

HISTORICAL ARCHAEOLOGICAL ASSESSMENT & RESEARCH DESIGN

APPENDIX H



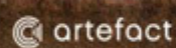
Sydney Metro City & Southwest Chatswood to Sydenham

Historical Archaeological Assessment
& Research Design

Report to Jacobs / Arcadis / RPS

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Artefact Heritage
ABN 73 144 973 526
Level 4, Building B
35 Saunders Street
Pyrmont NSW 2009

+61 2 9518 8411
office@artefact.net.au

EXECUTIVE SUMMARY

Project Background

The proposed Sydney Metro City & Southwest Chatswood to Sydenham project (the project) is the subject of this Historical Archaeological Assessment and Research Design (ARD). The project would involve construction and operation of an underground rail line, about 15.5 kilometres long, and new stations between Chatswood and Sydenham.

The Environmental Impact Statement (EIS) identified the potential for archaeological constraints and the need for the preparation of a historical ARD (mitigation measure NAH2) at all surface construction sites except Artarmon traction substation and Marrickville dive site (southern). This ARD has been prepared to comply with mitigation measure NAH2. The ten sites that are considered in this report are:

- Chatswood dive site (northern)
- Crows Nest Station
- Victoria Cross Station
- Blues Point temporary site
- Barangaroo Station
- Martin Place Station
- Pitt Street Station
- Central Station
- Waterloo Station
- Power Supply Routes – various locations near the metro rail line route.

Archaeological Management

The station and construction sites have been divided into archaeological management zones based on archaeological potential and construction impacts as submitted with the EIS.

Archaeological management zone mapping provided in Section 13.3 is based on a 'traffic light' coding:

- **Red** (Zone 1): Direct impact to significant archaeology. Archaeological investigation required prior to any construction impacts (bulk excavation etc.)
- **Amber** (Zone 2): Potential impact to significant archaeology. Prepare Work Stage Specific Archaeological Method Statement (AMS) once construction methodology and impacts are known. Archaeological investigation is likely required
- **Green** (Zone 3): Unlikely to contain significant archaeology. Construction to proceed with unexpected finds procedure as nil-low potential for significant archaeological remains.

Archaeological Mitigation

The following table presents a summary of the archaeological management and impact mitigation for the project. The summary is based on detailed analysis presented in this report.

Site	Site code	Potential archaeology	Impact	Management zone	Mitigation
Chatswood dive site	NC 3	Moderate potential for locally significant remains of mid-late 19 th century development	Potential direct impact – demolition, ground levelling and construction of construction site facilities	2	<ul style="list-style-type: none"> AMS Monitoring or Test/Salvage
	NC 5	Moderate potential for locally significant remains of Bryson's cottage and store (1860s) and later 19 th century development	Potential direct impact – demolition, ground levelling and construction of construction site facilities	2	<ul style="list-style-type: none"> AMS Monitoring or Test/Salvage
	NC 6	Low-Moderate potential for locally significant remains of the former School of Arts (1870s), later nineteenth century residential development and early twentieth century school	Direct impact – excavation for dive structure and access ramp	1	<ul style="list-style-type: none"> AMS Test/Salvage
	NC 1 NC 2 NC 4	Nil-Low potential for archaeological remains. Unlikely to reach significance threshold	Potential direct impact – demolition, ground levelling and construction of site amenities	3	<ul style="list-style-type: none"> Unexpected Finds Procedure
Artarmon Substation	All	Nil-Low potential for archaeological remains. Unlikely to reach significance threshold	Bulk excavation Construction of site facilities	3	<ul style="list-style-type: none"> Unexpected Finds Procedure
Crows Nest	All	Potential for late 19 th to mid 20 th century remains. Unlikely to reach threshold for local significance	Open shaft bulk excavation Demolition and construction of site facilities	3	<ul style="list-style-type: none"> Unexpected Finds Procedure
Victoria Cross	VC 2	Low potential for remains of c.1880s cistern and outhouse	Direct impact – bulk excavation	2	<ul style="list-style-type: none"> AMS Monitoring if required
	VC 3	Low-Moderate potential for potentially locally significant remains of c.1880s structures, cisterns and outhouses	Direct impact – bulk excavation	1	<ul style="list-style-type: none"> AMS Test/Salvage
	VC 1 VC 4 VC 5	Nil-Low potential for archaeological remains. Unlikely to reach significance threshold	Demolition, levelling and construction of site amenities	3	<ul style="list-style-type: none"> Unexpected Finds Procedure

Site	Site code	Potential archaeology	Impact	Management zone	Mitigation
Blues Point	BP 1	Moderate potential for locally significant archaeology associated with the 19 th century occupation and development of the ferry service and boatbuilding industry in Blues Point	Direct impact – retrieval shaft excavation Potential direct impact – landscaping (benching or cut/fill etc.) and construction of site amenities	1 / 2	<ul style="list-style-type: none"> AMS Test/Salvage in bulk excavation area Monitoring or Test/Salvage of other ground works
	BP 2 BP 3	Moderate-High potential for archaeological evidence associated with the 19 th century development of the ferry service and boatbuilding industry in Blues Point (State and local)	Potential direct impact – landscaping and construction of site amenities	2	<ul style="list-style-type: none"> AMS Monitoring or Test/Salvage
	BP 4	Low potential for locally significant remains	Potential direct impact – demolition and construction of site amenities	3	<ul style="list-style-type: none"> Unexpected Finds Procedure
Barangaroo	B 2 (west half)	Moderate potential for local and State significant archaeological evidence associated 19 th century wharf development and occupation	Direct impact – bulk excavation for station construction	1	<ul style="list-style-type: none"> AMS Test/Salvage
	B 3	Moderate-High potential for locally significant archaeological evidence associated with Cuthbert's shipyard	Direct impact – bulk excavation for station entrance	1	<ul style="list-style-type: none"> AMS Salvage
	B 5 (east only)	Moderate potential for locally significant archaeological evidence associated with 19 th century wharf development and occupation	Direct impact – bulk excavation for substation	1	<ul style="list-style-type: none"> AMS Test/Salvage
	B 1 B 4 B 5	Nil	Nil	3	<ul style="list-style-type: none"> Unexpected Finds Procedure
Martin Place	MP 3	Low potential for State significant archaeological remains associated with early landscape and informal colonial use pre 1840	Direct impact – demolition and bulk excavation	1	<ul style="list-style-type: none"> AMS Monitoring if required
	MP 1 MP 2 MP 4 MP 5 MP 6	Nil	Nil	3	<ul style="list-style-type: none"> Unexpected Finds Procedure
Pitt Street	PS 1	Moderate potential for State and locally significant archaeological remains dating from c.1820s	Direct impact – demolition, piling and bulk excavation	1	<ul style="list-style-type: none"> AMS Monitoring demolition Salvage

Site	Site code	Potential archaeology	Impact	Management zone	Mitigation
Central Station	PS 2 PS 3	Low potential for locally significant archaeological remains dating from c.1850s	Direct impact – demolition, piling and bulk excavation	1	<ul style="list-style-type: none"> AMS Monitoring / Salvage if required
	PS 4 PS 5 PS 6 PS 7 PS 8	Moderate-High potential for State and locally significant archaeological remains dating from c.1820s.	Direct impact – demolition, piling and bulk excavation	1	<ul style="list-style-type: none"> AMS Monitoring demolition Salvage
	PS 9 PS 10	Nil	Nil	3	<ul style="list-style-type: none"> Unexpected Finds Procedure
	CS 2 CS 3	Low potential for State significant archaeological remains associated with Devonshire Cemetery	Direct impact – piling and bulk excavation Potential direct impacts – temporary platform construction, demolition and levelling	1 / 2	<ul style="list-style-type: none"> AMS Monitoring / Test / Salvage if required Exhumation Policy applies
	CS 4	Moderate-High potential for rail-related remains from 1850s-1900s Local / State	Direct impact – bulk excavation northern CS 4 Potential direct impacts – ground works, piling	1 / 2	<ul style="list-style-type: none"> AMS Test/Salvage CS 4 north Monitoring / Salvage if required CS 4
	CS 5	Low potential for remains associated with 20 th rail	Potential direct impact – ground works, piling	3	<ul style="list-style-type: none"> Unexpected Finds Procedure
	CS 6	Moderate-High potential for locally significant remains of the Wesleyan chapel and school constructed in 1847	Potential direct impact – ground works, footing excavation, piling	2	<ul style="list-style-type: none"> AMS Monitoring / Salvage if required
	CS 7	Nil	Nil	3	<ul style="list-style-type: none"> Unexpected Finds Procedure
	CS 8	Nil-Low potential for 19 th and 20 th century rail remains	Potential direct impact – ground works, footing excavation, piling	3	<ul style="list-style-type: none"> Unexpected Finds Procedure
Waterloo	WL1-5 WL7-8 WL12-14 WL16-17 (east half of site)	Evidence of c.1880s residential, commercial and light industrial development	Direct impact – bulk excavation	1	<ul style="list-style-type: none"> AMS Testing (clarify significance) Salvage if significant
	Rest (west half of site)	Evidence of c.1880s residential, commercial and light industrial development	Potential direct impacts – ground works and construction of site facilities	2	<ul style="list-style-type: none"> AMS Monitoring / Test / Salvage depending on results from east half of site

Site	Site code	Potential archaeology	Impact	Management zone	Mitigation
Marrickville Dive Site	All	Nil-Low potential for archaeological remains. Unlikely to meet significance threshold	Bulk excavation Construction of site facilities	3	<ul style="list-style-type: none"> Unexpected Finds Procedure
	PSR 1	Low potential archaeological remains associated with former infrastructure such as drains, surfaces and kerbing. Unlikely to meet significance threshold	Potential direct impacts – services investigations and relocations, trench and pit excavation	3	<ul style="list-style-type: none"> Unexpected Finds Procedure
	PSR 2	Nil – Low potential for archaeology relating to Berry’s estate. Low potential for former infrastructure such as drains, surfaces and kerbing. Unlikely to meet significance threshold	Potential direct impacts – services investigations and relocations, trench and pit excavation	3	<ul style="list-style-type: none"> Unexpected Finds Procedure
	PSR 3	Low potential for former 19 th century infrastructure such as brick or stone drains, surfaces and kerbing	Potential direct impacts – services investigations and relocations, trench and pit excavation	3	<ul style="list-style-type: none"> Unexpected Finds Procedure
Power Supply Routes (PSR)	Hickson Road (south)				
		Low – Moderate potential for truncated archaeological remains relating to the Australian Gas Works, Girard’s Flour Mill, and a number of mercantile warehouse structures along the foreshore Local / State	Potential direct impacts – services investigations and relocations, trench and pit excavation	2	<ul style="list-style-type: none"> AMS Monitoring if required
	Sussex Street				
	PSR 4	Low – Moderate potential for truncated archaeological remains relating to the former alignment of Sussex Street. Stone warehouse and/or workshop present on site by 1865. Local	Potential direct impacts – services investigations and relocations, trench and pit excavation	2	<ul style="list-style-type: none"> AMS Monitoring if required
	Rest of PSR 4				
		Nil - Low potential for former 19 th century infrastructure such as brick or stone drains, surfaces and kerbing. Unlikely to meet significance threshold	Potential direct impacts – services investigations and relocations, trench and pit excavation	3	<ul style="list-style-type: none"> Unexpected Finds Procedure

Site	Site code	Potential archaeology	Impact	Management zone	Mitigation
		Margaret Street			
		Low potential for archaeological remains such as footings and other features associated with the c.1818-1840s military barracks, nil-low potential for burials. State	Potential direct impacts – services investigations and relocations, trench and pit excavation	2	<ul style="list-style-type: none"> AMS Monitoring if required
		Hunter Street			
	PSR 5	Low potential for State significant archaeological remains relating to the Tank Stream (1788-1850s) within approximately ten metres of the outer boundary of the physical drain structure	Potential direct impacts – services investigations and relocations, trench and pit excavation	1	<ul style="list-style-type: none"> AMS Monitoring
		Castlereagh Street			
		Low potential for former infrastructure such as brick or stone drains, surfaces and kerbing. Unlikely to meet significance threshold	Potential direct impacts – services investigations and relocations, trench and pit excavation	3	<ul style="list-style-type: none"> Unexpected Finds Procedure
		Hay Street			
		Low potential for former infrastructure such as brick or stone drains, surfaces and kerbing. Unlikely to meet significance threshold	Potential direct impacts – services investigations and relocations, trench and pit excavation	3	<ul style="list-style-type: none"> Unexpected Finds Procedure
		Elizabeth Street			
	PSR 6	Low-Moderate potential for former late 19 th archaeological remains of former infrastructure such as drains and kerbing. Unlikely to meet significance threshold	Potential direct impacts – services investigations and relocations, trench and pit excavation	3	<ul style="list-style-type: none"> Unexpected Finds Procedure
		Eddy Avenue			
		Nil - Low potential for State significant archaeology associated with the former Devonshire Cemetery	Potential direct impacts – services investigations and relocations, trench and pit excavation	1	<ul style="list-style-type: none"> AMS Monitoring
	PSR 7	Low potential for former infrastructure such as brick or stone drains, surfaces and kerbing. Unlikely to meet significance threshold	Potential direct impacts – services investigations and relocations, trench and pit excavation	3	<ul style="list-style-type: none"> Unexpected Finds Procedure

Site	Site code	Potential archaeology	Impact	Management zone	Mitigation
		Campbell Street			
		Low potential for archaeological remains of former mid 19 th century structures, and former 19 th century infrastructure such as drains and kerbing	Potential direct impacts – services investigations and relocations, trench and pit excavation	2	<ul style="list-style-type: none"> AMS Monitoring if required
	PSR 8	Rest of PSR 8			
		Low potential for archaeological remains of former late 19 th century terraces, infrastructure such as drains, surfaces and kerbing. Unlikely to meet significance threshold	Potential direct impacts – services investigations and relocations, trench and pit excavation	3	<ul style="list-style-type: none"> Unexpected Finds Procedure

CONTENTS

1.0	Introduction.....	27
1.1	Background.....	27
1.2	Site Locations	27
1.3	Report Overview	29
1.3.1	Aims	29
1.3.2	Structure	29
1.4	Assessment and Research Design Methodology.....	29
1.4.1	Outline	29
1.4.2	Grades of Archaeological Potential	30
1.4.3	Archaeological Significance.....	30
1.4.4	Archaeological Management Framework.....	30
1.5	Limitations.....	32
1.6	Authorship.....	32
2.0	Chatswood Dive Site (Northern)	33
2.1	Site Location	33
2.1.1	Land Parcels.....	33
2.2	Historical Analysis	34
2.2.1	Chatswood.....	34
2.3	Archaeological Potential	43
2.3.1	Previous Archaeological Studies	43
2.3.2	Land Use Summary	44
2.3.3	Previous Impacts	44
2.3.4	Potential Archaeological Remains.....	44
2.3.5	Summary of Archaeological Potential.....	50
2.4	Archaeological Significance.....	52
2.4.1	Site NC 1 and 2 – Railway Corridor.....	52
2.4.2	Site NC 3 and 4	52
2.4.3	Site NC 5 – Bryson’s Cottage and Store site	53
2.4.4	Site NC 6 – The School of Arts Site	55
2.4.5	Statement of Archaeological Significance	56
2.5	Archaeological Impacts	59
2.5.1	Proposed Works	59
2.5.2	Potential Archaeological Impacts	59
2.6	Archaeological Management	61
2.6.1	Archaeological Methodology	61
2.6.2	Research Questions	62

3.0	Crows Nest Station	65
3.1	Site Location	65
3.1.1	Land Parcels	65
3.2	Historical Analysis	66
3.2.1	European Exploration and Early Land Grants (1788 – 1880)	66
3.2.2	Residential Subdivision (1880 – 1930)	70
3.2.3	Early-Mid Twentieth Century Commercial Development (1930 – 1950)	73
3.2.4	Post-War Commercial Development (1950 – Present)	75
3.3	Archaeological Potential	75
3.3.1	Previous Archaeological Studies	75
3.3.2	Land Use Summary	76
3.3.3	Previous Impacts	76
3.3.4	Potential Archaeological Remains	77
3.3.5	Summary of Archaeological Potential	78
3.4	Archaeological Significance	81
3.4.1	Assessment of Archaeological Significance	81
3.4.2	Statement of Archaeological Significance	82
3.5	Archaeological Impacts	83
3.5.1	Proposed Works	83
3.5.2	Potential Archaeological Impacts	84
3.6	Archaeological Management	85
4.0	Victoria Cross Station	86
4.1	Site Location	86
4.1.1	Land Parcels	86
4.2	Historical Analysis	87
4.2.1	European Exploration and Early Land Grants (1788 – 1838)	87
4.2.2	Initial Residential Subdivisions and Developments (1838 – 1880s)	88
4.2.3	Commercial Development (1880s – 1932)	91
4.2.4	Post Sydney Harbour Bridge Commercial Development (1932 – Present)	94
4.3	Archaeological Potential	97
4.3.1	Previous Archaeological Studies	97
4.3.2	Land Use Summary	97
4.3.3	Previous Impacts	97
4.3.4	Potential Archaeological Remains	97
4.3.5	Summary of Archaeological Potential	99
4.3.6	Assessment of Archaeological Significance	100
4.3.7	Significance Assessment	100
4.3.8	Statement of Archaeological Significance	101

4.4	Archaeological Impact	103
4.4.1	Proposed Works	103
4.4.2	Potential Archaeological Impacts	104
4.5	Archaeological Management	105
4.5.1	Archaeological Methodology	105
4.5.2	Research Questions	106
5.0	Blues Point Temporary Site	108
5.1	Site Location	108
5.1.1	Land Parcels	108
5.2	Historical Analysis	109
5.2.1	European Exploration and Early Land Grants (1788 – 1850s)	109
5.2.2	Subdivision and Development of the Wharf (1850s – 1900)	112
5.2.3	Early Twentieth Century Wharf Development (1900 – 1932)	119
5.2.4	Post Sydney Harbour Bridge (1932 – Present)	120
5.3	Archaeological Potential	122
5.3.1	Previous Archaeological Studies	122
5.3.2	Land Use Summary	122
5.3.3	Previous Impacts	122
5.3.4	Potential Archaeological Remains	123
5.3.5	Summary of Archaeological Potential	126
5.3.6	Assessment of Archaeological Significance	127
5.3.7	Significance Assessment	127
5.3.8	Statement of Archaeological Significance	129
5.4	Archaeological Impacts	132
5.4.1	Proposed Works	132
5.4.2	Potential Archaeological Impacts	132
5.5	Archaeological Management	134
5.5.1	Archaeological Methodology	134
5.5.2	Research Questions	135
6.0	Barangaroo Station	137
6.1	Site Location	137
6.1.1	Land Parcels	137
6.2	Historical Analysis	139
6.2.1	Early Land Grants	139
6.2.2	Shipbuilding, Wharfage and Industrial Use	141
6.2.3	Foreshore Resumption and Construction of Hickson Road	146
6.2.4	Barangaroo Container Terminal and Commercial Redevelopment	149
6.3	Archaeological Potential	150

6.3.1	Previous Archaeological Studies	150
6.3.2	Land Use Summary	150
6.3.3	Previous Impacts	151
6.3.4	Potential Archaeological Remains	152
6.3.5	Summary of Archaeological Potential.....	156
6.4	Archaeological Significance.....	157
6.4.1	Assessment of Archaeological Significance	157
6.4.2	Other archaeological remains within the Barangaroo Station site	160
6.4.3	Statement of Archaeological Significance	160
6.5	Archaeological Impacts	162
6.5.1	Proposed Works	162
6.5.2	Potential Archaeological Impacts	162
6.6	Archaeological Management	164
6.6.1	Archaeological Methodology	164
6.6.2	Research Questions	165
7.0	Martin Place Station.....	169
7.1	Site Location	169
7.1.1	Land Parcels.....	169
7.2	Historical Analysis	171
7.2.1	Early Land grants.....	171
7.2.2	Commercial Development	173
7.2.3	Twentieth Century Development and Martin Place	176
7.2.4	Post-War Commercial Development	177
7.3	Archaeological Potential	179
7.3.1	Previous Archaeological Studies	179
7.3.2	Land Use Summary	179
7.3.3	Previous Impacts	179
7.3.4	Potential Archaeological Remains.....	181
7.3.5	Summary of Archaeological Potential.....	183
7.4	Archaeological Significance.....	183
7.4.1	Assessment of Archaeological Significance	183
7.4.2	Statement of Archaeological Significance	185
7.5	Archaeological Impacts	186
7.5.1	Proposed Works	186
7.5.2	Potential Archaeological Impacts	186
7.6	Archaeological Management	187
7.6.1	Archaeological Methodology	188
7.6.2	Research Questions	188

8.0	Pitt Street Station.....	190
8.1	Site Location	190
8.1.1	Land Parcels.....	190
8.2	Historical Analysis	191
8.2.1	Early Land Grants.....	191
8.2.2	Early-Mid Nineteenth Century Development	193
8.2.3	Nineteenth Century Urbanisation	195
8.2.4	Early Twentieth Century Commercial Development.....	199
8.2.5	Late Twentieth Century Commercial Development.....	202
8.3	Archaeological Potential	203
8.3.1	Previous Archaeological Studies	203
8.3.2	Land Use Summary.....	203
8.3.3	Previous Impacts	204
8.3.4	Potential Archaeological Remains.....	205
8.3.5	Summary of Archaeological Potential.....	208
8.4	Assessment of Archaeological Significance.....	211
8.4.1	Environment and Land Clearance Activities (1788 – 1820s)	212
8.4.2	Earlier Settler Development (Phase 1: 1820s-1840s).....	213
8.4.3	Mid-Late Nineteenth Century Urbanisation (Phase 2: 1840s-1900)	214
8.4.4	Steel's Infant's Training School (Phase 2)	215
8.4.5	Statement of Archaeological Significance	216
8.5	Archaeological Impacts	218
8.5.1	Proposed Works	218
8.5.2	Potential Archaeological Impacts	219
8.6	Archaeological Management	220
8.6.1	Archaeological Methodology	220
8.6.2	Research Questions	221
9.0	Central Station.....	225
9.1	Site Location	225
9.1.1	Land Parcels.....	225
9.2	Historical Analysis	226
9.2.1	Early European Settlement and the Devonshire Street Cemetery (1788 – 1855)	226
9.2.2	First and Second Railway Stations (1855 – 1900)	231
9.2.3	Twentieth Century Land Resumptions and Station Expansion (1901 – 1930)	235
9.2.4	Mid-to-late Twentieth Century Station Modifications (1930 – Present).....	237
9.3	Archaeological Potential	237
9.3.1	Previous Archaeological Studies.....	237
9.3.2	Land Use Summary.....	239

9.3.3	Previous Impacts	239
9.3.4	Potential Archaeological Remains.....	240
9.3.5	Summary of Archaeological Potential.....	248
9.4	Archaeological Significance.....	251
9.4.1	Assessment of Archaeological Significance	251
9.4.2	Statement of Archaeological Significance	253
9.5	Archaeological Impacts	255
9.5.1	Proposed Works	255
9.5.2	Potential Archaeological Impacts	256
9.6	Archaeological Management	258
9.6.1	Archaeological Methodology	259
9.6.2	Research Questions	260
10.0	Waterloo Station	263
10.1	Site Location	263
10.1.1	Land Parcels	263
10.2	Historical Analysis	265
10.2.1	Early Land Grants and Establishment of Industry (1788 – 1882)	265
10.2.2	Residential Subdivision (1880 – 1930).....	268
10.2.3	Early Twentieth Century Manufacturing and Industry (1930 – 1950).....	272
10.2.4	Post-War Commercial Decline and Modern Development (1950 – Present).....	274
10.3	Archaeological Potential	275
10.3.1	Previous Archaeological Studies	275
10.3.2	Land Use Summary	276
10.3.3	Previous Impacts	276
10.3.4	Potential Archaeological Remains.....	277
10.3.5	Summary of Archaeological Potential.....	278
10.4	Archaeological Significance.....	282
10.4.1	Assessment of Archaeological Significance	282
10.4.2	Statement of Archaeological Significance	283
10.5	Archaeological Impacts	284
10.5.1	Proposed Works	284
10.5.2	Potential Archaeological Impacts	285
10.6	Archaeological Management	286
10.6.1	Archaeological Methodology	286
10.6.2	Research Questions	287
11.0	Power Supply Routes	289
11.1	Site Locations	289
11.1.1	Land Parcels.....	289

11.2	Archaeological Potential	291
11.2.1	Introduction	291
11.2.2	Chatswood Dive Site Supply (PSR 1)	291
11.2.3	Crows Nest Station Supply (PSR 2)	292
11.2.4	Victoria Cross Station Supply (PSR 3)	293
11.2.5	Barangaroo Station/Hickson Road Supply (PSR 4)	294
11.2.6	Martin Place Station Supply (PSR 5).....	296
11.2.7	Central Station Site Supply (PSR 6).....	299
11.2.8	Marrickville Dive Site Supply (PSR 7)	301
11.2.9	Pitt Street Site Supply (PSR 8).....	302
11.3	Archaeological Impacts	305
11.3.1	Proposed Works	305
11.3.2	Archaeological Impacts	305
11.4	Archaeological Methodology	306
11.4.1	Archaeological Methodology	308
12.0	Archaeological Methodologies	309
12.1	Heritage Induction	309
12.2	Archaeological Investigation	309
12.2.1	Excavation Director	309
12.2.2	Specialists.....	310
12.3	Work Stage Specific Archaeological Method Statements	310
12.4	In-Situ Conservation	310
12.5	Research Questions	311
12.6	Test Excavation	311
12.7	Test/Salvage Excavation	311
12.8	Salvage Excavation	311
12.9	Monitoring	312
12.10	Archaeological Recording.....	312
12.11	Underfloor and Cesspit / Well Deposits.....	313
12.11.1	Underfloor Deposits.....	313
12.11.2	Cesspit / Well Deposits.....	313
12.11.3	Sieving Strategy.....	313
12.12	Environmental Samples.....	313
12.12.1	Sampling Strategy	313
12.13	Artefacts.....	314
12.14	Unexpected Finds Procedure	314
12.15	Human Skeletal Remains	314
12.16	Aboriginal Heritage	314

12.17	Preliminary Results Reporting	315
12.18	Post-Excavation Analysis and Final Report	315
12.19	Public Interpretation.....	315
13.0	Archaeological Management Summary	316
13.1	Introduction	316
13.1.1	Archaeological Management Zones	316
13.2	Summary of Site Specific Archaeological Management	316
13.2.1	Chatswood Dive Site	316
13.2.2	Artarmon Substation	317
13.2.3	Crows Nest Station	317
13.2.4	Victoria Cross Station	318
13.2.5	Blues Point Temporary Site	318
13.2.6	Barangaroo Station.....	319
13.2.7	Martin Place Station	319
13.2.8	Pitt Street Station.....	319
13.2.9	Central Station	320
13.2.10	Waterloo Station	321
13.2.11	Marrickville Dive Site	321
13.2.12	Power Supply Routes (PSR)	322
13.3	Archaeological Management Zone Mapping.....	324
14.0	Appendices	338
14.1	Unexpected Finds Procedure	338

FIGURES

Figure 1-1: Project overview and station locations.....	28
Figure 2-1: Chatswood dive site showing existing modern development and site codes.....	34
Figure 2-2: Pre-1860s parish map of Willoughby, showing Isaac Nicholls 380-acre grant and John Fleming's 25-acre grant. (Source: LPI LWc 140613, AO map 6205).....	36
Figure 2-3: Webb's farm. Cottage within Mowbray Road corridor. (Source: MLNSW Copy of E.J.H. Knapp's Plan of Mr. Nichol's Estate at Hunters Hill. Z/M3 811.141/1936/1).....	37
Figure 2-4: Bryson's cottage c.1870s (Source: Picture Willoughby).....	38
Figure 2-5: 1881 subdivision of area showing Byron's building (Source Trove Z/SP/C15/ 446); station site boundaries indicative.....	38
Figure 2-6: Detail from the 1899 Sydney Water plan for Willoughby (Sheet 4). Sydney Water/Water NSW Historical Research Archive PWDS1544 – S1411.	39
Figure 2-7: Early twentieth century subdivision plan of the Chatswood area, showing railway and residential development on former garden and orchard estates, approximate location of study area in red (Source: NLA).....	40
Figure 2-8: Detail from a Sydney Water plan for Willoughby (Sheet 44). The plan is undated but was updated between 1908 and 1960. Sydney Water/Water NSW Historical Research Archive BLKWTL3312.	41
Figure 2-9: School of Arts building on Mowbray Road as part of the School c.1910 (Source: Picture Willoughby).....	41
Figure 2-10: 1924 subdivision plan Trove Z/SP/C15/42. Study area boundaries are indicative.....	42
Figure 2-11: Shops along the Pacific Highway on the western part of the study area in 1949 (Source: Picture Willoughby).....	42
Figure 2-12: 1943 aerial photograph of study area. School of Arts building outlined in orange.....	43
Figure 2-13: Overlay of historical structures from the 1899 and 1908-1960 plan.....	45
Figure 2-14: Sydney Water field book sketch depicting houses and structures in NC 3 by 1898.....	46
Figure 2-15: Sydney Water field book sketch from 1898 showing the structures in NC 3.....	47
Figure 2-16: Sydney Water field book sketch of the properties on the corner of Mowbray Road and Gordon Road (Pacific Highway) in 1898. Bryson's cottage is named 'Sarina'.....	48
Figure 2-17: Sydney Water field book sketch of the former School of Arts building and Penzance in 1898.....	49
Figure 2-18: Areas with potential for significant archaeological remains at the Chatswood dive site..	58
Figure 2-19: Potential archaeological impacts - Chatswood dive site.....	60
Figure 3-1: Crows Nest Station site showing existing modern development and site codes.....	66
Figure 3-2: William Dawes' Map of New South Wales, 1792.....	67
Figure 3-3: Crows Nest Cottage in 1904. Source: Stanton Library.....	68
Figure 3-4: Watercolour painting of view from Berry's Estate, by Conrad Martens 1861.....	69
Figure 3-5: 1850s Parish Map of Willoughby, with Crows Nest Station site in blue.....	69
Figure 3-6: 1890 North Sydney Council block plan showing residential structures. Crows Nest Station site outlined in blue. Source: Stanton Library.....	71

Figure 3-7: 1909 Subdivision plan on Lane Cove Road showing early residential structures. Crows Nest Station site marked in blue. Source: National Library of Australia.....	71
Figure 3-8: Early 1900s photograph of Crows Nest Junction looking south (corner of Falcon Street and Pacific Highway)	72
Figure 3-9: 1912 view of Lane Cove Road looking north from Crows Nest Junction and illustrating the urban character of the time. Source: Stanton Library	72
Figure 3-10: 1939 building plans for vehicle garage and produce market, corner of Hume Street and Lane Cove Road. Source: Stanton Library.....	73
Figure 3-11: 1941 building plans for timber yard, corner of Oxley Street and Lane Cove Road. Source: Stanton Library	74
Figure 3-12: 1943 Aerial photograph showing commercial development on Pacific Highway. Crows Nest Station site marked in blue. Source: Lands and Property Information	74
Figure 3-13: 1940s aerial photograph showing typical commercial structures on Pacific Highway. Source: National Library of Australia	75
Figure 3-14: Archaeological potential at the Crows Nest Station site	83
Figure 3-15: Potential archaeological impacts - Crows Nest Station site	84
Figure 4-1: Victoria Cross Station site showing existing modern development and site codes.....	87
Figure 4-2: Property plan of Hastings Elwin dating to 1840-1849 which also shows the purchase of property by Judge Burton (source: National Library of Australia http://nla.gov.au/nla.obj-229988154/view)	89
Figure 4-3: Parish map of Willoughby dating to the 1860s (source: National Library of Australia http://nla.gov.au/nla.obj-229997080/view).....	89
Figure 4-4: Plan of allotments of St Leonards dated to 1857 (source: National Library of Australia http://nla.gov.au/nla.obj-229987895/view).....	90
Figure 4-5: Photo of Berry Street near Miller Street dated to c.1861. The southern construction site is located on the upper right hand side at the solitary tree, with no evidence of any developments except for fencing (source: Stanton Library)	90
Figure 4-6: Parish map of Willoughby dating to 1887 (source: National Library of Australia http://nla.gov.au/nla.obj-232482086/view).....	91
Figure 4-7: Block plan map of North Sydney (Sheet No. 29) dating to 1892 (source: Stanton Library File /000029). Victoria Cross Station site shown in blue	92
Figure 4-8: Photo of Miller Street looking north from Mount Street, dated to c.1890 (source: Stanton Library File 000/000169).....	93
Figure 4-9: Sale of Lord's Paddock estate, c. 1892, with the Montrose building present in the bottom left (source: Stanton Library File SP0/SP0138). Victoria Cross Station site shown in blue.....	93
Figure 4-10: Photo of the shops at the corner of Miller and Berry Street (north-west corner of southern site) dated to c. 1960s (source: Stanton Library File 003/003015)	94
Figure 4-11: Photo of the shops (left) at the southwest corner of the southern site dated to c. 1950s (source: Stanton Library File T00/T0067).....	95
Figure 4-12: Aerial photo of North Sydney dated to 1943 (source: LPI SIX Maps). Victoria Cross Station site shown in blue.....	95
Figure 4-13: Aerial photo of North Sydney dated to 1977 (source: Stanton Library File C00/C0039001)	96

Figure 4-14: Archaeological potential at the Victoria Cross Station site 103

Figure 4-15: Potential archaeological impacts - Victoria Cross Station site..... 104

Figure 5-1: Blues Point temporary site showing existing modern development and site codes 109

Figure 5-2: Plan of Port Jackson, coast of New South Wales as surveyed by Captain Hunter 1788 (map published in 1791) (source: <http://nla.gov.au/nla.obj-234845130/view>)..... 110

Figure 5-3: Early map of the future North Sydney area dating to c.1820s (source: Warne 2005:14) 111

Figure 5-4: Etching of Blues Point and view west towards Parramatta River, tentatively dated to c.1840s (source: Stanton Library File 000/000393) 112

Figure 5-5: View west across Blues Point, image captured in 1858-1859 (source: State Library of NSW SPF 799) 113

Figure 5-6: Parish map of Willoughby dated to 1864 showing the Blues Point Estate (source: <http://trove.nla.gov.au/work/32131978?q=blues+point&c=map&versionId=39032532>) 114

Figure 5-7: Blues Point subdivision plans dated to c.1867 (source: <http://acms.sl.nsw.gov.au/album/ItemViewer.aspx?itemid=1291960&suppress=N&imgindex=12>.... 115

Figure 5-8: Plan of Blues Point Estate dating to c.1871. (source: <http://acms.sl.nsw.gov.au/album/ItemViewer.aspx?itemid=1291960&suppress=N&imgindex=13>.... 116

Figure 5-9: View southwest across Blues Point showing small dwelling in the temporary site and overgrown steep sandstone sided point to the west/ southwest. Date of image c. early 1870s (source: State Library of NSW SPF 933) 117

Figure 5-10: View southwest over Blues Point. This image shows extension of structure within temporary site, formalisation of wharfage and shoreline, quarrying activity. Date of image c. 1890s (State Library of NSW SPF 935) 117

Figure 5-11: Block plan map of the Blues Point temporary site dating to 1891 showing the extension of the house and the construction of additional structures (source: Stanton Library File /000016) ... 118

Figure 5-12: South end of the site in the early 1890s showing the excavated area where a warehouse was soon built (source: Stanton Library File 000/000958) 118

Figure 5-13: South end of the Blues Point temporary site and vehicular wharf in 1924, with the south warehouse visible on the left (source: City of Sydney Archives 079/079847) 119

Figure 5-14: Aerial photograph of McMahons Point and Berrys Bay c.1921 (source: Stanton Library File 002/002624)..... 120

Figure 5-15: Image assumed to have been taken early Second World War of the SS Stratheden passing Blues Point. Structures within the Blues Point temporary site visible in the background (source: Australian War Memorial ID P00172.001)..... 121

Figure 5-16: Aerial photo of Blues Point dating to 1943..... 121

Figure 5-17: Historical structure overlay – Blues Point temporary site 125

Figure 5-18: Areas with potential significant archaeology at Blues Point temporary site 131

Figure 5-19 Potential archaeological impacts - Blues Point temporary site 133

Figure 6-1: Barangaroo Station site showing existing modern development and site codes 138

Figure 6-2 Development as of 1802 with no structures in the Barangaroo area 140

Figure 6-3: Plan dating to 1822 identifying lime kilns in the northern part of the study area (*28 lime kilns*) 140

Figure 6-4: Overlay of study area with Harper’s 1823 plan. Note the study area is indicative as due to inaccuracies in the early map 142

Figure 6-5 Early land grants along Millers Point foreshore (1833)..... 143

Figure 6-6: 1854 Plan with the Barangaroo Station construction site 144

Figure 6-7: 1865 Trigonometric plan with Barangaroo Station construction site 145

Figure 6-8 View of Cuthbert’s Shipyard, 1870..... 146

Figure 6-9 Established housing developed along Clyde, Hart and Wentworth Street 146

Figure 6-10 View of cutting on Hickson Road and warehouses on the wharf..... 147

Figure 6-11: 1900 Resumption Plan with the Barangaroo Station construction site..... 148

Figure 6-12: 1949 aerial photograph with Barangaroo Station construction site 149

Figure 6-13: Indicative shorelines at Barangaroo in the nineteenth century 152

Figure 6-14: Historical features and shoreline overlay 155

Figure 6-15: Areas with potential for significant archaeology at Barangaroo Station site..... 161

Figure 6-16: Potential archaeological impacts – Barangaroo Station site 163

Figure 7-1: Martin Place Station site showing existing modern development and site codes 170

Figure 7-2: Sketch of huts near the Martin Place Station site (Pitt, Castlereagh and Elizabeth Streets) 171

Figure 7-3: de Lesueur’s sketch of the colony of Sydney, 1802. Indicative Station site location marked in red..... 172

Figure 7-4: 1823 (Harper) plan showing the Martin Place Station site 172

Figure 7-5: 1833 map with Martin Place Station site shown in blue (Source:1833 City Survey Section 39 Plan-Historical Atlas of Sydney) 173

Figure 7-6: Shield’s 1844 plan of Sydney, Martin Place Station site location shown in blue is indicative..... 174

Figure 7-7: 1865 Trigonometric Survey of Sydney, Martin Place Station site in blue 175

Figure 7-8: 1880s Doves Map with Martin Place Station site shown in blue (Source: Block 14, 15, 16 of Doves 1880 plan of Sydney – Historical Atlas of Sydney) 176

Figure 7-9: 1956 plan with Martin Place Station site shown in blue..... 178

Figure 7-10: Construction of Martin Place Station using open-cut excavation (Source: City of Sydney Archives)..... 178

Figure 7-11: Areas in the Martin Place Station site with known prior extensive below-ground excavation..... 181

Figure 7-12: Archaeological potential of Martin Place Station site..... 185

Figure 7-13: Potential archaeological impacts – Martin Place Station site 187

Figure 8-1: Pitt Street Station site showing existing modern development and site codes 191

Figure 8-2: Approximate Pitt Street Station site shown in red on de Lesueur’s 1802 map..... 192

Figure 8-3: Harper’s 1823 map with Pitt Street Station site shown in blue 193

Figure 8-4: 1833 City Section Survey Plan, northern Pitt Street Station site shown in blue 194

Figure 8-5: 1833 City Section Survey Plan, southern Pitt Street Station site shown in blue 194

