henry Dodd, the man who managed the public farming at Rose Hill died. He was replaced by Thomas Clark, a recently arrived superintendent. On the 10 and 11 February the heat was extreme and there were fires in nearby bush. There had been little rain and most creeks were dry. During this hot weather corn had continued to grow well but it was constantly plundered by convicts to feed themselves. Stealing of food was the most common crime during this period of the colony.[105]

By March 1791, the brick and tiled store was completed at Rose Hill and a barrack for 100 men and the officers' barracks was to be finished in May. It was to replace the original one built within the redoubt. They are low level buildings due to the absence of limestone. Clay is used for a mortar but it does not allow walls to be built more than 12 feet (4m) high. The convicts are suitably accommodated in huts. All new convicts are to be sent to Rose Hill rather than Sydney, some will still go to Norfolk Island. There was little rain between June 1790 and March 1791 and the Parramatta River had little water. The British considered such dry weather was unusual and that it caused issues with growing corn. The loss of Henry Dodd meant there was no one suitable to manage farming and the convict labour. Phillip noted:

> I am persuaded that a large body of convicts on the account of Government will not answer any good purpose until the country can support itself.[106]

By April 1791 the reduction of rations was reintroduced. The Indian corn remaining after thefts at Rose Hill was harvested by 6 April. The governor was also seeking to find suitable land for free people or emancipated convicts nearby. An example of this was Phillip Schaeffer, who arrived on the *Guardian* as a superintendent of convicts but due to his poor English was given a grant of land at Rose Hill, as well as two 60-acre grants to two settlers from the *Sirius*. Therefore, by April 1791 Phillip was opening up private farming at Rose Hill as well as expanding public farming.[107] Both of which were essential for the survival of the colony. Tench noted on 1 May 1791:

> Many allotments of ground were parcelled out by the governor to convicts whose periods of transportation were expired, and who voluntarily offered to be com settlers of the colony.[108]

The British government had failed to send out additional suitable persons to superintend public farming at Rose Hill, to replace Dodd, but cultivation of crops continued. They were to sow 213 acres at Rose Hill in 1791 and they had made considerable progress since June

[104] Tench, W. 1979:195, November 16, 1790; Collins, 1975(1):103, July 1790.

[105] Collins 1975:123, 127. 130.

[106] HRA Vol 1:247-48, 4 March 1791; Collins 1975:117

[107] Collins 1975:130-132.; HRNSW 1(2):536.

[108] Tench 1979:222.

1790.[109] This is inconsistent with the dry weather noted earlier in this letter. Though Collins discussed that even though there was little rain and the creeks were drying up the corn was still growing well but was constantly being stolen from fields by the convicts.[110]

The shortness of rations was again noted in May 1791 in the three main settlements and many of the Second Fleet convicts were still struggling with health issues.[111] Two months later, in July 1791 some rain had fallen at Parramatta. A wheat crop was growing and more land was being cleared and sown with Indian corn. Collins states eight huts were built by this time, 140 acres of ground for animal enclosures was ditched and fenced and the trees thinned but some remained to provide shelter from the heat to the livestock. The only ground growing food in Sydney were private gardens and all the convict labour was being used in further extending public faming at Parramatta. Collins repeats the first negative description of comments about the soils at Parramatta, which were not considered good for farming but were much better than those at Sydney Cove, where nothing would grow without manure, not even a brassica. On the 2 June 1791, Governor Phillip renamed the Rose Hill settlement to Parramatta, the name given to it by Aboriginal people.[112]

The ships of the Third Fleet started to arrive on 9 July 1791 and the governor went to Parramatta to ensure there was suitable accommodation to receive the new convicts. The *Matilda* arrived on 1 August 1791:

> Fifty-five of the convicts brought in this ship, selected from the others as farmers or artificers, were sent up to Parramatta.

Due to the short notice of the new arrivals accommodation at Parramatta was 'got up; two tent huts, 100 feet (30.5m) long thatched with grass, were erected'.[113] The governor makes no comment about the suitability of convicts from the *Matilda* for farming but rather that they are unsuitable for hard work and are a burden on the colony. Although the new supplies brought out on the *Matilda* allowed for the increasing the weekly allowance of flour. As more ships arrived the governor was able to raise the ration. Another 100 convicts from the *Atlantic* were sent to Parramatta. Seventy of the convicts from the *Matilda* and *Atlantic* had scurvy.[114]

After the arrival of the Third Fleet the governor and an influx of skilled farmers and artificers was able to establish further private farming as well as:

- 12 convicts, terms expired, were located on separate farms at Prospect Hill, four miles west of Parramatta.
- 15 were placed on lots near the Ponds, two miles northwest of Parramatta.

At Prospect Hill this action resulted in a large group of Aboriginal people attacking a hut. With the addition of new stores, the rations were increased. With the arrival of the *Atlantic* a further 100 convicts were sent to Parramatta. More ground was being opened at Parramatta, about one and a half miles to the north to the south of the creek (Toongabbie). With this new labour it was likely that 40 to 50 further acres of public farming would be opened up and new fields of Indian corn were to be planted under the supervision of Thomas Daveney, one of the governor's free servants.[115]

[109] HRA Vol 1:249, 4 March 1791.

[110] Collins 1975 January, March April 1791, pp.130, 132.

[111] Collins 1975:135

[112] Tench 1979:239.

[113] Collins 1975:139-141, 144.

[114] HRNSW 1(2):596; Collins 1975:145-146.

[115] Collins 1975:144-146. This new land is shown on the 1791 plan as ten huts to the south of Toongabbie Creek.

Once all the ships of the Third Fleet arrived by October 1791 the new convicts included 1695 males, 168 females and nine children. This large number of new arrivals required the governor to send a ship to Bombay to buy additional provisions. By November many of the new convicts were in Parramatta and opening up new ground near to the settlement but there were still key issues of management.

> The great want of a proper person to be charged with the cultivation of the ground has been mentioned in my former letters, and from the consequence the person sent out for that purpose will be of to this colony, I am induced to trespass on your Lordship's patience by repeating what has been already observed in former letters. That it will require not only the good practical farmer, but a man who is calculated for the situation which he will be placed; he will have to direct the labour of a body of convicts, at present about fifteen hundred (very few of whom will feel themselves any ways interested in the success of their labours, or who will ever do more, or better, than what they find absolutely necessary to avoid punishment from the overseers under whose eyes they work; and very few of those overseers will be found men on whom much dependence can be placed); he will be charged with the grain and pulse to be raised for the support of several thousand people, and with all the public live stock, from which, nor from enforcing the labour of the convicts, is he to find any private advantage.[116]

As well,140 acres were enclosed for cattle. In total this was 920 acres of land thinned, cleared and cultivated. While at Parramatta a total of 510 acres of public farming which had been cleared, tilled and sown with crops by December 1791, less than three years after the arrival of the colony.[117] And by November and December 1791 the influx of labour from the Third Fleet convicts saw the ground in cultivation rise to unprecedented amounts (Table 3.5). Yet many of these convicts were a burden on the colony with 288 men dying within seven months of their arrival.[118]

Table 3.5: List of ground in cultivation at Parramatta, November 1791.[119]

Acres	Rods	Perches	hectares	%	Status of public and private farming
351	2	5	142.55	38.2	In maize
44	1	8	18	4.8	In wheat
6	1	30	2.65	0.7	In barley
1	0	0	0.4	0.1	In oats
2	0	3	0.8	0.2	In potatoes
4	2	0	1.86	0.5	Not cultivated; but cleared
4	2	15	1.9	0.5	Crescent mostly planed with vines
6	0	0	2.43	0.7	The Governor's garden partly sewed with maize and wheat
80	0	0	32.4	8.7	Garden ground belonging to individuals
17	0	0	6.9	1.8	Land in cultivation by the N. S. Wales Corps
150	0	0	60.7	16.3	Cleared and sewed with turnips
91	3	2	37.6	10.1	Ground in cultivation by settlers as per return of settlers
28	0	0	11.3	3.0	Ground in cultivation by officers of the civil and military
134	0	0	54	14.5	Enclosed and timber thinned for feeding cattle
918	**11**	**63**	**373.49**		A total of 922.3 acres

[116] HRNSW 1(2): 533, 5 November 1791.

[117] Collins 1975:151-153, 157.

[118] HRNSW 1(2):596.

[119] HRNSW 1(2):539

Phillip was seeking to encourage private settlers to undertake cultivation and expand beyond the areas of Parramatta and by November 1791 he had made 37 grants to private settlers, former marines and emancipated convicts.[120] By December settlers at Parramatta were:

- Settler, later superintendant of Convicts (1), presumably Phillip Schaffer
- Settler, late of marines (8)
- Settlers seamen, late of his Majesty's ship *Sirius* (2)
- Settlers whose sentences of transportation have expired (34).

Making a total of 54 grants made at or near Parramatta to expand farming and illustrates Phillip's intentions to expand cultivation beyond public farming.[121]

During December 1791 'frequent showers of rain which we have had lately gives reason to expect that our Indian corn will be good; and the wheat and barley have turned out better than expected'.[122] Recently arrived convicts working near to Parramatta in February 1792 clearing public ground were in poor health, they had:

> Landed in a weak and sickly state, wore in general a most miserable and emaciated appearance, and numbers of them died daily. The reduced ration by no means contributed to their amendment; the wheat that was raised last year (four hundred and sixty-one bushels) after reserving a sufficiency for seed, was issued to them...[123]

Descriptions of farms by David Burton of nearby private settlers at Prospect Hill noted that the 'land is excellent. Black rich light soil, in depth from fourteen to twenty inches, and for a considerable distance to the southward, westward, and eastward of those settlers the land is very good'. At the Northern Farms where there were four settlers, the excellent ground was 'a fine rich clammy light loam, from fifteen inches to two feet in depth'.[124] To the 15 settlers at The Ponds, and the 17 at the Field of Mars, eight marines and nine settlers, the land was 'a very good light loam of middling depth'. He also noted that different species of red gum trees placed oils in the ground which needed to be 'properly' worked and turned over' of the first crop would fail.[125]

In March 1792, Phillip restated the need for a 'proper person to be charged with the culture of the ground and with the grain which is raised'.[126] Therefore he was still reliant on a few individuals for public farming. The wheat grown in 1791, 400 bushels, was issued to the people and the wheat grown in 1791, 500 bushels, and 70 bushels of barley were kept for seed. The hours of convicts working on clearing and cultivation were 5am to 9am and then 4pm to 5.30pm, 5.5 hrs a day. They were under a reduced ration and did not have appropriate mills to efficiently grind grain for flour. Due to this reduced ration weakness of the convicts', little labour was undertaken. Yet Phillip was expecting to sow 900 acres of maize and wheat in 1792. But complained how much maize was stolen by convicts in the last crop but still expected to produce more than 5000 bushels. The recently arrived Major Grose, to take control of the NSW Corps, deceived himself that it would only take one shipment of corn and black cattle to fix the settlement and 'all difficulties would be over'.[127]

[120] HRNSW 1(2):540-541.
[121] HRNSW 1(2):571.
[122] HRNSW 1(2):570.
[123] Collins 1975:167.
[124] HRNSW 1(2):599.
[125] HRNSW 1(2):599-600.
[126] HRNSW 1(2):595.
[127] HRNSW 1(2):598, 610-611.

There were heavy storms between 9 and 13 April 1792 which damaged the Parramatta huts and left some stranded by flood waters. Most of the cleared ground was flooded and any remaining corn awaiting harvest was beaten down. The huts at Parramatta were repaired by the bricklayers. The ration was reduced on 13 April. Once the flood waters cleared the convict labour focused on harvesting the maize (May) and putting it into the stores and preparing ground for the next years grain. The convicts were also building the hospital and the Town Hall and marketplace where people could sell goods. It was a way of trying to stop selling of stolen goods. In May 1792 with the reduced rations and poor health of many recent convicts lead to stealing of approximately one-sixth of the Indian corn crop. The convicts harvesting the corn found 'immense piles of husks and stalks concealed in the midst' of standing corns. It was shelled and taken away to consume or sell. This was a serious issue in a time of short supplies. Maize or corn had become the key part of the convict ration and it was being hand ground in hand-mills and querns to provide it to all residents in Sydney and Parramatta. A further technique at Parramatta was a wooden mortar with a lever and pestle to break the corn and these pounded it much finer than the hand mills but required much labour. The new ration ordered by the British government was less than that issued two years earlier.

The reasons for the lack of stores in April/May 1792, other than increasing number of convicts and many ill ones unable to labour to produce grain, appears to revolve around a drought in the season prior to May 1792 – presumably the September to March 1791/92 period. Yes, some of the private farms near Parramatta had good crops and were able to take themselves off the stores. For example, Phillip Schaffer on his small grant grew 200 bushels of corn in c. April 1792 and with the aid of four convicts expected to plan 30 acres the next season. The majority of the settlers were doing very well and expected to be off the stores soon, during which time they had been on the same reduced rations as the convicts. It was also suspected that Aboriginal people were stealing corn from the grounds beyond Parramatta. By late June all the corn was harvested and in the Parramatta stores.[128]

By October 1792 Phillip reported that there was a successful crop, even though they had a long drought. Maize, 4844.5 bushels was grown, with 2649.5 bushels issued as bread, 695 bushels reserved for seed and other purposes and 1500 bushels were stolen from fields. By this time 1000 acres was in cultivation, 800 in maize and the rest in wheat and barley, at Parramatta and the new settlement of Toongabbie, three miles to the west. The assessment of ground at Toongabbie was that it was 'good and in the neighbourhood of this place there are several thousand acres of exceeding good ground'. Settlers had opened up 416 acres and 97 acres more was being cleared. Yet there were still issues such as a grub, dry weather or fire.[129] By October 1792 there were 66 private farms at and near Parramatta, including the assistant surgeon Thomas Arndell.[130] The population in Sydney (1161) was considerably smaller than in Parramatta (1906).[131]

By January 1793 the colony was again in drought and there were concerns the crops would fail.[132] By September 1793 the public crop of Indian corn had failed and the 'settlers from convicts' were able to supply the stores with corn but their was expectations were that the wheat crop would survive.[133] By October, Grose thought that there would be sufficient

[128] Collins 1975:172-173, 175-177, 178.

[129] HRNSW 1(2):645-646.

[130] HRNSW 1(2):661

[131] HRNSW 1(2):677

[132] HRA 1:414.

[133] HRA 1:447-448.

crops produced from both public and private farming.[134] By July 1794 Grose was praising the farms on the Hawkesbury:

> The settlers placed on the banks of the Hawkesbury area doing well, their farms having at this time all the appearance of most luxuriant crops. The overflowing of the river, so very much apprehended, and on which account the settlers did not wish to be placed there, appears to be without foundation. This is universally acknowledged to be the most rainy season that has ever been experienced in the colony... [135]

3.4.3 PHASE 3.1: GOVERNMENT FARMING & LAND CLEARANCE

Before land could be cultivated for agriculture, the bush and trees had to be cleared. Initial land clearance was difficult due to the unanticipated extent of the roots and the absence of horses or cattle to aid in the removal of the trees or their roots from the ground, as well as the hardness of the trees which were difficult to cut with the tools brought out in the First Fleet.[136] The intensive labour required to carry out the task meant that new land was unlikely to have been opened up unless necessary, and the area across Parramatta Square site may not have been cleared until it was required for agriculture. This probably did not happen until the soils at the first locations became exhausted and new areas were sought to be cultivated.

By 1791 the area was noted on plan as being 'ground in cultivation' as part of the government or public farming in Rose Hill (Figure 2.2). The site was cleared by c.1789 and a crop of grain was planted by mid-1790 and possibly a second one in 1790/1791. There was unlikely to be any further planting of the site by government after this time. Therefore by c.1791. By c.1809 an Evans' painting shows the main High (George) Street with vegetable gardens within each of the privately occupied and fenced lots, former convict huts. Timber fencing outlines the original boundaries of the convict huts, 100 feet by 200 feet (30m x 60m) allotments. It also shows some unusual diagonal lines formed with timber slabs which are shorter than the surrounding fencelines. These are thought to be early attempts at straightening the creeklines and or capturing and managing ground water during seasonal rain. These are thought to provide a model for interpreting the timber barrier found beneath the c.1840 Town Drain. Principal Surgeon Darcy Wentworth's 'Woodhouse' and grounds is shown in the background right, with an orchard, his grant formed the southern boundary of 3PS (Figures 2.5, Figure 3.31).

[134] HRA 1:454.

[135] HRA 1:479.

[136] Collins, D. 1975, vol 1, p. 46, 14th February 1789.

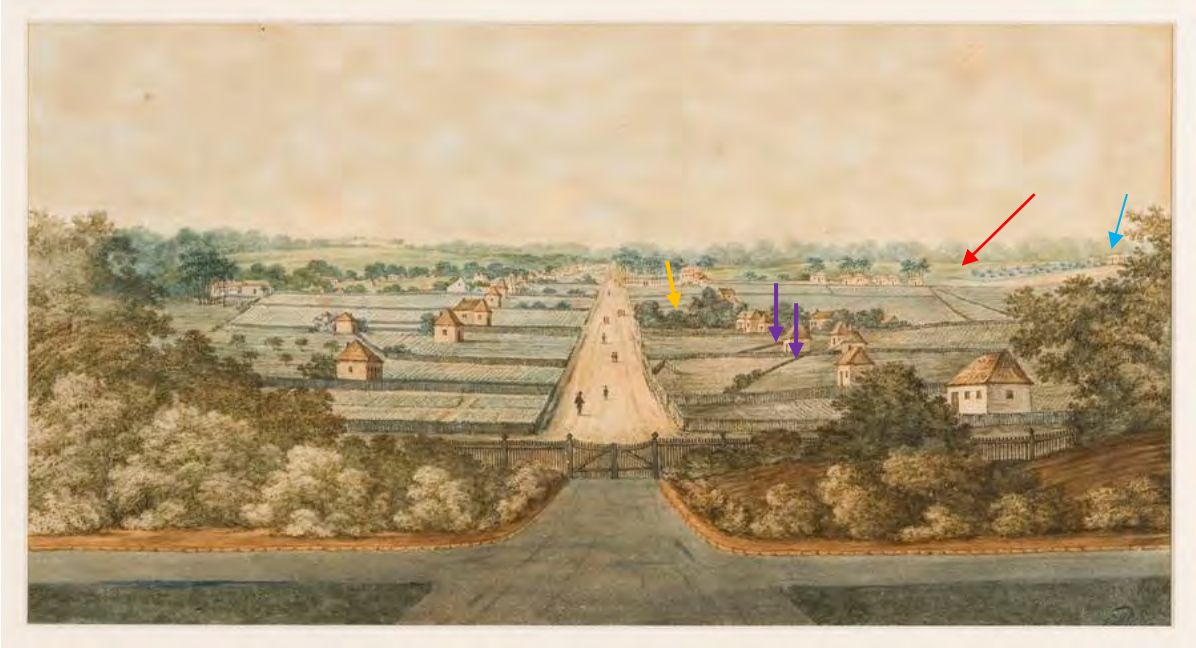

Figure 3.31: Diagonal fence lines with shrubs may indicate the presence of drainage channels or creeklines on the southern side of George Street (purple arrows). This is similar to the formalising of the drainage channel in 3PS with a timber barrier before the stone Town Drain was built. Darcy Wentworth's land, immediately south of 3PS is shown (blue arrow). The approximate location of the study area is arrowed in red. Evans c.1809, Sydney Living Museums Picture Collection, Museum of Sydney MOS2007/15.

Figure 3.32: Detail from Figure 3.31 showing diagonal lines formed with timber slabs which are shorter than the surrounding fencelines. These are thought to be early attempts at straightening the creeklines. These closely correspond to the timber barrier found beneath the c.1840 Town Drain. Caroline Simpson Collection, Sydney Living Museums Picture Collection, Museum of Sydney MOS2007/15.

3.4.3.1 HISTORIC BACKGROUND

The second area to be opened up by the British for agriculture was Rose Hill (later Parramatta) in November 1788 and it included the area of present-day George and Macquarie streets. The township was laid out in July 1790 on land once used for public farm as part of the Government Farm. On 12 November 1790 Watkin Tench and Henry Edward Dodd, who ran the Government Farm, were inspecting Rose Hill and Tench noted they 'crossed the old field, which is intended to form part of the main street of the projected

town'.[137] This may have coincided with the opening up of the area around the study area, south of the old fields. In November 1790, Watkin Tench noted that the 'plough had never yet been tried' and the amount of ground that each convict had to turn over by hand meant that it was 'just scratched over'.[138] The use of the plough is also commented upon by Tench in the earlier 'Narrative of the Expedition to Botany Bay', where he said that a potential emigrant should:

> provide all his wearing apparel for himself, family, and servants; his furniture, tools of every kind, and implements of husbandry (among which a plough need not be included, as we make use of the hoe), for he will touch at no place where they can be purchased to advantage.[139]

The township was set on land previously used for growing crops but which was quickly exhausted due to the want of manures and the inability to break up the soil adequately in the absence of oxen or horses to pull a plough. It is to be noted that at least six ploughs and harness for both oxen and horses were listed as part of the supplies brought out on the First Fleet.

According to a letter 26 August 1786, Steele asked the Navy Board to supply 'tools and implements of agriculture'.[140] Each of the male convicts and the marines were to be equipped with: 1 spade, 1 shovel, 1 grubbing hoe, 1 West India hoe, 1 garden hoe, 1 felling axe, 1 hatchet, 1 knife, gimblets (*aka* gimlets – a tool for boring holes) and wooden bowls, platters and spoons. Communal tools included: saws, adzes, broad axes, augers, chisels, planes., files, forges, bellows and anvils, grindstones, wheelbarrows, iron mills, plough, cooper's tools, nails, hinges, locks, bar iron, steel, glass, fishing lines, etc.[141] This list was then modified by Charles Middleton who drew up a second list which specified that ploughs and plough harness for six horses and six oxen were to be supplied.[142] It is not indicated which type of ploughs were sent.

Emancipated convicts were encouraged to become settlers. As an incentive to undertake cultivation, land would be granted to those who managed to cultivate for five years or more, tax free for ten years. In writing of his journey to Rose Hill, Watkin Tench described an example of non-government cultivation undertaken by emancipist James Ruse.

> My land I prepared thus: having burnt the fallen timber off the ground, I dug in the ashes, and then hoed it up, never doing more than 8 or perhaps 9 rods in a day, by which means, it was not like the government farm just scratched over, but properly done; then I clod-moulded it, and dug in the grass and weeds: - this I think almost equal to ploughing. I then let it lie as long as I could, exposed to sun and air: and just before I sowed my seed, I turned it all up afresh.[143]

Ruse also bemoaned the lack of cattle manure, when describing the quality of the soil of his farm he said:

> I will be bound to make it do with the aid of manure, but without cattle it will fail.[144]

Tench describing a settlement at Prospect Hill:

[137] Tench,1979 November 16 1790: 196.

[138] Tench, W. 1979. 194.

[139] Tench, W. 1788

[140] Frost, A. 2011:104 Letter from Steele to Navy Board 26 august 1786 ADM OT.

[141] Frost, A. 2011:105.

[142] Thompson to Harrison, Gordon and Stanley, 13 September 1786, USNA, Record group 45/446, in Frost 2011:105.

[143] Tench, W. 1790.

[144] Tench, W. 1790:198.

> To clear and cultivate the land, a hatchet, a tomahawk, two hoes, a spade and a shovel, are given to each person, whether man or woman; and a certain number of cross-cut saws among the whole.[145]

By 1791 the livestock on the government farm included:

> two stallions, six mares, and two colts; besides sixteen cows, two cow-calves, and one bull-calf, which were brought out by the *Gorgon*. Two bulls which were on board died on the passage, so that on the young gentleman just mentioned depends the stocking of the colony.[146]

Brambila's 1793 drawing depicts convicts pulling carts with passengers, highlighting the lack of draught animals at that time in Parramatta (Figure 3.33). Collins noted in January 1792 that convicts were pulling carts full of bricks. By 1798 when Collins wrote his account of the colony, he notes that 'cattle are prolific'.[147]

Figure 3.33: One of Fernando Brambila two drawings of Parramatta in 1793, shows stands of remnant native trees encircling the settlement and cleared areas surrounding the convict huts in cultivation. The scene also shows passenger carts being hauled by convicts, highlighting the lack of draught animals available in the colony. Held in the Museo Naval, Madrid (ref. no. Ms 1723-24).[148]

The c.1809 Evans painting shows the study area as cleared with an orchard of evenly placed trees planted on the Wentworth estate to the south (Figure 3.13). The fields shown in the foreground are planted, but mostly with vegetables and a few orchard trees. The study area is in the distance and not detailed, it cannot be determined whether it was planted at this time but it is probably unlikely due to the shift of public farming westwards.

[145] Tench, W. 1791:251.

[146] Tench, W. 1791:248.

[147] Collins, D. 1798: preface; 165.

[148] 'Vista de la Colonia Inglesa de Sydney en la Nueva Gales Meridional', Fernando Brambila 1793, pen ink and wash.

The methods for tilling the soil for agriculture was initially through the use of the hoe as documented by colonial observers. Evidence is also found in the archaeological record, where hoe marks are often revealed cutting into the subsoil. These appear as darker topsoil filling triangular dimples in the pale subsoil. Although documentary evidence suggest ploughs were part of the supplies for the First Fleet, they were not used at Parramatta in the first phases of cultivation. This may have been because when the land was cleared the stumps of larger trees such as mature eucalypts were left in the ground as the tree stumps and associated roots were difficult to remove (grub) and it was easier to hoe around them (Figure 3.34).[149] Or it could be due to the scarcity of draught animals which meant that the plough would need to be dragged by manual labour, although in the case of Parramatta, convicts could provide such labour.

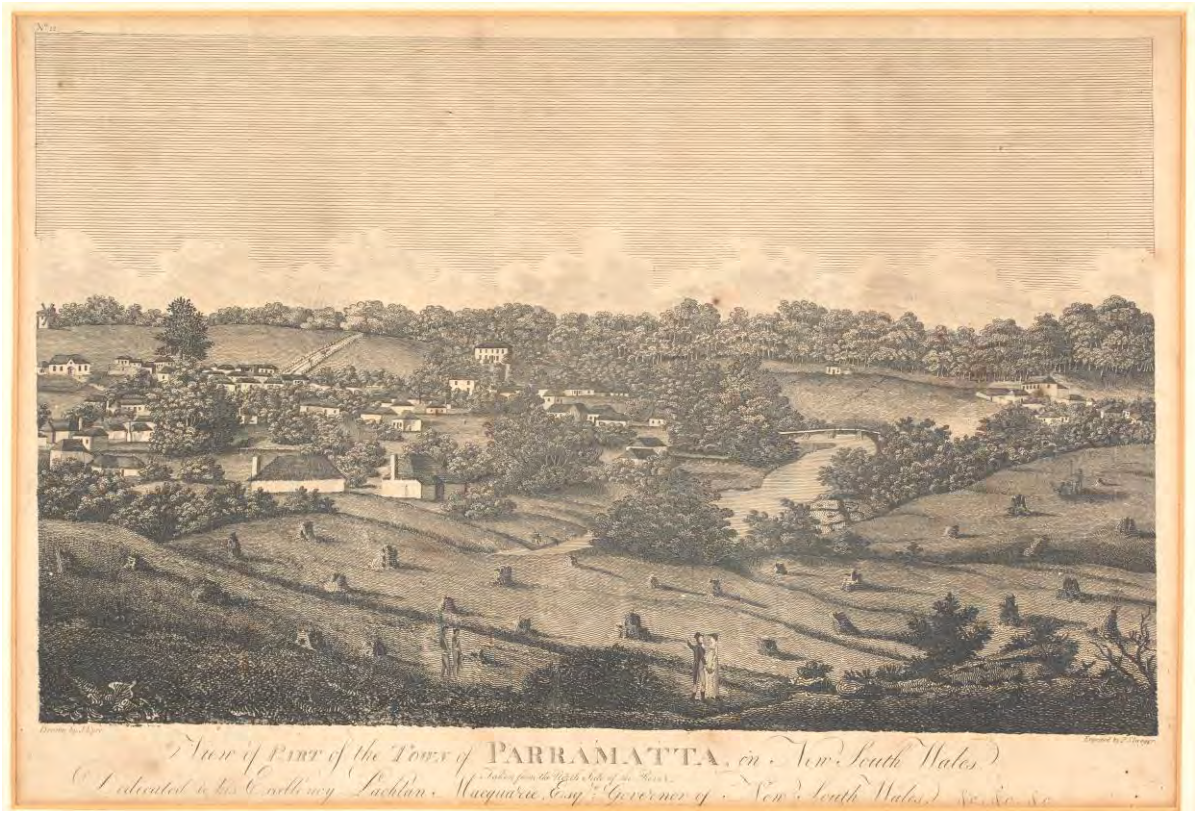

Figure 3.34: 1812 view showing stumps of trees in an otherwise cleared field. J Eyre engraving c.1812, 'View of part of the town of Parramatta in New South Wales taken from the north side of the river'. SV1B/Parr/10.

3.4.3.2 HISTORIC TOPSOIL

There was only limited evidence for land clearance or tree removal found within the study area. There was one patch of burnt (pink-orange) subsoil caused by land clearance or the burning and removal of tree roots and stumps in the rear of Lot 30 and a burnt-out tree bole to the north (Figure 3.37).

However, a section of well-preserved historic topsoil buried below the early cottage was a significant find (Figure 3.35, Figure 3.36 soil samples #140, 141, 142). Soil analysis showed the remnant topsoil had such a low phosphorus content (Colwell P 6.3 mg/kg, total P 80

[149] As this is a lithograph it is a representation of what the countryside may have looked like. We have not been able to locate the original images this lithograph is based on.

mg/kg) that it would only have provided enough Phosphorous in the soil to allow for the growing of two or three wheat crops, at a low yield of 13-14 bushels/acre, without adding manure.[150] Unless more phosphorus could be applied by adding manure, a wheat or maize paddock would then only be suitable for grazing. A new area of soil would need to be cleared for future crops. Therefore, the chemical makeup of the original pre-1790 topsoil and its low yield capabilities would have prompted the colonists to clear more land and allow for the reuse of the depleted original cultivated areas for grazing or establishing a new town. Residues leached from the ash within the sandy levelling fill (16193) above, appear to have also boosted the calcium level in the otherwise undisturbed historic topsoil underneath. As this topsoil was present when the first phase of residential development was started it will be discussed further in Phase 4.1.

Figure 3.35: Buried topsoil (16224) in TT17 beneath levelling fill which covered the footprint of the House 4. View to east, scale 500mm. IMG_4011.

[150] Lawrie 2019, Vol. 3, Sec. 8.6: 21.

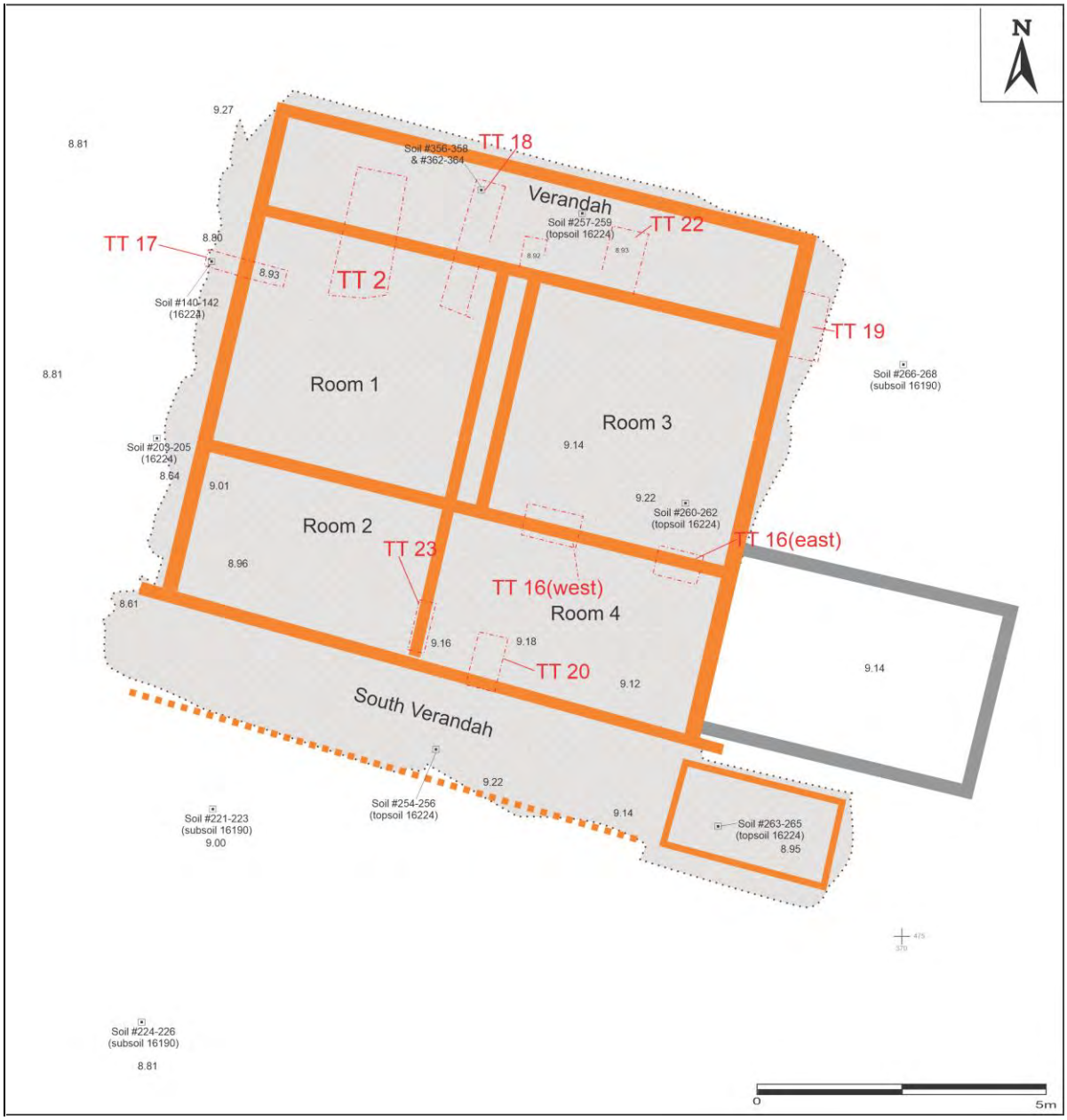

Figure 3.36: Schematic plan showing the location of remnant topsoil (16224) below the footprint of the c.1822 cottage (House 4). Extract from Plan 25.2, Volume 4, Section 10.

