

4.0 Archaeological Context & Research Questions

4.1 Archaeological sites in southern Sydney CBD, Darling Harbour and adjoining suburbs¹³⁶

There have been a number of archaeological projects in the western and southern parts of the CBD in the vicinity of the study area which would be relevant to the potential archaeological resource within the study area.

Sites in **Pymont** and **Ultimo** have been the subject of a number of archaeological projects, including the following:

1991	Paddys Market Site ¹³⁷
1994	Bowman Street, Pymont Point ¹³⁸
1994	Paragon Iron foundry, Bulwara Road, Pymont ¹³⁹
1996	CSR site, Pymont ¹⁴⁰
1996	Grace Bros., Broadway ¹⁴¹
2001-02	Quadrant site, Broadway ¹⁴²
2002	Bullecourt Place, Ultimo ¹⁴³
2005	Union & Edward Street, Pymont ¹⁴⁴

The reports from the Quadrant Site are currently being written up and the Union and Edward Street Site has been completed and should be released on Casey & Lowe's webpage within the next month. The remains at these sites were associated with mid-19th-century housing as well as industrial and commercial remains which were an integral part of 19th and 20th-century life on the peninsula. Sites with similar period remains would include those at the Quadrant site. Some of the remains from Union and Edward Street are fairly early, dating from the 1850s. This range of later house sites is similar to those found at most of the above archaeological sites. This was also the site of the later Gillespie flour mill, when it moved from the Anchor flour mill buildings in Darling Harbour. The Paddys Market site contained a mix of residential and commercial buildings built on the site of extensive reclamation on the shores of Darling Harbour. The Grace Bros site, like the Quadrant site, had the remains of various mid to late 19th-century housing as well as some evidence of commercial activities, such as slaughter houses.

Darling Harbour & Walsh Bay Sites

1992	Little Pier Street Precinct (Dickson's Mill) ¹⁴⁵
2003	30-34 and 38 Hickson Road (The Bond) ¹⁴⁶
2003/04	Towns Wharf, Walsh Bay ¹⁴⁷

¹³⁶ Please note this is not an exhaustive list of sites in these places. Further research into other archaeological projects would be undertaken as part of the next stages of the archaeological program.

¹³⁷ Godden Mackay with Wendy Thorp. Tony Lowe and Mary Casey worked on this site.

¹³⁸ Higginbotham 1995 Report on the archaeological excavation of the site of proposed community and public housing, Bowman & Harris Streets, Pymont, NSW.

¹³⁹ Casey & Lowe 1995.

¹⁴⁰ Casey & Lowe 2000.

¹⁴¹ Damaris Bairstow and Dana Mider.

¹⁴² Quadrant web page: www.australand.com.au/apart/syd/broadway/thequadrant/archaeology.cfm.

¹⁴³ Conference paper given at combined ASHA/AIMA/AAA conference, Townsville, 2002.

¹⁴⁴ Casey & Lowe, excavation in 2005 and report currently in preparation.

¹⁴⁵ Godden Mackay 1992.

¹⁴⁶ Archaeology & Heritage Pty Ltd 2004 Archaeological recording of annulus of 1882 gasholder and details of 19th-century gas mains, part of former AGL site 30-34 Hickson Road, for Bovis Lend Lease; Archaeology & Heritage Pty Ltd 2003 Archaeological recording and excavation, former AGL site 38 Hickson Road, Sydney, rock shelf at rear, for Bovis Lend Lease.

¹⁴⁷ Austral Archaeology & Mirvac. http://www.mirvac.com.au/forsale/NSW/walshbay/about_heritage_history.htm.

2005 KENS Site, Darling Harbour¹⁴⁸
 2008/2009 Darling Walk, Darling Harbour¹⁴⁹

The **Little Pier Site** contains the remains of Dickson's later mill (1833), rather than the original mill. His original mill was the first steam mill in the colony of NSW and ground wheat for flour and opened in May 1815.¹⁵⁰ In the 1820s Dickson opened a candle and soap factory and a brewery on the site to diversify his interests. This site has been retained *in situ*. See Section 4.2 below for more information on this project which is partly within the study area.

The **Towns Wharf Site** at Walsh Bay appears to have similarities to the Darling Walk site in that it is wharfrage located on the waterfront. While we have not found an excavation report has been written for this, there is some information available on the internet. There was major filling over substantial remains of buildings (Fig. 4.1). There was up to 3.5 m of fill within this site.

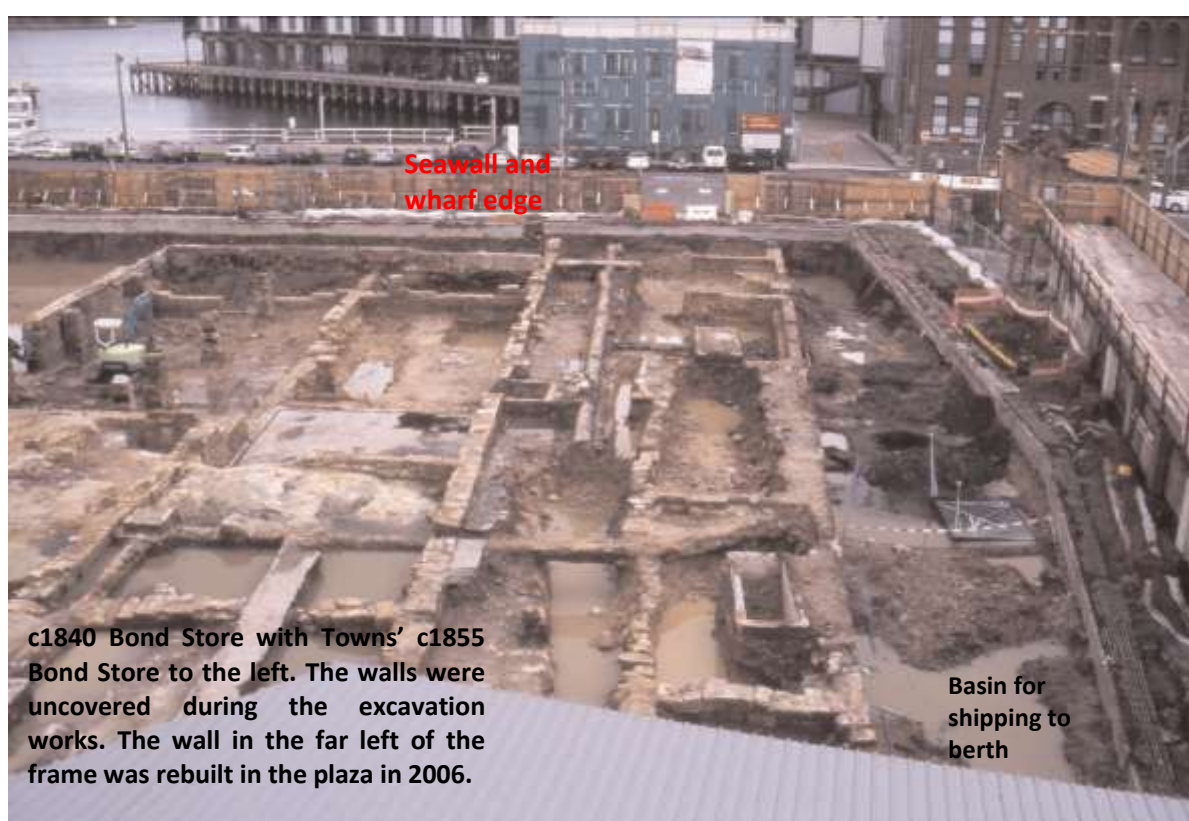


Figure 4.1: This photograph was taken as the excavation works progressed. You can see the cellar levels of the former bond stores that existed on the site, as well as the seawall and the later MSB overlay. These wall alignments are represented by the lines in the paving you can see in the plaza today.¹⁵¹

The **KENS Site** was excavated over a six-month period in 2005. According to an interview given by the excavation director Wendy Thorp:

“We excavated the best part of the city block minus the terraces at the southern end of the site,” archaeological director Wendy Thorp explains. “It was an extraordinary site as it had some unusual circumstances that led to the depth of preservation. We were excavating down on an

¹⁴⁸ Wendy Thorp; talk at Sydney Practitioners Workshop, November 2004;
<http://www.aacai.com.au/newsletter/101.html#summary>.

¹⁴⁹ <http://www.caseyandlowe.com.au/sitedw.htm>.

¹⁵⁰ Godden Mackay 1992, Vol. 1: 7.

¹⁵¹ <http://www.mirvac.com.au/forsale/NSW/walshbay/pdf/tp.All.pdf>.

average of 5m and in places up to 12m and all of that was European occupation. It was like city on city on city, so we excavated through 20th century levels right through to the various early years of the settlement.

“One of the most interesting finds was that in one part of the site along Sussex Street which was originally part of Darling Harbour, we found remnants of private dockyards, there was an area for boats to come in, seawalls all around it, steps leading down and part of the beach was intact. Along the rest of that frontage we also found other docks, slips and landing places.

“Higher above that, after the reclamation, we found essentially quite a rural landscape. On the newly formed land they had extended the boundaries of the land property out with fences. The fences had been buried in the fill and were still standing, and that was from about 1839. We found evidence of small wooden, stone and brick cottages and a lot of animal pens and paddocks.”

It wasn’t just pieces of rubble that were uncovered, Thorp says. “We found the foundations, then in places as we got further up the hill the buildings were up to shoulder height - you could walk into them. In Kent Street there were buildings of that height and they were a mixture of 1830s, 1840s and later – you could walk in the back door, you could see where the window ledges were.”

The earliest evidence of European settlement was located on the corner of Kent and Napoleon Streets, according to Thorp. “We found the remains of a building that certainly went back to the very settlement of Sydney around the 1790s and early 1800s, and that lay under another house and that in turn was expanded and became a hotel and the hotel remained up till the 1950s.”

Although the archaeological team had an idea of what they would find, they were surprised by just how much original material remained. Thorp says the reasons for this are twofold. “Firstly, there was the unusual circumstances of the site that allowed preservation: topography – there was a slight slope in places, then it jumped over a rock cliff which we also found had come to Kent Street, so people had built up the slope but instead of knocking things down they simply knocked them to a certain level and then filled over the top to level the slope out. Secondly because the site hasn’t really been touched - all the later 19th century material was demolished in about 1913, so this combination of circumstances led to an extraordinary state of preservation.”

The original profile has changed in that most of Sussex Street up to 1839 was part of the bay, Thorp says. “We found that shoreline, then the bay was reclaimed, then Sussex Street was extended, so we went from the shoreline to a street frontage, then a topographic change from going from a fairly gentle slope with one rock face to what it is now.”

Although none of the remnants have been kept physically on the site, Thorp says the artifacts recovered have been catalogued and will be accommodated in the completed development and the information retrieved from them will become part of a prepared interpretation package that will be incorporated into the development so there is a link between the new and the old. “There are lots of ways to do this,” she says. “It’s not been firmly decided on what shape it will take, but there’s the potential for signage or for some of the objects to be displayed. Some of the public art may reflect some of the older occupation on the site.”

In addition to the wealth of evidence of European occupation, Aboriginal archaeology was also found on the site. “In a couple of places there were tool-making areas where Aboriginal people had sat upon the cove and made tools,” says Thorp. While the exact dates of this pre-European settlement have not been finalised, they go back at least a few thousand years.¹⁵²

The KENS site is also similar to Darling Quarter (Walk) as it was the subject of major reclamation after 1839 when Sussex Street was extended northwards into that area. This reclamation phase is generally later than that undertaken at Darling Walk where major sections of it appears to have been reclaimed by Thomas Barker in the early 1830s. The KENS site indicates that reclamation can

¹⁵² http://www.infolink.com.au/articles/Digging-up-the-past_z159548.htm.

be much more extensive than perhaps previously understood. Notably there was up to 1 m of fill within this site and remains of buildings were occasionally up to shoulder height.

The **Darling Walk Site** was an extensive remnant industrial landscape associated with important industrial precincts:

- Barker's Mill – remains of the millpond and early jetty.
- Workers' housing.
- PN Russell Foundry and Carriage Works.
- Small foundries and soap factories.
- Extensive incremental reclamation and pre-reclamation use of the foreshore, including timber fences and environmental archaeology associated with the reclamation fills.
- Aboriginal archaeology – remains of a midden.
- Evidence of the original foreshore, rocky outcrops and sandy beaches with remnant cockle beds beneath the sandy beach.

A preliminary results report is found at: <http://www.caseyandlowe.com.au/sitedw.htm>.

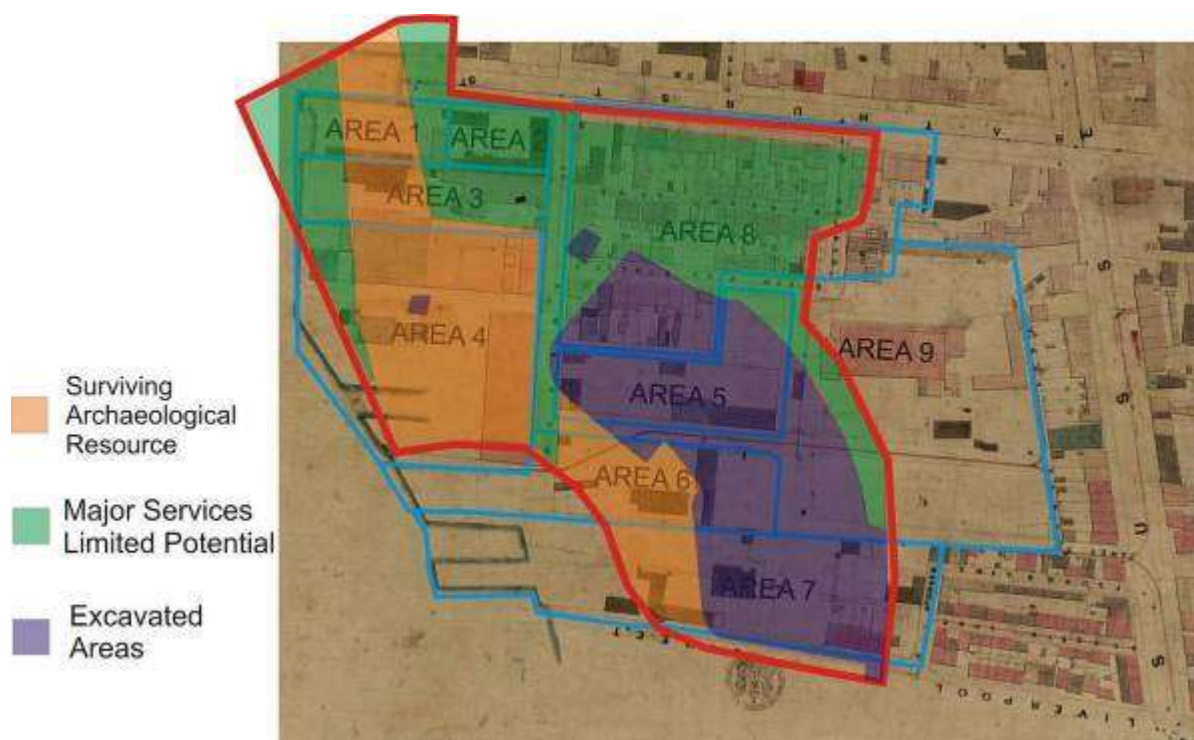


Figure 4.2: Plan of the area assessed for the Darling Walk project. Note that substantial areas of significant archaeology still survive within this area.

The **Barangaroo South** archaeological program undertaken by Casey & Lowe for Lend Lease recovered considerable information associated with the development of the Darling Harbour foreshore.¹⁵³ The main remains found were the result of reclamation where the eastern foreshore of Darling Harbour was extended into the harbour. The reclamation fills mostly consisted of stone rubble and levelling layers. In some cases the reclamation was bulk fills of sandstone rubble followed by clay-rich fills to raise the new ground above the high water mark (Area C4). Initially, bulk rubble fill was deposited into the harbour to create a platform within the tidal zone. In Area K bulk fills were introduced and compacted to create stable and level ground. Roughly-made

¹⁵³ <http://www.caseyandlowe.com.au/sitebarangaroosouth.htm>.

sandstone walls were built to assist in retaining the fills during this process. The sandstone walls were built on the initial bulk rubble fill and were later sealed by more rubble stone fill and the first surfacing over the new land. The main archaeological features and findings were as follows:

Natural Environment and Aboriginal Archaeology

Evidence for the original rocky shoreline.

There was no Aboriginal archaeological evidence

Henry Bass' shipyard 1830s-1850s

Sandstone seawall and reclaimed land that formed wharf facilities for Henry Bass' shipyard in the 1830s.

Informal boat ramp and structure made from sandstone pavers, brick piers and timber, which was used during the 1830s but buried by reclamation by the 1840s.

Cottage built on a rocky outcrop and partially on the reclaimed land and seawall. Likely constructed by the 1840s. Evidence for some period of domestic occupation. Survives until the 1880s.

Francis Girard's reclaimed land 1830s-1840s

Two phase of reclamation. Reclaimed land using rubble sandstone and layers of crushed sandstone and clays. There was no formal retaining structure on the western edge. Some rough sandstone walling at the northeast and southeast.

Hunter River (later Australasian) Steam Navigation Company 1840s-1880s

Occupies southern half of Francis Girard's reclaimed land from 1840s.

Remains of the timber wharf constructed by the 1850s consisting of timber piles and headstocks.

Remains of a large warehouse structure included sandstone pads to support a timber superstructure, and a substantial sandstone wall on the western harbour frontage that connected the building to the wharf structure.

Within the warehouse was an extensive *in situ* deposit of charred grains and corn, indicating that there was a fire in the later 19th century.

Breillat's Wharf 1840s-1880s

A substantial sandstone seawall retained the reclaimed land. It was constructed in the 1840s and was at least 45m in length. The base of the wall was constructed on rubble fills that were located at least 1m below low tide level.

At the southern end of the wall were the remains of a timber jetty.

At the northern end of this property were the remains of a structure with timber and sandstone footings. Extensive deposits of slag within the structure indicated that it may have functioned as a blacksmith's workshop.

Evidence for levelling and wharf redevelopment, including additional courses to the seawall, between the 1860s and 1870s.

Remains of a warehouse or store building dated to the 1870s with an occupation deposit containing artefacts associated with the men who worked at the wharf.

Grafton Wharf and Early 20th Century

Evidence for wharf and jetty improvements such as dead man anchors.

Evidence for levelling and resurfacing with roughly-made concrete.

Remains of two brick-built weighing stations.

Only a very small section of the original foreshore extended into Barangaroo South. Some of this was quarried sandstone. Most of Barangaroo South was land reclaimed by the 1850s,

approximately the eastern 40 metres or so. The remaining western area was reclaimed during the 1960s and 1970s.

Surry Hills and Haymarket

Casey & Lowe have excavated remains of the Haymarket brickfield on three separate sites between Elizabeth, Albion and Reservoir Streets in Surry Hills and part of an early pottery manufacturing site, the Thomas Ball Pottery (c1801-1823).¹⁵⁴ The remains of the brickfield were quite extensive, with the base of a clamp kiln as well as cart tracks. There was limited evidence for additional activity areas other than the clamp kiln remains. Casey & Lowe have also excavated the remains of houses on the 19-41 Reservoir Street site.

There was also an excavation at Cunningham Street, Haymarket by Austral Archaeology in 2009 which found remains of early industrial/commercial enterprises as well as residential housing.

4.2 Dickson's Mill – Pier Street Excavation

The six week investigation involved the digging five trenches (A-E, Figure 4.3).¹⁵⁵ The excavation revealed substantial structural remains and deposits, with archaeological features existing within 200mm of the ground surface and extending to a depth of more than 3m.¹⁵⁶ The extent of the significant archaeological features, including structural remains and deposits is shown in Figure 4.4.¹⁵⁷ This shows the presumed extent of structural remains and significant deposits. It is a composite plan of the structures known to have been erected on the site between 1831 and 1930, excluding those which are known to have been totally removed by later activities.¹⁵⁸ It is thought that the structure extending across Little Pier Street is an addition to Dickson's Mill, built between 1831 and 1836.¹⁵⁹ This structure is identified as 'structure 13' within the report.

Another plan has divided the site into four zones according to its archaeological sensitivity (Figure 4.5).¹⁶⁰ These zones are defined as:¹⁶¹

- **Unit 1** has been defined so as to take in those sections of the site that relate to the 1830s Dickson occupation and use, including structures, yards and areas where significant archaeological deposits have been encountered or may reasonably be expected. Unit 1 also includes the site of the original 1815 mill building as concluded on the basis of investigations carried out for this project. This includes structure '13' which extends into The Haymarket study area
- **Unit 2** has been selected to include all known areas of significant archaeological features or deposits, including structures and occupation areas used subsequent to the Dickson and Zollner periods, yards and associated features. Units 1 and 2 together define the extent of significant archaeological contexts within the site.
- **Unit 3** has been selected as a buffer zone around Units 1 and 2. This is an area within which activity, particularly physical disturbance, is likely to impact upon significant features within Units 1 or 2. An arbitrary 5m boundary has been shown on the plan. However, the actual extent of Unit 3 will depend on the nature of any structures or other disturbances proposed - clearly a major excavation or structure within 10m of Unit 1 has potential for major

¹⁵⁴ Casey & Lowe reports in progress, see <http://www.caseyandlowe.com.au/site710.htm>.

¹⁵⁵ Godden Mackay Pty Ltd. 1992. *Little Pier Street Precinct Archaeological Investigation*, Volume 2. Report for the Darling Harbour Authority. The trench locations are shown in Figure 1.2 (p 6).

¹⁵⁶ Godden Mackay 1992: 126.

¹⁵⁷ Godden Mackay 1992: 131.

¹⁵⁸ Godden Mackay 1992: 124.

¹⁵⁹ Godden Mackay 1992: 125.

¹⁶⁰ Godden Mackay 1992: 132.

¹⁶¹ Godden Mackay 1992: 124.

adverse impact on the significance of the site, unless it is well planned and properly constructed.

- **Unit 4** is the remainder of the site and shows areas in which the archaeological investigations and associated research undertaken as part of this project have established that no significant archaeological features remain. Although datable deposits and elements were encountered in Trench E, these are considered to have negligible research potential.