Figure 8-6: Detail of sketch of Sydney, viewed from Hyde Park, 1829. Pitt Street Station site in left background.....	195
Figure 8-7: Francis Webb Shield's Plan of Sydney, 1844, with indicative Pitt Street Station site	196
Figure 8-8: Woolcott and Clarke's 1854 Plan of Sydney with Pitt Street Station site	197
Figure 8-9: Fowles 1848 sketch of Pitt Street, between Market and Park Streets. Steel's Infant's Training School outlined in red.....	197
Figure 8-10: 1865 Trigonometrical Survey of Sydney, with northern Pitt Street Station site	198
Figure 8-11: 1865 Trigonometrical Survey of Sydney, with southern Pitt Street Station site	198
Figure 8-12: 1880 Doves Plan of Sydney with northern Pitt Street Station site.....	199
Figure 8-13: 1880 Doves Plan of Sydney, with southern Pitt Street Station site	199
Figure 8-14: 1930s Fire Underwriter's Plan, with northern Pitt Street Station site.....	200
Figure 8-15: 1930s Fire Underwriter's Plan, with southern Pitt Street Station site	200
Figure 8-16: City Building's Surveyor Detail Sheets from the 1950s, with northern Pitt Street Station site	201
Figure 8-17: City Building's Surveyor Detail Sheets from the 1950s, with southern Pitt Street Station site	201
Figure 8-18: Hotel Windsor in 1970, formerly named Barley Mow Hotel and currently The Windsor on Park (Source: City of Sydney Archives)	202
Figure 8-19: Pitt Street Markets in 1970, formerly Sargent's Ltd, and Keary's Coach factory, currently operating as a Hungry Jacks (Source: City of Sydney Archives).....	202
Figure 8-20: Young's Chambers in 1970, currently operating as McDonalds (Source: City of Sydney Archives).....	203
Figure 8-21: Historical structures and lot boundaries (Pitt Street Station site north)	207
Figure 8-22: Historical structures and lot boundaries (Pitt Street Station site south).....	207
Figure 8-23: Areas with potential for significant archaeology at Pitt Street Station site.....	218
Figure 8-24: Potential archaeological impacts - Pitt Street Station site	219
Figure 9-1: Central Station site showing existing modern development and site codes.....	226
Figure 9-2: Sketch of toll gate with adjacent Benevolent Asylum (Poor House) in 1821 by Edward Mason, facing south. The site of the future Central Station is located on the left of the image, behind the Benevolent Asylum.....	228
Figure 9-3: Extract from the 1845 Sheilds plan of Sydney showing the burial ground and Government Paddocks.....	228
Figure 9-4: 1870 Photo of 1867 Wesleyan Church (right) and 1847 Wesleyan School Hall (left of frame)	229
Figure 9-5: 1848 plan of proposed railway station and the Redfern and Haymarket area. The green and yellow shaded areas between Devonshire and Cleveland Streets are the location of the Government Paddocks	230
Figure 9-6: View of Sydney looking north from the Government Paddocks, 1844	230
Figure 9-7: 1850 painting of the turning of the first sod of ground for the construction of the first railway station.....	232
Figure 9-8: 1871 Photo of First Sydney Railway station carriage buildings	232

Figure 9-9: 1865 Trigonometric Survey of Sydney map of railway station facilities with Central Station site shown in blue 233

Figure 9-10: 1895 photo of the second railway station, facing south-east from Pitt Street..... 234

Figure 9-11: Second Railway Station map from CMP (Central Station site shown in blue) 1895 234

Figure 9-12: 1890s photo of the Church of England area of the Devonshire Street Cemetery, facing south from north-eastern corner 235

Figure 9-13: 1902 photo of the cleared Devonshire Street Cemetery area for the construction of the Main Concourse, view from Pitt Street facing south 236

Figure 9-14: 1943 Aerial photo with Central Station site shown in blue, source: LPI 237

Figure 9-15: 1901 photo of interments being exhumed in the Devonshire Street cemetery 240

Figure 9-16: Graphic illustrating Central Station in 1855 (source: CMP 2013) 243

Figure 9-17: Graphic illustrating Central Station in 1865 (source: CMP 2013) 244

Figure 9-18: Graphic illustrating Central Station in 1887 (source: CMP 2013) 245

Figure 9-19: Graphic illustrating Central Station in 2013 (source: CMP 2013) 246

Figure 9-20: Overlay of potential archaeological remains from the CMP 2013. Note this does not include illustrations of former railway related items in the south west of Central Station 247

Figure 9-21: Devonshire Cemetery and denomination areas 248

Figure 9-22: Areas for potential significant archaeology at Central Station site 255

Figure 9-23: Potential archaeological impacts - Central Station site 258

Figure 10-1: Waterloo Station site showing existing modern development and site codes 264

Figure 10-2: Geological sketch map of the Estuarine Beds, Shea's Creek Canal, Sydney, 1896. Indicative Waterloo Station site location shown in red 265

Figure 10-3: Plan of portions 1 to 11 at Shea's Creek, Cook's River, Parish of Petersham, 1859.... 266

Figure 10-4: Old Botany Road, continuation of Bourke Street, May 1873 267

Figure 10-5: Higginbotham & Robinson map of Waterloo, c.1885..... 269

Figure 10-6: Higginbotham & Robinson map of Waterloo, 1885-1890 270

Figure 10-7: 1895 Block plan showing residential and industrial/commercial structures..... 271

Figure 10-8: Victoria Park Racecourse, 1930s image via SLNSW 272

Figure 10-9: Dunkerley Hat Mills, Waterloo hat moulds and fabric rollers, 1963, image via SLNSW 273

Figure 10-10: Aerial view of Waterloo, 1943 image via sixmaps 273

Figure 10-11: 1951 Civic Survey of Sydney 274

Figure 10-12: Regional map of Waterloo, 1968 275

Figure 10-13: Archaeological potential of Waterloo Station site 284

Figure 10-14: Potential archaeological impacts - Waterloo Station site..... 285

Figure 11-1: Power supply routes overview 290

Figure 11-2: Chatswood Dive Site power supply route 291

Figure 11-3: Crows Nest Station power supply route..... 292

Figure 11-4: Victoria Cross Station power supply route 293

Figure 11-5: Barangaroo Station/Hickson Road power supply route 295

Figure 11-6: Martin Place Station power supply route 296

Figure 11-7: Military barracks on an 1837 map of Sydney..... 297

Figure 11-8: Map showing the Tank Stream 298

Figure 11-9: Central Station site power supply route 300

Figure 11-10: Marrickville Dive Site power supply route 301

Figure 11-11: Pitt Street Station site power supply route 302

Figure 11-12: Potential archaeological impacts Hickson Road and Sussex Street power supply routes..... 305

Figure 11-13: Potential archaeological impacts Margaret to Hunter Street power supply routes 306

Figure 13-1: Chatswood dive site archaeological management zones..... 324

Figure 13-2: Artarmon archaeological management zones 325

Figure 13-3 Crows Nest archaeological management zones 326

Figure 13-4: Victoria Cross Station site archaeological management zones..... 327

Figure 13-5: Blues Point temporary site archaeological management zones 328

Figure 13-6: Barangaroo Station site archaeological management zones 329

Figure 13-7: Martin Place Station site archaeological management zones 330

Figure 13-8: Pitt Street archaeological management zones 331

Figure 13-9: Central archaeological management zones 332

Figure 13-10: Waterloo archaeological management zones..... 333

Figure 13-11: Marrickville archaeological management zones 334

Figure 13-12: PSR 4 Hickson Road and Sussex Street PSR archaeological management zone 335

Figure 13-13: PSR 5 Margaret Street to Hunter Street archaeological management zones 336

Figure 13-14: PSR 6 Central to Eddy Avenue archaeological management zone 337

TABLES

Table 1-1: Archaeological management framework.....	31
Table 2-1: Land Parcels in the Chatswood dive site (northern) area	33
Table 2-2: Summary of potential archaeological remains at the Chatswood dive site	50
Table 2-3: Summary of areas with potential for significant archaeology at the Chatswood dive site ..	57
Table 2-4: Summary of archaeological impact mitigation for the Chatswood dive site.....	61
Table 2-5: Historical themes associated with the Chatswood dive site	62
Table 3-1: Land Parcels in the Crows Nest Station site.....	65
Table 3-2: Potential archaeological remains at the Crows Nest Station site	78
Table 3-3: Archaeological potential at the Crows Nest Station site	82
Table 3-4: Summary of archaeological mitigation for the Crows Nest Station site	85
Table 4-1: Land parcels in the Victoria Cross Station site	86
Table 4-2: Summary of potential archaeological remains at the Victoria Cross Station site	99
Table 4-3: Summary of areas with potential for significant archaeological remains at the Victoria Cross Station site	102
Table 4-4: Summary of archaeological mitigation for the Victoria Cross Station site	105
Table 4-5: Historical themes associated with the Victoria Cross Station site	106
Table 5-1: Land parcels in the Blues Point temporary site area	108
Table 5-2: Summary of potential archaeological remains at the Blues Point temporary site.....	126
Table 5-3: Summary of areas with potential for significant archaeology at the Blues Point temporary site	130
Table 5-4: Summary of archaeological mitigation for Blues Point temporary site.....	134
Table 5-5: Historical themes associated with the Blues Point temporary site.....	135
Table 6-1: Land parcels and current conditions in the Barangaroo Station site	137
Table 6-2: Summary of potential archaeological remains at the Barangaroo Station site	156
Table 6-3: Summary of areas with potential for significant archaeology at the Barangaroo Station site	160
Table 6-4: Summary of archaeological mitigation for the Barangaroo Station site	164
Table 6-5: Historical themes associated with the Barangaroo Station site	165
Table 7-1: Land parcels and contemporary land use in the Martin Place Station site	169
Table 7-2: Known sub-surface excavation and construction work in the Martin Place Station site ...	180
Table 7-3: Summary of potential archaeological remains at the Martin Place Station site	183
Table 7-4: Summary of areas with potential for significant archaeology at the Martin Place Station site	185
Table 7-5: Summary of archaeological mitigation for the Martin Place Station site.....	188
Table 8-1: Land parcels and contemporary land use in the Pitt Street Station site	190
Table 8-2: Summary of basement data for Pitt Street Station site	205

Table 8-3: Summary of potential archaeological remains at the Pitt Street Station site	208
Table 8-4: Summary of areas with potential for significant archaeology at the Pitt Street Station site	217
Table 8-5: Summary of archaeological mitigation for Pitt Street Station site	220
Table 8-6: Historical themes associated with the Pitt Street Station site	221
Table 9-1: Land parcels and contemporary land use in the Central Station site	225
Table 9-2: Summary of potential archaeological remains at the Central Station site	248
Table 9-3: Summary of areas with potential for significant archaeology at the Central Station site ..	254
Table 9-4: Potential archaeological impacts - Central Station site	256
Table 9-5: Summary of archaeological mitigation for the Central Station site	259
Table 9-6: Historical themes associated with the Central Station site	260
Table 10-1: Land parcels and contemporary land use in the Waterloo Station site	263
Table 10-2: Summary of potential archaeological remains at the Waterloo Station site	278
Table 10-3: Summary of areas with potential for significant archaeology at the Waterloo Station site	283
Table 10-4: Summary of archaeological mitigation for the Waterloo Station site	286
Table 10-5: Historical themes associated with the Waterloo Station site	287
Table 11-1: Description of power supply routes	289
Table 11-2: Archaeological potential and significance in the Chatswood Dive Site power supply route (PSR 1)	292
Table 11-3: Archaeological potential and significance in the Crows Nest Station power supply route (PSR 2)	293
Table 11-4: Archaeological potential and significance in the Victoria Cross Station power supply route (PSR 3)	294
Table 11-5: Archaeological potential and significance in the Barangaroo station / Hickson Road power supply route (PSR 4)	295
Table 11-6: Archaeological potential and significance for the Martin Place Station power supply route (PSR 5)	299
Table 11-7: Archaeological potential and significance for the Central Station site power supply route (PSR 6)	300
Table 11-8: Archaeological potential and significance for the Marrickville Dive Site power supply route (PSR 7)	301
Table 11-9: Archaeological potential and significance for the Pitt Street Station site power supply route (PSR 8)	304
Table 11-10: Summary of archaeological mitigation for the power supply routes	306
Table 13-1: Summary of archaeological management requirements at Chatswood dive site	316
Table 13-2: Summary of archaeological management requirements at Artarmon substation site	317
Table 13-3: Summary of archaeological management requirements at Crows Nest station site	317
Table 13-4: Summary of archaeological management requirements at Victoria Cross station site ..	318

Table 13-5: Summary of archaeological management requirements at Blues Point temporary construction site.....	318
Table 13-6: Summary of archaeological management requirements at Barangaroo Station site	319
Table 13-7: Summary of archaeological management requirements at Martin Place station site.....	319
Table 13-8: Summary of archaeological management requirements at Pitt Street station site	320
Table 13-9: Summary of archaeological management requirements at Central Station metro site ..	320
Table 13-10: Summary of archaeological management requirements at Waterloo Station site	321
Table 13-11: Summary of archaeological management requirements at Marrickville Dive site	321
Table 13-12: Summary of archaeological management requirements for PSR.....	322

1.0 INTRODUCTION

1.1 Background

The Sydney Metro network consists of Sydney Metro Northwest (previously known as the North West Rail Link) and Sydney Metro City & Southwest. The proposed Sydney Metro City & Southwest comprises two core components:

- The Chatswood to Sydenham project (the project), which is the subject of this Historical Archaeological Assessment and Research Design (ARD). The project would involve construction and operation of an underground rail line, about 15.5 kilometres long, and new stations between Chatswood and Sydenham.
- The second core component would involve upgrading the 13.5 kilometre rail line and existing stations from Sydenham to Bankstown which will be subject to a separate environmental assessment process.

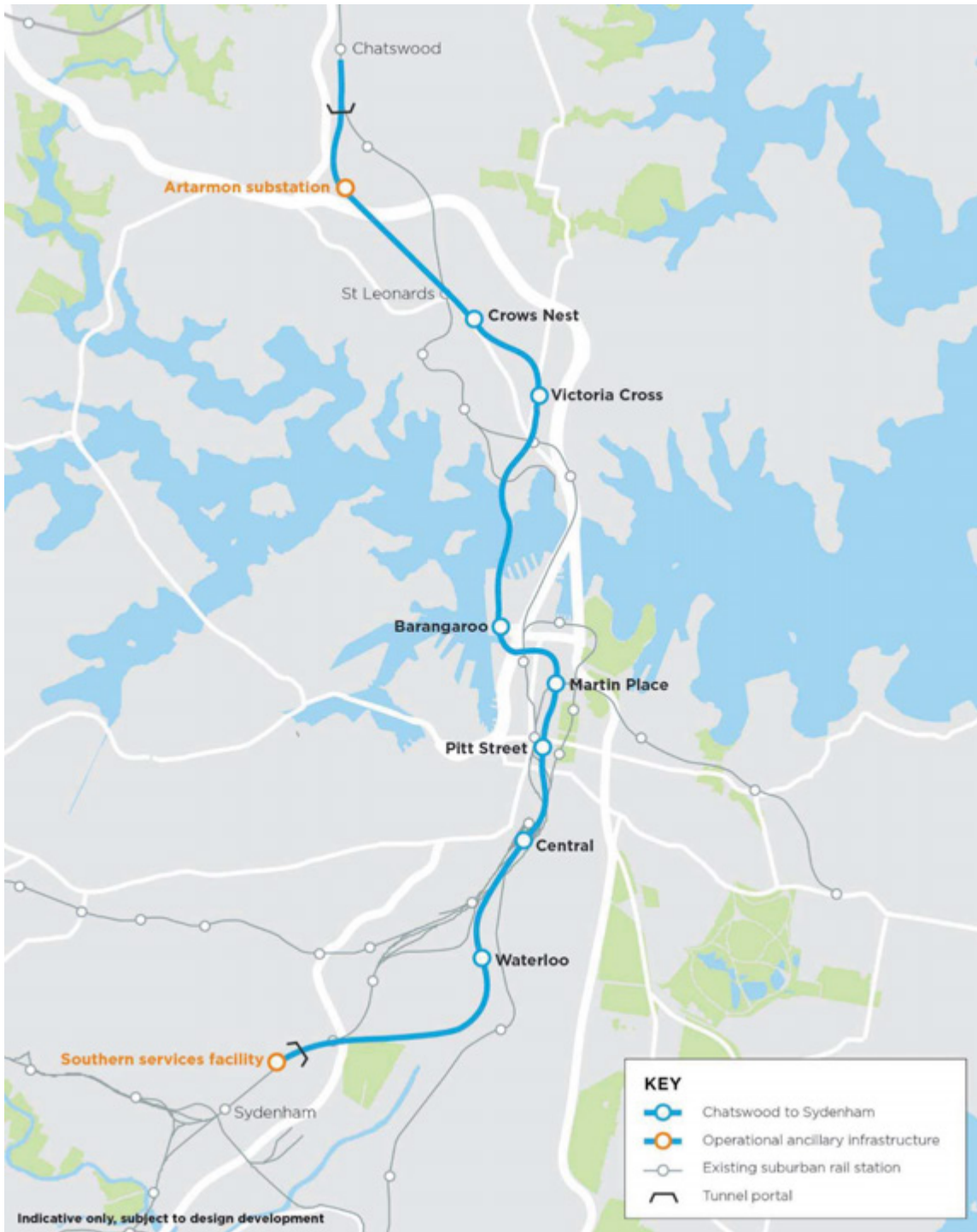
The project (Figure 1-1) is subject to assessment and approval by the Minister for Planning and Infrastructure under Part 5.1 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). A non-Aboriginal Heritage Impact Assessment (NAHIA) was prepared as part of the Environmental Impact Statement (EIS) for the Chatswood to Sydenham project.

1.2 Site Locations

The project involves the construction and operation of a metro rail line. The project would be mainly located underground in twin tunnels extending from Chatswood on Sydney's north shore, crossing under Sydney Harbour and continuing to Sydenham. The EIS identified the potential for archaeological constraints and the need for the preparation of a non-Aboriginal ARD (mitigation measure NAH2) at all surface construction sites except Artarmon traction substation and Marrickville dive site (southern). This ARD has been prepared to comply with mitigation measure NAH2. The ten sites that are considered in this report are:

- Chatswood dive site (northern)
- Crows Nest Station
- Victoria Cross Station
- Blues Point temporary site
- Barangaroo Station
- Martin Place Station
- Pitt Street Station
- Central Station
- Waterloo Station
- Power Supply Routes—various locations near the metro rail line route.

Figure 1-1: Project overview and station locations



1.3 Report Overview

1.3.1 Aims

The purpose of this ARD is to:

- Provide additional historical research and archaeological potential analysis to supplement the NAHIA archaeological assessment
- Identify potential construction impacts to significant archaeological resources
- Provide archaeological management strategies for each site and the project
- Identify archaeological impact mitigation and investigation methodologies for the project.

1.3.2 Structure

The ARD includes a section for each station of construction site with the potential for archaeological impacts. Each section provides a detailed assessment and applicable archaeological management strategies for each of these construction sites.

Details and further explanation on archaeological methodologies is provided in Section 12.0. A summary of the archaeological management for each site, including management zone mapping, is provided in Section 13.0.

1.4 Assessment and Research Design Methodology

1.4.1 Outline

The preparation of the ARD has included the following steps.

- **Historical research:** Additional primary archival research (review of maps, plans and other sources) has been undertaken to identify the location of former structures or features within the project sites in greater detail than was considered in the EIS.
- **Literature review:** Relevant existing archaeological studies and investigation reports were consulted to inform the archaeological potential and significance assessments.
- **Basement and geotechnical data review:** A review of available basement data and other information regarding the nature of ground conditions and previous impacts to potential archaeological resources. This information is used to inform the potential for archaeological remains.
- **Archaeological assessment:** Detailed archaeological assessment was undertaken based on the additional research and literature review.
- **Archaeological management:** Based on the potential for significant archaeological remains, and potential archaeological impacts, an archaeological management strategy was developed for each site. General archaeological management and investigation methodologies, including research questions, have also been provided.

1.4.2 Grades of Archaeological Potential

The archaeological potential of each station and construction site is presented in terms of the likelihood of the presence of archaeological remains considering the land use history and previous impacts at the site. This is presented using the following grades of archaeological potential:

- **Nil:** No evidence of historical development or use, or where previous impacts such as deep basement structures would have removed all archaeological potential
- **Nil-Low:** Low intensity historical activity, such as grazing, with little to no archaeological 'signature' expected, or where previous impacts were extensive, such as considerable bulk excavation and other earthwork activities such as grading
- **Low:** Research indicates little historical development, or where there have been substantial previous impacts, disturbance and truncation in locations where some archaeological remains such as deep subsurface features may survive
- **Moderate:** Analysis demonstrates known historical development and some previous impacts, but it is likely that archaeological remains survive with some localised truncation and disturbance
- **High:** Evidence of multiple phases of historical development and structures with minimal or localised twentieth century development impacts, and it is likely the archaeological resource would be largely intact.

1.4.3 Archaeological Significance

The assessment of archaeological significance has been undertaken in accordance with the Heritage Division guideline *Assessing Significance for Historical Archaeological Sites and Relics 2009*. The significance assessment considers research potential, historical association, aesthetic and technical significance, rarity, representativeness and intactness or integrity of the potential remains. Where intact remains are expected, social significance is also considered. The archaeological remains are assessed as either being of local or state significance.

1.4.4 Archaeological Management Framework

Table 1-1 provides an overview of the broad framework used when considering archaeological management. The significance of potential archaeological remains is a key factor in deciding how the resource would be managed. The table is not definitive and has been used as a general guide to archaeological impact mitigation requirements. The level of construction impact and the nature of the proposed construction methodology also influences how potential archaeological resources are managed.

Table 1-1: Archaeological management framework

Archaeological potential	Archaeological significance	Archaeological impact mitigation
Nil	N/A	Unexpected Finds Procedure
Nil to low	Unlikely to meet threshold of local significance	Unexpected Finds Procedure
	Local	Unexpected Finds Procedure
	State	Unexpected Finds Procedure
	State (cemetery sites)	Monitoring, if potential for burial-related remains cannot be ruled out
Low	Unlikely to meet threshold of local significance	Unexpected Finds Procedure
	Local	Unexpected Finds Procedure
	State	Monitoring (recording or salvage if archaeology found – depending on intactness)
Low to moderate	Unlikely to meet threshold of local significance	Unexpected Finds Procedure
	Local	Monitoring or Test/Salvage excavations
	State	Test/Salvage excavations
Moderate	Unlikely to meet threshold of local significance	Unexpected Finds Procedure
	Local	Test/Salvage excavations
	State	Test/Salvage excavations
Moderate to High	Unlikely to meet threshold of local significance	Unexpected Finds Procedure
	Local	Salvage excavations
	State	Salvage excavations
High	Unlikely to meet threshold of local significance	Unexpected Finds Procedure
	Local	Salvage excavations
	State	Salvage excavations

1.5 Limitations

Historical research included both primary and secondary sources. Literature review included relevant existing (and publicly available) archaeological studies. This background research was comprehensive, but not exhaustive. Additional historical and archaeological analysis undertaken as part of archaeological site investigations could further inform significance and enhance research outcomes.

Full basement, existing site conditions and services for all the sites data was not available. The assessed level of archaeological potential may vary once this information becomes available.

Assessment of potential archaeological impacts and development of mitigation requirements is based on design at the EIS stage. Construction impacts and archaeological management requirements may vary once final construction methodology, program and final designs are known.

1.6 Authorship

This report has been prepared by Duncan Jones (Heritage Consultant) and Abi Cryerhall (Principal), and reviewed by Dr Sandra Wallace (Director).

2.0 CHATSWOOD DIVE SITE (NORTHERN)

2.1 Site Location

The Chatswood dive site is located in the suburb of Chatswood in the City of Willoughby LGA (Figure 2-1). The dive structure is located within, and adjacent to, the existing railway corridor to the south of Chatswood Station and north of Mowbray Road. The site also includes areas for other construction-related activities.

2.1.1 Land Parcels

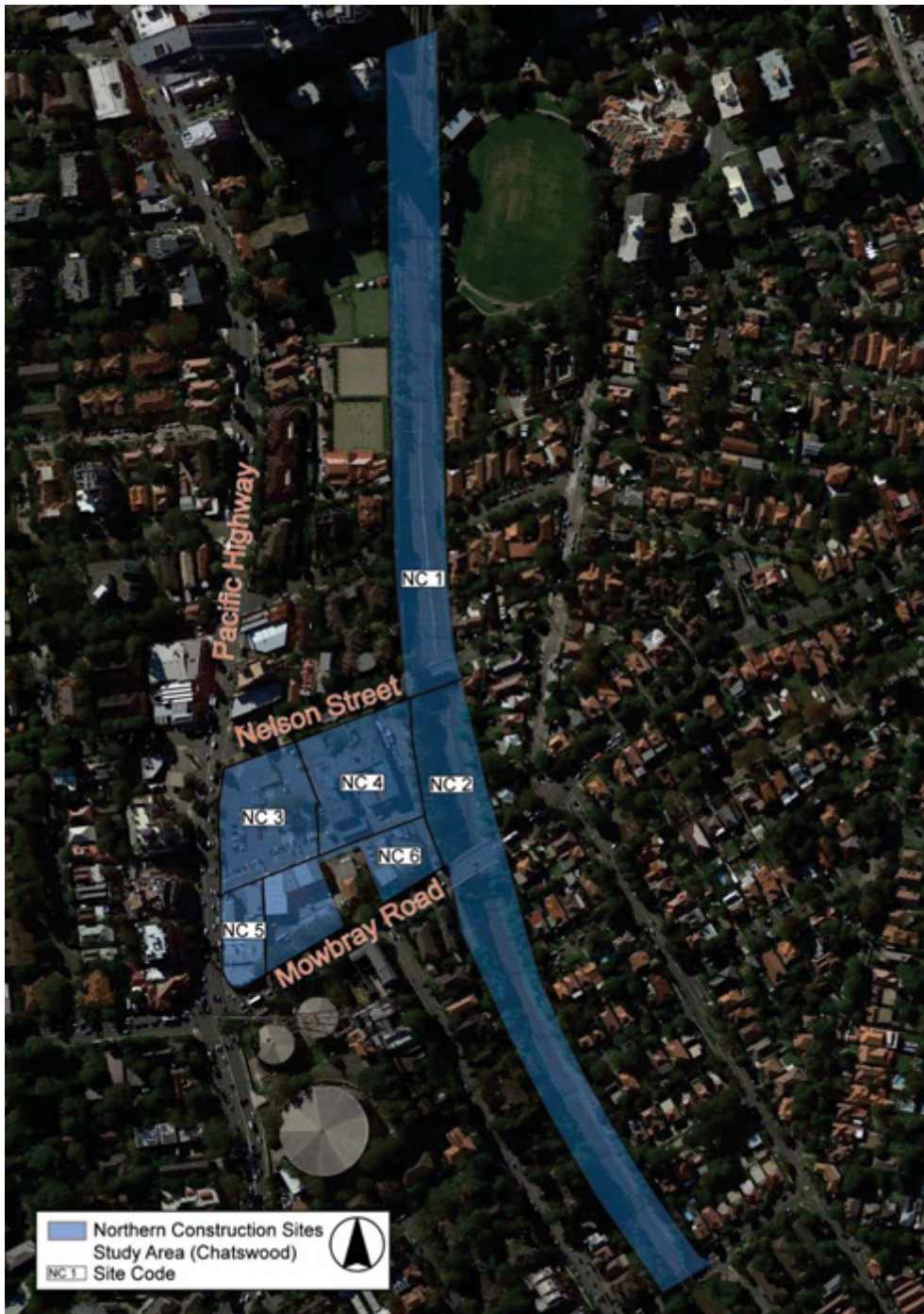
The land parcels associated with the Chatswood dive site area are presented in Table 2-1. Except for Mowbray House, all existing structures on these land parcels would be demolished prior to ground excavation. The Chatswood dive site area is illustrated in Figure 2-1.

Mowbray House (Willoughby LEP 2012: Item I96) is located within the construction area. However, as the building is being retained within the construction site, sub-surface impacts would not occur in this area.

Table 2-1: Land Parcels in the Chatswood dive site (northern) area

Site Code	Address	Lot	Existing Structures
NC 1	North Shore Railway Line, north of Nelson Street bridge	Lot 100 DP 1059485	Railway corridor, Nelson Street railway overbridge
NC 2	North Shore Railway Line, south of Nelson Street bridge. Including vegetated area on western side of railway line	Lot 100 DP 1059485 Lot 1 DP 221896	Railway corridor, Mowbray Road railway overbridge, vegetated area
NC 3	607 Pacific Highway, Chatswood 591 Pacific Highway, Chatswood 5 Bryson Street, Chatswood 339 Mowbray Road, Chatswood	Lot 3 & 4 DP 455907 Lot 1 & 2 DP 537580 Lot 5 & 6 DP 524631 Lot 1 DP 503447 Lot 3 DP 961402 Lot 4, 5 & 5 DP 65670 Lot 1 DP 243111	Bitumen car parking for Ausgrid depot
NC 4	339 Mowbray Road, Chatswood	Lot 2 DP 221896	Two-storey late 20 th century brick commercial offices and warehouses, access road and bitumen car parking; northern part of Ausgrid depot
NC 5	589 Pacific Highway, Chatswood 569 Pacific Highway, Chatswood 8 Bryson Street, Chatswood	Lot 1 DP 216408 Lot 6 DP 72759 Lot 3 DP 58646 Lot 1 DP 508715 Lot 1 DP 204133	Two-storey late 20 th century brick retail premises, offices and warehouses
NC 6	339 Mowbray Road, Chatswood	Lot 2 DP 221896 Lot 18 DP 60346	Two-storey late 20 th century brick commercial offices and warehouses; two-storey early 20 th century brick former school house (Mowbray House); access road and bitumen car parking; southern part of Ausgrid depot

Figure 2-1: Chatswood dive site showing existing modern development and site codes



2.2 Historical Analysis

2.2.1 Chatswood

The suburb of Chatswood was named after 'Chattie' (Charlotte) Hartnett, wife of district pioneer and former Mayor of Willoughby, Richard Hartnett.¹ After settlement, the initial land use in the Chatswood

¹ <http://www.visit chatswood.com.au/history/chatswood/>

locality was farming and timber.² The Chatswood dive site was originally part of a 380-acre grant in 1805 to Isaac Nicholls, who was a convict and first postmaster for the colony of NSW (Figure 2-2).³ The grant was later occupied by C. Webb by 1836 (Figure 2-3). John Bryson purchased the land in the 1860s and an area of land to the southwest of the intersection between Mowbray Road and Lane Cove Road / Gordon Road (now Pacific Highway). This intersection was part of the first commercial hub in Chatswood.

Bryson built his cottage and operated a timber yard and store for the nascent community. An 1899 Sydney Water plan indicates that the house was called 'Sarina', and the property contained a number of outbuildings immediately north of the cottage included sheds, store and external kitchen (Figure 2-6). An outhouse was located to the rear of the property. Two wells were also located within the property, to the rear of the cottage and complex of outbuildings, servicing the external kitchen.

Bryson had established a School of Arts in a room of his house in the early 1870s. In 1874 the Mechanic's Institute built a permanent residence for the School of Arts with Pymont sandstone on Mowbray Road before the rail bridge, to the east of Bryson's original cottage and store. In 1879 the School of Arts was taken over by Willoughby Council and served as its council chambers until 1903.⁴

The 1899 Sydney Water plan indicates that a number of small landholdings and residences were located within the study area at this time. In addition to Bryson's 'Sarina' cottage and store and the sandstone School of Arts building, the study area also contained a complex of sheds and a store fronting Gordon Road at the intersection of Bryson Street (Figure 2-6). A brick cottage was located immediately east of this complex, fronting Bryson Street, with a number of outhouses constructed to the rear. A small building, likely a cottage, outhouse and shed are located on the corner of Nelson Street and Gordon Road. A property called 'Penzance' was located on Mowbray Road, adjacent to the railway line and bridge (immediately east of the School of Arts building).

Following the opening of the North Shore Railway Line in 1890 a commercial centre was developed to the north of the station site, utilising the proximity to the station.⁵ By 1906 the site and former School of Arts had been leased by Lancelot Bavin for the Chatswood Preparatory School.⁶ During this year Mowbray House was constructed, which was a Federation Arts and Crafts school building and is still standing today.

The School purchased a number of surrounding plots to the south of Bryson Street as it grew. Bavin purchased the 'Penzance' cottage for boarders (Figure 2-6). A dining hall was added to the Main House (Mowbray House) and a cottage was built for the Master on the Mowbray Road frontage of the property. The former School of Arts building was used as a chapel (Figure 2-9). Between the chapel and the railway line was a science block, and behind the Main House was a recreation hall. A kindergarten fronted Bryson Street and tennis courts were located along Mowbray Road. The area to the north was used as a cricket ground, which can be seen in the 1943 aerial photograph (Figure 2-12).⁷

Properties along the Pacific Highway, which were not purchased by the school, had by 1914 been developed with a brick cottage on one plot and a weatherboard cottage on the other. As late as the 1930s these blocks were still described as being owned by a nurseryman.⁸

The Chatswood area was predominantly cleared farmland and orchards in the nineteenth century, but by the early twentieth century the region was progressively subdivided for residential development

² <http://www.visitchatswood.com.au/history/chatswood/>

³ Willoughby City Library Services 2013 *Chatswood CBD: Fact Sheet No. 4*.

⁴ <http://willoughbydhs.org.au/History/People/Bryson.html>

⁵ Willoughby City Library Services 2013 *Chatswood CBD: Fact Sheet No. 4*.

⁶ <http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=3430474>

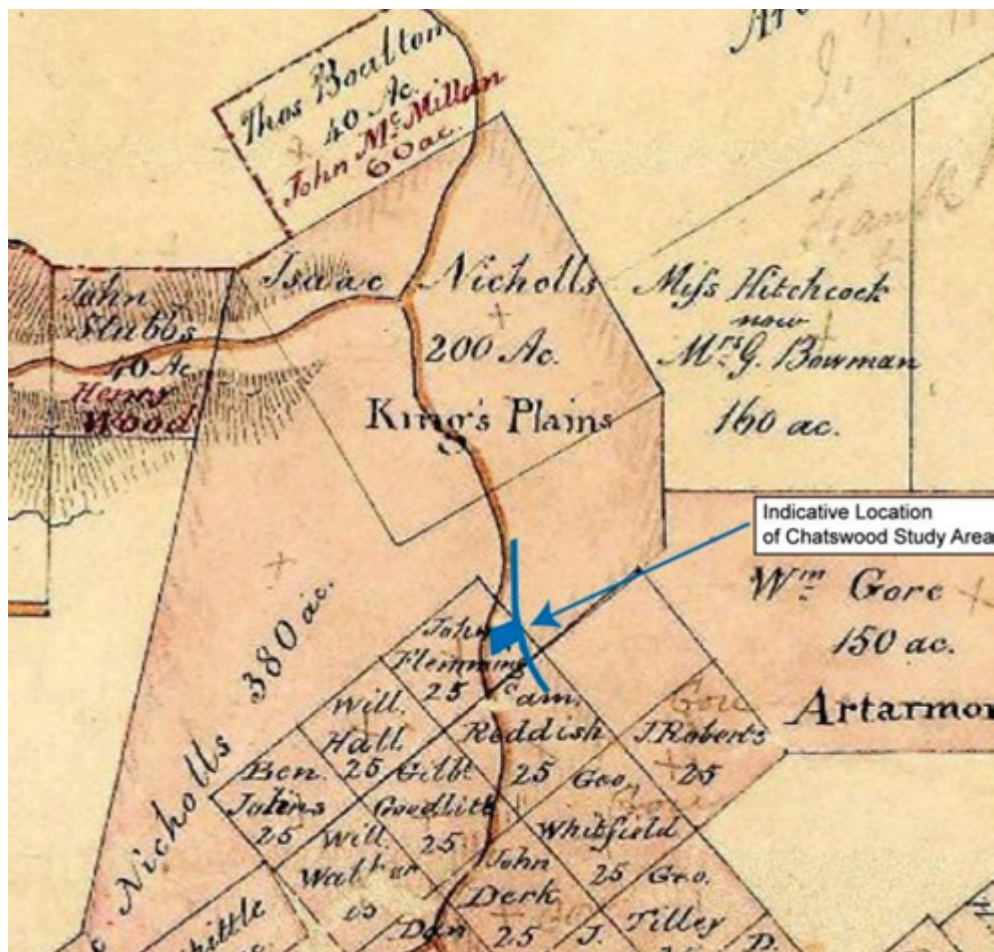
⁷ Thorp 1996

⁸ Thorp 1996

(Figure 2-7). The properties along the northern side of Bryson Street to Nelson Street were developed by 1910. The various portions were in the possession of members of the Hammond family until their purchase by Sydney County Council. Each portion had a cottage bearing names such as 'Loubet', 'Dorisville' and 'Manilla'.⁹ The Hammonds owned a butcher that opened in 1868 on the corner of Moriarty Street and the Pacific Highway, to the west of Nelson Street. A bake house, with associated buildings was present by 1924 in the northern part of the station site, and by the end of 1920s Bryson's main building appears to have been demolished (Figure 2-10).¹⁰ A 1949 photo depicts the type of shops running along the Pacific Highway, showing Reids Store which sold groceries (Figure 2-11).