3.4.3.3 BURNT TREE BOLE

There was limited evidence for any specific land-clearance. A single patch of burnt clay and charcoal from a tree bole in Lot 30 might be associated with this early phase. After the machine excavation of the historic topsoil below House 3 Room 1, a 900mm wide oval or circular patch of orange burnt clay with a linear burnt root (16592) was uncovered in the subsoil 16465 (Figure 3.37). This feature is the characteristic remains of a tree bole destroyed by burning; either through deliberate land-clearance, or as a result of controlled or uncontrolled fires prior to 1788. Samples for environmental analysis were taken from this feature.

The finding of a single burnt tree bole presents a strong contrast to 15 Macquarie Street, Parramatta where the remains of 17 tree boles were found in an area close to a creekline and approximately 500m to the west of 3PS.

Figure 3.37: Burnt clay (bright orange) and line of charcoal tree root from the burnt tree bole (16592) in the top of the subsoil (16465). View to west, 1m scale. DSC_9107.

3.4.3.4 EVIDENCE OF EARLY AGRICULTURE – GOVERNMENT FARMING

3.4.3.4.1 LOT 30 AND HOE MARKS

Among the earliest historical archaeological findings in Lot 30 was the evidence of hoe marks. These are a frequent indicator for early agricultural activities, at 3PS these pre-dated House 4 (c.1822) Phase 4.1. Close to the western limit of excavation of Lot 30, a series of marks made by digging a hoe through the topsoil into the subsoil were exposed in the subsoil below three furrows indicating early tillage or cultivation took place in this area (Figure 3.38, Figure 3.39, Vol. 4, Sec. 10, Plan 7.2). The tool marks were a collection of shallow, roughly ovoid and triangular-shaped cuts created by a hoe or spade. Their greatest length was no more than 300mm. They were filled with a grey-brown silty clay, the lower margin of modified topsoil (16318). They were visible, once the historic topsoil was stripped back, as dark marks cutting the pale subsoil.

A number of small linear or half-moon shaped hoe or spade marks were also noted in the central eastern yard zone of Lot 30 once the topsoil was stripped (Figure 3.40). The clearest marks were a cluster of 15 small sub-rectangular and half-moon shaped marks (16834). The marks measured between 100-150mm long x 40-60mm wide and had a maximum surviving depth of 30mm (Figure 3.41). Pollen analysis showed that the sample yielded abundant organic detritus but only low numbers of fossil miospores. The fossil miospores were wholly 'dominated' by fungal spores and casuarina pollen (*Allocasuarina/Casuarina*) but include significant numbers of hornwort spores (*Phaeoceros*) and the egg cases of unidentified soil microfauna plus trace numbers of eucalypt and pollen and fern spores.

Figure 3.38: Orthophoto showing hoe marks, regularly shaped dimples made by a person wielding a hoe to breakup and turnover the topsoil by breaking up the ground. This action causes the deeper marks into the subsoil to be back filled with darker topsoil, found in the rear yard of House 4.

Figure 3.39: Detail of hoe marks cut into the subsoil and filled with topsoil.

The presence of exotic dandelion pollen (Liguliflorae), soil infilling the hoe marks suggests that they date to after the original c.1789/90s land clearance and the beginnings of government farming at Rose Hill. *Cloacasporites* indicates the area was being used as a de facto latrine around this time or that human sewage was being used as fertilizer (Vol. 3. Sec 8.5). Pollen analysis of soil from the hoe marks are characterized in Table 3.6.

Table 3.6:Characterised pollen sample from hoe marks.

Sample # 218 (3)	Description
Abundant taxa	Fungal spores, *Phaeoceros*
Common taxa:	*Allocasuarina/Casuarina*
Frequent taxa:	*Phaeoceros*
Exotics:	Liguliflorae
Edible taxa	
Sewage:	*Cloacasporites* (1 specimen)
Microfauna:	egg cases (17 specimens)

Figure 3.40: Agricultural or hoe marks (arrowed) in the northern part of Lot 30 below House 3 (Aboriginal test pit N13). View to west, 500mm scale. IMG_0295.

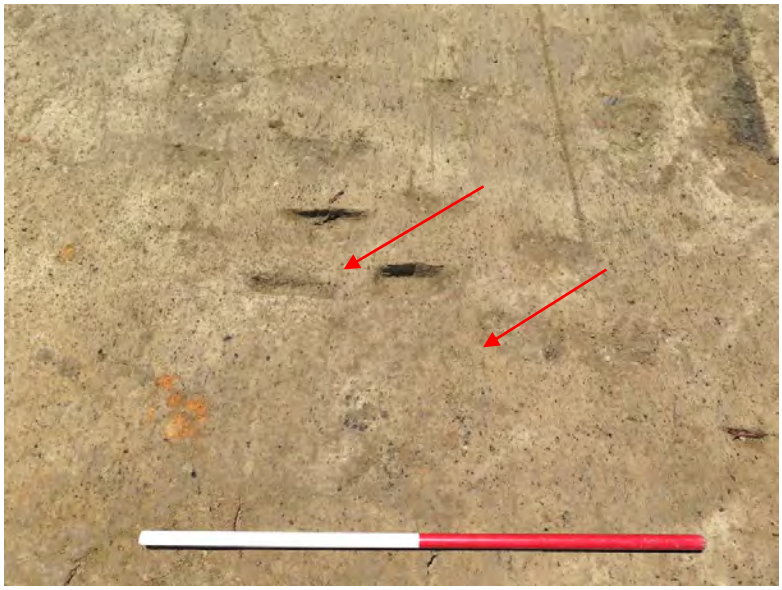

Figure 3.41: Tool or hoe marks (16834) with three excavated to show how shallow they are. View to north, 1m scale. IMG_3163.

Similar agricultural marks have been found on other historic sites in Parramatta, including associated with an early convict hut within the Parramatta Justice Precinct and within the site of 101 George Street Parramatta. The hoe marks associated with the convict hut are standard and represent a pattern of repeated actions, produced by making deeper marks in the ground with each rise and fall of the hoe (Figure 3.42). At 101 George Street, there was a large patch of well-defined hoe marks near the back of a later hotel (Figure 3.43).

Figure 3.42: Hoe marks associated with an early convict hut along Marsden Street, the Colonial Hospital Site, Parramatta Justice Precinct. View to south, 5/07/2005, 1m scale, Casey & Lowe.

Figure 3.43: A strong pattern of hoe marks was found at 101 George Street Parramatta, excavated in 2005 by Cultural Resources Management. Progress Report 7 and 8. 2m scale.

3.4.3.4.2 LOT 32

The western strip of Lot 32 within the study area did not contain any evidence for early agriculture, such as hoe marks. The presence of a 'garden' in the 1819 sale notice suggests that Maughan, the early lease, cleared the land and planted a kitchen or market-style garden for personal use, rather than undertaking large-scale ploughing or single crop planting events.[151] Maughan's house was already standing by this time, located on the northeastern side of the allotment (Figure 2.9). The section of Lot 32 within the study area was the western most strip of his garden, approximately 6m wide.

3.4.4 PHASE 3.2: LAND MODIFICATION AND EARLY USES

Under the administration of Governor Macquarie public works in Parramatta involved construction of a drain (1815) from George Street to the river (northern section of the Town Drain) with other drains constructed to allow land to be drained and made more suitable for building.[152] The most well-known example is the brick oviform drain from George Street north across Phillip Street to the Parramatta River. Previously this section of the drain was dated c.1820 but new research indicates that the government was contracting Mr Rowland Hassall to make 'a drain and tunnel from George Street to the River at Parramatta' as early as 1815.[153] The section of box drain within the study area was not part of this early government infrastructure.

Prior to these public works it is probable that natural creek and drainage lines were formalized or retained by channelization to straighten them. An example of this practice can be seen on c.1809 Evans' painting where low-lying timber fencing or barriers are shown running diagonally across the fields in narrow gullies (Figure 3.31, Figure 3.32). The two barriers arrowed to the south of High Street (George Street) may represent a formalization of two watercourses indicated on the plan of 1804 (Figure 3.44). At 3PS, a timber barrier found within a natural drainage channel is considered to represent a similar feature to the timber fences or barriers depicted in Evans' painting.

The northern end of the 3PS study area was significantly lower than to the south and the northwest corner of Lot 30 and Lot 28 were particularly low lying by up to 2m (Figure 3.6). There were a number of natural drainage line crossing the site from the southwest and south into the northwest corner as discussed in Phase 1.

The Parramatta Town Drain is an historic stormwater drain, commonly referred to as the 'Parramatta Town Drain', but also known as the 'Convict drain' that extends from the corner of Darcy and Church Street, through Civic Place, across Macquarie Street and on to the Parramatta River. The entire route is best shown on various stormwater maps prepared by the Parramatta City Council Engineering Department during the 20th century, and its known state of preservation is shown schematically below (Figure 3.45). The drain, constructed in sandstone is a box drain at its southwestern end, and sandstock oviform brick drain to the north elsewhere in Parramatta, passed diagonally across Lot 28/Leigh Place and diagonally cut through 8PS to the south. The portion of the drain uncovered during the current excavations was constructed in stone in c.1840. The archaeological program found a previously unknown aspect of the Town Drain, an ironbark split slab timber barrier precursor found below and long the western side of the Town Drain within Leigh Place. We think this was intended to as an attempt to both straighten the channel and then retain and redirect water to the east of the timber barrier.

[151] *Sydney Gazette*, 20 Nov. 1819, p 2.

[152] Kass 2009: 19.

[153] *Sydney Gazette* 22 April 1815; 2a

A long segment of the Town Drain (15.5m (51 ft) segment) was exposed and removed within Leigh Place during the archaeological program. When the drain was removed it was found to have been built within an existing creekline. This natural drainage feature was probably quite narrow and represented a seasonal drainage line carrying water from higher ground in the south, downslope and northwards towards the river – the bottom of the catchment. There is no depiction of this feature on the 1804 plan which suggests that it was either not identified by this time or that it was far less substantial than those depicted to the northwest of the site (Figure 3.44). It is also possible that it was not considered to warrant survey and planning as it was generally outside of the main areas of early occupation and therefore may not be considered important to denote on early plans.

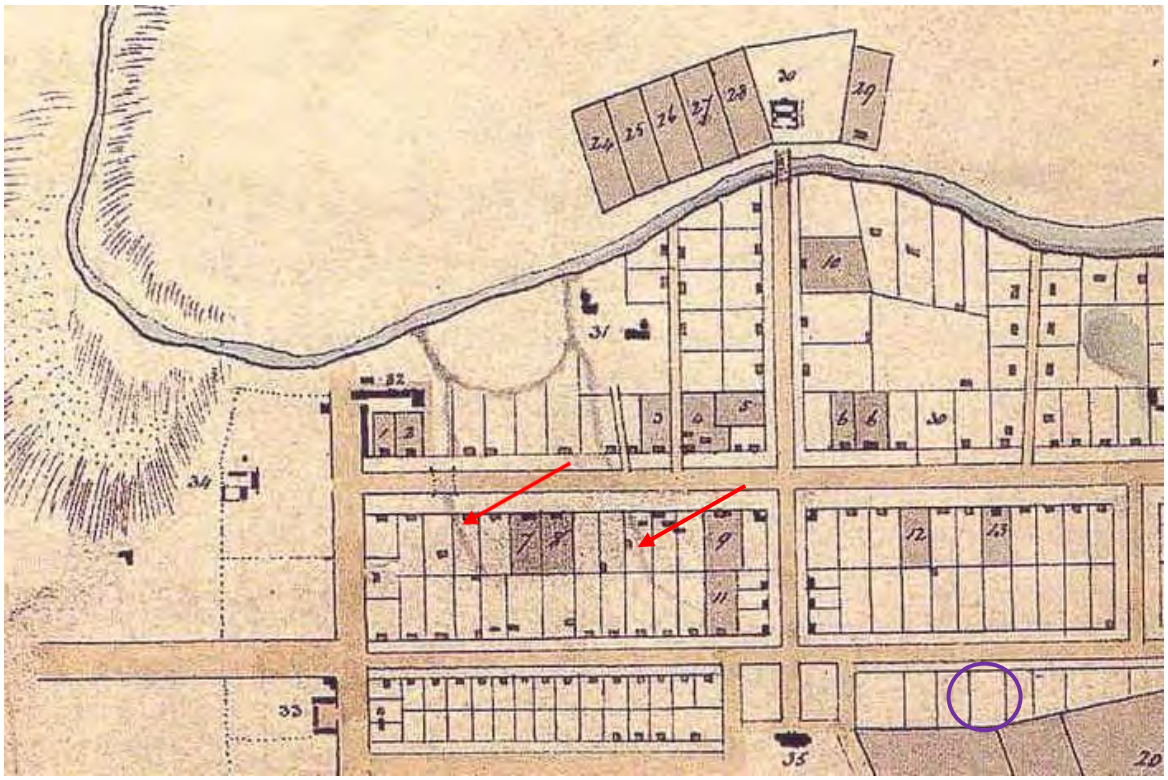

Figure 3.44: Detail of 1804 plan showing creeklines running northwest to the river arrowed in red. The study area is circled in purple. The survey for the plan was undertaken by Meehan in 1804 and not produced until 1813. Evans, Acting Surveyor, Sydney, 1804.TNA (UK) CO/700/New South Wales No.22. Evans' plan of Parramatta, drawing of survey by Meehan, 1804.

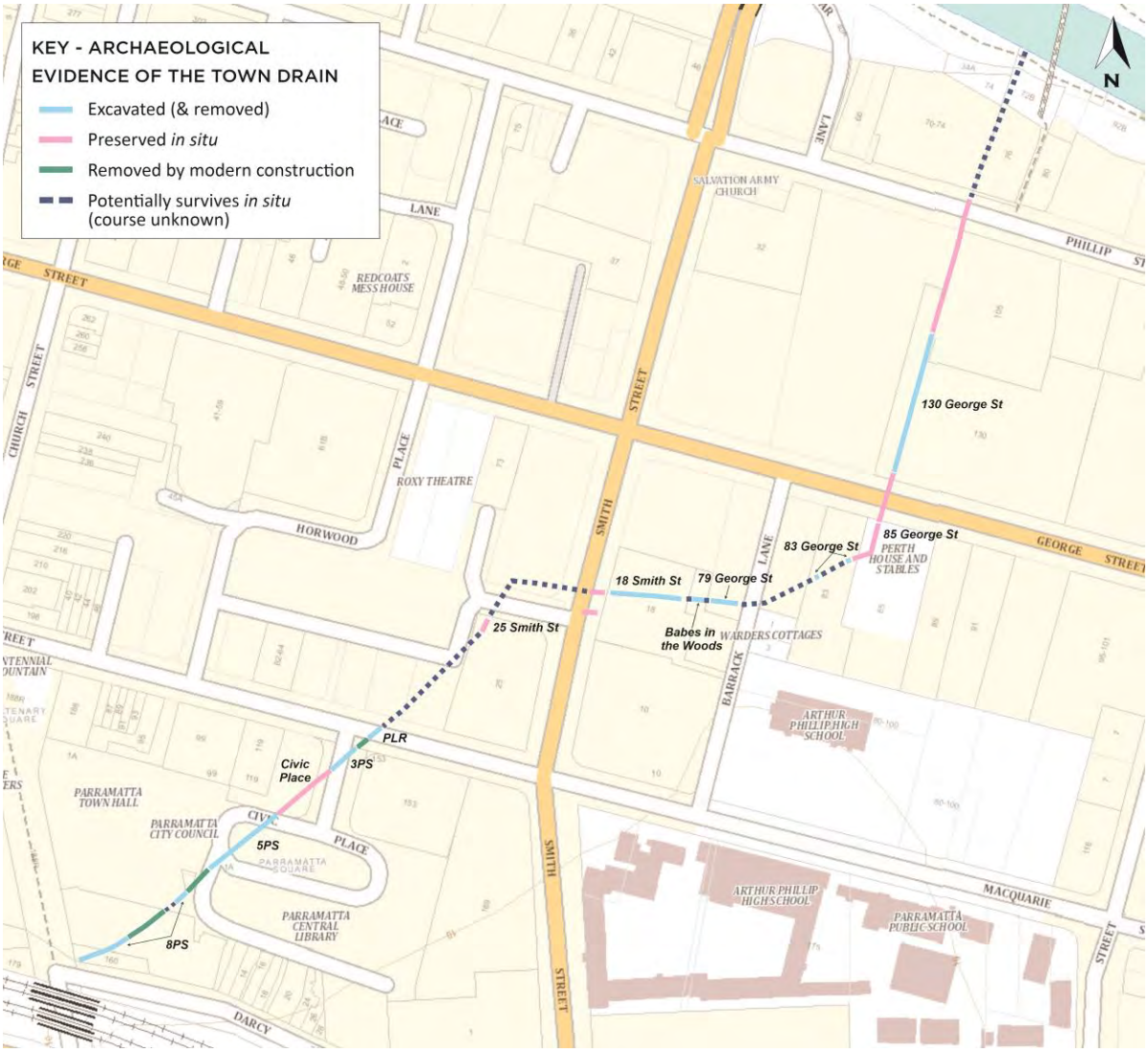

Figure 3.45: Plan showing the entire route of the Town Drain and its state of preservation (2016). Casey & Lowe annotation over SIX Maps.

3.4.4.1 THE FORMALISED CHANNEL

A timber barrier or shoring (17853) was found within the seasonal creekline (Figure 3.46). Due to the later impacts from the drain only parts of this survive. The channel was recorded at the base of a larger trench cut (17831) for the construction of the Town Drain, to be discussed in Phase 4. The channel or creekline existing in 1788 was created through natural processes, where the course of seasonal water draining downslope carved out the underlying subsoil and the flowing water deposited the grey silt within the channel.

The base of the channel was filled with the water-logged silty clay alluvial sediment (17852), into which a series of upright ironbark timber slabs, 17853, were embedded (Figure 3.47). The row of upright slabs, were embedded on the western side of the creekline forming a barrier for water to flow to the west. This barrier shows that the creekline was being manipulated or formalised before the stone drain was built, possibly by as much as 20 to 30 years.

A deep deposit of the grey silty clay built up within the channel on the eastern side of the barrier, whereas there was a thick layer of sandstone rubble mixed with yellow sandy clay

(17857) packed up against the western side. Therefore, the barrier was reinforced on its western side perhaps protecting the edge of the creek from erosion and the creek sediment had built up against it within the channel. There was no evidence for any form of timber barrier on the eastern side of the channel and no timbers at the base of the channel.

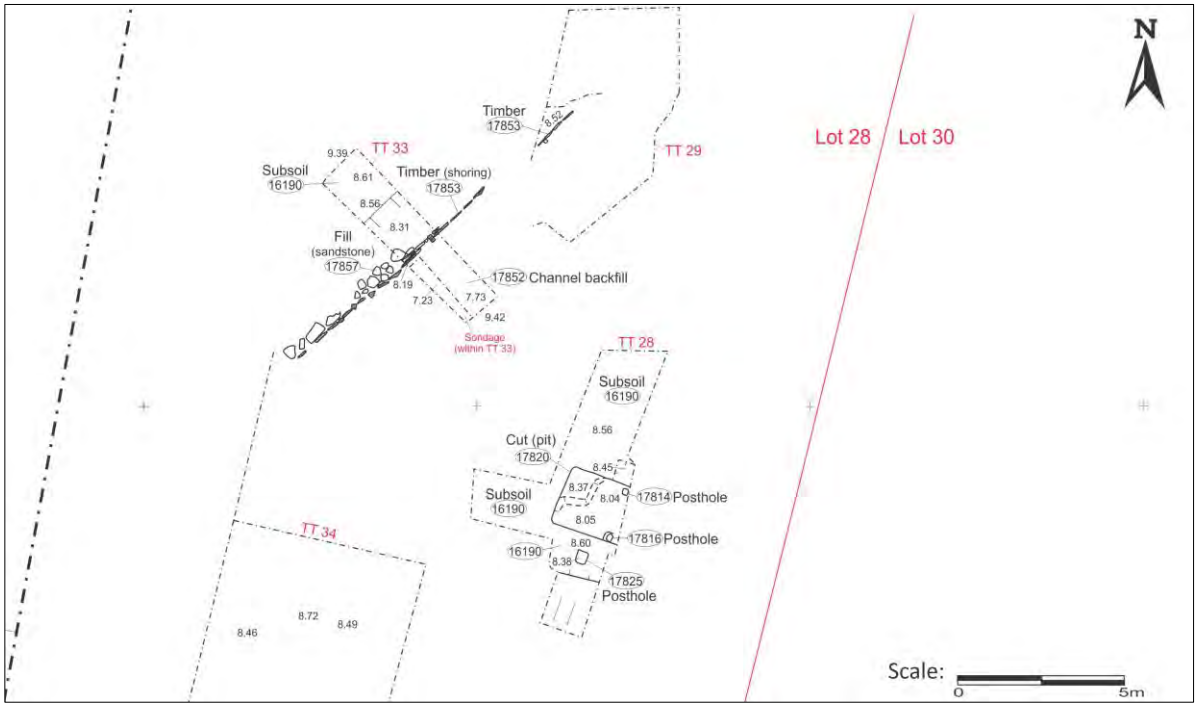

Figure 3.46: Plan of timber barrier (17853) exposed within TT33 and TT29.

Figure 3.47: Timber barrier (17853) in the creekline with sandstone rubble behind (17857) and the grey estuarine clay (17852) in the foreground. View to west, 1m scale. IMG_5808.

3.4.4.2 TIMBER BARRIER

The linear timber barrier embedded in the grey silty channel bed formalised the western edge of the creek/drainage channel. During excavation the barrier was first identified as a line of decaying timber beside the second course of sandstone blocks of the Town Drain at the northern end (Figure 3.48). This timber barrier was probably the precursor to the stone Town Drain. Perhaps delineating the edge of the creek creating a barrier to further erosion or directing the water prior to the drain construction, perhaps away from the pound or the house on Lot 27, the precursor to Wyverne. The feature ran parallel to the sandstone drain at a fairly uniform distance of 300mm from the western wall of the stone drain. This uniformity suggests that the timber barrier guided the later alignment of the 1840s drain.

The extent of the timber barrier was exposed to a length of 1.5m in the eastern part of the channel and 7.5m in the western section (Figure 3.49). It was built from large timber slabs positioned side by side, forming a barrier, with large squarish posts up to 1.06m high, perpendicular to the slabs at intervals of 2.3–2.7mm (Figure 3.50, Figure 3.51). The large paling slabs ranged from 260–340mm wide at the base, tapering towards the top, the longest was 870mm (Figure 3.52). Several had a curved outer edge showing that they had been split or less likely sawn from a large tree trunk. The bases of several palings were chamfered to form a wedge which would have facilitated driving them into the soft clay. One post was considerably wider at the base suggesting that it had been dug into the clay, however no evidence survived for a trench or posthole cut associated with any of the timbers. The timbers were driven into the clay (17852) then the sandstone rubble (17857) was packed in behind them, along the western side. The upright palings were closely fitted together without gaps between, which suggests that they were put in place to form a potentially watertight barrier on the western edge of the channel (Figure 3.53). No timbers were found along the eastern side of the channel.

Further there is evidence they may have been tired together with wire, which left shallow grooves on some of the slabs. This deliberate type of construction does suggest that this was more than a temporary waterproof barrier. See the Organics, Metal and Building Materials Report (Vol. 3, Sec. 8.7) for a detailed description of the barrier timbers.

Figure 3.48: The first sign of the timber barrier (17853) is the black organic line (red arrowed). The cut for the construction trench of the drain (orange arrow) in the subsoil with, the western sandstone wall of the Town Drain is in the foreground. View to west. IMG_5540.

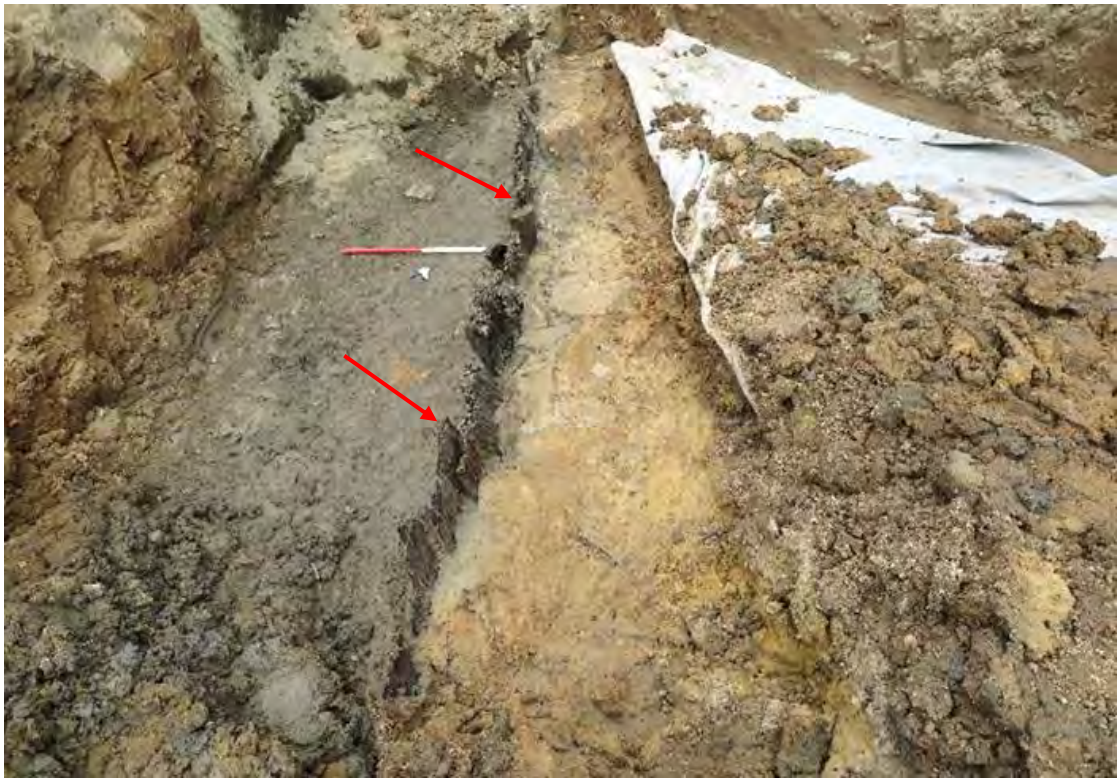

Figure 3.49: Timber barrier (17853) within the creekline at the western end of the drainage channel. View to south, 1m scale. IMG_5814.

Figure 3.50: Detail of the timber barrier 17853 found beside the Town Drain within the creekline. View to the west, 300mm scale. IMG_5817.

Figure 3.51: Detail of the timber barrier delineating the two deposits, and an upright post (red arrow) perpendicular to the slabs. Also note how the grey silts delineate the creekline to one side of the timber barrier and grey yellow natural clays outside the land channel to the west. View to west. IMG_5820.

Figure 3.52: Two timbers from the timber barrier 17853 showing the chamfered wedge-shaped base. Narrow-leafed Red Iron Bark (*Eucalyptus ?[2] crebra*). DSCN3713, DSCNS3727, scale 100mm.

Figure 3.53: A segment of the timber barrier 17853 (removed, retained and reconstructed) showing how they fitted together in the ground. Together these formed a well-constructed potentially water-resistant barrier. 1m and 500mm scale. DSCN_0062.

3.5 PHASE 4: AGRICULTURE & 19TH-CENTURY RESIDENTIAL OCCUPATION

Phase 4 refers to the early to mid-19th-century development of the allotments, Lot 28, Lot 1 (181), Lot 30 and part of Lot 32, that comprise the study area. This phase is characterised initially by: agriculture in the form of plough lines on Lot 1 (181); the introduction of the stone Town Drain c.1840 on Lot 28; the levelling fills, construction and early occupation of House 4 (original cottage built on John Thorn's land) on Lot 30; brick drainage introduced on Lot 32; then by extensions made to Thorn's house and (Lot 30); the construction and occupation of outbuildings for the White Horse Inn and Hilt's Coaching service (Lot 32) and the subsequent demolition of all of these buildings for new late 19th-century development across the site.

As these properties had different owners there are specific subphases reflecting the 19th-century internal development for each lot.

Phase 4 in Lot 28 was divided into two sub-phases:

- Phase 4.1: c.1820s to 1850s –Agriculture, introduction of the Town Drain and evidence for early residential occupation including a drain, pits and a pond.
- Phase 4.2: 1850s to 1880s – Later occupation - outbuildings and fences associated with Wyverne (built c.1870s) to the east.

Phase 4 in Lot 30 was divided into three subphases that relate specifically to the early cottage, House 4:

- Phase 4.1: c.1822 to 1850s Construction and early house occupation - landscape modifications (including pre-house levelling fills), pits and fences.
- Phase 4.2: 1850s to 1870s Later phase occupation and extension of the cottage and outbuildings drainage and a pond.
- Phase 4.3: 1883 Demolition of the early cottage (House 4).

Phase 4 in Lot 32 was divided into subphases that reflect the development of the White Horse Inn and Hilt's Coaching service, even though the majority of development in this lot falls further to the east and outside of the 3PS study area:

- Phase 4.1: 1830s–1850s Drains associated with the construction and occupation of the White Horse Inn
- Phase 4.2: 1850s–1870s Hilts Coach Service outbuildings and demolition in the early 1870s.
- Phase 4.3: 1870s–1880s Construction and occupation of two, two-storey semi-detached houses.

The following table summarises the phases site-wide with reference to subphases in each allotment; Phase 4 is shaded (Table 3.7).

Table 3.7: Archaeological phases across the site within lot boundaries.

Phase	Date	Phase Title	Lot 28 & Lot 1 (181)	Lot 30	Lot 32
1		Natural Landscape			
2		Aboriginal Occupation			
PHASE 3: BEGINNINGS OF BRITISH SETTLEMENT					
3.1	1788-1790	Government Farming: clearing and agriculture	Government Farming: clearing and agriculture	Government Farming: clearing and agriculture	Government Farming: clearing and agriculture
3.2	1790-c.1819	Land modification and early uses	Timber drain in creekline	Used for Fairs from 1814	
PHASE 4: EARLY OCCUPATION (c.1819-1870/80s)					
4.1	c.1819-1850s	Agriculture, construction, and early cottage occupation.	Plough Lines Lot 1(181) & 28 Town Drain, timber-lined drain, storage pit	House 4 construction by 1822 (levelling fills) – first sump, early occupation	Maughan's garden fenced in by 1819. White Horse Inn (from 1830) drains and outbuildings.
4.2	1850s-1870s	Later phase cottage occupation	Reconfiguration and extension of house - fences and outbuildings – levelling above the Town Drain	Extension to House 4 – construction of outbuilding on eastern part of Lot 30 - continued occupation until 1883.	Hilt's Coach Service (from 1851) outbuildings, occupation and rebuilding
4.3	1870s-1880s	Demolition (Lot 30)	Occupation of Wyverne	Demolition of House 4 (by 1884)	Demolition of former White Horse Inn and outbuildings
PHASE 5: REBUILDING AND OCCUPATION (1870S TO 1960s)					
5.1	1870s-1960s	Construction and occupation	Construction of plaster works (Lot 28). Continued occupation of Wyverne (Lot 27/8).	Levelling fills, construction & occupation of Cranbrook, Northiam and Harleyville (1880s).	Construction and occupation of 1870s houses -Late-19th century outbuilding. -Single storey shop (1950s)
5.2	Late 1950s-1960s	Demolition	Demolition of Plasterworks and Wyverne to make way for Civic Place (Lot 28)	Demolition of Cranbrook, Northiam and Harleyville to make way for the Post Office	Demolition of Macquarie flats in 1978
PHASE 6: MID TO LATE 20TH-CENTURY USES					
6	1960s-2015	Post Office & Civic Place	Civic Place construction and use	Post office construction occupation and demolition	Post office construction occupation and demolition

3.6 PHASE 4.1: AGRICULTURE & CONSTRUCTION C.1822 – 1850S

3.6.1 HISTORICAL CONTEXT

At Parramatta, larger grants and leases were given out to civil and military officers in 1799 around the periphery of the town. These included: Assistant Surgeon D'Arcy Wentworth, Surgeon John Harris, Surgeon William Balmain, Captain Edward Abbott. The 1804 map provides a significant survey of how the town looked at this time, what leases were given and who had received them (Figure 3.54).[154]

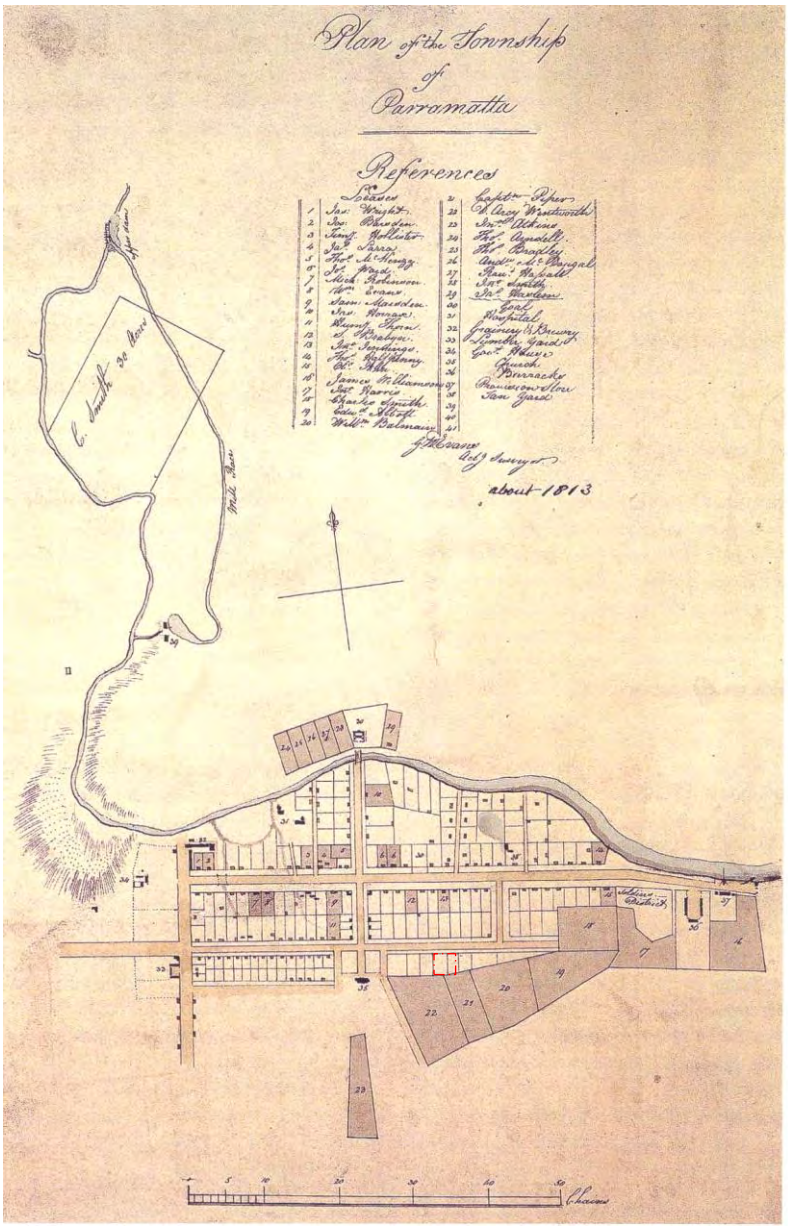

Figure 3.54: Evans' 1804 plan showing the large grants on the periphery of the town. D'Arcy Wentworth's grant, to the south of the study area is no. 22. 'Plan of the Township of Parramatta,' G. W. Evans Acting Surveyor, Sydney, 1804.TNA (UK) CO/700/New South Wales No.22

After 1810, new policies for the distribution of land were introduced by Governor Macquarie. These policies are traditionally thought to have 'straightened up' the town after the somewhat haphazard years of previous governors. The issuing of new grants or leases was already complicated by Macquarie's tough building regulations:

[154] Casey 2009:13.