Godden Mackay suggest that:

In relation to sub-surface features within Unit 1 the primary activity and objective on site should be conservation and interpretation. Features and deposits within Unit 2 should be retained, conserved and interpreted where possible, (unless other site requirements are such that this cannot be achieved). Unit 3 is a 'buffer zone' around significant features within which new developments may occur provided no activity detrimental to the conservation and interpretation of significant elements takes place. No site constraints need apply to areas within Unit 4 other than provision for monitoring and recording of sub-surface elements during excavation associated with construction activity.¹⁶²

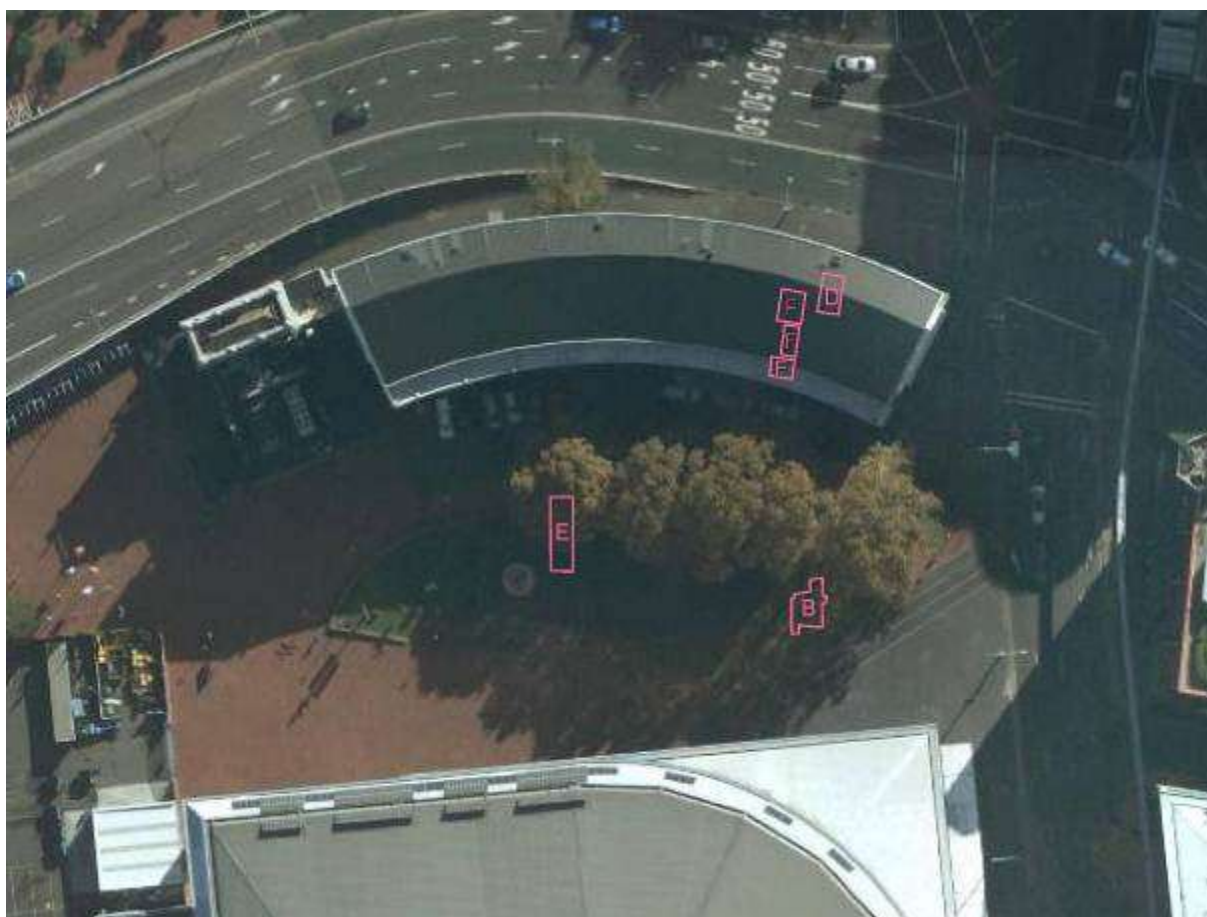
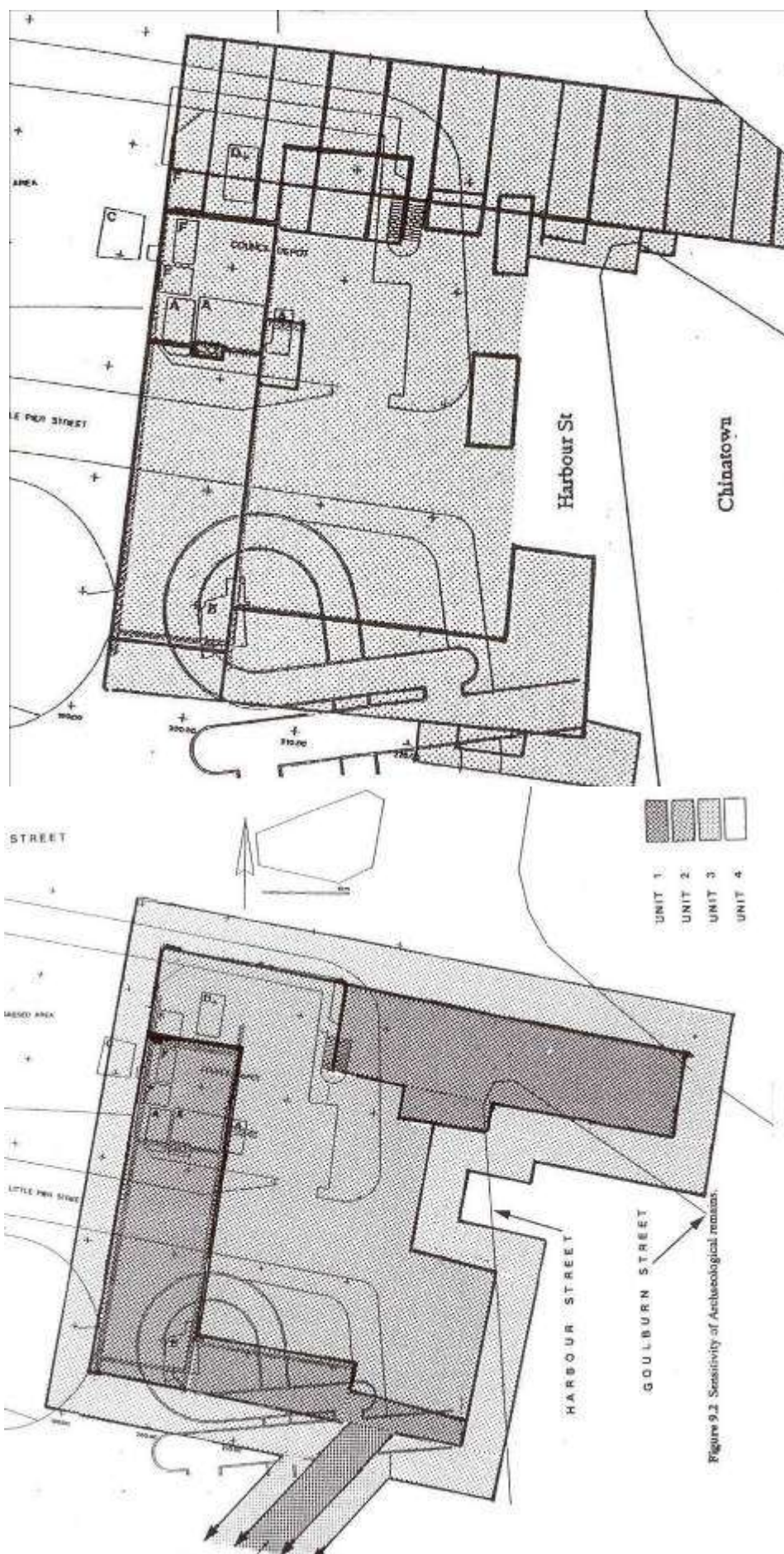


Figure 4.3: The Little Pier Street trenches. Only trenches E and B were within or adjacent to the current study area. All other Little Pier Street excavation trenches were under the hotel.

¹⁶² Godden Mackay 1992: 124.

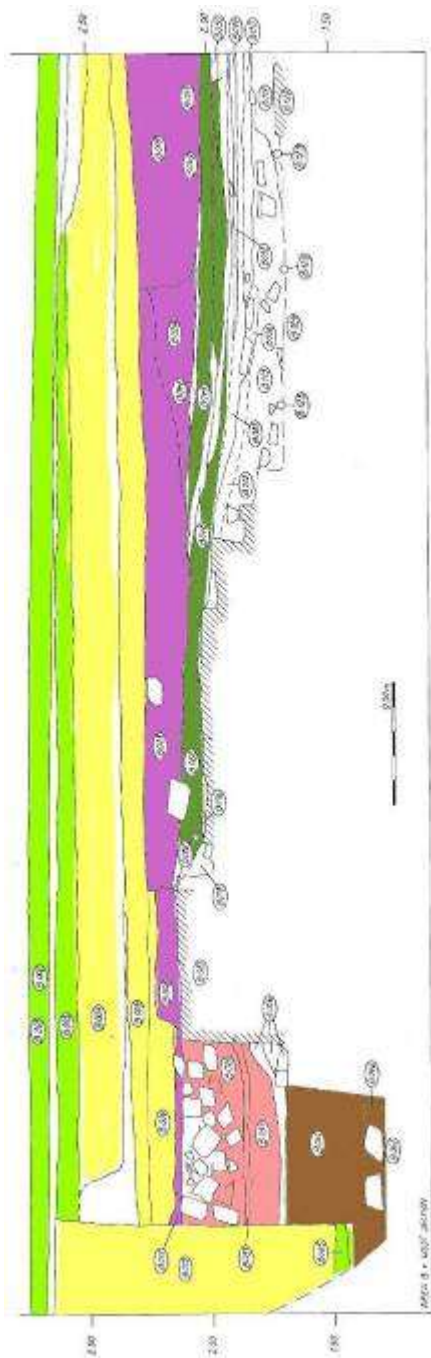


4.2.1.1 Trench B

In trench B, between 0.3 and 0.6m of material was removed by machine prior to hand excavation (Figure 4.3). Deposits phased from the 1930s began at RLs around 2.25 to 2.5 AHD in trench B (see section drawing). The description of the trench noted:

Trench B began as a square of some 4 metres, but was extended during the excavation. The eastern half was extended to 6.2 metres, by an addition at the north end; the western half was extended to 5.3 metres by an addition at the south end.

In the southern half 500-600mm were removed by machine, while in the north up to 300mm was so removed. All the extensions were completely removed by hand. The remaining excavation continued to a depth of between 500 and 800 mm, with two small areas continuing to 100 and 145 mm (central east and south west). Bedrock, or undisturbed natural, was not found.¹⁶³



Phase I	Reclamation and construction
Phase II	Early occupation (c. 1830s-1868).
Phase III	Zollner's Galvanising Works, 1868-1886.
Phase IV	Later occupation, 1886 to c. 1930s
Phase V	Demolition, early 1930s
Phase VI	City Markets, 1930s to 1970s
Phase VII	The Entertainment Centre.

Figure 4.6: Trench B phases and colour-coded section drawing, west section. Godden Mackay 1992

¹⁶³ Godden Mackay 1992: Vol 3, 49

4.2.1.2 Trench E

In Trench E, deposits phased from the 1930s began at RLs around 2.25 AHD in trench E (Figure 4.3):

The trench was excavated as a single rectangle with an area of approximately 13.2 sq. m. The depth of excavation varied from 0.7m in the north to 2.5 m in the south. The floor of the trench consisted of a continuous slope which allowed machine access to the southern face of the trench. Approximately 20.5 cu. m. of material were removed during excavation.¹⁶⁴

Phase	Description & Date
I	Cockle Bay/Darling Harbour pre-1868
II	Reclamation 1868-1870
III	Vacant land 1870-1879
IV	Wood Yard and Saw Mill 1879-1896
V	Vacant land 1896-1934
VI	Sydney City Council 1934-1986 City Markets No. 6 1937-1986
VII	Darling Harbour Authority 1987-1992

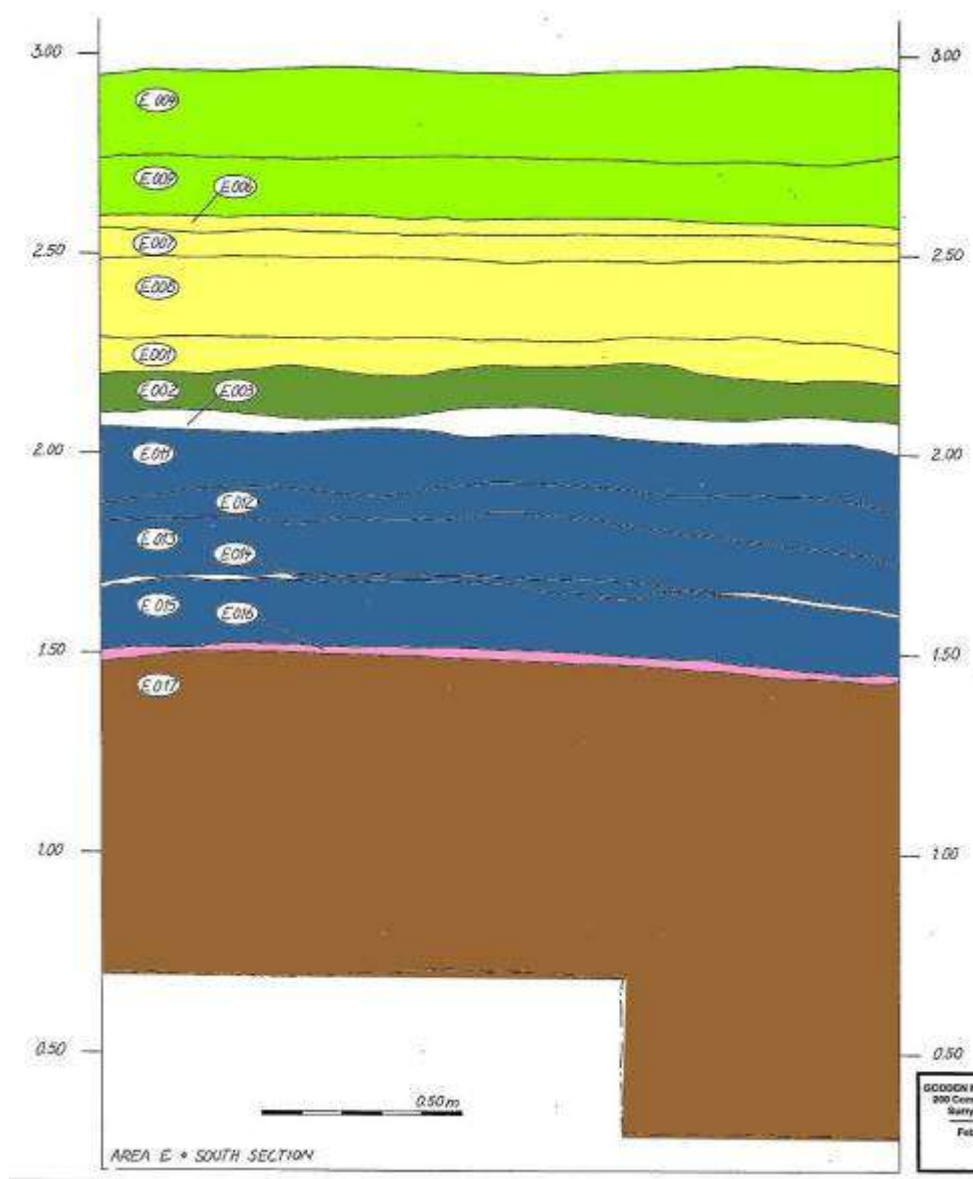


Figure 4.7: Trench Phases and colour-coded section drawing, Trench E, south section. Godden Mackay 1992.

¹⁶⁴ Godden Mackay 1992: Vol 3, 102

4.2.1.3 Trench F

About 0.3m of fill was removed by machine and a further 0.6m by hand in the original part of the trench. When the trench was extended, only 0.4m of fill was removed before detailed excavation began. Deposits phased from the 1930s began at RLs around 2.25 to 2.5 AHD in trench F (see section drawing).

The area excavated was originally a rectangle 1.9m x 6.8m in two bays created by the foundations of the council depot. They were called I (southern) and II for convenience during excavation. Another bay to the north 3.2m x 4.0m was later included (III) and I was extended to the west by 1.1m.

Approximately 0.3m of deposit was removed by machine and 0.6m by hand in I and II. In III 0.4m of fill was excavated by hand.

Excavation stopped at these depths throughout the trench because substantial structures in good condition had been reached.¹⁶⁵

Phase I	Construction of sandstone L-shaped building (documents suggest 1831/6 but see trench A) and occupation
Phase II	Zollner's Galvanising works 1868 - 1885
Phase III	Post-Zollner's use of L-shaped building and construction/occupation of stores 1885 - 1932
Phase IV	Construction of council depot 1940
Phase V	Darling Harbour Authority works 1987

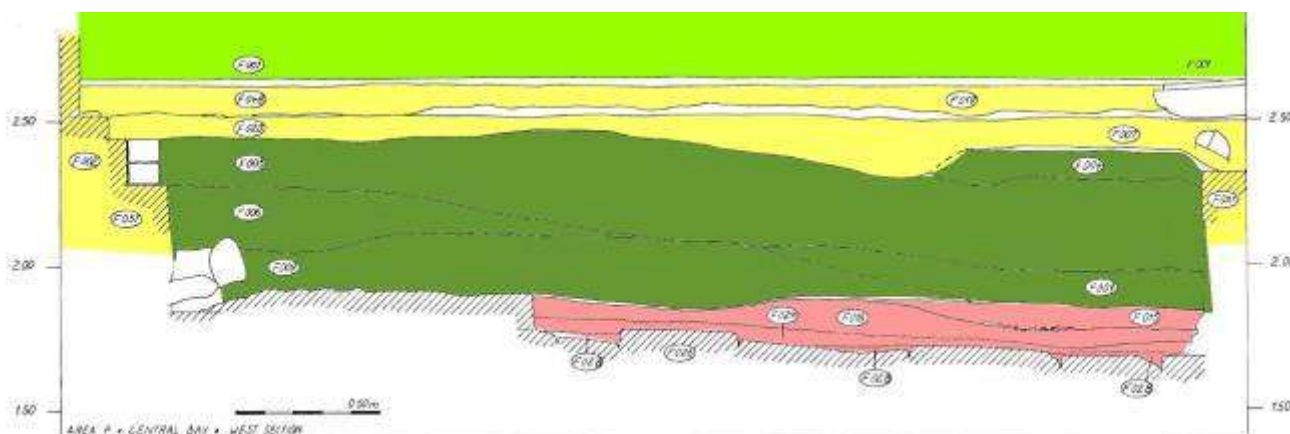


Figure 4.8: West section drawing of Trench F underneath the hotel, Figure 4.3. Godden Mackay 1992.

4.2.1.4 Trench D

In trench D, only 0.2m of material was removed by machine prior to hand excavation. Deposits phased from the 1930s began at RLs around 2.25 to 2.5 AHD in trench D (see section drawing). The trench was described as:

The excavated area is a rectangle measuring 3 X 5m. Approximately 0.2m of deposit over the whole trench (mostly reinforced concrete) was removed by machine. The depth excavated manually varied between 0.2m and 2.2m. At no point did the excavation in this trench reach natural undisturbed deposit or bedrock.¹⁶⁶

¹⁶⁵ Godden Mackay 1992: Vol 3, 110.

¹⁶⁶ Godden Mackay 1992: Vol 3, 81.

Phase I	Filling of Cockle Bay 1813 - 1831/6
Phase II	Occupation of N end of L-shape building in some form 1831/6 - 1870/84
Phase III	Final demolition of N end 1810-1884
Phase IV	Construction of Eight Stores 1884
Phase V	Occupation of Eight Stores 1884 – 1932 [Concrete floor D003]
Phase VI	Demolition of stores and L-shaped building 1932
Phase VII	Construction of council depot c.1940
Phase VIII	Darling Harbour Authority works 1987

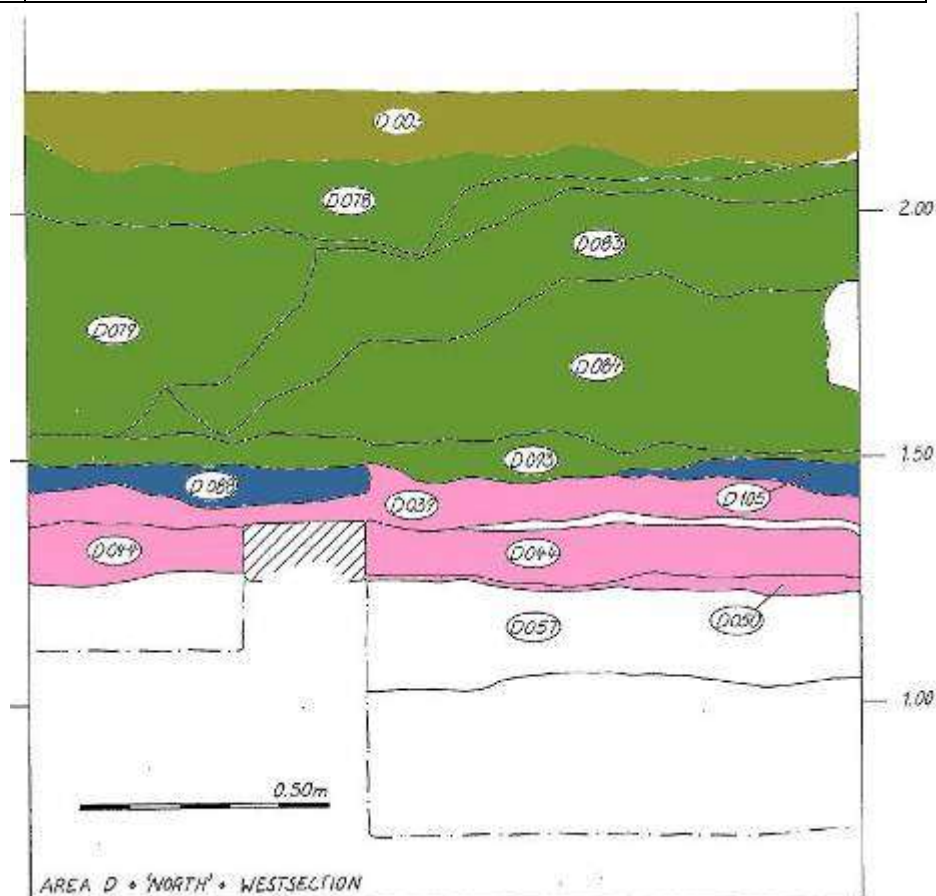


Figure 4.9: Trench D, located beneath the hotel, but within the 1830s building, phases and colour-coded section drawing. Godden Mackay 1992.

Summary

That archaeology associated with Dickson's mill from the 1830s survives between RL 2.2m to 2.5m and deeper. The north-south Zollner building identified on Dove's 1880 plan is also present on the *Ignis et Aqua* plan and on the 1828 plan. This building was demolished in the 1930s for the construction of the market building. This is the main item associated with the mill extending into the project area. It is also noted that the building was erected on reclaimed land which is likely to have been built in a similar fashion to wharfage found at Barangaroo South. Therefore it is not only the building which is significant but the associated reclamation and evidence of its construction.

- **Trench B:** demolition of the 1830s building was found at about RL 2.4m to RL 2.2m. Late occupation (1868-1886) extended down from RL 2.2m to approximately RL 1.8m – both 1886-1930s uses and the Zollner-related archaeology (1868-1886) (Figure 4.6).
- **Trench E:** outside the footprint of the 1830s building, to the west within an 1879 timber mill, which was vacant land above the 1860s reclamation. Timber yard and archaeology survived at approx. RL 2.3m (Figure 4.7).

- **Trench F:** located beneath the hotel building and within the 1830s mill building, included occupation deposits of 1830s building which survived to RL 2.5m but this was dated 1885-1932. RLs on Zollner's galvanizing works (1868-1885) were RL 2m.
- **Trench D:** survival of 1830s building but 1880s occupation (1884-1932) between RL 1.5m and RL 2.2m.

The early 20th-century archaeology contains deposits and remains associated with the continuous occupation of the 1830s mill building. It is noted that most of the early deposits are beneath

4.3 Notes from Paddys Market Report regarding fills over the archaeology

The Paddys Markets site is to the south of the study area, beneath the Market building, on the southern side of Hay Street. Area A0 was an L-shaped trench covering about 765m² of the open area excavation. It was intended 'to sample the overburden above the archaeological deposits as a means of determining what depth could be mechanically excavated prior to the commencement of manual excavation'. The depth of excavation varied between 1.0m and 1.8m.¹⁶⁷

Areas A1 and A2: 'After approximately 1.5 metres of overburden was mechanically removed the entire area was manually excavated to a depth that varied between 200mm and 1.3 metres'.¹⁶⁸

Area A3: 'After the initial overburden was mechanically removed to a depth of approximately 1.75 metres the archaeological deposits removed by hand in this area varied in depth from approximately 300mm to 700mm'.¹⁶⁹

Area A4: 'A depth of approximately 1.0 metres of overburden was mechanically excavated and manual excavation thereafter reached depths varying between 0.7 metres and 2.0 metres'.¹⁷⁰

Area A5: 'An overburden of approximately 1.5 metres was mechanically removed and the manual excavation of the site reached depths varying from 300mm to 1.0 metres'.¹⁷¹

From the description of the construction of Paddys Markets:

As work progressed further in that direction, with an accumulation of debris building up, walls of the former terraces were left standing up to 1.5 metres in height.[204] By the time the site of the mill was reached walls and foundations to a combined depth of three metres were left to be covered with rubble. Most of the above ground stone work was salvaged from the site.[205]...