Mowbray House continued to be used as a school until 1954, and from 1957 has housed an electricity depot.¹¹ In 1957 the former School of Arts building was dismantled and relocated to Beaconsfield Road to become the Holy Trinity Church.¹² Over time the Depot purchased surrounding residential properties which were reused as storage and offices, with Depot Building 1 being constructed in 1961.¹³ In 1983 Chatswood was declared a Town Centre and has since grown into a prominent suburb of North Sydney.¹⁴

Figure 2-2: Pre-1860s parish map of Willoughby, showing Isaac Nicholls 380-acre grant and John Flemming's 25-acre grant. (Source: LPI LWc 140613, AO map 6205)



⁹ Thorp 1996

¹⁰ <http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=3430474>

¹¹ <http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=3430474>

¹² <http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=3430474>

¹³ <http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=3430474>

¹⁴ Willoughby City Library Services 2013 *Chatswood CBD: Fact Sheet No. 4.*

Figure 2-3: Webb's farm. Cottage within Mowbray Road corridor. (Source: MLNSW Copy of E.J.H. Knapp's Plan of Mr. Nichol's Estate at Hunters Hill. Z/M3 811.141/1936/1)

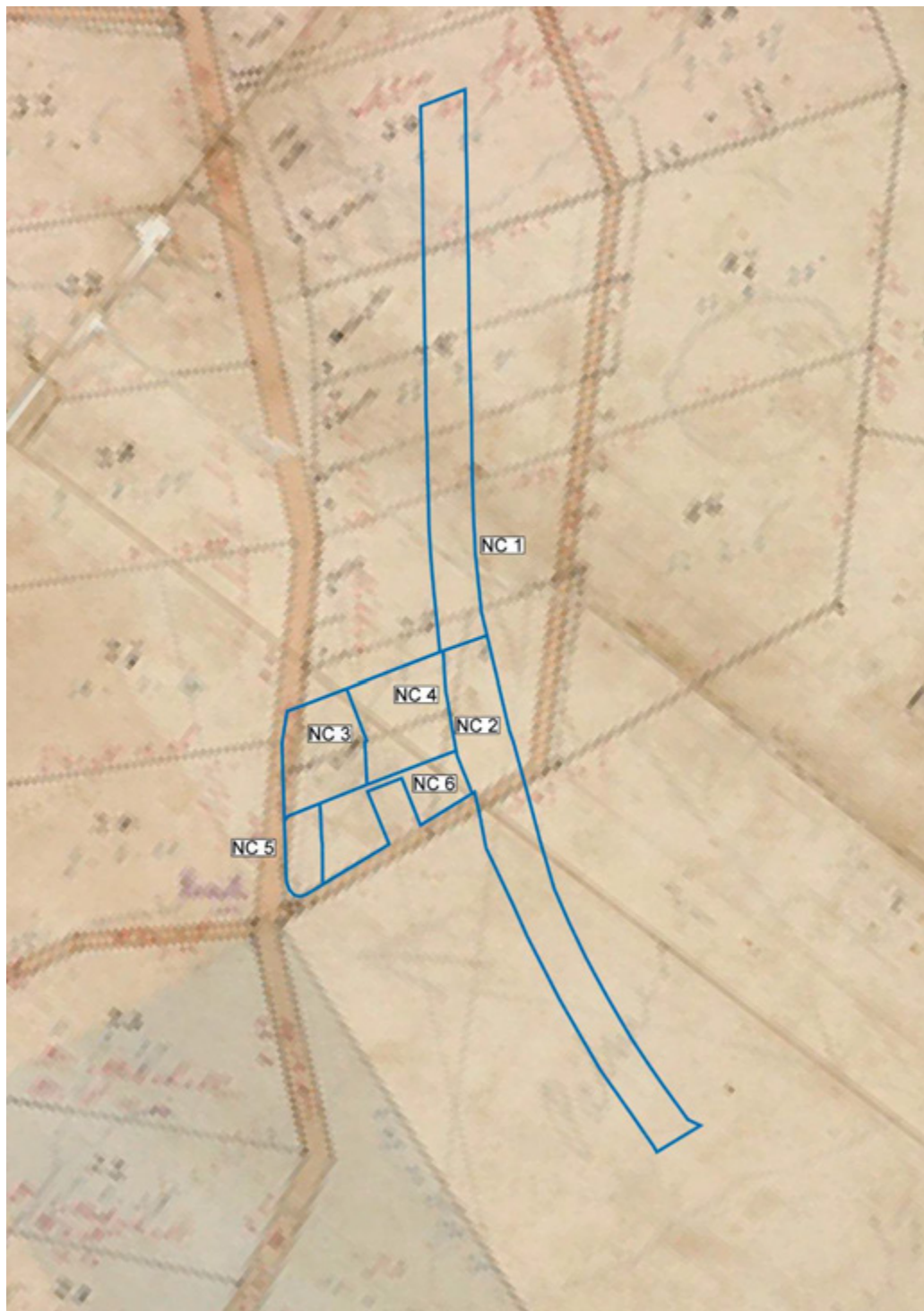


Figure 2-4: Bryson's cottage c.1870s (Source: Picture Willoughby)



Figure 2-5: 1881 subdivision of area showing Byron's building (Source Trove Z/SP/C15/ 446); station site boundaries indicative

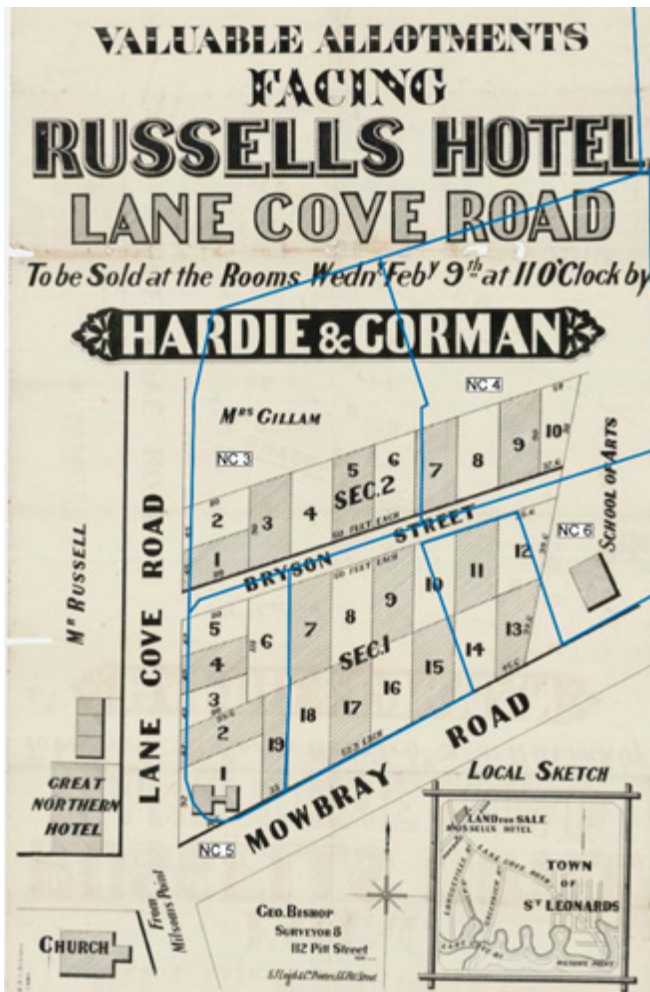


Figure 2-6: Detail from the 1899 Sydney Water plan for Willoughby (Sheet 4). Sydney Water/Water NSW Historical Research Archive PWDS1544 – S1411.

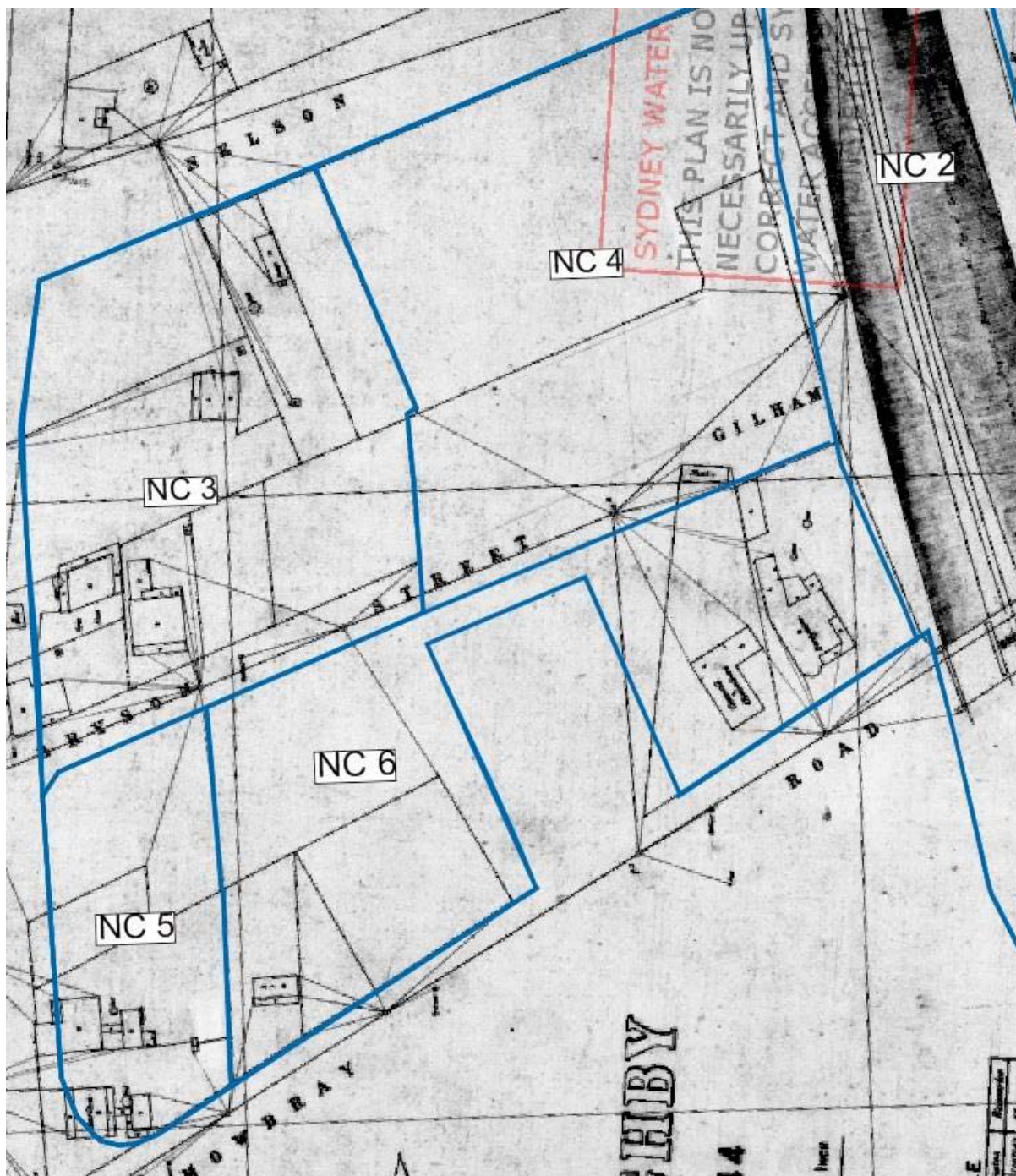


Figure 2-7: Early twentieth century subdivision plan of the Chatswood area, showing railway and residential development on former garden and orchard estates, approximate location of study area in red (Source: NLA)



Figure 2-8: Detail from a Sydney Water plan for Willoughby (Sheet 44). The plan is undated but was updated between 1908 and 1960. Sydney Water/Water NSW Historical Research Archive BLKWTL3312.



Figure 2-9: School of Arts building on Mowbray Road as part of the School c.1910 (Source: Picture Willoughby)



Figure 2-10: 1924 subdivision plan Trove Z/SP/C15/42. Study area boundaries are indicative

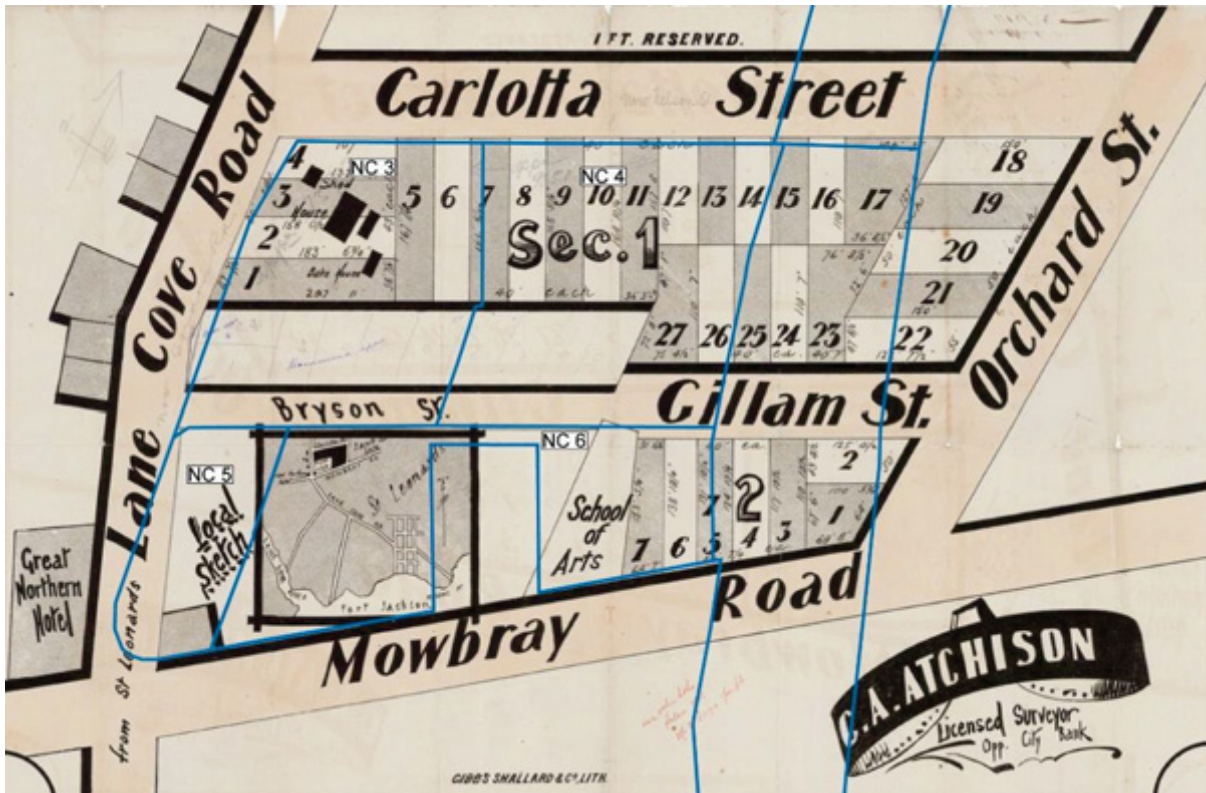


Figure 2-11: Shops along the Pacific Highway on the western part of the study area in 1949 (Source: Picture Willoughby)



Figure 2-12: 1943 aerial photograph of study area. School of Arts building outlined in orange



2.3 Archaeological Potential

2.3.1 Previous Archaeological Studies

There have been few previous archaeological investigations in the area. Existing studies concerning the Chatswood dive site do include some archaeological analysis though they are more built heritage in focus.

An assessment was undertaken for the Chatswood South Uniting Church by Rappaport Heritage in 2005.¹⁵ The archaeological assessment identified that there was a good potential to recover locally significant remains in the south-eastern portion of the churchyard.

¹⁵ Rappaport Heritage 2005

A heritage study for the Sydney Electricity Headquarters which is within the Chatswood dive site was prepared by Wendy Thorp in 1996. The study provides a brief archaeological assessment of the site, stating that although it is likely that archaeological remains would be located at the site, their significance may not meet the threshold of local significance. Thorp proposed that, due to the continuity of use of the adjacent Mowbray House as a school, archaeological remains from the School of Arts are not likely to add significant information.¹⁶

2.3.2 Land Use Summary

The Chatswood dive site is associated with early land grants and agricultural activities, subdivision and residential development, and later modern development.

- Phase 1 (1788 – 1860) early land grants and agricultural activities. Early land use associated with timber getting, vegetation clearance and road building. First land grant to C. Webb in 1836 and the development of farming and pasturage. Clearing and laying out of Lane Cove Road (now Pacific Highway).
- Phase 2 (1860 – 1905) late nineteenth century agricultural and suburban development. Development of orange and strawberry orchards, timber yards, livery stables, residences, including Bryson's Cottage in NC 5. The School of Arts was constructed in the study area in NC 6 in the 1870s. The residence, 'Penzance' was constructed in NC 6 in the late nineteenth century. Several brick and timber buildings were located in NC3. The North Shore Railway Line was constructed in the 1890s, and passes through the study area.
- Phase 3 (1905 – 1960) early twentieth century commercial and residential development. Land use associated with the construction and expansion of the Chatswood Preparatory School (1906 – 1954). Federation and Inter-War era residential housing constructed. Electricity depot established in 1957. The School of Arts dismantled and removed in the 1950s. Duplication and electrification of the rail line.
- Phase 4 (1960 – Present) late twentieth century commercial development. School and residences removed except for Mowbray House. Development of brick two-storey commercial properties and warehouses. Expansion of electricity substation; by early 2000s the Ausgrid depot covers the majority of the non-rail corridor portion of the study area.

2.3.3 Previous Impacts

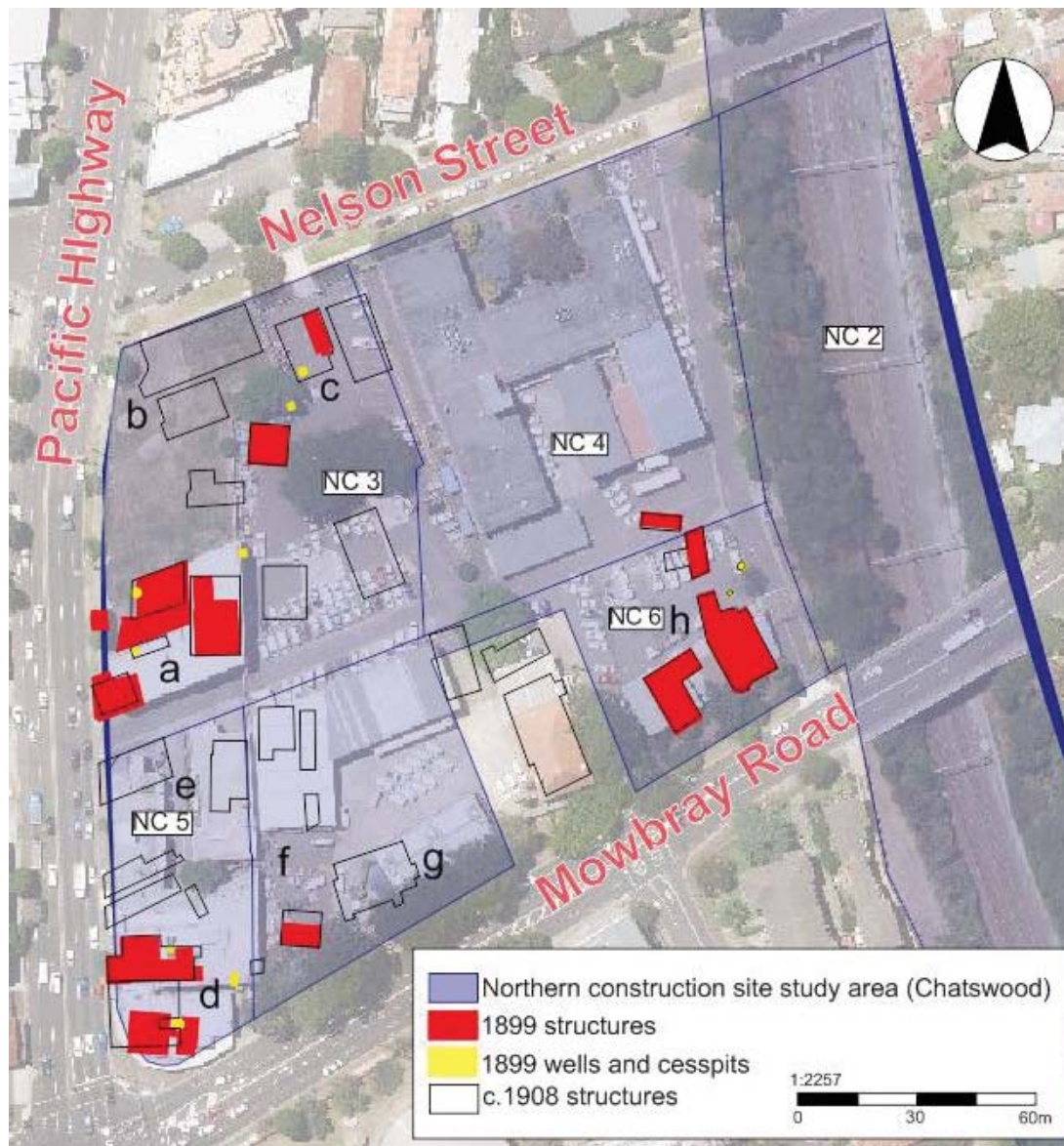
With the exception of Mowbray House, all of the residential and school buildings which had been constructed in the study area before 1943 have since been demolished. Buildings constructed after this time are predominantly post-war brick commercial buildings with minimal footing or basement levels. Despite clearing and ground works in areas of demolition, the lack of large and extensive basements has meant that modern construction is unlikely to have caused significant sub-surface impacts. In areas where car parks and road surfaces now exist, the level of previous ground disturbance is also likely to be low-moderate.

2.3.4 Potential Archaeological Remains

Historical records indicate that development at the site began in the mid nineteenth century with Bryson's cottage. Land within the site had been subdivided and a number of structures built on ten lots the late 1890s (Figure 2-13). During the first half of the twentieth century more subdivision and development occurred. A further ten properties were added between 1906-1960.

¹⁶ Thorp 1996

Figure 2-13: Overlay of historical structures from the 1899 and 1908-1960 plan



Phase 1: 1788 – 1860

Archaeological remains associated with the original grant to Isaac Nicholls of 380 acres would be ephemeral in nature as timber getting, land clearance, and farming are often hard to define in the archaeological record where subsequent land development has occurred.

The farm owned by C. Webb that was noted in an 1836 map possibly included outbuildings, sheds, fences, a house, and postholes associated with the fencing of the property. However, the existence or location of such remains is unclear. It likely that archaeological remains associated with the farm would have been impacted by later development.

Phase 2: 1860 – 1905

The first recorded development was Bryson's cottage in the 1860s (Site NC 6) on the corner of Mowbray Road and the Pacific Highway. Bryson used the rest of the land for farming and orchards. Archaeology associated with the farming and orchards would be ephemeral in nature and likely to

have been impacted by later development. By the late 1890s there had been several subdivisions and a number of other dwellings and structures.

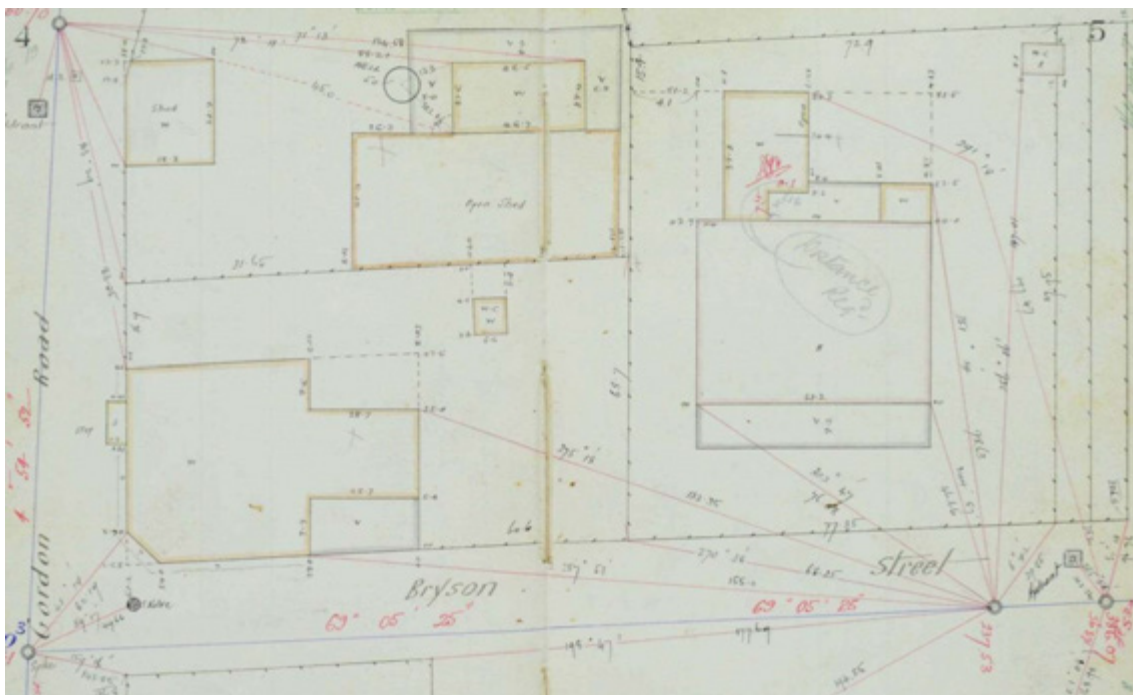
Site NC 3

By the late nineteenth century a complex of outbuildings and a cottage was located on the corner of Bryson Street and Gordon Road (Pacific Highway), a brick cottage on the corner of Nelson Street and Gordon Road, and a timber cottage south of Nelson Street (Figure 2-6 and Figure 2-14).

The brick cottage and shed on the corner of Nelson Street and Gordon Road (NC 3) are currently below a carpark (a in Figure 2-13). This complex of buildings also included a WC (illustrated on the 1899 Sydney Water PWD plan, but not on the 1898 field book¹⁷). The field book indicates that at some point between 1898 and 1899 the brick cottage was extended to include a verandah, and an extension to the rear with a brick fireplace. The cottage and WC are present on the 1943 aerial of the study area. As the area currently contains a carpark, archaeological remains of the complex are likely to survive. These may include brick footings, remains of the WC, postholes associated with the verandah, accumulated occupation deposits below the verandah, garden soils and artefacts associated with the occupation of the property. Remains of the WC are likely to include the brick floor, and potentially backfill deposits and services.

The survival of archaeological evidence of the timber cottage to the east (c in Figure 2-13), however, is likely to be limited to postholes. Brick flooring associated with the extension to the rear of the structure (likely to be a kitchen) may also survive. A well and WC are also located to the rear of the building. Again, it is unlikely that the WC would contain an intact refuse deposit, although the lower portions of the well may contain artefactual evidence of the occupation of the property. The 1908-1960 Sydney Water PWD plan (Figure 2-8) indicates that a brick extension and verandah were added to the cottage in the early twentieth century, this structure is visible on the 1943 aerial.

Figure 2-14: Sydney Water field book sketch depicting houses and structures in NC 3 by 1898



¹⁷ Sydney Water/Water NSW Historical Research Archive, item PWDFB2923.

Figure 2-15: Sydney Water field book sketch from 1898 showing the structures in NC 3



Site NC 4

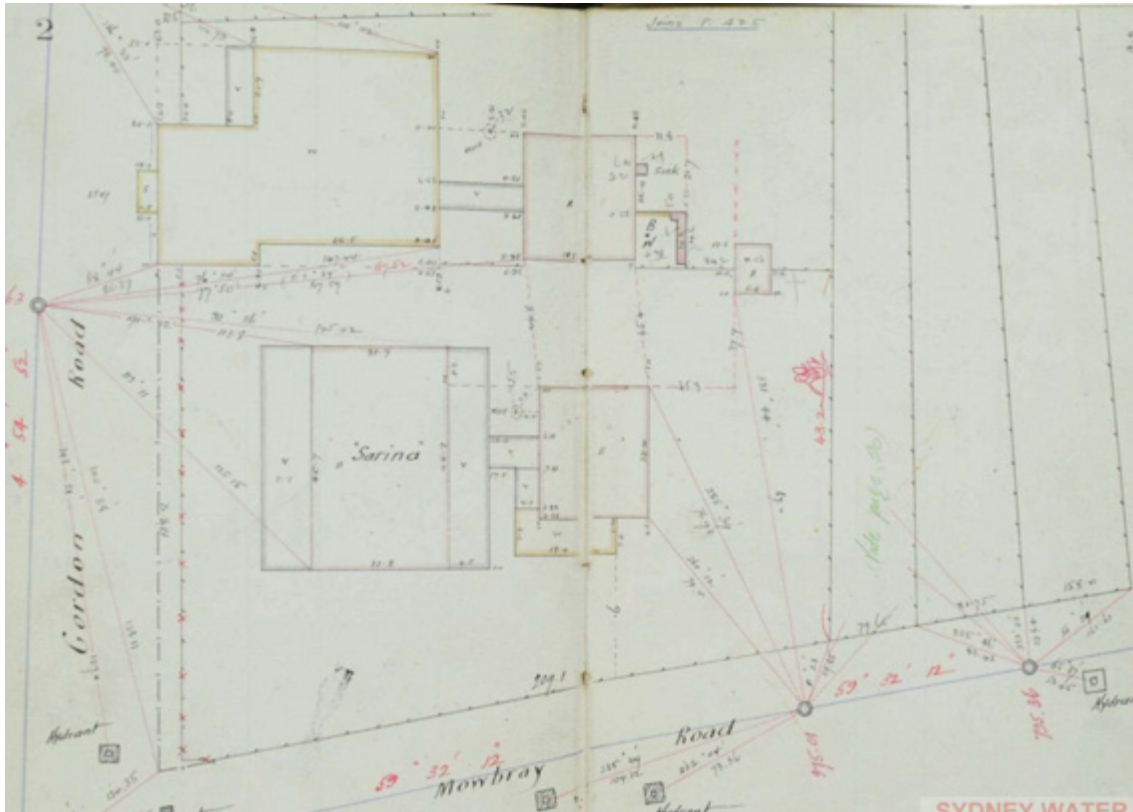
In the late nineteenth century, this part of the site was vacant (Figure 2-6). It was fenced, suggesting that it may have been used for small-scale agriculture, orcharding or grazing of livestock.

Site NC 5

When Bryson first purchased his estate in the 1860s for farming and orchards, he also constructed his cottage. He also established a timber yard on his property at this time. The cottage was still noted in twentieth century maps, though it had changed ownership and names. There is a potential that archaeological remains of this house and associated features and occupation are present in the NC 5 site at the corner of Mowbray Road and Pacific Highway (d in Figure 2-13). Archaeological remains could include brick or stone footings, timber base plates, postholes, hearths / chimney base, underfloor deposits, brick or stone wells and cesspits, remains of outbuildings, path and yard surfaces, and artefact bearing deposits and fills.

In 1898 the complex of buildings at the corner of Bryson Street and Gordon Roads consisted of a number of timber sheds, one of which was open on one side and had a verandah, and a timber building likely to have been a store facing Gordon Road (Figure 2-16). A well and WC were associated with this complex. A brick cottage with verandah and wooden extensions to the rear, and a brick WC in the rear yard, is located immediately behind this complex of buildings. The cottage and portions of the buildings are visible on the 1943 aerial. This location is currently occupied by warehouses. It is likely that the survival of archaeological remains has been impacted by the construction of these warehouses. Remains could consist of truncated brick or stone footings, postholes and the lower portions of wells and the floor of the WC. There is potential for artefacts within in well or cesspit backfills and within rubbish pits or unstratified in garden and yard soils to be located in the rear yard of the cottage, and in the yards associated with the wooden sheds and store.

Figure 2-16: Sydney Water field book sketch of the properties on the corner of Mowbray Road and Gordon Road (Pacific Highway) in 1898. Bryson's cottage is named 'Sarina'



Site NC 6

By 1890 a small cottage with verandah was also located in NC 6 to the east of Bryson's cottage in NC 5 (f in Figure 2-13). It was demolished in the latter half of the twentieth century and currently the site is a carpark. Archaeological remains could include of brick or stone footings and postholes, the former yard areas may contain paths, surfaces, garden soils and rubbish pits.

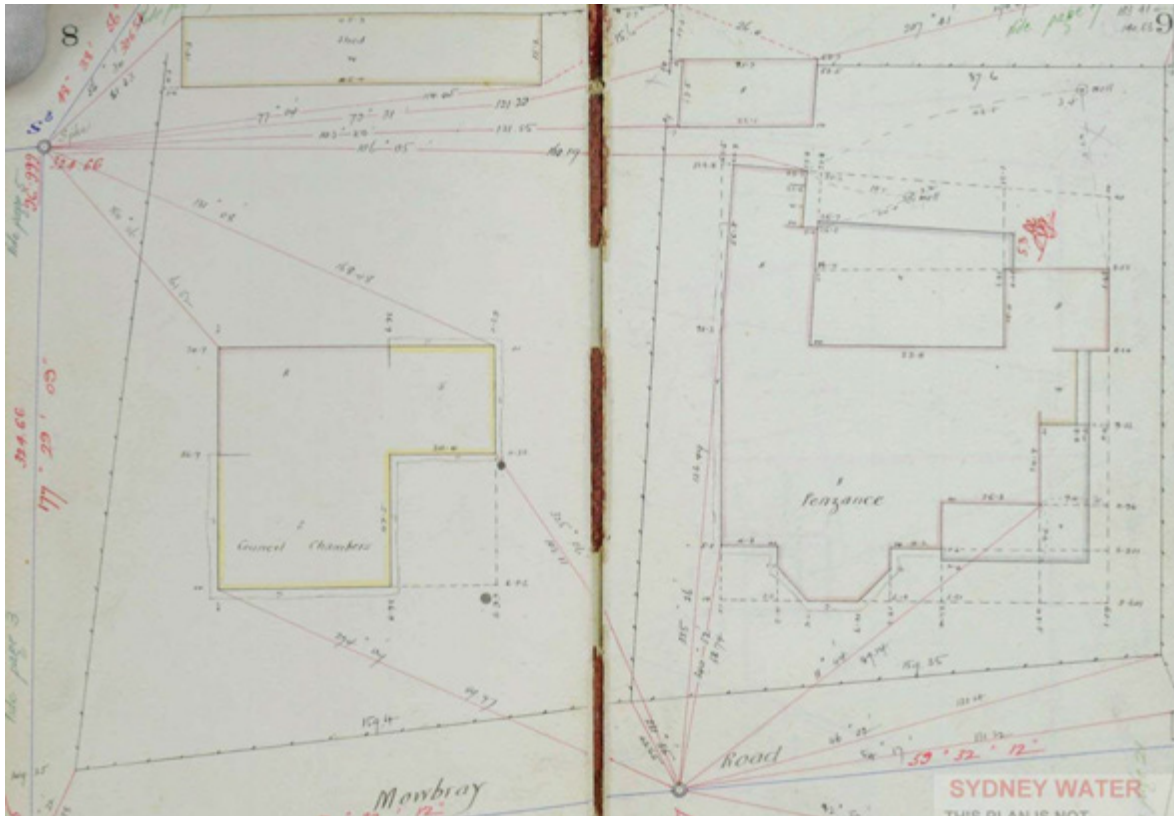
The School of Arts building was constructed within the NC 6 site in 1874 (h in Figure 2-13). It became the Council Chambers in 1878 until the early 1900s when it was incorporated into the Chatswood Preparatory School (Mowbray House) complex. The building was dismantled in 1957 and reconstructed on Beaconsfield Road as a new church, outside of the study area. Previous archaeological assessment of the site suggests there would be limited potential for significant archaeological remains. However, despite the dismantling of the school and subsequent development, original building footings may remain, as may former yard surfaces and drainage features. The 1899 Sydney Water PWD plan indicates that a shed was located at the rear of the property, archaeological remains such as postholes and surfaces may survive. Wells and cesspits with artefact bearing deposits may also be present.

The study area also contained 'Penzance' by 1898 (Figure 2-17). It was later purchased by the Chatswood Preparatory School. Located immediately east of the School of Arts hall, Penzance consisted of the main brick house, a timber verandah on the south-east frontage, and a large timber extension to the rear. A number of outbuildings and sheds were located to the rear of the property, including two wells. The main buildings are present on the 1943 aerial, although the sheds had been removed prior to this. Today the location contains a carpark and warehousing. It is likely that archaeological remains of the house survive below the current ground surface. Remains are likely to consist of brick or stone footings, postholes and the lower portions of the two wells, which could

contain artefact-rich deposits. The rear yards (below the carpark) may contain paths, surfaces, garden soils and rubbish pits.

From 1890 the north shore rail line was constructed through the study area.

Figure 2-17: Sydney Water field book sketch of the former School of Arts building and Penzance in 1898



Phase 3: 1905 – 1960

Further residential subdivision and development occurred in this period. Brick houses with verandahs and outbuildings were constructed in NC 3, NC 5 and NC 6 (west). Some existing late nineteenth century structures continued in use.

Bryson's cottage (later named Sarina) was redeveloped as three terraces fronting the Pacific Highway (Figure 2-8). The School and associated buildings dating between 1906-1954 were present to the south of Bryson Street. Archaeological remains of the school buildings, including a cottage ('Penzance'), master's cottage, science block, recreation hall, kindergarten, tennis courts and associated services such as wells/cisterns. Most of the remains would be subsurface features such as footings, postholes and cisterns due to the clearing of the land for later development. It is possible that artefact bearing deposits relating to the school could remain across the site to the south of Bryson Street in site NC 6.

The former cottages associated with the Hammond family – 'Loubet', 'Dorisville', and 'Manila' in 1910 – may have footings, outbuildings, yard surfaces and former services. The brick cottage and weatherboard cottage dating to 1914 would have similar archaeological remains.

The 1924 subdivision plan shows a baker's shop with large residence present in the NC 3 site, near the corner of Nelson Street. Remains associated with the former baker's shop could include brick footings, oven bases, ash and other fire debris, yard surfaces, demolition debris and isolated artefacts.

The north shore rail line was duplicated and upgraded to electric during this phase.

Phase 4: 1960 – Present

The 1960s onwards saw the consolidation of the school and the taking over of the land by the Ausgrid depot with some demolition of buildings and the construction of new ones. North of Bryson Street was used for car parking and low-rise commercial development. The area along the Pacific Highway has been used for low-rise commercial development.

2.3.5 Summary of Archaeological Potential

Based on historical information, land use data and evidence of sub-surface impacts, a summary of the potential archaeological remains in the Chatswood dive site is provided Table 2-2 below.

Table 2-2: Summary of potential archaeological remains at the Chatswood dive site

Site Code	Phase	Likely archaeological remains	Potential
NC 1	1 (1788 – 1860)	Archaeological deposits associated with William Nicholl's and Webb's early farming land grants could include fence postholes, tree boles, field drains and isolated artefact deposits.	Nil - Low
	2 (1860 – 1905)	Construction of North Shore Railway Line throughout the majority of the land parcel. Excavation of rail corridor for grade changes through study area. Potential archaeological remains of former rail infrastructure.	Low
	3 (1905 – 1960)	Duplication and electrification of railway line. Potential archaeological remains of former rail infrastructure.	Low
NC 2	1 (1788 – 1860)	Archaeological deposits associated with William Nicholl's and Webb's early farming land grants could include fence postholes, tree boles, field drains and isolated artefact deposits.	Nil - Low
	2 (1860 – 1905)	Construction of North Shore Railway Line throughout the majority of the land parcel. Excavation of rail corridor for grade changes through study area. Potential archaeological remains of former rail infrastructure.	Low
	3 (1905 – 1960)	Duplication and electrification of railway line. Potential archaeological remains of former rail infrastructure.	Low
NC 3	1 (1788 – 1860)	Archaeological deposits associated with William Nicholl's and Webb's early farming land grants could include fence postholes, tree boles, field drains and isolated artefact deposits.	Nil - Low
	2 (1860 – 1905)	Archaeological remains associated with the brick cottage and shed, and wooden cottage and shed on the corner of Gordon Road and Nelson Street. Brick and stone footings, chimney base, timber base plates, postholes, yard and path surfaces, cesspits and wells, artefact bearing deposits and outbuildings. Archaeological remains associated with the complex of buildings at the corner of Bryson Street and Gordon Roads, and the brick cottage facing Bryson Street. Brick and stone footings, chimney base, timber base plates, postholes, yard and path surfaces, cesspits and wells, artefact bearing deposits and outbuildings.	Moderate

Site Code	Phase	Likely archaeological remains	Potential
NC 4	3 (1905 – 1960)	Potential archaeological remains relating to former 20 th century bakery on site: brick and concrete footings, ash and fire waste fills, isolated artefact deposits.	Low - Moderate
	4 (1960 – Present)	Potential archaeological remains relating to Hammond cottages and Federation and Inter-War residential houses, with timber postholes, brick and concrete footings, terra cotta and copper pipes and drains, outbuildings and isolated artefact deposits.	Moderate - High
	1 (1788 – 1860)	Archaeological deposits associated with William Nicholl's and Webb's early farming land grants could include fence postholes, tree boles, field drains and isolated artefact deposits.	Nil - Low
	2 (1860 – 1905)	Archaeological potential for structures related to former timber yard: postholes, isolated artefact deposits.	Low
	3 (1905 – 1960)	Potential for archaeological deposits associated with use of land as cricket pitch and sports ground for Chatswood Preparatory School: isolated artefact scatters, field drains, postholes.	Nil - Low
	1 (1788 – 1860)	Archaeological deposits associated with William Nicholl's and Webb's early farming land grants could include fence postholes, tree boles, field drains and isolated artefact deposits.	Nil - Low
	2 (1860 – 1905)	Archaeological remains relating to c1860s Bryson's cottage, Bryson's store and commercial livery stables. By late 19 th century another house and outbuildings to the north. Brick and stone footings, chimney base, timber base plates, postholes, yard and path surfaces, cesspits and wells, artefact bearing deposits.	Moderate
	3 (1905 – 1960)	Potential archaeological remains relating to Federation and Inter-War residential / commercial buildings, with brick and concrete footings, terra cotta and copper pipes and drains, outbuildings and isolated artefact scatters.	Moderate
	1 (1788 – 1860)	Archaeological deposits associated with William Nicholl's and Webb's early farming land grants could include fence postholes, tree boles, field drains and isolated artefact deposits.	Nil - Low
NC 6	2 (1860 – 1905)	School of Arts (also Council Chambers) building present on this site 1874-1957. Archaeological remains could include: brick and stone footings, yard surfaces, cesspits and well, artefact bearing deposits. Archaeological remains associated with two cottage sites (including Penzance to the east of the School of Arts building) including brick and stone footings, chimney base, timber base plates, postholes, yard and path surfaces, cesspits and wells, artefact bearing deposits.	Low - Moderate
	3 (1905 – 1960)	Potential archaeological remains relating to school buildings associated with the Chatswood Preparatory School (former School of Arts building and Penzance cottage complex). Potential for brick and concrete footings, services and drains, outbuildings and artefact scatters.	Moderate

2.4 Archaeological Significance

A number of potential archaeological features could remain below the present buildings in the Chatswood dive site. Sites NC 1 and 2 have low potential for archaeological remains of late nineteenth and twentieth century former rail infrastructure. Site NC 3 has potential for remains of mid-late nineteenth century cottages, stores and outbuildings, a late nineteenth century timber yard and the early twentieth century commercial (bakery) and residential development. NC 5 has potential for archaeological remains associated with Bryson's Cottage (1860s). NC 6 has potential for archaeological remains associated with the School of Arts, council chambers and 'Penzance' (later the Chatswood Preparatory School (1870s-1950s).