> no Person shall presume to build any House within these Towns, without previously submitting a Plan of such House and Out-houses, or Offices. no Town Leases will be granted in either of these Places, until [the town Magistrate] is furnished with, and approves of the Plan of Such House or Offices.155

As a result, many risked the conditions of permissive occupancy and held land rent-free, tentatively erecting unregulated buildings until 1823. Following the replacement of Governor Lachlan Macquarie in 1821 by Sir Thomas Brisbane and in the wake of the Bigge Commission into the colony, the Surveyor General, John Oxley, was delegated to create order from the chaos of town tenures across the colony. After Parramatta was comprehensively mapped in 1823, in order to establish the identity of the holders of town lands, many occupiers were offered leases from the Crown, which they accepted. All leases were dated as 30 June 1823, although most lessees were already in residence. On the basis of these leases, householders in Parramatta could apply for a grant of land if they had erected buildings worth over £1,000 or, alternately, they could obtain a grant by the payment of 21 years quit rent. Consequently, there is far greater information about the nature of buildings, improvements and the identity of landholders in Parramatta after that date.[156] The 1823 plan shows allotments and improvements including houses erected on the allotments by that date or often earlier (Figure 3.55). The 1823 plan shows the study area with houses on Lot 30 and Lot 32, but no house on Lot 28/Lot 181.

The 1836 plan shows which allotments were granted, which leased, and indicates the name of the owner or lessee (Figure 3.56). The name Robert Day is shown on Lot 1 (181), Cliffe on Lot 28, John Thorn is shown in red on Lot 30 and both William Maughan and Robert Blake on Lot 32.

This early residential use of the area during the first half of the 19th century remains relatively stable until the 1850s when changes to all the properties occur, with shifts in ownership, site use and building development.

[155] *Sydney Gazette* 11 May 1823
[156] Casey, M. 2009 p. 14.

Figure 3.55: 1823 plan of Parramatta showing the numbered allotments and improvements formalised by the survey. Buildings shown on Lot 30 and Lot 32. SARNSW Item No 4907.

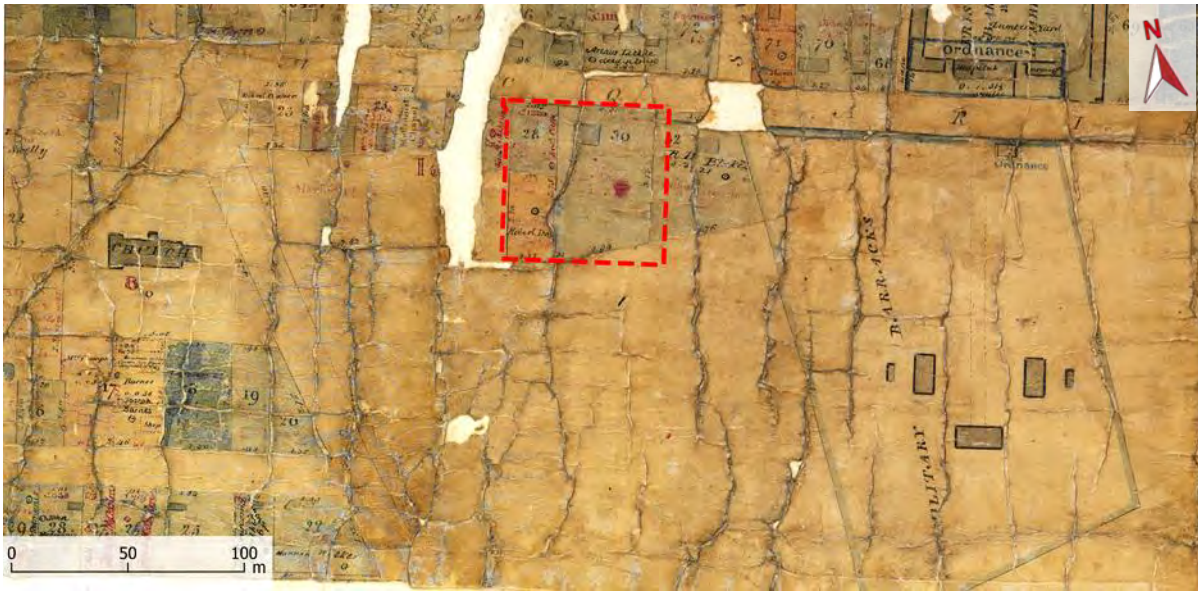

Figure 3.56: Detail of 1836 plan created from Richards' 1831 survey showing grants and leases with the name of the grantee or occupier. On Lot 28, Robert Day and Cliffe are shown on Lot 30 and Lot 32. SRNSW Item No 4799.

3.6.2 ARCHAEOLOGICAL EVIDENCE

The residential development and occupation of the study area during the first half of the 19th century is represented by the following archaeological evidence:

- Plough marks and agriculture Lot 1(181)
- The Town Drain Lot 28
- Drain from sump to Town Drain Lot 28 & Lot 30
- The White Horse Inn built with associated drains Lot 32
- John Thorn's Cottage - the construction and occupation of the timber cottage on Lot 30 from the c.1822 – 1850s
- Storage Pit Lot 28

This archaeological evidence will be discussed within ownership lot boundaries and thematically in a more general way. Themes for this phase include:

- Agriculture
- Water management (Town Drain, drains, sumps and levelling prior to construction). Related to the pre-European landscape and effect of European intervention to this landscape
- Residential construction and occupation of households

The extent of the Phase 4 evidence is shown in a composite orthophoto (Figure 3.57)

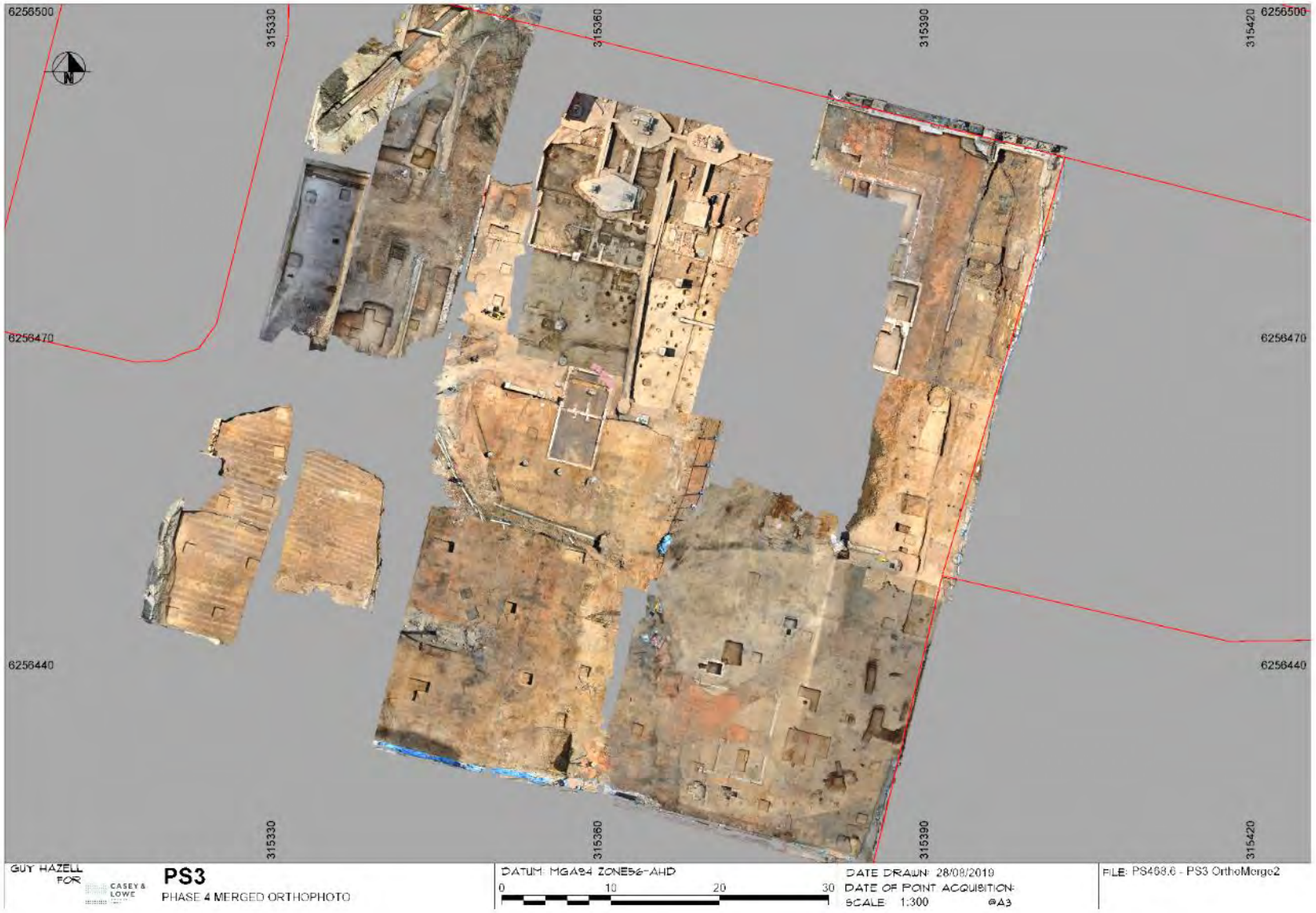

Figure 3.57: Composite orthophoto of the study area showing Phase 4 features. G. Hazell (Arcsurv).

3.6.3 AGRICULTURE – C.1822-1850S

3.6.3.1 HISTORIC CONTEXT

The second area to be opened up on the mainland by the British for agriculture was Rose Hill (later Parramatta) and it included the area of present-day George and Macquarie streets. The township was laid out in July 1790 on land once used for public farming. On 12 November 1790 Watkin Tench and Henry Edward Dodd, who ran the Government Farm, were inspecting Rose Hill and Tench noted they 'crossed the old field, which is intended to form part of the main street of the projected town'.[157] This may have coincided with the opening up of the area around the study area, south of the old fields. In November 1790, Watkin Tench noted that the 'plough had never yet been tried' and the amount of ground that each convict had to turn over by hand meant that it was 'just scratched over'.[158] The use of the plough is also commented upon by Tench in the earlier 'Narrative of the Expedition to Botany Bay', where he said that a potential emigrant should:

> provide all his wearing apparel for himself, family, and servants; his furniture, tools of every kind, and implements of husbandry (among which a plough need not be included, as we make use of the hoe), for he will touch at no place where they can be purchased to advantage.[159]

The township was set on land previously used for growing crops but which was quickly exhausted due to the want of manures and the inability to break up the soil adequately in the absence of oxen or horses to pull a plough. It is to be noted that at least six ploughs and harness for both oxen and horses were listed as part of the supplies brought out on the First Fleet.

According to a letter 26 August 1786, Steele[160] asked the Navy Board to supply 'tools and implements of agriculture'. Each of the male convicts and the marines were to be equipped with: 1 spade, 1 shovel, 1 grubbing hoe, 1 West India hoe, 1 garden hoe, 1 felling axe, 1 hatchet, 1 knife, gimblets (*aka* gimlets – a tool for boring holes) and wooden bowls, platters and spoons. Communal tools included: saws, adzes, broad axes, augers, chisels, planes., files, forges, bellows and anvils, grindstones, wheelbarrows, iron mills, plough, cooper's tools, nails, hinges, locks, bar iron, steel, glass, fishing lines, etc.[161] This list was then modified by Charles Middleton who drew up a second list which specified that ploughs and plough harness for six horses and six oxen were to be supplied.[162] It is not indicated which type of ploughs were sent.

Emancipated convicts were encouraged to become settlers. As an incentive to undertake cultivation, land would be granted to those who managed to cultivate for five years or more, tax free for ten years. In writing of his journey to Rose Hill, Watkin Tench described an example of non-government cultivation undertaken by emancipist James Ruse.

> My land I prepared thus: having burnt the fallen timber off the ground, I dug in the ashes, and then hoed it up, never doing more than 8 or perhaps 9 rods in a day, by which means, it was not like the government farm just scratched over, but properly done; then I clod-moulded it, and dug in the grass and weeds: - this I think almost equal to ploughing. I then let it lie as long as I could, exposed to sun and air: and just before I sowed my seed, I turned it all up afresh.[163]

[157] Tench, W. 1979 *Sydney's First Four Years,* November 16 1790, p. 196,

[158] Tench, W. 1979 *Sydney's First Four Years,* November 16 1790, p. 194.

[159] Tench, W. 1788

[160] Frost, A. 2011: 104 Letter from Steele to Navy Board 26 august 1786 ADM OT.

[161] Frost, A. 2011: 105.

[162] Thompson to Harrison, Gordon and Stanley, 13 September 1786, USNA, Record group 45/446, in Frost 2011:105.

[163] Tench, W. 1790

Ruse also bemoaned the lack of cattle manure, when describing the quality of the soil of his farm he said:

> I will be bound to make it do with the aid of manure, but without cattle it will fail.[164]

Tench describing a settlement at Prospect Hill:

> To clear and cultivate the land, a hatchet, a tomahawk, two hoes, a spade and a shovel, are given to each person, whether man or woman; and a certain number of cross-cut saws among the whole.[165]

By 1791 the livestock on the government farm included:

> two stallions, six mares, and two colts; besides sixteen cows, two cow-calves, and one bull-calf, which were brought out by the *Gorgon*. Two bulls which were on board died on the passage, so that on the young gentleman just mentioned depends the stocking of the colony.[166]

Brambila's 1793 drawing depicts convicts pulling carts with passengers, highlighting the lack of draught animals at that time in Parramatta (Figure 3.58). By 1798 when Collins wrote his account of the colony, he notes that 'cattle are prolific'.[167]

Figure 3.58: One of Fernando Brambila two drawings of Parramatta in 1793, shows stands of remnant native trees encircling the settlement and cleared areas surrounding the convict huts in cultivation. The scene also shows passenger carts being hauled by convicts, highlighting the lack of draught animals available in the colony. *Vista de la colonia inglesa de Sidney, en la nueva Gales meridional,* held in the Spanish Naval Museum.

The c.1809 Evans painting shows the study area as cleared with an orchard of evenly placed trees planted on the Wentworth estate to the south (Figure 3.13). The yards of various lots are shown in the foreground are planted, but mostly with vegetables and a few orchard trees. The study area is in the distance and not detailed, it cannot be determined whether

[164] Tench, W. 1790

[165] Tench, W. 1791

[166] Tench, W. 1791

[167] Collins, D. 1798: preface.

it was planted at this time but it is probably unlikely due to the shift of public farming westwards past Toongabbie by this time.

The methods for tilling the soil for agriculture evolved over time. Initially it was convict labour using hoes to break up the soil, as documented by colonial observers (Section 3.4.1). Evidence is also found in the archaeological record, where hoe marks are often revealed cutting into the subsoil. These appear as darker topsoil filling triangular dimples in the pale subsoil. Although documentary evidence suggest ploughs were part of the supplies for the First Fleet, they were not used at Parramatta in the first phases of cultivation as there were no animals available to pull the ploughs (Section 3.4.1). This may have been because when the land was cleared the stumps of larger trees such as mature eucalypts were left in the ground the tree stumps and associated roots were difficult to remove (grub) and it was easier to hoe around them (Figure 3.59). Or it could be due to the scarcity of draught animals which meant that the plough would need to be dragged by manual labour, although in the case of Parramatta, convicts could provide such labour.[168]

Figure 3.59: c.1812 view of Parramatta showing stumps of trees in an otherwise cleared field Wentworth's house is to the left, up the hill. J Eyre engraving c.1812, 'View of part of the town of Parramatta in New South Wales taken from the north side of the river'. NLA PIC Drawer 2232 #S1963.

[168] Tench, W. 1979:195, November 16, 1790; Collins, 1975(1):103, July 1790.

3.6.3.1.1 PLOUGHS

Ploughs are employed to turn over the upper layer of the soil bringing fresh nutrients to the surface loosening and aerating the soil, by cutting a long soil slice and turning it upside down, burying surface residue, conserving moisture and killing weeds. As the plough is dragged through the soil it creates long trenches of fertile soil called a furrow. Ploughing the soil homogenises and modifies the upper 12-25 cm of the soil to form a plough layer, where the roots of plants grow. Ploughs are traditionally drawn by working draught animals such as oxen and horses but could also be pulled along by human-power. Normally a single mould-board plough would be drawn by two draught animals with one person steering and manoeuvring it using handles at the back.

The mould-board plough or turn plough was introduced to Australia in the 1800s. The components of a mould-board plough include a beam, hitch, vertical regulator, coulter, (vertically mounted part of plow that cuts an edge c.18cm deep ahead of the ploughshare) ploughshare (cutting or leading edge of the mould-board) and mould-board – the blade that turns the soil) (Figure 3.60).

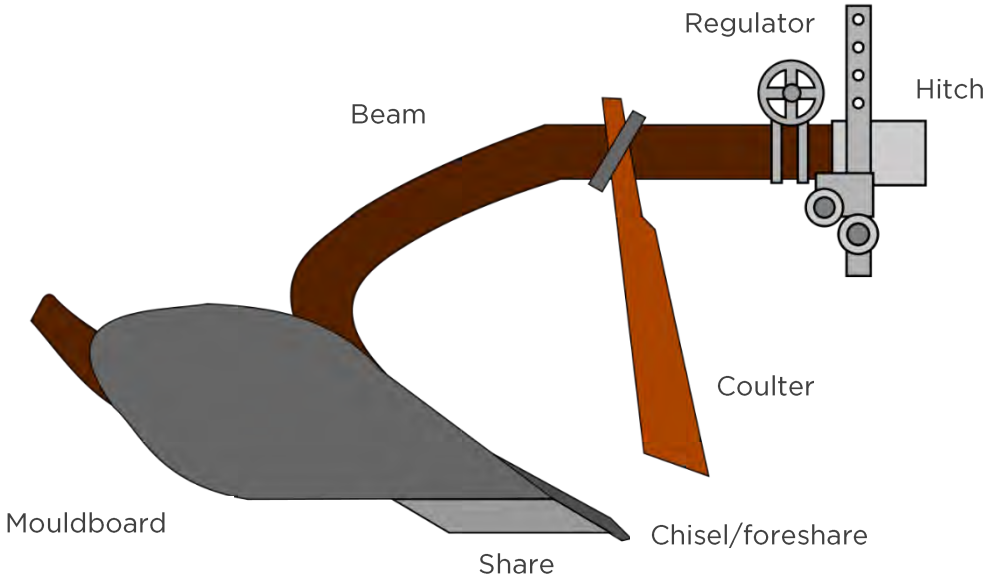

Figure 3.60: Schematic diagram of a mould-board plough. The Rotherham and wooden breaking ploughs are examples of mould-board ploughs.[169]

The first ploughs used in the colony were light, such as the Rotherham plough, although these were found to break in the initial land clearance phase and were often replaced by heavier and stronger 'wooden breaking ploughs'.[170] The Rotherham swing plough, designed in the early 1730, was constructed from a wooden frame with the fittings and coulter made of iron and the mouldboard and share covered with an iron plate. This new design was considered, to be more efficient and lighter to pull than any other kind at that time (Figure 3.61). The Rotherham plough works by cutting a slice of soil called a sod. A vertical incision is made by the coulter and a horizontal incision by a flat blade or ploughshare. As the plough travels through soil it makes an L-shaped cut from the

[169] Diagram after CC BY 3.0: https://en.wikipedia.org/wiki/Plough, with annotations by C & L.

[170] Pratley & Rowell 2003; Birmingham et al 1979:17.

combined effect of the coulter and share. The curved mouldboard is dragged horizontally through the L-shaped incision and then flips the sod over forming a furrow.[171]

In his 1826 *Account of the State of Agriculture and Grazing in New South Wales*, former Principal Clerk in the Office of the Colonial Secretary at Sydney, James Atkinson, described the use of the plough as:

> The plough in general use is the swing plough; a great many iron Scotch ploughs have been imported, and answer very well; ploughs with wooden mould-boards are made in the Colony at about £3 or £3 l0s. each, but they are seldom made on correct principles, and do their work badly. Perhaps the kind of plough best adapted for general purposes is that with an iron foot and mould-board, and wooden beam and handles they are not so expensive, and are more easily repaired in case of accident. A wrought-iron share is best for breaking up new land, but after the ground has been completely cleared of roots and large stones, cast-iron shares may be used with advantage.[172]

Wheels on ploughs only became common on locally made ploughs in New South Wales from the 1850s.[173]

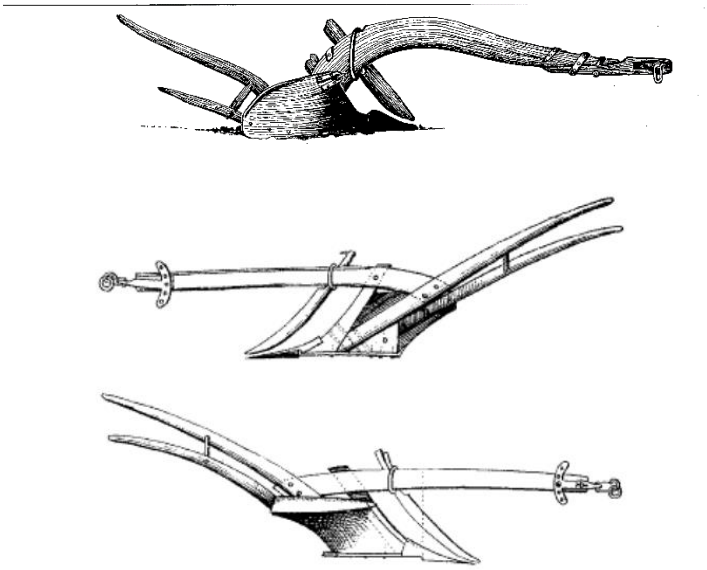

Figure 3.61: The heavy wooden breaking plough (top) and the Rotherham swing plough (middle and bottom).

3.6.3.2 ARCHAEOLOGICAL EVIDENCE OF PLOUGHING LOT 1 (181)

Evidence for agricultural activity of ploughing within the study area was mainly found in Lot 1 (181) within Civic Place, where an extensive series of 1830s plough lines were revealed. Limited evidence was found within Lot 30 and Lot 32 in the form of occasional hoe marks and garden beds (Figure 3.62).

[171] Brunt 2003.

[172] Atkinson, J. 1826: 37

[173] Birmingham, Jack & Jeans 1979:17.

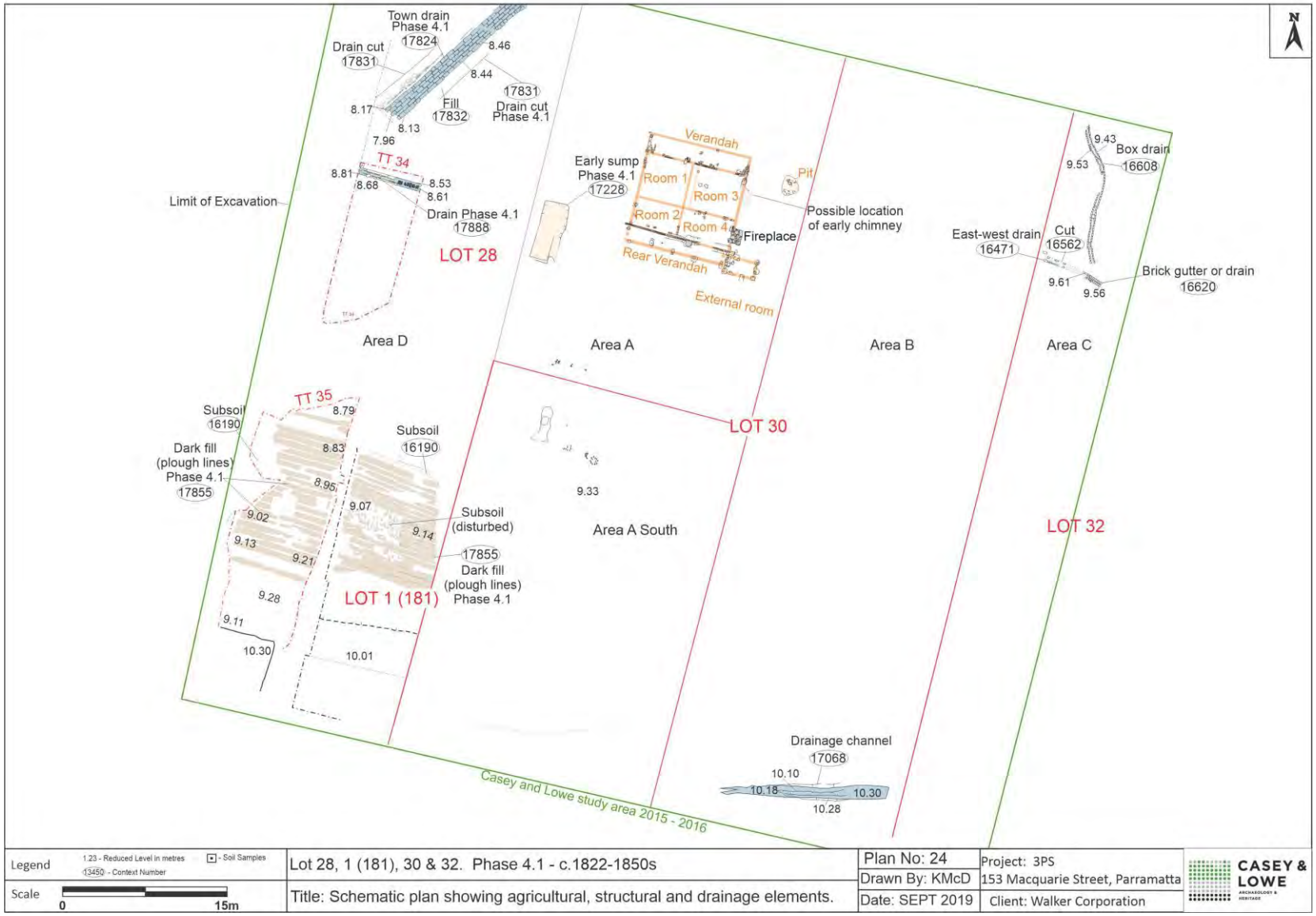

Figure 3.62: Plan of study area showing location of plough lines, agricultural marks and drainage elements.

Within Lot 1 (181), the modified historic topsoil had been ploughed in rows cutting into the subsoil (Figure 3.63, Figure 3.64). The series of plough lines were revealed crossing Lot 1 (181) in an east west alignment, perpendicular to the north south lot boundaries of the adjacent Lot 27 and Lot 30. The lines were distinct and represent a single cultivation event, where the plough had only been dragged once across the area with no criss-crossing or re-ploughing. These cultivation marks probably denote a single crop and may represent a practice of permissive occupancy whereby a grant could be secured by showing improvement of the land.

Figure 3.63: Orthophoto of plough lines found in Lot 1 (181). G. Hazell (Arcsurv).

The plough lines did not extend to the north into Lot 28 nor to the south into the former land once granted to D'Arcy Wentworth (Figure 2.5). The archaeological works to the south, within site 4&6 PS, found this area generally disturbed and contaminated but with no evidence of plough lines extending into Wentworth's grant. No evidence for the plough lines was found during the excavation of Lot 30 and it appears they did not extend to the east beyond the boundary of Lot 1(181). A few agricultural marks and linear features revealed in Lot 30 could be part of that event but the evidence is ephemeral and not conclusive. It is possible that the plough lines continued further to the west into Lot 179 (The Pound) as far as the creek/drain line but no evidence for this was documented during excavations in the 'Pound' in Civic Place, undertaken by Wendy Thorp (CRM) for Niche in

2016, as part of the 5 Parramatta Square development.[174] This further suggests ploughing activity was confined to Lot 1 (181).

As the area of ploughing was contained within the lot boundary it was probably undertaken by the leaseholder, rather than as part of early agriculture when the area was shown on the 1791 plan to be 'in cultivation' and where the use of ploughs was unknown (Figure 2.2). The plough lines are also unlikely to relate to the period when the area was shown to be 'reserved space for the fairs' on the 1814 plan (Figure 2.5). They may rather relate to the leasehold of Robert Bateman from 1823-1831 or Robert Day from 1831 or Emanuel Cliffe from 1835. Lot 28 and Lot 1 (181) changed hands throughout the 1830s until 1835, when Cliffe, purchased them both along with the adjacent Lot 27 (outside the study area). The sale included a cottage under construction on Lot 27.[175] The artefactual evidence and pollen analysis of the topsoil within the plough lines suggests that they date to the c.1830s, therefore any of these leaseholders could have undertaken the cultivation.

3.6.3.3 PLOUGH LINES

The plough lines, cutting into the pale yellow/grey subsoil (16190), were collectively assigned context number 17855 (Figure 3.64, Figure 3.65). The plough lines were linear cuts in the subsoil. In profile they were shown to have gradual concave sides forming a U-shape in section (Figure 3.66). The average width of the plough lines was 450mm with surviving depths ranging from 30–100mm and they were all greater than 6m in length (Figure 3.64, Figure 3.67, Figure 3.68, Figure 3.69, Figure 3.70). The area of the plough lines was exposed within a series of large trenches, due to the civil works program and the need to maintain site access along the Civic Place roadway. Therefore, the complete length of the plough lines was not able to be recorded in a single trench. The fill within the plough furrows was a soft mid brown/grey silty clay with some patches of yellow sand and some charcoal fleck inclusions, therefore it was a mix of modified historic topsoil (17819), subsoil (16190) and lenses of yellow sandy material (17827).

Viewing the plough furrows in section shows how the soil had been churned up and turned over with topsoil mixed in with the subsoil into which it was cut (Figure 3.66). The evenness, regularity and depth of the furrows, points to the use of a plough, in contrast to the use of hoes from earliest days of the colony. The plough used was a single plough made from wood with an iron blade such as the Rotherham plough discussed above. Multiple furrow ploughs such as 'double furrow' ploughs were not used until the 1860-70s in Australia.

[174] Pers comm. Caitlin D'Gluyas (28 July 2018). We have tried to obtain a copy of the 5 Parramatta Square report but it is unavailable.

[175] LTOD, No 201 Bk H; also in Col Sec. Court of Claims, Rep 1220, SRNSW 2/1772.

Figure 3.64: Detail plan of the plough lines in Area D Lot 1 (181), southwest corner of 3PS. The Aboriginal test pits are annotated in blue. Extract from Plan 2, Vol. 4. Sec. 10.

Figure 3.65: The top of linear plough lines visible in an Aboriginal test pit BJ52. The dark soil is within the cut of the plough blade with the pale exposed subsoil between the two plough lines is undisturbed (Figure 3.64). View to east, 1m scale. IMG_5970.

Figure 3.66: Aboriginal test pit BQ49 showing the wavy profile of the plough lines visible in the section (Figure 3.64). The topsoil was churned or turned over by the action of the plough. View to east, 1m scale. IMG_5630.

Figure 3.67: Plough lines at the southeast end of Civic Place. The land was ploughed east-west. View to southeast, 1m scale. IMG_5703.

Figure 3.68: Plough lines at the centre of Civic Place. A patch of yellow sandy material 17827 can be seen at the base of the plough lines (arrowed in red). This is similar to deposit 17827 seen in TT28. TT28 is located further to the north (see Plan 2, Vol. 4, Sec. 10). View to east, 1m scale. IMG_6031.

Figure 3.69: Plough lines at southwest end of Civic Place. The Aboriginal test pit nearest the scale is numbered BQ55. View to southeast, 1m scale. IMG_5879.

3.6.3.4 ARTEFACT EVIDENCE

Eight plough lines were fully excavated from the northern part of TT35. The plough lines prior to excavation are in Figure 3.70 and in section in Figure 3.71. The fill within the plough lines was 100 per cent wet sieved. Limited cultural material was retrieved from the furrows. The ceramic evidence included fragmentary pieces of Chinese porcelain c.1780+, salt glazed stoneware, including a jar (c.1780+), blue flow c.1830-c.1930, locally-made lead glaze ceramics c.1801+, pearlware c.1780-c.1870, blue transfer print pearlware c.1800-c.1870, yellowware c.1830+, green transfer print c.1830+, red transfer print c.1830+, and bone china c.1800+. The presence of green and red transfer print and yellowware alongside forms dating to earlier periods does suggest a depositional timeframe from the 1830s. Twenty-four fragments of glass were recovered from the furrows. The majority of glass fragments were from bottles (17) but most glass was too fragmentary to identify specific form or datable attributes. Dating of glass is limited to early crown window glass (made prior to 1850) and one dip-moulded beer/wine bottle (with a date range of 1820–1870).

3.6.3.4.1 POLLEN ANALYSIS

Several pollen samples were taken from different plough lines. Two samples #335 and #344 were analysed with similar results (Table 3.8). The microflora was dominated by fungal spores (1000%), hornwort spores (55%) and casuarina pollen (52%), with much lower relative abundances of dandelion pollen (6%) and what might be immature cereal pollen (1%). The very high relative abundance of Allocasuarina/Casuarina pollen in these samples and sample #362 (21), Table 3D, provides seemingly unequivocal evidence that she-oaks were growing along the creekline traversing Lot 28. Significant occurrences of wattle pollen (2%) are consistent with Suttor's observations that a grove of wattle was growing near Church Street c.1800 (Macphail 2019, Vol. 3, Sec. 8.5: 46-7). This data provides firm evidence that human sewage and other organic matter were used as manure

on the site. There was no pollen evidence to show what plants were sown in the plough lines or if it was hand-watered.