The rubble from the demolition was left as an irregular surface all across the site. It rose in height from the former area of Mill Lane in the north to Engine Street in the south.[207] The irregularity of this material was demonstrated by the subsequent depths of fill required above it to level the site; in places it was more than a metre and in some less than 300mm.[208]¹⁷²

The report then continues to describe how a reinforced concrete base was then laid over the demolished buildings. On top of this was fill brought in to level the site. The fill was deposited on the site from the north.¹⁷³

¹⁶⁷ Godden Mackay 1993: 5.

¹⁶⁸ Godden Mackay 1993: 13.

¹⁶⁹ Godden Mackay 1993: 13.

¹⁷⁰ Godden Mackay 1993: 15.

¹⁷¹ Godden Mackay 1993: 15.

¹⁷² Godden Mackay 1993: 106 (citing 204 (Evidence of Excavation: Area A3-5), 205 (Area A1-2), 207 (Area A5) and 208 (Area B5)).

¹⁷³ Godden Mackay 1993: 106.

A review of some of the archaeological site plans indicated that the RLs on yard and paved surfaces was between RL 2.2m and RL 2.4m. This is above the RLs for historical ground levels found at Darling Quarter and Barangaroo South and probably suggests that the 1860s reclamation by the state was more consistent over the site and linked in more closely to the RLs of surrounding ground and road systems.

4.3.1 Brief notes on 19th-century dam walls

Dams were made for a variety of purposes in the 19th century but a common and long established use in that period was the supply of water to water-mills and other water-powered technologies. This is most likely the dam building tradition John Dickson was adapting, when he constructed a dam to supply water to his steam engine.

The 1841 British handbook, *A glossary of Civil Engineering*, gives a brief description of how dams of the period were typically constructed:

Timber framing is very frequently employed in the construction of dams, but masonry is better, and, of course, the requisite precautions must be taken to prevent any leakage of water from above. A thick bed of puddle should be laid next the upper side of the water, protected by a layer of gravel. Dams are usually made in the form of a segment of an arch on the plan, and the face of the dam wall should be plumb, or battered down very gradually, and the lower level, or foot, being properly paved or planked.¹⁷⁴

The same handbook adds that dams were to be constructed in such a way that the water could flow over their top, in case of flood or if the water in the dam was not being used.¹⁷⁵

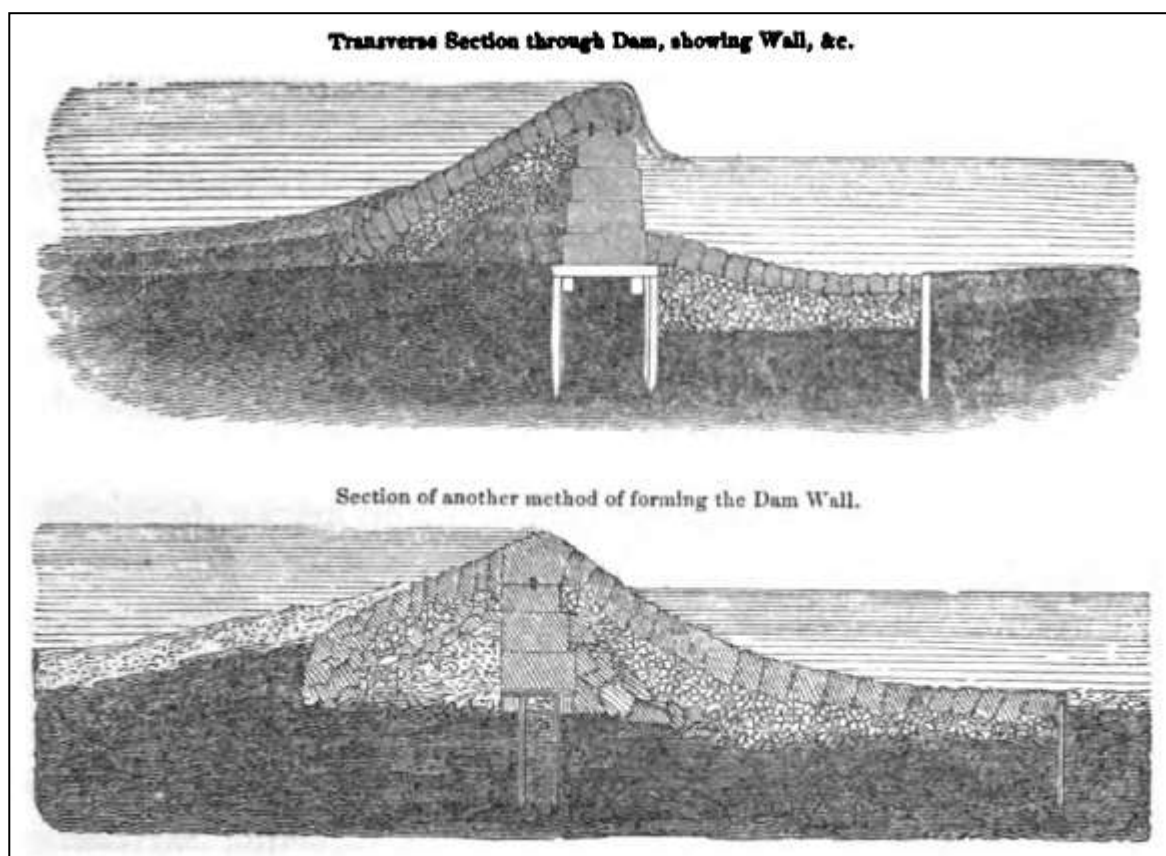


Figure 4.10: Cross-sections of dam walls from *A glossary of Civil Engineering* (Brees 1841: 75).

¹⁷⁴ Brees 1841: 73-74.

¹⁷⁵ Brees 1841: 73.

4.4 Research Questions

This section provides a preliminary indication of the type of research questions that might be pursued to investigate the archaeological remains at the site so as to inform the assessment of heritage significance.

4.2.1 Residential Housing and Material Culture

Those developed from the investigating the archaeological remains at the CSR site (1996) were further developed for Union & Edward Street, Pyrmont (2004), 19-41 Reservoir Street, Surry Hills (2005) and Darling Quarter (Walk) 2008-2012. These have been found to provide a solid basis for exploring residential housing in a range of working-class and lower middle-class environments.

1. What evidence survives of the housing in this part of Ultimo/Pyrmont/Darling Harbour?
2. What evidence is there for the standard of living enjoyed by the earliest residents? Is there artefactual evidence for different standards of living between the houses occupied on the early manufacturing sites and workers housing?
3. Is there evidence for cottage crafts or other unrecorded professions or works in the area?
4. Has evidence for mid nineteenth-century early industry survived along the foreshores?
5. The material culture associated with the 19th-century occupation of The Haymarket site has the ability to inform us about day-to-day issues associated with the lives of the residents of Ultimo/Darling Harbour. The material culture can provide information on living standards, consumer choices, construction of gender identity and the nature of childhood.
6. An important aspect of the analysis of the archaeological remains from this study area is the opportunity it provides for a comparative examination of the sets of archaeological evidence from individual **households** and the houses as part of a larger **neighbourhood**. This will be a focus of the overall analysis. It requires a **comparative analysis** of each house or dwelling lot or specific context, such as cesspit deposits, to each other. This is facilitated by the archaeological methodologies established for comparative analysis by Casey & Lowe which includes such things as a ceramic pattern series, and the cataloguing process which is designed to facilitate a comparative analysis of sets of data through using criteria such as minimum vessel counts.¹⁷⁶

Therefore the material culture of The Haymarket site should add to our understanding about the cultural, social and economic influences on the residents of Pyrmont and how these influences affected their behaviour, as manifested through their choices about:

- where activities were undertaken within a house,
- what type of activities were undertaken within a house,
 - what, how and where to eat,
 - what to wear,
 - what was acceptable recreation for adults and children within working-class homes?
- what to buy.

These questions mostly focused on urbanisation, material culture of consumerism and gender identities, childhood and women's lives in the home and in the case of the Biddell Bros confectionery factory outside the home. These are currently important questions feeding archaeological research designs.

¹⁷⁶ Casey 2004.

Chinese residents and businesses

The presence of a number of Chinese residents in this area during the late 19th and early 20th century presents an opportunity for exploring issues and questions relating to **ethnicity**. The archaeological excavation of the Silknet property, Mary Street, Surry Hills found clear evidence of Chinese occupation. Less evidence was found at the 19-41 Reservoir Street excavation, mostly due to later 20th-century building impacts. It is anticipated that the mostly 20th-century occupation deposits associated with the Chinese residents will leave similar archaeological remains. This evidence will provide a way of examining the material life of the Chinese residents and shed light on how they negotiated Sydney life and their standards of living, and the evidence for Chinese cultural practices and foodways. In addition there are a number of Chinese businesses operating within The Haymarket study area. While the nature of these businesses may curtail deposition of archaeological deposits we also know that during the 20th century many Chinese businesses may have provided illegal accommodation for Chinese men.¹⁷⁷

4.4.1 Industrial Archaeology

The CSR site mentioned above was not an industrial site although the CSR housing was workers' housing for those who were employed in the surrounding area of industrial Pyrmont. The questions relating to the industrial sites within The Haymarket study area relates to both the technological nature of the sites and the evidence for work place practices as well as issues of urbanisation and concentration of work and living arrangements in close proximity.

A set of questions were developed by Casey & Lowe in 1995 for an iron foundry site in Pyrmont and also for a brick making area in Surry Hills on three different archaeological projects during the 1990s and in 2005.¹⁷⁸ These questions relate to the exploration of the layout of the industrial set up, and how work moved through the site. These have been explored successfully at the Darling Quarter and Barangaroo South archaeology projects and subsequent reporting. The type of research questions which would be used to address the range of industrial sites within The Haymarket are:

Questions that relate to the various use of the foundries and mills:

- spatial use of the mill, identification of activity areas, i.e. as in the case of a foundry:
 - furnace and melting of pig iron
 - casting of moulds
 - machine shop
 - storage of scrap iron
 - general use of yard area
 - movement around the site
- Levels of technology evident in the various processes of the industrial activities undertaken within the mills and workshops.
- Evidence for the type of items produced by the individual company.
- Evidence for the working conditions of the staff.
- Were these exclusively male workplaces, if so do they help us understand the construction of male gender roles and relationships. If not, such as the Biddell Bros confectionery factory how were women's lives and gender roles redefined within this place.
- Other relevant questions as they arise.
- How the landscape or landform was transformed to allow for the operations of the mill or factory or workshop, i.e. the casting of moulds in the ground, the creation of a mill pond or the construction of a building.
- Relationship between the workshop/mill/foundry/factory and the associated residential accommodation.

¹⁷⁷ Lydon 1999 & Fitzgerald 1996.

¹⁷⁸ Casey & Lowe 1995: 4-5, report in production.

- How was the life in the residences affected by being in such close proximity to an industrial complex?
- Is this relationship exemplified by the presence or evidence of pollution within close proximity to the house? In the case of the Bulwarra Road house the whole backyard was overlain with metal dross, suggesting that it was used as an extension of the industrial premises. The proximity of the foundry meant that there were no windows in the northern side of the house, the sunny side, so as to stop any smoke and soot on furnace firing days from entering into the house through the windows. Also no washing would have been done on furnace firing days.

4.4.2 Landscape Archaeology

The exploration of how the landform of Darling Harbour was altered between c.1815 and 1980s is fascinating as it testifies to the need for more land in specific locations for commercial advantage and to provide adequate drafts for shipping. This represents the development of urban pressures as early as the 1830s to concentrate local industry around the main transport network, shipping, so as to aid distribution of their products and the importation of goods as needed. The ability of entrepreneurs to transform mud flats into useful land build wharfage far enough into the harbour to provide safe mooring for ships bringing in cargo and taking away goods. The alteration and manipulation of the landform of Darling Harbour has been part of its story for the last 212 years. The methods and means by which the landform was altered can tell us much about attitudes to waste and rubbish disposal, deposition of waste from other construction projects, such as the reclamation of this area in the 1920s with material excavated from the city train tunnels. As the history showed when waste or rubbish was being thrown into the reclaimed land people complained and eventually this stopped. It is possible that the reclamation of the Darling Mills Estate may contain quantities of artefacts.

Specific Research Questions

- What was the nature of the original landform?
- Evidence for shells, such as cockles and oysters, and what plant species were found in this area?
- How has this part of Darling Harbour evolved over time?
- What different materials and means were used, and what was the depth of the reclamation at each stage? How different were these practices compared to Darling Quarter (Walk), Barangaroo South and KENS sites.
- Were the phases of reclamation successful or not?
- Where did the reclamation fill come from?
- How was the new landform used?
- What was the relationship between the reclaimed land and the wharfage?
- Other relevant questions will be addressed as they arise.

5.0 Heritage Significance

5.1 Heritage Significance

This following discussion and statement of significance is written for The Haymarket site within the SICEEP area. This section has been written accordance with the Heritage Branch 2009 guidelines, *Assessing significance for historical archaeological site*.

Apart from NSW State guidelines, the nationally recognised Australia ICOMOS Charter for the Conservation of Places of Significance (*The Burra Charter*) also defines 'cultural significance' as meaning:

'aesthetic, historic, scientific and social value for past, present and future generations.'

Significance is therefore an expression of the cultural value afforded a place, site or item.

Understanding what is meant by value in a heritage sense is fundamental, since any society will only make an effort to conserve things it values. In terms of built heritage, what we have inherited from the past are usually places that have been continuously cared for. Conversely, many archaeological sites will comprise places which, for whatever reason, have not been cared for until the relatively recent period.

Our society considers that many places and items we have inherited from the past have heritage significance because they embody, demonstrate, represent or are tangible expressions of values society recognises and supports. Our future heritage will be what we keep from our inheritance to pass on to the following generations.¹⁷⁹

5.2 Previous Statement of Significance

The City Plan Archaeological Assessment in 2012 provided a Statement of Significance for the SICEEP site as a whole. As of mid-February 2013 they have provided an updated Archaeological Assessment and Discussion of Significance. This is reproduced below:¹⁸⁰

AREA ONE - SYDNEY ENTERTAINMENT CENTRE AND CAR PARK

(a) An item is important in the course, or pattern, of NSW's or the local area's cultural or natural history

The subject site generally illustrates the history of urban development for Sydney. It was originally part of the swamp at the head of Darling Harbour. The area was first used for its waterways and as a food source, Sydney mud oysters and other shellfish, which were then utilised as a lime source for creating mortar for early Sydney constructions.

From the period of 1815 onwards, Phase 1, this part of the site is significant as the location of early colonial industry. Firstly, John Dickson's dam of the eastern stream entering Darling Harbour created a freshwater pond to power his first steam mill. The site is located across the area of the pond, the dam and Darling Harbour. Dickson's later mill extensions were located in the north eastern area, outside of the SICEEP site. The buildings were later used by Simon Zollner for the first galvanising plant in Sydney, dating from the 1840s. The archaeological features are regarded as historically significant at a State level because they were the first established and helped to form the industry and outline of 19th and early 20th century history for Darling Harbour. They include the following:

The dam, constructed 1813-15, which runs north east to south west underneath the Sydney Entertainment Centre is of High Significance.

¹⁷⁹ This section is an extract based on the Heritage Office *Assessing significance for historical archaeological site*, 2009: 1.

¹⁸⁰ City Plan, May 2012; 2013: 96-100.

- The mill, the later part of Dickson's 1815 mill is c.1830 and is located under the Novotel Rockford Hotel and in the north east corner of the site
- The archaeological features from Phase 3, the railway development are historically significant at a **State** level due to their being the first Australian transport network and goods loading area into and out of Sydney.
- The archaeological structures and features from Phase 5 for the site are regarded as historically significant at a **Local** level because historically they were the first commercial buildings in the area and their industry is now rare and related to 19th century industry, commerce and lifestyles. There is high potential for their survival.
 - The archaeology relating to the buildings formerly located on the northwest part of the site bounded by Little Pier Street, Lackey and Factory Streets. These are the Railway Pier Hotel, Biddell Bros Confectionary Works and the Parramatta Wood Co and Willis Bros Timber yard.
 - During Phase 5 – Dickson's Mill was now the Zollner Galvanising Works.
- The archaeological structures and features from Phase 6 for the site are therefore historically significant at a **local** level because historically they were the first established. There is high potential for their survival. The items are:
 - The archaeology relating to the buildings formerly located on the north west part of the site bounded by Little Pier Street, Lackey and Factory Streets. These are the former Railway Pier Hotel, which became the Central Markets Hotel and the commercial buildings bounded by it.
 - The hydraulic pumping station on the former Little Pier Street is above ground and is a State Listed Heritage Item. There are likely to be archaeological remains below ground relating to this building.

(b) an item has strong or special associations with the life or works of a person, or group of persons, of importance in NSW's or the local area's cultural or natural history

- The potential archaeological remains within the SICEP site are associated with a number of significant persons and with their industrial manufactories. The main historical figures are John Dickson, John Harris, Simon Zollner and Alexander Cormack.
- John Dickson was a significant figure in the Colony and the first to establish a Steam Mill to grind grain, amongst other uses. Dickson owned the land along the eastern part of the site and established his mill pond, dam, Mill and Pier in this area and north of the subject site. John Dickson and his Mill were important in the founding of industry using the deep waters of Darling Harbour for wharves and thus beginning the shipping industry of the area which continued until the 1980s.
- John Harris, was the owner of the Ultimo Estate, the land of the western part of the subject site. His ownership was formative for the site, in that the wrangling over his estate meant that the area was not subdivided until the 1850s, when the Darling Harbour Railway was first proposed.
- Alexander Cormack was an important local figure. He established a cooperage on the site from about 1874 and operated three premises across the precinct. The cooperage operated until 1916 and was a prominent feature of the area. He owned a number of houses in the area. One cooperate was on the site of the Entertainment car park, on either Hay or Little Quay Street (see 1880 plan) and another was in the centre of the Entertainment Centre block itself, on Burns Street.
- Simon Zollner, commenced his galvanising works on the site of Dickson's Old Steam Mill in 1868. By 1870, Zollner's Sydney Galvanizing Works was a significant enterprise and employed fifty-two men and boys and worked fifteen to eighteen tons of black sheet-iron a week into galvanized tubs, buckets, tanks, sheep troughs, guttering and ridging for the Sydney area.
- The technologies these industrialists developed and the goods produced in their workshops and mills supported the development of the economy of NSW during the nineteenth century.

c) an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW or the local area

- The potential archaeological resources in this part of Darling Harbour are not considered likely to demonstrate aesthetic characteristics. The items nominated as being within the subject site will demonstrate a degree of creative and technical achievement in NSW and for the local area, as historically in some cases they were the first. However, a high degree does not appear likely, simply because what will have been preserved on the site will refer to the foundations, yard surfaces, possibly broken machinery and artefacts which will doubtless also not be complete due to the processes of development that the site has been part of. However, subsurface features, such as drains and footings may demonstrate high levels of creative and technical achievement in their design and construction. It is clear that the phases of fill have protected areas of the site and therefore items that demonstrate the growth in technology for industry, such as early examples of boilers and the layout of a cooperage are anticipated. As such, the items located could be assessed as having **State** significance.

(d) an item has strong or special association with a particular community or cultural group in NSW or the local area for social, cultural or spiritual reasons

- The archaeological potential discussed in this Assessment consists mainly of below ground or ground level remains which may assist the local community in appreciation and commemoration of the former uses of the site. As such they have a **local** level of significance.
- The area of the SICEEP site and where it is situated at the head of Darling Harbour has significant historical links to the wider Sydney community. It relates to the historical and ongoing functions of Chinatown, to local industry and commercial enterprises, to food markets and all the associated workers and suppliers, to the working docks of Sydney, to the railway and goods network including the wool industry and through these historical connections also to history and industrial heritage groups and associations such as the Powerhouse Museum.
- Since the 1980s redevelopment, the area also has an association with locals and visitors as a place of public recreation and events. This particular aspect of its social association will be ongoing as part of the new redevelopment of the site.

(e) an item has potential to yield information that will contribute to an understanding of NSW's or the local areas cultural or natural history

- The SICEEP site has high potential to yield a range of information that will contribute to an understanding of both State and local cultural and natural history. This report in its entirety addresses this criterion, particularly Section 4, Archaeological Potential.

The following is a summary for local and State significance ranking:

- The area of the SICEEP site is expected to contain original shoreline. Sampling and analysis of the soils, and excavation in the area will contribute to our understanding of the original Long Cove area. *Local significance*
- The area of the SICEEP site contains a c.1813 constructed dam, later reinforced in the 1830s and then demolished in the 1860s. Dickson's dam was one of the first such constructed and confirmation of its depth and its construction will contribute to our understanding of the process. *State significance.*
- The area of the SICEEP site, as one of the first areas of 19th century industry in Sydney as well as for NSW is expected to contribute to our understanding of the technology, layouts, working conditions and living conditions of the time. The extent and the condition of the archaeology is uncertain due to the layers of development, however, the previous programmes of excavations in the area discovered a high degree of retention for ground level features as well as some above ground level structures. *State and Local significance.*

- The commercial history of the area overlaps with the industrial and residential uses from c.1830s onwards. The archaeological potential therefore is significant in shedding light on this aspect of the subject site. *Local significance.*
- The area of the SICEEP site as an area of 19th century housing forms part of the ongoing story of urban housing still present in many areas of Sydney. The 1880s terrace housing facing Harbour Street are of less importance, due to the fact that housing of this type is still standing in many part of inner city Sydney. The earlier housing, which may predate the 1865 Trigonometrical survey plan and may confirm the 'third class' 1850s housing is located within the footprint of the Sydney Entertainment Centre and to its southeast, and is expected to be largely impacted by the later 19th century industry in the area. However, as noted for the archaeology at Darling Walk, the land reclamation built up the landform, which may mean that foundations of earlier housing survive. The later housing is not regarded as significant. Housing earlier than 1880 is regarded as being of *Local Significance.*

(f) an item possesses uncommon, rare or endangered aspects of NSW's or the local areas cultural or natural history

- The archaeological potential of the SICEEP site is assessed as having both uncommon and rare aspects of State and local cultural history. These aspects generally relate to the early and mid 19th century industry and housing of the area. The industry relating to Darling Harbour and the subject site was historically one of the first such industrial precincts in Sydney. The area of John Dickson's Mill and its later reuse as Zollner's galvanizing works has previously been excavated and analysed in 1991 -1992 and it has been listed as a heritage item on the Sydney Harbour Foreshore Authority Heritage and Conservation Register. It is not recommended for excavation (or any impact) in this Assessment.
- There are a number of small scale industries documented for the area which relate to 19th century technologies and functions that no longer exist. As such these are uncommon and have a Local significance assessment.
- The earlier housing documented for the south and eastern parts of the area, and considered to be workers housing and likely to be of poor quality, is also considered to be rare. Nothing is documented for the types of houses on the subject site and their excavation and analysis is expected to be informative.
- The potential to locate original shoreline for the area of Darling Harbour is part of the natural history of the site and this aspect is considered to be rare.

(g) an item is important in demonstrating the principal characteristics of a class of NSW's or the local area's

- **cultural or natural places; or**
- **cultural or natural environments**
- The archaeology of the SICEEP site is important in demonstrating the principal characteristics of a class of NSW's or the local area's cultural places AND natural environments. As noted above, the area of the subject site has been assessed as containing archaeological resources pertaining to the original shoreline and early 19th century industry and housing. While the potential will have been impacted by the later known development, the area is still considered representative of these historical processes. A comparison is to be made between the findings of the archaeological programme of this site with that of the adjacent sites, particularly Darling Walk, 2008-2009, currently still in analysis. It is anticipated that the subject site will be representative of the 19th century resources located in that part of Darling Harbour.

5.3 Individual Statements of Significance

These are for SHFA S170 precincts within the study area and a Sydney Water S170 item.

5.3.1 SHFA S170 Register Items

▪ **Exhibition Centre Precinct – Archaeological Remains – Iron Wharf** **STATE**

(Directly east of the Exhibition Centre, Darling Harbour 2000)

The Iron Wharf was considered to be an engineering masterpiece at the time of its construction. Parts of the wharf still remain buried at the site and are significant archaeological remains. They have the potential to inform about early large scale iron construction. The Iron Wharf is significant as it was one of the first large scale iron constructions in the world. The construction of the wharf led to the development of Darling Harbour as the major goods centre in Sydney.