2.4.1 Site NC 1 and 2 – Railway Corridor

The potential for buried remains of former rail infrastructure such as tracks, utilities and drainage systems is low. Such remains would unlikely yield archaeological data which would contribute to research questions and provide information not available from any other source. Though the remains would be associated with the historical development and technological changes of the railway, it is unlikely the potential archaeological resource would reach the threshold for local significance.

2.4.2 Site NC 3 and 4

Potential archaeological remains in these sites are associated with early land clearance and agriculture, timber yard and late nineteenth century residential development, and early twentieth century residential and commercial development.

There is nil to low potential for archaeological remains of early nineteenth century agricultural and horticultural land uses, and it is unlikely any fragmentary remains would reach the threshold for local significance. Remains associated with the nineteenth century timber yard would likely be truncated, ephemeral and not easily recognisable or associated with the yard. These type of remains would be unlikely to contribute to research questions or provide archaeological data not available from other historical sources. Therefore, remains of this phase of activity would be unlikely to reach the threshold for local significance.

Archaeological remains of early twentieth century residential and commercial development, such as the bakery recorded in NC 3 on a 1924 subdivision plan, are unlikely to include artefact-rich deposits as these were likely built with reticulated water and likely serviced by municipal garbage collection. Water services in the Chatswood area were available from the 1890s. As such remains from this period are not expected to meet the threshold for local significance.

Site NC 3 – Cottages and Outbuildings

Archaeological remains associated with the late nineteenth century complex of timber outbuildings, sheds and store fronting Gordon Road, and the brick and wooden cottages and outbuildings, are located with NC 3. Archaeological remains of these buildings, if found to be substantially intact and in association with artefact-rich deposits, are likely to reach the local significance threshold. The significance of these potential archaeological remains has been discussed below.

Research Potential (Criterion E)

A number of timber-built sheds and outbuildings, sheds and brick cottages are located within NC 3. These first appear on the 1899 Sydney Water PWD plan, although they are likely to have been constructed earlier. At this stage Chatswood consisted of a number of small and medium-sized land grants, mainly used for small-scale agricultural and industrial purposes and typically associated with a residence. Commercial development was concentrated on Lane Cove Road/Gordon Road, and, along

with Bryson's store (located within site NC 5, discussed below), the complex of sheds and buildings on the corner of Bryson Street and Gordon Road are likely to have been associated with a store or other commercial activity. Archaeological remains have the potential to inform us of the material practises of these early stores and commercial activities, and life in semi-rural areas before the railways and suburban development. Recent work on the Sydney Metro Northwest project would provide relevant comparative data.

The lack of municipal sewerage systems and rubbish collection in the area in the mid to late nineteenth century suggest that cesspits, wells, cisterns and rubbish pits potentially have been backfilled with artefact-rich deposits. The higher potential for occupation-related artefacts within remains for former structures add to the research potential of the site. Artefact analysis could provide information about daily domestic and working life in semi-rural areas not so readily available from other sources.

Association with Individuals, Events or Groups of Historical Importance (Criteria A, B and D)

The potential archaeological remains are associated with the transformation of Chatswood from a rural landscape to a suburb of Sydney. The development began in the mid nineteenth century with the establishment of trading outposts and small commercial hubs along main roads through farming land.

The archaeological remains have the potential to engage the local community and provide tangible evidence of the suburb's historical development. Artefacts and other results have potential to be easily interpreted. The archaeological results could also provide additional and complimentary data regarding Sydney's suburban development for archaeological researchers and local historians.

Aesthetic or Technical Significance (Criterion C)

Remains of early buildings may have some technical significance depending on the construction technique used to build them. The potential archaeological remains could provide evidence of individual innovation or adaption to the local environment and available resources, especially when compared to other similar archaeological data sets.

Ability to Demonstrate the Past through Archaeological Remains (Criteria A, C, F and G)

There have been few archaeological investigations of similar sites in the Chatswood area. Site NC 3 has areas of moderate potential archaeological potential which could provide an archaeological dataset to illustrate the material culture of the latter half of the nineteenth century and the development of Chatswood. Remains associated with the former cottage and with any remaining wells or cesspits could provide information of high research interest associated with the historical development Chatswood. This archaeology would likely engage and be of interest to the local community. The potential archaeological remains would provide a dataset which illustrates a typical pattern of suburban development in the area—rural farmland with trading outposts along main roads to suburban development connected by rail.

Significance Level

Overall, NC 3 site has potential archaeological remains of local significance. Remains associated with Phase 2 would be locally significant under Criteria A, D, E and G. Remains from Phase 1 and Phase 3 are unlikely to reach the significance threshold.

2.4.3 Site NC 5 – Bryson's Cottage and Store site

Research Potential (Criterion E)

John Bryson's cottage and commercial store was established near the corner of Mowbray Road and Lane Cove Road (now the Pacific Highway) in the 1860s. When these buildings were constructed, the Chatswood area was largely economically undeveloped, with a mix of small and medium-sized agricultural land grants. Prior to the construction of the North Shore railway line in the 1890s, the

Chatswood area was relatively remote. The area around Lane Cove Road at Mowbray Road was the first commercial centre in the suburb of Chatswood.

Commerce and trade was conducted along Lane Cove Road. Bryson's cottage, store and lumber yard has the potential to inform us of the material practices of these early trades.

Due to the remoteness of the Chatswood settlement at this time, there is a paucity of archival and documentary sources describing domestic and working life in this area. Material remains may give us insight into trading practices of settlers, timber getters, early farmers, and exchange with the early manorial estates of the Lower North Shore.

The lack of municipal sewerage systems and rubbish collection in the area in the mid to late nineteenth century suggest that cesspits, wells, cisterns and rubbish pits potentially have been backfilled with artefact-rich deposits. The higher potential for occupation-related artefacts within remains for former structures add to the research potential of the site.

The archaeological data from Bryson's cottage could be compared with results from other properties in the site, such as the one developed to the north by 1898. As this property fronted the main road it is also likely to have had both a commercial and residential function. It appears this property was development later than Bryson's and a comparative analysis may illustrate changing economic and suburban development in the latter half of the nineteenth century.

The results could also be compared with similar site types in the Sydney area. For example, a number of rural homestead sites in the north west Sydney region were excavated as part of the Sydney Metro Northwest project. Results from the Bryson's cottage site and those from Metro Northwest could provide insight into the differing lives and fortunes of residents in rural nineteenth century north and north western Sydney.

Association with Individuals, Events or Groups of Historical Importance (Criteria A, B and D)

The potential archaeological remains are associated with the transformation of Chatswood from a rural landscape to a suburb of Sydney. The development began in the mid nineteenth century with the establishment of trading outposts and small commercial hubs, such as John Bryson's store, on main roads through farming land. Rail connections in the later nineteenth century facilitated suburban development and in some cases redirected the commercial hubs away from those previously established along roads. This pattern of development is repeated in many of the north west Sydney region suburbs.

The potential archaeological remains are also associated with John Bryson, who was a pioneer of Chatswood and prominent individual in the area. He was pivotal in establishing the School of Arts, and helped build the Chatswood Methodist (now Uniting) Church, the first church in the region. He was an important member of the early Methodist bush mission, and a founding councillor of the North Willoughby ward, elected in 1865. Archaeological investigation of his former property could also provide evidence and contribute to knowledge of the local area's development.

The archaeological remains have the potential to engage the local community and provide tangible evidence of the suburb's historical development. Artefacts and other results have potential to be easily interpreted. The archaeological results could also provide additional and complimentary data regarding Sydney's suburban development for archaeological researchers and local historians.

Aesthetic or Technical Significance (Criterion C)

Remains of early buildings may have some technical significance depending on the construction technique used to build them. Bryson was a carpenter and builder and constructed the buildings that he lived in and worked from personally. The potential archaeological remains could provide evidence of individual innovation or adaption to the local environment and available resources, especially when compared to other datasets from the site and other areas of Sydney.

Ability to Demonstrate the Past through Archaeological Remains (Criteria A, C, F and G)

Bryson's cottage was renamed 'Sarina' by the end of the nineteenth century and likely changed function with changing owners. The building was still shown to be extant in the 1920s, but by the 1940s it had been replaced with brick two-storey commercial terraces. These Pacific Highway-facing brick commercial buildings have since been replaced with corner-facing two-storey brick commercial buildings in the 1970s. While the site is slightly recessed below the surrounding street level, this building does not have a basement level.

Considering the general low level of previous sub-surface impacts there is a moderate potential to encounter the original footings of the cottage and any outbuildings. Cesspits and wells, if present on this site, are likely to remain relatively intact. There have been few archaeological investigations of similar sites in the Chatswood area. Recent work on the Sydney Metro Northwest project would provide relevant comparative data. Remains associated with the former cottage and with any remaining wells or cesspits are likely to provide information of high research interest associated with the historical development Chatswood. The potential archaeological remains would provide a dataset which illustrates a typical pattern of suburban development in the area—rural farmland with trading outposts along main roads to suburban development connected by rail.

Significance Level

Overall, NC 5 site has potential archaeological remains of local significance. Remains associated with Phase 2 would be locally significant under Criteria A, B, D, E and G. Remains from Phase 1 and Phase 3 are unlikely to reach the significance threshold.

2.4.4 Site NC 6 – The School of Arts Site***Research Potential (Criterion E)***

The School of Arts building was constructed by the Mechanic's Institute in 1874 on Mowbray Road, directly to the west of the North Shore railway line. In 1878 it became Willoughby Council's first permanent council chamber. Willoughby Council was the first incorporated municipality on the North Shore, and the administration of the then sparsely settled area was conducted from this building. In the early 1900s the building was adapted as a chapel and incorporated into the Chatswood Preparatory School.

The variety of uses that the building was employed for (technical school, council chamber, school chapel) may provide us with a material sequence of adaptation and change in the character of the community over the lifespan of the building and grounds. The building and several other (including Penzance) were incorporated into a preparatory school in the early twentieth century. Archaeological remains of former building uses, in particular as private residences, may survive amongst education-related remains.

Other archaeological remains, such as artefacts within backfills of wells or cesspits, may provide insight into standards of education and the lives of those who worked and attended in the late nineteenth century, and in the early twentieth. Archaeological remains associated with the council chambers use may evidence of the local government activities and organisation in the late nineteenth century.

Association with Individuals, Events or Groups of Historical Importance (Criteria A, B and D)

The School of Arts archaeological site is associated with the historical development and provision of education in Chatswood. The building later became home to the local council and in the early twentieth century reverted back to an educational institution.

John Bryson was an early commercial entrepreneur and public figure in the Chatswood area, who was personally responsible for encouraging the growth of public institutions in the nascent community. The School of Arts operated from Bryson's property (NC 5) initially. However, the

Mechanics Institute funded the construction of a separate School of Arts building in adjacent land (NC 6) and was completed in 1974. The use of the School of Arts as the first permanent council chamber of Willoughby Council has meant that the building is associated with the first municipal government of the North Shore.

The archaeological remains have the potential to engage the local community and provide tangible evidence of the suburb's historical development. Artefacts and other results have potential to be interpreted and made publicly available. The archaeological results could also provide additional and complimentary data regarding Sydney's suburban development for archaeological researchers and local historians.

Aesthetic or Technical Significance (Criterion C)

The School of Arts building was dismantled in 1957 and reconstructed in its original configuration as the Holy Trinity Anglican church on the corner of Beaconsfield Road and Dalrymple Avenue, Chatswood. Archaeological remains relating to the original site of the building may be able provide additional details of the school's construction method, particularly if the original footings remain. Archaeological remains associated with the later council and preparatory school phases may also provide evidence about the evolution and layout of ancillary buildings such as outhouses, storage buildings, residences for teachers and students.

Ability to Demonstrate the Past through Archaeological Remains (Criteria A, C, F and G)

It is expected that archaeological remains within the School of Arts site would be truncated from later development. Footings of the former School of Arts (later chapel) and other buildings within the site may be able to demonstrate the evolution of the site through three different uses. If artefacts are present at this site, they may also provide tangible evidence regarding daily life at the school / council / preparatory school.

The potential archaeological resource may provide an additional dataset which would be representative of education and institutional facilities in the latter nineteenth and early twentieth century. However, it is expected the remains would be truncated and unlikely to contain extensive and intact artefact bearing deposits.

Significance Level

If relatively intact, the Phase 2 (and early Phase 3) potential archaeological resource at NC 6 site would be of local significance under Criteria A, B and D. Previous impacts to the site may have reduced the research potential of the archaeological remains. Remains associated with Phase 1 and Phase 3 would unlikely meet the significance threshold.

2.4.5 Statement of Archaeological Significance

The majority of the Chatswood Dive Site is unlikely to contain significant archaeological remains. However, Sites NC 3, NC 5 and NC 6 have potential for locally significant archaeology (Table 2-3).

A complex of outbuildings, including a shop and cottage, were constructed on the corner of Bryson Street and Gordon Road in the late nineteenth century (NC 3). Archaeological remains would be associated with the development and increasing commercialisation of Chatswood, at a time when the area was dominated by small-scale agricultural development. The archaeological remains have the potential to inform knowledge of the daily domestic and working life of residents and employees, and provide insight into commercial trade in a semi-rural outpost. The archaeological remains would be representative of a pattern of rural to suburban development.

Bryson's Cottage (NC 5) was built in the mid nineteenth century at a time when the surrounding area was relatively undeveloped. The archaeological remains are associated with the development of Chatswood from a rural to suburban area of Sydney. The remains could provide evidence concerning

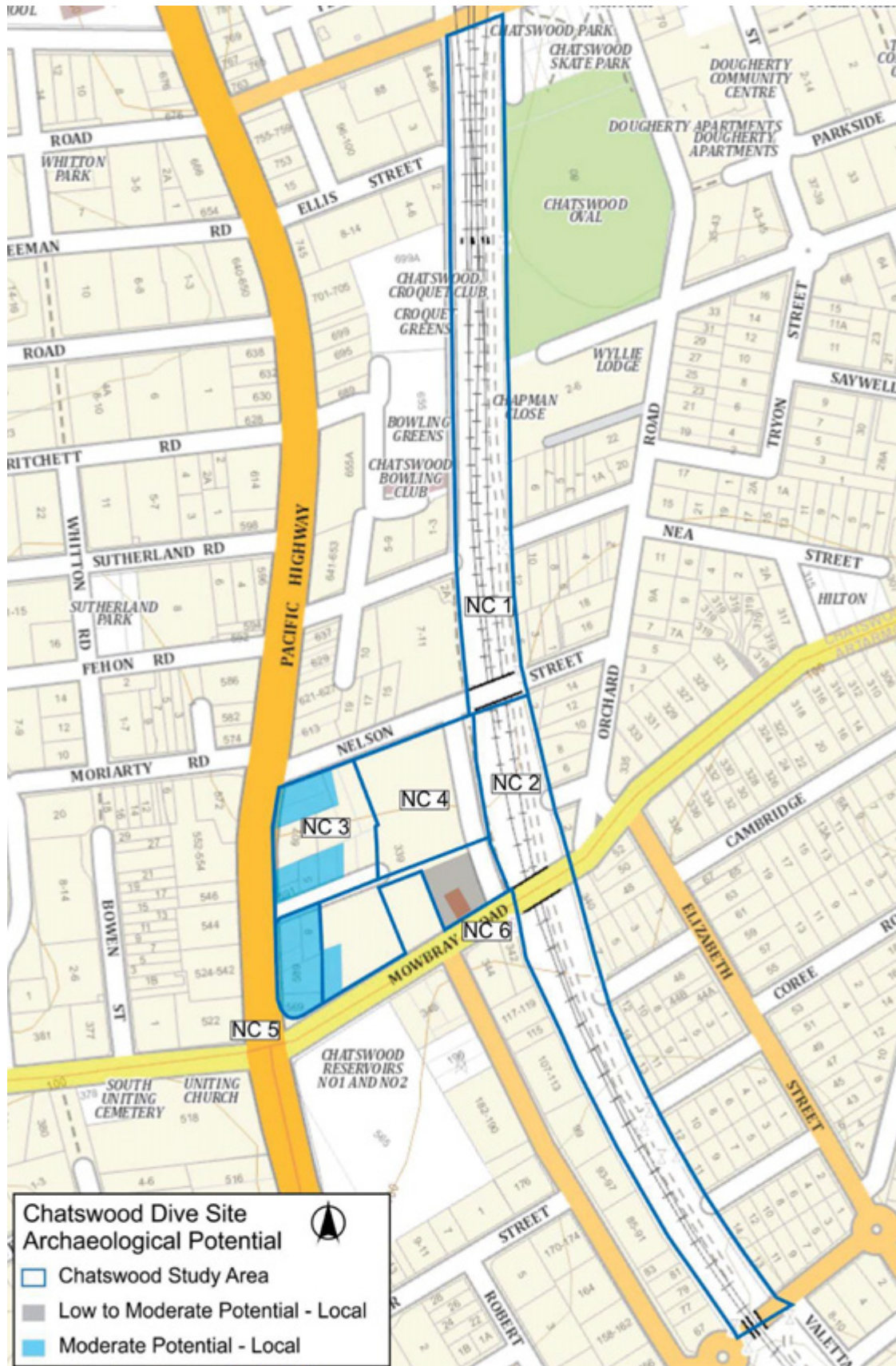
John Bryson, a local pioneer and influential early Chatswood resident. Investigation of the site would inform knowledge regarding daily life and trade in a semi-rural outpost and how this changed with the arrival of the railway. The potential remains could also contribute to knowledge about construction techniques and availability of resources. The archaeological remains would be representative of a pattern of suburban development in the area.

Archaeological resources related to the School of Arts site (NC 6) are associated with the development and provision of education in Chatswood. The remains are also associated with the first local government council in the area as the former School of Arts building served as a chambers in the late nineteenth to early twentieth century. They have the potential to provide information about the original construction of the building and the use and adaptation of the structure for Willoughby Council's first council chamber, and then the preparatory school.

Table 2-3: Summary of areas with potential for significant archaeology at the Chatswood dive site

Site Code	Phase	Potential	Archaeological resource	Significance
NC 3	2 (1860 – 1905)	Moderate	Archaeological remains relating to the store, outbuildings and cottages. Including brick and stone footings, timber base plates and postholes, cess pits and wells, path and yard surfaces, artefact bearing deposits.	Local
NC 5	2 (1860 – 1905)	Moderate	Archaeological remains relating to Bryson's cottage, Bryson's store and commercial livery stables, and another late nineteenth century residential/commercial development. Brick and stone footings, timber base plates and postholes, cess pits and wells, path and yard surfaces, artefact bearing deposits.	Local
NC 6	2 (1860 – 1905) 3 (1905 – 1960)	Low - Moderate	Archaeological remains associated with the former School of Arts site, sub-surface features such as brick or stone footings, wells, cesspits containing artefacts. Likely truncated.	Local

Figure 2-18: Areas with potential for significant archaeological remains at the Chatswood dive site



2.5 Archaeological Impacts

2.5.1 Proposed Works

The Chatswood dive site is about 24,000 square metres in area and located adjacent to the T1 North Shore Line in Chatswood. The site is currently occupied by an Ausgrid depot and a number of commercial and retail buildings.

The Chatswood dive site will be used to:

- Support surface metro track works and adjustment to the T1 North Shore Line between Chatswood Station and Brand Street, Artarmon, including track slewing and construction of the T1 North Shore Line 'Down' (northbound) track viaduct
- Excavate and construct the tunnel dive structure and portal
- Launch and support two tunnel boring machines for the major tunnelling works
- Support tunnel rail systems fit out works.

The southern portion of the site would be used for offices, workshops and car parking; spoil storage and handling would be located at the northern end of the site adjacent to the existing rail line, with segment storage adjacent to the Pacific Highway. The dive structure would be constructed in the eastern portion of the site.

Construction impacts

Proposed construction works within the Chatswood dive site include:

- Ground disturbance works associated with the removal of existing structures and the Nelson Street bridge
- Bulk excavation required in the construction of the dive site
- Excavation to construct the site access and egress ramp
- Localised excavation to upgrade or install in-ground services required for the establishment of the water treatment plant, site offices, staff amenities and the spoil and dive works facilities
- Foundation works for the establishment of site amenities and facilities
- Clearing and ground works would impact up to 500mm across the whole site.

2.5.2 Potential Archaeological Impacts

Bulk excavation for the dive structure, and a site access/egress ramp, has potential to impact locally significant archaeological remains associated the former School of Arts site (Site NC 6, Figure 2-19). The School of Arts was constructed in the 1870s, dismantled and relocated in 1957. In this time the site was also used as a council chamber and as part of a preparatory school. There is low-moderate potential for archaeological remains to be present. If present, excavation for the dive structure and the access ramp would remove all remains within the excavation footprint.

Demolition, grading and resurfacing, and excavation for new footings and utilities in the south west corner of the construction site also have potential to impact locally significant archaeological remains associated with Bryson's cottage and store, constructed in the 1860s (Site NC 5). There is moderate potential for archaeological remains associated with Bryson's cottage and store to be present. Depending on the extent and depth of ground disturbance in this area (Site NC 5), the works could impact part of, or all of, the surviving archaeological remains.

Figure 2-19: Potential archaeological impacts - Chatswood dive site



2.6 Archaeological Management

Archaeological impact mitigation and investigation is required for Chatswood dive site in Site NC 3, NC 5 and Site NC 6. All other areas would be subject to an unexpected finds procedure during construction works. See Table 2-4 below for a summary of archaeological impact mitigation requirements for Chatswood dive site.

Table 2-4: Summary of archaeological impact mitigation for the Chatswood dive site

Site Code	Potential archaeology	Impact	Mitigation
NC 3	Moderate potential for locally significant remains of mid-late nineteenth century residences, stores and outbuildings including wells and WCs	Potential direct impact – demolition, ground levelling and construction of construction site facilities	<ul style="list-style-type: none"> AMS Monitoring or Test/Salvage
NC 5	Moderate potential for locally significant remains of Bryson's cottage and store (1860s) and residential/commercial buildings (late 19 th)	Potential direct impact – demolition, ground levelling and construction of construction site facilities	<ul style="list-style-type: none"> AMS Monitoring or Test/Salvage
NC 6	Low-Moderate potential for locally significant remains of the former School of Arts (1870s), residential and school-related remains (late 19 th and early 20 th)	Direct impact – excavation for dive structure and access ramp	<ul style="list-style-type: none"> AMS Test/Salvage
NC 1 NC 2 NC 4	Nil-Low potential for archaeological remains, unlikely to meet the significance threshold	Potential direct impact – demolition, ground levelling and construction of site amenities	<ul style="list-style-type: none"> Unexpected Finds Procedure

2.6.1 Archaeological Methodology

The following archaeological methodology for the Chatswood dive site is based on impacts known at project approval stage. Explanation and further details regarding the archaeological process and methodologies identified below are provided in Section 12.0.

- An AMS for Site NC 3, Site NC 5 and Site NC 6 would be prepared prior to construction works commencing at the Chatswood dive site. The AMS would:
 - Review scope of works and construction methodology for site facilities and reassess potential for impacts to significant archaeological resources in Site NC 3 (Cottage, store and outbuildings) and NC 5 (Bryson's 1860s cottage site)
 - Identify opportunity for in situ conservation of archaeological remains at Site NC3 and Site NC 5
 - Confirm archaeological mitigation for Site NC 3 and Site NC 5 based on construction impacts, whether monitoring and recording or test / salvage, to mitigate impacts
 - Confirm timing for archaeological investigation in Site NC 6 within the construction program
 - Consider opportunities to provide information regarding the archaeological findings to the public.

- A test / salvage archaeological investigation would be undertaken prior to main bulk excavation for the dive structure and access ramp in Site NC 6.
- Unexpected finds procedure would apply to all other areas (Sites NC 1, NC 2 and NC 4) during the construction program.
- A preliminary results report would be written once archaeological fieldwork has been completed.
- Post-excavation analysis of fieldwork results, artefacts, samples and other archaeological data would be undertaken and included in a final archaeological investigation report.
- Significant archaeological findings would be considered for inclusion in heritage interpretation for the project.

2.6.2 Research Questions

The historical themes appropriate for the Chatswood dive site is presented in Table 2-5.

Table 2-5: Historical themes associated with the Chatswood dive site

Australian theme	NSW theme	Explanatory notes	Comments
3. Developing local, regional and national economies	Agriculture	Activities relating to the cultivation and rearing of plant and animal species, usually for commercial purposes.	The early development of the Chatswood area for orchards by John Bryson in the mid-19 th century.
3. Developing local, regional and national economies	Commerce	Activities related to the buying, selling and exchanging of goods and services	Bryson opened a timber yard in the study area to sell the produce from timber getting camps on the North Shore. The Mowbray Road/Pacific Highway intersection became the first commercial centre of the Chatswood area.
4. Building settlements, towns and cities	Towns, suburbs and villages	Activities associated with creating, planning and managing urban functions, landscapes and lifestyles in towns, suburbs and villages	The Chatswood study area was the first commercial centre in Chatswood. The first permanent Willoughby Council Chamber was established in the study area in the late 19 th century.
6. Educating	Education	Activities associated with teaching and learning by children and adults, formally and informally	The Mechanics Institutes originally established a School of Arts in the study area in the mid/late-19 th century.
8. Developing Australia's cultural life	Domestic Life	Activities associated with creating, maintaining, living in and working around houses and institutions	Bryson's Cottage was one of the earliest residences constructed in the Chatswood area, and may possess archaeological remains which demonstrate daily and working lives during early suburban settlement of the region.
8. Developing Australia's cultural life	Religion	Activities associated with particular systems of faith and worship	Bryson was a member of the Bush Missionary Society. His cottage was used as a congregation meeting place before he assisted in the construction of Chatswood's first church.

Australian theme	NSW theme	Explanatory notes	Comments
8. Developing Australia's cultural life	Social Institutions	Activities and organisational arrangements for the provision of social activities	The Mechanics Institutes originally established a School of Arts in the study area in the mid/late-19 th century.

The following research questions would guide archaeological investigations for the Chatswood dive site.

Site NC 3 – Cottages, stores and outbuildings

- Can the architectural types of the buildings inform current knowledge about nineteenth century preferences and availability of building materials in Chatswood?
- Can the arrangement of interior rooms indicate how households were structured and how does this reflect society and social norms?
- Are there remains of wells and cesspits, and what do they tell us about the evolution of utility services in the area?
- Do the archaeological remains attest to what type of commercial activity was being undertaken in this part of the study area? And how does this compare with Bryson's store (NC 5)?
- What do the artefacts and other archaeological evidence contribute to our knowledge of nineteenth century rural domestic life and economy?
- How does the assemblage compare to other contemporary archaeological sites in the area or similar rural locations around Sydney? Results from Site NC 5 and from recent archaeological investigations for the Sydney Metro Northwest project could be used for comparison.

Site NC 5 – Bryson's cottage

- How does Bryson's estate inform current knowledge of orchard growing in Chatswood?
- Can the architectural types of the buildings inform current knowledge about nineteenth century preferences and availability of building materials in Chatswood?
- Can the arrangement of interior rooms indicate how households were structured and how does this reflect society and social norms?
- Are there remains of wells and cesspits, and what do they tell us about the evolution of utility services in the area?
- Is there artefactual evidence associated with Bryson's occupation and use of the site? What can they tell us about the Bryson family?
- What do the artefacts and other archaeological evidence contribute to our knowledge of nineteenth century rural domestic life and economy?
- How does the assemblage compare to other contemporary archaeological sites in the area or similar rural locations around Sydney? Results of recent archaeological investigations for the Sydney Metro Northwest project could be used for comparison.
- How did the railway and suburban subdivision affect the Bryson residence and commercial activity and does this reflect patterns in similar localities in the Sydney area?
- How does the development of the Bryson's estate fit within the wider Chatswood development? Does this development compare with similar archaeological sites and suburbs?

Site NC 6 – The School of Arts site

- Does the site contain evidence of the original location of the School of Arts?
- To what extent was the material of the building removed when it was dismantled? Were significant parts of the building's fabric left behind and re-fabricated at its new site?
- Are there remains of wells and cesspits, and what do they tell us about the evolution of utility services in the area?
- Can archaeological remains and artefactual deposits discriminate between the three phases of use of the building – technical school, council chamber and school chapel?
- Are there archaeological remains associated with private residential occupation in surrounding lots? How do they compare to other remains on the site and in Sydney suburban areas?
- Do the artefacts provide evidence of domestic occupation and daily life in Chatswood in the latter half of the nineteenth century?
- How do the building material and techniques differ between residential, commercial and public buildings?
- Do the artefacts contribute to knowledge regarding the students and the provision of education in the latter half of the nineteenth century?
- How does the assemblage compare to other institutional sites in the city and other suburban areas?
- What are the similarities with other educational and institutional archaeological sites dating to the latter half of the nineteenth and early twentieth century?

3.0 CROWS NEST STATION

3.1 Site Location

Crows Nest Station site is located to the north-east of the Pacific Highway in the suburb of Crows Nest, in the North Sydney Council LGA. The station is located between the Pacific Highway, Oxley Street, Clarke Lane and Hume Street. The station entrances are located on Clarke Street and the Pacific Highway.

3.1.1 Land Parcels

The land parcels associated with the Crows Nest study area are presented in Figure 3-1. All existing structures on these land parcels would be demolished for the station construction.

Table 3-1: Land Parcels in the Crows Nest Station site

Site Code	Address	Lot	Existing Structures
CN 1	521 – 539 Pacific Highway, Crows Nest	A//DP374468 B//DP374468	Single storey car parking lot with single storey office
CN 2	511 Pacific Highway, Crows Nest	//SP71539	Three-storey office building
CN 3	507 – 509 Pacific Highway, Crows Nest	4//DP1096359	Two-storey commercial building
CN 4	503 – 505 Pacific Highway, Crows Nest	3//DP655677	Two-storey commercial building
CN 5	501 Pacific Highway, Crows Nest	1//DP575046	Single storey commercial building
CN 6	497 Pacific Highway, Crows Nest	2//DP575046	Two-storey commercial building
CN 7	Hume Street, between Pacific Highway and Clarke Lane, Crows Nest	N/A	Two lane suburban street with street parking
CN 8	495 Pacific Highway, Crows Nest	A//DP442804	Two-storey Australia Post Office
CN 9	479 Pacific Highway, Crows Nest	101//DP747672	Site of building redevelopment (no permanent structures as of May 2015)
CN 10	477 Pacific Highway, Crows Nest	100//DP747672	Two-storey commercial building
CN 11	Clarke Lane, between 497 – 501 Pacific Highway and 14 Clarke Street, Crows Nest	N/A	One-way, single lane rear access lane
CN 12	14 Clarke Street, Crows Nest	1//SP52547	Single storey vehicle workshop

Figure 3-1: Crows Nest Station site showing existing modern development and site codes



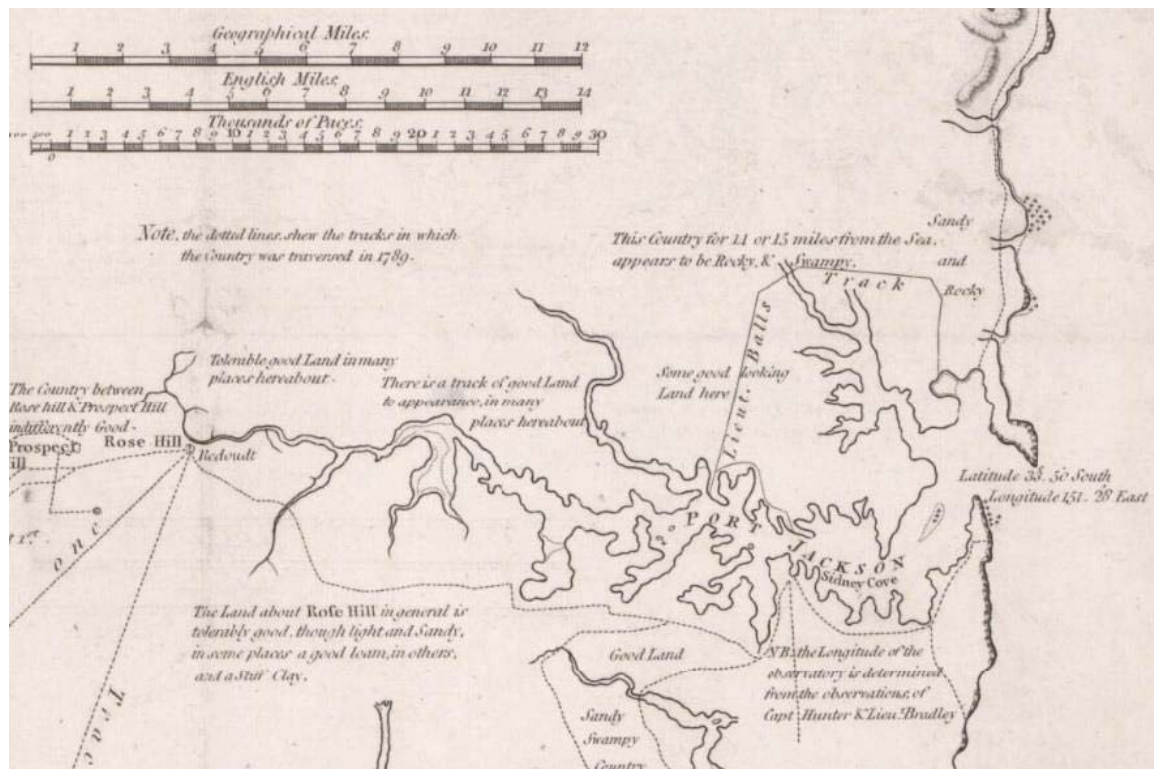
3.2 Historical Analysis

3.2.1 European Exploration and Early Land Grants (1788 – 1880)

Initial European settlement in Sydney was concentrated on the southern side of Port Jackson and around Sydney Cove. The exploration of the upper waterways of Port Jackson commenced shortly after the arrival of the colonists at Sydney Cove. The first Europeans to explore the hinterland of the North Shore were Lieutenant Henry Ball and two marines in April 1788. Splitting off from an expedition exploring the creeks that fed into Middle Harbour, Ball and his men returned to Sydney Cove overland and took two days to return to the North Shore to what is now Ball's Point. He

described the land that he travelled through as “a jumble of rocks and thick woods”¹⁸. William Dawes records the land that he surveyed through as “good looking land” (Figure 3-2).

Figure 3-2: William Dawes' Map of New South Wales, 1792¹⁹



No substantial settlements had been established inland from the northern shore of Port Jackson by 1820. Travel in and around Port Jackson was predominantly achieved by boat and the European settlement that existed on the North Shore at this time was confined to water frontages.

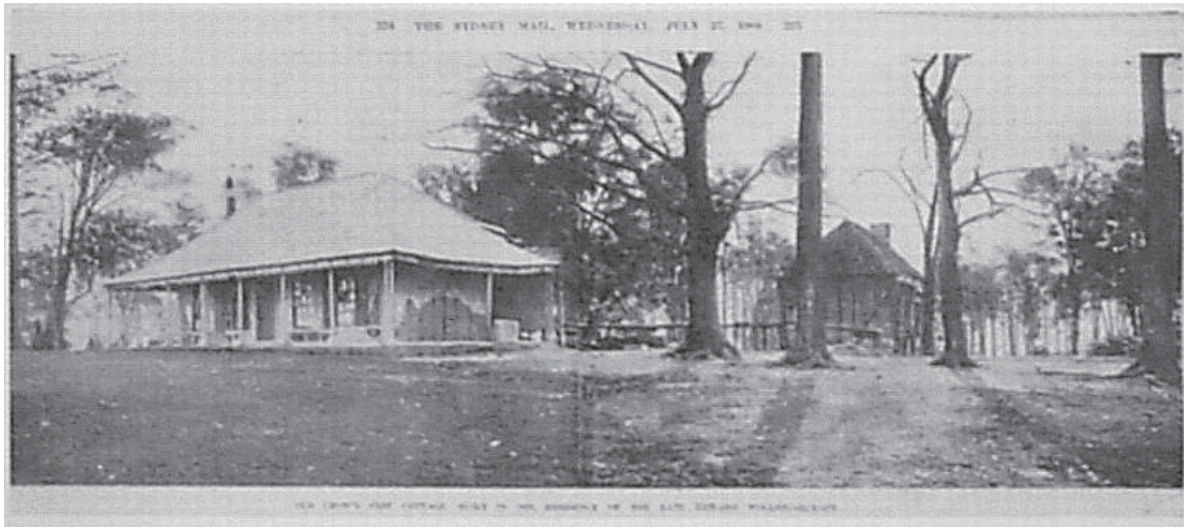
During this first thirty years of the colony, the area that eventually became the suburb of Crows Nest was forested with native vegetation. There is no evidence of European settlement in this area at this time, likely due to the relative distance of the higher ridges from the harbour foreshores where early settlement was then clustered.

The first land grant in the Crows Nest Station site was a single large property bestowed to Edward Wollstonecraft in 1820. Wollstonecraft was a solicitor from London who had formed a commercial partnership with Alexander Berry, a Scottish merchant, in 1812. This commercial partnership resulted in Wollstonecraft and Berry travelling separately to the colony of Sydney in 1819 and receiving land grants from Governor Macquarie.

Wollstonecraft was given 2,000 acres of land from the Crown, of which he chose 526 acres of land on the North Shore. This grant stretched from Balls Head Cove on Port Jackson up to the ridge line, encompassing what is now Wollstonecraft, Crows Nest and St Leonards. He built a cottage in 1820 and called it the “Crows Nest Cottage” due to the prominent views over the harbour to the south that the property enjoyed (Figure 3-3). Wollstonecraft died in 1832, leaving his property to Berry and his sister, Elizabeth, whom Berry had married.

¹⁸ Bradley, W. 1792 *A Voyage to New South Wales, 1786 – 1792*, quoted in Champion and Champion 2006, “Finding the Right Track: Governor Phillips Inland Exploration from Manly towards Middle Harbour and Westwards: 15th to 18th April 1788”

¹⁹ National Library of Australia, MAP NK 2456/126.

Figure 3-3: Crows Nest Cottage in 1904. Source: Stanton Library

The Wollstonecraft estate was primarily an agricultural estate, which was described in 1832 as possessing “luxuriant orchards and gardens”²⁰. Both Wollstonecraft and Berry were founding members of the Agricultural Society of NSW (now the Royal Agricultural Society of NSW). Their interest in developing new and marketable crops in the colony is best represented by their experiments with tobacco and maize on their large agricultural holdings on the Shoalhaven²¹. In 1831 the quality of the nectarines from Crows Nest estate was remarked on in the Sydney Monitor²².

Wollstonecraft and Berry had chosen their land grants, both on the North Shore and on the Shoalhaven River, for their relative seclusion. In choosing the location of their properties, Wollstonecraft and Berry “neither wished to elbow any one nor to be elbowed”²³ and while there appears to be some land clearing that had occurred during the mid-nineteenth century, the area was not substantially developed before the end of the century (Figure 3-4).

Alexander Berry did not live in the Crows Nest Cottage after inheriting Wollstonecraft’s land, instead choosing to build a larger residence in 1850 nearly a kilometre to the south which he called “Crows Nest House”. Crows Nest Cottage was rented out to tenants.

Berry and Wollstonecraft’s property was characteristic of North Shore land grants during the nineteenth century: large acreages which grew in size over time as property owners purchased or acquired neighbouring land. On these large estates a number of wealthy mansions were built, particularly along the southern foreshores. In order to house the workers for these estates, the first town on the North Shore, St Leonards (now North Sydney) was surveyed and gridded roads were laid out in 1838 (Figure 3-5)²⁴.