The same vegetation-type is recorded by miospores recovered from the hoe marks and plough lines from topsoil used to infill the creekline on Lot 28 (Phase 3), and also from early-late 19th-century samples that appear to incorporate original topsoil (Samples 218, 230, 254, 320, 335, 344). Oddly there is little pollen evidence to support the 1830s dating of this context.

Table 3.8: Samples 335 & 344 from two different plough line furrows.

Sample # 335	Description
Abundant taxa	Fungal spores, *Allocasuarina/Casuarina*, Phaeoceros
Common taxa:	Liguliflorae, native Poaceae, Cloacasporites
Frequent taxa:	Immature Cerelia, *Cyathea, Allocasuarina/Casuarina* pollen aggregates, *Eucalyptus* pollen and immature pollen aggregates, Asteraceae (low spine types), unassigned monolete and trilete fern spores, *Anthoceros*
Exotics:	Liguliflorae (Cerelia?)
Edible taxa	
Sewage:	Cloacasporites (5%)
Microfauna:	egg cases (46%), dental plates and other insect parts (3%)
Sample # 344	**Description**
Abundant taxa	Fungal spores, *Allocasuarina/Casuarina*, Phaeoceros
Common taxa:	Liguliflorae, native Poaceae, *Calochlaena, Anthoceros,* Zygnemataceae
Frequent taxa:	*Cyathea, Acacia,* Asteraceae (low spine types), Cyperaceae, *Microsorium*-type, unassigned trilete fern spores
Exotics:	Liguliflorae, *Stellaria*
Edible taxa:	
Sewage:	Cloacasporites?
Microfauna:	egg cases (40%)

Figure 3.70: Plough lines in the western part of Civic Place. The dark soil was excavated form all the furrows int his area and were wet sieved to provide a sample of artefacts from within the dark soil. View to southwest, 1m scale. IMG_5920.

Figure 3.71: Orthophoto showing the depth and form of a wavy section of a group of plough lines in TT35. G. Hazell (Arcsurv).

The plough lines are considered to represent a single cultivation event to grow one crop of vegetables or grain or stock feed. This form of farming activity was not continued on the site as the use of the property became more residential. These extensive plough lines are an excellent example of a later phase of cultivation once the plough was introduced and became more normal in Parramatta. They plough lines are more regular and even than other examples found, such as a series of plough furrows from a site at 52 O'Connell Street, Parramatta North which were also cut into the subsoil (Figure 3.72). These were interpreted by Higginbotham as being associated with the planting of grapevines. The lines

are far less regular than those found on Lot 1 (181) and are therefore unlikely to be the product of ploughing and more likely the product of the use of hoes and spades.

Figure 3.72: Archaeological excavation revealed evidence of trenching for vine cultivation at 52 O'Connell Street, North Parramatta. Higginbotham, suggests the trenching was for the planting of grapevines. *http://www.higginbotham.com.au/northparramatta.html* (accessed 4/06/19)

3.6.4 WATER MANAGEMENT

The 3PS site had a gently sloping topography down from higher ground in the south to a deeper natural drainage channel at the northwest corner of the site, where a drainage or creekline flowed towards the Parramatta River. Two other shallow drainage lines were found to flow from the southeast side of the site, flowing down towards the deeper channel in the northwest, beneath House 4 (Figure 3.73). The northwest corner of the site was wet and boggy. There is a fall of 2m from the southeast to the northwest. Early attempts at water management, in the form of the formalisation or straightening of the water channel with a timber barrier, is discussed in Phase 3. The next phase of large-scale water management was the construction of a large a sandstone box drain, the Town Drain. Other water management approaches were localised to private properties and took the form of constructing shallow brick and timber-lined box drains, informal unlined drainage channels and the introduction of sumps all of which typically related to management of water within individual lots.

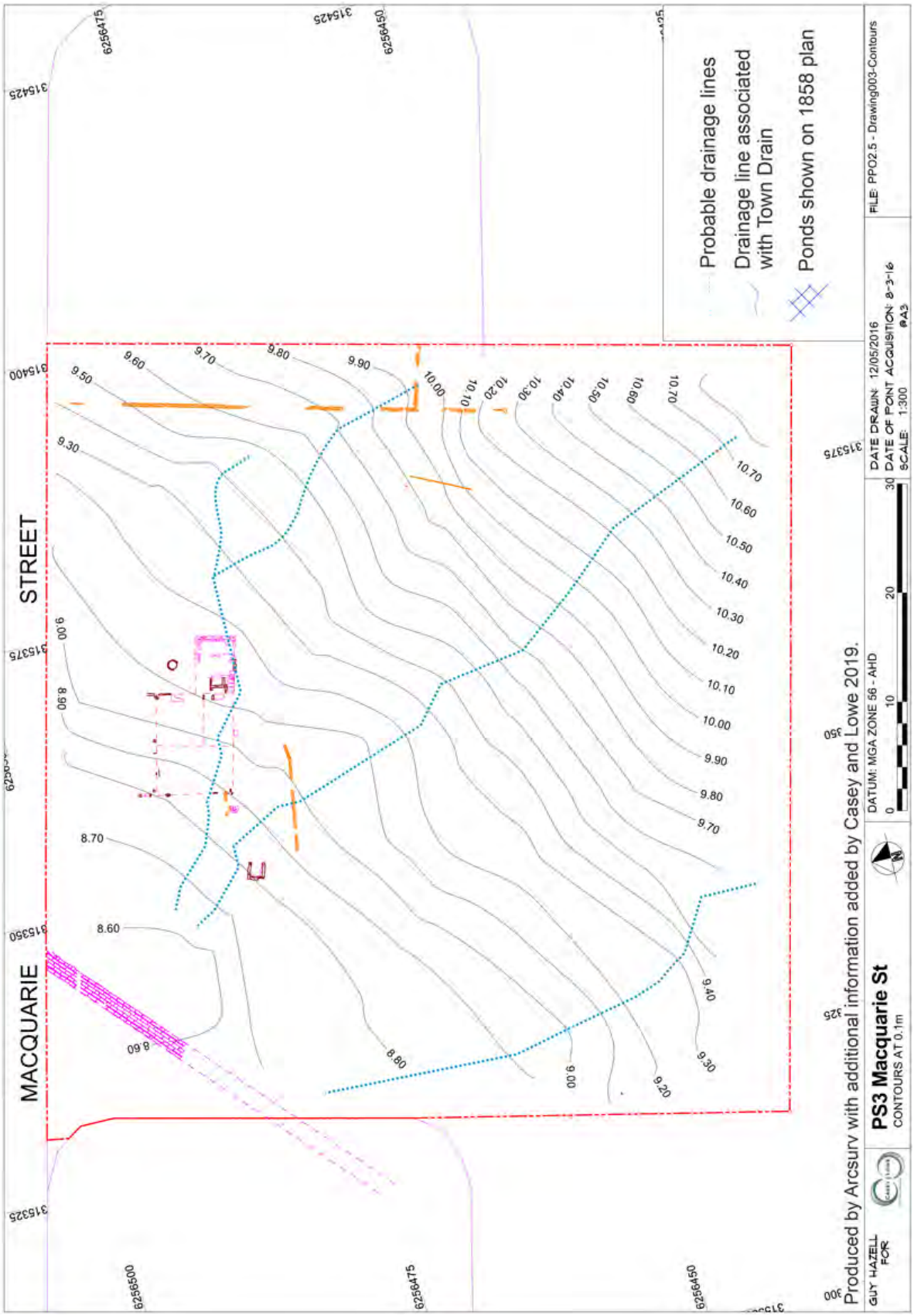

Figure 3.73: Contour plan showing the three drainage lines crossing the site. The orange lines are drainage within the site. G. Hazell (Arcsurv) with annotations by Casey & Lowe.

3.6.4.1 TOWN DRAIN

The Parramatta Town Drain within 3PS was a box drain constructed in sandstone blocks at its southwestern end and built c.1840. Other parts of the Town Drain, outside of the site, from George Street northwards are sandstock brick oviform. The 3PS drain passed diagonally across Lot 28/Civic Place (Figure 3.75, Figure 3.76, Figure 3.77). A 15.50m segment of the Town Drain was excavated within the roadway (Leigh Place or Civic Place) in two stages due to access issues (Figure 3.78, Figure 3.79). A further 25m segment of drain was excavated within the southwest of 8PS from the corner of Darcy and Church Street and 7m in the centre of 8PS, a total of 47.5m, during subsequent investigations for the Parramatta Square development (Figure 3.75). When the drain was removed it was found to have been built within an existing creekline or channel with a row of upright timbers embedded in the western side forming a barrier or shoring (17853) with a fill of sandstone rubble (17857) packed behind the timbers. This indicates that the creekline was being manipulated or formalised before the drain was constructed, whether facilitating the construction process or as part of an earlier water management strategy. The drain was within cut (17831).

A deposit of grey silty clay (17852) filled the channel; artefacts collected from within the silty clay, were securely sealed below the drain. These artefacts included sandstock brick fragments, ceramics, glass and a partial leather shoe (Figure 3.74). The shoe was a hand-stitched square duckbill-toed lace-up shoe, a style which generally dates to between 1830 to c.1860.[176] The shoe was rather worn suggesting that it had been deliberately discarded. The ceramics recovered were red and grey transfer printed table-wares (dating from the 1830s onwards). The base of a dark green beer/wine bottle included a stamped seal on the lower body; with the letters 'WPP' embossed. The bottle was free-blown with a slightly sagging base which is generally dated to pre-1820 before mould blown glass technologies were adopted.

The Town Drain (17824) was constructed from large sandstone blocks forming a box drain (Figure 3.77, Figure 3.78, Figure 3.79). The walls of the drain were preserved up to three blocks or courses high in places to only one block high, where the upper courses had been removed at some stage. The blocks of the drain were fairly uniform in size; roughly worked sandstone with some evidence for single pick marks. The sides of the drain were formed from blocks with an average length of 650mm and width of 300–330mm; the thickness of the blocks ranged from 210–350mm, with the thickest blocks towards the base. The base or floor of the box drain was dish-shaped, comprising five blocks, with the central three positioned at slight angles to form a curve and two forming the base beneath the side coursing (Figure 3.78). The blocks of the base were also fairly uniform in size, ranging in length from 700–820mm with an average width of 300mm and thickness of 180mm. The internal channel of the drain, formed by the side walls, was 830mm wide and from 300–770mm deep with an extant length of 15m; externally the drain was 1.5m wide. Within Parramatta Square the drain extended from the southwest corner of Darcy Street and Church Street down to Macquarie Street, for a distance of 165.30m from RL 9.342 to 8.151m at invert level, a fall of 1.20m. This gradient is expressed as a ratio of 1:138 or 72 per cent.

[176] Bower, R. 1999.

Figure 3.74: Leather duck-bill toed shoe, ceramics and a bottle stamped with the letters WPP found within the grey clay of the creekline, below the Town Drain. Scale 100mm, IMG_4899.

The eastern wall of the drain appeared to curve at the northeastern Macquarie Street end, veering to the east under the pavement with a concrete slab on top (Figure 3.78, Figure 3.80). The southwestern end of the drain was truncated by a cement stormwater pipe which had replaced the drain in the 1960s. The whole of the sandstone drain under the road was filled with stabilised sand and road base.

The excavation trench (17831) for the drain was cut into the subsoil (Figure 3.81, Figure 3.82). In 8Ps the drain was narrower in scale, with surviving sandstone capping (Figure 3.83).

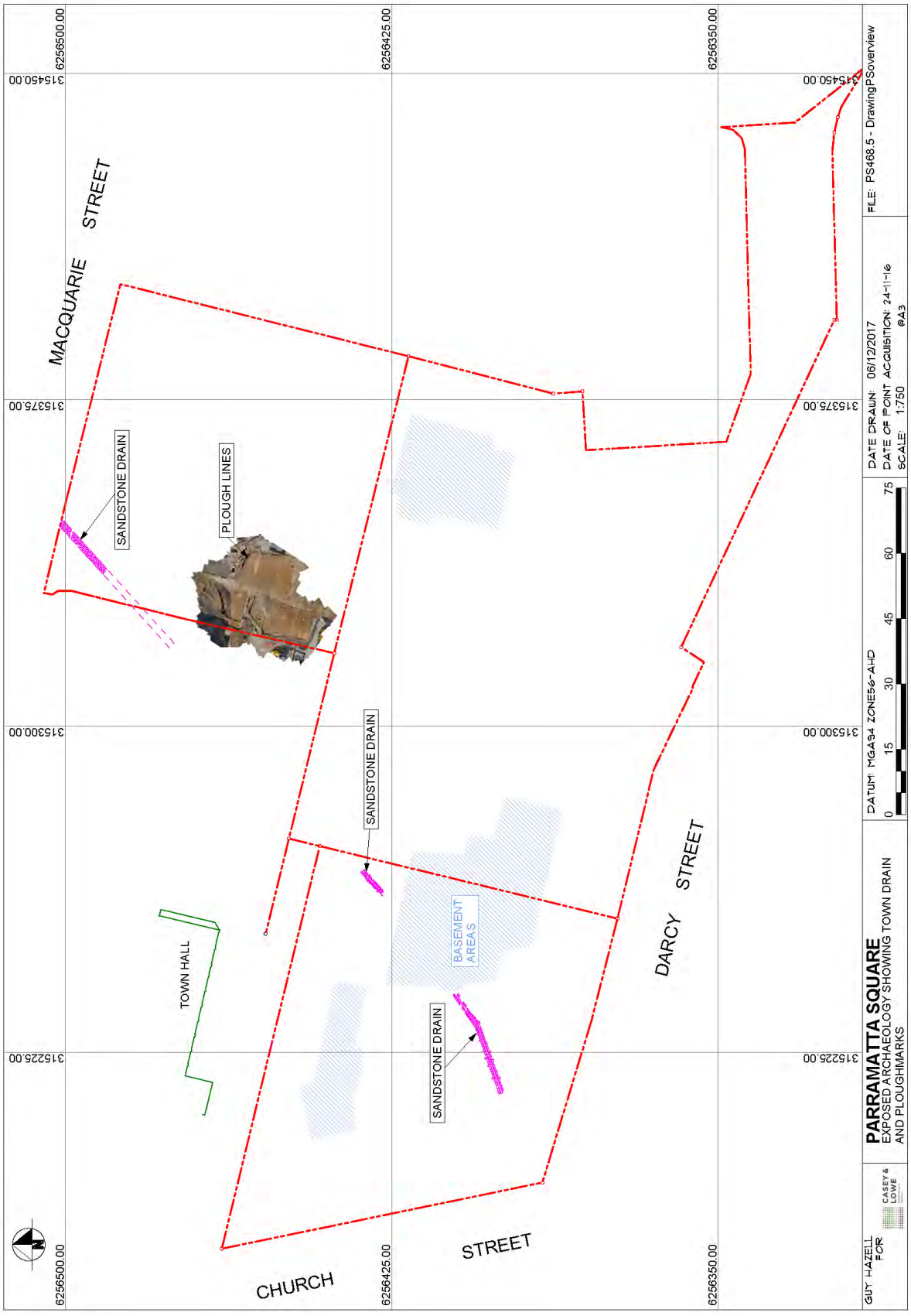

Figure 3.75: Plan of the extent of the Town Drain across Parramatta Square. 3PS in the northeast and 8PS to the southwest. G. Hazell (Arcsurv).

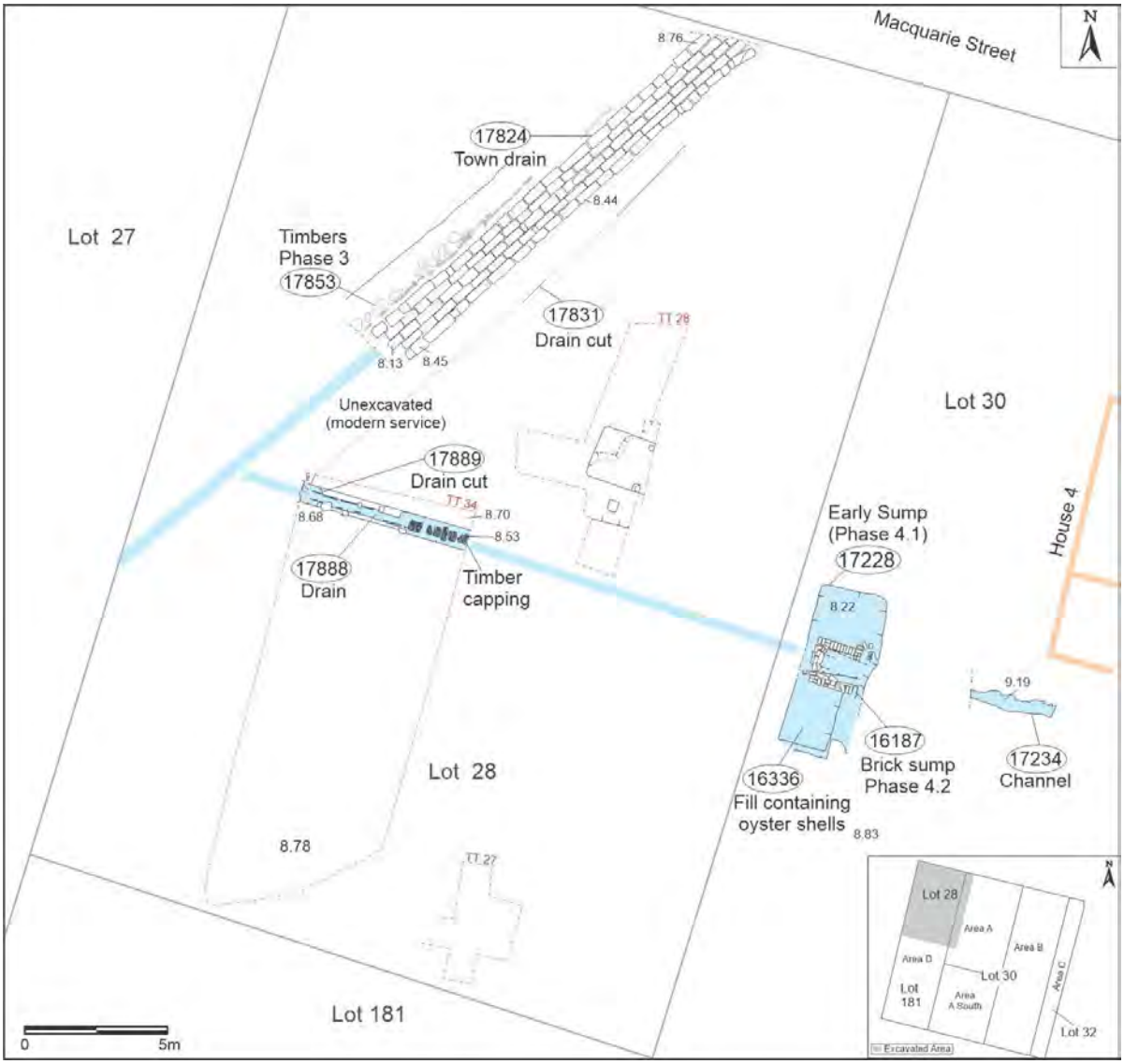

Figure 3.76: Plan showing the timber-capped drain (17888) and its relationship with the Town Drain (17824) and a pit or sump from Lot 30.

Figure 3.77: Composite orthophoto of the Town Drain extending diagonally across Civic Place. G. Hazell (Arcsurv) 2016.

Figure 3.78: Left: Southwestern end of sandstone Town Drain showing the shallow dish shape at the base. View to southwest, 1m scale. IMG_5743. Right: North-eastern end of drain extending under Macquarie Street. View to north, 1m scale. IMG_5522.

Figure 3.79: Left: View of the southwestern end of the drain. View to southwest, IMG_5745. Right: Detail of coursing of the western wall of the drain. View to west, 1 m scale. IMG_5742.

Figure 3.80: Left: Detail of curved eastern wall of Town Drain heading under the pavement of Macquarie Street. View to northeast. IMG_5545. Right: The drain as an effective water receptacle after heavy rain. View to northeast, 1m scale. IMG_5443.

3.6.4.1.1 CUT FOR THE DRAIN

The u-shaped cut for the installation of the drain, context 17831, was filled with two distinct backfills (Figure 3.81, Figure 3.82). The upper fil, (17832), was a deliberate bulk filling event where the cut was backfilled, behind the side walls after the construction of the drain. The lower fill (17857), was a thick layer of sandstone rubble mixed with yellow sandy clay packed in beside the timber barrier (17853), discussed above in Section 3.6.4.1.

The western cut for the drain was clearly identified for a length of 10.5m whereas the eastern side was only found for a length of 3.5m due to the presence of a c.1950s stormwater drain pipe (Figure 3.81). The cut was U-shaped, approximately 3.30m wide and at least 1.2m deep (Figure 3.82). The trench cut had gently sloping slightly curving sides and a concave base. The cut was excavated deliberately to allow the sandstone blocks to be laid, perhaps widening the original channel.

Figure 3.81: Cut 17831 visible cutting into the pale subsoil on the north-western side of the drain. View to northwest, 1m scale. IMG_5793.

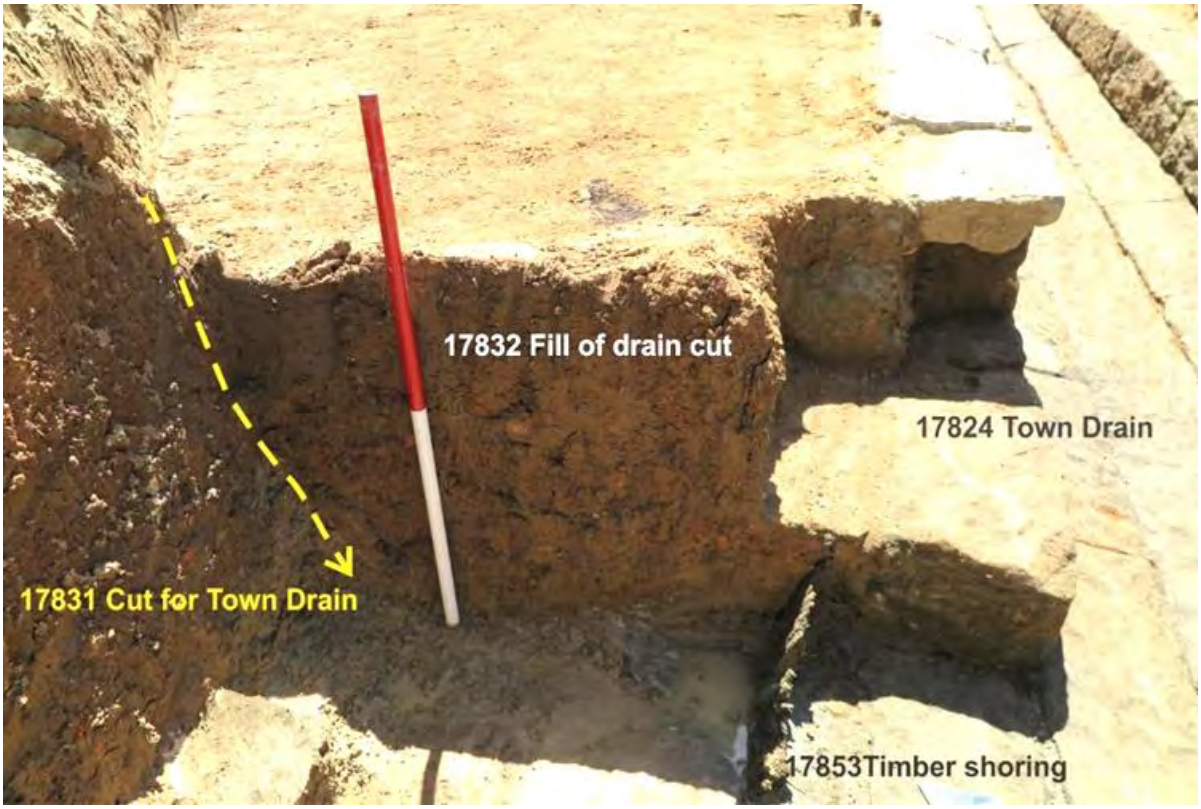

Figure 3.82: Western side of the Town Drain showing the cut and upper fill for the drain. View to north, 1m scale. IMG_5739.

Figure 3.83: Two views of the continuation of the Town Drain in 8PS to the southwest. Partially exposed with capping stones in place (left) and completely exposed without capping stones (right). View to southwest, 1m scale. DSC_0380 & IMG_6495.

3.6.4.2 TIMBER-CAPPED DRAIN LOT 28

During the excavation of TT34 within Civic Place, a small sandstone and timber-capped drain (17888) was revealed within Lot 28, extending from the western boundary of Lot 30 towards the sandstone Town Drain running in an east-west alignment (Figure 3.76, Figure 3.84). Although fairly rudimentary, the channel appeared to be draining into the Town Drain at its western end (Figure 3.86, Figure 3.76). The junction where the timber-capped drain met the Town Drain was not exposed as it was beneath the footpath on the eastern side of the road, and was not excavated due to live services.

The exposed section of this drain (17888) was 5.7m in length, ranging from 260–640 mm in width and 370mm deep. It was built within trench cut (17889), a linear trench with slightly sloping sides and a flat base. The trench was cut into the historic topsoil (17819) and the underlying pale grey subsoil (16190). The drain capping was made from timber pieces (ranging from 300–420mm long, 100–250mm wide and 30–60mm thick) cut to fit in the width of the channel at the eastern end for a length of 2.2m with occasional sandstone blocks lining the sides of the drain at the western end for 3.7m. The drain was a more formal structure at the western end where it was closest to the Town Drain, with sandstone sides and capping (Figure 3.86). There was no stone or timber flooring, the base of the drain was the pale grey sub-soil (16190).

There were two fills within the drain. The upper fill (17890) was a mid-brown clayey sand with occasional patches of clay and a humic lens at the base above some of the decaying timbers; a few sandstock brick fragments <20mm and occasional charcoal pieces and sandstone fragments <30mm. The fill was 5.7m in length and 220mm in depth; narrower (260mm) at the western end between the sandstone blocks and wider (630mm) at the eastern end where it sat above the timbers (Figure 3.85). The lower fill (17891) was only exposed in the western end of the drain, in association with the sandstone elements, but was also present under the timbers of the drain capping in the eastern end and is the true drain fill (Figure 3.86). This fill (17891) was a red-brown firm silty sand with occasional sandstock brick fragments <20mm and charcoal flecks, c.5.7m in length, 270mm wide and 20mm thick.

This drain was truncated at its eastern end by modern impacts from the 1960s post office but was shown through survey to be aligned with an early pit or sump (17228) and a later brick sump, built above the earlier version (16187), to the west of the cottage on Lot 30 (Figure 3.76, Figure 3.87, Figure 3.88, Figure 3.89) (see Vol. 2, Sec. 7, Area A Trench Report). It is probable that the occupants of the cottage on Lot 30 were using the sump and the drain as a convenient way to dispose of effluent, directly into the Town Drain and/or the creekline prior to the formalisation of the drain in c.1840. Therefore, it was related to opportunistic use of the site by the adjacent property on Lot 30.

Figure 3.84: Timber-capped drain heading westwards from the sump/cesspit in Lot 30 to the Town Drain. View to east, 1m scale. IMG_6093.

Figure 3.85: Detail of timber capping and the upper fill (17890) of the drain channel IMG_6090.

Figure 3.86: Western end of the small drain (17888) heading westwards towards the Town Drain. The fills (17890, 17891) within the drain are in section. View to west, 1m scale. IMG_6088.

Figure 3.87: Sump or cesspit on Lot 30, Area A, associated with the c.1822 cottage and shown on the Railway Resumptions plan of 1858. The channel of the drain (near the scale) continued as the timber-capped drain on Lot 28 in Area B. View to west, 1m scale. IMG_4680.

3.6.4.3 HOUSE 4 DRAINAGE LOT 30

Two related drainage features were found in the immediate vicinity of House 4, one identified as a rudimentary water catchment or sump and the other a shallow informal channel (Figure 3.88).

3.6.4.4 SUMP

Approximately 6m to the west of House 4, was an early sump or catchment trench (17228) that collected excess water and channelled it westwards towards the Town Drain. This feature was directly beneath a later brick sump (16187) which appears to have replaced it, discussed with the later phase of the house (Phase 4.2). The earlier sump was a large rectangular trench cut (Figure 3.89) measuring 5.7m by 1.52m to 2.51m. The sump had irregularly-shaped sides, both steep and gradual and showed signs of water erosion and collapse (undermining) in some spots, indicating it was probably not lined (no surviving evidence supported lining). The base was largely uneven, with some flatter sections.

The fill within the cut (16336) was a moderately compacted, very fine grained, dark grey clay particles and fine-grained sands with inclusions of large pieces of charcoal and frequent oyster shells and shell fragments. The deposit was 180 to 290mm deep and cut into the subsoil (16190). Three glass fragments were found within the deposit, two of which were undiagnostic bottle sherds and one Crown window glass fragment (pre-1850).

Shells and soil samples were collected (samples #188, 189 and 190), the soil was wet sieved and artefacts were collected during sieving. Over 760 oyster shell fragments were retrieved (see Vol. 3, Sec. 8.4). All shells analysed were identified as Sydney rock oyster that had originated in Sydney harbour and were shipped to the site. The oysters were processed for meals and the shells discarded as household rubbish as part of the infilling of the sump/trench when it was no longer in use. Some faunal bone fragments were found including one cow bone fragment, large and medium mammals and part of a bird wing. No butchery marks were identified on these bones (see Vol. 3, Sec. 8.3). Soil sample #188 was analysed for pollen remains. The results indicated that there was diverse microflora present, which included abundant native species such as she-oak *Casuarina* (61%), *Eucalypt* 12%, native grasses, ferns and wattle alongside exotic species of dandelion and knotweed. Abundant algal cysts hint that the pit was waterlogged at some stage. There was trace evidence for human sewage in the form of *cloacasporites* (see Vol. 3, Sec. 8.5).

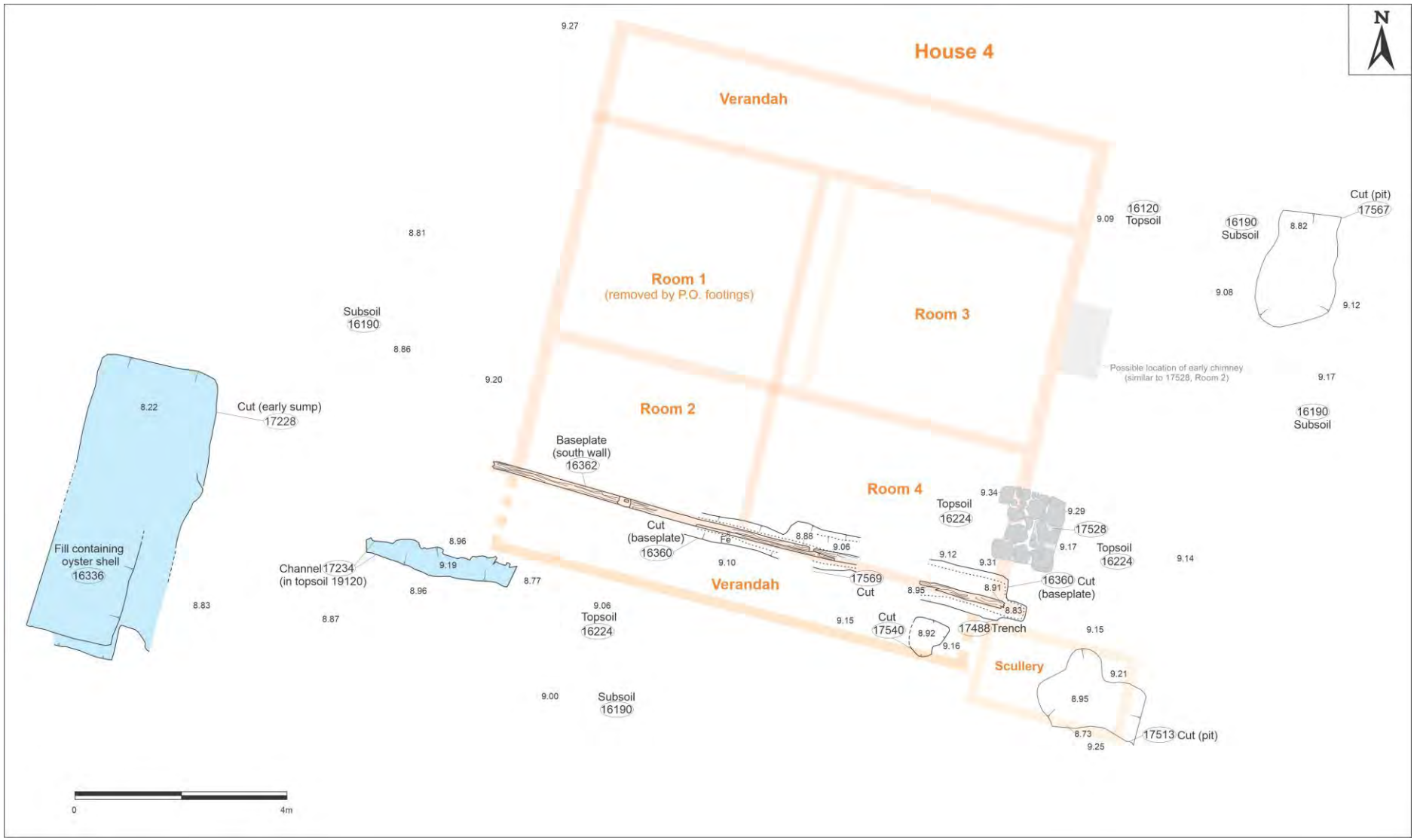

Figure 3.88: Drainage features relating to the Phase 4.1, House 4 (shaded blue). A large rectangular sump/pit (17228) and shallow drainage channel (17234) were found near this house.

Figure 3.89: Large rectangular cut (17228) cutting the subsoil close to the property boundary of Lot 30 which is represented by the sandstone wall. This large feature was used as a sump or catchment for drains leading from House 4 and was later replaced by a more formalised brick sump (16187) which flowed into the Town Drain (to the west in Lot 28). View northwest. Scale 1m. IMG_4715.

3.6.4.5 CHANNEL

A linear feature or trench (17234) was excavated in the area of the south verandah, 2m south of the baseplate and just south of the verandah postholes. This feature ran east-west and extended westwards beyond the southwest corner of the house (Figure 3.88, Figure 3.90) towards the creekline on the same alignment as the brick sump (16187) (Phase 4.2). The trench (17234) was irregular and ill-defined. It varied in width from 370 to 660mm and 120 to 180mm deep with a concave base. The fill (17235) was a mix of dark brown modified topsoil and bright orange-red sand and contained artefacts.