▪ **Chinese Garden of Friendship (includes buried remains)** **STATE**

(Day Street / Pier Street, Darling Harbour)

The Chinese Garden of Friendship celebrates the sister state relationship between the people of Guangdong province and the people of NSW. It was a gift for the celebrations of Australia's Bicentennial and maintains a cultural and visual link with Chinatown. As such it is an important cultural site for the Chinese community, whose association with the area extends until before the 1870s. It is also an important cultural and leisure site for the wider community and international visitors. The Chinese Garden has landmark qualities as an authentic Chinese Garden which was a co-operative effort between the Guangdong Province of the People's Republic of China and the New South Wales Government. Archaeological deposits from the former Freezing and Refrigeration works may be undisturbed under the garden. Historically this site is significant as the development of refrigeration and freezing occurred here. This had a profound effect on the eating habits and health of the city and the nation. Large quantities of frozen meat were shipped from the site to Britain, an important export industry. The site had an effect on the development of the pastoral industry, especially the dairy and meat industry. The Chinese Garden has been constructed over the site of the NSW Fresh Food and Ice Co, but as the disturbance to the ground is minimal there may be large archaeological deposits still extant. The site offers research potential into the invention and development of refrigeration and freezing technology in Australia.

▪ **Pier Street Precinct Archaeological Remains (s170)** **STATE**

(Bounded By Hay, Harbour, Pier Streets and Merino Boulevard (Darling Drive))

Little Pier Street precinct displays historical significance, firstly, due to being part of Dickson's Steam Mill Complex, which included Australia's first Steam Engine and marked the arrival of industrial technology. Little Pier Street Precinct also was the establishment of Australia's first salting works, which introduced innovative industrial and commercial enterprise. Aesthetically, the site contains sub-surface structural features such as; walls, floors and boiler foundations. Socially, Little Pier Street Precinct has become a place of high social value as an archaeological site, which contains physical evidence directly related to well-known events in Australia's history. The presence of actual relics has increased the interpretative potential of the site.¹⁸¹

According to the AHMS (2009) *CMP Hydraulic Pumping Station*, this precinct also includes the Hydraulic Pumping Station archaeology although it does not mention that archaeology from this site survives outside the footprint of the standing building. The CMP does not address the potential archaeological resources outside the footprint of the surviving building (see below) nor does the history for this S170 listing mention the pumping station archaeology. This heritage item is located

¹⁸¹ S170 register, State Heritage Inventory.

to the immediate north of The Haymarket study area. This precinct also includes Dickson's dam wall and the archaeology of covered by this report.

This heritage item is located to the immediate north of The Haymarket study area.

▪ **Cockle Bay Precinct, Archaeological Remains**

STATE/LOCAL

(East Side of Darling Harbour, West of Sussex Street, North of Pier Street, Darling Harbour, NSW)

Statement of Significance

The site is significant for the archaeological potential still extant, this is important for the information it may reveal about industrial and technological advances over almost a two hundred year period. This area was where beginnings of industry, the development of technologies and significant transportation facilities in Australia occurred. Some of these developments such as freezing and refrigeration had important implications both in Australia and internationally. Part of the area includes Chinatown and thus has cultural significance for the Chinese community whose association with the area extends to c.1870s. It is a large site with a diverse history stretching back to pre-European settlement. It includes Cockle Bay which was named for the large middens and thus may have indigenous archaeological significance.¹⁸²

▪ **Hydraulic Pumping Station**

STATE

This statement relates to the standing building but the identified level of significance is likely to relate to the sub-surface remains to the east.

Statement of Significance

Hydraulic Pumping Station No.1 played a pivotal role in the industrial, commercial and architectural development of Sydney. As the city's first and major public provider of hydraulic power, it has strong historical associations with many prominent buildings and firms. The elegant structure of the remaining building is one of the very few industrial landmarks remaining in this part of the city.

It is noted that this Statement of Significance is purely for the extant building which is listed on the SHR, not for the archaeological remains of the rest of the pumping station which extend to the east of the building. There has been some misunderstanding about the archaeological potential of this area. The core site is currently just outside the SICEEP study area but there may be subsurface tunnels etc associated with this site.

▪ **Darling Harbour Rail Corridor**

State?

(West side of Darling Harbour to Pyrmont, Darling Harbour)

Statement of Significance

The Darling Harbour goods line was part of the first railway opened in New South Wales in 1855, the current corridor corresponds with that purchased from the Harris family in 1853 for this purpose. It therefore has a high degree of significance as a place. The Ultimo Road Bridge is believed to be constructed in the 1850s, and is therefore one of the only remaining features of the original railway which joined Darling Harbour and Granville (Parramatta Junction) in 1855. The siting of the railway along what was the edge of Darling Harbour strongly influenced the development of Pyrmont and Ultimo. Because of it, wool stores, engineering works and other industries were built here after the 1870s, giving this part of Ultimo its industrial, rather than residential, flavour. The site also contains two railway bridges. The Railway Square road overbridge (outside the curtilage of this listing) built in 1855 is historically significant as the oldest railway bridge to be constructed and still in use in New South Wales. It is a strong

¹⁸² S170 register, State Heritage Inventory. This item was not identified in the Archaeological Assessment.

connection to the first railway construction and the original Redfern (Sydney) Station. The Ultimo railway underbridge is a mid 19th century construction with classic revival inspired cast iron columns and mid 19th century sandstock brick abutments. Both items are assessed individually as historically rare, scientifically rare, archaeologically rare and socially rare.

5.3.2 Dickson's Mill, Little Pier Street¹⁸³

The following Statement of Significance considerable predates the 2009 archaeological significance guidelines but still provides a valuable assessment of the significance of these remains:

Significant in the evolution and pattern of the history of New South Wales

The arrival of steam technology and the establishment of industry represents one of the most important events in the economic and historic development of New South Wales. The arrival and establishment of Dickson's steam engine was significant not only for the colony itself, but also significant on a world scale as an example of technical innovation and adaptation in a post industrial revolution colonial settlement.

The use of the site for what amounted to contemporary "high tech" industrial purposes was continued by the Sydney Salting Company and William Allen in the mid Nineteenth Century. The demise of the site as a saltworks evidences social change and city development as reflected in' statutory planning of the time.

The Zollner Galvanising Works are also of considerable historic importance, marking the advent of another new technology and process for its time, and being the first, and for a period the only, producer of a product that brought major change to Australian building design.

Originally located on the shores of Cockle Bay (Darling Harbour) at the southwestern extremity of Sydney Town, the study area quickly developed a mercantile and industrial character which was continued throughout the Nineteenth Century and for the greater part of the Twentieth Century.

The physical evidence at the site documents all of these major events to some degree. Some features, such as the chimney flues in Building 13 relate to specific events (The Sydney Salting Company use and departure) or occupation (Zollners Galvanising Works indicated by zinc slag). Others, including changing floor levels and artefact deposits show the general pattern of Sydney's economic and industrial growth during this period.

Significant in possessing or contributing to creative or technical accomplishment in New South Wales

The establishment of Australia's first steam engine, which occurred within the Dickson's Mill complex, was one of the most important technical achievements in the history of the State. The precinct retains strong associational links with the event, by virtue of the presence of steam boiler foundations, even though the current Little Pier Street Precinct may not contain fabric from the initial operation of the engine.

The structural features exposed by the archaeological excavation are substantial and surprisingly, (unlike most archaeological relics), present a "third dimension" - through their height. They have distinctive aesthetic qualities and attributes created by size, material and layout.

Significant through association with a community in New South Wales for social, cultural or spiritual reasons.

The high level of public interest shown in the Little Pier Street site during the excavation season provides clear evidence of substantial interest from the community at large.

In addition the site and the features exposed during the excavation have social value and public significance as one of relatively few places that could be known and revered as the site where an important event occurred. This public significance can be realised particularly in relation to

¹⁸³ Godden Mackay 1992:105-108

the current site, through interpretation, (even though the 1815 mill was nearby, rather than on this site). The established presence of physical evidence enhances the ability of the public to relate to the site and its history.

Significant for the potential to yield information contributing to an understanding of the history of New South Wales

The Little Pier Street site is an archaeological resource which has already contributed information relevant to a better understanding of Sydney's history, and particularly an understanding of the enterprises that operated there. The archaeological investigation has provided precise locational information unavailable from sometimes inaccurate early plans.

Specifically, archaeological investigation of the Dickson's Mill complex has revealed information on the nature of the first sequence of industrial buildings in the colony, the range of activities undertaken at the site, the equipment and materials available at different times, and working conditions. Similar information has been revealed about the Sydney Salting Company, William Bell Allen, the occupants of the Pier Street stores and other enterprises that used the site.

The artefact collection which should be regarded as an integral part of the fabric of the place has outstanding research potential and is an important resource for future studies of material culture.

Significant in possessing rare, endangered or uncommon aspects of the history of New South Wales

The Little Pier Street Precinct contains a range of building fabric and deposits covering a period from its first development in the 1830s. The extent of building activity undertaken within Sydney's Central Business District during the 1960s, 1970s and 1980s has removed any existing stratified historic deposits at many sites. Areas with potential for in situ preservation of relics from nineteenth-century Sydney, and particularly the first half of the century, represent a finite, rare and endangered resource.

Significant in demonstrating the characteristics of a class of cultural places or environments in New South Wales

The continuous occupation of the Little Pier Street site throughout the Nineteenth Century for a series of industrial purposes has left a range of evidence of changes and development in industrial technologies, and working conditions over time. The site could be argued to contain the most comprehensive physical record of nineteenth century industrial development in Australia. Abandonment of buildings and adjacent sites during the late Nineteenth Century and early Twentieth Century reflects general decay of districts contiguous to the city "core".

Significant for association with people, activities, phases or events in the evolution of New South Wales

The Little Pier Street Precinct, as the site of John Dickson's mill, has strong association with a major figure in Australian history - John Dickson - a true industrial pioneer and innovator, a man of outstanding vision who saw applications and opportunities for a new technology in the colonial situation. Dickson was also important because of his activities as merchant, major agriculturalist and pastoralist and foundation member of the Agricultural Society.

The site also has the association with a number of other significant industrial enterprises most particularly the Sydney Salting Company and Zollner's Galvanising Works.

Can the site contribute knowledge that no other resource can

The archaeological record provides evidence that is different from, and may supplement, documentary sources. The research already undertaken as part of this project (prior to, during and after excavation), included systematic examination of known sources. This research has revealed much about this site and about wider aspects of Sydney's history. However, the information available from the documentary record was not sufficient for comprehensive evaluation of the significance of the place, nor the management needs. Excavation and analysis of physical evidence have provided much new data, thereby confirming the archaeological potential of the place and its status as a resource with continuing scientific research potential.

Can the site contribute knowledge that no other site can?

In a site specific sense, the archaeological resources of the Little Pier Street Precinct, because of their ability to yield information about the Dickson, Zollner and other enterprises, have obvious potential to contribute information available from no other site.

At the more general level, the site is rare because it includes nineteenth-century industrial material Culture, unavailable from the majority of former industrial sites in Sydney and Darling Harbour, as a result of the destructive influence of late twentieth-century developments.

Is this knowledge relevant to general questions about human history and other substantive questions relating to Australian History, or does it contribute to other major research questions?

The site of Dickson's mill is important on a world scale representing the arrival of the industrial revolution on a continent. The advent of steam technology and the later establishment of saltworks, galvanising works, and other industries were also major events in Australian history, information about which is relevant to a general understanding of the country's economic and social development. Questions about nineteenth-century industrial and working conditions are also important in fleshing out Sydney's social history.

Summary Statement of Cultural Significance

The Little Pier Street Precinct has historic significance as part of Dickson's Steam Mill Complex, which included Australia's first steam engine and which marks the arrival of industrial technology in a post industrial revolution colonial settlement.

Through its association with Dickson's Mill, the Sydney Salting Company and the later Zollner Galvanising Works, the Little Pier Street Precinct has high social and public significance as an "historic site".

The Little Pier Street Precinct has considerable archaeological scientific research potential as it is known to contain a range of archaeological features which, through archaeological investigation, have the ability to yield information about the site itself and about Sydney's and Australia's history, which is unavailable from other sites or resources.

The Little Pier Street Precinct includes substantial sub-surface physical evidence including sandstone walls and boiler foundations which have distinct aesthetic qualities and potential to facilitate understanding of the scale and operations of the site, and which also provide a tangible link with the historic activities that happened there.

5.3.3 Sydney Water S170 item

▪ Hay Street Stormwater Channel No.30P1

LOCAL

Statement of Significance

The Hay Street Stormwater Channel system is highly significant as it was one of the first five original combined sewers constructed in Sydney around the 1860 period. The other four sewers were; Blackwattle Bay (SHI 4570535), Woolloomooloo (SHI 4570813), Tank Stream (SHI 4573709) and Bennelong (SHI 4570854). These five sewers were responsible for greatly improving public health by diverting stormwater and sewage off the streets and discharging it out into the Harbour. The five sewers are the first examples of sewerage and drainage services to be built in Sydney, and potentially Australia. The subsequent construction of the BOOS (Bondi Ocean Outfall Sewer) in 1889 and the connection of the Hay Street system in 1901 diverted sewer flow from the Harbour and into the ocean. Eventually the drain was used predominantly for stormwater, this further improved public health, hygiene and living standards for the city's residents. The channel is of technological significance as it provides an excellent example of the engineering and construction techniques of the late 1800's and of the city's early infrastructure. The numerous extensions and modifications made throughout the years provide and an archaeological record of the advancements made in drainage construction techniques. The

operational curtilage for Hay Street SWC includes all original fabric and archaeological evidence including, but not limited to the channel bed, walls and coping. There is no visual curtilage associated with this structure as it is located predominantly underground. To formulate a specific curtilage statement that includes details of surrounding landuse and encroachment of various developments would require further investigations and is beyond the scope of this study.

Curtilage

The curtilage includes all original fabric and archaeological evidence including, but not limited to, all land within Sydney Water's boundaries, the channel bed, walls and coping, as shown on the curtilage plan. There is no visual curtilage associated with this structure as it is located predominantly underground. To formulate a specific curtilage statement that includes details of surrounding landuse and encroachment of various developments would require further investigations and is beyond the scope of this study.

5.4 Basis of Assessment of Heritage Significance

To identify the heritage significance of an archaeological site it is necessary to discuss and assess the significance of the study area. This process allowed for the analysis of the site's manifold values. These criteria are part of the system of assessment which is centred on the *Burra Charter* of Australia ICOMOS. The Burra Charter principles are important to the assessment, conservation and management of sites and relics. The assessment of heritage significance is enshrined through legislation in the NSW *Heritage Act* 1977 and implemented through the *NSW Heritage Manual* and the *Archaeological Assessment Guidelines* and *Assessing significance for historical archaeological sites*.¹⁸⁴

The nature of heritage values and the degree of this value will be appraised according to the following criteria:¹⁸⁵

5.4.1 Nature of Significance Criteria:

Criterion (a): Historic Significance - (evolution)

Criterion (a): *Historic Significance - (evolution)*

an item is important in the course, or pattern, of NSW's cultural or natural history (or the cultural or natural history of the local area);

Criterion (b): *Associative Significance – (association)*

an item has strong or special association with the life or works of a person, or group of persons, or importance in NSW's cultural or natural history (or the cultural or natural history of the local area);

Criterion (c): *Aesthetic Significance - (scenic qualities / creative accomplishments)*

an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW (or the cultural or natural history of the local area);

Criterion (d): *Social Significance - (contemporary community esteem)*

¹⁸⁴ NSW Heritage Office 1996:25-27; 'Assessing Heritage Significance', a NSW Heritage Manual update from the Heritage Office website (July 2001); Heritage Branch 2009 *Assessing Significance for Historical Archaeological Sites and Relics*.

¹⁸⁵ NSW Heritage Office 2001, NSW Heritage Office 2009.

an item has a strong or special association with a particular community or cultural group in NSW for social, cultural or spiritual reasons (or the cultural or natural history of the local area);

Criterion (e): *Technical/Research Significance - (archaeological, educational, research potential and scientific values)*

an item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history (or the cultural or natural history of the local area);

Criterion (f): *Rarity*

an item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history (or the cultural or natural history of the local area);

Criterion (g): *Representativeness*

an item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places of cultural or natural environments (or the cultural or natural history of the local area).

To be assessed as having heritage significance an item must:

- meet at least one of the one of the seven significance criteria
- retain the integrity of its key attributes

If an item is to be considered to be of State significance it should meet more than one criterion, namely in the case of relics, its research potential.¹⁸⁶ Archaeological Significance:

may be linked to other significance categories especially where sites were created as a result of a specific historic event or decision, or when sites have been the actual location of particular incidents, events or occupancies.

Other relevant factors may be comparative values related to the intactness and rarity of individual items. The rarity of individual site types is an important factor, which should inform management decisions.

Relics must also be ranked according to their heritage significance as having:

- Local Significance
- State Significance

If a potential relic is not considered to reach the local or State significance threshold then it is not a relic under the NSW Heritage Act.

'State heritage significance', in relation to a place, building, work, relic, moveable object or precinct, means significance to the State in relation to the historical, scientific, cultural, social, archaeological, architectural, natural or aesthetic value of the item.

'local heritage significance', in relation to a place, building, work, relic, moveable object or precinct, means significance to an area in relation to the historical, scientific, cultural, social, archaeological, architectural, natural or aesthetic value of the item.¹⁸⁷

¹⁸⁶ Heritage Branch, *Assessing Significance for Historical Archaeological Sites and Relics* 2009:9

¹⁸⁷ This section is an extract based on the Heritage Office *Assessing Significance for Historical Archaeological Sites and Relics* 2009: 6.

5.4.2 Research Potential

*Research potential is the most relevant criterion for assessing archaeological sites. However, assessing research potential for archaeological sites can be difficult as the nature or extent of features is sometimes unknown, therefore judgements must be formed on the basis of expected or potential attributes. One benefit of a detailed archaeological assessment is that the element of judgement can be made more rigorous by historical or other research.*¹⁸⁸

Assessment of Research Potential

Once the archaeological potential of a site has been determined, research themes and likely research questions identified, as addressed through archaeological investigation and analysis, the following inclusion guidelines should be applied:

Does the site:

- (a) contribute knowledge which no other resource can?*
- (b) contribute knowledge which no other site can?*
- (c) is the knowledge relevant to general questions about human history or other substantive problems relating to Australian History, or does it contribute to other major research questions?*¹⁸⁹

If the answer to these questions is yes then the site will have archaeological research potential. The new significance guidelines have taken a broader approach.

5.4.3 Level of Heritage Significance

New criteria were developed in 2009 to identify whether the archaeological resource is of Local or State significance.¹⁹⁰ The following four criteria were identified in the 2009 guidelines and are considered to be relevant to The Haymarket study area:

- *Archaeological Research Potential (current NSW Heritage Criterion E).*
- *Associations with individuals, events or groups of historical importance (NSW Heritage Criteria A, B & D).*
- *Aesthetic or technical significance (NSW Heritage Criterion C).*
- *Ability to demonstrate the past through archaeological remains (NSW Heritage Criteria A, C, F & G).*

The new significance guidelines were designed to assess significance in light of the amendments to the definition of relics needing to be of either local or State significance. The examples provided were fairly obvious ones but do not help us work out how a less obvious site has State rather than local significance. This means that it is basically down to the skill and expertise of the archaeologist assessing the site.

5.5 Discussion of Heritage Significance

This discussion of heritage significance specifically relates to the potential archaeological remains within The Haymarket section of the SICEEP. It is noted that this discussion of significance is not seeking to replace the Statement of Significance written for the Godden Mackay 1992 report on the Dickson's Mills site, which we consider quite adequate for its purposes, considering it precedes the

¹⁸⁸ NSW Heritage Office 1996: 26.

¹⁸⁹ Bickford, A. & S. Sullivan 1984: 23.

¹⁹⁰ Heritage Branch, Dept of Planning 2009.

2009 guidelines by eight years. This statement has been drawn on to understand the significance of the dam wall as part of the original mill.

However, the following discussion and Statement of Significance does replace the City Plan 2013 discussion and statement (Section 5.2). This is due to the additional extensive historical research undertaken for this report which includes many more historic maps, the analysis of the development of housing and business within the study area, as well as the analysis of Land Titles, council rate assessments and *Sands Directories* which allow us to understand in more detail the patterns of residential and commercial development (Appendices 4 to 8), as well as the discussion of archaeological potential (Section 3), extensive context analysis and identification of research questions the research design would address (Section 4). Section 4 also includes detailed understanding of many nearby archaeological sites, including ones Casey & Lowe have excavated along the eastern foreshore of Darling Harbour. All these sites are directly comparable in terms of archaeological resources, historic development and archaeological potential and understanding significance. As well, this report addresses the indicative impacts of The Haymarket Concept Proposal in Section 6. Therefore, this Archaeological Assessment supersedes the CityPlan Non-Indigenous Archaeological and Impact Assessment for the SICEEP Concept Proposal and subsequent DAs. We note we agree with them about the State significance of Dickson's 1830s mill site and Dickson's c1815 dam wall. The CityPlan report has mistakenly identified the Hay Street stormwater as having State significance. The Sydney Water S170 item identifies it as having local significance.

Criterion (a): Historic Significance - (evolution)

an item is important in the course, or pattern, of NSW's cultural or natural history (or the cultural or natural history of the local area);

The Haymarket study area illustrates many aspects of the evolution of Darling Harbour's history and archaeology from the 1813 into the early 20th century. The Haymarket site has archaeological potential to demonstrate the development and expansion of Darling Harbour throughout the 19th century, as it became a centre for industry, maritime and railway trade as well as early residential occupation. Much of the housing persisted into the 20th century but some was demolished for manufactories. The historical developments and the associated potential archaeological remains within The Haymarket area include:

- The edge of the western foreshore.
- Dickson's c1815 built his steam mill and dam wall, which created a mill pond for fresh water to operate the first steam mill introduced into Australia and the beginnings of steam power and industrialisation in Australia. The mill became important in successfully grinding grain for flour. It quickly proceeded to replace the frequent failures of the early windmills which ran along the ridge lines of Millers Point and the Government Domain. This technology was the first step in the transformation of the eastern foreshore of Darling Harbour which made it the key industrial and maritime centre for the NSW economy during the mid and later 19th century. In this place were the beginnings of the transformation of pre-industrial colony of NSW, where labour was centred on access to convicts who were not always appropriately skilled, to one where private capital made and sold goods to supply the colony and provided impetus for further private investment and development. Once the mill pond was no longer required, steam mills were now able to operate on salt water, the land to the east of the dam wall was reclaimed and the wall started to act as a seawall until buried c1865 under the line of Little Darling Street.
- Partial remains of Dickson's 1830s mill, Little Pier Street, later occupied by a saltworks and Zollner's galvanizing work. Dickson's mill buildings were modified and enlarged as it proved successful and required more steam engines to produce the required goods, the most important of which was the grinding of flour for bread.
- 1850s Darling Harbour goods line.

- 1855-1857 reclamation of Dickson's mill pond and subdivision as the head of Darling Harbour silted up and became unnavigable.
- c1865 drains and reclamation.
- Remains of 15 houses and a pub built and occupied prior to 1865.
- Development of early manufactories and industries in the between 1865 and 1880:
 - Biddell Bros Confectionery
 - Phoenix Foundry
 - Blacksmith
 - Cormack cooperage, at three locations.
- Further subdivision and construction of new housing between 1865 and 1880, the yards and cesspits of 19 houses along Harbour Street and 17 houses on other streets.
- Later Rowland's water works, by late 1880s.
- No 1 Hydraulic power pumping station in 1891 which provided power to hydraulic lifts throughout the city. This reaffirms the significance of this part of Darling Harbour to the place which saw the first introduction of both steam and hydraulic power, within 200m of each other. Immediately outside the western study area is the Ultimo Power House which was highly significant.
- Range of storage and warehouse buildings used in association with the Darling Harbour goods line, providing temporary warehousing.
- From the 1880s into the 20th century, Chinese people, typically associated with market occupations and stores, began to move into houses between Harbour and Lackey Street. By 1911 there were eight Chinese tenants listed by the rates in the 23 houses on Harbour Street which grew to 10 of the 13 remaining houses in 1918. By 1914 four Chinese tenants moved into Little Hay Street, and by 1918 nine houses were occupied by Chinese residents. By 1921 Chinese people had been allowed to own land in NSW and a number had acquired property with houses and stores. Business operating included War Hing & Co, Wing Sang & Co. By 1933 new Chinese businesses included Chew Lee Co. Ltd and Hop Lek & Co.