With the increase in population on the North Shore, the first roads were cleared and constructed in the area by the 1850s. Lane Cove Road was laid out following the ridge line north-west from the township of St Leonards (now North Sydney) towards Gore Hill and the Artarmon land grant in the north. It is not likely that this road would have been sealed at this time.

²⁰ Sydney Gazette, 24 November 1832.

²¹ T. M. Perry, 'Berry, Alexander (1781–1873)', Australian Dictionary of Biography, National Centre of Biography, Australian National University, <http://adb.anu.edu.au/biography/berry-alexander-1773/text1987>, published first in hardcopy 1966, accessed online 19 May 2016.

²² Sydney Monitor, 11 May 1831.

²³ T.M. Berry, *op cit*.

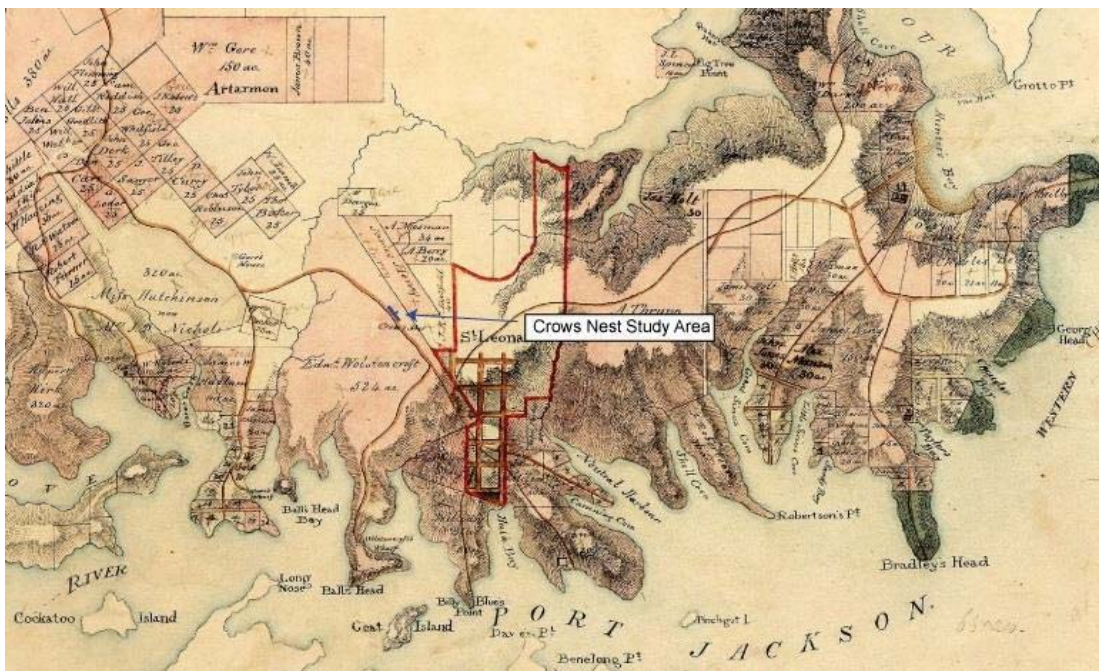
²⁴ Staas, R. Thorpe, W. and Wright, M. 1997. Conservation Area Studies: Holtermann Estate A, B, C, D and Lady Hay Estate (Crows Nest Road), North Sydney. Report prepared for North Sydney Council, pp. 9 – 10.

After 1850, Berry began a process of subdividing portions of his land for residential sale to the public. However, land sales and development in this part of the North Shore was slow and only a few of the properties were sold. After Berry's death in 1873, the estate was inherited by his relative, Sir John Hay. After Hay's death in 1909, his wife, Lady Hay, continued attempts to subdivide and sell portions of the estate, although the number of properties that sold was minimal until the 1890s.

Figure 3-4: Watercolour painting of view from Berry's Estate, by Conrad Martens 1861²⁵



Figure 3-5: 1850s Parish Map of Willoughby, with Crows Nest Station site in blue



²⁵ Paintings of Conrad Martens, Historic Houses Trust.
<http://collection.hht.net.au/firsththpictures/picturerecord.jsp?recno=30941> accessed online 19 May 2016.

3.2.2 Residential Subdivision (1880 – 1930)

In the 1890s John Hay donated a portion of the estate to the government in order to build what is now the North Shore Rail Line. The line was completed in 1893 and ran from the ferry wharf at Milsons Point in the south to Hornsby in the north. The rail line was supplemented by a cable tram through the town of North Sydney, which was extended to Lane Cove Road (now the Pacific Highway) in 1898.²⁶

Portions of the Berry estate had been progressively sold during the 1880s and 1890s, although the majority of these allotments were to the east and south of the Crows Nest study area. The portion of the Berry estate which was adjacent to Lane Cove Road was put up for subdivision several times from 1892 until 1910. Despite the increase in population and the growth of public transport in the area, these allotments sold poorly and few were developed before the end of the nineteenth century.

In the process of subdividing the Berry Estate, the road grid was laid out and standardised in the study area and Lane Cove Road was straightened towards its present-day alignment as the Pacific Highway. It is likely that Lane Cove Road was resurfaced during this period with the construction of the cable tram after 1898.

By 1895 water tanks had been constructed at Chatswood to supply the lower North Shore with their potable water supply. In addition, the North Sydney sewerage system was constructed between 1891 and 1898²⁷. With the resurfacing and widening of Lane Cove Road, and the laying out of new streets, these residential areas were incorporated into the growing network of municipal water and sewerage supply in Sydney by 1900.

North Sydney Council block plans from 1890 show two structures within the Crows Nest Station site, one on Lane Cove Road and another on Clarke Street (Figure 3-6). Both appear to be residential structures from their design. A subdivision map from 1909 also shows an additional structure on Lane Cove Road, however the Clarke Road properties from the 1890 plan are not depicted (Figure 3-7). North Sydney Road (now Willoughby Road) had developed as a retail and commercial area (Figure 3-8) although that development had not spread further north at that time.

Crows Nest Cottage was demolished to make way for a church in 1909 and further residential subdivision occurred up until the 1920s. While residential properties were constructed along the secondary streets of Crows Nest, the street frontages on Lane Cove Road were earmarked for commercial development, and were largely vacant until the 1930s (Figure 3-9).

²⁶ Staas, R. Thorpe, W. and Wright, M. 1997. Conservation Area Studies: Holtermann Estate A, B, C, D and Lady Hay Estate (Crows Nest Road), North Sydney. Report prepared for North Sydney Council, p. 10.

²⁷ Aird, W.V. 1961. *The Water Supply, Sewerage and Drainage of Sydney*. Halstead Press, Kingsgrove. pp. 67 – 68; 154 – 155.

Figure 3-6: 1890 North Sydney Council block plan showing residential structures. Crows Nest Station site outlined in blue. Source: Stanton Library

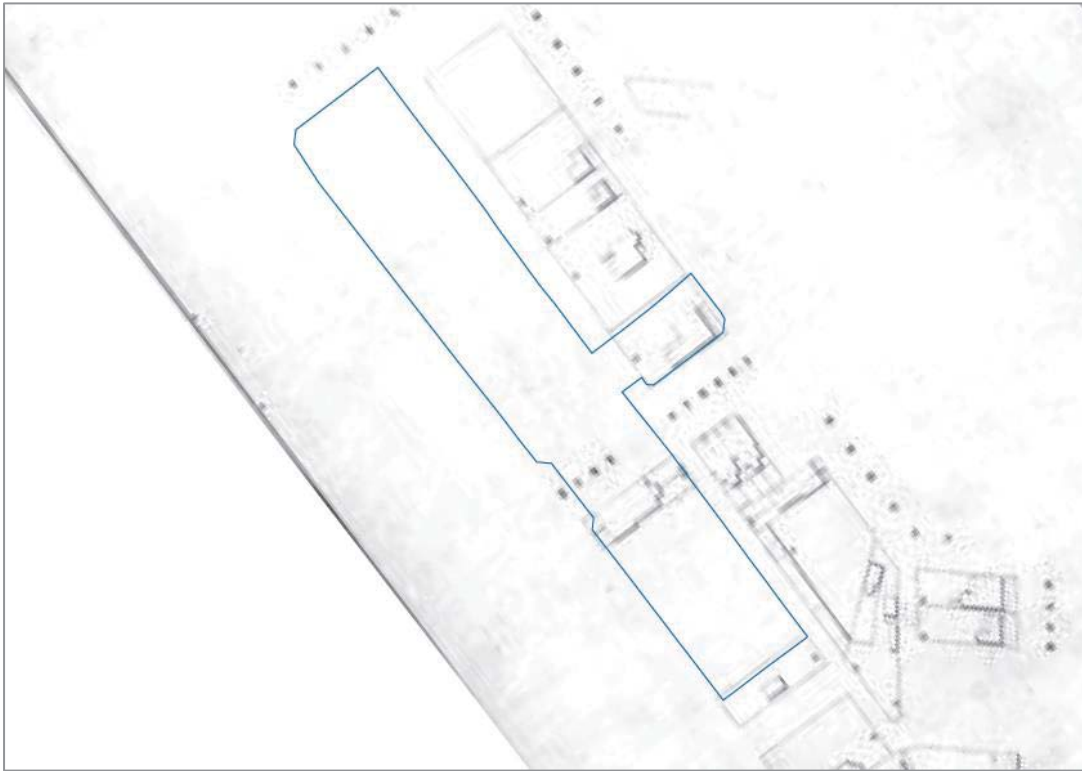


Figure 3-7: 1909 Subdivision plan on Lane Cove Road showing early residential structures. Crows Nest Station site marked in blue. Source: National Library of Australia

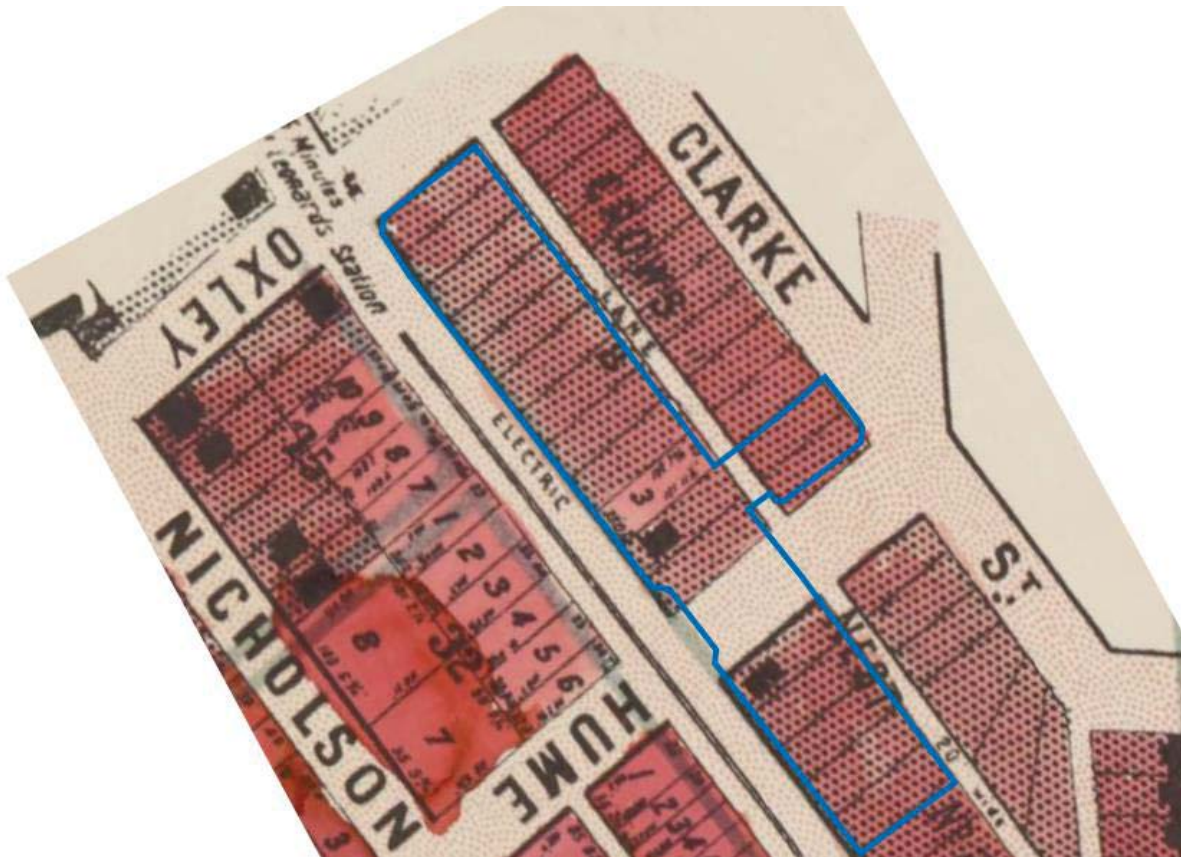


Figure 3-8: Early 1900s photograph of Crows Nest Junction looking south (corner of Falcon Street and Pacific Highway)



Figure 3-9: 1912 view of Lane Cove Road looking north from Crows Nest Junction and illustrating the urban character of the time. Source: Stanton Library



3.2.3 Early-Mid Twentieth Century Commercial Development (1930 – 1950)

In 1932 construction of the Sydney Harbour Bridge led to increased development on the North Shore. By this time, the remainder of Berry Estate subdivisions had been sold, predominantly for residential housing. Commercial development increased along the Lane Cove Road frontages in Crows Nest.

Building plans and photographs from the 1930s to the 1940s show a number of large businesses opened on Lane Cove Road. On the corner of Hume Street and the Pacific Highway, a vehicle garage and a produce market were constructed in 1939 (Figure 3-10). On the corner of Oxley Street and the Pacific Highway, a timber yard was constructed in 1941 (Figure 3-11). Several smaller one and two-storey commercial properties were also constructed along the Lane Cove Road facing in the study area.

The Crows Nest Station site was only partially developed by 1943, with commercial properties on the majority of the area, a large undeveloped lot on the eastern corner of Hume Street and Lane Cove Road, and smaller cleared lots along the Hume Street frontage. The residential structure on the corner of Clarke Street and Hume Street remains (Figure 3-12).

Further aerial photographs from the 1940s show that the surrounding suburb of Crows Nest was largely residential in character except for commercial areas along Willoughby Road, Falcon Street and the Pacific Highway (Figure 3-13).

Figure 3-10: 1939 building plans for vehicle garage and produce market, corner of Hume Street and Lane Cove Road. Source: Stanton Library

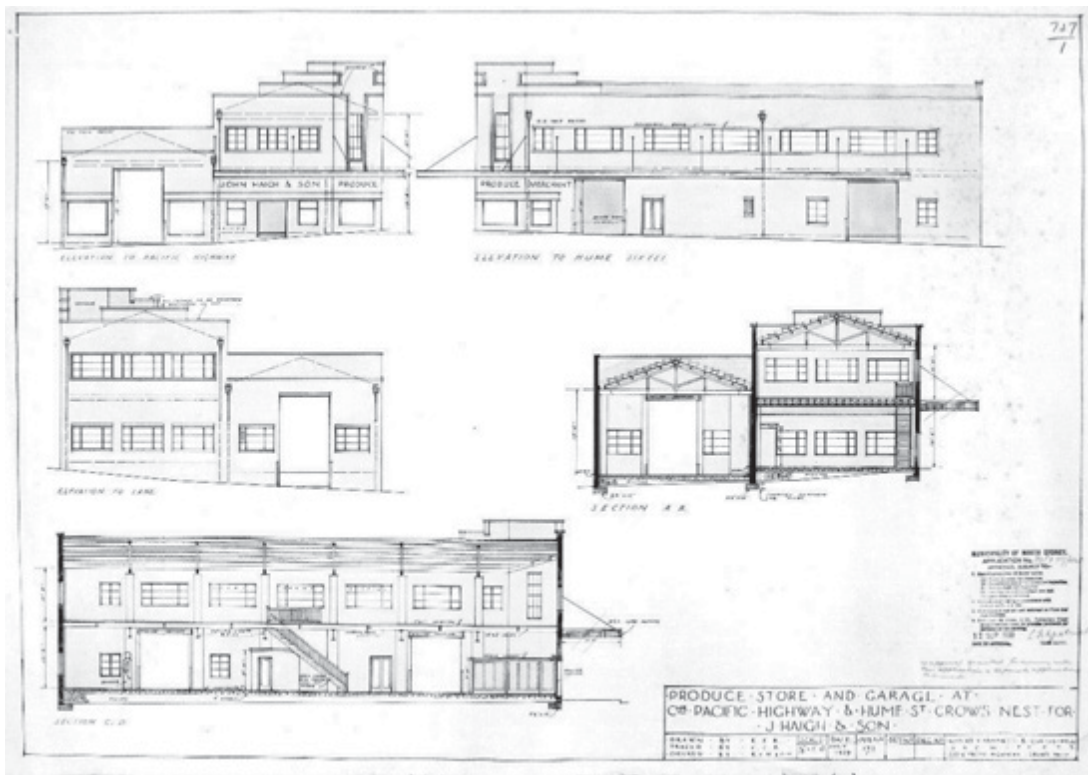


Figure 3-11: 1941 building plans for timber yard, corner of Oxley Street and Lane Cove Road.
Source: Stanton Library

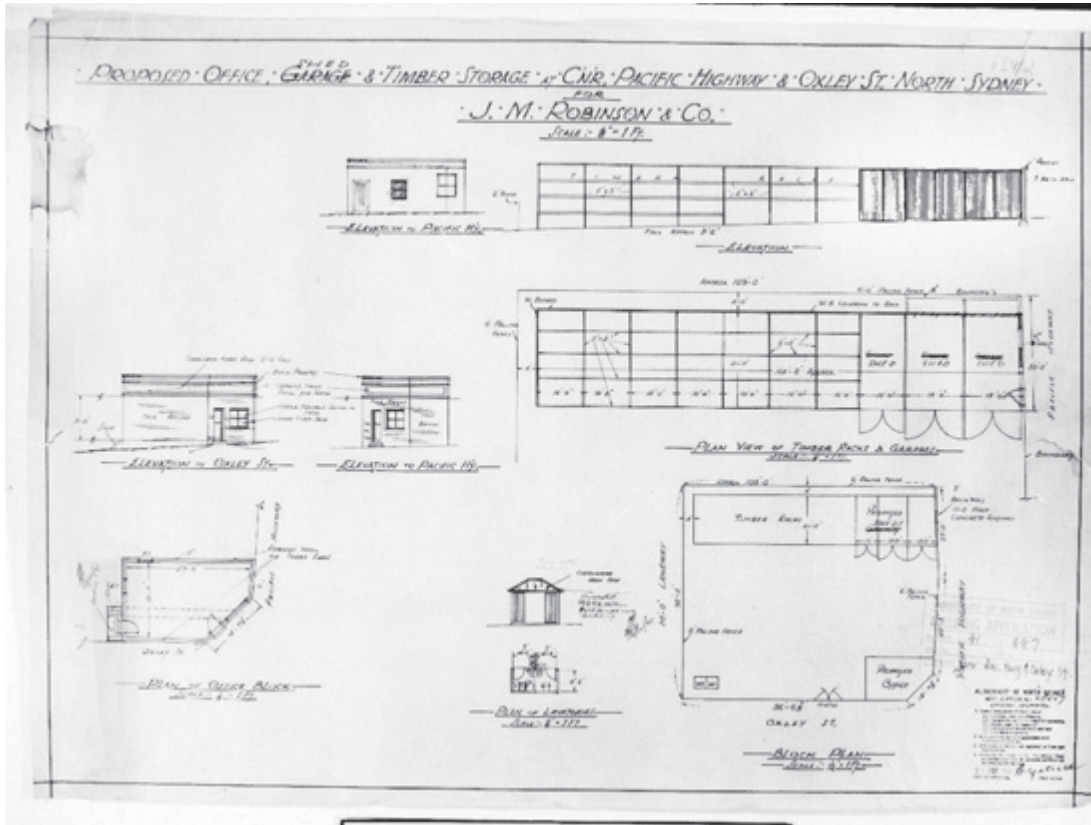


Figure 3-12: 1943 Aerial photograph showing commercial development on Pacific Highway. Crows Nest Station site marked in blue. Source: Lands and Property Information



Figure 3-13: 1940s aerial photograph showing typical commercial structures on Pacific Highway. Source: National Library of Australia



3.2.4 Post-War Commercial Development (1950 – Present)

Properties on the Pacific Highway in Crows Nest continued in commercial use after World War II. With the increase in motor vehicle traffic following the war, the electric tram line which ran up the Pacific Highway was decommissioned in 1958. Development on the North Shore has increased since the 1960s, when cheaper land values compared to the Sydney CBD encouraged corporations to move their offices to the newly built high-rises of North Sydney.

During this time, many of the existing late Victorian and Federation-era housing that existed in Crows Nest near to the Pacific Highway was redeveloped for further commercial properties. The Brutalist St Leonards Centre on Oxley Street was constructed during 1972. The Crows Nest Station site today is a mix of office complexes, car parks and retail premises. While the majority of these commercial buildings were constructed post 1980, a number are the original 1930s and 1940s commercial buildings which have been repurposed for modern use.

3.3 Archaeological Potential

3.3.1 Previous Archaeological Studies

Few archaeological studies in the North Sydney/Crows Nest area have been previously conducted. This is primarily because much of the residential streetscape in the area has not been substantially altered or redeveloped since the first structures were built on them at the end of the nineteenth century.

Two significant heritage studies have been produced for the Crows Nest area – the North Sydney Heritage Study in 1981 (updated in 1993)²⁸, and the Conservation Studies for the Holtermann and Lady Hay Estates in 1998²⁹. These heritage studies document the development of the residential and commercial areas in Crows Nest and North Sydney from a built heritage perspective.

An archaeological excavation of the sub-floor deposits and structures of the modified Italianate Gothic mansion in Kirribilli, called Greencliffe, was conducted in 1994³⁰. The house was originally constructed on a subdivision of the Robert Campbell estate, one of the early settlers in North Sydney in 1858. The sandstone cottage was built for a tenant occupier at that time. The house was substantially remodelled in the 1920s.

Excavations at Greencliffe focussed on investigation of underfloor deposits and an open area excavation in the surrounding yard. Nineteenth century domestic artefacts were recovered, as well as evidence of the original sandstone layout of the 1858 cottage from sandstone footing pads. The excavation and physical fabric analysis revealed the architectural modifications made through several stages of repurposing the house. These architectural and artefactual changes broadly corresponded with the changing demographic trends and the roles of the occupants of the lower North Shore from the mid-nineteenth century until the 1990s.

3.3.2 Land Use Summary

European occupation of the Crows Nest Station site has been divided into four distinct phases of historical activity, which are discussed below.

- Phase 1 (1788-1880) exploration and Wollstonecraft/Berry Estate. Land clearance, timber getting and farming
- Phase 2 (1880-1930) subdivision. Residential development and occupation
- Phase 3 (1930-1950) commercial. Commercial development and activity
- Phase 4 (1950-present) post war commercial. Commercial redevelopment and activity, infrastructure development.

3.3.3 Previous Impacts

The Crows Nest Station site is located in an area with a surface gradient rise of 10 metres over the approximately 190 metre length of the study area. Post-1950 commercial development is likely to have included grading and levelling across the whole area. Several modern premises have sub-surface car parks, and a number of other properties have ground levels which have been excavated into the gradient of the slope. This level of modern excavation has reduced the potential to recover archaeological remains of former structures in many parts of the study area.

In addition to building redevelopment on many of these sites, the installation of several water, sewerage, electricity and fibre-optic utility services on the outer edge of the Pacific Highway and in Clarke Lane have caused further localised subsurface impacts.

²⁸ Godden Mackay Pty Ltd. 1993. *North Sydney heritage study review 1993, volume I and II*. Report prepared for North Sydney Council.

²⁹ Staas, R. Thorpe, W. and Wright, M. 1997. *Conservation Area Studies: Holtermann Estate A, B, C, D and Lady Hay Estate (Crows Nest Road)*, North Sydney. Report prepared for North Sydney Council.

³⁰ Casey and Lower, 1995. *The Archaeological Investigation of 'Greencliffe': 51 – 53 Kirribilli Avenue, Kirribilli, Sydney*. Report prepared for Bruce Swalwell Architects.

3.3.4 Potential Archaeological Remains

Phase 1 (1788 – 1880)

Archaeological remains associated with the earliest period of European settlement are likely to be ephemeral in nature and relate to land clearance and farming or grazing. The only known structures near the Crows Nest Station site prior to the 1880s was Crows Nest Cottage and an unidentified structure, possibly a timber shed, directly to the north of the cottage (the structure in the right of the photograph in Figure 3-3). These structures were located approximately 150 metres to the south of the Crows Nest Station site, in the parcel of land now occupied by the Crows Nest Uniting Church on the corner of Shirley Road and Nicholson Street.

From paintings and occasional late nineteenth century photographs of Wollstonecraft and Berry's land grant, the land was partially cleared of native vegetation and fences were built in some areas on the property. The existence and location of any additional ancillary farming or timber getting buildings from this period is unknown. There is no direct evidence of any structures located in the Crows Nest Station site at this time.

The location of Lane Cove Road's early alignment directly adjacent to the Crows Nest Station site may indicate some potential of locating previously unknown archaeological items from this period such as timber structures and fence posts. Unsealed road surfaces also have poor archaeological visibility.

Phase 2 (1880 – 1930)

Prior to the construction of commercial properties along the Pacific Highway, there is evidence for three residential structures in the Crows Nest Station site. Two of these structures are evident on North Sydney Council block plans from 1890 (Figure 3-6), and a third structure is evident on a subdivision plan dating from 1909 (Figure 3-7). The sites with structures by 1890 are CN 8 and CN 12.

From these plans, the properties are either late Victorian or Federation houses. Water and sewerage supply had been connected in this area by 1890. Because of the reticulated water supply and sewerage network, as well as municipally organised garbage collection from this time, subsurface features such as wells and cesspits are unlikely to be present within the study area as most buildings were constructed after 1890. Tongue and groove floorboards, ubiquitous from the later nineteenth century in suburban contexts, also prevent the accumulation of underfloor deposits. Generally, there is potential for footings, yard surfaces and former services associated with development in this phase.

Two terrace houses are depicted in CN 8 and one in CN 12 are the only structures in the study area on the 1890 plan. These also have WCs in the rear yard adjacent to the laneway. Twentieth century development in CN 12 is likely to have removed all previous archaeological remains. The level of previous impact is not as great at CN 8. There is potential for footings, yard surfaces and former services. In addition, there may be remains of the two WCs in the rear yard. However, results from investigations of similar archaeological sites strongly suggest remains of WCs in suburbs with municipal services dating to the 1890s are highly unlikely to contain artefact bearing deposits.

Phase 3 (1930 – 1950)

The Crows Nest Station site developed its commercial character from the 1930s onwards and the first two-storey structures date from this time. Commercial properties were constructed throughout most of this area, with some areas remaining vacant. One lot on the eastern corner of Hume Street and the Pacific Highway has been cleared where formerly a residential structure had existed on the land. The only other remaining residential structure, remaining until at least the 1940s, was located off the Pacific Highway frontage on the corner of Clarke Street and Hume Street.

From archived building plans, the majority of these commercial structures were constructed with brick and concrete pylon footings which descended less than 500 mm into the ground surface in limited areas. The degree of excavation and infilling required to level the ground surface for these building constructions is unclear.

Phase 4 (1950 – Present)

Commercial development in the Crows Nest study area after 1950 varies between renovation of pre-existing structures for modern commercial use and the demolition of earlier structures for new commercial premises. Levelling the ground surface and the construction of basement car parks has increased the degree of subsurface disturbance during construction activities compared to previous phases of building.

3.3.5 Summary of Archaeological Potential

Based on historical information, land use data and evidence of sub-surface impacts, a summary of the potential archaeological remains in the Crows Nest Station site is provided in Table 3-2 below.

Table 3-2: Potential archaeological remains at the Crows Nest Station site

Site Code	Phase	Likely archaeological remains	Potential
CN 1	1 (1788 – 1880)	No documentary evidence of former structures located in this area. Potential for tree boles, field drains, fence postholes, isolated artefact scatters. Former unsealed Lane Cove Road alignment through this area. Potential for informal road surfaces such as gravel, with informal cut drains and gullies.	Nil - Low
	2 (1880 – 1930)	No documentary evidence for built structures in this area. Potential for informal land uses, fence postholes, drains, isolated artefacts.	Nil - Low
	3 (1930 – 1950)	Timber yard with storage area, outhouses and single storey office building constructed in 1941 – 1942 on the north-western half of the land parcel. Archaeological remains consisting of postholes, footing (brick, stone or concrete), drains and services (ceramic and metal), path or yard surfaces (cobble, tiles, concrete, kerbing).	Moderate (in northern area of lot) Nil - Low elsewhere on lot
	4 (1950 – Present)	No evidence of any structures located on the south-eastern half of the land parcel. Construction of car park and office complex on this site after 1980. Ground level of lot is least disturbed in the northern corner of the site, where the ground surface level is at its lowest elevation. Basement level cuts into the hill further to the south-east likely removing earlier archaeological phases.	Nil
CN 2	4 (1950 – Present)	Present office structure basement car park likely removed all archaeological remains of previous phases.	Nil
CN 3	4 (1950 – Present)	Construction of three-storey office building with underground car park present on site after 1980.	Nil

Site Code	Phase	Likely archaeological remains	Potential
CN 4	1 (1788 – 1880)	No documentary evidence of former structures located in this area. Potential for tree boles, field drains, fence postholes, isolated artefact scatters. Former unsealed Lane Cove Road alignment through this area. Potential for informal road surfaces such as gravel, with informal cut drains and gullies.	Nil - Low
	2 (1880 – 1930)	No documentary evidence for built structures in this area. Potential for informal land uses, fence postholes, drains, isolated artefacts.	Nil - Low
	3 (1930 – 1950)	Single storey commercial building constructed on southern area of lot 1939 – 1940.	Nil
	4 (1950 – Present)	Retention of 1939 – 1940 single storey commercial building at southern area of land parcel; two-storey commercial building constructed on rear of lot after 1950.	Nil
CN 5	1 (1788 – 1880)	No documentary evidence of former structures located in this area. Potential for tree boles, field drains, fence postholes, isolated artefact scatters. Former unsealed Lane Cove Road alignment through this area. Potential for informal road surfaces such as gravel, with informal cut drains and gullies.	Nil - Low
	2 (1880 – 1930)	Late Victorian/Early Federation residential house constructed during this period. Possible outbuildings (sheds, outhouses) postholes and footings (brick or stone), path and yard surfaces, garden soils with occasional artefacts.	Low - Moderate
	3 (1930 – 1950)	Single storey brick vehicle garage constructed 1939 – 1940. Potential archaeological remains include former drains and services (ceramic and metal), former surfaces and paths, artefactual evidence of commercial activity.	Nil
	4 (1950 – Present)	Retention of single-storey former 1940s vehicle garage with minor façade renovation and conversion to retail premises.	Nil
CN 6	1 (1788 – 1880)	No documentary evidence of former structures located in this area. Potential for tree boles, field drains, fence postholes, isolated artefact scatters. Former unsealed Lane Cove Road alignment through this area. Potential for informal road surfaces such as gravel, with informal cut drains and gullies.	Nil - Low
	2 (1880 – 1930)	No documentary evidence for built structures in this area. Potential for informal land uses, fence postholes, drains, isolated artefacts.	Nil - Low
	3 (1930 – 1950)	Two-storey produce market constructed on site 1939 – 1940.	Nil
	4 (1950 – Present)	Produce market building continued in use to present.	Nil

Site Code	Phase	Likely archaeological remains	Potential
CN 7	1 (1788 – 1880)	No documentary evidence of former structures located in this area. Potential for tree boles, field drains, fence postholes, isolated artefact scatters. Former unsealed Lane Cove Road alignment through this area. Potential for informal road surfaces such as gravel, with informal cut drains and gullies.	Nil – Low
	2 (1880 – 1930)	Subdivision plans indicate that Hume Street was laid out as an unsealed road at this time. Potential for localised informal road surfacing such as gravel, with informal cut drains and gullies.	Nil - Low
	3 (1930 – 1950)	The road was sealed during this time. Likely installation of utility services in this area. Potential for former ceramic and metal drainage/water pipes, former electricity conduits, former kerbing and drainage pits.	Nil
	4 (1950 – Present)	Bitumen road with utility services. Potential for former ceramic and metal drainage/water pipes, former electricity conduits, former kerbing and drainage pits.	Nil
CN 8	1 (1788 – 1880)	Area located in the Wollstonecraft/Berry estate from 1821. No documentary evidence of former structures located in this area. Former unsealed Lane Cove Road alignment through this area.	Nil - Low
	2 (1880 – 1930)	Late Victorian/Early Federation residential house constructed during this period. Possible outbuildings (sheds, outhouses) footings, former services, yard services.	Moderate
	3 (1930 – 1950)	No documentary evidence for built structures in this area. Potential for informal land uses, fence postholes, drains, isolated artefacts.	Nil - Low
	4 (1950 – Present)	Australia Post Office constructed on this lot during the 1950s. Post Office is excavated into sloping ground to the south and east of the lot; only the northern corner of the site has not been significantly ground disturbed by the construction of this building.	Nil
CN 9	4 (1950 – Present)	Construction of a single storey commercial building after 1980. This site was recently (2015) redeveloped which caused significant subsurface impacts.	Nil
CN 10	1 (1788 – 1880)	No documentary evidence of former structures located in this area. Potential for tree boles, field drains, fence postholes, isolated artefact scatters. Former unsealed Lane Cove Road alignment through this area. Potential for informal road surfaces such as gravel, with informal cut drains and gullies.	Nil - Low
	2 (1880 – 1930)	No documentary evidence for built structures in this area. Potential for informal land uses, fence postholes, drains, isolated artefacts.	Nil - Low

Site Code	Phase	Likely archaeological remains	Potential
CN 11	3 (1930 – 1950)	Single storey commercial building constructed on this lot in 1940. Potential for archaeological remains of former drains and services (ceramic and metal), surfaces and paths, former internal structural remains (posts/footings).	Moderate
	4 (1950 – Present)	Construction of a two-storey commercial building after 1990.	Nil
	1 (1788 – 1880)	No documentary evidence of former structures located in this area. Potential for tree boles, field drains, fence postholes, isolated artefact scatters.	Nil - Low
	2 (1880 – 1930)	Subdivision plans indicate that Clarke Lane was laid out as an unsealed road at this time. Potential for localised informal road surfacing such as gravel, with informal cut drains and gullies.	Nil - Low
	3 (1930 – 1950)	Clarke Lane was sealed at this time. Installation of stormwater drains also occurred at this time.	Nil
CN 12	4 (1950 – Present)	Concrete – bitumen road surface with utility services.	Nil
	4 (1950 – Present)	Construction of vehicle garage on site after 1980. This vehicle garage has been excavated up to a metre below street level, likely disturbing any earlier archaeological resources.	Nil

3.4 Archaeological Significance

Separate significance assessments for each site code have not been provided as the assessment against each criteria is similar for all site code areas.

3.4.1 Assessment of Archaeological Significance

Research Potential (Criterion E)

Wollstonecraft chose the location of his Crows Nest estate in part due to the relative seclusion of the property from the growing colony in the 1820s. He established orchards throughout his estate. Wollstonecraft, and later Berry, attempted to keep new landholders on the North Shore away from their estates. However, the farms that he established were worked by tenant farmers who are not apparent in the historical documentary record. The relationship between Wollstonecraft and Berry, and their tenant working population, is of research interest.

Remains related to the Wollstonecraft and Berry estates in the Crows Nest Station site are likely to relate to agricultural or grazing activity, and undocumented farming or fencing structures on their farm estates. There is little information on the operation of these farm estates, which were praised for the quality of their produce in the 1830s. Any archaeological information regarding the people who may have worked the orchards would contribute to our understanding of tenant farmers experience during the early colony. However, such activities would not leave a strong archaeological 'signature' and potential remains would be ephemeral in nature.

Other archaeological resources in the study area consist of potential remains associated with late 1800s and early 1900s residential properties facing the Pacific Highway and Clarke Lane (CN 8 for example). Archaeological remains associated with the former residential housing on these lots would

not provide unique or important research resources, and as such they would not meet the threshold for local heritage significance.

Archaeological resources from the later commercial developments along the Pacific Highway are well documented historically. These archaeological resources are also relatively common. They would not provide significant new information for research, and as such would not meet the threshold for local heritage significance.

Association with Individuals, Events or Groups of Historical Importance (Criteria A, B and D)

Wollstonecraft and Berry were figures of importance in the early colony, being responsible for establishing significant commercial ventures, property holdings and towns (on the South coast in particular). Both Wollstonecraft and Berry were founding members of the New South Wales Agricultural Society (now the Royal Agricultural Society) and their endeavours to experiment with new commercial crops was part of the early economic development of the colony. However, it is considered unlikely that the potential archaeological remains within the study area could be directly associated with these two prominent historical figures.

Aesthetic or Technical Significance (Criterion C)

Intact and substantial archaeological resources are not expected within the study area, and therefore would not have aesthetic significance. There is some limited potential that remains associated with Phase 1 (1788-1880) which could demonstrate changes in agricultural practices over time and therefore be of technical significance.

Ability to Demonstrate the Past through Archaeological Remains (Criteria A, C, F and G)

Given the study area was not developed until the 1880s and 1890s, and archaeological remains associated with Phase 1 (1788-1880) are expected to be ephemeral at best, it is unlikely that intact archaeology with the ability to demonstrate the historical development of the area would remain.

3.4.2 Statement of Archaeological Significance

The study area has nil-low potential for archaeological remains associated with Wollstonecraft and Berry's estate phase of activity (1788-1880). Any remains would be highly truncated and are unlikely to be legible or meet the significance threshold.

Whilst there may be more potential to encounter archaeological remains associated with late 1880s to early 1900s development, such remains are unlikely to be associated with artefact bearing deposits, and would have little research value. Phase 2 and 3 remains are unlikely to reach the significance threshold.

A summary of the potential archaeological resources is provided in Table 3-3 and Figure 3-14 below.

Table 3-3: Archaeological potential at the Crows Nest Station site

Site Code	Phase	Archaeological resource	Potential	Significance
All	All	Ephemeral remains associated with early land grants and rural activities. Archaeological remains associated with residential and commercial development from with c1890-early 1900. Potential for footings, former path and yard surfaces, drainage and postholes/footings of former outbuildings.	Nil - Moderate (varies through site)	Unlikely to reach the threshold for local significance

Figure 3-14: Archaeological potential at the Crows Nest Station site



3.5 Archaeological Impacts

3.5.1 Proposed Works

Crows Nest Station works include a cut-and-cover excavation for the station. This involves an open cut excavation down to the level of the base of the rail tunnel. In addition to the station area, additional areas would also be excavated to create pedestrian access points leading up to Clarke Street. Ground excavation would proceed to an approximate depth of 25 metres below street level, to the bottom of the rail tunnel.

Site offices, workshops, water treatment facilities and storage areas would be established during construction on a temporary working platform constructed at street level over the open excavation area. The extent of excavation and ground disturbance for these works will be known following detailed design.

Construction Impacts

Construction works would include the following:

- Demolition, removal of slab, construction of site work areas and amenities
- Excavation to depth of 25 metres for the full footprint of the site between the Pacific Highway and Clarke Lane
- Varying depths of excavation (between 0 metres and about 10 metres) between Clarke Street and Clarke Lane to construct vertical transport.

3.5.2 Potential Archaeological Impacts

There is nil-low potential for locally significant archaeological remains within the Crows Nest Station site (Figure 3-15). Construction works are therefore unlikely to result in impacts to significant archaeological resources.

Figure 3-15: Potential archaeological impacts - Crows Nest Station site



3.6 Archaeological Management

Implementation of an Unexpected Finds Procedure is an appropriate archaeological management strategy for the Crows Nest Station site (Table 3-4).