Its location at the rear of the house and on an east-west alignment towards the sump and creek indicates it was a drainage channel. The irregular shape could suggest a naturally formed channel following the slope towards the creek. Two brick-lined drains (16337 and 16332) associated with the later phase of the house (Phase 4.2) and also running westwards replaced this early drain with a more formalised replacement.

The ceramics found within the fill were mainly tablewares and included early types such as a piece of locally-made pottery (c.1801-1823), creamware and pearlware, (both starting in the 1780s) and blue (earlier) and black transfer print (c.1830s onwards), whiteware and salt-glaze (see Ceramics Report, Vol. 3, Sec. 8.1). A few glass fragments were also early alcoholic beverage bottles that included one piece of champagne bottle dating from 1760-1800 and a dip moulded beer/wine bottle 1800-1820. This drain through its association with House 4 dates from c.1822 and possibly predates the Town Drain (c.1840) as it flowed into the early sump and not the later sump.

Figure 3.90: Left: Shallow linear trench (17234), probable drainage channel running east-west towards the sump (17288) and brick sump (16187) and creekline (image right). View south, scale 1m (left). IMG_4727. Right: The drainage channel in section. View east, scale 50cm (right). IMG_4730.

3.6.4.6 WHITE HORSE INN DRAINS LOT 32

A network of drains were the earliest features recorded across the northern third of Lot 32. They were cut into the modified topsoil and subsoil and covered by all other fills and structures (Figure 3.91). There were three different sections of this drainage system, however all appear to be part of the same network that carried water northwards towards Macquarie Street (Figure 3.92). A more informal drainage channel was also found at the southern end of Lot 32 and Lot 30 that may have drained water or effluent away from a cesspit.

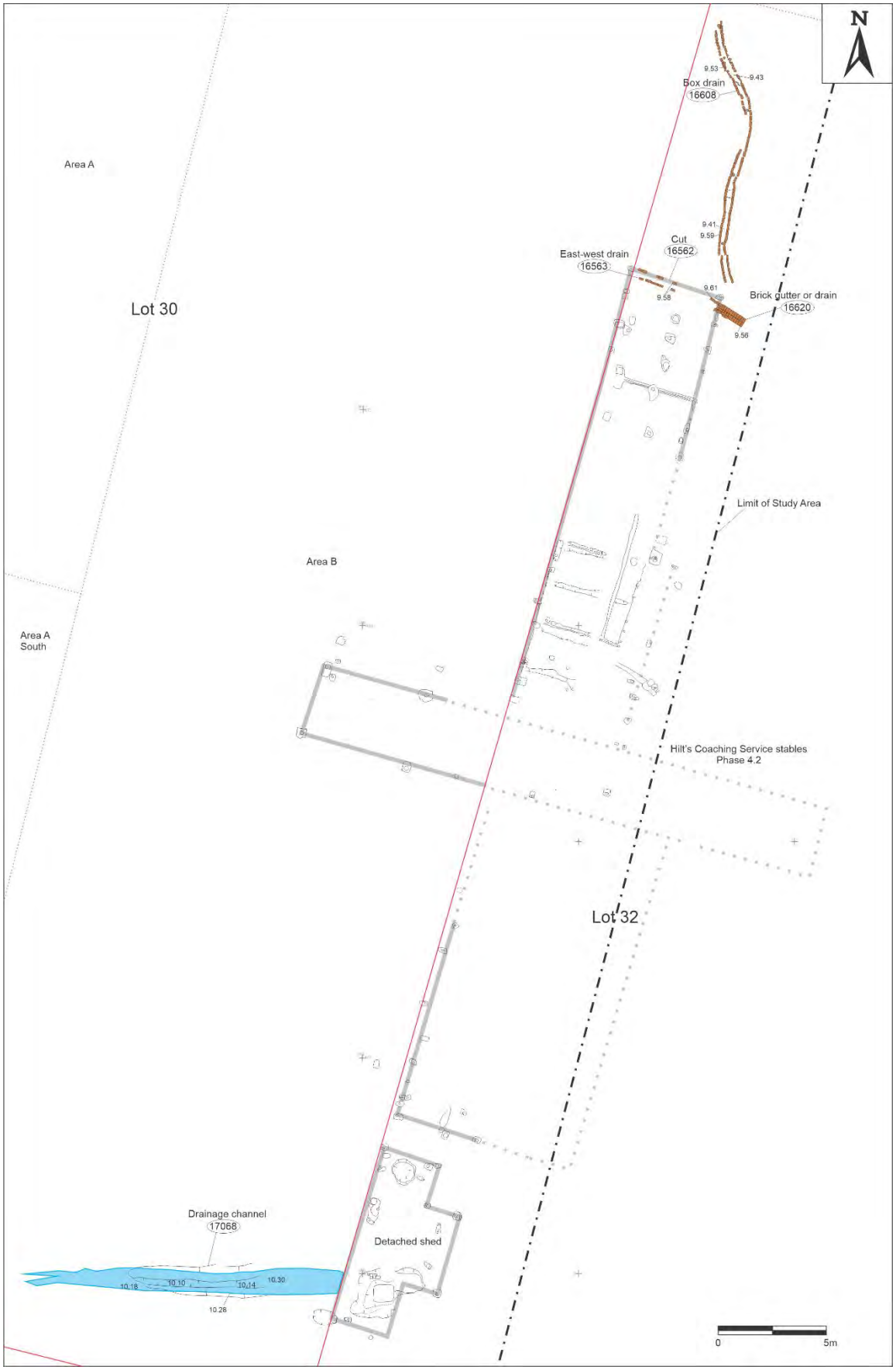

Figure 3.91: Phase 4 drainage features in Lot 30 and Lot 32. The northern drains are brick and the southern drain is an informal trench.

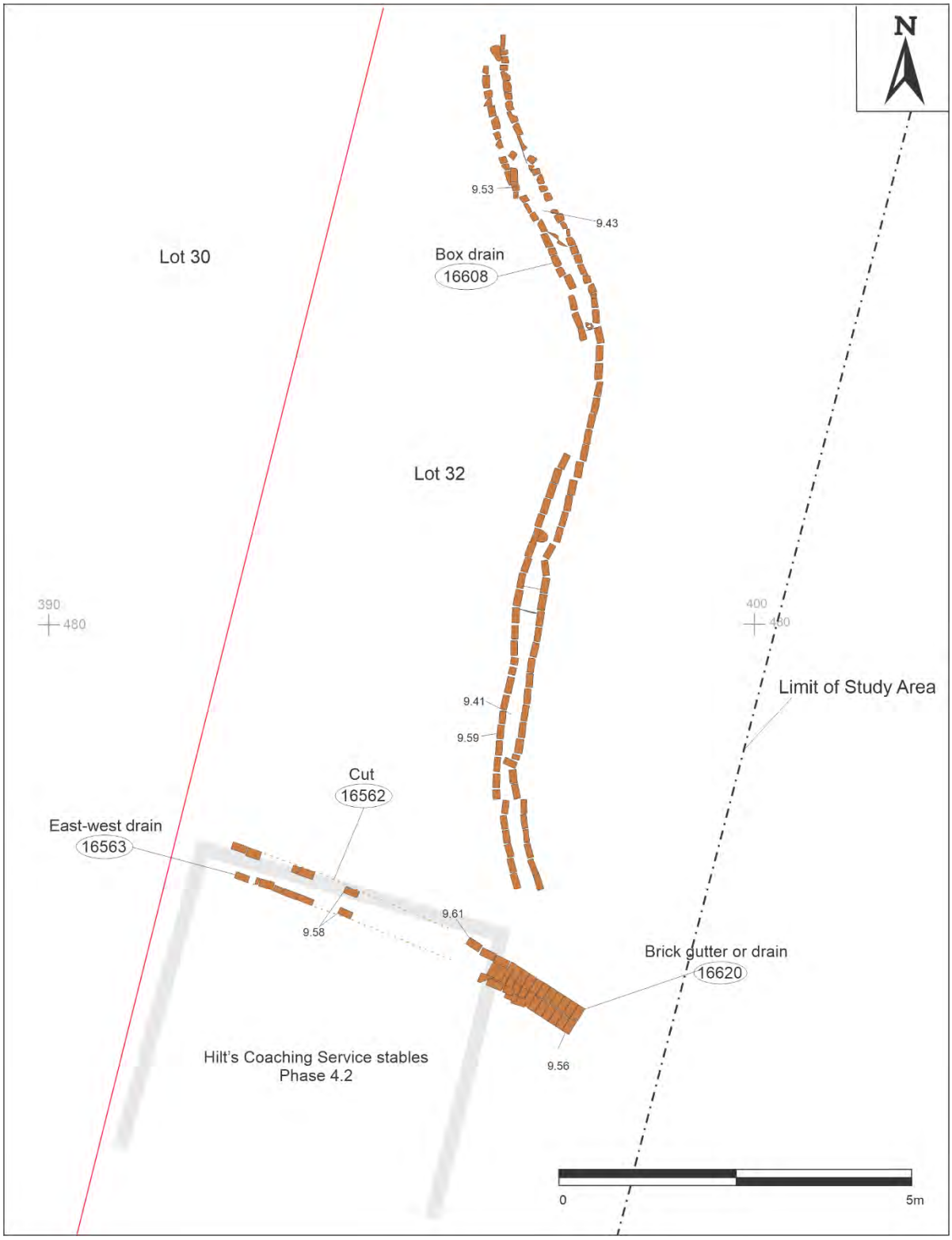

Figure 3.92: Brick Drains at the northern end of Lot 32 associated with the White Horse Inn.

3.6.4.6.1 SERPENTINE DRAIN

A serpentine linear drain was found running 13m, south to north across the northern end of Lot 32 (Figure 3.93). The southern part of the drain was at RL9.60m, falling to an approximate level of RL9.37m at the northern end. The sides of the drain were lined with flat sandstock bricks (16608), but the base was unlined. The bricks were two courses high along most of the length of the drain and had average dimensions of 240 x 115 x 70mm. There was no evidence of any bonding material. Bricks sampled and catalogued from the serpentine drain (16608/#9048) and the east-west drain 16563 (16563/#9041) were very similar and were both dated 1830-1860. A few patches of decayed wood within the drain fill hint that it may have been capped with timber.

The brick sides of the drain were missing from the southern end where it intersected with the flat section of drain (16620), suggesting there may have been repairs to the drain, or impacts after it ceased to be used (Figure 3.94). The drain probably continued to the northwest however, it was truncated by a footing from the 1960s Post Office building.

Figure 3.93: Photo showing the full length of brick-lined drain 16608. The patches of decayed timber, possibly the drain's capping, are arrowed and two tree boles numbered in white. View to south, 1m scale. IMG_0743.

Figure 3.94: Photo showing the intersection of the three drain elements. View to south, 500mm scale. IMG_0813.

The drain had probably fallen out of use by the late 1840s, when the stable and sheds were built to the south. There were two fills recorded within the drain, the upper fill (16611) was a soft, mid-grey silty clay with some rust-coloured sand, charcoal, ceramic and glass inclusions; the lower fill was a clean yellowish brown, or greyish brown clayey sand. The glass retrieved consisted of fragments of bottles (5) and tableware (2). Identified bottle forms were for alcohol and include dip-moulded beer/wine (1820–1870) and schnapps (1800–1900) bottles. The items were both press-moulded with panelled shape (1835*TPQ*). Results of temporal analysis for glass artefacts suggest that fill in the serpentine drain accumulated during the subsequent Hilts Coaching Service phase of site development (1850s–1873) (see Glass Report, Vol. 3. Section 8.3). While the drain was not serving its primary purpose after the late 1840s, the main section of the drain could still have been open or silting-up with surrounding soils for a longer period given there were no known structures in the northern third of the area. This would account for the 1835*TPQ* of the glass in the upper fill.

Pollen analysis of the drain fill (16611) suggested that the surrounding ground was poorly drained with sedges, ferns and hornworts growing on damp bricks or sediment within the drain. Exotic pine pollen within the drain fill supports an age range from mid-late 19th century. Pine trees were planted in large numbers in Parramatta from the late 19th century but documentary evidence from Parramatta Park suggests they were planted earlier.[177] Analysis of sample #49, taken from the accumulation in the base of the drain, indicated that it may have been still in use into the mid-late 19th century (Macphail 2019: Vol. 3, Sec. 8.5).

[177] Governor Brisbane planted 4 pine trees as markers around the Observatory (1821-1848). SHR listing, 'Parramatta Park and Old Government House'.

Available at https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=5051462. Accessed on 27/08/2020.

3.6.4.6.2 WEST DRAIN LINED WITH SANDSTOCK BRICKS

An east-west running drain, also with sides lined with sandstock bricks (16563) was contemporary with or slightly predating the serpentine drain. The drain had a maximum length of 4.5m, width of 460mm and depth of 150mm. The sandstock bricks of the lining were discontinuous along the length of the drain cut, surviving two courses high in places and completely missing in others (Figure 3.95). The bricks had average dimensions of 230 x 110 x 70mm, slightly smaller than those in the serpentine drain. The drain ran parallel to a later gutter (16471) on the north side of the stables and sheds structure, but was cut into the subsoil at a lower level. The fill (16564) within the drain consisted of moderately soft bands of white, grey and orange iron-stained find grained sands with a rippled or marbled effect, caused by water activity, it did not contain any artefacts. The fill was thicker in the eastern part of the drain, becoming thinner towards the west indicating that the water was draining from the west down towards the east. This drain was buried by fills associated with the construction of the t-shaped structure on Lot 32, therefore the drain may have only been in use for a short time prior to the construction of the stables or sheds. A short period of use and/or early date of backfill of the drain is supported by pollen analysis of the water affected fill (16564, Pollen Sample #37) which showed a high proportion of native casuarina pollens and only rare exotic pollen such as pine and cereals, giving an early-mid 19th century date (Macphail 2019:40-41, Vol. 3, Sec. 8.5).

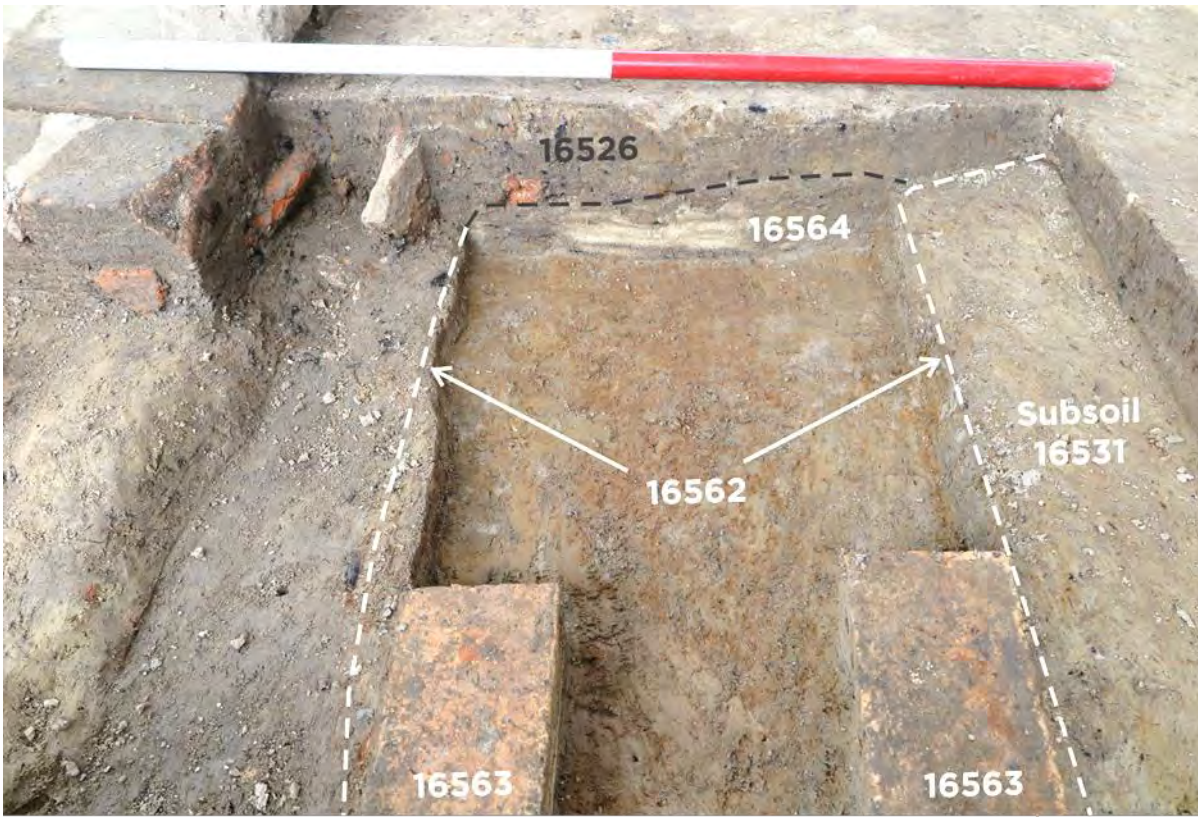

Figure 3.95: Section photo showing the sandstock brick lining 16563 along the sides of the drain cut 16562. After the drain stopped being used, it silted up with lenses of sand (16564) before being covered with a compact mixed clay fill (16526). View to east, 1m scale. IMG_0627.

3.6.4.6.3 SANDSTOCK BRICK GUTTER OR DRAIN

Two rows of red sandstock bricks (16620), laid flat, formed a gutter or base at the intersection of the serpentine and east-west drains (Figure 3.96). This gutter or wider section of box drain may have acted as a sump, or collection point for water flowing down from the west from drain 16563 and either continuing to the east (outside the study area), or into the serpentine drain 16609. There was no evidence of *in situ* drain deposits.

Figure 3.96: Flat sandstock bricks forming the base of a gutter, drain or sump (16620), intersecting with the north-south serpentine drain 16609 (bottom) and east-west drain 16562 (right). View to south, 500mm scale. DSC_9192.

3.6.4.6.4 DRAINAGE CHANNEL AT SOUTH END OF LOT 30 & 32

A linear, east-west running channel, measuring at least 13m long (17068) at the southern end of Lot 32 extended into Lot 30 (Figure 3.97). The cut for the channel had a shallow, u-shaped profile and was between 1.1 and 1.5m wide and 170mm deep. The southern half of Lot 30 and Lot 32 had been cut down during the 20th century, so the channel may originally have been much deeper. The channel was located close to a robbed-out cesspit at the rear of the White Horse Inn/Hilt's Coaching service (16934) visible on the 1858 plan, (Figure 2.4). It ran from there towards a pond at the southern end of Lot 30 suggesting that the channel may have been draining waste or water from the cesspit into the pond. However, as the pond is only known from 1858 onwards this drainage pattern is not certain. There was no evidence for *in situ* fills or accumulations in the base of the channel that may show water activity.

The drainage channel was filled with two types of greyish-brown silts. The upper fill 17069 was grey-brown, very fine silty loam that contained small fragments of charcoal, small fragments of ceramics, brick, sandstone and ironstone inclusions (17069). The lower fill was a mix of the underlying brownish red plastic basal clay and the upper grey-brown silt

(17125). The lower fill also had a concentration of iron oxide nodules, as well as the same fragments of ceramics, brick, sandstone and charcoal flecks as the upper fill.

The base of the channel showed a gentle slope from the east down to the west. If the channel did indeed facilitate the drainage of the cesspit or other waste water from the Lot 32 property down across the back of Lot 30 towards the pond, it shows that the two properties were sharing or joint-managing the flow of water, perhaps to be stored in the pond for common use.

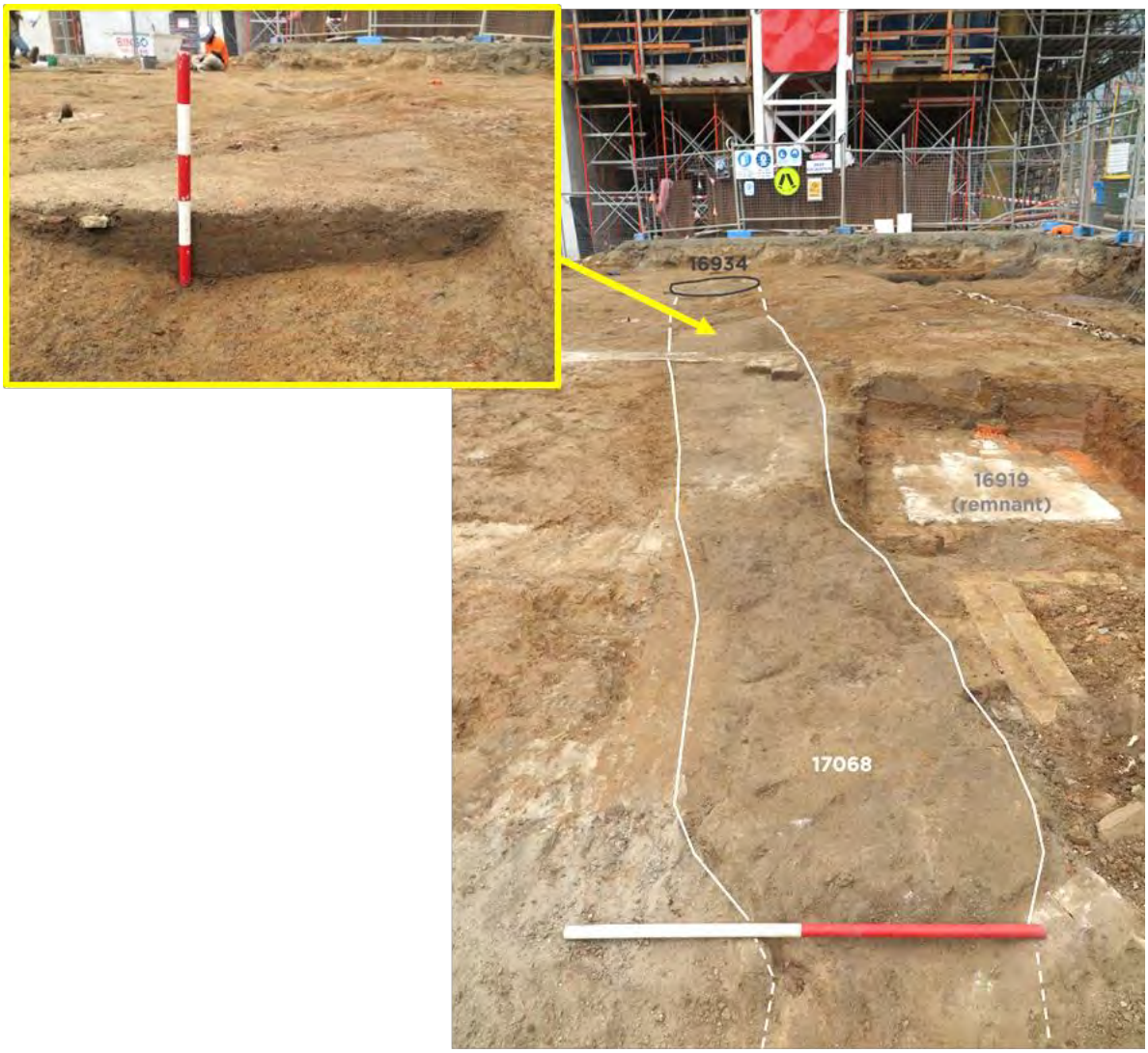

Figure 3.97: Photo showing the linear drainage channel (Area B) in relation to the cesspit 16934 (right) and west-facing section through the fills in TT 21 (above). Both photos view to east, 1m scale (right) and 500mm scale (above).

3.6.5 RESIDENTIAL DEVELOPMENT

Initial residential development within the study area involved the construction of a cottage on Lot 30 by 1822 and a storage pit in Lot 28. Other activities such as cultivation on Lot 1(181) and drains on Lot 28, Lot 30 and 32 are discussed above.

3.6.5.1 LOT 30 HISTORIC CONTEXT

Lot 30 was leased to John Thorn on 30 June 1823 as part of the formalising of leases across Parramatta. It is possible that a cottage had already been constructed prior to the lease as it appears on an 1822 plan (Figure 2.8) but any earlier residential occupation is not documented. A house was depicted on Stewarts 1823 Plan at the front of Lot 30 in the northwest corner fronting Macquarie Street (Figure 2.10). By 1833, the property to the east of Thorn's Lot 30, was described as being bounded by the premises of John Thorn, occupied by George Harvey; suggesting that Thorn was not in residence but rather leasing out this property.[178] Thorn was known to be the lessee of several other properties in Paramatta. The 1836 and 1844 maps of Parramatta show the building in the same position and with similar configuration as the 1823 plan (Figure 2.13, Figure 2.14). In 1845, the property was sold to George Cavill. The 1858 plan shows the house was extended with an additional room added to the eastern side of the building along with some yard structures and fence lines (Figure 2.15). It is likely that these extensions were carried out during the ownership and occupancy of Cavill, who was in residence from 1845 until his death in 1863. These later modifications will be discussed in Phase 4.2 (1850s–1870s).

The archaeological evidence for the earliest phase of the cottage is represented by: the raising of the ground level in the north of the allotment to allow for the construction of the house in what was clearly a low-lying, waterlogged area, construction of the cottage and associated pits. The multiple phases of occupation and renovation of the house and its associated yard structures, fills and deposits will be discussed in Phase 4.2. For ease of recording this house was referred to as 'House 4' during the excavation and will continue to be referred to as House 4 throughout this report.

3.6.5.2 PRE – HOUSE 4 ORIGINAL TOPSOIL

The so called 'original' topsoil (discussed previously in Phase 3) had been modified to some extent during the period of land clearance and agriculture, and early use of the site as 'reserved for fairs' and was therefore not pristine. Across the site the original topsoil was only detected *in situ* beneath the footprint of House 4, where it was numbered context 16224 (Figure 3.98). This deposit was identified as original topsoil as it had been sealed by construction levelling fills for the first phase of the cottage. Therefore, it was unaffected by later contamination and mixing from deposits above.

Ceramics from the topsoil included tableware from the 1780s through to the 1830s, with frequent examples of blue transfer print pearlware, supporting this identification (see Vol. 3, Sec. 8.1). The artefacts within the buried topsoil (16224) were sealed by 1822. Elsewhere the historic topsoil had been exposed and mixed with occupation deposits from the 1820s onwards and then from deposits from the 1870s until the 1960s.

[178] LTOD, No 840 Bk G.

Figure 3.98: Remnant original topsoil (16224) seen in north-facing section below Room 3, House 4, with imported levelling fills 16193 above and A2 subsoil (16190) below. View to southwest, scale 500mm. IMG_4426.

3.6.5.3 POLLEN EVIDENCE

Two samples of historic topsoil (16224), buried under levelling fills of the c.1822 cottage, were shown to have some introduced species present, therefore the topsoil had some limited exposure to exotic species prior to the construction of the house, probably when exposed following initial land clearance, government agriculture and use 'for the fairs'. However, the abundance of native species provides a good indication of the pre-settlement vegetation within the study area.[179]

Pollen analysed from the samples taken of buried original topsoil (16224) are characterised in Table 3.9, Table 3.10:

Table 3.9:Characterised sample (8).

Sample # 254 (8)	Description
Abundant taxa:	fungal spores, *Allocasuarina/Casuarina* (she-oak), *Phaeoceros* (hornwort)
Common taxa:	*Eucalyptus* and unassigned Myrtaceae, native Poaceae, *Anthoceros*
Frequent taxa:	Liguliflorae (dandelion), unidentified tricolporates
Exotics:	Liguliflorae (dandelion), unidentified tricolporates
Edible taxa:	Nil
Sewage:	Nil

[179] Taken from Macphail 2019; Vol. 3, Sec. 8.5: 32-33.

Sample # 254 (8)	Description
Microfauna:	egg cases (18%)

The frequent occurrence of dandelion (5%) and unidentified tricolporate pollen types (1%) are inconsistent with the sample representing an unmodified (natural) topsoil. Conversely, the presence of Acacia (1%), Eucalyptus (8%) and very high relative abundance of *Allocasuarina/Casuarina* pollen (66%) is equivocal evidence for a pre-British settlement age. An unusual finding is the significant (2%) occurrence of bracken-like (Pteridium) spores – a fern that is typically colonizes sandy soils after fire. Abundant microfaunal egg cases imply the soil profile has been bioturbated even if this was not apparent at the time of sampling.

Table 3.10: Characterised sample (10).

Sample #Lawrie 2 (10)	Description
Abundant taxa	*Allocasuarina/Casuarina* (including pollen aggregates), *Phaeoceros*
Common taxa:	native Poaceae, Anthoceros, fungal spores
Frequent taxa:	Liguliflorae, Cyperaceae, *Calochlaena*, unidentified trilete fern spores
Exotics:	Cerelia, Liguliflorae, unidentified tricolporate
Edible taxa:	Cerelia
Sewage:	Nil
Microfauna:	egg cases (1%)

Frequent dandelion pollen shows the topsoil post-dates British settlement. Sample 10 is important in that (a) bioturbation appears to have been minimal and (b) the association of trace cereal pollen, frequent dandelion pollen and abundant hornwort spores is evidence that the sample represents a period after the early 1790s clearance phase (see Macphail & Casey 2008). In this context, the hornwort spores are likely to represent the use of fire to clear the native woody vegetation. The significant representation of sedges and ferns implies the clay-rich soils were damp.

3.6.5.4 RAISING AND LEVELLING FILLS, PRE-CONSTRUCTION OF HOUSE 4

House 4 was built on top of levelling fills, two thick sand deposits which were not part of the natural soil profile. These sandy fills (16193, 16223) were laid onto the original topsoil (16224) and were associated with the footprint of the first phase of the early cottage (House 4), they were relatively clean and contained few artefacts. The sands were intentionally imported to raise and then level the ground prior to the construction of the house. Its purpose was to raise ground levels, as the northern part of Lot 30 was low lying and susceptible to waterlogging due to its closeness to the creekline on Lot 28, to the west. To the southeast of the site were two small seasonal drainage channels falling towards the western creekline and across the site where the levelling fills were deposited. The intention behind raising these would probably be to raise the house out of the ground water. Such sandy fills would have provided better drainage than the less permeable waterlogged clays, notably the ancient Pleistocene clays in the southern area.

The raising and levelling fills were exposed in section within a series of test trenches (Figure 3.101). The lowest of the fills (16193) sat directly above the original historic topsoil (16224), effectively sealing it (Figure 3.99). The fills, although of varying colours, mottled light grey

to red-brown to mottled yellow, were ultimately relatively homogenous and clearly part of the one raising and levelling event (Figure 3.100). They were thicker at the northern half of the house below Rooms 1 and 3, (up to 310mm) getting shallower upslope to the south, following the underlying topography (80mm) and respecting the original landform (Figure 3.103).

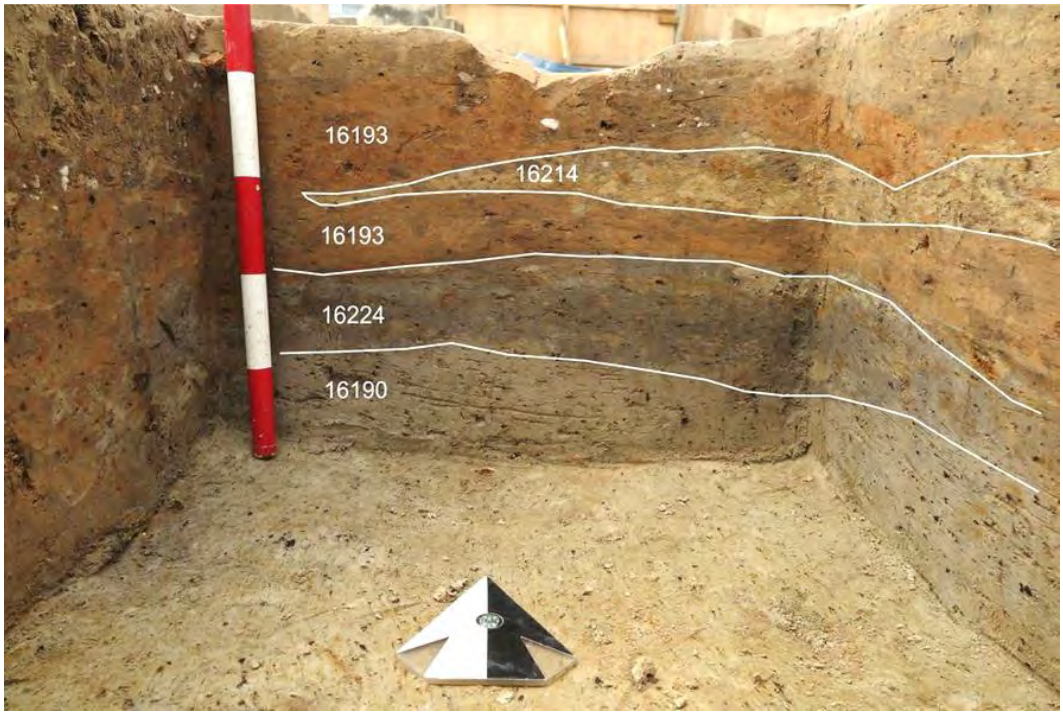

Figure 3.99: Detailed south-facing section (below Room 3, House 4) showing the depth of the imported sandy fills (16193 and 16214) above the original topsoil (16224) and subsoil (16190).. Context 16193 was generally above 16214 but in places the two were mixed or forming lenses suggesting they were deposited contemporaneously. View north, scale 500mm. IMG_4423.