Criterion (b): Associative Significance – (association)

an item has strong or special association with the life or works of a person, or group of persons, or importance in NSW's cultural or natural history (or the cultural or natural history of the local area);

The potential archaeological remains within the study area are associated with a number of significant persons and industrial manufactories: John Dickson's mill and dam wall, his association with the establishment of the first steam mill in Australia and the construction of the dam wall for his mill pond. Also Dickson's mill was established with the assistance of Governor Macquarie who granted the land to Dickson and presumably access to convict labour to build the wall but historical evidence on this is unclear. Other associations are with Cormack who operated his cooperage across at least three properties and also owned houses within the study area; the long-term occupation by Biddell Bros and Rowlands water works, Zollner's galvanizing works and the William Allen's saltworks. While Surgeon John Harris had owned the eastern foreshore as part of the Ultimo Estate he undertook no redevelopment of this swampy land. The establishment of the easement for the Darling Harbour Goods Line cut through this land which was then subject to complex subdivisions by his heirs. While part of his estate, there is no strong association with the potential archaeological resource within the study area.

Criterion (c): Aesthetic Significance - (scenic qualities / creative accomplishments)

an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW (or the cultural or natural history of the local area);

The technical significance of the potential dam wall is uncertain but it is considered to be the first such engineering works of this kind in Australia. That it was established in c1815 and continued to

perform until c1865, approximately 50 years, is testimony to the successful design and construction of the wall.

According to the Godden Mackay statement about the significance of Dickson's mill:

The establishment of Australia's first steam engine, which occurred within the Dickson's Mill complex, was one of the most important technical achievements in the history of the State. The precinct retains strong associational links with the event, by virtue of the presence of steam boiler foundations, even though the current Little Pier Street Precinct may not contain fabric from the initial operation of the engine.

The structural features exposed by the archaeological excavation are substantial and surprisingly, (unlike most archaeological relics), present a "third dimension" - through their height. They have distinctive aesthetic qualities and attributes created by size, material and layout.

Criterion (d): *Social Significance - (contemporary community esteem)*

an item has a strong or special association with a particular community or cultural group in NSW for social, cultural or spiritual reasons (or the cultural or natural history of the local area);

While no community consultation has been undertaken for the study area's potential archaeology, the maritime and industrial archaeology and heritage of NSW have strong community interest and support. These places not only represent the success of the entrepreneurs and owners but also the many workers whose skills and labour supported the achievements of these industrial places. The industrial heritage of Darling Harbour occupies a special position in the industrial heritage of NSW as it was the place where so many 'firsts' happened. The current study area is important in its own right as well as representative of the first steam engine, the first engineering of a dam wall, the first hydraulic pumping station. All are representative of the industry of Darling Harbour, the remnants of which disappeared 20 years ago when they were demolished for the Darling Harbour Redevelopment. The Open Day for the Barker's Mill held during the Cross City Tunnel works in 2003 saw 300 people visit the site with relatively limited publicity. The public interest when archaeological work was undertaken at Dickson's Mill in 1991 was quite strong. Today this area is located immediately adjacent to Sydney's China town, the centre of which is Dixon Street, named after John Dickson. It is likely that Chinese people and others will be interested in the archaeology of the Chinese residents. There has been a considerable growth in Chinese-Australian history in the last decade and Mary Casey has presented conference papers on Chinese archaeology. One conference was to celebrate 100 years since the birth of Qwong Tart. The other was a general conference held by the Chinese Australian Historical Society. There is a keen and growing interest in this area of research by the descendants of the early Chinese arrivals in Australia.

Criterion (e): *Technical/Research Significance - (archaeological, educational, research potential and scientific values)*

an item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history (or the cultural or natural history of the local area);

The study area contains a potential layering of industrial, engineering, manufactories, commercial and residential sites within an intensively modified industrial/urban landscape which was used from c1815 as part of Dickson's Mill and millpond. Development of the area began in the mid 19th century into the 1930s. The eastern edge of the study area was quickly occupied and used while other portions were swampy land on the western edge of the foreshore. As most of the study area was within the harbour, there was little use of the majority of the area until it was reclaimed in two stages in 1855-57 and c1865. The focus of the 1860s-1880s occupation was to the east of Lackey Street and this is the main location for the potential archaeological resource, except for a few sites to the west of Lackey Street (Figure 5.1). Analysis of construction, occupation, demolition and

rebuilding of the houses erected between 1850s and 1910s indicates that there was a cycle of demolition of residential housing, to be replaced by commercial buildings, such as the demolition of houses for the Rowlands water works and Sydney Hydraulic Power Company building on Burns Street. Developments included the replacement of the Wadsworth stone cutting yard by the council weights and measures building in the 1920s and the expansion of the Cormack cooperage, later the Centennial Cooperage, onto a range of properties, mostly vacant land or yards. Some houses on Harbour Street were replaced by stores buildings. Another change saw the movement of Chinese residents into the area from the 1880s into the 1930s where they had a strong involvement in market-related activities, stores and warehouses. In 1937 the buildings east of Lackey Street, south of Little Pier Street and north of Hay Street were demolished for the new market building. Many of these activities have the potential to leave layers of information about the past.

It is noted that warehouses and store buildings probably have limited archaeological potential, mostly footings and concrete slabs. Due to their later date most of them would have disposed of their rubbish using municipal rubbish collection. They have little research potential.

The archaeological recording, analysis and interpretation of the potential archaeological remains within the study area has the ability to yield substantial information on a range of industrial and commercial activities which were essential to the development of NSW from c1815 into the early 20th century. The recording of the dam wall will significantly add to our understanding of the construction of this major engineering works. In addition there is likely to be extensive remains of former housing and the archaeological evidence of their occupation. Aside from the c1815 dam wall these potential archaeological remains may include: footings of houses and outbuilding, demolition deposits, artefact-bearing deposits, underfloor and cesspit deposits, and rubbish pits, many of which can contain 100s of artefacts.

This type of technological and chronological layering is not typical of Sydney sites beyond Darling Harbour which often have one or two phases of occupation. It is more common in Parramatta to have more than two phases but the profile of these types of sites is substantially different. This layering of a number of phases has been found on other sites along the Darling Harbour foreshore where the process of reclamation has built up the landform, such as Darling Walk, KENS site, Towns Place and Barangaroo South. These types of sites have considerable wharfage and stores which have not been found at most of these other sites (except Towns Place), but Barangaroo South had much less industrial archaeology than found at Darling Quarter (Walk) which included parts of Barker's Mill, small foundries, the boiler room of the PN Russell carriage works, elements of the PN Russell foundry, as well as associated workers' housing.

The potential archaeological remains within The Haymarket as identified in Criterion (a) have the ability to address a range of substantive research themes, outlined in detail in Section 4.4:

- Analysis of the archaeology of residential housing and material culture through comparative analysis of households and neighbourhoods. Themes that could be explored include consumption and standards of living, lives of women and children and the nature of housing on the two estates.
- Archaeological research into Chinese residents and businesses, exploring material culture, foodways and ethnicity.
- Industrial archaeology
- Interpretation of the archaeological landscape and landform modification
- Other research questions as they arise.

These archaeological remains are considered to have a moderate to high level of potential survival within The Haymarket area. The *in situ* survival and archaeological recording of these remains has

the ability to yield information that will contribute to an understanding of NSW's cultural and natural history.

One of the surprising elements of the excavation of this type of site is how we respond to the recovery and exposure of large-scale archaeological landscapes, with their seawalls, edges of reclamation fill, buried slips and jetty piles. These present a complex and surprising response to those visiting such a site which is much more than archaeological research potential. The materiality of such a buried landscape is hard to express or even interpret.

Criterion (f): *Rarity*

an item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history (or the cultural or natural history of the local area);

The potential survival of the c1815 dam wall is within the category of uncommon or rare aspects of NSW cultural heritage. Its likely engineering and construction represents evidence of early private enterprise being assisted by the Macquarie administration and presumably by convict labour. While there are a number of Governor Macquarie-related standing buildings, and a number of archaeological sites, and many convict-period remains, the dam is a very rare example of early private investment and its survival into the 21st century is highly unusual. The known remains of the 1830s part of Dickson's mill building is part of the enterprise of Australia's first steam mill and its later operations. It is seen as a rare surviving example of steam milling.

The remains of the mid to late 19th-century housing is not uncommon on urban archaeological sites in Sydney and inner suburbs. Many similar sites have been excavated, as outlined in Section 4. This type of archaeological remains is not considered to be rare. It is possible that the evidence associated with the Chinese housing is rare but these quite late occupations have not always left strong evidence of occupation because of various factors such as municipal rubbish disposal. The creation of deposits associated with Chinese residents is possibly inconsistent across the site.

Evidence of 19th-century Darling Harbour industrial and manufacturing complexes is relatively rare in the context of NSW but also in the context of surviving archaeological resource within Darling Harbour. This area was excluded from the Zoning Plan for the City of Sydney and Pyrmont and Ultimo because it was managed by the Darling Harbour Authority when these plans were produced. Therefore there is no means of having certainty about the potential archaeological resource within the extended area. It is noted that Darling Walk and Barangaroo South have large basements and substantial parts of these sites were subject to bulk excavation and removal of these remains.

There is the potential for areas of substantial reclamation beneath the 1980s Darling Harbour redevelopment. Pre-1850s reclamation has been found at Darling Walk, KENS Site and Paddys Market Site and Barangaroo South. It is likely that other areas of substantial reclamation survive beneath the Sydney Entertainment Centre and Carpark, notably the 1850s and 1860s reclamation. Reclamation fill has limited research potential and is not considered to be rare.

Criterion (g): *Representativeness*

an item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places of cultural or natural environments (or the cultural or natural history of the local area).

The issue of representativeness is contentious in historical archaeology. While sites can be seen to be representative of sites belonging to the working, middle or upper classes or convict or freed persons they are always different within that class or group and each site furthers and extends our knowledge of these types of sites and the differences between them. Therefore while the potential archaeological remains within the study area are seen to be representative of a type of social group

or activity they will each be different, telling their own story, one with different nuances and meaning.

Aspects of the archaeological resource within the study area will be representative of a range of archaeological sites to be found elsewhere in Sydney, industrial, commercial and residential. This present site is quite rare in its mixture of industrial and residential occupation from the mid to late 19th century. The archaeological remains of late 19th-century houses, industrial and commercial manufactories were all erected above the 1850s and 1860s reclamation, mostly to the east of Lackey Street. They will generally be representative of other contemporary housing but with a number of differences.

The reclamation deposits themselves are typically sterile material from the excavation of railway tunnels etc. In some areas it may include municipal rubbish collection but most of it is likely to be sterile. Extensive strategies and understanding of reclamation has already been identified and recorded in detail at Barangaroo South and Darling Quarter. Therefore any further reclamation will have a limited ability to add new information. Some sample recording should be sufficient to extend our understanding of the reclamation processes and approaches within Darling Harbour.

5.5.1 Levels of Significance

The Heritage Branch's 2009 significance guidelines identified a series of questions that could address this level of significance for archaeological sites and relics. Many of these have been addressed within the discussion of significance but are further discussed below:

5.5.1.1 Archaeological Research Potential (Criterion E)

- **To which contexts (historical, archaeological and research-based) is it anticipated that the site will yield important information?**

The study area is considered to have a moderate to high ability to yield archaeological information. This can also be relevant to historical, archaeological and research-based contexts.

- **Is the site likely to contain the mixed remains of several occupations and eras, or is it expected that the site has the remains of a single occupation or a short time-period?**

As has been demonstrated, the study area should contain archaeological evidence from a number of distinct phases of occupation dating from the early 19th to the mid 20th century. First came Dickson's c1815 dam wall and the 1830s mill building which was partially erected on reclaimed land, followed by the reclamation in 1850s of the mill pond and the development of housing and some early manufactories. The second stage of reclamation saw the expansion of housing into the west of Little Darling Street. By 1900 some houses had been replaced by other commercial enterprises. Most were demolished by 1937 for the council market building.

- **Is the site rare or representative in terms of the extent, nature, integrity and preservation of the deposits (if known)?**

Potential and known archaeological remains within the study area are considered to be rare. These are:

- Dickson's c1815 dam wall associated with the operation of Australia's first steam mill used to grind flour.
- Known remains of Dickson's 1830s mill buildings, also associated with Zollner's galvanizing works and an early saltworks.

The integrity of the remains of the dam wall is uncertain but it is likely that substantial portions of it survive across the site. The remains of Dickson's 1830s mill building is known from testing to have quite substantial remains, with deep footings.

Archaeological remains identified on (Figure 5.1) as being of local significance and outlined above in Criterion (a) are considered to be representative.

▪ **Are there a large number of similar sites?**

It is considered that the dam wall is the only known surviving dam wall from this period in Australia's history but such research has not been undertaken. As discussed in the rarity and representativeness sections there are a number of sites containing similar archaeological remains as within Darling Harbour but these are a diminishing resource.

▪ **Is this type of site already well-documented in the historical record?**

The detailed historical research in Chapter 2 indicates that there is considerable historical information regarding the study area. Some of the historical resources were investigated for the first time during research for this project and it does illustrate that the historical development of the study area has not necessarily been well researched previously. We consider that there is considerable opportunity for further research.

▪ **Has this site type already been previously investigated with results available?**

Aspects of this type of site have previously been investigated on sites in Darling Harbour, notably Paddy's Market, Darling Quarter (Walk) and Barangaroo South. The Little Pier Street project investigated elements of the Dickson's 1830s mill site.

▪ **Is the excavation of this site likely to enhance or duplicate the data set?**

The archaeological recording and excavation of this site would provide considerable new information. In some areas, such as reclamation, it may provide duplicate sets of data which would need to be appropriately sampled to provide an overview of the reclamation but not necessarily detailed recording of all stages of reclamation. It is acknowledged that many mid to late 19th-century houses have been excavated in Sydney but if we obtained archaeological deposits associated with the Chinese residents' occupation this would provide quite a different data set.

5.5.1.2 Associations with individuals, events or groups of historical importance (Criteria A, B & D)

▪ **Does the archaeological site link to any NSW Historic Themes? Will the site contain 'relics' and remains which may illustrate a significant pattern in State or local history?**

Yes, the key historic themes relating to the study area are listed below:

Australian Theme	NSW Theme	Notes	Examples
3 Developing local, regional and national economies	Commerce	Activities relating to buying, selling and exchanging goods and services	market place, consumer wares, trade routes, etc
3 Developing local, regional and national economies	Environment – cultural landscape	Activities associated with the interactions between humans, human societies and the shaping of their physical surroundings	A landscape type
3 Developing local, regional and national economies	Industry	Activities associated with the manufacture, production and distribution of goods	Industrial machinery, foundry, railway or wharves

3 Developing local, regional and national economies	Technology	Activities and processes associated with the knowledge or use of mechanical arts and applied sciences	Technology associated with power supply
3 Developing local, regional and national economies	Transport	Activities associated with the moving of people and goods from one place to another, and systems for the provision of such movements	Wharf
4 Building settlements, towns and cities	▪ Towns, suburbs and villages ▪ Land tenure ▪ Utilities	Activities associated with creating, planning and managing urban functions, landscapes and lifestyles in towns, suburbs and villages; provision of services.	Railway, housing, reclamation, water & drainage, subdivision, abandoned wharf, seawall, power house

▪ **Is the site widely recognised?**

Yes, Darling Harbour is recognised by specialist communities and more generally with the public as a place containing industrial and maritime heritage of the past.

▪ **Does the site have symbolic value?**

Possibly, but not explicitly.

▪ **Is there a community of interest (past or present) which identifies with, and values the specific site?**

Yes, there is a community of interest in terms of heritage groups, such as heritage engineers etc who value the remnants of our industrial past as well as members of the public who are also interested.

▪ **Is the site likely to provide material expression of a particular event or cultural identity?**

It is unlikely the study area will provide material expression of a particular event or cultural identity.

▪ **Is the site associated with an important person? (the role of the person in State or local history must be demonstrated/known)**

The study area in general is associated with a number of important persons. Key elements of the archaeology within the study area is associated John Dickson who established Australia's first steam mill and built the mill pond by constructing the dam wall.

▪ **What is the strength of association between the person and the site?**

High level of association.

▪ **Did the person live or work at the site? During the phase of their career for which they are most recognised? Is that likely to be evident in the archaeology /physical evidence of the site?**

The potential remains of the c1815 dam was associated with the very beginnings of Dickson's milling career in Australia. The dam wall and millpond are presumed to have continued to have provided water to the adjacent steam mill into the 1830s and possibly later.

▪ **Did a significant event or discovery take place at the site? Is that evident/or likely to be evident in the archaeology/physical evidence of the site?**

No significant events or discoveries have taken place within the study area.

5.5.1.3 Aesthetic or technical significance (NSW Criterion C):

- **Does the site/is the site likely to have aesthetic value?**

Yes, the creative significance of Dicksons's c1815 dam wall and the remains of the 1830s mill are likely to retain aesthetic values. All archaeological sites can have incidental aesthetic values, notably in relation to the process of ruination but this cannot be determined until a site is excavated. We consider this to be an incidental part of any site, meaning there is no intentionality involved in such an aesthetic outcome.

- **Does the site/is the site likely to embody distinctive characteristic?**

Not certain.

- **Does the site/is the site likely to embody a distinctive architectural or engineering style or pattern/layout?**

Possibly in the case of the c1815 dam wall.

- **Does the site demonstrate a technology which is the first or last of its kind?**

Yes, as in the case of the c1815 dam wall and its association with Dickson's mill.

- **Does the site demonstrate a range of, or change in, technology?**

This site has layers of information and therefore has a range of remains from different phases and stages of the development of this part of Darling Harbour. Generally it will demonstrate a range of technology.

5.5.1.4 Ability to demonstrate the past through archaeological remains (NSW Heritage Criteria A, C, F & G).

- **Does the site contain well-preserved or rare examples of technologies or occupations which are typical of particular historic periods or eras of particular significance?**

The Haymarket may contain 'well-preserved' c1815 dam wall and Dickson's 1830s mill buildings. Other examples of manufacturing within the study area may also be well preserved within the study area. This cannot be determined without testing.

- **Was it a long-term or short-term use?**

Long-term use of a range of elements which may survive at the site.

- **Does the site demonstrate a short period of occupation and therefore represents only a limited phase of the operations of a site or technology or site? Or does the site reflect occupation over a long period?**

The study area represents a series of both long-term and short-term activities and occupations.

- **Does the site demonstrate continuity or change?**

The study area is expected to demonstrate a mixture of continuity and change.

- **Are the remains at the site highly intact, legible and readily able to be interpreted?**

A moderate to high level of archaeological potential is predicted but there will be areas where there will be more extensive impacts but these are unknown. It is likely that something like 70 to 80 per cent of the identified significant archaeology will survive within the site. It is therefore likely that much of the archaeology within the study area will be intact and legible and readily able to be interpreted. The potential remains that are likely to be relatively intact are:

- c1815 dam wall
- Dickson's 1830s mill and other associated uses, such as Zollner's galvanizing works.
- Range of 1850s to 1880s housing and manufactories.

Many of these elements would be highly interpretable.

5.6 Statement of Heritage Significance

The Haymarket study area has the ability to contain potential archaeological remains which demonstrate the development, reclamation and expansion of Darling Harbour throughout the 19th century, when it was a centre for steam industry manufacturing at the intersection of maritime and railway trade in NSW. Remains from the study area have the ability to represent the changing nature of Darling Harbour's occupation and activities throughout the 19th century. Among the important potential buried remains within The Haymarket area are:

- Edge of western foreshore.
- Dickson's c1815 dam wall and 1830s mill.
- 1855-1857 reclamation of Dickson's mill pond and subdivision as the head of Darling Harbour silted up and became unnavigable.
- Remains of 15 houses and a pub built and occupied prior to 1865.
- Development of early manufactories and industries in the between 1865 and 1880:
 - Biddell Bros Confectionery
 - Phoenix Foundry
 - Blacksmith
 - Cormack cooperage, at three locations
- Further subdivision and construction of new housing between 1865 and 1880, the yards and cesspits of 19 houses along Harbour Street and 17 houses on other streets.
- Occupation of houses and shops by Chinese people from the 1880s into the 1920s. This would have been a residential part of China town prior to its demolition in the 1930s.

These potential remains are associated with significant persons such as John Dickson who introduced the first steam mill to Australia and built the c1815 dam to create a millpond to collect fresh water. Darling Harbour was a focal hub for maritime and railway infrastructure and trade since the 1810s and the layers of industrial and maritime remains across the study area represent this social and economic significance. These layers of significance are valued by various members of the community. These layers of archaeological remains have the ability to yield new information about this industrial and residential past, and possibly that of the development of Sydney's China town. Some of the remains are considered to be rare, as they are early examples of their kind, while other elements are considered to be representative of other remains which may survive in other buried and reclaimed landscape.

Archaeological remains considered to be of State significance.

- Dickson's c1815 dam wall
- Dickson's 1830 mill buildings

Archaeological remains considered to be of local significance:

- Residential housing throughout the eastern half of the study area: remains of 27 houses and yards established prior to 1880, including later Chinese residents; also includes 15 houses and Australian Inn hotel built by 1865, and the rear yards and cesspits of 19 houses which are beneath Harbour Street.
- 1870s/1880s manufactories
 - Cormack cooperage, later Centennial Cooperage

- Biddell Bros confectionery factory
 - Rowlands Aerated and Mineral Water works
- Four pub sites.
- Some small shops operated where the tenant lived as well as worked, including Chinese shops and store keepers and warehouses.
- Workshop associated with the Sydney Hydraulic Pumping Station.
- 1850 and 1860s reclamation of the millpond and Darling Harbour.
- Possible remains of 1860s ditch running near the alignment of Lackey Street and illustrated on the 1865 plan.

Archaeological remains which may cross the local significance threshold if they contained artefact deposits:

- Chinese store on the corner northwest corner of Hay and Lackey Street.

Archaeological remains which are considered not to reach the local significance threshold:

- Majority of the study area to the west of Lackey Street, except for the Cormack Cooperage and one of the Chinese stores.
- The western strip of buildings is quite damaged by the 1980s culverts and is considered to have no research potential.
- The stores and warehouses between Lackey Street and Hay Street West are also considered to have no research potential.

6.0 Impacts of the Proposed Design

6.1 Description of the Proposed Works and Possible Impacts

6.1.1 Concept Proposal Design Impacts

This analysis addresses The Haymarket concept proposal which proposes the redevelopment of the Sydney Entertainment Centre (SEC) and SEC carpark, in the area to the south of Pier Street, north of Hay Street, west of Harbour Street and east of the light rail line. The proposed design involves demolition of buildings and ground slabs, capping beams, in-ground services and the like, but generally the retention of existing piles. The new buildings will generally be constructed on new piled foundations. The current RL of the slab for the Entertainment Centre is RL 3.4m. Archaeological remains are expected from RL 2.3m and below. It is likely that pile caps, services and the like will be excavated beneath RL 2.4m.

It is noted that as this report is being written at the concept design stage, detailed design plans are not available. Therefore this report can only deal with the general impacts rather than specific impacts. Once detailed designs are available they will need to be addressed in an Archaeological Research Design and Management Strategy report which will provide detailed archaeological strategies for management of expected impacts. Specific archaeological recommendations need to deal with specific impacts. This section of the report addresses the general issues and the mitigation section provides guidance on how to manage and avoid or limit impacts from the detailed design. General impacts are outlined in Table 6.1. The potential archaeological issues associated with the proposed scope of works are discussed below.