Table 3-4: Summary of archaeological mitigation for the Crows Nest Station site

Site Code	Potential archaeology	Impact	Mitigation
All	Low – moderate potential for late 19 th to mid 20 th century remains. Unlikely to reach threshold for local significance	Full excavation of the site	<ul style="list-style-type: none"> Unexpected Finds Procedure

4.0 VICTORIA CROSS STATION

4.1 Site Location

The Victoria Cross Station site is located in the heart of North Sydney central business district. The station is located beneath Miller Street, between Berry Street and McLaren Street. The station entrances would be located on Miller Street. The site location for this analysis is based on the total area encompassed by the construction site (Figure 4-1).

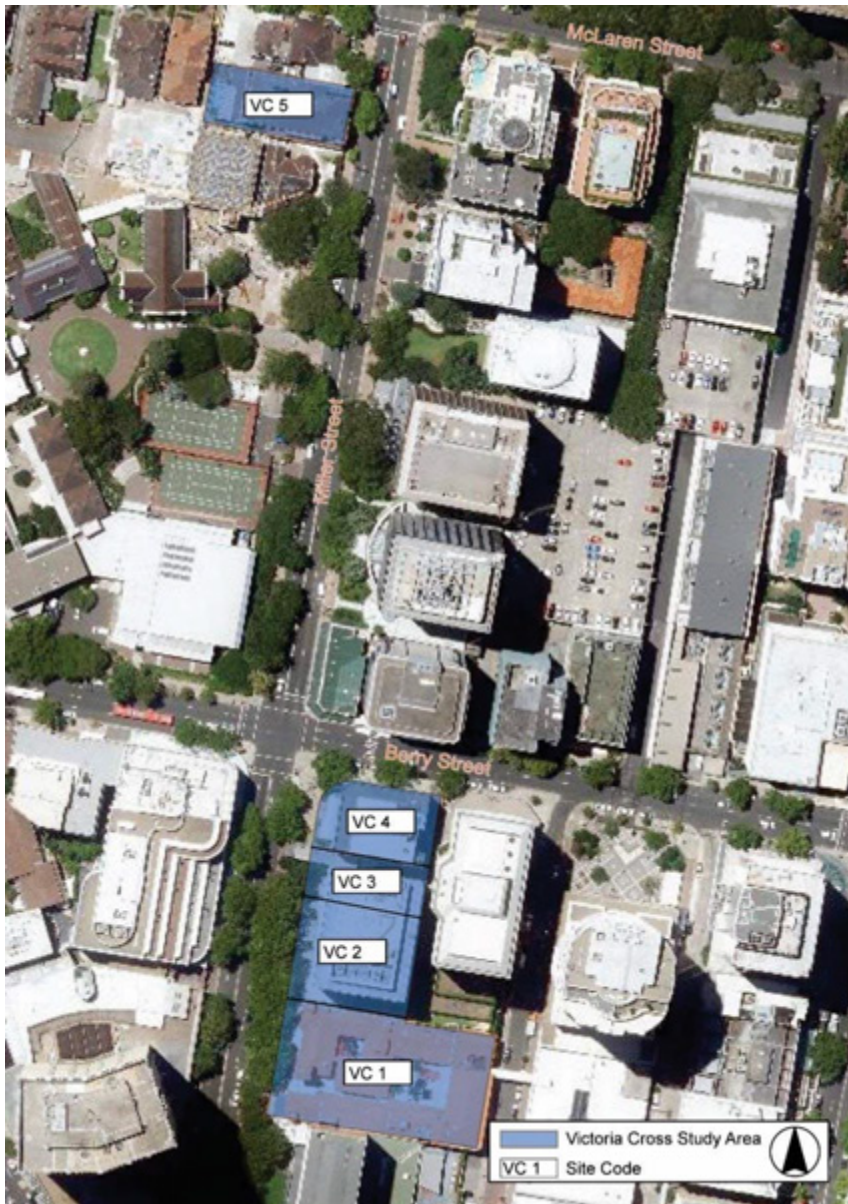
4.1.1 Land Parcels

The Victoria Cross study area is located on land parcels presented below. All existing structures on these land parcels would be demolished. The Victoria Cross land parcels and study area are presented in Table 4-1 and Figure 4-1.

Table 4-1: Land parcels in the Victoria Cross Station site

Site Code	Address	Lot	Existing Structures
VC1	155-167 Miller Street, North Sydney	SP35644	Tower Square. Two-storey commercial building. Underground car park
VC2	181 Miller Street, North Sydney	15/DP69345	Multi-storey office building
VC2	181 Miller Street, North Sydney	2/DP123056	Multi-storey office building
VC2	181 Miller Street, North Sydney	1/DP123056	Multi-storey office building
VC3	187 Miller Street, North Sydney	A/DP160018	Two-storey Victorian Style shopfront. "Shop" (I0898)
VC4	189 Miller Street, North Sydney	1/DP633088	Multi-storey office building and underground car park
VC5	194 Miller Street, North Sydney	1/DP781576	Multi-storey office building and underground car park

Figure 4-1: Victoria Cross Station site showing existing modern development and site codes



4.2 Historical Analysis

4.2.1 European Exploration and Early Land Grants (1788 – 1838)

The first recorded land granted in the vicinity of the study area was a 30-acre lot given to former convict Samuel Lightfoot in 1794 which was located southeast of the study area.³¹ By the end of that year however, his grant had been transferred to Thomas Muir, who named the farm 'Hunter's Hill'.³² By 26 April 1800, this grant had been purchased by Robert Ryan, who had also been granted an additional 90 acres for his service in the Royal Marines and NSW Corps.³³ Ryan subsequently sold his 120-acre lot to Robert Campbell in 1806. In 1922, Campbell leased the land to James Milson, a free settler, who was officially one of the earliest permanent residents in the area. Milsons Point was named after Milson. By 1826 there were disputes between Milson and Campbell regarding payments

³¹ Colonial Secretary Index, 1788-1825

³² The Sydney Morning Herald 7/6/1913:5

³³ Colonial Secretary Index, 1788-1825

and land ownership after each party lost their respective copies of the promissory grant (Wilson's was destroyed by a bush fire).³⁴ In order to try and solve the dispute, Government surveyor Sir Thomas Mitchell was asked to visit the property in 1828 and provide a report.

Mitchell identified an area as suitable for a potential township just a few kilometres north of Milsons Point. Prior to this, no substantial settlement had yet to be established in the area and the site Mitchell referred to, which included the study area, had yet to be included in any land grants.³⁵ That year, Mitchell produced a plan for the potential township, which included suggestions for subdivisions, streets, a reserve and a great road towards the north of the colony and Broken Bay.³⁶ Although Mitchell's plan was initially discarded, further requests for land in the area led to the entire locality being resurveyed in 1836. The proposed township was accepted and by 1838 a basic design had been produced which included the present east-west layout of McLaren, Berry and Mount Streets, and the north-south layout of Miller and Walker Streets.³⁷ The township of St Leonards, possibly named after St Leonards near Hastings in Britain, was officially gazetted in 1838. Prior to this no developments had taken place within the township or Victoria Cross Station site.

4.2.2 Initial Residential Subdivisions and Developments (1838 – 1880s)

Following the official gazetting of the town, the land was divided into smaller lots and offered for sale. In total the town was divided into 48 half-acre building allotments separated into three sections. The initial growth was slow to begin with and by the 1840s there is no indication that any of the allotments within the southern station site had been sold. An 1840s property plan indicates that the northern station site was purchased from the Crown by Judge William Burton (Figure 4-2). However, there is no indication that any structures were developed on either the northern or southern station sites at the time.

During the 1850s, the town was divided into 35 additional sections and sold off. The southern station site is located in the north-west corner of section 3 while the northern station site is located in the north-east portion of section 7 (Figure 4-3). To allow for the construction of a range of buildings, including cottages, villas, mansions and terraces, the allotments were subdivided into various sizes.³⁸ A plan of allotments of St Leonards dating to 1857 indicates that only the south-east portion of the southern station site had been sold by that stage, which had been included in land purchased by Dean (Figure 4-4). There is still no indication that any structures had been built within the southern station site (Figure 4-5), though the plan does indicate that several businesses had been established along Miller Street. These businesses consisted of a druggist, bakery, grocery and butcher. Although none of the maps or plans from the 1850s indicate any developments within the northern station site, sources suggest that Burton had built a cottage either within or adjacent to it. The cottage was originally known as "Church Hill Cottage", but following its purchase by Robert Napier in 1861 it was renamed "Montrose".³⁹ The house was later purchased by John Whitton, Engineer-in-Chief of NSW Railways. In 1869, the Borough of St Leonards was formed, and the provision of utilities such as gas, water, roads, garbage collection, sewerage and sanitation began to be carried out.⁴⁰

³⁴ Thorp, W. 1999. North Sydney Olympic Pool, Milsons Point. Archaeological Assessment for Brian McDonald and Associates, p. 8

³⁵ Masson, L. 2010. North Sydney. Dictionary of Sydney. Site accessed on 1/6/2016 at: http://dictionaryofsydney.org/entry/north_sydney

³⁶ Masson 2010.

³⁷ Masson 2010.

³⁸ Masson 2010

³⁹ North Sydney Council. Set in Stone, p. 4

⁴⁰ Masson 2010

Figure 4-2: Property plan of Hastings Elwin dating to 1840-1849 which also shows the purchase of property by Judge Burton (source: National Library of Australia <http://nla.gov.au/nla.obj-229988154/view>)

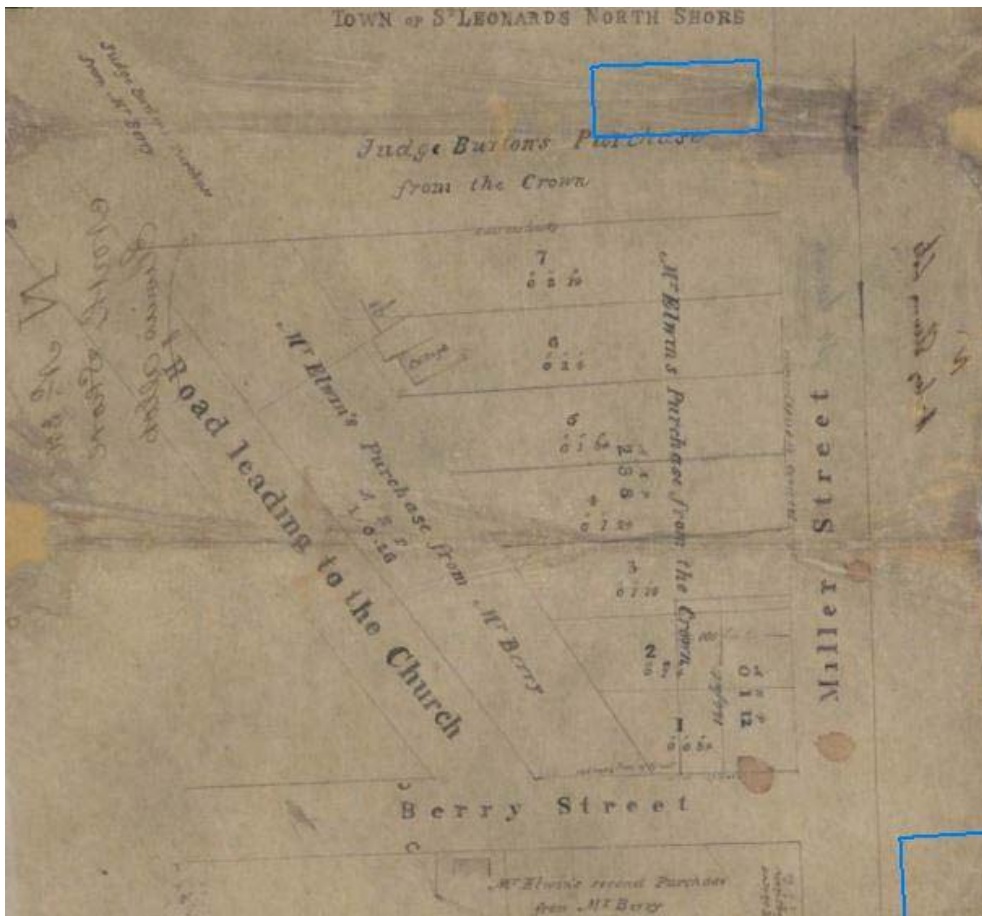


Figure 4-3: Parish map of Willoughby dating to the 1860s (source: National Library of Australia <http://nla.gov.au/nla.obj-229997080/view>)



Figure 4-4: Plan of allotments of St Leonards dated to 1857 (source: National Library of Australia <http://nla.gov.au/nla.obj-229987895/view>)



Figure 4-5: Photo of Berry Street near Miller Street dated to c.1861. The southern construction site is located on the upper right hand side at the solitary tree, with no evidence of any developments except for fencing (source: Stanton Library)

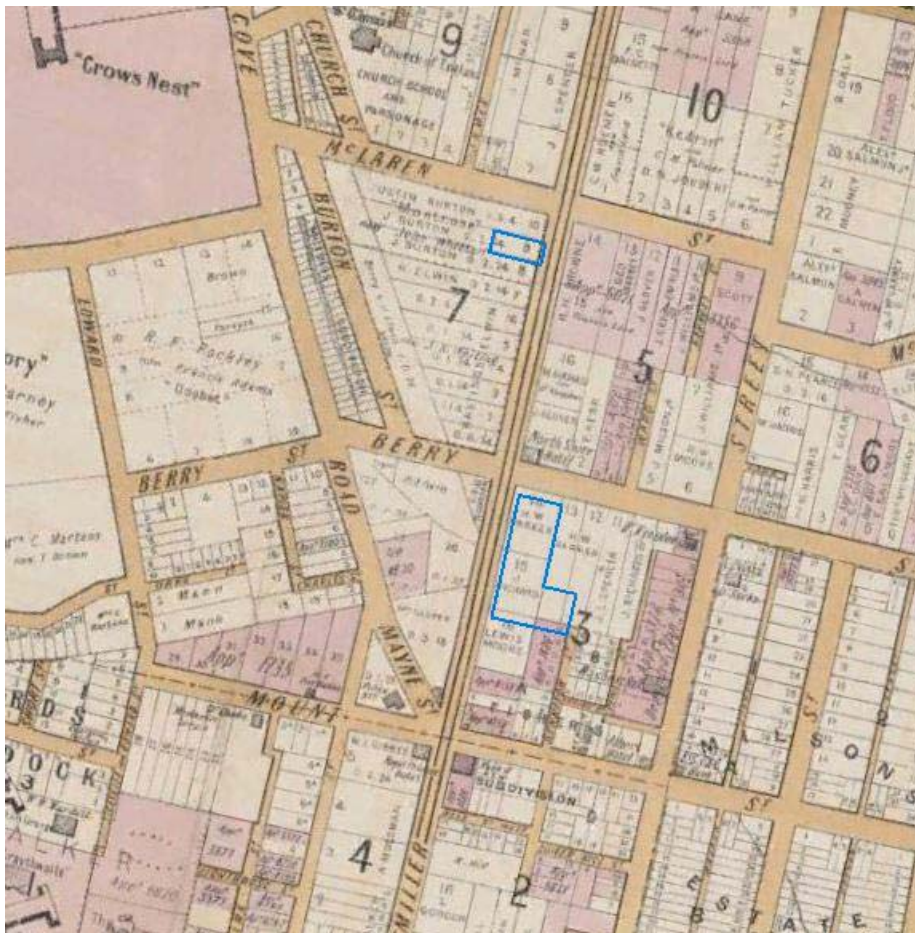


4.2.3 Commercial Development (1880s – 1932)

By the 1880s, Miller Street was part of the commercial and civic centre of St Leonards. Development was aided by the establishment of the cable tram which ran from Ridge Street to the ferry wharf at Milsons Point.⁴¹ Settlement in the area increased dramatically during this period and included the construction of a number of public buildings, including the former School of Arts, Post Office/Court House/Police Station complex and a Masonic Hall.

A parish map of Willoughby dating to 1887 (Figure 4-6) indicates that the allotments within the study area had been further subdivided. The southern station site was then occupied by H. W. Parker (Lots 13 and 14) and J. Richard (Lot 15). There is still no indication that there were any structures present within these lots at that stage. Sources from the 1890s however indicate that substantial development had occurred. An 1892 block plan map indicates that there were multiple structures present within the southern station site (Figure 4-7), and photos from the 1890s confirm that there were structures present all the way along Miller Street (Figure 4-8). The block plan suggests that the main structure on the corner of Miller Street and Berry Street was a single large building which had been divided into about eight separate sections, suggesting that the building was a Victorian Style terrace. One of these sections appears to be the still extant Shop at 187 Miller Street (LEP I0898).⁴² The terrace was originally developed for residential purposes before later being converted into shops. The block plan also indicates that there was an open sewer creek at the south end of the southern station site.

Figure 4-6: Parish map of Willoughby dating to 1887 (source: National Library of Australia <http://nla.gov.au/nla.obj-232482086/view>)



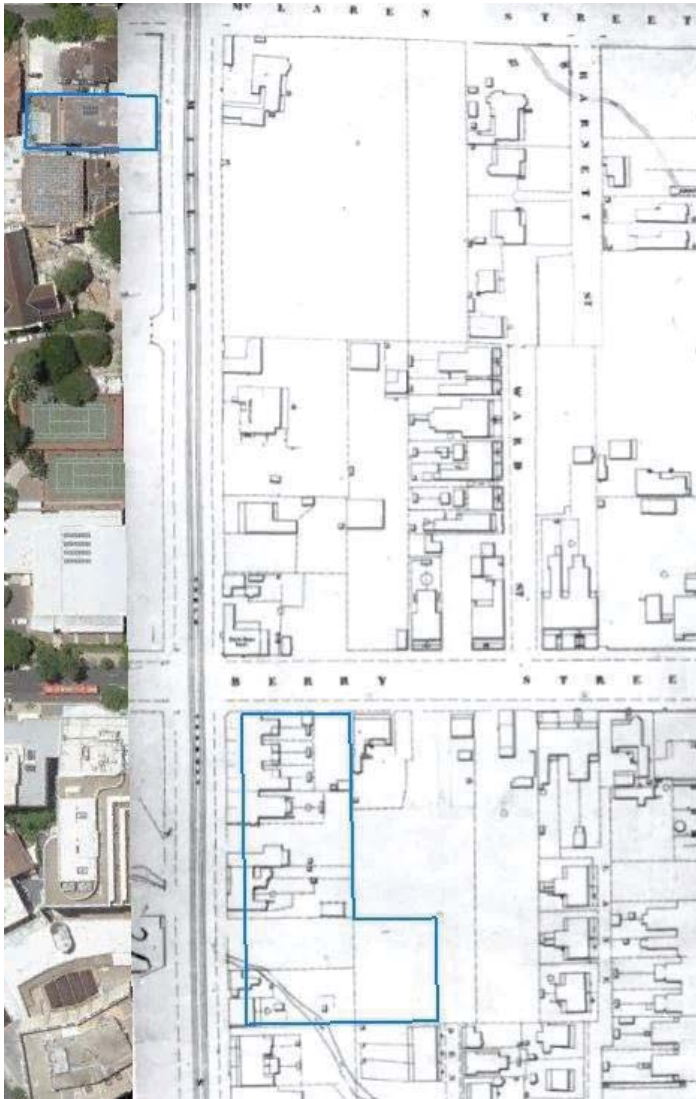
⁴¹ Masson 2010

⁴² OEHL 2013 <http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?id=2180834>.

The same 1887 parish map (Figure 4-6) indicates that the northern station site was occupied by J. Burton, now bearing the Montrose name. A block plan map of the area dating to 1890 suggests that the Montrose house was located immediately adjacent to the west of the study area (Figure 4-7) however, a sale for a nearby estate in 1892 suggests that it was located at the intersection of Miller and McLaren Street (within the study area) (Figure 4-9). This could potentially indicate that the house was extended in the short time between the dates of the two sources, or it is possible that one of the maps is inaccurate.

Between 1880 and 1920, St Leonards was occupied by a mixed variety of upper, middle and lower income workers. The study area and land between Miller, Berry and Ridge Streets were settled by the North Sydney medical fraternity. The area would soon become known as the 'Macquarie Street on the North Shore'.⁴³ In 1907, the Montrose property was sold, subdivided and subsequently demolished.⁴⁴ Buildings constructed on the newly subdivided lots included "Stormanston" (I0882), "Fairhaven" (I0883), the "House" at 31 Miller Street (I0884), "O'Regan" (I0899) and "Restaurant" (I0900). The Restaurant was originally a doctor's residence and was named after the former Montrose house.

Figure 4-7: Block plan map of North Sydney (Sheet No. 29) dating to 1892 (source: Stanton Library File /00029). Victoria Cross Station site shown in blue



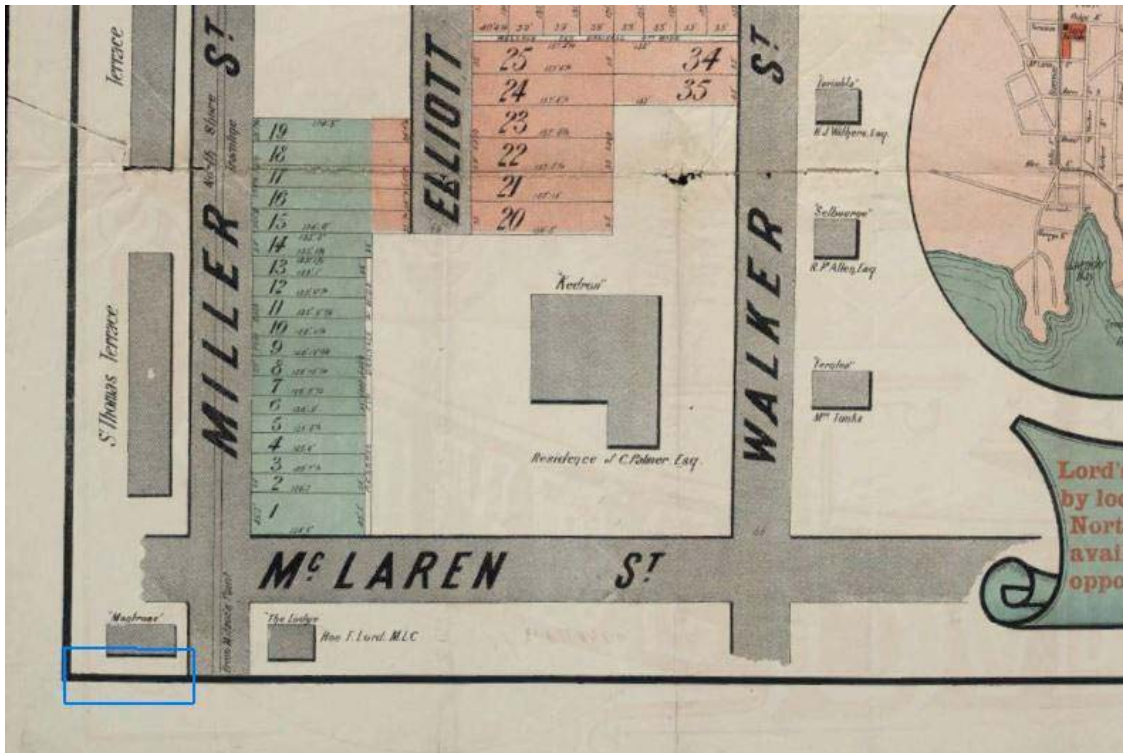
⁴³ Masson 2010

⁴⁴ North Sydney Council. Set in Stone, p. 4

Figure 4-8: Photo of Miller Street looking north from Mount Street, dated to c.1890 (source: Stanton Library File 000/000169)



Figure 4-9: Sale of Lord's Paddock estate, c. 1892, with the Montrose building present in the bottom left (source: Stanton Library File SP0/SP0138). Victoria Cross Station site shown in blue

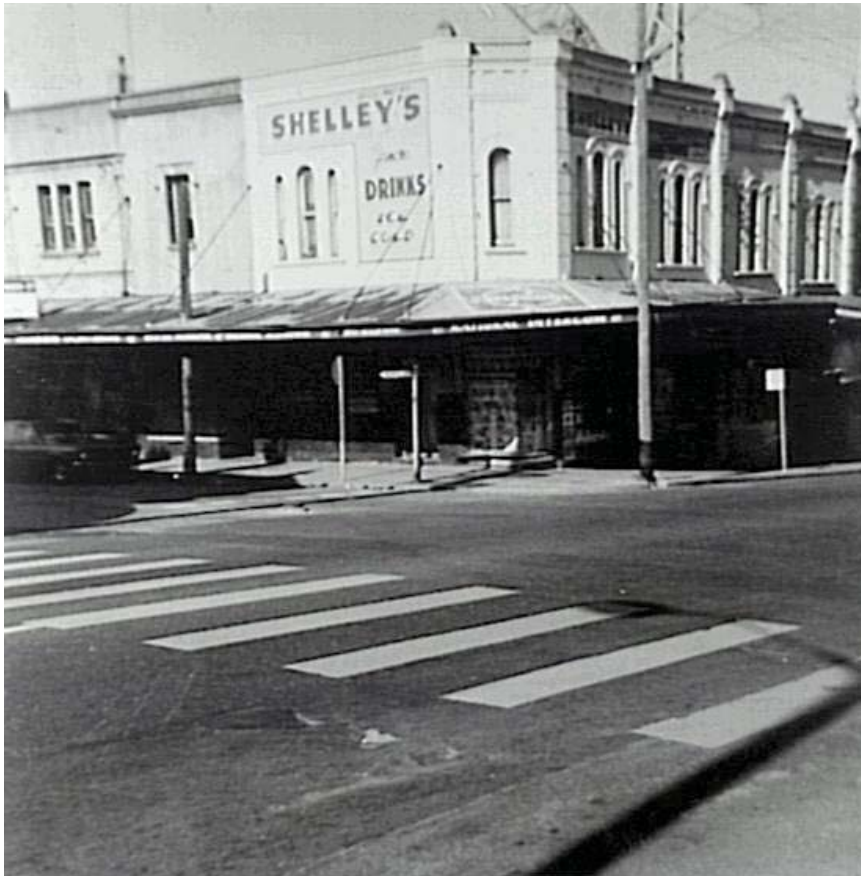


4.2.4 Post Sydney Harbour Bridge Commercial Development (1932 – Present)

The 1930s was a period of reduced economic and population growth in North Sydney. The recent completion of the Sydney Harbour Bridge and the beginning of the Depression had impacted the area, causing land prices to drop and population growth to halt. The construction and opening of the Sydney Harbour Bridge also had a major impact on the layout of the suburb, with Lane Cove Road (renamed the Pacific Highway) being extended and widened, and Junction Street to the south being completely removed. In 1939 the area was named Victoria Cross in a competition held by the North Sydney Council.⁴⁵

Developments in the area during the 1940s primarily focussed on rebuilding. Earlier buildings were replaced with Art Deco style hotels, garages and public buildings, and large Federation and Victorian houses were converted into boarding houses.⁴⁶ The terrace at the corner of Miller Street and Berry Street appears to have still retained most of its original fabric at this stage, and was now being used for shops (Figure 4-10), as was the building at the south-west corner of the southern station site (Figure 4-11). Aerial photos of the area in 1943 indicate that both the northern and southern station sites had been completely developed.

Figure 4-10: Photo of the shops at the corner of Miller and Berry Street (north-west corner of southern site) dated to c. 1960s (source: Stanton Library File 003/003015)



⁴⁵ The Sydney Morning Herald, 23 November 1939

⁴⁶ Masson 2010.

Figure 4-11: Photo of the shops (left) at the southwest corner of the southern site dated to c. 1950s (source: Stanton Library File T00/T0067)



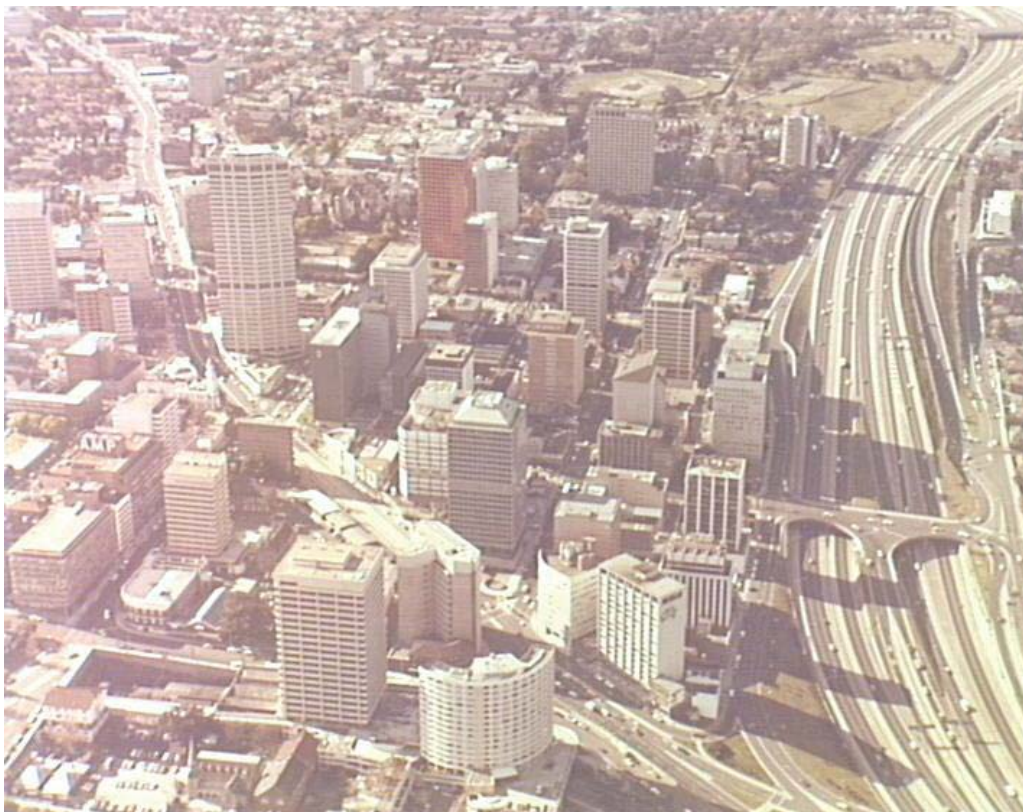
Figure 4-12: Aerial photo of North Sydney dated to 1943 (source: LPI SIX Maps). Victoria Cross Station site shown in blue



From the 1950s to the 1980s the Victoria Cross area underwent significant changes. As a result of the low land prices during this period, large corporations moved into the area and constructed substantial office blocks (Figure 4-13).⁴⁷ This resulted in the demolition and removal of a significant amount of the early buildings in the northern and southern station sites, to make way for large buildings such as the Mutual Life and Citizens Assurance Company (LEP I0893) located adjacent to the southern station site. The construction of these offices included the establishment of underground car parks and basements, such as the ones at 155-167, 189 and 194 Miller Street. From c.1970 to c.1988, the Restaurant (LEP I0900) served as the headquarters of the Royal Australian Institute of Architects.⁴⁸ In 1984, the North Sydney Bus Shelter (LEP I0407) was constructed adjacent to the northern station site, with the design being modelled after a nearby former 1920s tram shelter.⁴⁹ As of 1977, the terrace on the corner of Miller and Berry Streets was still present, and Tower Square (155-167 Miller Street) was opened in 1980.⁵⁰

Currently the northern and southern station sites are predominantly occupied by the large office blocks established during the second half of the twentieth century, with most of the late nineteenth and early twentieth structures having been removed. In the southern study area, the only earlier building still present appears to be the Victorian Styled “Shop” at 187 Miller Street (LEP I0898). Several of the early twentieth century structures constructed following the demolition of the Montrose house are still present in the immediate vicinity of the northern study area.

Figure 4-13: Aerial photo of North Sydney dated to 1977 (source: Stanton Library File C00/C0039001)



⁴⁷ Masson 2010

⁴⁸ OEH 2013 <http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2180865>.

⁴⁹ OEH 2014 <http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?id=2181325>.

⁵⁰ The Sydney Morning Herald - Wednesday Nov 12, 1980: 15.

https://news.google.com/newspapers?nid=1301&dat=19801112&id=S_9jAAAAIBAJ&sjid=N-cDAAAIAAJ&pg=1427,4775556&hl=en

4.3 Archaeological Potential

4.3.1 Previous Archaeological Studies

Relevant previous studies for the lower north shore are discussed in the Crows Nest Station site chapter (refer Section 3.3.1). These also apply to the Victoria Cross Station site.

4.3.2 Land Use Summary

European occupation of the Victoria Cross study area has been divided into four distinct phases of historical activity, which are discussed below.

- Phase 1 (1788-1838) early exploration and land grants with land clearance, grazing and other low intensity activities
- Phase 2 (1838-1880s) initial residential subdivisions and occupation
- Phase 3 (1880s-1932) early commercial development and use
- Phase 4 (1932-present) post Sydney Harbour Bridge commercial development.

4.3.3 Previous Impacts

Impacts to potential archaeological remains within the station site are primarily associated with successive phases of building developments. Typically, the earlier the building the less impact on potential remains. Since initial European settlement, the station site has been heavily modified and its development has included several rounds of subdivision and at least two or three separate building developments. From the mid-twentieth century the station site underwent significant modern commercial development. This resulted in the demolition of most of the earlier buildings to be replaced with large office blocks. The exact depth of excavation for the foundations of the office blocks is unknown.

The limited basement information suggests that a basement covers the majority of the lot located at 194 Miller Street (VC5) in the northern study area. Basement 2 (the lowest) has been excavated to a depth ranging between 4.94 metres below the ground level fronting Miller Street and 8.94 metres below the ground level towards the rear of the property (74.16m AHD). This has likely completely removed any archaeological remains within this area.

Underground car parks are also present at 155-167 (VC1) and 189 Miller Street (VC4), suggesting that substantial excavation have occurred in these locations as well. No 181 Miller Street (VC2) appears to be situated slightly below the street level, suggesting that this area has also been partially excavated. Basement data and site inspection would confirm if an underground car park is present and extent of previous excavation of this site.

4.3.4 Potential Archaeological Remains

Phase 1 (1788 – 1838)

Historical sources suggest that prior to the gazetting of St Leonards no lands had been granted to settlers within the study area or the immediate vicinity. Any remains from this phase are likely to be ephemeral camps from early explorers or surveyors. Some land clearance may have begun at the very end of this phase as the area was being prepared for the township of St Leonards. Any of the original roads laid out during this phase would have started as dirt roads, which are poorly visible within the archaeological record.

Phase 2 (1838 – 1880s)

This phase of development saw the station sites subdivided at least twice. In the northern station site, the original Montrose house was constructed in the 1840s or 1850s. By the 1860s there was a fence around the perimeter of the allotment. Although the 1890 block plan map is likely the more accurate source, and suggests that the house was located outside of the study area, the contradicting 1892 map suggests that it is still possible that a portion of the house was located within the northern station site. Remains associated with this period would likely consist of structural and artefactual evidence of the occupation and use of the former cottage, undocumented outbuildings and the use of the remainder of the allotment. This would likely take the form of stone or brick footings, yard surfaces, drains, postholes, artefactual deposits and possible wells or cesspits.

In the southern station site, sources suggest that during this phase there were no substantial developments except for further subdividing of the allotments. A photo of the site (Figure 4-5) does indicate that a fenceline had been established around the boundary of the allotment and it appears that the land had been cleared. Evidence of land use in this section at the time could include postholes associated with the fence and subdivision boundaries, evidence of land clearance and possible cultivation or grazing, isolated artefact scatters and postholes associated with minor undocumented outbuildings. There is the potential that the more substantial terrace and other buildings found in the next phase of development were actually present towards the end of this phase. Remains of these items would likely consist of brick or stone footings.

Historical photos of this phase indicate that dirt roads were still present until at least the 1960s. By 1869 however, utilities such as water, roads and sewerage were provided. Evidence of these utilities such as informal kerbs or drains may be present. This also means however, that high concentrations of artefacts resulting from deposits within wells or cesspits are unlikely to have formed in the study area after this point. Later sources (see Figure 4-7) indicate that the presence of an open sewer creek located at the south end of the southern station site which ran underneath Miller Street. It is possible that this feature was also present during this phase. The lower depth of the creek suggests that it might have been less impacted by later developments. Evidence of the sewer could include the culvert at the roads edge and more highly concentrated artefactual deposits on the creek bed.

Phase 3 (1880s – 1932)

This phase saw the study area develop as part of the commercial centre and civic centre of St Leonards. In the northern station site, the original Montrose house was demolished in 1907 and the property was subdivided with new buildings being constructed. In the southern station site, the allotments were also subdivided and multiple structures were built. These buildings primarily fronted Miller Street and Berry Street and the main building on the corner of Miller Street and Berry Street appears to be a single large building, which was divided into at least eight long narrow sections. Remains associated with these structures would likely consist of substantial stone or brick building footings (mid-twentieth century photos and the extent shop in the study area suggest that the buildings were constructed of brick). Because of the reticulated water supply and sewerage network, as well as municipally organised garbage collection from this time, subsurface features of high archaeological research potential such as wells, cisterns or underfloor deposits are unlikely to have formed in the study area.

There is little indication that the roads were surfaced during this phase. However, there does appear to be kerbing present which could still remain. Evidence of drains and culverts may also be present, along with denser artefactual deposits associated with the open sewer drain.

Phase 4 (1932 – Present)

Commercial development in the Victoria Cross Station site after the opening of the Sydney Harbour Bridge consisted of the renovation of pre-existing structures for modern commercial use followed by the demolition of earlier structures for new commercial premises. The levelling of the ground surface and the construction of multi-storey office buildings has increased the degree of subsurface

disturbance during construction activities compared to previous phases of building. In the case of the allotments with basements or underground car parks, constructions would have entirely removed remains of previous developments.

4.3.5 Summary of Archaeological Potential

The Victoria Cross Station site has been heavily modified since the mid-nineteenth century, with significant development of large commercial buildings occurring from the 1950s onwards. The variable but generally high degree of subsurface disturbance from modern construction activities has reduced the likelihood of locating extensive intact archaeological deposits in the study area.

Archaeological remains associated with any phase of development within the northern station site is extremely unlikely. The construction of the basement in that location has most likely removed any archaeological remains.

Within the southern station site, no major developments are known to have occurred until the late 1880s or early 1890s. Prior to this, archaeological remains are likely to be associated with the minor and informal occupation and use of the land. Archaeological remains from subsequent phases would likely consist of the building footings of the early commercial buildings. Because of the later development of this site and the early establishment of utilities, concentrated artefactual deposits from wells or cisterns are unlikely. Within the area of the underground car park at 189 Miller Street, the potential for of archaeological remains to be present is nil.

A full description of the archaeological potential of recovering these resources can be found in Table 4-2 below.