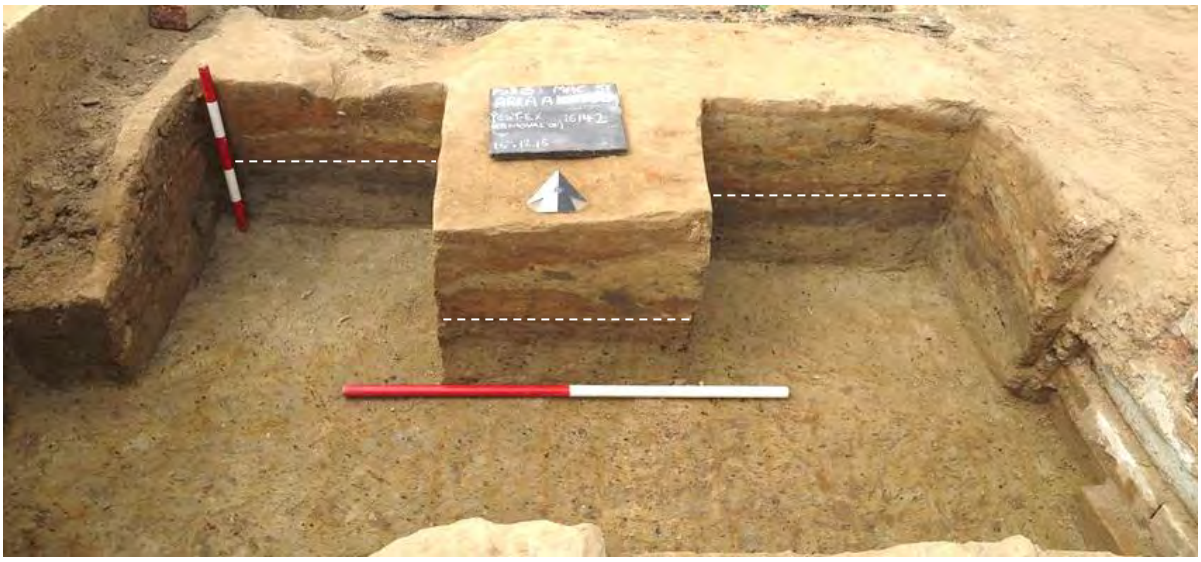

Figure 3.100: South-facing section showing the imported fills above the natural deposits dashed in white. These fills were deepest below the northern half of House 4 as the slope of the natural was steeper towards the north. View north, scale 1m and 500mm. IMG_4421.

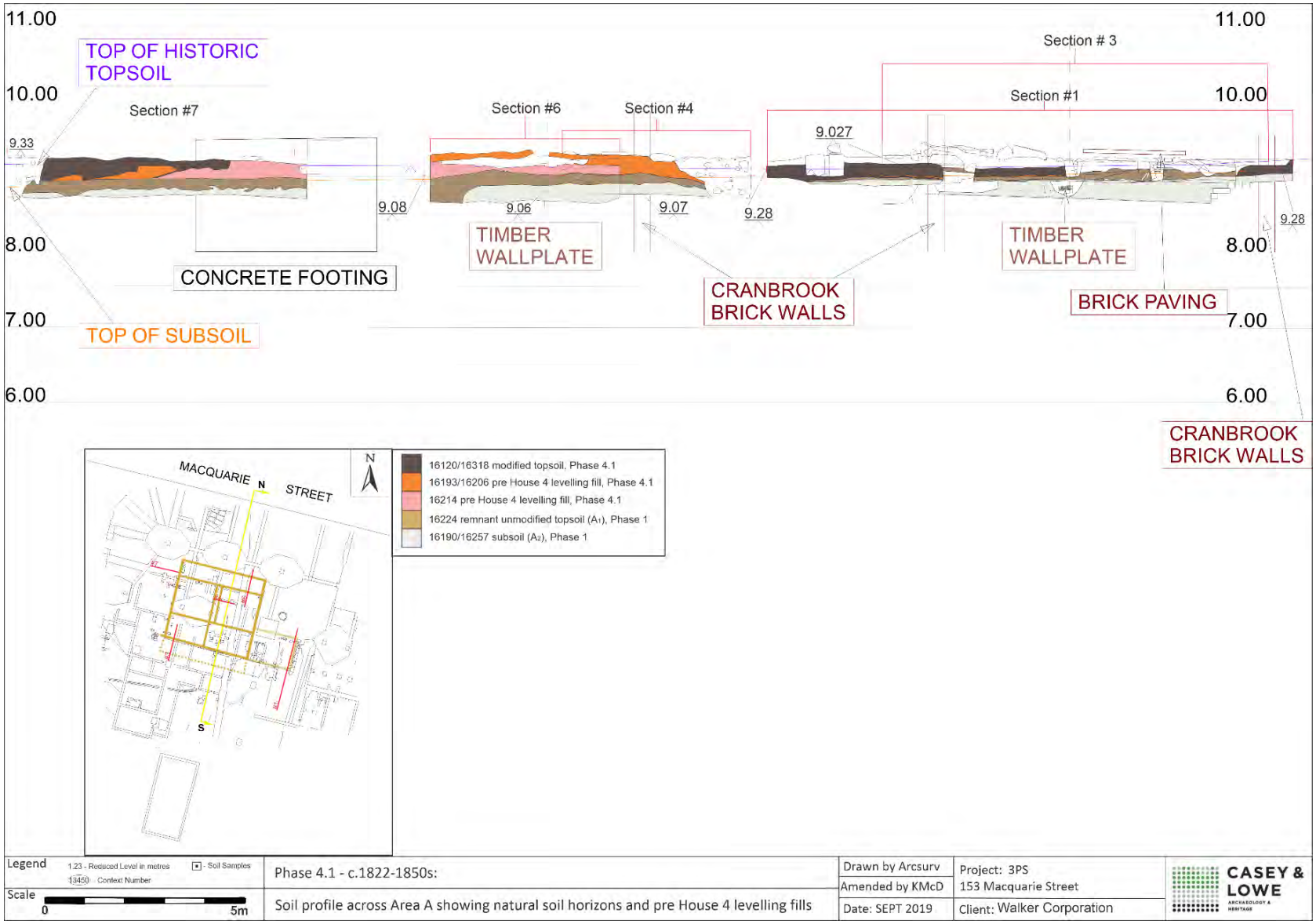

Figure 3.101: Soil profile across the northern part of Area A showing the original topsoil (16224), the imported sands (16193, 16206, 16214) and the northern base plate of House 4. G. Hazell (Arcsurv) with further annotations by C & L.

3.6.5.4.1 ARTEFACTS & ECO FACTS

Occasional historic artefacts, including glass and ceramic fragments were found within the levelling fills (see Ceramics and Glass Reports, Vol. 3, Sec. 8.1 & 8.2). A sample of 30 buckets of this sand was sieved to collect artefacts. The few fragments of glass were generally unidentifiable; however, the ceramics were more diagnostic. The ceramics were fairly homogenous, with mostly food preparation or serving tableware including fragments of bowls, plates, cups, saucers and a mug. The ceramic fabric types represented included: fine earthenware, coarse earthenware, bone china and porcelain, with surface finishes and decoration including: locally-made ceramics, blue hand painted Chinese porcelain, pearlware, revival pearlware, dipped creamware, blue transfer print pearlware, green and brown transfer print, hand painted pearlware, gilded and sponge decoration. The date ranges of these ceramics were from 1780–1870. Some of these ceramics may have been deposited with the fills during the lifespan of the house as well as during its construction. The bulk of the ceramics were recovered from contexts 16193 and 16223.

Animal bone and shell were also present (see Faunal and Shell Reports, Vol. 3, Sec. 8.3 & 8.4). Analysis of the bone showed that the most frequently identified species were sheep, then cattle and pig; chicken and fish bones and scales were also present. Butchery marks on the cattle fragments were largely indicative of carcass disarticulation and portioning. Indicating that the animals were being butchered off site. No native faunal remains were identified; however, one human tooth was recovered. The shells present were predominantly Sydney rock oyster, with three fragments of Sydney cockle.

Localised to the northern part of the house footprint was levelling fill 16214, mottled yellow, orange and white coarse-grained sands mixed with pockets of grey-brown sandy loam. Towards the base of this fill, a sandstock brick and timber plank were found just above the original topsoil confirming the fill was an imported and not naturally accumulating deposit. Fill 16214 was 100 per cent wet sieved and was found to contain both historical and Aboriginal artefacts. Therefore, wherever the source of the sandy fill had originated (possibly to the east of modern Charles Street or to the north closer to the river) it was a mixed post-contact deposit.

The uppermost of the sandy fills had some building materials (sandstone, brick and mortar) fragments pressed into it, as well as a number of artefacts including four coins (Figure 3.102). The coins were identified as:

- 1805 Irish penny of George III (extremely worn)
- 1826 British halfpenny of George IV
- 1826 British halfpenny of George IV
- 1826 British penny of George IV

These coins were associated with the northern verandah and their deposition is probably related to gaps between the verandah floorboards. The three coins dating from 1826, post-date the house construction c.1822, and are therefore associated with the occupation of the house rather than the levelling event. Whereas, the 1805 coin could have been deposited at any time from levelling fill deposition, construction, to occupation of House 4. It may possibly be associated with the site from where the fills were removed. Conversely, as it was very worn, it could have been in circulation for a long period of time before being lost (see Artefact Overview, Vol. 1, Sec. 4).

Figure 3.102: Coins from context 16193, left image showing reverse side of coins, right image showing obverse. Top left: George IV 1826 British half penny. Bottom left: 1805 Irish penny. Top right: George IV 1826 half penny. Bottom right: George IV 1826 penny. Scale 100mm. DSC_1068 and DSC_1070.

Soil and pollen samples were collected from levelling fills (16193 and 16214) (see Vol. 3, Sec. 8.5 & 8.6). Results from the pollen analysis (sample #236) suggest this modified sandy levelling fill may have come from the shallow gully/creekline crossing Lot 28.[180] The pollen analysis also showed that native flora such as she-oak (*Allocasuarina/Casuarina*) and hornwort (*Phaeoceros*) were present along with exotic dandelion (Liguliflorae). The presence of the exotic species confirms that the fill was imported after the establishment of the township. Soil analysis of the sandy fills (sample #358) found that they remained uncontaminated by heavy metals despite being close to the roadway as they had been sealed below the occupation layers of the early 19th-century house. The sand had the highest pH of any sample tested (pH 7), possibly produced by runoff from lime-washed walls from the cottage above. It also contained specks of charcoal and an elevated calcium content, suggesting fireplace ash deposition.[181]

[180] Macphail, M 2019: 30-31.

[181] Lawrie 2019, Vol. 3, Sec. 8.6: 8.

Figure 3.103: North-facing section within TT17 on the exterior (western) side of House 4. The brick remains are sitting on the imported mottled sands (16223). Above 16223 was the historic modified topsoil (16222) that accumulated during the lifespan of the house. View south, scale 500mm. IMG_4009.

3.6.5.5 CONSTRUCTION OF THE ORIGINAL COTTAGE (HOUSE 4)

The first cottage (House 4) on the site, was a rectangular structure on Lot 30 fronting on to Macquarie Street (Figure 3.105). House 4 was severely impacted by the footings of later 19th-century and 20th-century structures, however there was enough evidence surviving to confirm it was a four-roomed cottage with a front (north) and rear verandah. The rooms were numbered 1 to 5 (Figure 3.104). The original four-roomed house measured 7.18m (23.55 feet) (north-south) by 9.45m (31 feet) (east-west). With the inclusion of verandahs to the front and rear, the total length north-south was 10.52m (34.50 feet). The two front rooms (Rooms 1 and 3), were larger than the rear rooms (Rooms 2 and 4) (Table 3.11). The only evidence for an internal partition was between Rooms 3 and 4 and a single posthole between Rooms 2 and 4. Room 4 was the original kitchen, with two phases of a fireplace whereas Room 3 only had evidence for one fireplace in a later phase. In the 1850s Room 5 replaced Room 4 as the kitchen. It first appeared on the 1858 plan and will be discussed along with the other later additions and occupation deposits in Phase 4.2.

Table 3.11: Dimensions of House 4 (c.1819 house) and rooms, including verandahs and later extensions.

House Dimensions (N-S) x (E-W)	
Metric	Imperial
7.18m x 9.45m (67.9 sqm excl. verandahs) 10.52m (N-S) including verandahs	23' 7" x 31' 34'6" including verandahs

Room Dimensions (Interior) (N-S) x (E-W)		
Room No.	Metric	Imperial
Room 1	Approx. 4.23m x 4.3m (18.2sqm)	Approx. 13' 11" x 14' 1"
Room 2	2.8m x 4.3m (12sqm)	9' 2" x 14' 1"
Room 3	4.23m x 4.77m (20.2sqm)	13' 11" x 15' 8"
Room 4	2.8m x 4.77m (13.4sqm) 5.15m (E-W) including fireplace	9' 2" x 15' 8" 16' 11" (E-W) including fireplace
Room 5 (Extension)	2.78m x 4.25m(11.8sqm)	9' 2" x 13' 11"
Front Verandah	1.67m x 9.45m (7.1sqm)	5' 6" x 31'
Rear Verandah	Approx. 1.6m x 9m (14.4sqm)	Approx. 15' 1" x 29' 6"

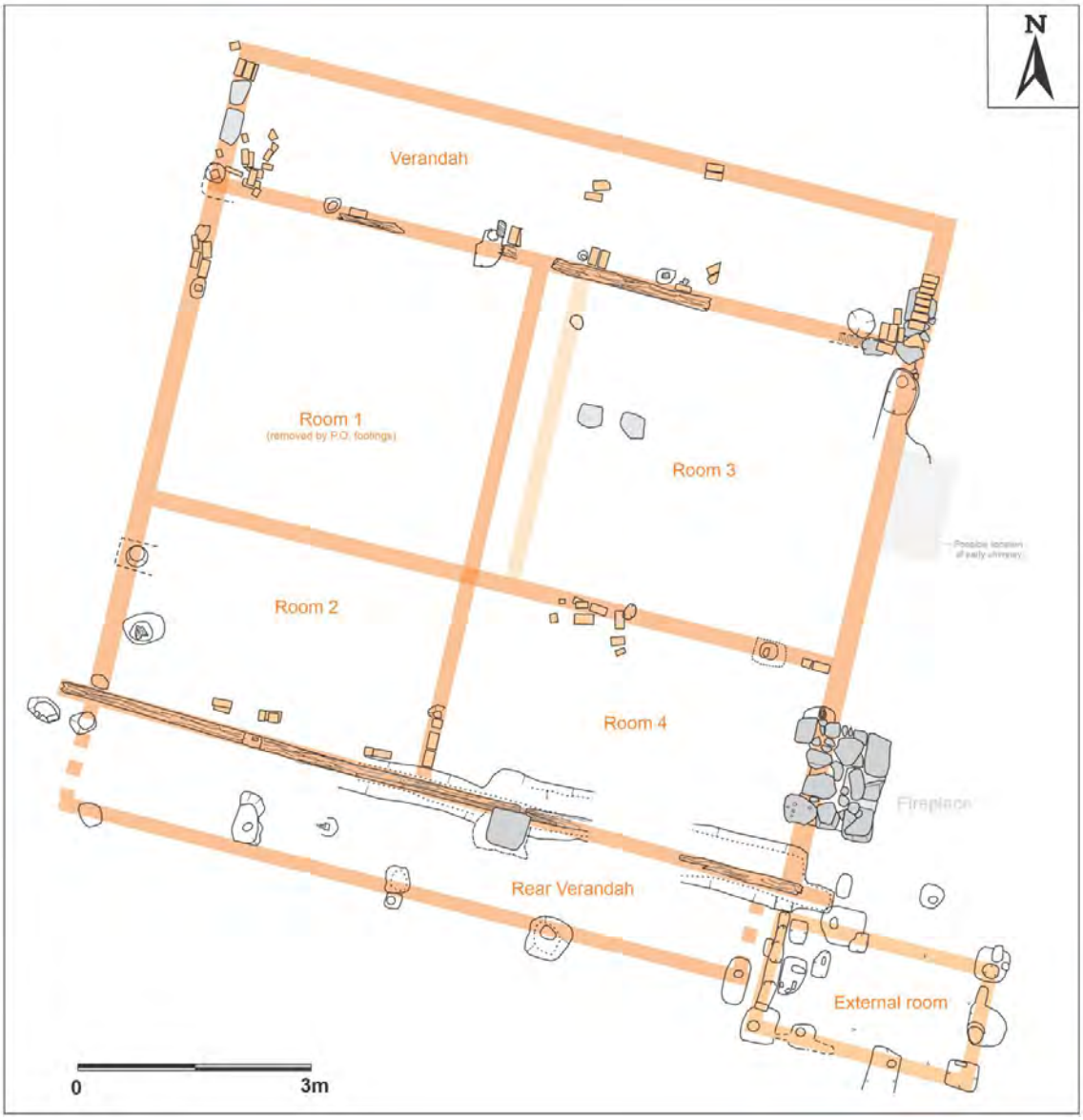

Figure 3.104: Plan of the first phase of House 4, showing the layout and numbering of the rooms.

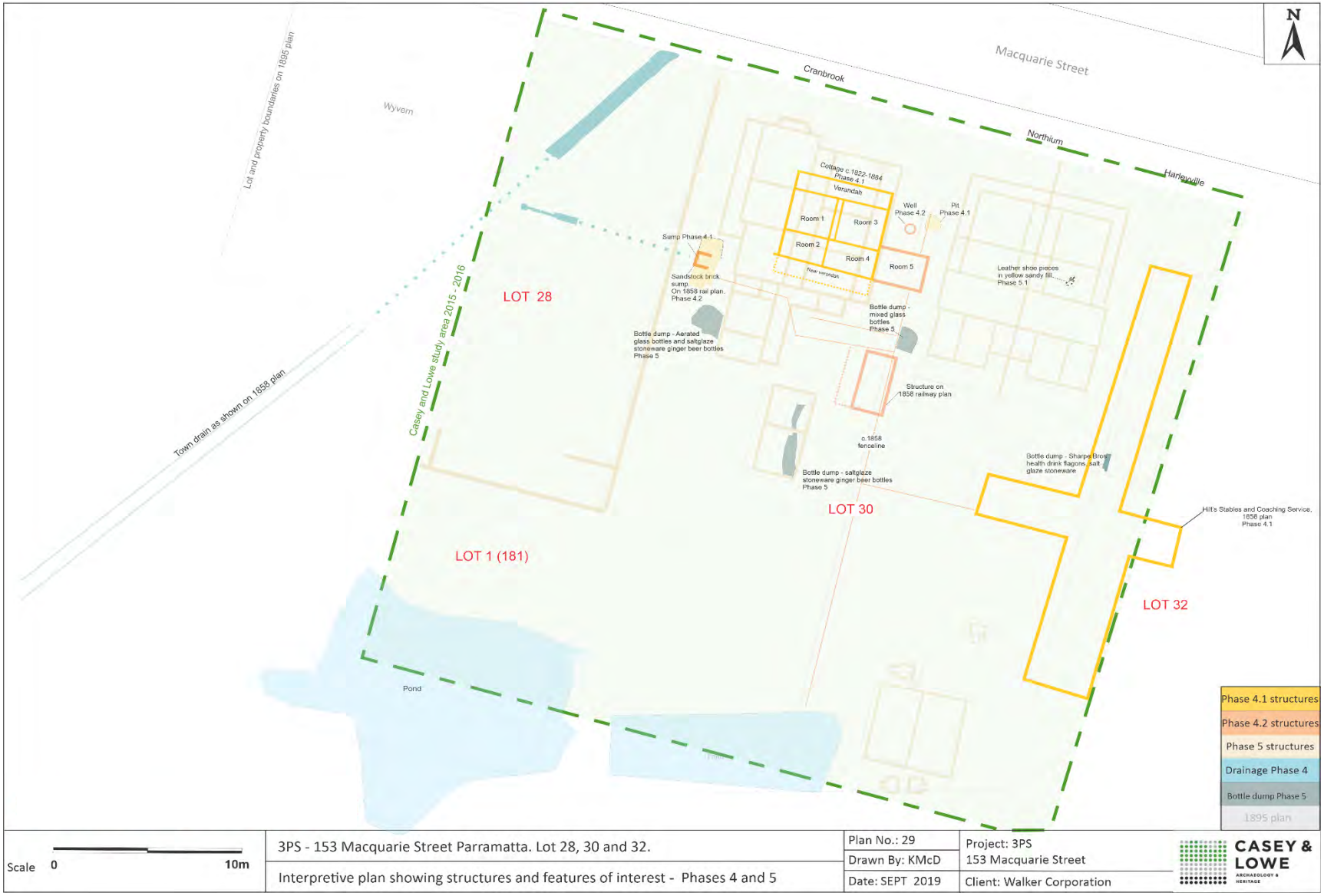

Figure 3.105: Schematic plan showing the location of House 4 within the study area in relation to the later 19th-century features. The early house was impacted by the substantial and deep brick footings of Cranbrook (Phase 5.1).

House 4 was built on top of and cut through the imported levelling sands discussed above. The archaeological remains for the timber frame of the house consisted of a series of postholes and a timber wall baseplate supporting the rear, south wall (Figure 3.106, Figure 3.107). The north, east, west and internal partition walls were constructed of timber upright posts. The northern wall featured a much-degraded horizontal timber (17270) that appeared to represent a floor support rather than a wall baseplate. There were also the remains of postholes for the verandas and brick supports for a timber floor.

Along with the baseplate, a total of 15 postholes were excavated and identified as belonging to the main structural part of the original house. Seven of these postholes were part of the rear verandah, with five brick piers the only extant remains of the front verandah. In many cases, only the pipe (shape of post) and post-pipe fill of the postholes were found, however, one or two had remains of a post *in situ.* These postholes are summarised in Vol. 2, Trench Report Area A, Table 7.1, 7.2.

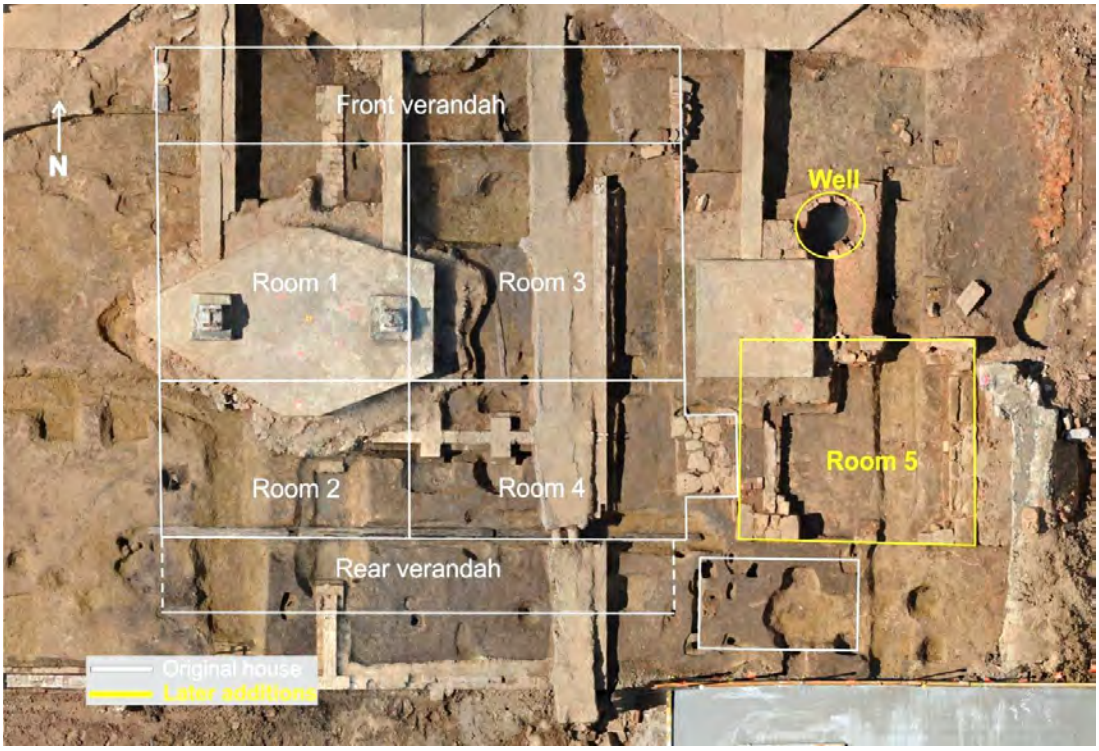

Figure 3.106: Orthophoto showing the remains of the cottage (House 4) outlined in white. Later extensions shown in yellow. Impacts from the footings of Cranbrook and the 1960s post office foundations can also be seen. These footings removed significant aspects of House 4. G. Hazell (Arcsurv), annotations Casey & Lowe.

3.6.5.5.1 LEVELS

The levels taken across the various elements of the house were fairly uniform with minor variations helping to inform functions for different features (Figure 3.107). A horizontal timber (17270) within the north wall of the cottage was at an RL 9.25 to 9.31m, which was a similar level to the top of the bricks (16281) on the eastern perimeter at RL 9.28- 9.33m, suggesting that they served a similar function, as supports for the timber-flooring system. Two flat stones at RL 9.32m, in the middle of Room 3, are also likely to be part of the support system for the floor. In the area of the front verandah seven brick piers were identified (16215). Levels taken on the top of the piers ranged from RL 9.18 to 9.20m, slightly lower than the horizontal timber plate which would suggest that there was a small

step, down from the house to the verandah, a common feature of weatherboard cottages. The rear wall of the house was dominated by a large ironbark timber baseplate (16362). Levels taken along the length of the baseplate were between RL 8.89m and 9.09m, almost one foot (300mm) lower than the plate at the front of the house suggesting the two horizontal timbers served different functions.

3.6.5.5.2 WALLS

The walls of the cottage were composed of a series of upright posts forming a frame that would have supported the roof. The evidence for this form of wall construction were a series of postholes (Figure 3.107). Horizontal weatherboards and wall linings would have been attached to these uprights. The upright posts were mainly circular in section, bush or un-milled timbers with occasional examples of rectangular posts, which may represent repairs or modifications. The corner posts were generally more substantial than the other external wall posts, while the few extant interior partition wall posts were smaller in size, (see Vol. 2 Trench Report Area A, Table 7.1, 7.2). The rear wall of the cottage differed from the others with a timber baseplate supporting upright timber slabs laid close to or overlapping one another. A cross-section drawing through a slab hut from the Blue Mountains shows a similar construction technique to that used in House 4 (Figure 3.108).

Figure 3.107: Plan of the first phase of House 4 showing the postholes, baseplate and wall configuration.

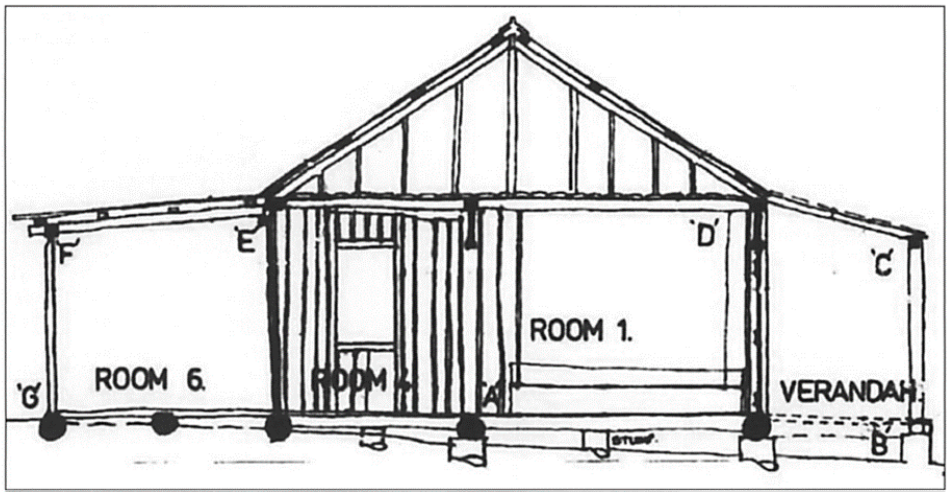

Figure 9: Section of Billy Maxwell's 1925–1926 hut, west side. Rooms 1 and 4 and the south verandah were erected in 1925; room 6 in the north skillion was added in 1926. The careful construction of the hut on its raised sill, supported on stumps and bed-logs, is shown very clearly (Graham Edds, in Edds and Associates, 'Kedumba Slab Hut' 2001:figure 3.16, p. 3.33).

Figure 3.108: Drawing of a section through slab hut c.1925 in a similar configuration to House 4. Note the front wall is resting on a baseplate which is in turn resting on wooden stumps or posts where the ground slopes down and the rear wall rests on a baseplate that sits directly on the ground.[182]

NORTH WALL OF HOUSE 4

A row of six postholes formed the northern wall of the house (Figure 3.107). The four larger posts were at a distance of 2.2 to 2.5m centres apart. The larger posts all had sub-circular or sub-rectangular post-pipes (Figure 3.109, Figure 3.110). The post-pipe fills within each of the postholes contained demolition fills of broken sandstock bricks, small fragments of grey plaster with a thin set coat (some with paint) and mortar fragments. Within posthole 16231 the remains of the timber post (16233) survived *in situ*. When the post was removed it measured 850mm in length with a bevelled base (Figure 3.111). Wood sample analysis determined the species of the post was narrow-leaved red ironbark.[183]

A horizontal timber plate was found running east-west (17270) on the alignment of the front wall of the cottage (Figure 3.109). This timber element was preserved c.5m in length, but would originally have run the full width of the house. What remained was in poor condition, thin and badly decaying 100 to 130mm wide and 60mm thick. No nails or joins were evident. The timber plate was not set into a foundation trench and there was nothing to suggest it supported timber uprights (unlike the timber baseplate at the rear of the house, see below). Therefore, at the front of the house the large upright posts supported the frame of the structure and the horizontal timber plate only supported the timber floor.

[182] Jack, I. 2009: Figure 9, p. 62.

[183] Ilic J, 2016, Wood Identification Results sampled by Know Your Wood, Oakleigh South, Victoria, 24/6/2016.

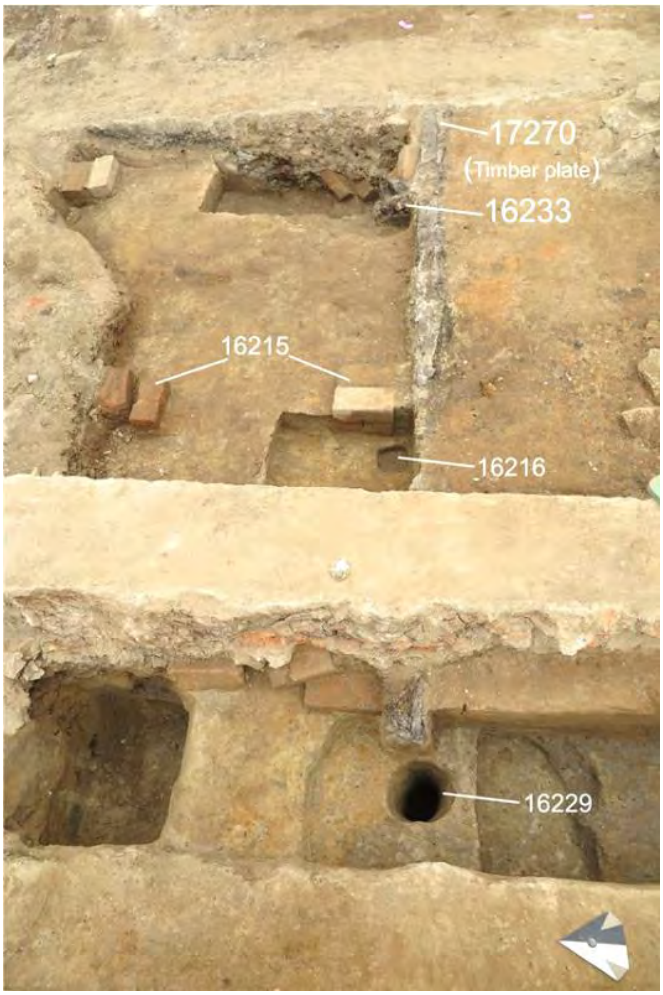

Figure 3.109: Post-pipes along the northern wall of House 4 abutting the horizontal timber plate (17270). To the east of each post were sandstock brick piers that supported the verandah floor. View east. IMG_4155.

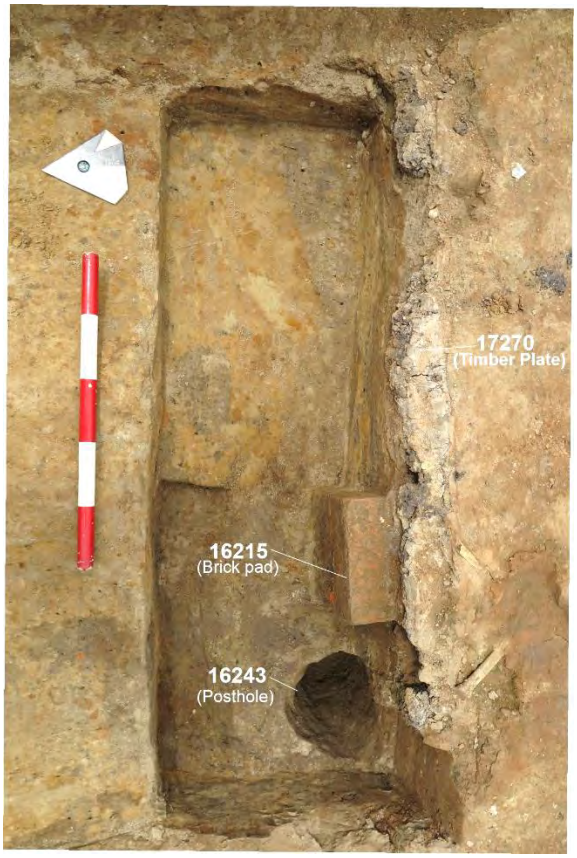

Figure 3.110: Only a small segment of the timber base plate (17270) survived in the north western portion of the house where it was very degraded. The postholes and brick pads were still evident. View east. Scale 500mm. IMG_4174.

Figure 3.111: Timber post (16233) from posthole 16231, north wall of House 4. The end of the post was wedge shaped to aid its placement in the ground. Scale 100mm. DSCN3727.

EAST WALL OF HOUSE 4

Due to the impacts of the 1960s Post Office footings and the 1850s extension to the southeast, all that remained of the east wall were two postholes, a construction trench and a row of sandstock bricks (Figure 3.107, Figure 3.112). The posthole (17803), close to the northeast corner of the house, was on the same alignment as the eastern edge of the front verandah. This posthole was associated with a north-south aligned linear construction trench (17807) measuring 1790 x 420 x 120mm with near vertical sides and a flat base. The second posthole (17576) 4.5m to the south had a decaying post *in situ*. This posthole was abutting the early Room 4 fireplace (17528).

A single row of flat sandstock bricks ran along the eastern perimeter of the early house (17594). The bricks running north-south were laid end to end. In the northeast corner of the house the row of bricks abutted the front verandah, two courses deep (Figure 3.112) and 1.2m in length. The bricks were at the same level as the timber plate at the front of the house and were laid to support flooring rather than the walls.

Figure 3.112: Northeast corner of House 4 showing the front verandah and the row of single bricks (17594) running north-south along the eastern wall of the house. After these bricks were removed another posthole (17803) was found within a shallow construction trench (17807). View south, scale 1m. IMG_5209.