Table 6.1: Works to be undertaken for the proposed redevelopment of The Haymarket.¹⁹¹

USE	SCOPE
Commercial Residential Retail Student Housing Other	▪ Demolish existing Sydney Entertainment Centre (SEC) and SEC carpark and other commensurate structures. ▪ Undertake excavation and reinstatement works commensurate with any requirement for the remediation of contamination within the site. ▪ Within the footprint of the former SEC and SEC car park, remove existing ground slab, capping beams, pile caps, in-ground services and the like to the extent required by the proposed redevelopment works. It is generally proposed to retain existing piles in ground. ▪ Outside the footprint of the former SEC and SEC car park, remove existing ground slabs, pavements, walls, kerbs, other improvements and the like to the extent required by the proposed public realm redevelopment works (typically as required to regrade the site to the requirements of the approved overland flow and flooding strategy for the site. Localised filling may also be required). Existing piles, remnant structures and infrastructure services (both active and redundant) are proposed to remain in ground.

¹⁹¹ This information was provided by Lend Lease Development.

	▪ Existing remnant piles and other obstructions from the recent SEC, SEC carpark and monorail and former structures including wharves, dam walls and the like, to generally remain in ground. ▪ Build new development structures and buildings typically above ground – new piles indicatively on an 8m grid (typical but subject to scheme design development). Grouped piles (with common pile caps or rafts etc) will be utilised under lift and stair cores of larger structures. ▪ Structural bridging is generally proposed over the c1815 dam wall beneath NE and SE buildings. The proposed bridging beams will be facilitated by the requirement to typically raise habitable spaces of new developments above the 100 year ARI (Average Reoccurrence Interval). Where insufficient depth of cover over the wall exists, localised removal of sections of the wall to facilitate bridging structures may be required. The configuration of piles and bridging beams proposed to conserve the dam wall will be subject to further scheme design development and practical engineering design considerations (such as spans and the like) and the exact location and heights of the wall which at this stage are unknown. There may be some cases where piling is required adjacent/through the dam wall edges at depth to facilitate practical engineering spans of bridging beams. Localised breaching of the dam may be required to facilitate the installation, augmentation and diversion of existing utility and other services. In these cases, breaching is proposed to be limited to 2 or 3 locations so as to minimise impact on the wall. ▪ Avoid development works directly over and adjacent the heritage stormwater culvert in Hay Street. Implement suitable management plans to manage construction impacts of demolition, piling, infrastructure works and the like adjacent and in the proximity of the culvert (such as vibration etc) to maintain any impacts within limits that retain the structural integrity of the drain in accordance with its CMP guidelines. ▪ No intention for basements (at this stage), in part to minimise impact on existing infrastructure services, archaeology, contamination and groundwater. ▪ Provide new/augmented utility services (including stormwater augmentation, power, water, sewer, communications and the like) to service the proposed development and manage forecast flooding impacts in accordance with the approved flood strategy. Redirect existing infrastructure services and utilities generally outside the property boundaries where required by relevant authorities. Some infrastructure works, such as flood mitigation, sewer and power (such as vaults), may require excavation to depths greater than 3m. In these cases, commensurate building works such as dewatering, shoring, management of acid sulphate soils and the like will be
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	required. ▪ Landscaping of public domain areas, involving tree planting, hard and soft landscaping including turf, bio swales and the like.
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6.2 Statutory Process

The following sections will address the SSDA areas as outlined in the DGRs and where relevant specific buildings within these areas. This approach allows for a more refined understanding of impacts within each of the four DA areas. The DGR areas are:

- SSDA2: Southern Haymarket Precinct (Concept).
- SSDA3: Student Accommodation in the Haymarket Precinct.
- SSDA4: Public Carpark in the Haymarket Precinct.
- SSDA5: Southwest mixed use development in Haymarket Precinct.

The information available on the individual developments is outlined in Table 6.1 and illustrated on Figure 1.3.

6.3 Impacts of the proposed works on potential archaeological resource

6.3.1 Demolition

The proposed design involves demolition of existing buildings and other improvements including ground slabs, pavements, capping beams, pile caps and in-ground services (where required to facilitate the proposed development scheme) but retention of existing services, piles and other former remnant below ground structures where the development scheme permits. The current RL on the slab for the Sydney Entertainment Centre is RL 3.4m. The removal of the ground slab will reduce this RL. Outside the footprint of the proposed buildings, RL 3.4 will likely be reduced by about 1m to RL 2.4m (indicative) to conform to the site grading requirements required by the approved flood mitigation and strategy and commensurate flood water overland flow regime. The regrading of the site flood mitigation has the potential to bring the proposed development close to the levels of the archaeology which are likely to be encountered from RL 2.3m and deeper.

In relation to new construction, it is likely that some pile caps, raft slabs, ground beams and the like including services (both building and infrastructure-related services and utilities) will be excavated beneath RL 2.5m where the redevelopment scheme requires. Where possible, remnant structures and infrastructure are proposed to be retained below ground as removal has the potential to cause further damage to the potential archaeological resources.

There is some potential for impacts during the demolition stage, principally through impacts on the upper levels of archaeology, ground vibration and other disturbances. These disturbances need to be carefully managed to limit impacts on archaeological resources. It is considered that establishment of appropriate protocols, such a vibration monitoring, can mitigate some impacts to within acceptable levels (Refer PSM 2013). These will be outlined in the Section 7: Mitigation.

6.3.2 Contamination

There is the potential for some contamination to exist within the imported fill materials below the site. Such contamination may require localised remediation. Remediation is likely to require

excavation and removal from the site (followed by reinstatement with material meeting the on-site reuse criteria). Any underground storage tanks that remain on the site are likely to require removal.

No development specific Remediation Action Plan has been developed and approved for the site to date. Future remediation action plans can be assessed during the Research Design and Archaeological Management Strategy stage. It is noted that highly contaminated areas will reduce the significance of any potential archaeological resource.

6.3.3 Site Regrading for Flood Mitigation of Public Domain

In the areas surrounding the new buildings there is a requirement for regrading for flood mitigation purposes. While the flood study is yet to be approved, it is expected that RLs will vary across this area between RL 2.3m to RL 2.6m in the eastern and central areas and will rise again towards the west. As outlined above, the likely RLs on the upper levels of the potential archaeology across the area may fall between RL 2m and RL 2.4m. Therefore there is some potential for impacts on the State-significant archaeology of Dickson's Mill. There is also potential for impacts within the proposed Boulevard on the locally-significant archaeology of Biddell Bros confectionery factory and some of the later stores buildings. Some works may require excavation to greater than 3m in depth in specific locations commensurate with infrastructure services works.

6.3.4 Infrastructure Services (New Infrastructure, infrastructure diversion and augmentations)

The Haymarket will require:

- The installation of new infrastructure services and utilities to service the proposed new development scheme. This will include the provision of new stormwater, sewer, water, electrical, gas, communications and the like.
- The local diversion of some existing infrastructure services and utilities to move these services out from under the proposed development lots proposed as part of the new development scheme. This will include diversions of water main, electrical, sewer, gas, stormwater and communications.
- The augmentation of some existing infrastructure services and utilities which may include stormwater, electrical and gas.

A key issue for this is that there is likely to be a need to for some infrastructure services and utilities to cross the line of the c1815 Dickson's dam wall. This is not considered to be an issue in Hay Street where there are already extensive services which during their original installation will have removed the upper layers of the dam wall. There is potential for a problem, however, to the north of the SEC and proposed NE building where the dam wall extends beyond the development footprint toward Dickson's mill. There is the potential for impacts on this State-significant item within this area. It is proposed that these impacts could be minimised by "bundling" infrastructure services and utilities in close proximity where they cross the wall so as to minimise the impacts required to install them (subject to relevant utility and authority approvals).

In addition, concrete encasement of services may allow these services to be installed at shallower than standard depths to further minimise impacts on the wall (subject to relevant authority approvals). Mitigation strategies will be developed to limit potential impacts to the dam wall at the Research and Design phase. It is possible that some of the new and augmented stormwater services may need to be linked into the Hay Street stone drain which is listed on the S170 register. Mitigation strategies are identified below to address these issues. A good way to generally limit the impacts of services is to utilise the old road alignments throughout the site, notably Lackey and Hay Street which will already have alignments of services but are expected to have no significant archaeology, other than the Hay Street stormwater channel.

6.3.5 Landscaping of Public Domain

While initially it was proposed to heavily landscape the northern part of the site, in the vicinity of Dickson's Mill, this is now no longer part of the proposed development scheme. The excavation of holes for trees, however, can impact on the potential archaeology. Generally, planting within The Boulevard is expected within the former Lackey Street. Where the Boulevard is aligned to the former Lackey Street there are no issues, other than impacts on 1860's reclamation. There is some potential for impacts for post-1880 buildings on the eastern side of former Lackey Street. Tree planting in the west near Darling Drive is not considered to impact on the significance of the potential archaeological resource within the study area.

The piling grid for the site is indicatively 8m, subject to further design development (Figure 6.1). There are five main groups of buildings with four towers:

- NE has four towers with 9, 15 and 40 floors.
- SE has three towers with 9, 15 and 28 floors.
- N has 6 storeys.
- NW has 11 and 12 storeys.
- SW has three towers with 9, 25 and 40 storeys.
- Student housing is two towers with 17 and 19 storeys.

6.3.5.1 NE Building

- Many piles are proposed be a single 600mm piles (P1) or 750mm diameter (P2).
- Low rise has a series of P3 piles (2 x 600mm dia.).
- Tower 4 has a considerable impact with P5 piles (3 x 900mm dia.) and a core.
- Additional close piling impacts include lift cores, staircases and other impacts.
- Indicative dimensions for the depths of beams is 1800mm, pile caps 1200mm, 1500mm and 1800mm.
- In addition, there may be further excavation requirements within the building development lots for structures including stormwater detention and retention tanks, hydraulic pits, including trade waste and the like.
- In addition, excavations may be required associated with remediation of contamination, removal of remnant underground storage tanks, localised pile demolition, infrastructure services and the like.

Note: the final configurations and dimensions of piled foundations will be subject to further scheme and design development.

This footprint of this proposed building is above the local and State-significant archaeology of:

- c1815 Dickson's dam wall (State) (Figure 6.2, Figure 6.3).
- Rear yards of 33 houses along Harbour Street (local) (Figure 6.5).
- Remains of eight houses and yards along eastern side of Burns Street and two on Little Hay Street (local) (Figure 6.5).
- Rowlands Aerated & Mineral Water works building and stables (local) (Figure 6.7).
- Late 19th and early 20th-century store buildings (local?) (Figure 6.7).
- The western edge of this building may extend into the western side of eight houses on the western side of Burns Road and Cormack's cooperage building (Figure 6.5).

Proposed Impacts

As there is no proposed bulk excavation (at this stage) and all buildings are to be piled on an 8m grid (indicative), this approach has potentially reduced the degree of impacts, compared with traditional bulk excavation as may be associated with other development sites (such as Darling Quarter (Walk) and Barangaroo South). Aside from piles, the pile caps, capping beams and the like are expected to be excavated below final current ground levels. As there is no design for the RLs of the capping

beams, it is not possible to fully understand potential impacts on the archaeological resource at this stage, although it is expected they will have some impact. While the insertion of a second sequence of piles does reduce the archaeological potential of the site, it will still leave a lot of it intact within the development area. There are some areas where there will be greater impacts which will remove the archaeology. In addition, the impacts of the capping beams may be more extensive than anticipated at present.

The proposed design seeks to reduce impacts on the State-significant Dickson's dam wall by using a bridging beam/pile system. The width of the dam wall is unknown but it is likely that the below water width of the dam was much wider than the upper sections of the wall. Where insufficient depth of cover over the wall exists, localised removal of the wall to facilitate bridging structures may be required. The bridging pile system will seek to mitigate impacts as much as possible but where the dam wall is wider than 6m it may need to be penetrated in a few places. The design process for the bridging system at the Concept Proposal stage is indicative (Figure 6.1). During the detail design stage, the design of the bridging beams will be progressed to resolve the final design. This will involve archaeological testing to ground-truth the location of the dam wall and understand its construction materials, dimensions and degree of survival.

6.3.5.2 SE Building

- Many piles will be a single 600mm piles (P1).
- Low rise has a series of P3 piles (2 x 600mm diameter).
- Tower 4 has a considerable impact with P5 piles (3 x 900mm dia.) and a core.
- Additional close piling impacts include lift cores, staircases and other impacts.
- In addition, there may be further excavation requirements within the building development lots for structures including stormwater detention and retention tanks, hydraulic pits, including trade waste and the like.
- In addition, excavations may be required associated with remediation of contamination, removal of remnant underground storage tanks, localised pile demolition, infrastructure services and the like.

Note: the final configurations and dimensions of piled foundations will be subject to further scheme and design development.

This footprint of this proposed building is above the local and State-significant archaeology of:

- c1815 Dickson's dam wall (State) (Figure 6.2, Figure 6.3).
- Rear yards of four houses along Harbour Street (local), (Figure 6.5, Figure 6.6).
- Remains of seven houses and yards along eastern side of Little Hay Street, three houses on Hay Street and two on Harbour Lane (local), (Figure 6.5, Figure 6.6).
- The Phoenix Foundry on the corner of Burns Street and Hay Street (Figure 6.5).
- Late 19th century Sydney Hydraulic Power building on the corner of Burns and Hay Street, above the site of the Phoenix Foundry (local?) (Figure 6.7).
- The western edge of this building may extend into the western side of eight houses on the western side of Burns Road and Cormack's cooperage building (Figure 6.5, Figure 6.6).
- Reclamation fills, 1850s and 1860s.
- Adjacent to a S170 item, the Hay Street stormwater.

Proposed Impacts

As there is no proposed bulk excavation (at this stage) and all buildings are to be piled on an 8m grid (indicative), this approach has potentially reduced the degree of impacts, compared with traditional bulk excavation as may be associated with other development sites, such as Darling Quarter (Walk) and Barangaroo South. Aside from piles, the pile caps, capping beams and the like are expected to be excavated below final current ground levels. As there is no design for the RLs of the capping

beams, it is not possible to fully understand potential impacts on the archaeological resource at this stage, although it is expected they will. While the insertion of a second sequence of piles does reduce the archaeological potential of the site, it will still leave a lot of it intact within the development area. There are some areas where there will be greater impacts which will remove the archaeology. In addition, the impacts of the capping beams may be more extensive than anticipated at present.

The proposed design seeks to reduce impacts on the State-significant Dickson's dam wall by using a bridging beam/pile systems. The width of the dam wall is unknown but it is likely that the below water width of the dam was much wider than the upper sections of the wall. Where insufficient depth of cover over the wall exists, localised removal of the wall to facilitate bridging structures may be required. The bridging pile system will seek to mitigate impacts as much as possible but where the dam wall is wider than 6m it may need to be penetrated in a few places. The design process for the bridging system at the Concept Proposal stage is indicative (Figure 6.1). During the detail design stage the design of the bridging beams will be progressed to resolve the final design. This will involve archaeological testing to ground-truth the location of the dam wall and understand its construction materials, dimensions and degree of survival.

An engineer's assessment report (PSM 2013 for Lend Lease) has been undertaken to assess a range of potential issues that may arise from the proposed development scheme buildings that have the potential to impact detrimentally on the Sydney Water S170 register item, the Hay Street stormwater drain (Appendix 1).¹⁹² This report has considered a range of industry standard design and construction techniques that can be implemented to manage impacts within acceptable limits and has concluded:

The assessment described in this report demonstrates that the buildings proposed as part of the Haymarket redevelopment can be constructed so as to have negligible detrimental effects on the adjacent existing stormwater infrastructure...¹⁹³

PSM (for Lend Lease) consider that there are unlikely to be any issues with the building design, mostly because of the 4m distance between the drain and the expected closest pile. The only issue of concern is that driven piles may cause vibration impacts. Lend Lease has recently advised Casey & Lowe that driven piles are not proposed for the development scheme. Therefore the excavation of new piles along the Hay Street boundary needs to be appropriately managed to avoid impacts. The specific recommendations are:

Vibration is the main issue in regards to potential threats to the heritage drain. The use of a driven pile foundation system near the drain is therefore unsuitable. Conventional pile types such as bored piles, continuous flight augers, or screwed displacement piles are considered more appropriate.¹⁹⁴

As long as the pile excavation requirements are implemented it is presumed there will be no impact on the Hay Street historic drain.

PSM note that the mitigation strategies will be the subject of further design development.

6.3.5.3 Haymarket Square

- There is an open space which will be regraded to RL 2.4m.
- The indicative landscape scheme prepared by Lend Lease indicates the potential for a chain of three shallow linked ponds or pools running diagonally across the square which will be cut below RL 2.4.

¹⁹² *Proposed Haymarket Redevelopment, Hay Street-Lackey Street, Darling Harbour, Assessment of Impacts on Adjacent Infrastructure*, Pells Sullivan and Meynink, for Lend Lease Development, March 2013

¹⁹³ Pells Sullivan and Meynink 2013:13.

¹⁹⁴ Pells Sullivan and Meynink 2013:12.

Within the footprint of the Haymarket Square are the remains of:

- River Shannon Hotel (local) (Figure 6.5).
- Eight houses, yards and deposits on Burns Street (local) (Figure 6.5, Figure 6.6).
- Cormack cooperage building and yards (local) (Figure 6.5, Figure 6.7).
- Early 20th-century store buildings, including a Chinese tobacco warehouse and Chinese tenants in the old Cormack cooperage building which survived into the early 20th century (Figure 6.7).
- Reclamation fills, 1850s and 1860s.

Proposed Impacts

There is likely to be some impacts on the potential archaeological resource which is of local significance within this area from the proposed Haymarket Square. These impacts are from reduced RLs and a water feature excavated into the ground. Any proposed impacts on the potential archaeology may require a mixture of archaeological testing, monitoring or open-area excavation.

6.3.5.4 N Building

- Retail to ground floor
- Community use on L1
- Three floors of residential apartments, making a total of 36 apartments.

Within the footprint of the proposed N Building are the remains of:

- Biddell Bros Confectionery factory and yard which operated from this site until the 1930s (Figure 6.5). This site is considered to be of local significance.
- Reclamation fills, 1860s.

Proposed Impacts

There is likely to be some impacts by the proposed development on the potential archaeological resource of the Biddell Bros confectionery factory which is of local significance. Any proposed impacts on the potential archaeology may require a mixture of archaeological testing, monitoring or open-area excavation.

6.3.5.5 NW Building

- Commercial building
- Offices on ground floor
- 4 levels car park above
- 6 levels office above car park
- Community facility (child care) on top floor.

Within the footprint of the proposed NW Building are the remains of:

- The 1860s reclaimed land within the footprint of this building is undeveloped in 1880 and 1894; it is adjacent to the Cormack cooperage yard and buildings (Figure 6.5, Figure 6.6).
- The *Ignis et Aqua* plan indicates that there are a substantial number of store buildings (Figure 6.7, Figure 6.8). Only some of these buildings have archaeological research potential and may reach the local significance threshold.

Proposed Impacts

There is likely to be some impacts on the potential archaeological resource which is of local significance by the proposed building. Some of the stores were occupied by Chinese and there is the possibility that these may have a greater archaeological research potential and reach the local significance threshold. Any proposed impacts on the potential archaeology may require a mixture of archaeological testing, monitoring, sampling or open-area excavation.

6.3.5.6 W Building

- Retail GF
- Residential apartments sleeving podium car park
- 3 buildings above podium level (storeys are from ground level)
 - 3 storey low-rise
 - 25 storey tower
 - 40 storey tower
- 465 apartments total.

Within the footprint of the proposed W Building are the remains of:

- The 1860s reclaimed land within the footprint of this building includes only one structure on the 1880 plan, the Cormack cooperage work shed and yard (Figure 6.5). The archaeology of this complex is considered to be of local significance (Figure 6.6).
- The *Ignis et Aqua* plan indicates that there are a substantial number of store buildings built in the twentieth century (Figure 6.8). Only some of these buildings have archaeological research potential and may reach the local significance threshold.

Proposed Impacts

The construction of the proposed building is likely to be some impacts on the potential archaeological resource of the pre-1880 Cormack cooperage which is of local significance. Impacts on the 20th-century stores are typically considered to be of little importance. Some of the stores were occupied by Chinese occupants and there is the possibility that they may have a greater archaeological research potential and reach the local significance threshold, notably on the corner of Hay Street. Any proposed impacts on the potential archaeology may require a mixture of archaeological testing, monitoring, sampling or open-area excavation.

6.3.5.7 Student Housing

W1 and W2, both with two towers of 17 and 19 storeys. The student housing sits over the eastern edge of the former railway line and some of the 1980s stormwater culverts (Figure 6.2, Figure 6.3, Figure 6.6).

- Part of the eastern foreshore is original foreshore as well as 1860s reclaimed land.
- The *Ignis et Aqua* plan indicates that there are a substantial number of store buildings within the study area which were built in the 20th century and demolished in the 1930s when the railway was widened (**Error! Reference source not found.**Figure 6.8).
- The excavation of the large stormwater culverts through this area will have removed a lot of the evidence for these buildings. The surviving remains of these buildings are not considered to reach the local significance threshold.

Proposed Impacts

There will be no impacts on significant archaeology, as defined as relics under the *Heritage Act 1977*, by the construction of the student housing.

6.3.6 SHFA S170 heritage issues

There are two SHFA S170 register precincts within the proposed footprint of The Haymarket redevelopment. These are outlined in Section 1.6.3 and 5.3.1.

6.3.6.1 Pier Street Precinct - Dickson's Mill, Dam Wall

This covers the whole of the Haymarket study area as it is bounded by Hay, Harbour, Pier Streets and Merino Boulevard (Darling Drive). It includes archaeological remains of:

State Significance

- Dickson's c1815 dam wall
- Dickson's 1830 mill buildings

Local Significance

- Residential housing throughout the eastern half of the study area: remains of 27 houses and yards established prior to 1880, including later Chinese residents, also includes 15 houses and Australian Inn hotel built by 1865, and the rear yards and cesspits of 19 houses which are beneath Harbour Street.
- 1870s/1880s manufactories:
 - Cormack cooperage, later Centennial Cooperage
 - Biddell Bros confectionery factory
 - Rowlands Aerated and Mineral Water works
- Four pub sites.
- Some small shops operated where the tenant lived as well worked, includes Chinese shops and store keepers and warehouses.
- Workshop associated with the Sydney Hydraulic Pumping Station.
- 1850 and 1860s reclamation of the millpond and Darling Harbour.
- Possible remains of 1860s ditch running near the alignment of Lackey Street and illustrated on the 1865 plan.

A section of the footings of the 1830s Dickson's Mill buildings and most of the line of the c1815 dam wall are thought to survive within the study area (Figure 6.9, Figure 6.10). Both of these items are of State significance. Most of the proposed design and redevelopment avoids the mill area, except for the regrading for flood mitigation. Proposed tree plantings have been removed from this area by Lend Lease as they were seen to have a potential impact on the buried archaeology of the mill within the study area. The final RLs of the regrading of the area for flood mitigation are likely to come close to the RLs at the top of the Dickson's Mill archaeology. The degree of impact may be the top 200 to 300mm of demolition material connected to the mill but because of the State significance of this item clarification of the issues need to be resolved through archaeological testing to determine the nature of potential impacts once the detail design has been resolved. Protocols need to be established for making sure this area of the site is excluded from the construction zone and any impacts do not affect the State-significant archaeology.

Dickson's c1815 dam wall

Substantial remains of this dam cross through the site (Figure 6.9, Figure 6.10) - they are discussed in detail in Section 6.3.6, Table 6.1 and in Section 7: Mitigation.

6.3.6.2 Archaeology of Local Significance

The proposed impacts on the archaeology throughout the study area are addressed in detail in Section 6.3.6 above. There will be impacts on archaeology of Local significance but the extent of this cannot be clarified until the detail design stage (Figure 6.9, Figure 6.10). Where there will be substantial impacts on archaeology of Local significance, a methodology and Research Design will need to be written to manage these impacts within the context of best practice and NSW Heritage Council and Heritage Branch guidelines.

6.3.6.3 Darling Harbour Rail Corridor

This listing of the corridor includes the goods line and the overhead bridges. The focus of the statement of significance (Section 5.3.1) is on the place and the railway bridges. While a section of the corridor of the surviving railway lines north of Hay Street and south of Pier Street, now used for the light rail, is within the study area, there are no direct impacts from the development within the listed rail corridor. Other issues in terms of visual analysis are addressed in the TDK heritage report.