Table 4-2: Summary of potential archaeological remains at the Victoria Cross Station site

Site Code	Phase	Likely archaeological remains	Potential
VC 1	1 (1788 – 1838)	Present basement car park likely removed all archaeological remains of previous phases.	Nil
	2 (1838 – 1880s)	Present basement car park likely removed all archaeological remains of previous phases.	Nil - Low
		Fill and artefact deposits within possible open sewer creek may be present (only south-west corner of site).	
	3 (1880s – 1932)	Present basement car park likely removed all archaeological remains of previous phases.	Nil - Low
Fill and artefact deposits within open sewer creek may be present (only south-west corner of site).			
VC 2	4 (1932 – Present)	Previous large commercial building (present in 1943) demolished and replaced with current office building and basement car park (opened in 1980).	Nil
	1 (1788 – 1838)	Evidence of informal camps such as postholes and artefact scatters. Evidence of land clearing, woodcutting, tree boles and informal road surfaces.	Nil - Low
	2 (1838– 1880s)	Evidence of informal use of land and undocumented occupation or structures such as brick or stone building footings, postholes, isolated artefact scatters, subdivision boundaries (fencing postholes), informal camps, land clearing, tree boles, informal road surfaces, drainage and kerbing.	Nil - Low

Site Code	Phase	Likely archaeological remains	Potential
VC 3	3 (1880s – 1932)	Evidence of the residential and commercial development of the study area including brick or stone building footings, yard surfaces and occupation-related deposits. Likely impacted by later office redevelopment.	Low
	4 (1932 – Present)	Evidence of more formal road surfaces, drainage and kerbing. Evidence of the open sewer creek culvert and high concentrations of associated artefactual deposits.	Nil
	1 (1788 – 1838)	Evidence of informal camps such as postholes and artefact scatters. Evidence of land clearing, woodcutting, tree boles and informal road surfaces.	Nil - Low
	2 (1838 – 1880s)	Evidence of informal use of land and undocumented occupation or structures such as postholes, isolated artefact scatters, subdivision boundaries (fencing postholes), informal camps, land clearing, tree boles, informal road surfaces, drainage and kerbing.	Nil - Low
	3 (1880s – 1932)	Victorian Style shopfront known to be present by 1892. Building may contain underfloor deposits. Remains of a former yard surface, or more formal road surfaces, drainage and kerbing may be found outside of the building.	Low - Moderate
VC 4	4 (1932 – Present)	Retention of 19 th century shopfront, with minor façade renovation and conversion to retail premises.	Nil
VC 5	4 (1932 – Present)	Present office structure basement likely removed all archaeological remains of previous phases.	Nil

4.3.6 Assessment of Archaeological Significance

Although significant portions of the Victoria Cross Station site have been heavily impacted by modern developments, there are some areas where archaeological deposits could remain below the present buildings. The significance of the archaeological remains is contingent upon their level of intactness.

4.3.7 Significance Assessment

Research Potential (Criterion E)

Phase 1 dates to the earliest European exploration and settlement of the North Shore. As St Leonards was not gazetted until the very end of this phase and because the study area was not part of any land grants prior to this, it is unlikely that this phase would have produced any substantial archaeological remains. Archaeological remains associated with land clearance and grazing activities would be ephemeral in nature. The potential for archaeological evidence from this phase is nil-low and as such it is unlikely they would reach the threshold for local significance.

Archaeological remains from Phase 2 may have research potential associated with the nineteenth century development of the study area. Of particular significance would be structural or occupational remains of the Phase 3 Victorian Terraces. It is possible that these buildings were constructed earlier

than originally thought. In addition, there have not been many archaeological investigations of this phase of development in the northern city suburbs and potentially they have a different archaeological signature to those within the CBD. If the terraces do date to Phase 2, archaeological deposits associated with the extant shop at 187 Miller Street could have research value. The fill within the open sewer creek also has moderate research potential if it is found to substantially pre-date the assumed 1890s date. If so, artefactual deposits within it could also provide information relating to the early development and occupation of the study area. Archaeological remains from this phase would have significance at a local level. The potential for archaeological evidence from this phase to be present is low-moderate.

Archaeological evidence from Phase 3 is not rare and it is unlikely that remains from this phase would provide information that is not obtainable from alternative historical sources. It is unlikely that occupational deposits from Phase 3 will reach the threshold of local significance.

Archaeological evidence from Phase 4 is not rare will not provide information that is not obtainable from alternative historical sources. Therefore, archaeological evidence from Phase 4 will not reach the threshold of local significance.

Association with Individuals, Events, or Groups of Historical Importance (Criteria A, B and D)

A review of the available documentary sources has not provided any evidence to indicate that the study area is associated with any known individual or group of historical importance. The potential archaeological remains are associated with the late nineteenth century development of St Leonards and its commercial activity.

Aesthetic or Technical Significance (Criterion C)

It is considered unlikely that the potential archaeological resources would be extensive or indeed intact. Considering they represent the later nineteenth century development commercial development of a suburban area, it is not considered the potential archaeology would have any particular aesthetic or technical significance.

Ability to Demonstrate the Past through Archaeological Remains (Criteria A, C, F and G)

The potential archaeological remains are expected to be fairly limited and not represent multi-phased development. However, there is some potential that the archaeological remains could demonstrate the change from a village to a city fringe suburb with a large population and commercial centre in the later nineteenth century.

Significance Level

Depending on their nature and extent, pre 1890s archaeological remains in Site VC 2 and VC 3 would be of local significance under Criteria A and E.

4.3.8 Statement of Archaeological Significance

There is little potential for archaeological remains of the earliest phase of historical land use. Potential archaeological evidence dating to Phase 2 and the study area's mid-to-late nineteenth century suburban development could have research potential, depending on the nature and level of intactness of the surviving remains. There is nil-low potential for archaeological remains from this phase to have survived within the study area, however, if substantial intact remains were identified they may be of local significance. Substantial archaeological remains may also be representative of the early development of St Leonards.

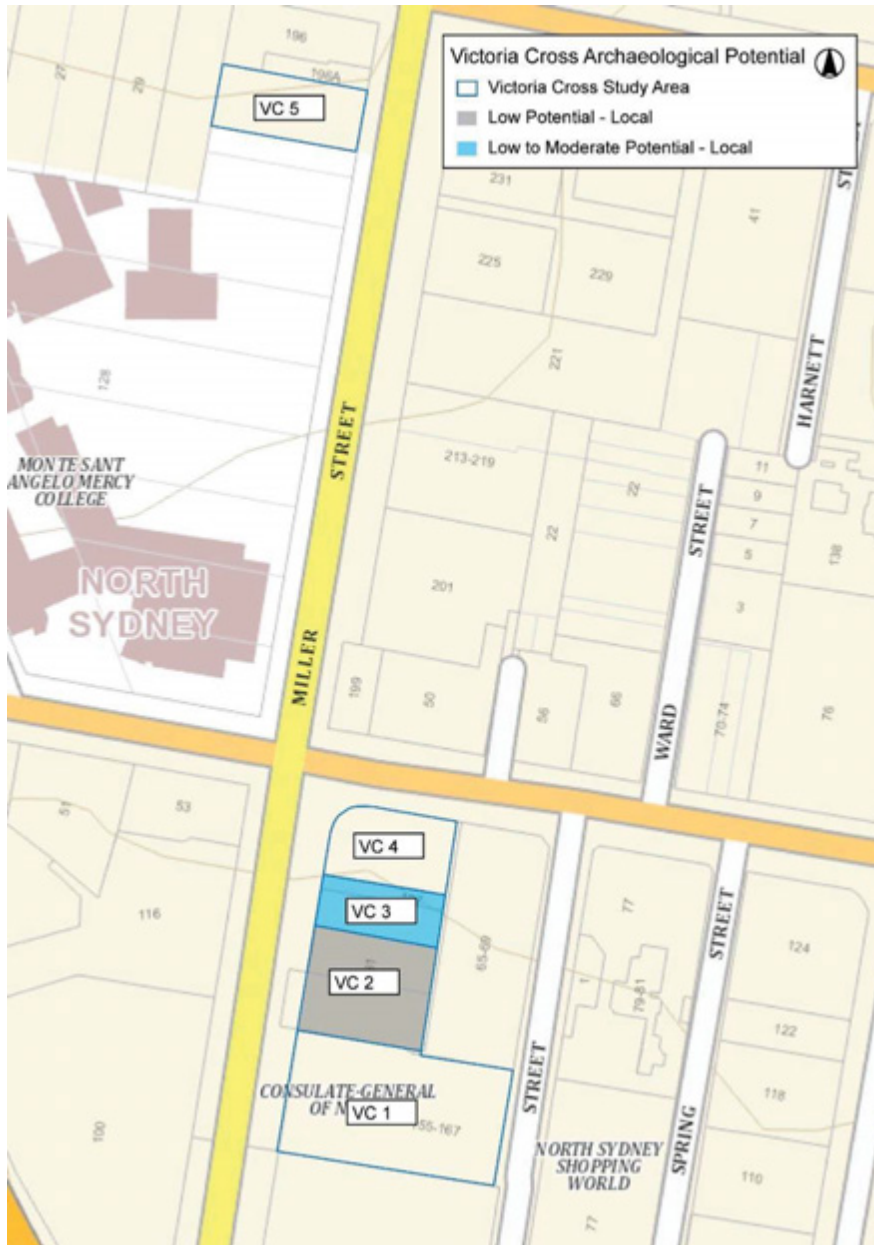
Potential archaeological evidence dating to Phase 3 would generally have low research potential as remains from this phase are not rare and not likely to contain artefacts. Evidence of substantial remains associated with the Victorian terraces may be of local significance, as they are representative of the residential and commercial development of area during this period.

Potential archaeological evidence dating to Phase 4 does not have research potential and will not reach the threshold of local significance.

Table 4-3: Summary of areas with potential for significant archaeological remains at the Victoria Cross Station site

Site Code	Phase	Potential	Archaeological resource	Significance
VC 2	3 (1880s – 1932)	Low	Truncated archaeological remains associated with later nineteenth century development.	Local
	2 (1838 – 1880s)	Low	Possible underfloor deposits (if current building dates to this phase).	Local
VC 3	3 (1880s – 1932)	Low - Moderate	Archaeological resources associated with the continuous occupation of the current building and its transition from residential to commercial use. Potential for underfloor deposits and cistern.	Local

Figure 4-14: Archaeological potential at the Victoria Cross Station site



4.4 Archaeological Impact

4.4.1 Proposed Works

The proposed arrangements during construction phase at Victoria Cross include the northern and southern building shafts that would be serviced from a suspended working platform over the majority of the shaft area.

The proposed sequencing of the excavation works for the northern and southern shafts of Victoria Cross entails the following:

- Demolition of existing buildings to basement
- Working platforms are formed for piling rigs i.e. backfill pits if necessary
- Piling works – perimeter walls and long piles

- Excavation of the site to allow for the construction of the working platform
- Construction of suspended working platform over shafts, with a shaft opening of at least 15 metres x 20 metres for the removal of spoil and machinery access
- Construction of acoustic shed where necessary and site infrastructure i.e. site office, staff amenities, workshop
- Shaft excavation to required depth.

4.4.2 Potential Archaeological Impacts

Site VC 3 has low-moderate potential and Site VC 2 has low potential for archaeological remains associated with c.1880s development. Historic maps indicate that these properties had cisterns and outhouses. If relatively intact archaeological features containing artefact-rich deposits are present, they are likely to reach the threshold for local significance (Figure 4-14). These areas would be subject to bulk excavation and therefore the construction works have potential to impact locally significant archaeological remains (Figure 4-15).

Evidence associated with the former creek is unlikely to be present below the current basement level (Site VC 1). The proposed construction works in this area are not yet known, however it is likely to comprise demolition, ground levelling and construction of site facilities. These works are unlikely to impact remains of this feature.

Figure 4-15: Potential archaeological impacts - Victoria Cross Station site



4.5 Archaeological Management

Archaeological impact mitigation is required for the Victoria Cross Station site (Table 4-4). Test/Salvage excavation should be undertaken in Sites VC 2 and VC 3 prior to bulk excavation work in these areas. Unexpected finds procedure would apply elsewhere.

Table 4-4: Summary of archaeological mitigation for the Victoria Cross Station site

Site Code	Potential archaeology	Impact	Mitigation
VC 2	Low potential for locally significant remains c.1880s cistern and outhouse	Direct impact – bulk excavation	<ul style="list-style-type: none"> AMS Monitoring if required
VC 3	Low-Moderate potential for locally significant remains of c.1880s structures, cisterns and outhouses	Direct impact – bulk excavation	<ul style="list-style-type: none"> AMS Test/Salvage
VC 1 VC 4 VC 5	Nil-Low potential for locally significant remains	Demolition, levelling and construction of site amenities	<ul style="list-style-type: none"> Unexpected Finds Procedure

4.5.1 Archaeological Methodology

The following archaeological methodology for the Victoria Cross station site is based on impacts known at project approval stage. Explanation and further details regarding the archaeological process and methodologies identified below are provided in Section 12.0.

- An AMS would be prepared for the Victoria Cross station site. This would:
 - Review the available basement data to confirm level of potential in VC 2 and VC 3
 - Confirm the appropriate archaeological mitigation for VC 2 and VC 3.
- Monitoring may be required in Site VC 2 depending on the basement and previous impact levels.
- A test/salvage excavation would be undertaken in Site VC 3 prior to impacts from bulk excavation. The testing should focus on the cistern and outhouse recorded on the 1890 plan, and within the late nineteenth century kitchen area of the house. This two-step archaeological process involves the following:
 - Test excavation to clarify if archaeological remains reach the threshold for local significance
 - Salvage excavation of locally significant archaeological remains prior to impact.
- Unexpected finds procedure would apply to all other areas (Sites VC 1, VC 4 and VC 5).
- A preliminary results report would be written once archaeological fieldwork has been completed.
- Post-excavation analysis of fieldwork results, artefacts, samples and other archaeological data would be undertaken and included in a final archaeological investigation report.
- Significant archaeological findings would be considered for inclusion in heritage interpretation for the project.

4.5.2 Research Questions

The historical themes associated with the Victoria Cross study area is presented in Table 4-5.

Table 4-5: Historical themes associated with the Victoria Cross Station site

Australian theme	NSW theme	Explanatory notes	Comments
3. Developing local, regional and national economies	Commerce	Activities related to buying, selling and exchanging goods and services	The first buildings on Miller Street were laid out to provide commercial services for the township of St Leonards (North Sydney), however they did not substantially develop until the late 19 th century.
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 creek is marked as a possible open sewer on 1890s plans of the study area. The construction of the tram line on Miller Street necessitated an under-the-road culvert for this water course. This creek may have been used as an open sewer or as a dumping ground for nearby residences. The degree of landscape modification of this creek is unknown.
4. Building settlements, towns and cites	Utilities	Activities associated with the provision of services, especially on a communal basis	A creek is marked as a possible open sewer on 1890s plans of the study area. The construction of the tram line on Miller Street necessitated an under-the-road culvert for this water course. This creek may have been used as an open sewer or as a dumping ground for nearby residences. The degree of landscape modification of this creek is unknown.
8. Developing Australia's cultural life	Domestic life	Activities associated with creating, maintaining, living in and working around houses and institutions	Underfloor and isolated artefact deposits may demonstrate the technological, commercial and working practices of the early inhabitants of the St Leonards (North Sydney) township.

The following research questions should be used to guide archaeological investigation.

- Is there substantial structural evidence of the previous Victorian terraces located within the southern portion of the study area? Are there deposits containing artefacts, and would the remains have research potential and reach the threshold for local significance?
- Is there evidence of land use in the study area prior to the construction of late nineteenth century residences and shops? Was the land used for pasturage or for agriculture prior to the development of the township of St Leonards (now North Sydney)?
- Is there evidence of earlier construction in the study area than the buildings present in plans from 1892?
- Are there remains of wells/cisterns and cesspits, and what do they tell us about the evolution of utility services in the area?

- Are there artefact-bearing deposits associated with the original commercial use of the building at 187 Miller Street? Is there a material change in artefact deposits that demonstrate changing commercial, technological and working practices over the history of the building?
- Are there underfloor artefact deposits extant in the study area? How do these underfloor deposits compare with other sites in the area, such as results from excavations at the Greencliffe estate?
- Does the artefact assemblage provide additional information regarding later nineteenth century daily life and economy in the area?
- Is there any archaeological evidence related to the creek in the study area, shown in plans from 1892? Was this creek used as an open sewer or a culvert? Are there intact and sealed artefact deposits relating to the use of the creek as a dumping ground for the early settlement of St Leonards (North Sydney)?

5.0 BLUES POINT TEMPORARY SITE

5.1 Site Location

The temporary construction site at Blues Point is located within the Blues Point Reserve at the end of Blues Point Road (Figure 5-1). The site is bounded by Henry Lawson Avenue (sometimes referred to as Henry Lawson Drive) to the north and Blues Point Road to the west. The site is located at the very southern end of McMahons Point and is within the North Sydney LGA.

The temporary construction site is for the retrieval of the cutter head and shield of the tunnel boring machines (TBMs) launched from Chatswood and Barangaroo. During the construction works the site would expand to encompass the current car parking on Blues Point Road adjacent to the reserve and the end of Blues Point Road to gain access to the existing wharf.

5.1.1 Land Parcels

The Blues Point temporary site is located on land parcels presented in Table 5-1 and the current use is illustrated in Figure 5-1.

Table 5-1: Land parcels in the Blues Point temporary site area

Site Code	Address	Lot	Existing Structures
BP 1	Henry Lawson Avenue, McMahons Point	1/DP902933	Reserve. Contains a small bus shelter
BP 2	Henry Lawson Avenue, McMahons Point	2/230594	Reserve
BP 3	Henry Lawson Avenue, McMahons Point	1/DP1159898	Reserve
BP 3	Blues Point Road, McMahons Point	7048/DP1077149	Reserve and road/parking space
BP 3	Blues Point Road, McMahons Point	2/DP581992	Reserve and road/parking space
BP 4	Blues Point Road, McMahons Point	n/a	Road/parking space

Figure 5-1: Blues Point temporary site showing existing modern development and site codes



5.2 Historical Analysis

5.2.1 European Exploration and Early Land Grants (1788 – 1850s)

Almost immediately after the First Fleet's arrival in Port Jackson efforts were made to commence mapping of the Sydney Harbour shoreline. Mapping of the water depths within the harbour was necessary in order to improve the safety of navigation by determining which areas were accessible to crafts of various sizes.⁵¹ The first survey of the shoreline was undertaken by Captain John Hunter and Lieutenant Bradley. Within two days of landing, Hunter and Bradley had set out and between 28

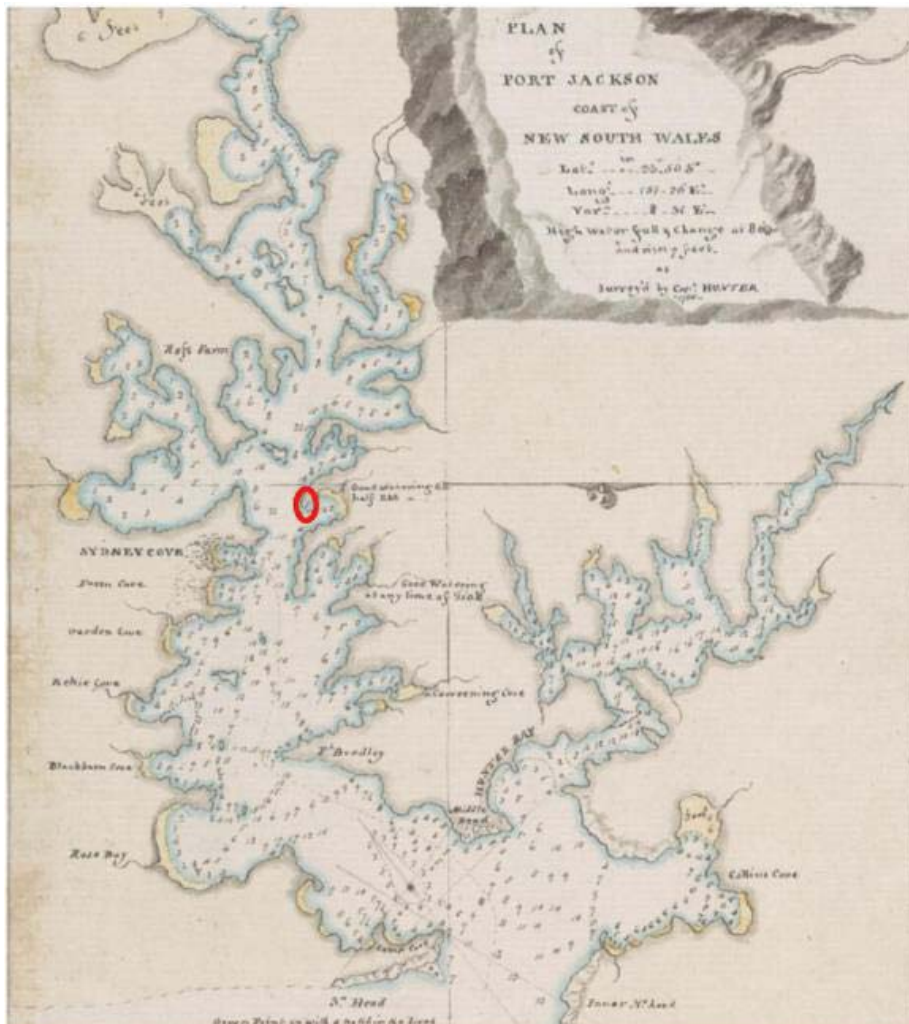
⁵¹ Mulhearn, P. 2014. The 18th and 19th Century Charting of Sydney Harbour / Port Jackson. Site accessed on 17/6/2016 at: http://www.e-perimtron.org/Vol_9_2/Mulhearn.pdf

January and 6 February they had managed to survey the area from the Heads to Homebush Bay.⁵² This expedition and the subsequent map that they produced (Figure 5-2) included the North Shore and the current study area.

Billy Blue's Land Grant

The Blues Point temporary site was originally located within an 80-acre land grant provided to William (Billy) Blue in 1817 (Figure 5-3). A former American slave living in London, Blue was sentenced to seven years' transportation in 1796 for stealing raw sugar. Blue arrived in Sydney in 1801 with two years of his sentence remaining. Following this, Blue found work as a waterman, and in 1811, he was appointed harbour watchman and constable by Governor Macquarie.⁵³ Blue's land grant consisted of the area which came to be known as Blues Point, which was named after him, and much of present day McMahons Point.⁵⁴ Blue named his farm "Northampton". Due to his previous work on and around the river and his property's position on the north side of the harbour, Blue saw the potential for operating a boat service to the site.

Figure 5-2: Plan of Port Jackson, coast of New South Wales as surveyed by Captain Hunter 1788 (map published in 1791) (source: <http://nla.gov.au/nla.obj-234845130/view>)



⁵² Mulhearn, P. 2014. Charting the Sydney Harbour Shoreline. Dictionary of Sydney. Site accessed on 17/6/2016 at: http://dictionaryofsydney.org/entry/charting_the_sydney_harbour_shoreline.

⁵³ Park, M. 2005. Blue, William (Billy) (1767–1834). Australian Dictionary of Biography. Site accessed on 8/6/2016 at: <http://adb.anu.edu.au/biography/blue-william-billy-12804>.

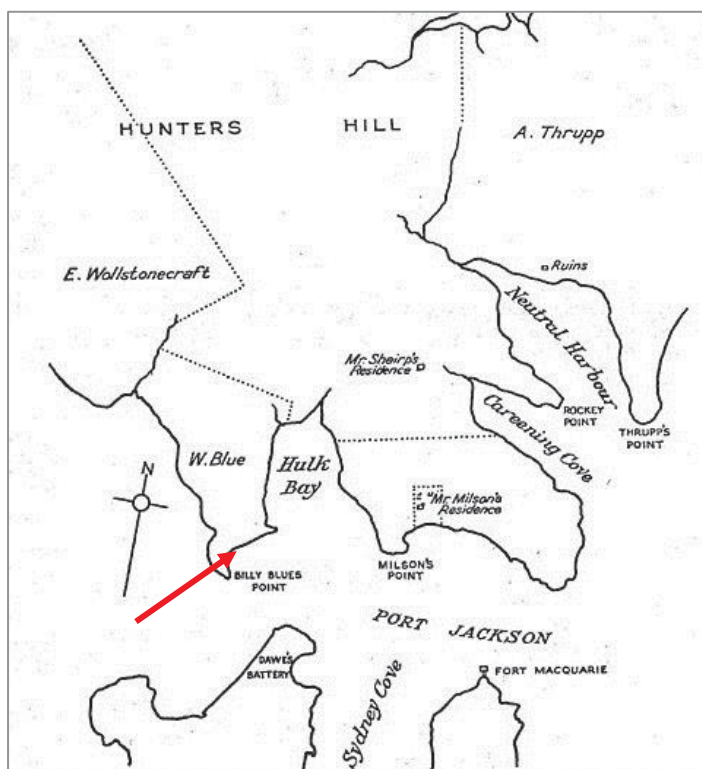
⁵⁴ Park, M. 2008. McMahons Point. Dictionary of Sydney. Site accessed on 8/6/2016 at: http://dictionaryofsydney.org/entry/mcmahons_point.

Within a short period of time Blue had managed to build up a “fleet of ferries”, consisting of about eleven row boats which he used to ferry people between Dawes Point in the Rocks and Blues Point.⁵⁵ In an attempt to oust Blue from his land, Edward Wollstonecraft and William Gore, both landholders on the north shore with vested interests in harbour trade, alleged in 1823 that Blue was a law-breaker who regularly smuggled goods and harboured escaped prisoners. Following a petition to the Governor, Sir Thomas Brisbane, Blue was allowed to “have the Use and Occupation of his ferry, which he formerly occupied between his farm in Northampton and Sydney.”⁵⁶

Blue died in 1834, at which point his estate was divided amongst his children and his eldest son William continued to run the ferry service. The estate remained in his family until the mid-nineteenth century. There is no indication that any permanent buildings were constructed during this period, with Blue’s cottage being located a short distance away.⁵⁷ An etching of Blues Point tentatively dated to c. 1840s suggests that a stone seawall with a small jetty had been constructed along the foreshore by that stage (Figure 5-4). Following the gazettement of the Township of St Leonards in 1838, a road northward from Blues Point was established and by the following year had been gazetted as St Leonards Road (now Blues Point Road).

During the period Blue established his ferry business at the point, a prison ship the *Phoenix* was moored in the main bay, called Hulk Bay and now Lavender Bay (see Hulk Bay references in Figure 5-3 and Figure 5-9). Between 1825 and 1837 the *Phoenix* was used to house convicts awaiting trial or secondary transportation, and invalid convicts awaiting transfer to Port Macquarie Invalid Station. While on the hulk the convicts were sent ashore to undertake various manual labour tasks such as quarrying, timber cutting and land reclamation.⁵⁸

Figure 5-3: Early map of the future North Sydney area dating to c.1820s (source: Warne 2005:14)



⁵⁵ Park 2005.

⁵⁶ Park 2005.

⁵⁷ <http://trove.nla.gov.au/newspaper/article/18024537>

⁵⁸ <http://sydneylivingmuseums.com.au/stories/convict-hulks>

Figure 5-4: Etching of Blues Point and view west towards Parramatta River, tentatively dated to c.1840s (source: Stanton Library File 000/000393)



5.2.2 Subdivision and Development of the Wharf (1850s – 1900)

From the 1850s, Blue's family began subdividing the estate. Sources vary on when the subdivisions began, with some suggesting that the family began to sell off portions of the property as early as 1836.⁵⁹ Regardless, the earliest developments on the estate lands occurred around its northern end, with development of the southern end generally following afterwards. One of the earliest developments in the southern area of the peninsula was the construction of the nearby Figtree Inn in c.1843, one of the first hotels established in the North Sydney area.⁶⁰ Population in the area remained fairly small until the 1850s and 1860s. By the 1870s however, most of the middle and southern portions of the peninsula had been subdivided, with developments including the nearby cottage of William Blue Jnr, the "Gibraltar" house and "Bellvue" villa, and a stone retaining wall along the west side of Blues Point Road.

With William Blue continuing his father's ferry service (even making use of larger boats by the 1840s), and the adjacent Blues Point Road providing access to St Leonards, Blues Point continued to develop as a popular ferry wharf.⁶¹ A photograph of the study area in the late 1850s confirms that a substantial network of stone seawalls and a series of small timber wharves had been constructed along the foreshore (Figure 5-5). Maps of the area during the mid-1860s and early 1870s indicate that the property was owned by one J. E. Stevens and that a stone building had been constructed in the north-west corner of the study area with another smaller building (appears to be a ferry box) situated just to the south of this (Figure 5-6 to Figure 5-8).

⁵⁹ North Sydney Council. "It was a very close community". North Sydney History Walk, p. 1.

⁶⁰ North Sydney Council. From Track to Tarmac. North Sydney History Walk, p. 10.

⁶¹ OEH 2013: <http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2180677>.

Figure 5-5: View west across Blues Point, image captured in 1858-1859 (source: State Library of NSW SPF 799)



Photos of the foreshore dating to the early 1870s confirm the presence of the stone building and ferry box (Figure 5-9). Sources suggest that this house was later owned by the Sydney Ferry. Alternatively, it has been suggested that this house might have been used by various leases for wharfage purposes before eventually becoming the North Sydney Council tar depot.⁶³ Subsequent photos and block plans of the study area dating to the early 1890s indicate that the house was expanded over time and that additional structures had also been constructed within the area (Figure 5-10 and

Figure 5-11). These structures included a jetty, a large open shed on the east side of the study area, another shed to the south and four smaller structures. By the late nineteenth century, Blues Point was well known for its boatbuilding and repair industries.

A photo of the south section of the site dated to the early 1890s (before the large south shed had been constructed) indicates that the south shed was constructed within an excavated area (Figure 5-12). The photo indicates that a stone retaining wall had been built along the excavated area, with railing on top of it. The photo also indicates that, by that stage, stone kerbing had been established along the edge of Blues Point Road. The 1891 block plan also indicates that a portion of the land adjacent to the north of the study area had been reclaimed for a road, resulting in the demolition of the buildings which had previously stood there (

⁶² North Sydney Council. From Track to Tarmac. North Sydney History Walk, p. 12.

⁶³ North Sydney Council. From Track to Tarmac. North Sydney History Walk, p. 12.

Figure 5-11).

Figure 5-6: Parish map of Willoughby dated to 1864 showing the Blues Point Estate (source: <http://trove.nla.gov.au/work/32131978?q=blues+point&c=map&versionId=39032532>)



Figure 5-7: Blues Point subdivision plans dated to c.1867 (source: <http://acms.sl.nsw.gov.au/album/ItemViewer.aspx?itemid=1291960&suppress=N&imgindex=12>)

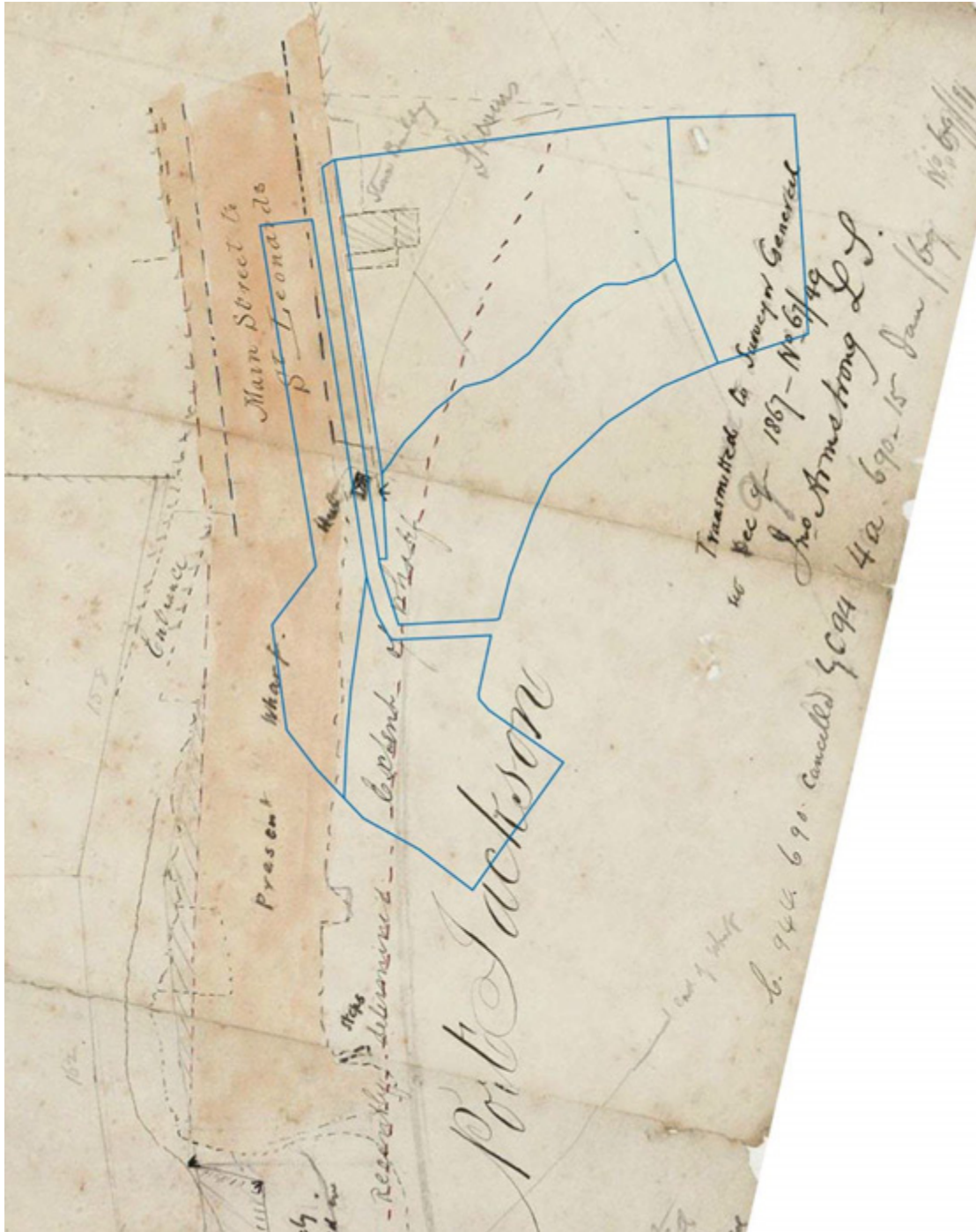


Figure 5-8: Plan of Blues Point Estate dating to c.1871. (source: <http://acms.sl.nsw.gov.au/album/ItemViewer.aspx?itemid=1291960&suppress=N&imgindex=13>)

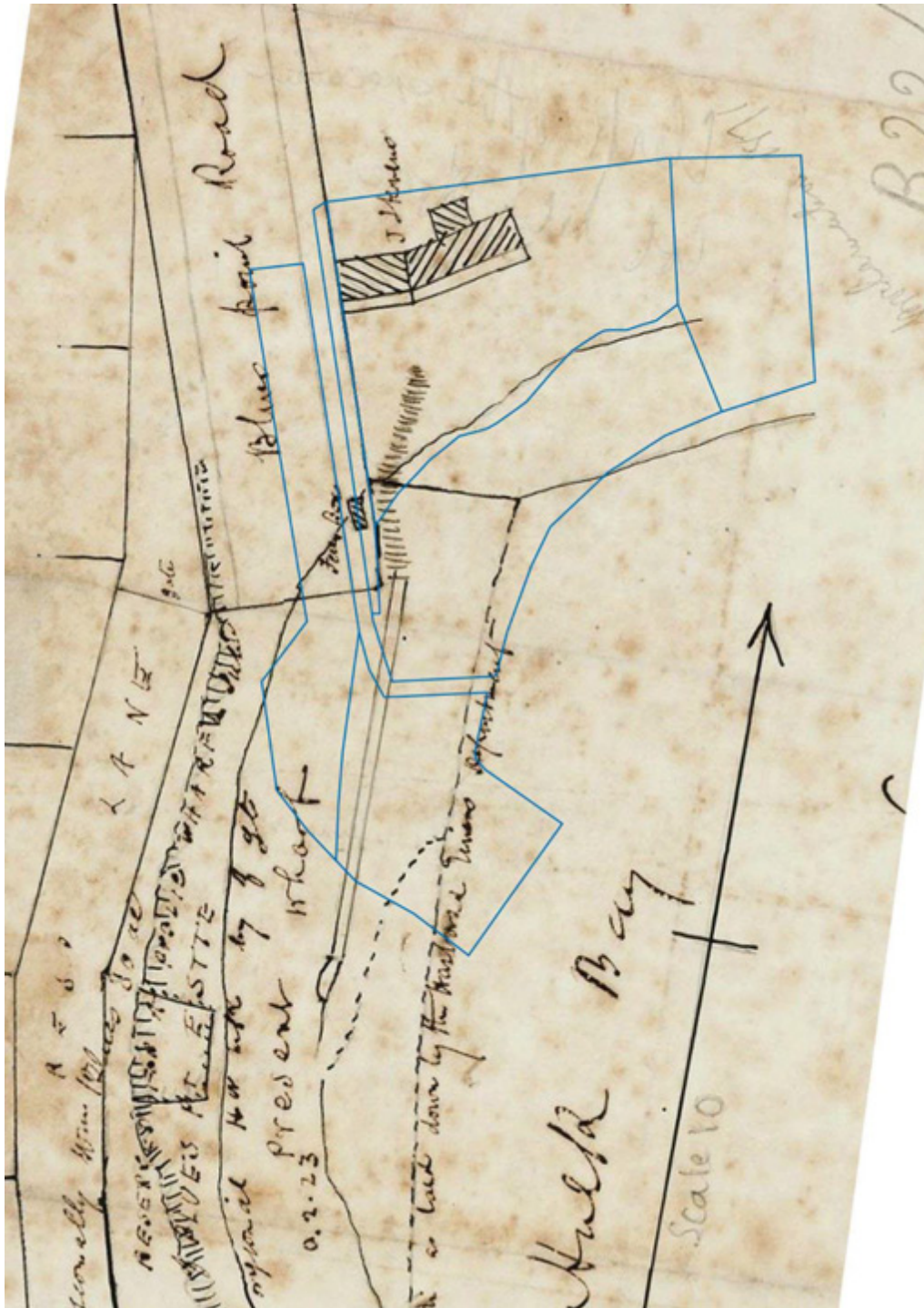


Figure 5-9: View southwest across Blues Point showing small dwelling in the temporary site and overgrown steep sandstone sided point to the west/ southwest. Date of image c. early 1870s (source: State Library of NSW SPF 933)

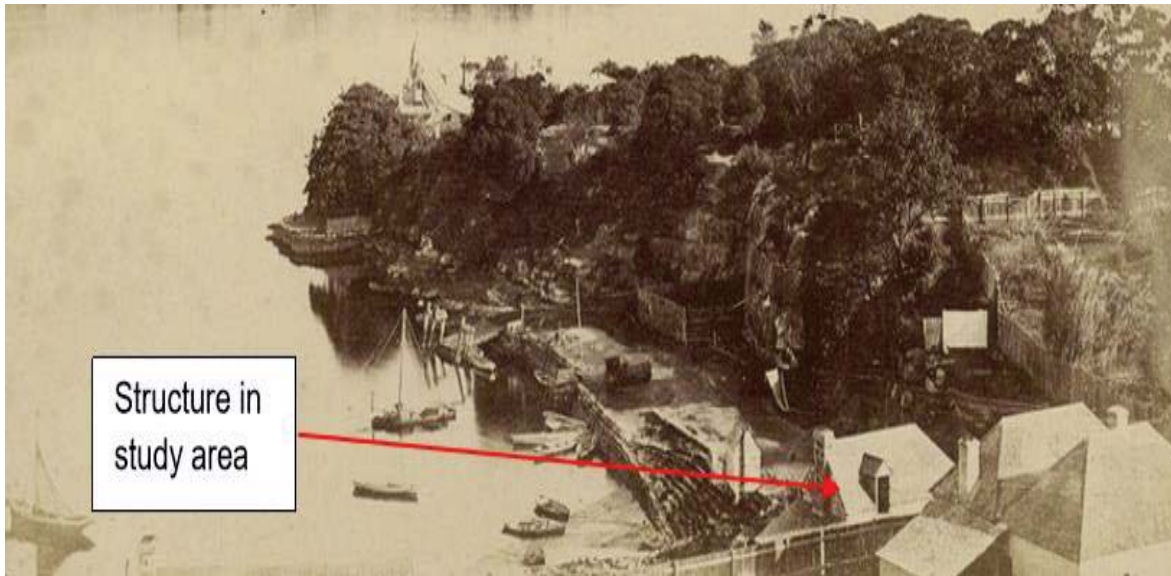


Figure 5-10: View southwest over Blues Point. This image shows extension of structure within temporary site, formalisation of wharfage and shoreline, quarrying activity. Date of image c. 1890s (State Library of NSW SPF 935)



Figure 5-11: Block plan map of the Blues Point temporary site dating to 1891 showing the extension of the house and the construction of additional structures (source: Stanton Library File /000016)