WEST WALL OF HOUSE 4

Four postholes represented the western wall of House 4. The three postholes closest to the northwest corner were 700mm apart (Figure 3.107, Figure 3.113) and on the same north-south alignment as the edge of the front verandah. The post-pipes varied between circular and sub-rectangular, however their dimensions were similar to the post-pipes along the northern wall. Ceramic fragments found in some post pipes included pearlware with a date range of 1802-1832. The third posthole on this alignment (16333) was oval in plan; the shape probably created during removal of the post. Its post-pipe fill (16334) contained demolition debris including three near whole flat sandstock bricks. One brick had mustard-yellow shell mortar attached and another had orange-red shell mortar. Plaster samples (with set coat) of two different coloured renders (grey and a light buff/brown) were retained. The fourth posthole, at the southern end of the wall, had a rectangular post (17433) which partially survived (17435) *in situ*. It was located 700mm north of the south wall baseplate (16362) but was not on the same north-south alignment as the other postholes along the western wall. It was an early feature which may in some way be associated with the construction phase of the original house but not necessarily part of the wall frame.

Figure 3.113: Three postholes (17585, 17583 and 16333) running north-south along the western wall of House 4. The posthole in the foreground (16333) looks a lot larger than the other, this posthole had to be re-excavated on a number of occasions after heavy rain. View north. Scale 1m. IMG_5315.

SOUTH WALL OF HOUSE 4

The southern wall of the house had a different construction style to the other three walls. Instead of a row of postholes there was a construction trench (16360) running east-west cut through the imported sandy levelling fills and the underlying natural soil (Figure 3.107). Within the trench was a quartered and split horizontal ironbark timber baseplate (16362/#23245). Analysis of the baseplate established that it was grey ironbark (*Eucalyptus ?2siderophloia*) and although three other samples of timber from 3PS were ironbark this was the only example of the grey species.[184] Ironbark was named for its tough, grey to black, longitudinally furrowed rough bark on their trunks and large branches. They are frequently found growing in coastal NSW, north of Sydney as well as within Parramatta Park.[185] These hardwood trees grow tall and straight making them ideal for the timber industry as millable logs and are known for their durability, they are resistant to termites. It is a dense timber and difficult to work.[186]

[184] Ilic J, 2016, Wood Identification Results sampled by Know Your Wood, Oakleigh South, Victoria, 24/6/2016.

[185] http://plantnet.rbgsyd.nsw.gov.au/cgi-bin/NSWfl.pl?page=nswfl&lvl=sp&name=Eucalyptus-siderophloia. Note the remains of an iron bark stump beneath a section of Old Government House; also https://www.parrapark.com.au/assets/Uploads/Resources/plans-of-management/PPT-Conservation-and-Management-Plan-Final-v2-2007.pdf p. 22, (21/8/2019).

[186] Kass et al 1996:4; https://ironwood.com.au/grey-ironbark-technical-specs/ (21/8/2019)

The baseplate was formed from four large structural timbers laid flat in an east-west alignment to support the southern wall made of upright timber slabs (Figure 3.114). The construction cut for the baseplate (16360) originated above the sandy levelling fills to the north (inside the house) and levelling fill (17236), to the south underneath the verandah area. The trench for the baseplate ran slightly longer than the full width of the house (9.6m) and was 700mm in width and 400mm deep.

The total length of the four baseplate sections measured 9.18m with the segments varying in length from 2.59m to 3.48m (Figure 3.115, Figure 3.116). The segments were from 60-190mm wide and between 60-120mm thick. The four timbers used for the baseplate were trapezoidal in section with the wider flat surface at the top and the narrower side sitting downwards into the trench. The trapezoidal shape indicates that it was a quarter of a larger spilt log. The baseplate was more substantial and better preserved than the timber from the northern wall of the house (17270). No posts or stumps were found below the baseplate suggesting that it was resting directly on the ground in a similar way to the slab hut construction shown in Figure 3.108. The following description of specifications for a cottage to be built in 1858 nearby in Westmead is close to the construction method employed in House 4, although the rear wall is of a slightly different configuration.

> The bottom plate 8" x 8" shall be placed on 18 stumps 2 feet in length and 12 inches in diameter and put 18 inches in the ground the plate shall be sawn or axed square to the arris and set level upright posts and studs of the dimensions shewn on plan shall be morticed into top (plate 6 x 4) and bottom plates and grooved to receive the slabs. The slabs shall be well fitted into groove and close jointed. The doors to be 1 ½ inch wrought framed and battened and provided with best lock and bolt. Floor joists to be 6 x 2 ½ hardwood and set 18 inches apart centre to centre to be covered with 1 inch tongued & grooved pitch pine boards properly skew nailed to joists.[187]

Interestingly, the dimensions of the rear wall baseplate were comparable with the description above, with a maximum preserved width of 190mm, which correlates to approximately 7 ½ inches, although the thickness of the surviving timber was less at 123mm (6 ½ inches).

The surviving remnants show no sign of saw cutting which is disappointing as the site was located close to the government sawpits and lumberyard to the west on Pitt and Macquarie Street from the 1790s and then from c.1820 at the Convict Barracks east along Macquarie Street c.1820[188] and appear on plan by 1822 (Figure 2.9). Yet as the baseplate appears to be parts of a quartered log then it is likely it did not come from the barracks.

[187] Specification and Sketch of cottage for Asylum Farm c.1859. Source: Public Works Department, Correspondence, Parramatta Lunatic Asylum 1856-66, SANSW 2/618C.

[188] Parramatta Park Trust 2012 https://www.parrapark.com.au/assets/Shaping-the-Domain-brochures/Shaping-the-Domain-World-Heritage-1788-1856-Parramatta-Park-Brochure.pdf. Accessed 01/08/19. GML Heritage 2016:13.

Figure 3.114: Timber baseplate (16362) running east-west within foundation trench (16360) which supported the southern wall of House 4. This photo shows the baseplate cutting the original topsoil (16224) and the subsoil (16190) following the removal of the sandy levelling fills (17236). View east, scale 1m. IMG_5239.

Figure 3.115: Sections of the timber baseplate, the centre piece shows he corroded nails driven through the timber. 1m scale. DSC_6916, DSC_6928 and DSC_6883.

Figure 3.116: Orthophoto view of baseplate fully excavated *in situ* with individual sections labelled. G. Hazell (Arcsurv) annotations by C & L.

Along the southern edge of the baseplate was an additional strip of smaller rectangular timbers laid on edge (Figure 3.117). These timbers, 50mm wide and 30mm thick, were secured to the side of the baseplate with large iron nails (90mm in length) and continued even if there was a join/gap in the baseplate timbers. The nails were hand-forged and square in section, a technique dated from c.1788.[189] The nailheads (30mm in diameter) were heavily encrusted and clear identification was not possible (Figure 3.118). The side timber and nails functioned as a support or brace for the vertical timber slabs or weatherboards, that formed the rear wall of the house.

One method of slab hut construction used in colonial Australia was to use a horizontal baseplate to support the upright timbers, fastened on either side by a nail rail (Figure 3.119).[190] The smaller side timbers nailed to the baseplate may have functioned as such nail rails.

Figure 3.117: Detail of two of the long timber segments (16362) aligned to form the baseplate with a small gap between the two timbers (left), IMG_3368. The image on the right shows the second layer of smaller timbers, with the nails *in situ*, which acted as a bracket or brace to support the upright timbers (IMG_5294). Scale 30cm.

[189] Varman 1993: 169.

[190] Edwards R. 1988: 19.

Figure 3.118: Detail of nails from baseplate. Scale 100mm. IMG_3098 Gallery2.

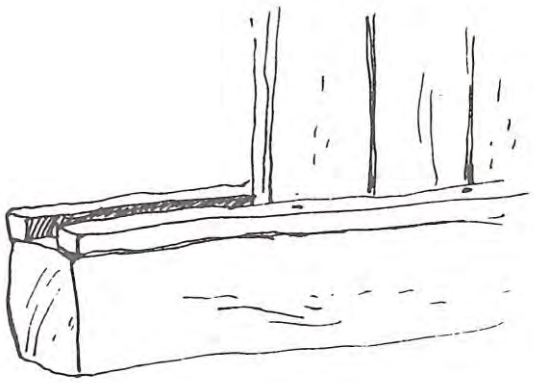

Figure 3.119: Example of a slab hut construction showing nail rails on a baseplate bracing upright timbers.[191]

Within the packing fill (16361) of the construction trench (16360) for the baseplate, were impressions or voids of upright slabs/posts (17506) which had been removed (Figure 3.120). No upright timbers were found *in situ* within the packing or post-pipes. When the packing fill (16361) was removed the baseplate was found below the voids for the upright timbers. The few artefacts found in this fill included a small fragment of crown window glass which dates pre-1850 and tiny fragments of pearlware (1780–1832) and blue hand painted porcelain in production from 1780 to c.1870. All of which support an early date for the packing fill, c.1822.

The impression or shape of the void created by the removal of vertical wall slabs (17506) was clear during excavation as the fill within these shapes (17405) was different to the packing fill (16361) of the construction trench (16360). At the eastern end of the south wall, the voids were rectangular and measured 230–250 x 120 x 250mm with vertical sides,

[191] Edwards R. 1988:19

suggesting they were split timbers (Figure 3.120). In the central portion of the wall a series of smaller, narrower up-right shapes were found; 190mm long and 60mm wide (Figure 3.121). They were straight along the southern side where they were held in place by the narrow strip of wood bolted to the top of baseplate (nail rail) but curved along the northern (interior) side. The interior face of the wall was probably plastered to create a straight finish. These curved slabs were from the outer edge of a log spilt lengthways and are traditionally used during the late 18th and 19th century.

Two large postholes defined the southeast (17496) and southwest (17324) corners of the structure. The fill (17325) of the southwest corner posthole contained small brick fragments and charcoal flecks and a number of large sandstock bricks with rectangular frogs. The rectangular frogged bricks are dated 1850-1900, their presence in the fill along with large fragments of glass and ceramics (also from 1850 onwards) suggests the fill is backfill from the post removal and demolition phase of the house and is not original packing fill. A similar sized posthole (17496) on the same alignment was identified at the south-eastern end of the baseplate. This posthole was probably the original southeast corner post which was removed and replaced during the construction of later additions (Room 5) and brick paving (16181).

Figure 3.120: Southeast corner of House 4 showing the packing fill (16361) with impression or voids made when wall slabs were removed from the trench. The baseplate (16362) was found below these voids once the packing fill was removed. In the background (red) is the later addition to the house (Room 5), constructed with sandstone footings. View east. Scale 1m. IMG_5116.

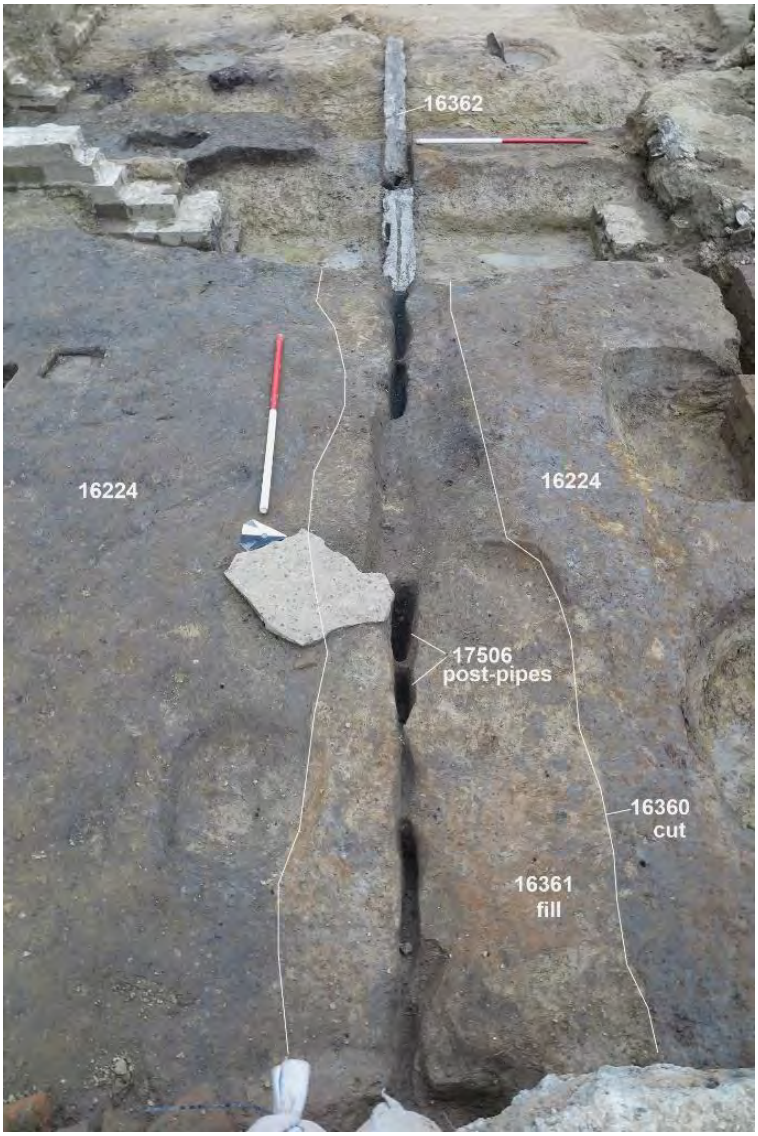

Figure 3.121: Southwest corner of House 4 showing part of the baseplate (16362) in the background and the excavated impressions of the upright wall slabs within the packing fill (16361) before exposing the baseplate in this area. The trench for the baseplate (16360) is outlined cutting through topsoil (16224). View west. Scale 1m. IMG_5176.

INTERNAL WALLS

Only two postholes were found along a possible north-south partition and these postholes were not perfectly aligned. The post-pipe fill (16237) of posthole (16236) between Rooms 2 and 4 (Figure 3.107, Figure 3.123), contained a quarter sandstock that was 64mm thick with yellow sandy mortar attached, small fragments of shell plaster and mortar along with some pipe stems, animal bone and a Victorian Coronation Commemorative medal (17582/#1858) dated 1837/38 (Figure 3.122). These artefacts may have been deposited once the post was removed as part of the demolition phase of the house (Phase 4.3).

On the same north-south alignment was a single row of bricks (16235) three courses deep and laid end to end (Figure 3.53, Figure 3.122). The average brick size was 214 x 102 x 64mm and they were all flat sandstock bricks with mustard-yellow sandy mortar between the courses and whitewash on the sides of the bricks. Like the brick rows along the perimeter of rooms 2 and 4 (see Figure 3.106), these were floor supports. The whitewash and yellow mortar may suggest they were from a later phase of occupation or renovation as this yellow-coloured mortar was not found in the northern rooms of the house. The presence of whitewash on the bricks may also suggest the bricks were being reused from elsewhere and are not part of the original construction phase.

Figure 3.122: Victorian Commemorative Medal dated 1837/38, from context 17852. Left: obverse side, reads “HER MOST GRACIOUS MAJESTY VICTORIA”. Right: reverse side, shows a wreath around a crown on a starburst. Scale 100mm. DSC_1061, DSC_1062.

Figure 3.123: Posthole (16236) and brick row (16235) forming north-south partition within House 4 between Rooms 2 and 4. View east, scale 1m. IMG_3945.

Figure 3.124: East-west partition between Room 3 and Room 4, House 4. A posthole was found in TT16 (east) along with a row of bricks head-to-head. View east. Scale 1m. IMG_4065.

There was some evidence for an internal east-west partition between Room 3 and Room 4 on the eastern side of the house where there were two postholes (16309, 17504) and a single row of sandstock bricks (16341). The row of sandstock bricks appeared to continue to the west beyond posthole 17504 where a few bricks were found disturbed. The large concrete pad from the Post Office building removed any evidence of an internal partition extending westwards between Rooms 1 and 2 (Figure 3.106). The two bricks laid end to end (16341) were on the same alignment as the bricks on the perimeter of the structure (Figure 3.124). There was a difference between the fills in Rooms 3 and 4 (Figure 3.125). The yellow sandy mortar demolition fill (16218) was only found in the back rooms and did not extend into the front rooms, again supporting the right location of a partition.

Figure 3.125: Extension westwards of Test Trench 16 (TT16 west) showed the same difference between fills in the two rooms. After the bulk demolition debris was removed in both rooms, the yellow sandy fill (16218) was only within Room 4. A second posthole was found deeper down. East at top. Scale 50cm. IMG_4036.

3.6.5.6 ROOMS

Room 1 was located at the front of the house in the northwest corner. This room was the most severely impacted by the post office footings (Figure 3.106, Figure 3.107). There were no occupation-related deposits within this room. Based on the location of partition posthole in the other rooms, this room measured approximately 4.23m (north-south) by 4.3m (east-west), making it almost square (Table 3.11). For comparison of dimensions with other early cottages from Parramatta Square see Table 5.5 Chapter 5.

Room 2, the back room in the southwest corner and was not as deep as Room 1 (Figure 3.126). The interior of this room measured approximately 2.8m (north-south) by 4.3m (east-west). The room contained a row of bricks along the eastern and western walls (16235 and 16276). There was also a row of flat sandstock bricks laid flat on one face just north of the baseplate in the interior of the room running east-west (16317). The bricks were two courses (130mm) deep and laid head-to-head with gaps between. The brick size was 217 x 102 x 65mm. As this row of bricks was north of the baseplate and rear wall, they were identified as supports for a timber floor. Further evidence for a timber floor were linear impressions (16313) running north-south which were the result of the removal of timber bearers/joists.

Room 3, a front room in the northeast corner measured 4.23m (north-south) by 4.77m (east-west). In the western half of Room 3 were two flat roughly square stones; both were local Parramatta shale. The stones were placed in the centre of the room and sat on the

imported sand levelling fills (16193). Their location and level suggest they were pads/piers to support the timber floor.

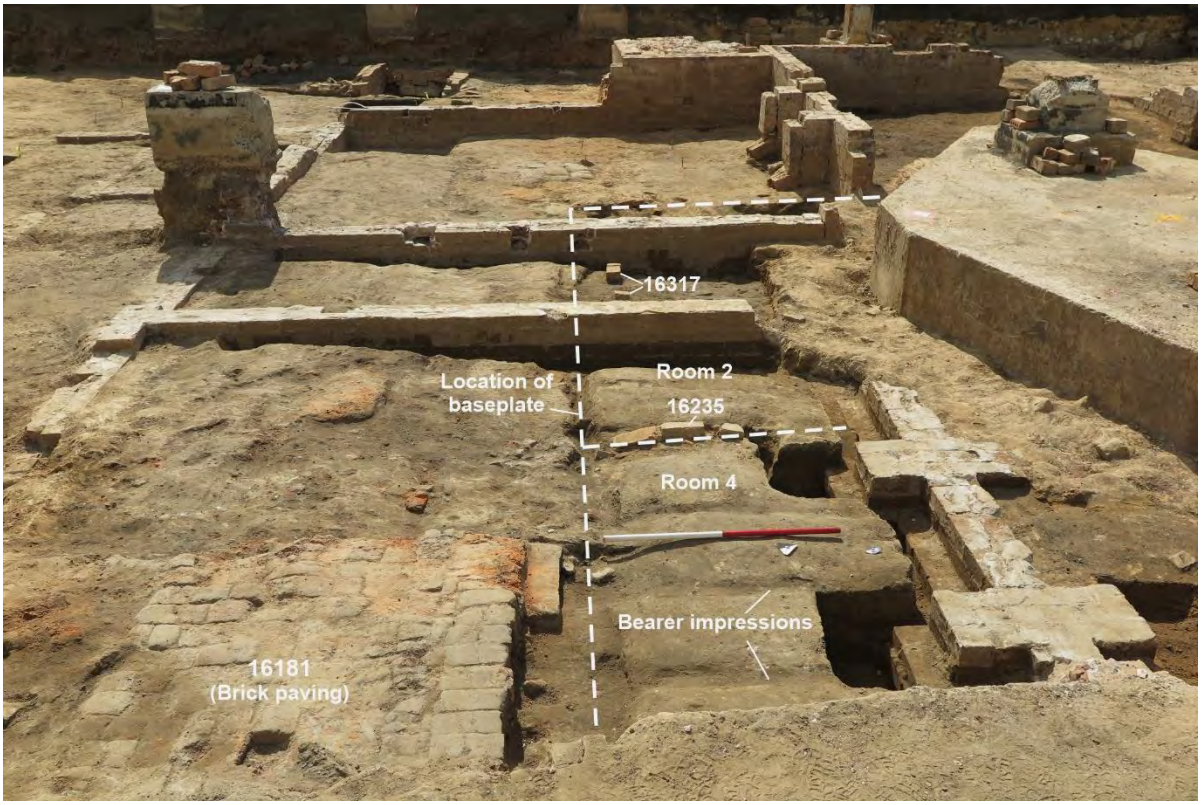

Figure 3.126: Southern half of Rooms 2 and 4, House 4. In the foreground are the linear impression left by the timber bearers/joists running north-south. A row of bricks (16235) formed part of the partition between these two rooms and the brick piers or pads to support the timber floor (16317) were located just north of the baseplate within both rooms. The brick paving at the rear of the house was a later addition (Phase 4.2). View west. Scale 1m. IMG_4124.

Room 4, in the southeast corner was the original kitchen. The interior of the room measured 2.8m (north-south) by 4.77m (east-west). In the eastern half along the external wall was the original stone fireplace (17528). A later phased (Phase 4.2) brick fireplace with a large dressed hearthstone (16202) was built on top of the original fireplace. The stone fireplace only became visible after removal of the later structure (Figure 3.127). It was set further back than the brick fireplace and extended into what later became Room 5.

The stone fireplace was rectangular, measuring 1380 x 1150 x 230mm. The internal space measured 680 x 480mm. It was entirely constructed of unfinished blocks of local Parramatta shale with natural divots and uneven surfaces (Figure 3.128). Some blocks appeared well cut although most were irregular in shape. The stones varied in size and most were quite thin. The largest stone measured 440 x 370 x 70mm. The large block in the southwest corner had five conical shaped holes. Three holes aligned in a row (Figure 3.129) and were 35 to 45mm in diameter and 40mm deep. The holes were used to place an upright post as a mechanism for suspending pots over the fire with a chimney crane. The later phased fireplace 16202), occupation deposit (16245) and timber bearers/joists (16313) associated with Room 4 are discussed in Phase 4.2.

Figure 3.127: General view showing the original stone fireplace (17528) in Room 4 (dashed) found below the later brick fireplace of Room 4. View south. Scale 1m. IMG_5247.

Figure 3.128: Detail of the original fireplace constructed of irregular and unfinished blocks of local Parramatta shale. View east, scale 1m. IMG_5283.

Figure 3.129: Detail of the corner stone of the original fireplace (17528) in Room 4. The conical shaped holes supported a metal chimney crane to hold pots over the fire. The holes could also be caused by a fire grate or firedogs (side supports). Scale 30cm. IMG_5305.

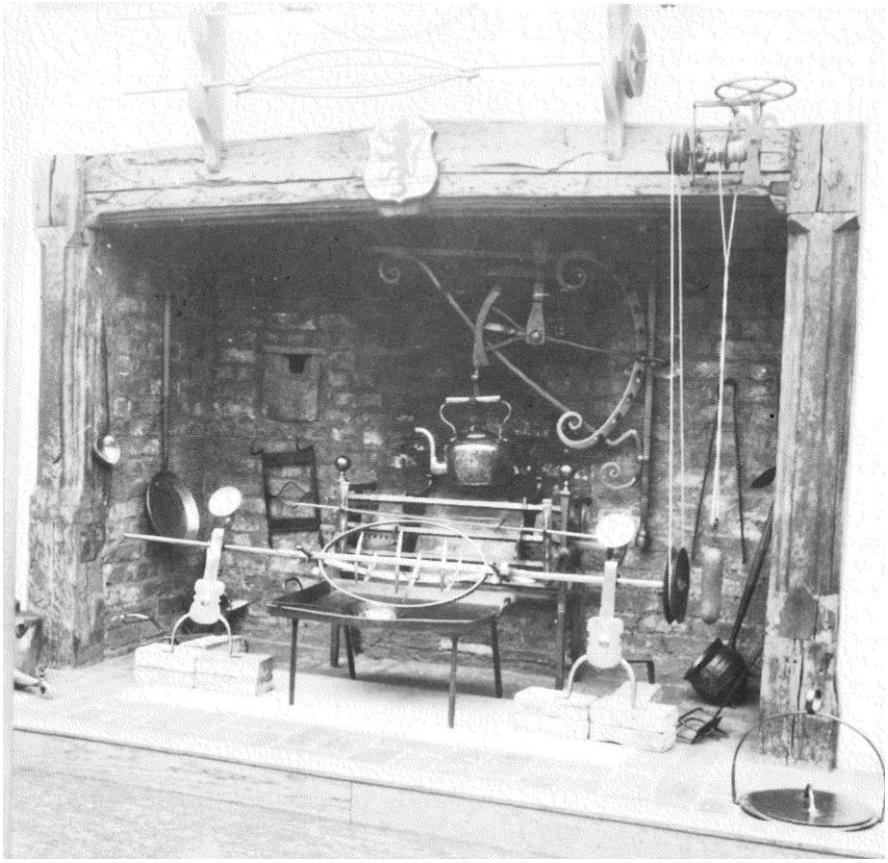

Figure 3.130: The fireplace in the additional kitchen would have been a much smaller version of this one. Note the fire dogs or grates to either side and the narrow-footed bases. A typical Victorian inglenook fireplace, reproduced in the Castle Museum York.[192]

[192] Fearn 1977:5.

3.6.5.6.1 VERANDAHS

House 4 was built with front and rear verandahs. The front (north) verandah had more structural remains of brick and stone while only postholes remained of the rear (south) verandah. There was also evidence to suggest modifications to the rear verandah throughout the lifespan of the house. The orientation of the house to the north and the incorporation of the verandah into a house built by c.1822 expresses the way two quite important elements of colonial vernacular housing developed in New South Wales. It indicates that the use of the verandah had become common in private-built housing by this date. Orientation of the house and verandah to the north, is also a mark of how the layout of the early town in 1790 understood the important difference between the northern and southern hemispheres with the sun passing across the northern sky. The attachment of a verandah to the south is not about protecting the occupants from the fierce sun but was probably more of a skillion for undertaking domestic activities in an area adjacent to the kitchen.

FRONT OR NORTH VERANDAH

The front verandah ran the full width of the house fronting Macquarie Street and measured 9.45m long (east-west) by 1.67m wide (north-south) the interior width was 1.53m (5 feet) (Figure 3.107, Figure 3.131). Seven brick piers were placed as supports for a timber floor and at either end of the verandah were brick and stone structural remains, all recorded as (16215). The piers were square, with two flat sandstock bricks (210 x 103 x 64mm) side by side, some were two courses deep. The distance between the centres of brick piers varied from 900mm up to 1.5m. At the eastern end a row of six bricks were laid on their sides abutting two more bricks laid flat (also context 16215), the bricks were all sitting on local shale footings (Figure 3.132). This stone was also used for the original fireplace in Room 4 (17528). Parramatta shale was found in early structures on other excavations in Parramatta.[193] The bricks and shale form a threshold or step (also numbered 16215) at the end of the verandah. The western end of the verandah also featured a similar shale footing, however there the bricks were not preserved.

Although there were no identified occupation-related deposits within the floor space of the front verandah, there were some artefacts pressed into and resting on the levelling sands below (16193). These included coins with a date range of 1826-1842. Above (16193) and below the demolition layer (16200) was a copper British halfpenny of George IV (1826) and at the interface between context 16206 and the demolition 16200 was a silver British threepence Victoria (1842). These coins probably fell through the timber floor-boards of the verandah during the earlier lifespan of the house (Figure 3.134).

[193] George and Charles Street excavation, Parramatta, Casey & Lowe, 2002 and 109-113 George Street excavation, Parramatta (Casey & Lowe, 2004-2005) in the basement of the c.1814 Rev Hassell's house.

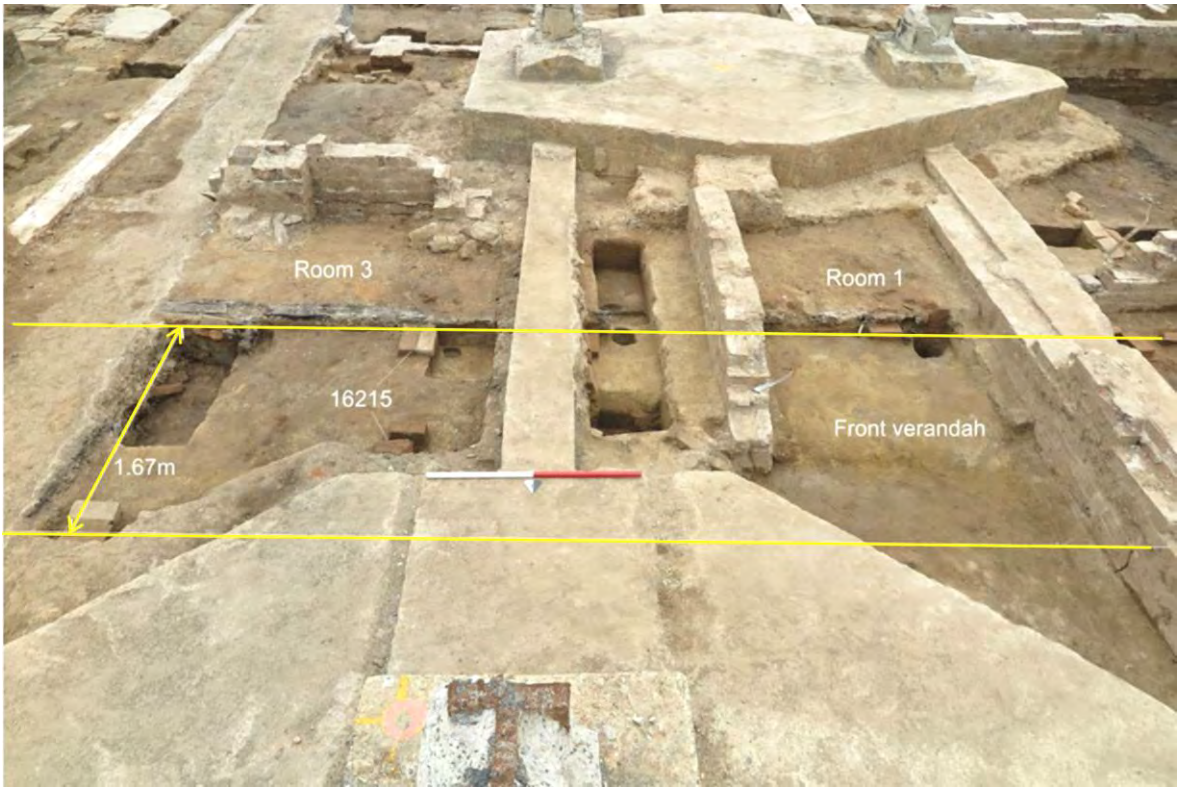

Figure 3.131: Middle section of the front verandah of House 4, there are substantial impacts from construction of 1880s Cranbrook villa and the 1960s post office footings. The horizontal timber plate (17270) and postholes are at the rear (south) of the verandah with numerous brick pad/piers (all numbered 16215) east of the postholes and further to the north. View south, scale 1m. IMG_4143.

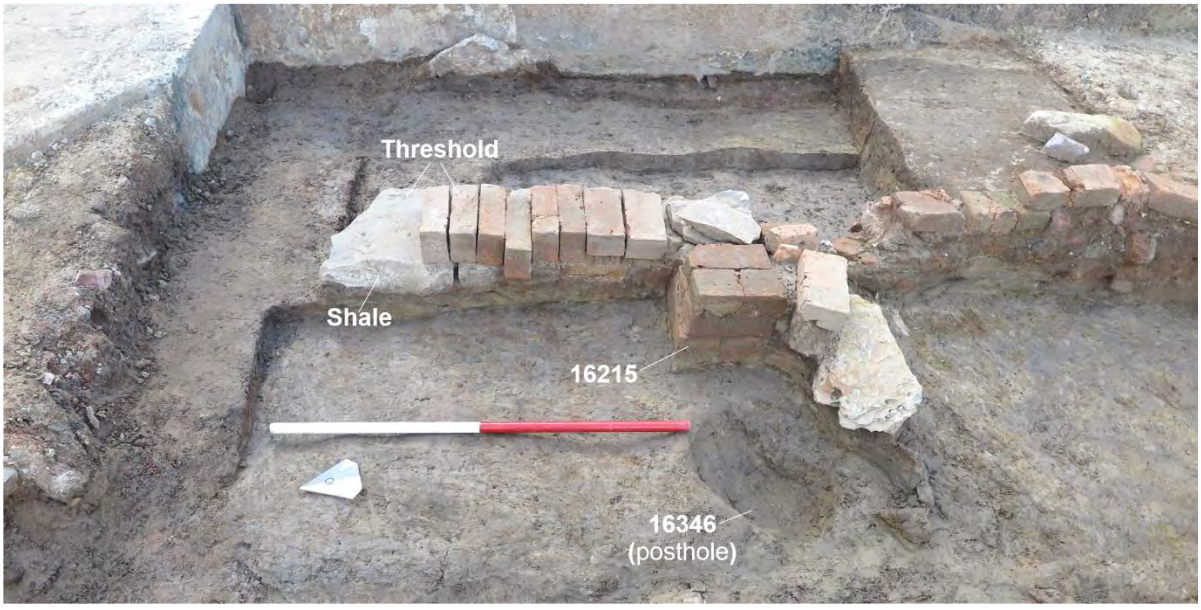

Figure 3.132: Eastern end of the front verandah constructed with local shale and bricks, forming a threshold. Beside the verandah wall is another brick pier, two courses deep, to support the verandah timber floor. View east, scale 1m. IMG_5263.

Figure 3.133: Western end of the front verandah with blocks of Parramatta shale and sandstock bricks similar to the eastern end. This area was greatly impacted by the Post Office footings. View east, scale 1m. IMG_4042.

Figure 3.134: Coins found under the front verandah. Copper halfpenny of George IV 1826 (left) and British silver threepence 1842 (right). Scale 100mm. IMG_4468. Gallery2.

BACK OR SOUTH VERANDAH

The early phase of the south verandah was not as substantial as the front verandah with its threshold and brick piers (Figure 3.107). Some postholes along the back verandah were sealed by a later phase of sandstock brick paving (16181) which coincided with the construction of an additional room (Room 5) at the eastern end of the house, first shown on the 1858 historic plan. Therefore, the postholes and features sealed by the brick paving were associated with the pre-1850s phase of the cottage. The verandah postholes are summarised in Vol. 2 Trench Report Area A, Table 7.2.