There is no impact on the archaeological or technical significance of this item by the proposed Haymarket development.

Summary

There are two SHFA S170 register precincts within the footprint of the proposed redevelopment:

- Darling Harbour Railway Line

There are no non-indigenous archaeological impacts arising from the Haymarket Concept Proposal in relation to the Darling Harbour Railway Line.

- Pier Street Precinct

The Pier Street Precinct includes the whole of the Haymarket Concept Proposal study area. This Precinct is the subject area of this report. The proposed Haymarket Concept Proposal will have substantial impacts on the archaeological remains of local significance. Strategies are identified in Section 7 to minimise impacts on archaeological remains of State significance and mitigate the impacts on items of local significance.

It is also noted that under the 2009 significance assessment criteria for archaeological sites and relics, we have identified that there are archaeological remains within the study area which do not meet the local significance threshold and are therefore not considered to be 'relics' under the *Heritage Act 1977*.



Figure 6.1: Draft pile plan of The Haymarket South with an indicative 8m grid, tower cores, staircases and other high impact areas. Robert Bird for Lend Lease.

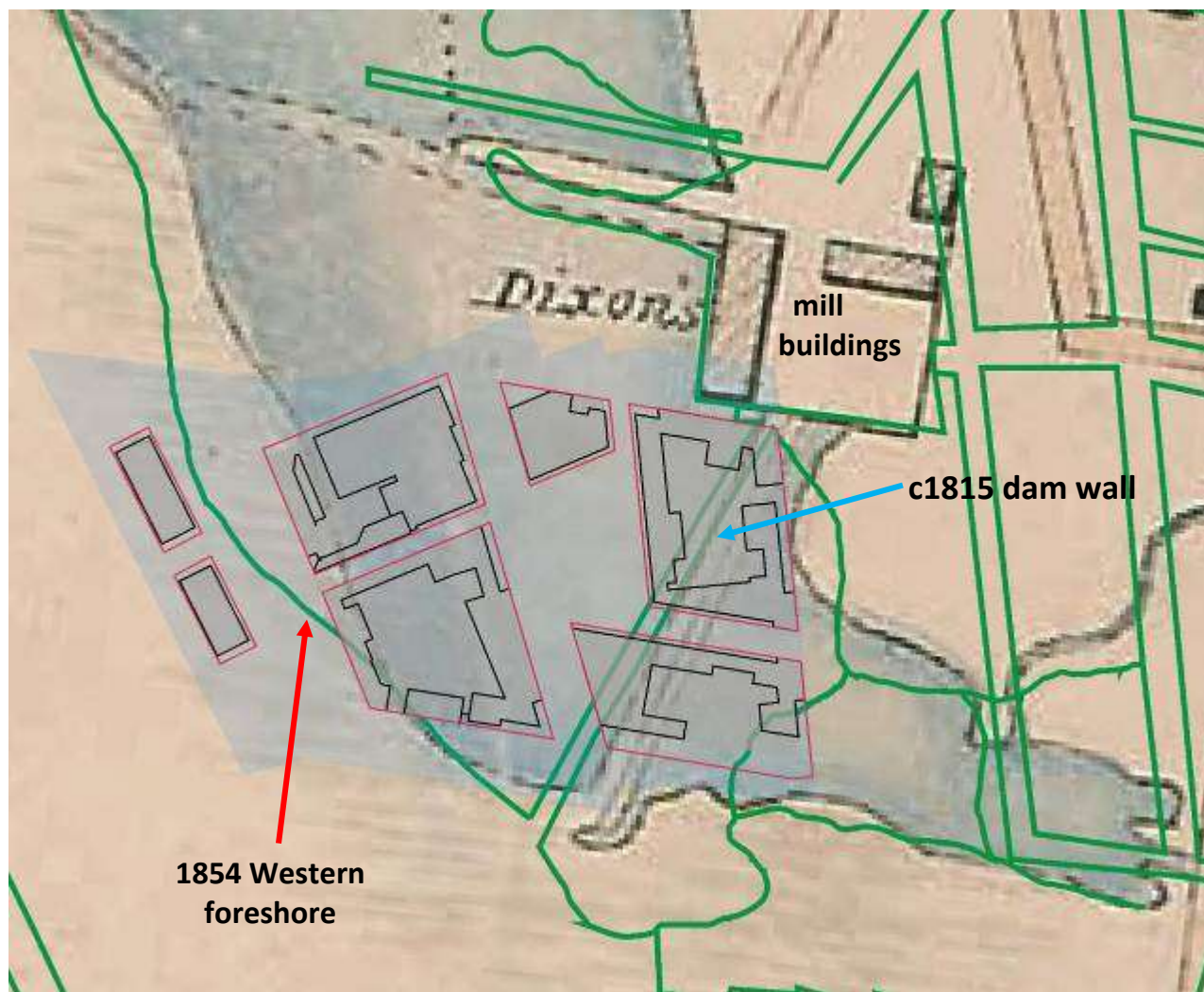


Figure 6.2: Overlay of The Haymarket study area (blue shade), the proposed buildings (grey shade & red outline), the 1854 plan (green outline) onto the 1828 plan. This overlay suggests that there is a poor fit between the 1828 and 1854 plans in relation to the dam wall (blue arrow). The 1828 plan shows the approximate position of the c1815 dam wall (blue arrow) beneath the proposed eastern buildings and the intrusion of Dickson's mill buildings and reclaimed land into the northeast corner of the study area. The 1854 western foreshore outline indicates that the 1828 plan probably includes shoaling and low tide areas. Surveyor Thompson, SR Item No: SZ467 SRNSW.

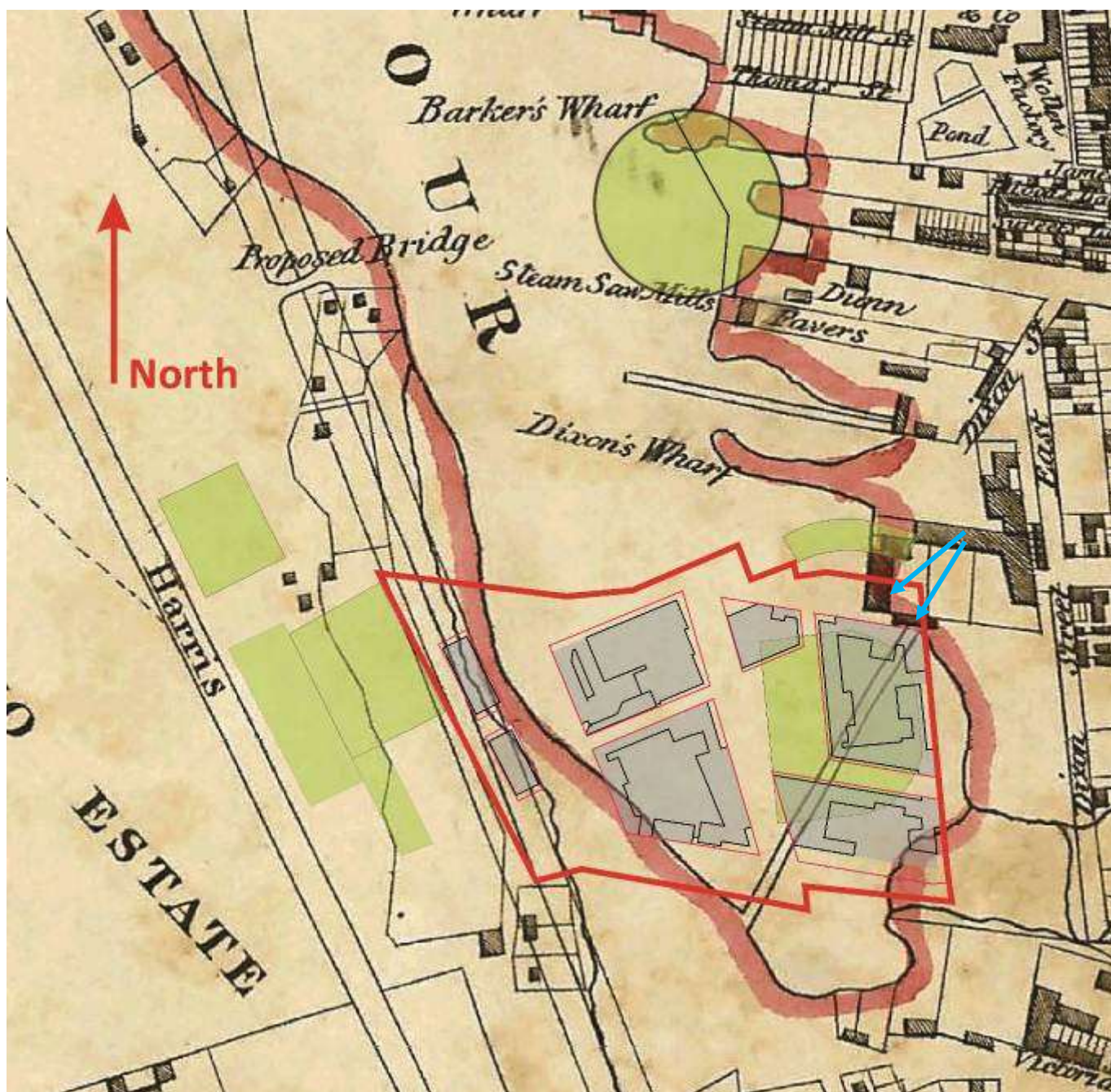


Figure 6.3: Overlay of The Haymarket study area (red outline), the proposed buildings (grey) onto the 1854 plan and some of the existing elements, such as the Entertainment Centre, Tumbalong Park and Powerhouse (green). The 1854 plan shows the approximate position of the c1815 dam wall beneath the proposed eastern buildings and the intrusion of Dickson's mill buildings (blue arrow) into the northeast corner of the study area. It is possible the location of the southeastern mill building is inaccurate. Woolcott & Clark 1854.

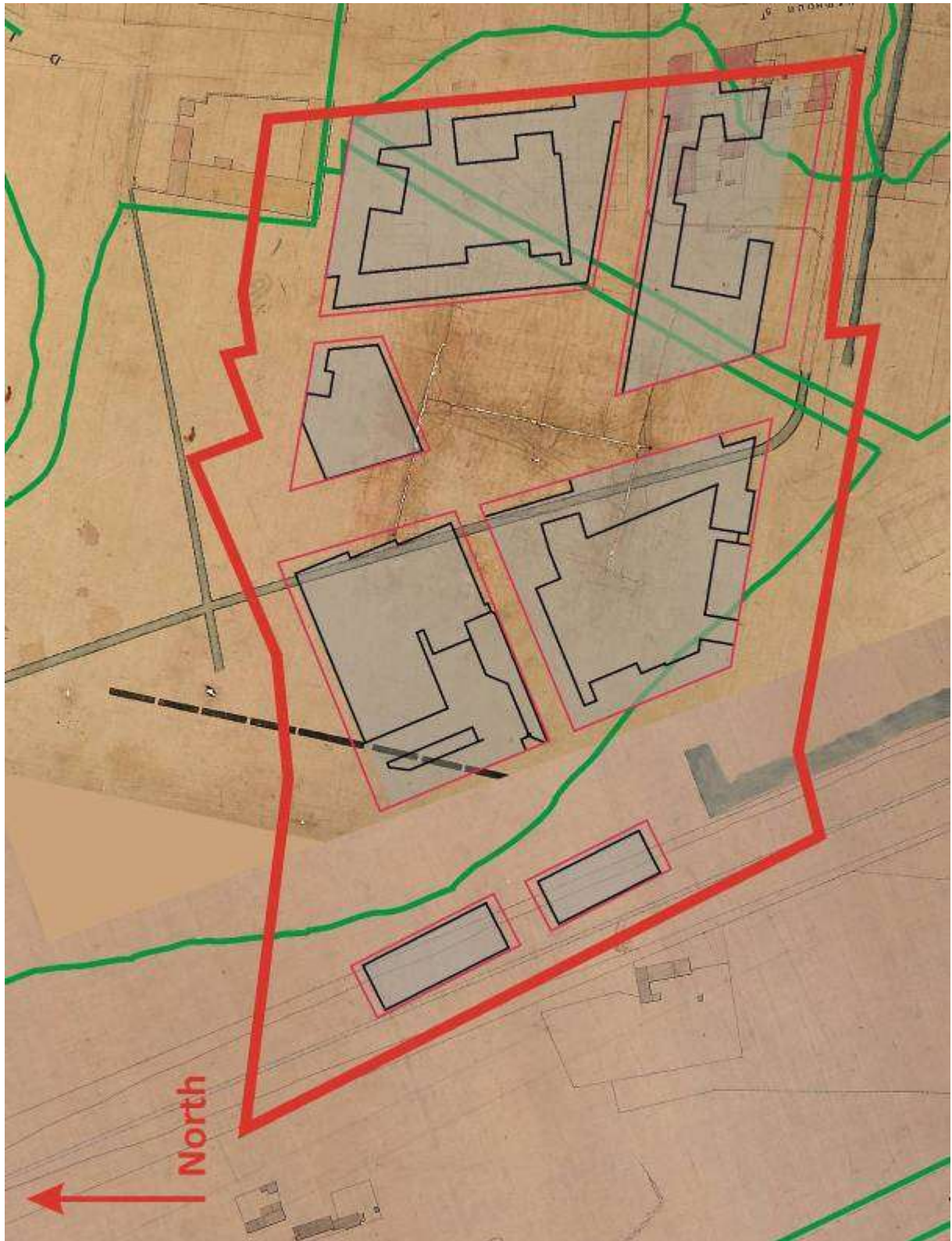


Figure 6.4: Overlay of the proposed building onto the 1865 survey. There is limited archaeological potential west of Lackey Street.

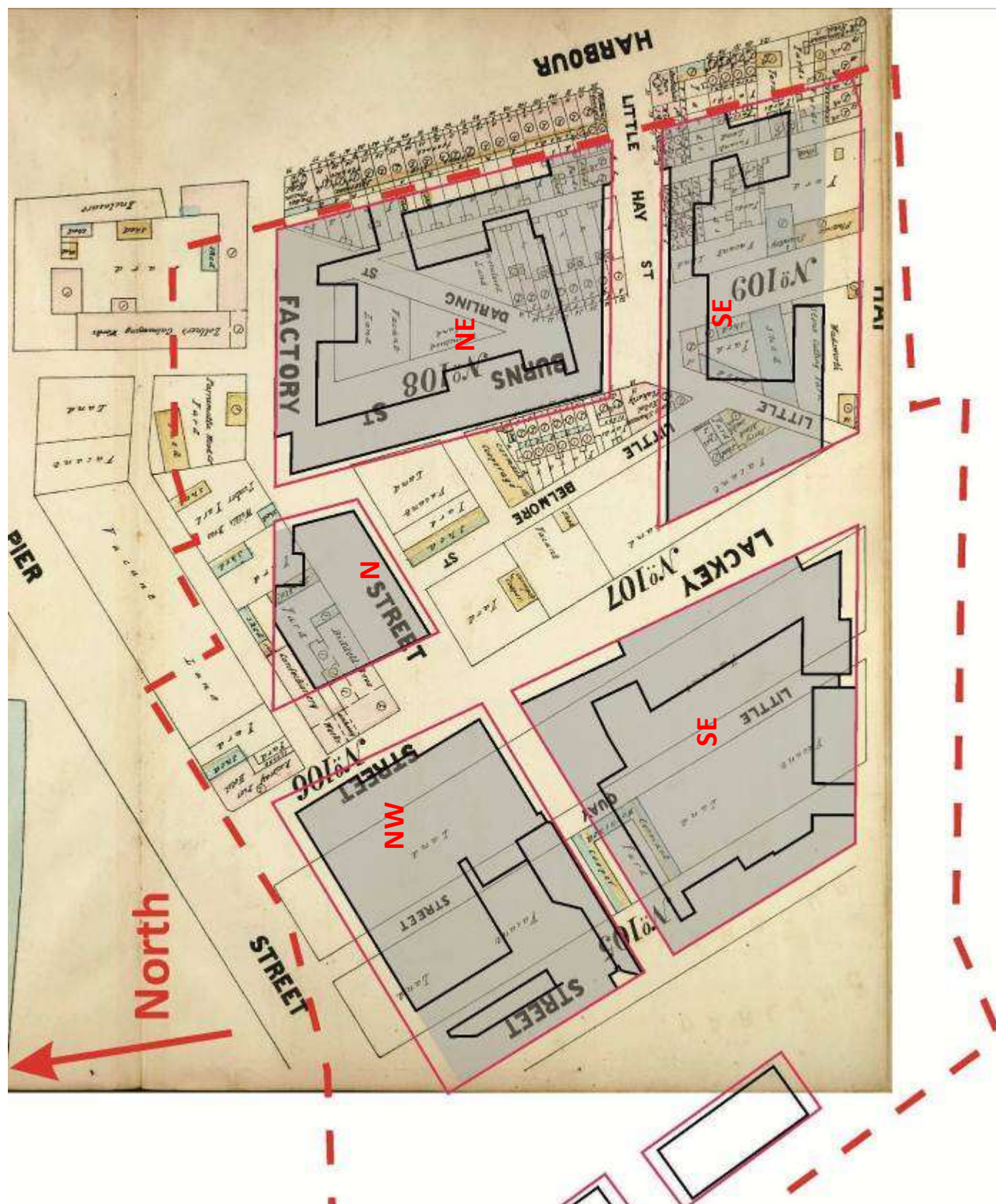


Figure 6.5: Overlay of the proposed building onto the 1880 plan. There is limited archaeological potential west of Lackey Street. Dove's 1880 plan, Historical Atlas of Sydney, City of Sydney.

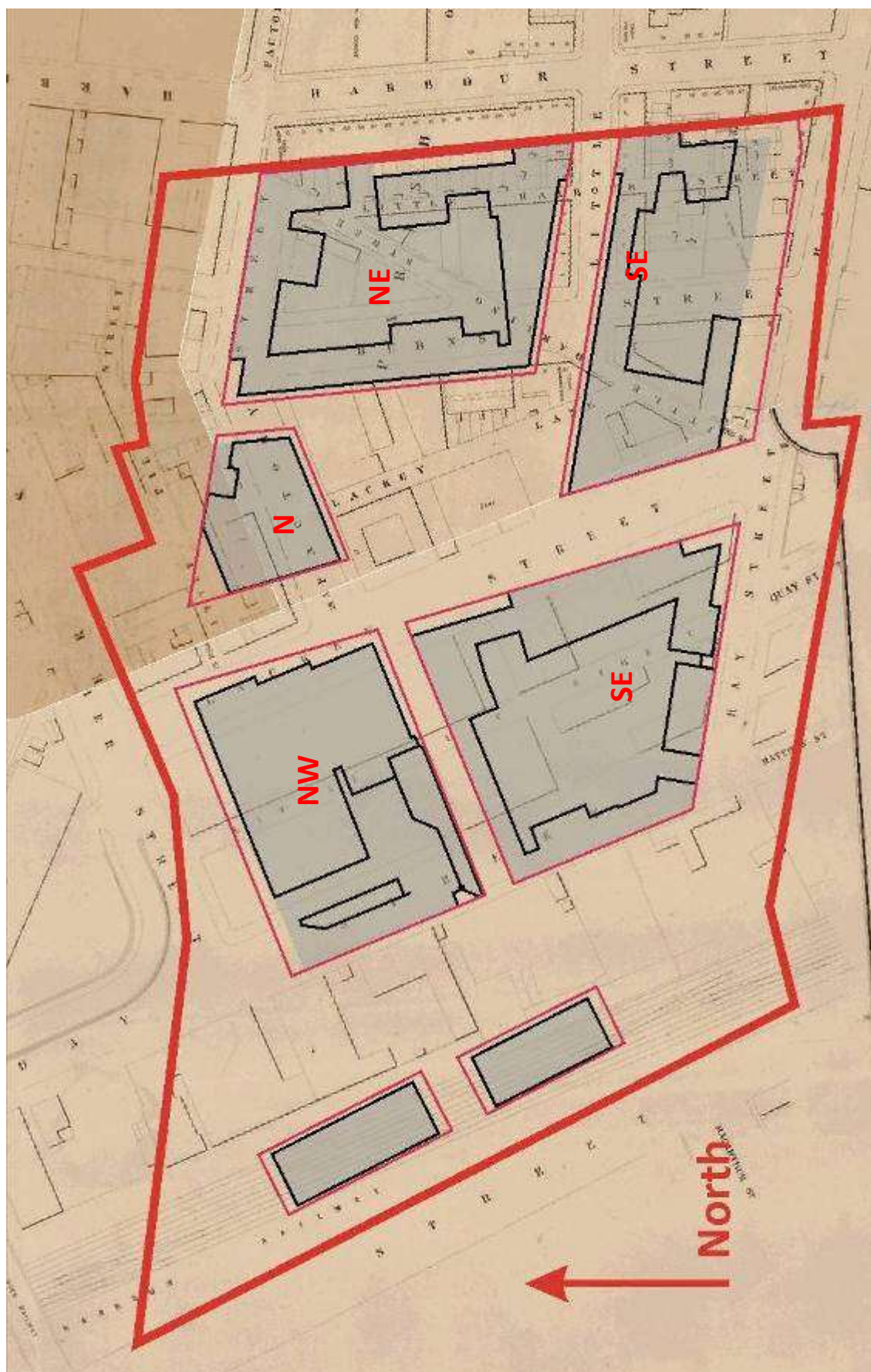


Figure 6.6: Overlay of proposed Concept Proposal buildings onto the 1890s *Metropolitan Detail Plan*.

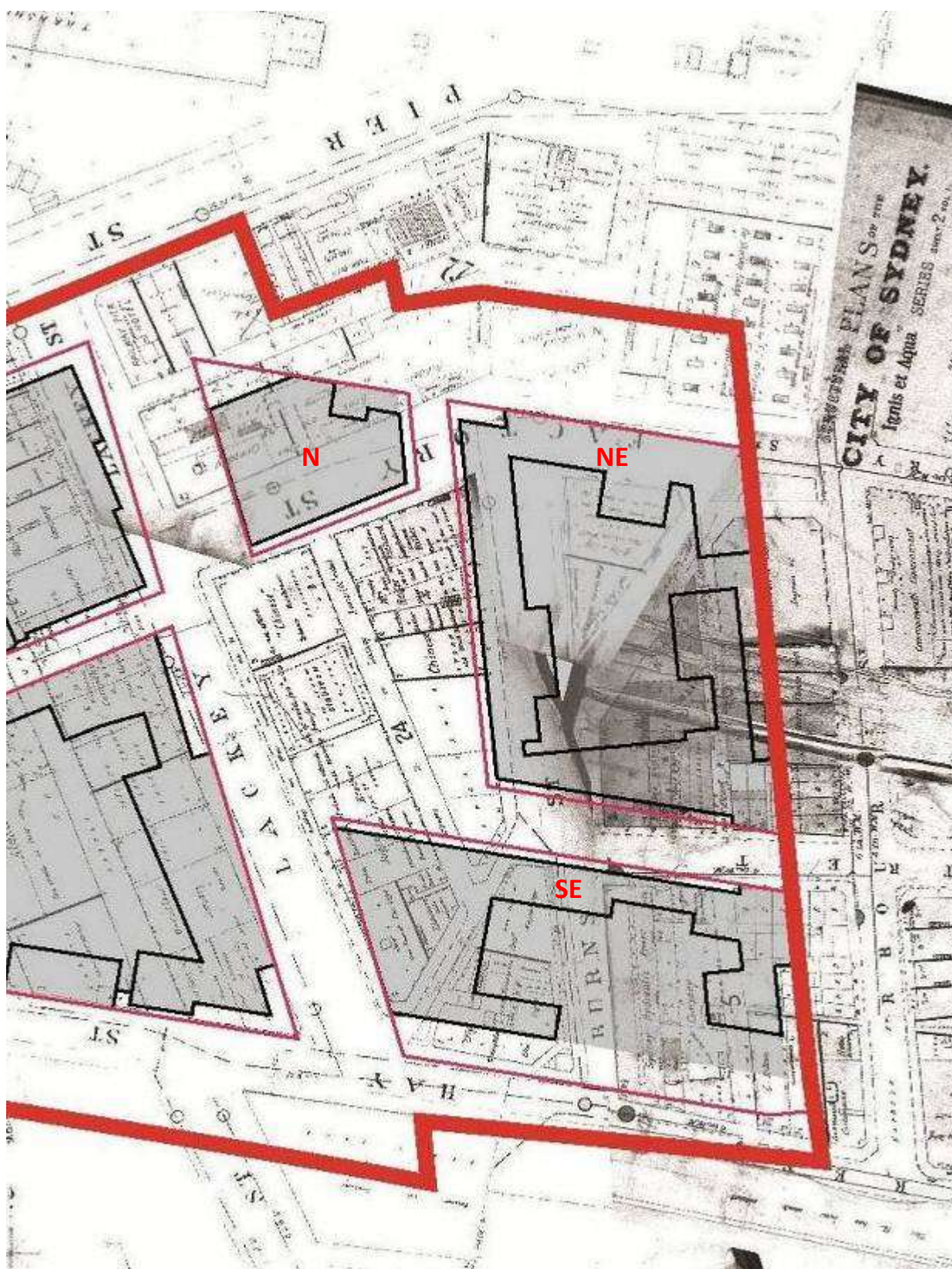


Figure 6.7: Overlay of proposed Concept Proposal buildings on the *Ignis et Aqua* early 20th-century plan, eastern part of the study area. North is at the top.

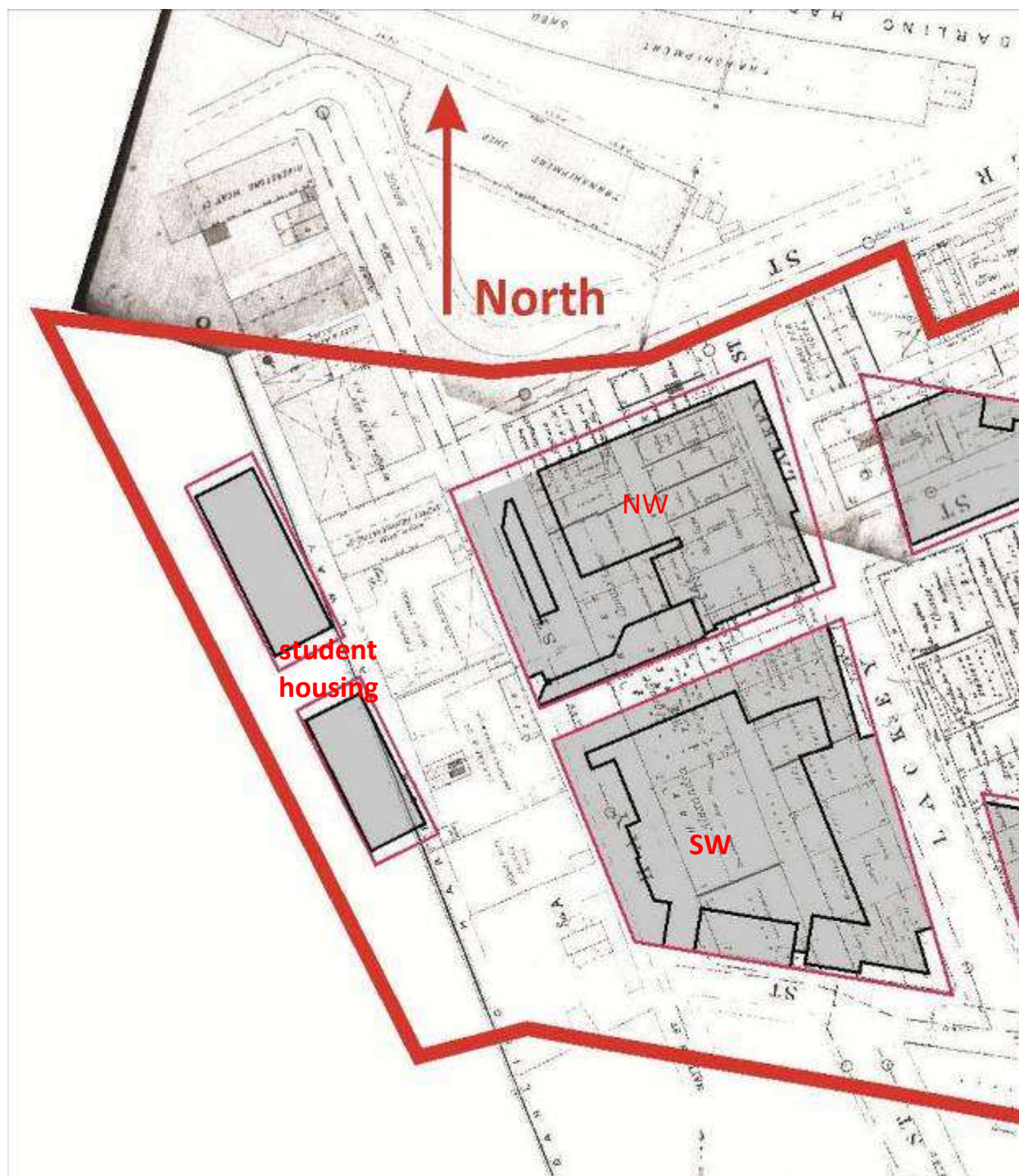


Figure 6.8: Overlay of proposed Conept Proposal buildings on the *Ignis et Aqua* early 20th-century plan, eastern part of the study area. North is at the top.

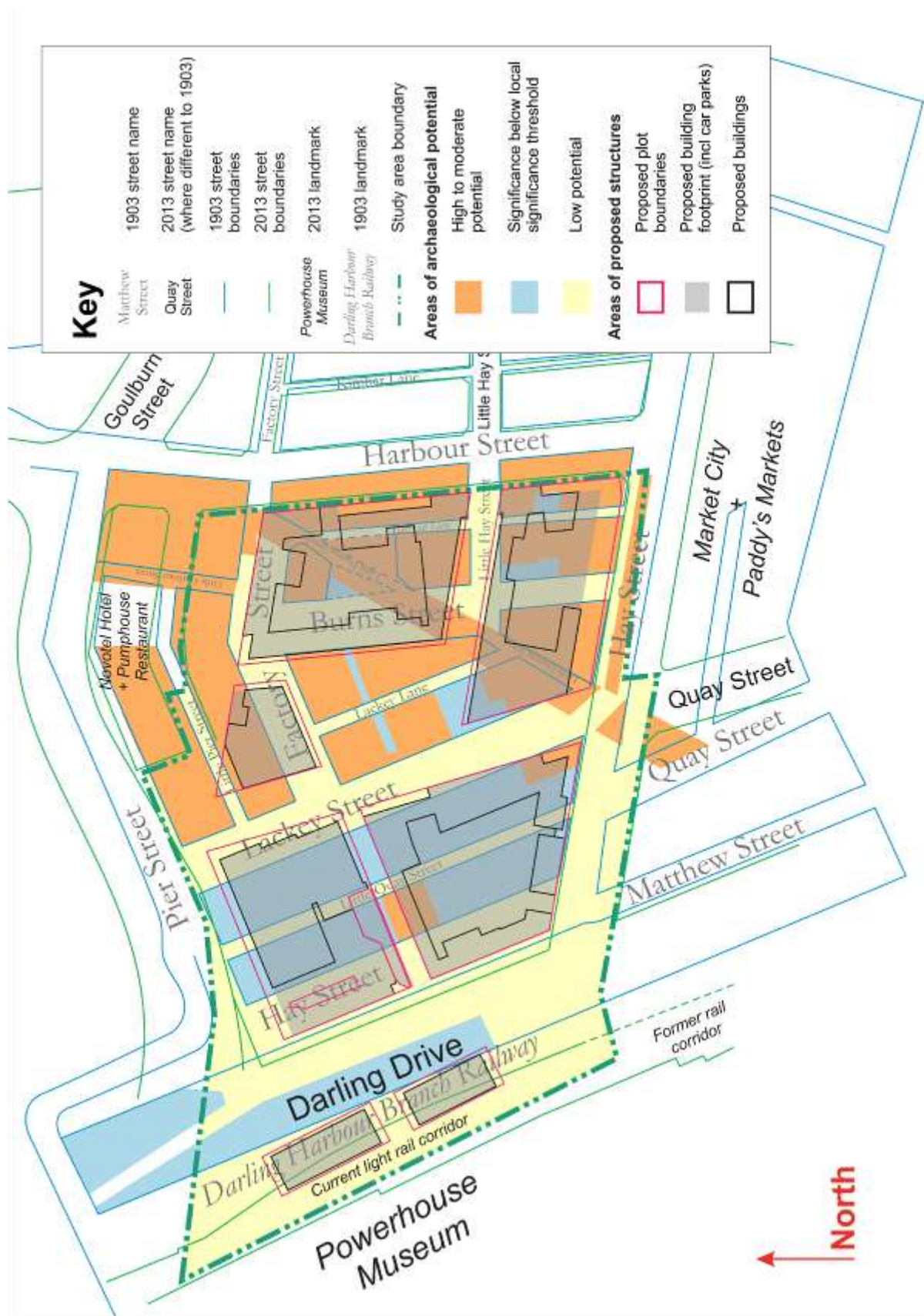


Figure 6.9: Plan of Archaeological Potential with the Concept Proposal.

7.0 Mitigation

7.1 The Haymarket Concept Proposal

As identified in Section 6 of this report there is potential for substantial impacts arising from the proposed Haymarket Concept Proposal which will need to be appropriately managed. As the proposed building layout, piers and beams, footings and slab design and likely impacts are only indicative at this stage, detailed mitigation strategies cannot be identified at this time. The normal process of an Archaeological Assessment is to provide a historical analysis, assessment of archaeological potential and significance, and recommendations to manage the resource. Then at the Research Design and Management Strategy stage detailed impacts are addressed and the main mitigation strategies identified. As this is a SSD, these stages are more fluid. It is noted that there will be subsequent (Stage 2) DAs for all parts of The Haymarket Concept Proposal area. It is at the SSDA stage, when the detailed building designs will become available, that the Research Design can be written to provide detailed mitigation strategies and archaeological methodologies.

As there are some potential issues associated with State-significant archaeological remains, Lend Lease and Casey & Lowe have been able to develop strategies designed to minimise impacts on the State-significant archaeology which are set out below as Key Issues (Section 7.2). Where there are likely to be more substantial impacts on the archaeological remains of local significance, more general recommendations have been identified. These will be developed in detail during the Research Design and Management Strategy for the Haymarket. It is likely that this will be written in two stages.

7.2 Mitigation for Key Issues Arising from the Concept Proposal

7.2.1 Dickson's c1815 dam wall and *in situ* conservation

Key issues identified in relation to the *in situ* retention of the State significant c1815 dam wall:

- The construction of the NE and SE buildings above the dam wall.
- The likelihood of new major infrastructure services, diversions and augmentations, such as:
 - culverts, for either flood mitigation or stormwater, which will cross the site and therefore pass across the line of the dam wall.
 - relocation of a high voltage cable from the footprint of the Entertainment Centre northwards into the park area.
 - Other infrastructure services diversions and augmentations to be identified at detailed design stage.

Design above Dickson's dam wall

To comply with the NSW requirements, as identified in the City Plan Archaeological Assessment, there is a requirement to conserve Dickson's dam wall (c1815) *in situ*:

The line of Dickson's dyke is still expected to be *in situ* underneath the Sydney Entertainment Centre...It is regarded as being of State significance. The best management for this significant item is to leave it *in situ*....Preparations can then be made for the protection of the earthen sections...¹⁹⁵

The recommendation to retain Dickson's dam wall (mistakenly called a dyke) is reiterated on page 69 of the Archaeological Assessment (2012a, 2013). It is also included in the *Baseline Heritage Impact Assessment* (2012c:72, 2013). Casey & Lowe agrees with this recommendation and considers it an important heritage outcome for the redevelopment.

¹⁹⁵ City Plan May 2012a: 8(iv).

To endeavour to achieve this aspiration Robert Bird Group (for Lend Lease) has prepared a conceptual structural system design of bridging beams/piles which are intended to minimise impacts on the dam wall if it survives *in situ* (Figure 6.1). The development scheme column loads that would have otherwise been placed on piles within the dam wall are proposed to be transferred over the footprint of the wall onto bridging plies. Where insufficient depth of cover over the wall exists, localised removal of wall to facilitate bridging structures may be required. There may be some cases where piling is required adjacent/through the dam wall edges at depth to facilitate practical engineering spans of bridging beams. The main assumptions about the wall informing this design is that it is no more than 6.5m at its widest section. Currently there is an indicative concept design only and this design is proposed to be further developed and refined to address the results of archaeological testing which will provide more certainty to inform the design process. It is hoped that the final design can result in minimal and acceptable impacts on Dickson's dam wall through the implementation of appropriate mitigation strategies. This needs to be ground-truthed through archaeological testing at the earliest opportunity to provide a preliminary design and then further testing and subsequent survey following building demolition. It is considered possible that the wall may be too wide, particularly at its base, and too high at its crown, to successfully span it in all places.

Services

Substantial remains of the c1815 dam wall are considered likely to survive and will therefore cross diagonally through the eastern half of the site, extending into adjoining areas outside the Concept Proposal. Therefore it is very difficult to introduce infrastructure services into the study area without some impacts on the dam wall. It is likely that a section of dam wall within Hay Street has been considerably impacted by the 1860s Hay Street stormwater channel as well as other services that are known to have been placed along the street, including a later stormwater culvert (Figure 3.3). The impacts in the northern area are considered to be fewer and less substantial. If infrastructure services are to be put through this area then they will need to be 'bundled' into a single crossing point so as to reduce impacts. Concrete encasement (subject to authority approval) may also aid in reducing the depth of excavation required. An excavation through this area will offer an opportunity to record the archaeological remains of the dam wall which are unlikely to be exposed in other areas where it is being retained *in situ*.

7.2.2 Regrading of open spaces over Dickson's mill for loop road and flood management

The northern park area is partially above the *in situ* archaeology of Dickson's Mill (Figure 5.1). These remains are considered to be of State-heritage significance and should be conserved *in situ* (Figure 4.5, Figure 5.1). General RLs in this area for flood mitigation are likely to be RL 2.4 to RL 2.5 across the footprint of the park, Factory Lane and Pump House Plaza. This means there is some possibility of impacts which need to be managed/mitigated by:

- Testing to confirm the levels at which the State-significant archaeology survives in this area.
- Based on the results of testing, develop strategies to identify constraints to maintain the State significance of the surviving archaeology.
- Develop protocols for managing the ground reductions through this area so they do not impact on the State-significant archaeology of the 1830s mill buildings.
- Exclude the footprint of Dickson's mill from the construction zone.

7.2.3 Impacts on Hay Street drain arising from infrastructure services, new inlet structures, new flood mitigation infrastructure and adjacent residential development

Engineering analysis of the design of the adjacent SE building is that it should not have any impact on the stability of the Hay Street drain structure. The only concern expressed was the piling methodology so as to manage vibration. Lend Lease has agreed that driven piles will not be utilised. Ongoing engineering advice on this indicates vibration needs to be managed to avoid impacts.

The design, excavation and installation of new services needs to be carefully designed to avoid impacts, both intended and unintended, on the drain. Once design details are clarified, it is likely that Sydney Water, as the owner of the item and in compliance with their S170 obligations under the *NSW Heritage Act 1977*, will request a Heritage Impact Statement prior to their approval for any works in this area. The engineering report (Appendix 1) identified that the piling of the adjacent redevelopment needs to be appropriate, not driven piling. Further engineering advice will be provided at the appropriate stage.

7.2.4 SHFA S170 heritage issues

There are two SHFA S170 register precincts within the footprint of the proposed redevelopment:

- Darling Harbour Railway Line

There are no non-indigenous archaeological issues arising from the proposed Haymarket Concept Proposal in relation to the Darling Harbour Railway Line.

- Pier Street Precinct

The Pier Street Precinct includes the whole of the study area. This Precinct is the subject of this report. The proposed Haymarket Concept Proposal will have substantial impacts on potential archaeological remains of Local significance. Strategies will be developed to minimise impacts on potential remains of State significance.

7.3 General Mitigation Strategies for Impacts

7.3.1 Archaeological Testing

Archaeological testing is a strategy which can be used within the Haymarket redevelopment to more fully understand the archaeological issues prior to finalising the detailed design. This is especially necessary in relation to the State-significant archaeology as well as some of the locally-significant archaeology (Figure 5.1). Testing would involve the following steps:

- Write a testing methodology and Research Design to provide guidance during design development so as to be able to minimise impacts on State-significant archaeology and refine understanding of the locally-significant archaeology. In addition, this testing can confirm our understanding of the potential archaeological remains assessed as not meeting the local significance threshold.
- Undertake archaeological testing which will inform the SSDAs within The Haymarket.
- These may need to be focused on individual SSDAs, as required by the staged development.
- Resolve detailed design using results of archaeological testing.
- Write overall Non-Indigenous Research Design and Management Strategy for the staged SSDAs.

7.3.2 Non-Indigenous Archaeological Research Design and Management Strategy

Once the detailed design becomes available write a Non-Indigenous Archaeology Research Design and Management Strategy (RDMS) to assess the detailed impacts and provide detailed mitigation strategies to manage the impacts on the archaeological remains of local significance. One of the issues of concern here is the extent to which the footing system will impact on the archaeology. There is a likelihood that the sections of the area to the east of Lackey Street may be subject to open area excavation. This RDMS will fully assess impacts and identify appropriate strategies for:

- Open area stratigraphic excavation
- Archaeological sampling
- Archaeological monitoring

- Archaeological recording strategies
- Cataloguing of artefacts
- Archaeological reporting.

Specific requirements will include:

Repository for Artefacts

SHFA, the owner of The Haymarket area, will provide storage in perpetuity for artefacts recovered from the site. SHFA already has an artefact repository.

Post-Excavation Archaeological Reporting

The proposed archaeological program needs to be reported on in accordance with Heritage Council guidelines and best practice. This is to include:

- catalogue of artefacts and reporting
- conservation of important artefacts
- detailed trench or area reports
- overall excavation report
- photo archive.

7.3.3 Site Regrading for Flood Mitigation of Public Domain

Mitigation

- Undertake archaeological testing to understand the RLs at which State-significant archaeology occurs.
- Review of these RLs at detail design stage should hopefully avoid impacts.
- Archaeological testing may be needed in some areas to refine our understanding of the level at which the archaeology may be found in key areas, especially the areas of the State-significant archaeology of Dickson's Mill and the Haymarket Square.

7.3.4 Hay Street Stormwater

The Hay Street stormwater channel is outside the development footprint and 4m away from piling. By implementing the requirements of the engineering report for this S170 register item (Appendix 1) there should be no impacts from vibration. There is the possibility of other services in the vicinity of the stormwater culvert as well as linking in of other services. This will be subject to further engineering and heritage assessment at the detailed design stage.

8.0 Results and Recommendations

8.1 Results

The study area is The Haymarket area within the SICEEP site. The historical research and archaeological analysis undertaken for this report indicates that the study area was involved in the very beginnings of steam technology in Australia with the introduction of Dickson's 1815 steam mill and the construction of a dam wall for his mill pond. The later 1830s Dickson's mill building is also partly within the study area. Much of the study area was within Darling Harbour, except for the western edge of foreshore. Reclamation and subdivision of Dickson's Mill Estate, to the east of the dam wall, between 1855 and 1857 saw the initial residential and commercial development of the study area. Around 1865 the area to the west of the dam wall was reclaimed and by 1880 there was considerable occupation of the study area. Early development prior to 1880 was focused to the east of Lackey Street, except for an early cooperage building.

This Archaeological Assessment has identified that the land to the east of former Lackey Street has medium to high archaeological potential and significance at a local level. In the area west of Lackey Street only some of the area is considered to have local heritage significance.

Potential archaeological remains of State significance were identified as being within The Haymarket Concept Proposal development area. These are:

State Significance

- Dickson's c1815 dam wall
- Dickson's 1830 mill buildings

Mitigation strategies have been identified to minimise impacts on State-significant archaeology. In relation to Dickson's c1815 dam wall it is proposed:

- To design a building complex with bridging piers to minimise impact on the dam wall.
- Undertake archaeological testing to clarify the nature, extent and degree of survival of the dam wall prior to refining the design for the NW and SW complexes.

Potential archaeological remains of local significance were identified as being within The Haymarket Concept Proposal development area. These are:

Local Significance

- Residential housing throughout the eastern half of the study area: remains of 27 houses and yards established prior to 1880, including later Chinese residents; also includes 15 houses and Australian Inn hotel built by 1865, and the rear yards and cesspits of 19 houses which are beneath Harbour Street.
- 1870s/1880s manufactories
 - Cormack cooperage, later Centennial Cooperage
 - Biddell Bros confectionery factory
 - Rowlands Aerated and Mineral Water works
- Four pub sites.
- Some small shops operated where the tenant lived as well as worked, including Chinese shops and store keepers and warehouses.
- Workshop associated with the Sydney Hydraulic Pumping Station.
- 1850 and 1860s reclamation of the millpond and Darling Harbour.
- Possible remains of 1860s ditch running near the alignment of Lackey Street and illustrated on the 1865 plan.

Hay Street Stormwater - Sydney Water S170 item

This is outside the development footprint and 5m away from the nearest likely piling. By implementing the requirements of the engineering report for this S170 register item (Appendix 1) there should be no impacts from vibration. There is the possibility of other services in the vicinity of the stormwater culvert, as well as the linking in of other services. This will be subject to further engineering and heritage assessment at detailed design stage.

8.2 Recommendations

1. Archaeological remains of State significance within The Haymarket Concept Proposal area should be retained *in situ*. Strategies to mitigate development impacts to include:
 - Bridging beams to minimise impacts on the c1815 dam wall.
 - Design of piers, beams etc to minimise impacts on the dam wall.
 - Reduce the number of crossing points across the line of the dam wall for new infrastructure services, diversion and augmentation to a point at the north and south of the NE and SE buildings
 - Archaeological testing to provide information about the archaeology, notably RLs so as to appropriately manage the State-significant archaeological remains.
 - Develop protocols to manage issues during the demolition, regrading and construction stages of redevelopment so as to minimise intended or unintended impacts.
 - Include site heritage and archaeology information during workers' induction.
2. Archaeological testing needs to be undertaken so as to:
 - Inform the detailed design process.
 - Refine our knowledge of the location, nature and degree to which the predicted archaeology survives within the Concept Proposal area.
 - Write a specific research design for testing identifying areas requiring further assessment.
 - Integrate the results of the testing in relation to State-significant heritage into the detailed design of the buildings, site regrading for flood mitigation, infrastructure services and landscaping.
3. Where there are impacts on archaeological remains, either local or State, archaeological recording will need to be undertaken in accordance with Heritage Council and Heritage Branch guidelines and best practice methodologies.
4. Write a Non-indigenous Archaeological Research Design and Management Strategy to refine impacts, identify appropriate archaeological methodologies and research questions and guide the archaeological program. This is to be written once the detailed design for buildings has been prepared.
5. Produce site protocols to manage and minimise intended and unintended impacts.
6. Any proposed development in the vicinity of the Hay Street stormwater channel needs to be undertaken in accordance with engineering and heritage advice. Depending on the final design for new or augmented infrastructure services, it may be necessary to write a specific Heritage Impact Statement.
7. SHFA will need to provide a repository for artefacts following the completion of the archaeological program.
8. Public interpretation of the archaeology of State and locally significant archaeology should be undertake within the proposed redevelopment. This may include a mixture of opportunities for:

- Public open days for engagement of the public with the significant archaeology within the site.
 - Exposure of surviving archaeology within the redevelopment and acknowledging the environmental constraints of such projects.
 - Interpretation of artefacts through site display.
 - Interpretation of the results of the archaeology program throughout the precinct.
9. Write an excavation report in accordance with Heritage Council guidelines and standard conditions of consent. This is to include:
- detailed trench or area reports
 - overall excavation report
 - catalogue of artefacts and artefact reports
 - conservation of important artefacts
 - response to research questions
 - photo archive.
10. Consultation with SHFA and Heritage Branch archaeologists about the archaeological issues of the site, approaches to *in situ* retention of the State-significant archaeology, and the Non-indigenous Archaeological Research Design and Management Strategy.

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