The postholes directly south of the baseplate were not all perfectly aligned east-west. This suggests the width of the verandah may have been altered over the lifespan of the house. A series of postholes in the southeast corner, formed a small storeroom or skillion adjoining the eastern end of the verandah just outside the kitchen.

There were seven postholes running east-west associated with the earliest phase of the rear verandah (Figure 3.107, Figure 3.135, Figure 3.136). Only one of these postholes (17424) had a surviving post *in situ.* This post was set 870mm south of the baseplate and was not aligned east-west with any of the other postholes, it may have been an upright post to support the roof or an internal partition in the rear verandah area. The other six postholes were all between 1.2m and 1.3m south of the timber baseplate. Many of these postholes had similar characteristics with mostly oval post-pipes. Fragments of bone, glass, ceramic, pipe stems, oyster shell and brick were found in these postholes, which is unusual in early features and may instead be from the post-removal phase or pressed in from the occupation-related material directly above. Posthole 17223 was completely covered over with the brick paving (16181), sealing it to before the 1850s, but further east, posthole 17488 may have remained extant for longer as the brick paving was laid around it.

Figure 3.135: Rear verandah postholes running east-west cutting the grey sandy levelling fill (17236) after the occupation-related deposit (17229) was removed. The postholes had oval post-pipes. Only the top 100mm of the packing fill was removed. The timber baseplate can be seen in the background. The sandstone block (17484) was possibly the threshold for the back door. The rubbly fill (17380) surrounding the sandstone was part of the levelling before the brick paving (16181) was laid. View northwest along the rear verandah. Scale 1m. IMG_4783.

Figure 3.136: Postholes associated with the south verandah cutting the original topsoil (16224). Threshold blocks 17484 can be seen to the south of the baseplate. The white dashed line marks the edge of the early verandah. View east. Scale 1m. IMG_5180.

OCCUPATION-RELATED DEPOSIT FROM REAR VERANDAH

A mid grey-brown loamy silt (17229) was localised to the footprint of the south verandah (Figure 3.137). This deposit extended the width of the house (east-west) and up to 1.5m south of the baseplate. It was similar to the modified historic topsoil (16120). Closer to the house it was found above a grey sandy levelling fill (17236). The deposit (17229) varied in depth from 10-80mm and contained numerous artefacts, including: oyster shell, ceramics, glass, kaolin pipe stems, brick fragments and charcoal flecks, which represented an accumulation related to the early occupation phase (c.1822-1850s) of House 4. There was no evidence to suggest a timber-floored verandah at the rear of the house (which had few impacts from the 1960s post office), therefore this accumulation could be a degraded earthen surface into which artefacts were deposited over the use life of the surface. The postholes of the verandah roof supports, all contained similar artefacts near the surface where the deposit was pressed into the top of the packing fills. The posthole cuts were not visible until this occupation deposit (17229) was removed as it had accumulated over time covering them over. This deposit was excavated in 1m x 1m squares and 100 per cent wet sieved (Figure 3.137).

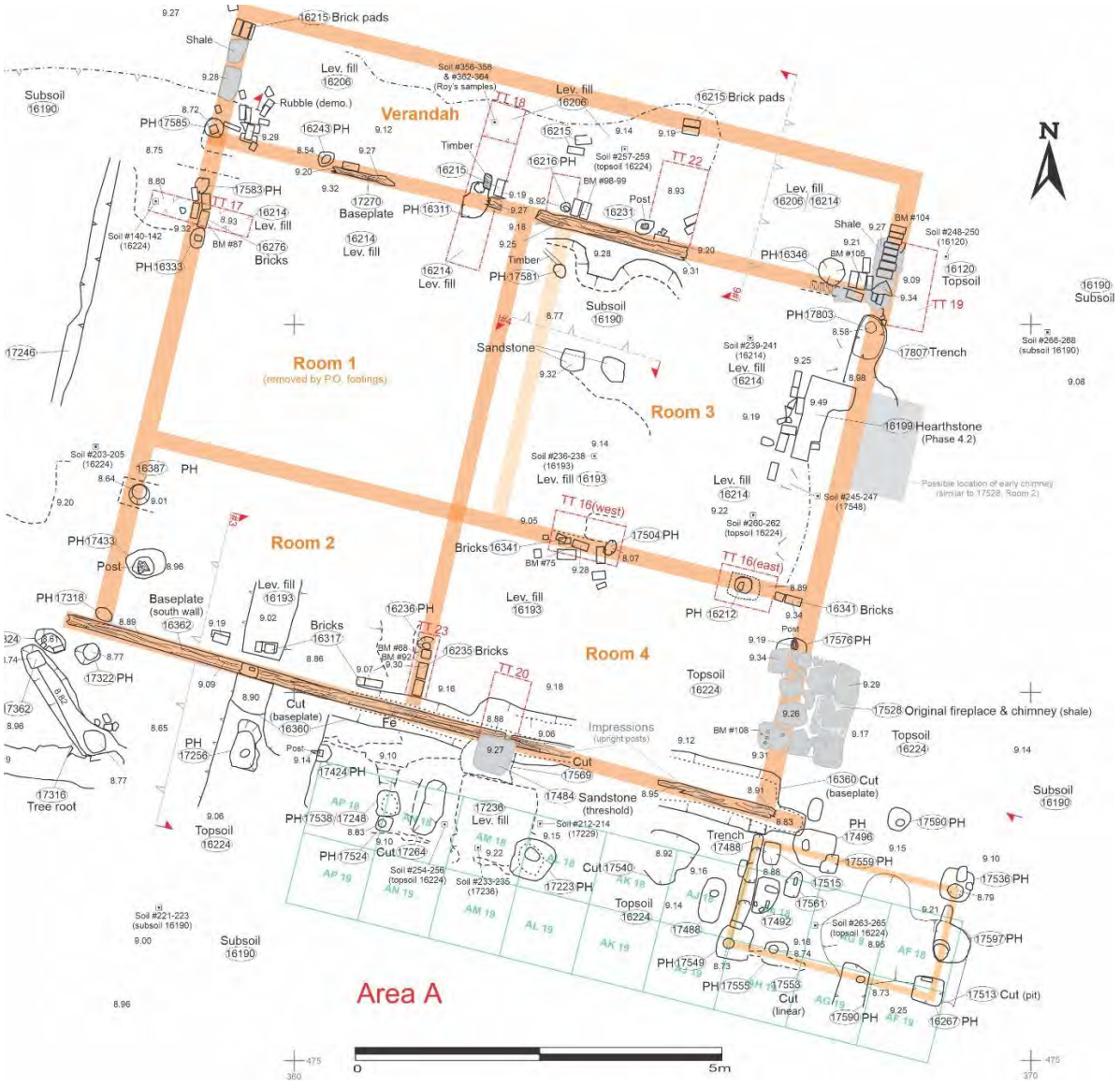

Figure 3.137: Plan of House 4 showing grid squares allocated in the region of the southern verandah during excavation of context 17229.

The range and detail of miscellaneous and other artefacts from this occupation related deposit will be discussed in the Artefact Overview Vol. 1, Sec.4.

Ceramics were predominantly associated with food preparation or serving and included fragments of bowls, plates, cups, saucers, an eggcup, a salt-glazed blacking bottle and a jug (see Vol. 3, Sec. 8.1). Tableware included, bone china, lustre ware, pearlware, creamware, hand-painted porcelain, one locally-made sherd, blue transfer print and whiteware. A fragment of a locally-made vessel with a date range of 1801–c.1823 gives a date of before the 1820s for the acquisition of, but not necessarily the deposition of that piece (as it may have been held for some time before it was broken and then disposed of). The ceramic evidence supports the assumption that the occupation deposit beneath the verandah accumulated during the 1830s–1850s and that the subsequent resurfacing and brick paving occurred after this time, during the ownership of George Cavill, after 1845.

The date range for the glass in this deposit (17229) is pre-1860s with the latest manufacturing date for a glass bottle at 1859. The end dates for manufacturing include a group of 16 items which ceased being made between 1820 to 1850, another 14 items ceased being made by 1870 (Vol. 3, Sec. 8.2).

Some cut-wrought nails found in this deposit, were rectangular and square in section, one with a rose head and one with a clasp head, forms normally dated from 1820–1870. However, some of the glass fragments from this deposit have a *TPQ* of 1850 and 1859 suggesting a later date for its deposition and therefore a later date for the introduction of the brick paving (see Vol. 3, Sec. 8.2). If this later dating is correct then the verandah may have been paved in the latter years of Cavill's occupancy in the 1850s in conjunction with the building of the new kitchen (Room 5), which is on plan by 1858 (Figure 3.145).

BACK DOOR STEP/THRESHOLD

Two Parramatta shale blocks (17484) sitting on top of each other, at the rear of House 4 formed a threshold or back door step for the original kitchen (Figure 3.104, Figure 3.107, Figure 3.136). The stones were located near the southwest corner of Room 4, about 1m east of the partition between Rooms 2 and 4. The uppermost stone was roughly square in shape, was not dressed and measured 470 x 430 x 120mm. A level taken on the upper stone was RL 9.27m. This RL is the same height as those taken on the local shale thresholds/steps on either side of the front verandah (west end RL 9.28m, east end RL 9.27m) suggesting the original floor level throughout the house was approximately at RL 9.27m. The lower stone was more irregular in shape and measured 450 x 260-300mm; it was only 30mm thick. These two stones were sitting in a circular pit (17569) in the base of which was an artefact-rich fill (17570) with an early date. Above this fill and surrounding the stone step was a second fill (17479) mixed with a rubbly artefact-rich levelling fill (17380) put in place to raise the ground level around the backdoor area before the brick paving (16181) was laid.

These upper fills appear to relate to the period just prior to extensions and modifications of the rear verandah undertaken during Cavill's occupancy in the 1850s. The fill included bone fragments from a large mammal and butchered sheep/goat.

17570

Ceramics (6 mic) from the lower fill (17570) included tableware fragments of porcelain and fine earthenware, with a manufacturing date range between 1780-1810 and an end date between 1820-1870, with most items made before 1860 (see Vol. 3, Sec. 8.1).

17479

The six items in this context were made from 1800-1840 and to c.1870-c.1880 with a fragment of bowl into the early 20th century.

17380

This fill deposit contains 57 items (258 frags) with a beginning of manufacturing date between 1770 to 1853, suggesting this was deposited after 1853. The glass evidence points to a date in the late 1850s. Several fragments were from vessels with a manufacture date before 1820 and 1850 but one vessel with an embossed-base, dates from 1859–1890. This also means that fragments of stemware glass and some bottles had end dates of 1820 (2), and two stemware glasses ceased being made by 1840. A base sherd of fine earthenware exhibited a blue transfer printed basemark reading "NANKIN / JAR". This pattern is attributed to Ridgway & Morley, who operated in Hanley, Staffordshire and dates to

between 1842 and 1844. The dating of the artefacts fits well for the construction of the brick paving and the addition of the kitchen in the later 1850s.

3.6.5.7 STRUCTURE ADJOINING REAR VERANDAH

A number of postholes and linear trenches found in the southeast corner of House 4 were on the same alignment as the rear verandah but extended further to the east than the wall of House 4. The features formed a small rectangular room, like a scullery or wet room, adjoining the eastern end of the rear verandah just outside the original kitchen (Room 4) and to the south of the later addition (Room 5) (Figure 3.107, Figure 3.138). The postholes and post-pipe fills were also covered by the brick paving indicating this small structure was demolished prior to the laying of the brick paving and the construction of the new kitchen (Room 5). The features associated with this structure are summarised in Vol. 2, Sec. 7 Area A Trench Report Table 7.3. The posts were mainly circular, ranging in diameter from 120-200mm. The structure measured 2.8m (east-west) by 1.5m (north-south). The western wall was a common wall with the eastern end of the rear verandah, represented by a linear trench (17511) 1.3m long and 150 to 200mm wide. The trench ran perpendicular to the eastern end of the timber baseplate (16382) with sub-rectangular post holes for removed upright timbers/posts along its length (Figure 3.107, Figure 3.138). There was no evidence for a floor or surface within this structure and it may have been a dirt floor.

Figure 3.138: Small rectangular structure adjoining the eastern end of the south verandah. The numbered features (including their post-pipe fills) were all below the brick paving (16181) suggesting this structure was demolished when the new kitchen (Room 5) was built and the verandah area was extended and paved. View to east, scale 1m. IMG_5278.

3.6.5.7.1 HOUSE 4 SUMMARY

The early cottage House 4 was built by 1822 in the northwest corner of Lot 30 on the lowest part of the site. Imported sandy levelling fills were brought into this area to raise the ground level, prior to construction of the house as this area was prone to waterlogging and seasonal flooding. These imported sands did not extend far beyond the footprint of the house.[194] The original house was rectangular in plan with a north facing orientation, it was notably different to a convict hut. It had four rooms and a front and rear verandah. Both the front and rear room on the eastern side of the house had a fireplace with a sandstone hearth and an external brick chimney. The original stone fireplace in Room 4 and hearthstones (in Rooms 2 and 4) were replaced when the eastern extension, a new kitchen, was built in the 1850s.

The posthole remains and timber baseplate indicate that the original house was a timber slab or weatherboard building. The rows of postholes along the sides of the house suggest the outside walls were sheeted horizontally with weatherboards supported by upright posts while the base plate buried into the ground at the rear of the house supported vertical slabs. The front verandah was outlined by evenly spaced brick pads that supported a raised timber floor and a shallow brick and stone wall or step at either end. The front verandah roof was possibly a continuation of the roofline of the house, a bungalow-style roof rather than a separate verandah. The rear verandah was not as clearly defined. While a row of postholes was found, there was no evidence to suggest a timber floor. The early verandah postholes were backfilled and covered over with brick paving by the 1850s when renovations took place indicating the verandah posts at the rear were not structurally important to the frame or roof of the house. Posthole remains for a small stand-alone room, possibly a scullery or wet room, were found at the eastern end of the south verandah, just off the kitchen. This small room was demolished when the eastern extension, Room 5 and new verandah, was built and these postholes were sealed beneath brick paving.

3.6.5.7.2 EARLY YARD FEATURES

In the immediate vicinity of the early cottage were two large pits and one smaller one (Figure 3.139). One was a rubbish pit or backfilled garden feature (17567) and one a pit located within the scullery (17513), with the third just outside the scullery (17540).

[194] It is noted that post-1880 and 1960s impacts removed considerable evidence of House 4 and associated deposits. Therefore, a clear understanding of the extent of deposits or house dimensions is not always possible.

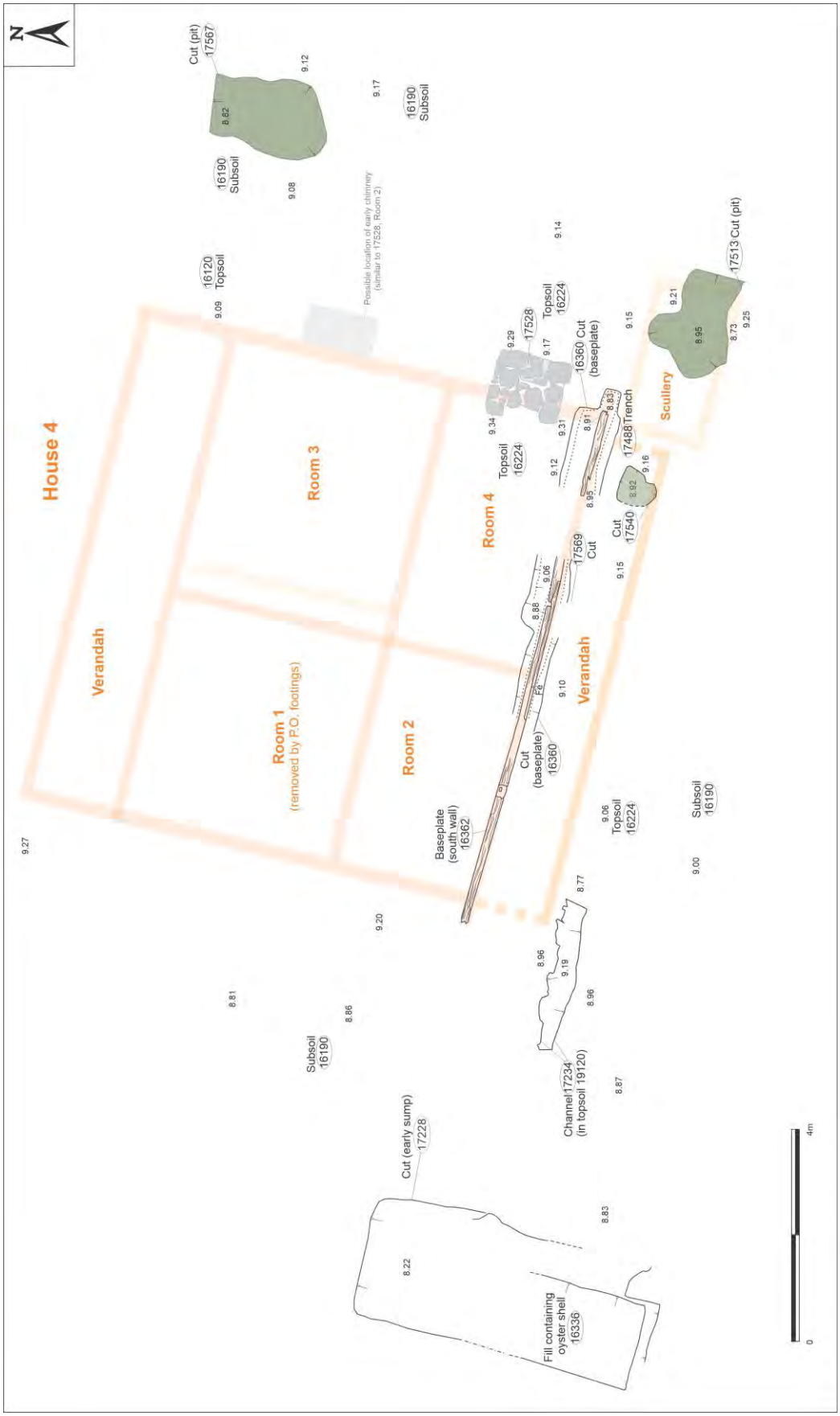

Figure 3.139: Plan of yard features (shaded) in relation to House 4. Pit 17513 and 17540 to the south and 17567 to the north of the house.

3.6.5.7.3 PITS UNDER THE BRICK PAVING

Two early pits were found that post-dated the demolition of the scullery but pre-dated the brick paving. The largest (17513) was within the footprint of the small rear structure/scullery and truncated some of its postholes dating it to after the demolition of prior to the laying of the brick paving. The pit was an irregular shape and was truncated at the eastern end by a modern service trench (Figure 3.140). The fill (17514) was mostly demolition material, a firm grey-brown clayey loam with flat sandstock bricks and ceramics, including one whole salt glazed blacking bottle 1817-1834. Ceramics included tableware red transfer print and blue transfer print from the 1830s but pearlware dating from the 1800s on (see Vol. 3, Sec. 8.1). These dates point to the demolition of the scullery occurring after the 1830s, if as late as the 1840s it may have been during the ownership of Cavill from 1845.

The second pit, also in the rear verandah area, was 2m west of 17513 (Figure 3.140). This cut (17540), was irregular in shape, with unevenly sloping sides and an uneven base. The fill (17541) was moderately compacted mid to pale brown clayey loam with charcoal flecks, some oyster shell, brick fragments and occasional bone fragments including a sheep mandible and three fragments of two separate salt glazed blacking bottles (c.1805–1930). As this pit was also under the brick paving it is probably contemporary with the pit in the scullery, context 17513.

Figure 3.140: Two pits 17540 and 17513 cutting postholes forming the rectangular structure. The posthole in the centre of pit 17513 is from a later phase (Phase 5.1). North of the structure below the footings of Room 5 was another posthole (17590) associated with the original house. View west. Scale 1m.

SHALLOW PIT IN FRONT YARD OF COTTAGE

In the front yard area, east of House 4, a large shallow pit was found (17567). It pre-dated most of the other features in this area and was visible cutting the subsoil (Figure 3.141). The pit was rectangular in plan with vertical sides and a near flat base and measured 2.45m x 1.45m x 240mm. The northern end was truncated by a 20th-century service trench and postholes revealed within the pit were associated with later fence lines.

The fill (17568) of the pit contained abundant glass fragments and some early ceramics including lead glaze, hand painted creamware and porcelain and a blue flow tea cup. One lead glaze milk pan was recovered in 33 fragments (Figure 3.142, Figure 3.143). Lead glaze ceramics were locally made and have a date range from c.1801-1823 (see Vol. 3; Sec. 8.1). Once vessel was identified as made by convict potter Thomas Ball at his Pottery in the Haymarket. The base of the pan shows marks (stacking scars) made when it was being fired in the kiln. This suggests the sale and purchase of 'seconds' was acceptable for utilitarian vessels such as this pan. Creamware from 1780–1840 and blue flow and blue transfer print from the 1830s onwards. Over 200 fragments of glass were in the deposit with a date range of 1700–1830 (see Vol. 3, Sec. 8.2). The glass fragments predominantly had an alcoholic beverage function. Faunal remains included butchered fragments of sawn and chopped cow and sheep/goat (see Vol. 3. Sec. 8.2). The overall early dates for the glass and ceramics, with a *TPQ* of 1830, support the theory that the pit was in use and backfilled during the initial phase of occupation of the cottage rather than an earlier pre-cottage phase (see Vol. 3, Sec. 8.2).

Figure 3.141: Large pit (17567) cut by three postholes, only two were excavated at the time of this photo. The easternmost posthole may have belonged to the House 4 fence line. The other two belonged to Phase 5 (Cranbrook). View to west, scale 1m. IMG_5339.

Figure 3.142: Locally-made milk pan, made by convict potter Thomas Ball in the Haymarket and found in pit 17567. It is in 3PS foyer, heritage interpretation display. Scale 100mm. IMG_4022.

Figure 3.143: Base of pan with stacking scars caused during firing in the kiln. Made by convict potter Thomas Ball, Haymarket and found in pit 17567. Scale 100mm. IMG_4027.

3.6.5.8 ARCHAEOLOGICAL EVIDENCE FOR RESIDENTIAL LAND USE IN LOT 28

The main structural development in this area was the construction of the Town Drain which ran diagonally across Lot 28, to Macquarie Street discussed above. There was some evidence of an early occupation phase in Lot 28 including a storage pit filled with brick rubble and some postholes and pits. The main feature was the storage pit discussed here. This evidence was found on the southeast side of the drain and therefore on the other side of the drain to the cottage erected on Lot 27.

3.6.5.8.1 STORAGE PIT

The remains of a storage pit (17820), was found towards the northern end of Lot 28. The pit was initially identified as an irregular concentration of sandstock brick fragments, context 17821, within TT28 (Figure 3.144). Excavation of the feature revealed that the bricks were a fill within a large rectangular pit cut into the subsoil, with postholes located in the north east and south east corners. Context 17821, was a series of three fills, the upper 200–300mm was made up of compacted sandstock brick rubble composed of flat orange sandstock fragments, mostly quarter and half brick pieces, within a matrix of redeposited modified historic topsoil 17819 (Figure 3.145). Some dark green glass fragments were found within the brick rubble. Below this was a patchy, firm dark-grey silty clay (redeposited subsoil 16190), up to 100mm thick sitting above a thin band (10–20mm) of moderately soft coarse-grained red-mid brown sand with occasional charcoal and burnt orange clay flecks at the base. The lowest layer contained small fragments of lead glaze and Chinese ceramics, suggesting it was deposited in the early 19th century.

The pit was aligned east-west 2m x 1.8m and 300–450mm deep, with the vertical sides to the south, east and northeast corner. The pit floor was uneven where the north west corner raised, whereas the rest of the base was flat, creating a lower L-shaped section as can be seen in Figure 3.146.

Postholes 17814 and 17816 were located in the north and south-east corners of the pit (Figure 3.146), details summarised in Vol. 2, Sec. 7, Area D Trench Report Table 3.2. These postholes may have formed part of the superstructure above the pit perhaps supporting a lean-to roof as they were only on one side and none were found on the western end. The postholes were not visible from above and were sealed by the brick fill within the pit. Therefore, the timber posts must have been removed before the pit was abandoned and backfilled.

Figure 3.144: Brick fill 17821 sealing pit 17820 and postholes within TT28. View to the east, 1m scale. IMG_5381.

Figure 3.145: Brick fill 17821 of pit 17820, shown half sectioned within TT28. View to the west, 1m scale. IMG_5409.

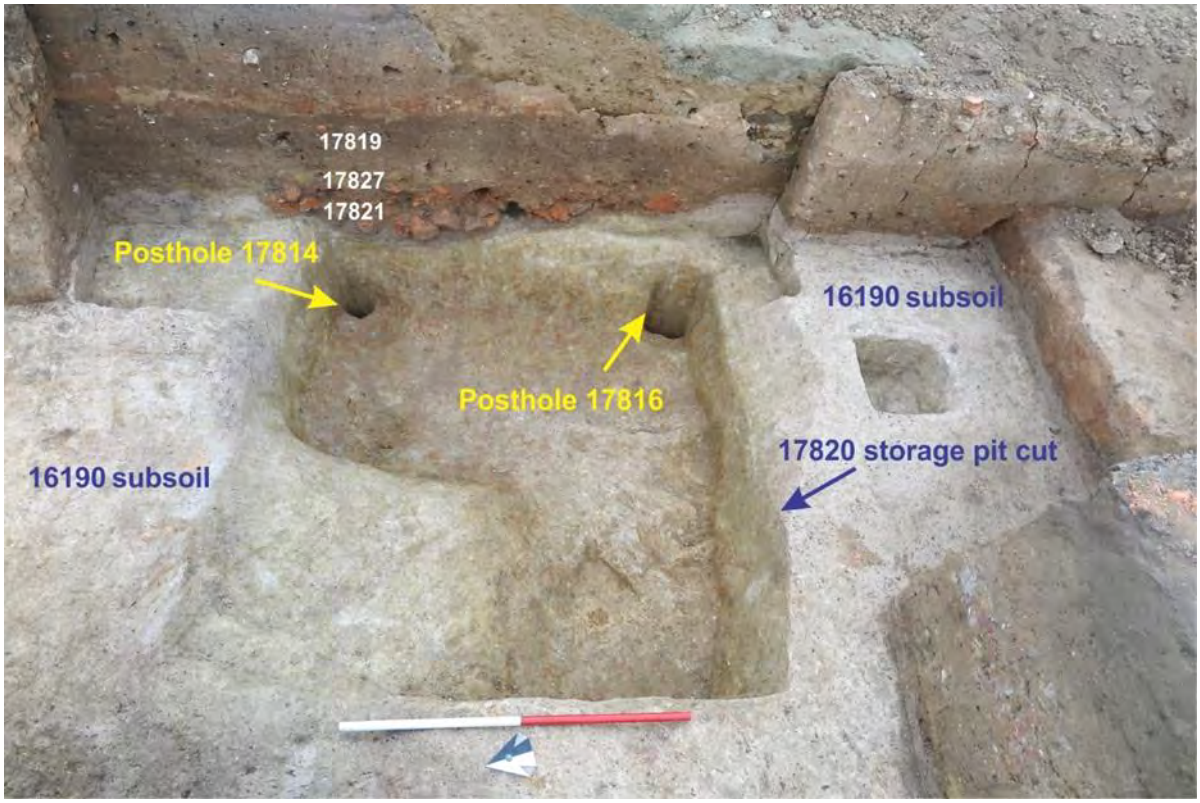

Figure 3.146: Storage pit cut into subsoil with two postholes on the eastern side. The pit was filled with sandstock brick fragments, (17821). View to the east, 1m scale. IMG_5497.

3.6.5.9 ARCHAEOLOGICAL EVIDENCE FOR RESIDENTIAL LAND USE IN LOT 32

Edward Lakeman purchased the western half of Lot 32 from William Maughan in 1833. At that time there was a building on the eastern half of the lot but nothing on the western portion bought by Lakemen. Lakeman was issued with his publican's licence, for the White Horse Inn on Macquarie Street from 1834.[195] Brownrigg's plan of 1844 shows that a second building had been erected on the Macquarie Street frontage of Lot 32 by this date, but there are no structures shown in the central or southern parts of the lot (Figure 2.14). Therefore, Lakeman must have built the structure shown on 1844 plan by this time. At least one stable building was built by 1851, as the auction sale notice of 31 May 1851 specifically refers to '...excellent roomy back premises, with stables'.[196] It is not clear whether the stables referred to in the notice is the long rectangular building on the eastern edge of the newly subdivided property or the t-shaped building shown on the western edge of the boundary between Lot 30 and Lot 32 as depicted on the 1858 Railway resumptions plan (Figure 2.15).

As the construction date for the western stable is uncertain it will be discussed as part of the continued occupation of the property as Hilt's Coaching Service in Phase 4.2, 1850s – 1870s. However, a series of sandstock brick drains found on the western edge of Lot 32 predating the stables shown on the 1858 plan (discussed above in water management) and a shift in the boundary fence line relates to the early residential or commercial use of the land as part of the White Horse Inn and will be discussed here.

[195] Butts of Publicans Licenses, 1834, No 41, SARNSW 4/65

[196] *SMH*, 29 March 1851, p 8.

3.6.5.10 EARLIEST FENCE LINE

The possibility of an earlier boundary fence became evident during the post-excavation analysis of the postholes recorded in Lot 32. Overlays of the historic plans showed the boundary between Lot 30 and Lot 32 as shifting approximately one metre to the west between the 1823 (Figure 2.10) plan, when it first appears, and the 1858 plan (Figure 2.15) when it seems to have shifted to the west. Thirteen postholes appear on a close alignment with the 1823 plan and fall within the interior of the stables and shed building footprint, with only a metre gap between the interior postholes and the western external wall (Figure 3.147, Figure 3.148). It is possible therefore, that during the construction of the stables and shed structures of the White Horse Inn between 1845 and 1858, the western boundary fence between Lot 32 and Lot 30 was moved roughly 1m to the west.

The majority of the postholes consisted of a large rectangular cut (average of 400 x 200mm long), containing an oval or circular post pipe or impression (average diameter of between 70 and 150mm, maximum depth of 200mm) and a firm, mottled red and grey clay packing fill. The fact that the packing fill was very similar to the surrounding subsoil and underlying parent clay is also an indication that the postholes were excavated during the early occupation of the area.

Figure 3.147: Photo showing the different alignments of the postholes for the walls of the central section of the stables and sheds (Structure 5) in yellow, and three of the postholes believed to be the earliest boundary fence line arrowed white. View to north, 1m scale. IMG_1201.

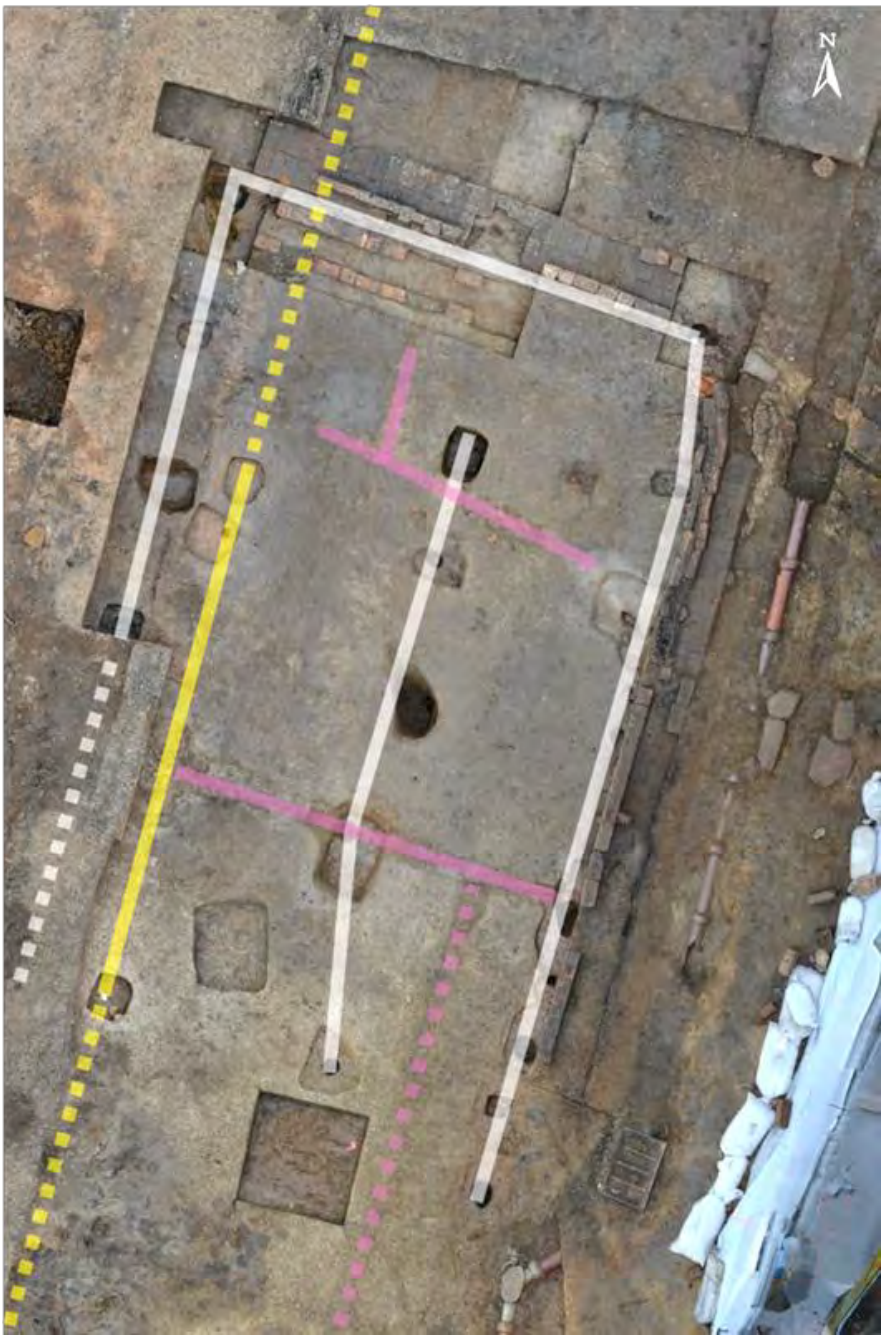

Figure 3.148: Ortho-photo showing the different alignments of the postholes for the walls of the northernmost part of the stables and sheds (Structure 5) in white, the internal dividing walls in pink and the postholes believed to be the earliest boundary fence line in yellow. The inferred extensions of the walls are dotted. G. Hazell (Arcsurv).