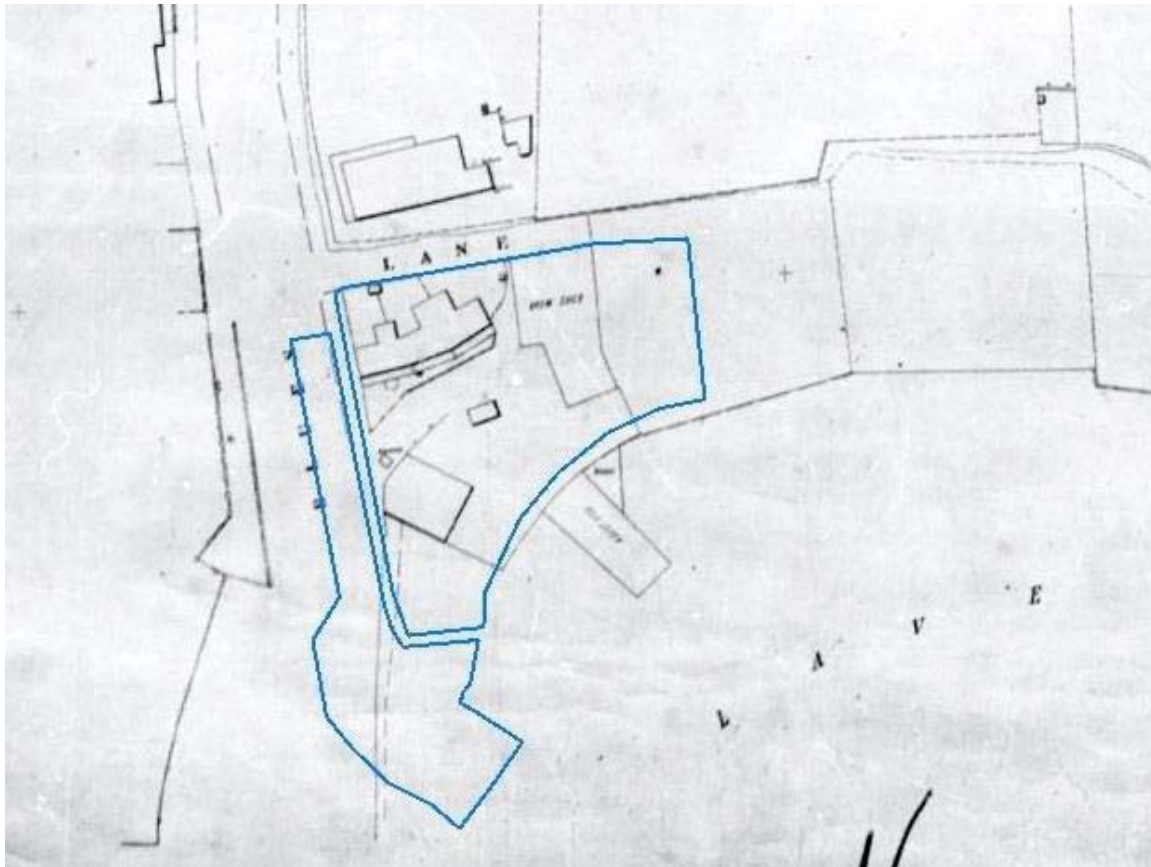
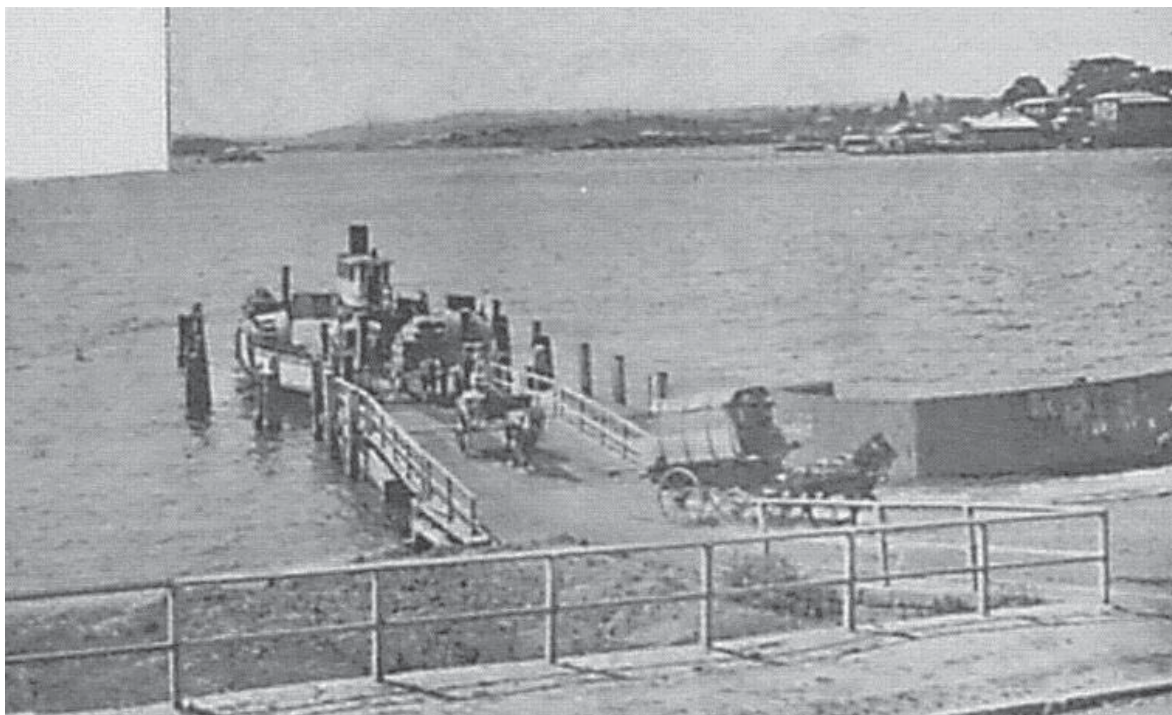


Figure 5-12: South end of the site in the early 1890s showing the excavated area where a warehouse was soon built (source: Stanton Library File 000/000958)



5.2.3 Early Twentieth Century Wharf Development (1900 – 1932)

During the early 1900s the foreshore continued to develop and it retained its reputation as an important area for ferries, boatbuilding and repairs.⁶⁴ In 1900, a vehicular ferry was established on the foreshore at the south end of the study area. The ramp located at the south end of Blues Point Road became a major landing point for vehicular ferries crossing to Dawes Point (Figure 5-13).⁶⁵ In 1909, growth and development in the area was stimulated by the extension of a tramway to McMahons Point. This resulted in further excavation of the cliff to the north of the study area for a tramway loop, with the subsequent road being named Henry Lawson Drive.⁶⁶ By the early twentieth century a large majority of the peninsula was ringed with ferry wharves such as the ones adjacent to the study area, with many of these being used by the Sydney Ferry Company (

Figure 5-14).

Figure 5-13: South end of the Blues Point temporary site and vehicular wharf in 1924, with the south warehouse visible on the left (source: City of Sydney Archives 079/079847)



⁶⁴ Park 2005.

⁶⁵ <http://www.walkingcoastalsydney.com.au/brochures/documents/HC2011Day1HistoricalNotesApril2011.pdf>, p. 3

⁶⁶ North Sydney Council. From Track to Tarmac. North Sydney History Walk, p. 11.

Figure 5-14: Aerial photograph of McMahons Point and Berrys Bay c.1921 (source: Stanton Library File 002/002624)



5.2.4 Post Sydney Harbour Bridge (1932 – Present)

Following the opening of the Sydney Harbour Bridge in 1932 the area underwent substantial development. Contrary to much of the surrounding suburb, development and activity within the study area itself actually decreased. The opening of the bridge provided people with an alternative, and more effective, method of crossing the harbour. As a result of this, the ferry service and tram service to McMahons point were replaced with bus services, and the vehicular ferry service was also cancelled.⁶⁷ Following this, it was not long before the structures within the study area were demolished, with photos of the time suggesting that the demolitions took place between the early part of the World War II and 1943 (Figure 5-16).

The surrounding suburb again saw extensive development following the end of the war. In the late 1950s, a large portion of McMahons Point, including the study area, was to be rezoned as industrial waterfront by the North Sydney Council. However, a group of residents and architects, led by Harry Seidler, instead argued that the area could be used for residential developments. A plan of the proposed residential development did not include any suggestions for structures within the study area. Regardless, this redevelopment was opposed by residents and the new council, and while some early houses were demolished only two towers were built (Blues Point Tower and Harbour Master).

⁶⁷ OEH 2013: <http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2180677>.

Following the demolition of the house and outbuildings and the backfilling of the site, little to no further developments have occurred within the study area. Other changes include the removal of most of the jetties and wharfing in the 1950s and 60s, and the construction of the bus shelter in 1984. Today the area is currently an open spaced reserve.

Figure 5-15: Image assumed to have been taken early Second World War of the SS Stratheden passing Blues Point. Structures within the Blues Point temporary site visible in the background (source: Australian War Memorial ID P00172.001)

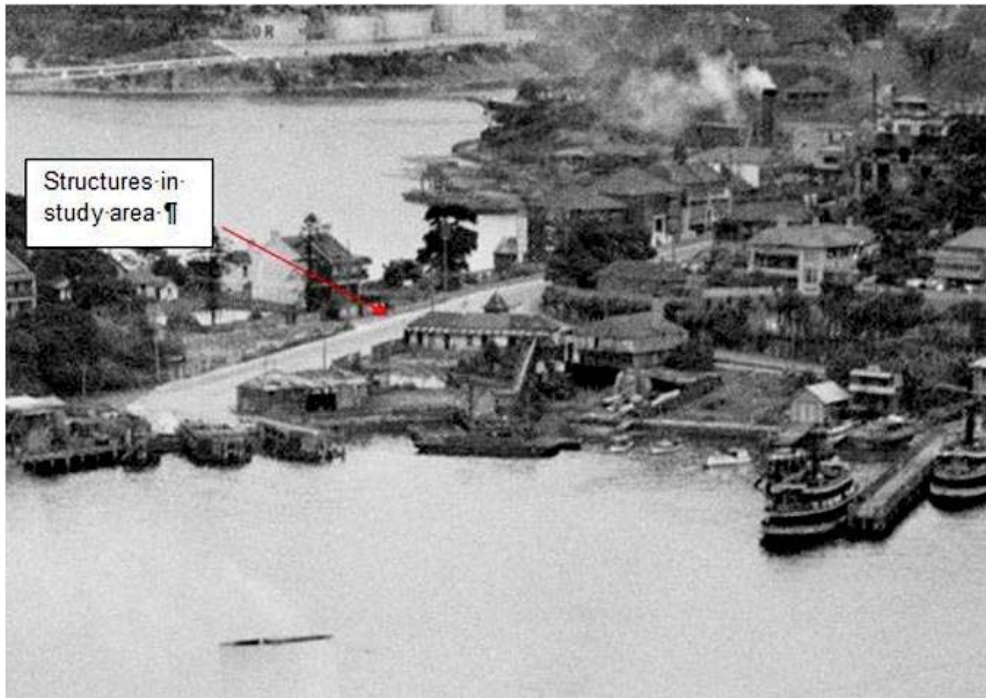
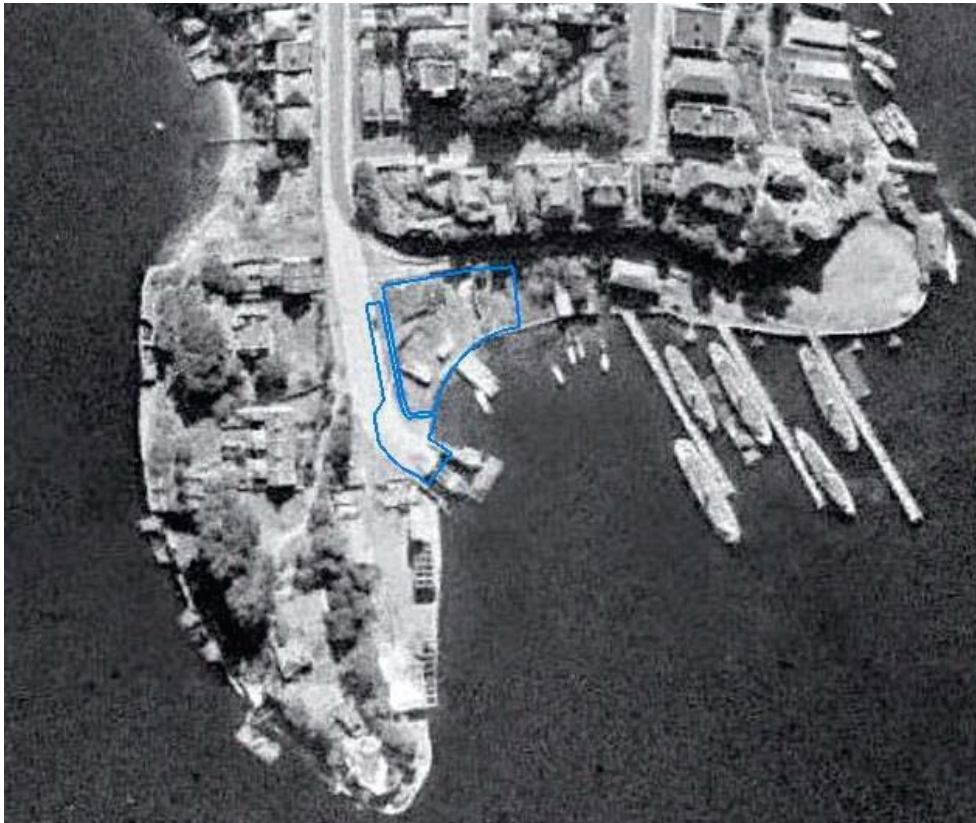


Figure 5-16: Aerial photo of Blues Point dating to 1943



5.3 Archaeological Potential

5.3.1 Previous Archaeological Studies

Few archaeological studies have been conducted within the Blues Point area and there have not been any which discuss the study area specifically. The studies mentioned in relation to the previous two station sites (Section 3.3.1 and Section 4.3.1) are relevant to Blues Point.

Other investigations of nineteenth century industrial foreshore sites in Sydney provide examples of the type of archaeological remains and survival level expected at Blues Point. Similar archaeological sites include Barangaroo South excavation by Casey & Lowe from 2011 to 2012.⁶⁸ Barangaroo is located on the eastern shore of Darling Harbour and archaeological remains of multiple phases of land reclamation and wharfage/jetty development dating from the 1830s and early twentieth century survived. Archaeological investigation at Balmain East wharf undertaken by Artefact Heritage in 2016 also demonstrate a high level of archaeological survival and that remains of former maritime infrastructure have the potential to be buried below subsequent land reclamation fills.

5.3.2 Land Use Summary

European occupation of the Blues Point study area has been divided into four phases of historical activity, which are discussed below.

⁶⁸ Casey & Lowe 2012 Archaeological Excavation: Barangaroo South, Preliminary Results. Report to Lend Lease (Millers Point).

- Phase 1 (1788-1850s) Exploration and the estate of William Blue and early development of the foreshore (wharfage and seawalls associated with Blue's ferry service)
- Phase 2 (1850s-1900) Subdivision and development of the boatbuilding industry
- Phase 3 (1900-1932) Early twentieth century continued development of the wharf
- Phase 4 (1932-present) Post Sydney Harbour Bridge disuse.

5.3.3 Previous Impacts

The study area is associated with maritime activities such as ferry services (including services to transport people, vehicles and other stock) and boatbuilding/repairs. These activities have likely resulted in heavily modification of the foreshore environment. Based on the review of the available sources, these modifications likely included reclamation of shallow foreshore areas from the mid-nineteenth to early twentieth centuries, and in-cutting of sections during the mid-twentieth century. Successive periods of expansion, demolition, rebuilding and subdivision of the wharves, jetties and other structures on the site would also have potentially disturbed or remove evidence of earlier activities. However, it is likely that in a number of cases the structures were only demolished to ground level before being backfilled, as was common practice during nineteenth century redevelopment. Furthermore, reclamation of the land may have buried some earlier features and thus helped to preserve them.

The study area today consists of open land reserve, with the structures and jetties having been removed during the second half of the twentieth century. However, they were not replaced with significant modern developments. As a result, this period is unlikely to have entirely removed subsurface evidence of the former structures.

5.3.4 Potential Archaeological Remains

Phase 1 (1788 – 1850s)

Archaeological remains associated with the earliest period of European settlement are likely to be ephemeral in nature. Although Blue engaged in farming on his estate, given the study area's location on the foreshore it is unlikely that land clearing, grazing or cultivation took place within the study area itself. No structures are known to be present in the study area during this phase. Archaeological remains from this period could consist of evidence of unrecorded buildings and informal camps, such as postholes or artefact scatters. Blues Point Road was gazetted in 1839 and would have initially been a dirt road, remains of which are unlikely to be visible in the archaeological record.

Blue is believed to have operated a ferry service within the study area though not lived there. Sources suggest that by c.1840s the foreshore featured a timber jetty and stone seawall (Figure 5-4). It is possible that these features had been established even earlier, within Blue's lifetime. If these earlier sections were buried within subsequent reclamation fills, it is possible that evidence of the early development of the of the wharf remains, such as original sections of the seawall, timber posts and postholes associated with the jetty, and evidence of landfills.

Phase 2 (1850s – 1900)

This phase saw significant developments along the foreshore and by the end of the century it featured more substantial wharf, a large jetty and a stone seawall. This seawall might have been the original seawall or it could have replaced the earlier one following land reclamations. If sections of the seawall were buried during land reclamations, it is possible that further remains of them may be uncovered. Remains of the wharves and piers would likely consist of timber posts and postholes.

This phase saw the construction of the first known structures within the study area. These included a sizeable building(s) at the north-west corner of the study area, (later appears to be three residential buildings built as a group) with associated outbuildings, a ferry box warehouse to the east and south of the larger building, and at least three to four smaller structures. Sources suggest that the large building (later three properties?) was built of stone, while it is most likely that the other buildings were timber and corrugated iron. It also appears that the warehouses were likely raised off of the ground. Archaeological evidence of these structures could potentially include stone building footings and postholes associated with the warehouses and smaller outbuildings. Artefactual deposits associated with commercial, administrative or residential occupation may also be recovered in the form of yard scatter, underfloor deposits or higher density rubbish dumps or backfills within cesspits or wells for example. Because a sewerage network and municipally organised garbage collection was likely established in the area during this period, concentrated pockets of artefacts are less likely to be found from the late nineteenth century onwards.

The early 1890s photo of the south section of the study area indicates that a stone retaining wall was built along the edge of the area excavated for the south warehouse (Figure 5-12). This area has since been backfilled but it is possible that sections of the stone wall are still present. The 1891 block plan also indicates that the property was enclosed by a wooden fence. Remains associated with this would consist of postholes. Blues Point Road still appears to be a dirt road throughout this period, however, stone kerbing had been established along its edges which is potentially still present. There is also potential for drainage channels and other related features.

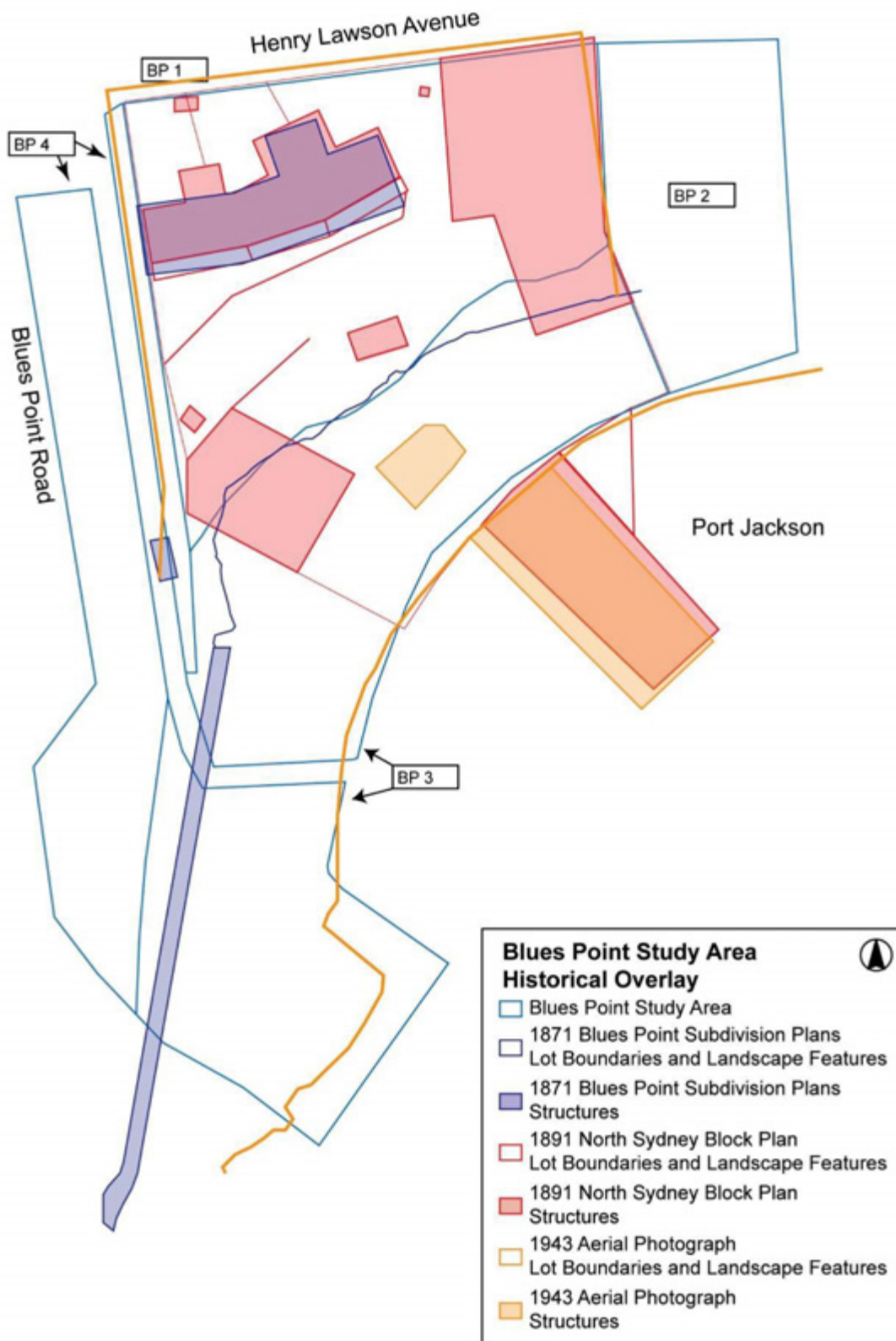
Phase 3 (1900 – 1932)

This period saw the continued development of the wharf. In particular, the vehicular wharf was opened at the beginning of the twentieth century. It is also possible that the wharf and jetties were again altered during this period. Associated remains would likely consist of timber posts and postholes. Photos of the site during this period indicate that the main structure was likely expanded. Associated remains would predominantly consist of building footings or occupation deposits. Features such as cisterns or cesspits are unlikely to be present due to the establishment of public utilities.

Phase 4 (1932 – Present)

Following the opening of the Sydney Harbour Bridge, the wharves at Blues Point rapidly declined. As a result, it is unlikely that the study area underwent any further significant developments until the buildings were demolished in the 1940s and the wharves in the 1950s and 60s. By this period Blues Point Road had been surfaced, and in 1984 a bus shelter was constructed at the north edge of the study area. The demolition of the earlier structures and infrastructure of the wharves is likely to have impacted the remains of the previous periods of development. However, because the area has not been further developed since then, there is still potential for remains from earlier phases to be present beneath the surface.

Figure 5-17: Historical structure overlay – Blues Point temporary site



5.3.5 Summary of Archaeological Potential

Although the buildings and foreshore infrastructure within the study area were demolished during the middle of the twentieth century, no modern developments have replaced them. Therefore, there is the potential that archaeological evidence of the previous phases of development might still be present beneath the surface. There is generally moderate potential for Phase 1 archaeological remains to still be present, with remains most likely consisting of evidence of the former wharf and seawalls on the foreshore. Archaeological remains at the site are most likely to consist of the former buildings and wharfage infrastructure from Phase 2 (Figure 5-17) and into Phase 3. These remains will likely consist of structural elements, with a lower chance for artefactual deposits from Phase 2. As there does not appear to have been any new developments following the opening of the Sydney Harbour Bridge, there is generally nil potential for any remains from this phase.

Based on historical information, land use data and evidence of sub-surface impacts, a summary of the potential archaeological remains in the Blues Point temporary site study area is provided in Table 5-2 below.

Table 5-2: Summary of potential archaeological remains at the Blues Point temporary site

Site Code	Phase	Likely archaeological remains	Potential
BP 1	1 (1788 – 1850s)	Evidence of unrecorded buildings, informal camps or minor land clearance such as postholes or isolated artefact scatters and tree boles. Informal road surfaces such as gravel, with informal cut drains and gullies.	Nil - Low
	2 (1850s – 1900)	Structural evidence of main building and outbuildings such as stone footings. Yard surfaces, occupation-related deposits such as yard scatters, underfloor deposits, rubbish dumps or cesspit backfills. Evidence of outbuildings such as timber posts or postholes. Evidence of fencing around property such as fence postholes. Informal road surfaces such as gravel, potential drainage and kerb features	Moderate
	3 (1900 – 1932)	Structural evidence of additions to the main building such as stone or brick footings. Yard surfaces or minor occupation - related deposits such as yard scatters and underfloor deposits. Evidence of more formal road surfaces, potential drainage and kerb features.	Moderate
	4 (1932 – Present)	No evidence of further developments until demolitions in the mid-twentieth century and no developments since except for the still extent bus shelter.	Nil
BP 2	1 (1788 – 1850s)	Evidence of unrecorded buildings, informal camps or minor land clearance such as postholes or isolated artefact scatters and tree boles. Evidence of wooden jetty (timber posts and postholes), stone seawall and land reclamation fill.	Nil - Low (north half) Moderate (foreshore)
	2 (1850s – 1900)	Structural evidence of recorded or unrecorded outbuildings such as posts or postholes, yard surfaces, occupation-related deposits and rubbish dumps. Evidence of wharfage infrastructure (alterations or additions) such as timber posts, postholes, land reclamations or stone walls (seawall and retaining wall).	Nil - Low (north half) Moderate - High (foreshore)

Site Code	Phase	Likely archaeological remains	Potential
BP 3	3 (1900 – 1932)	Structural evidence of outbuildings or wharfage infrastructure (alterations or additions) such as timber posts, postholes, land reclamations or stone walls (seawall and retaining wall). Evidence of informal road surfaces such as gravel, potential drainage and kerb features. Evidence of fencing around property such as fence postholes.	Nil - Low (north half) Moderate - High (foreshore)
	4 (1932 – Present)	No evidence of further developments until demolitions in the mid-twentieth century and no developments since.	Nil
	1 (1788 – 1850s)	Evidence of wooden jetty (timber posts and postholes), stone seawall and land reclamation fills. Informal road surfaces such as gravel, with informal cut drains and gullies.	Moderate
	2 (1850s – 1900)	Structural evidence of outbuildings or wharfage infrastructure (alterations or additions) such as timber posts, postholes, land reclamation fills or stone walls (seawall and retaining wall). Evidence of informal road surfaces such as gravel, potential drainage and kerb features. Evidence of fencing around property such as fence postholes.	Moderate - High
BP 4	3 (1900 – 1932)	Structural evidence of outbuildings or wharfage infrastructure (alterations or additions) such as timber posts, postholes or land reclamations. Isolated artefact scatters. Evidence of more formal road surfaces, potential drainage and kerb features.	Moderate - High
	4 (1932 – Present)	No evidence of further developments until demolitions in the mid-twentieth century and no developments since.	Nil
	1 (1788 – 1850s)	Potential for evidence of unrecorded buildings such as postholes and isolated artefact scatters, tree boles. Informal road surfaces such as gravel and drainage features.	Nil – Low Low
	2 (1850s – 1900)	Evidence of informal road surfaces, potential drainage and kerb features.	Moderate
	3 (1900 – 1932)	Evidence of more formal road surfaces, potential drainage and kerb features.	Moderate
	4 (1932 – Present)	Modern road surface and kerbing is still extant.	Nil

5.3.6 Assessment of Archaeological Significance

Sections of the study area have moderate potential to contain archaeological remains of the first wharf development from the c.1840s and into the early 1900s. The foreshore area has potential to contain archaeological remains of successive seawall and wharf development buried below reclamation. The significance of the archaeological remains is contingent upon their level of intactness and it is expected this site contains relatively intact archaeology. An assessment of the potential archaeological significance of the site is provided below.

5.3.7 Significance Assessment

Research Potential (Criterion E)

The initial phase of development of the study area is associated with the earliest phases of settlement on the North Shore. Archaeological remains from this period are rare and have the potential to yield information which is not obtainable from other sources. This information could contribute to better

understanding of early nineteenth century practices associated with water transport and early colonial life on the North Shore. Evidence of the original seawall would also provide information on how they were constructed. If intact remains from the first period of development are recovered, they would have significance at a State level.

Information relating to the history of the former stone building (later illustrated as three residential properties) in the north-west corner of the study area (BP1), which was likely constructed during Phase 2 (present by 1864), is currently limited. If substantially intact archaeological remains are recovered, they could have research potential relating to the use and ownership of the building, or the residential and commercial development of Blues Point from the mid-late nineteenth century. Sources currently suggest that the building was either used by various lessees for wharfage purposes before becoming the North Sydney Council tar depot, or that it was a dwelling house belonging to the Sydney Ferry Company.⁶⁹ Archaeological evidence from Phase 2 associated with the buildings in the study area would have significance at a local level. The potential for remains from this phase to have survived is moderate.

For over 100 years, since the study area was first granted to Blue, the foreshore was continuously utilised for various ferry and boat services. Since the first wharf, jetty and seawalls were built, the infrastructure on the foreshore has likely been altered, reconstructed and replaced on several occasions. If substantial intact evidence of the former infrastructure is discovered, it will have potential to answer questions relating to how the foreshore has developed over time and how the infrastructure has been altered to potentially accommodate larger ships or changing technologies. The potential for remains from the wharfage infrastructure to have survived is moderate.

Archaeological evidence from the twentieth century is not rare and is unlikely to have high research potential. Evidence from Phase 3 is unlikely to reach the level of local significance under this criterion, and evidence from Phase 4 will not reach the level of local significance under this criterion.

Association with Individuals, Events, or Groups of Historical Importance (Criteria A, B and D)

The Phase 1 development of the study area is associated with the life of Billy Blue. Blue was a well-known character in the early days of the settlement of the North Shore and was personally known to Governor Macquarie. At one stage Blue was the only person licenced to ply a ferry across the harbour. His ferry service on the North Shore was one of the first in the area and, as the main landing point for travel to the township of St Leonards, it strongly contributed to the development of the region. The area today has significant association with Blue, with the area being named Blues Point after him. Archaeological remains clearly associated with Billy Blue would have significance at a State level.

The development of the foreshore during Phase 2 is likely associated with the early development of the North Shore Ferry Company. Formed in 1861 by James Milson Jnr, the North Shore Ferry Company operated the very first commercial ferry across the Sydney Harbour.⁷⁰ Due to its technological innovations during this phase, such as building the first double-ended-propeller-driven ferry in the world, the company was recognised for its progressive approach.⁷¹ Sources suggest that the wharfage and the main building were owned by the company, who used them to transport people and cargo. If substantial archaeological evidence of these features is discovered, they would likely have significance at a local level.

Though local community consultation regarding the potential archaeology at Blues Point temporary site, it is likely archaeological investigations would be of interest. The local community have a strong

⁶⁹ North Sydney Council. From Track to Tarmac. North Sydney History Walk, p. 11.

⁷⁰ Wotherspoon, G. 2008. Ferries. Dictionary of Sydney. Site accessed on 19/6/2016 at: <http://dictionaryofsydney.org/entry/ferries>.

⁷¹ Transport for NSW 2015. Sydney Ferries. Site accessed on 19/6/2016 at: <http://www.transport.nsw.gov.au/customers/ferries/sydney-ferries>.

connection and engagement with the history and heritage of area. This is demonstrated by active local history groups, available online resources, frequent heritage events in the area, and support at a local government level. The potential archaeological resource would be of interest to the local residents and other interested groups, and would have social significance at a local level.

Aesthetic or Technical Significance (Criterion C)

The initial development of the foreshore infrastructure, including the wharfage and seawalls, would have likely required extensive alterations of the natural layout of the study area. During the Phase 1 settlement of the North Shore, when the area was still relatively undeveloped and population was small, this would have represented a considerable feat of engineering. As a result, intact archaeological remains associated with the early foreshore developments in the study area, such as wharfage or seawalls, would potentially demonstrate technical significance at a State level.

Ability to Demonstrate the Past through Archaeological Remains (Criteria A, C, F and G)

Archaeological evidence of the Phase 1 foreshore infrastructure could potentially be representative of the early development of boating services within Sydney Harbour. Due to the potentially significant modification of the foreshore over time, it is likely that they have been impacted by later developments and alterations to the area. The significance of the remains would depend on their level of intactness. Sufficiently intact archaeological evidence dating to this phase would have significance at a State level. However, the potential for these remains to be present is low.

Archaeological evidence of the Phase 2 development of the foreshore infrastructure and the associated buildings could potentially be representative of the development of the Blues Point foreshore from the mid-nineteenth century to the early twentieth century. Remains from this period could demonstrate the growth of the foreshore into an area well known for its ferry services and boatbuilding/repairs industries. The level of intactness of the remains would determine their significance. Archaeological evidence from Phase 2 will likely have significance at a local level, and while artefactual deposits from Phase 3 are not likely to have the same significance, structural remains of the wharfage infrastructure may reach the level of local significance.

Significance Level

Potential archaeological remains associated with Billy Blue (1820s-1830s) would be State significant under Criteria A, B and F. Other archaeological remains dating from the mid-1830s onwards would be of local significance under Criteria A, B, C, D and G.

5.3.8 Statement of Archaeological Significance

There are potential archaeological resources of local and state significance at the Blues Point (Table 5-3 and Figure 5-18). The Phase 1 development of the site is associated with Billy Blue's harbour ferry service. Billy Blue was a notable former convict in the early nineteenth century. Substantial intact archaeological evidence could be representative of the development of early boating services in the Sydney Harbour, could demonstrate technical significance and could provide information relating to early boating practices and colonial life on the North Shore. Archaeological evidence of this would have significance at a State level.

The Phase 2 development of the site is associated with the development of the foreshore into an area known for its ferry services and boatbuilding/repairs. Substantial remains from this period could demonstrate representativeness of this development, and could provide information relating to the history of the occupation of the site and how the wharfage might have adapted to accommodate changing needs and technologies. This phase of development is also potentially associated with the beginnings of the North Sydney Ferry Company, the first commercial ferry service in Sydney Harbour and technological innovators. Substantial remains from this phase would likely have significance at a local level.

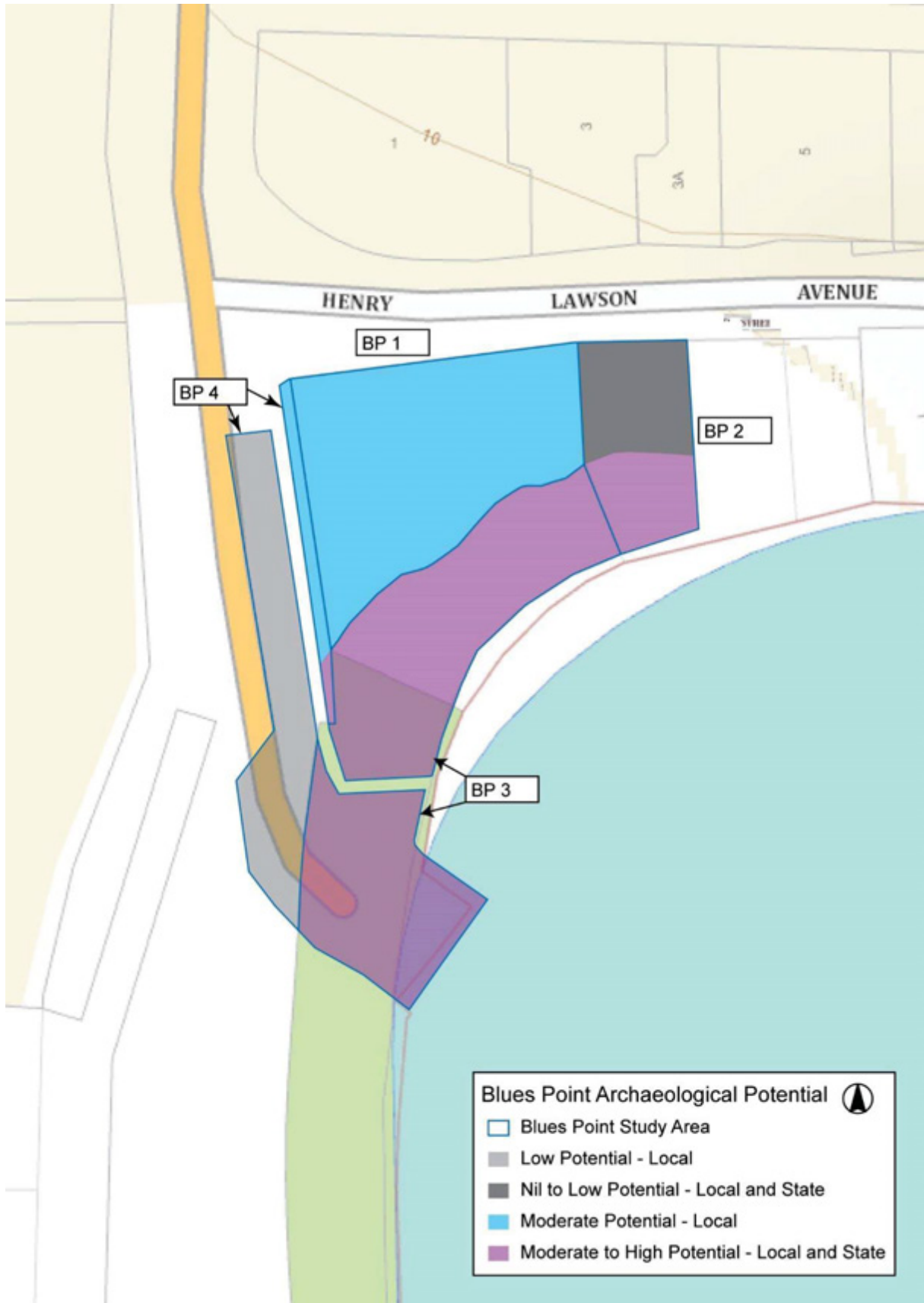
Archaeological deposits from the late nineteenth century onwards are not rare and are unlikely to have any research potential. Structural remains of the wharfage from Phase 3 however may be representative of the continued development of the Blues Point foreshore during the early twentieth century and may have research potential relating to influences on the design of the wharfage. Archaeological evidence of this may have significance at a local level.

With local community active and engaged with local heritage, the potential archaeological resource also has social significance at a local level.

Table 5-3: Summary of areas with potential for significant archaeology at the Blues Point temporary site

Site Code	Phase	Potential	Archaeological resource	Significance
BP 1	1 (1788 – 1850s)	Nil – Low	Archaeological evidence associated with Billy Blue's ferry service or the pre-1850 Blue Estate.	State
	2 (1850s – 1900)	Moderate	Archaeological evidence associated with the occupation and development of the ferry service and boatbuilding industry in Blues Point.	Local
	3 (1900 – 1932)	Moderate	Archaeological evidence associated with the continued occupation of the study area.	Unlikely to reach the threshold of Local significance
BP 2	1 (1788 – 1850s)	Nil - Low (north half) Moderate (foreshore)	Archaeological evidence associated with Billy Blue's ferry service or the pre-1850 Blue Estate.	State
	2 (1850s – 1900)	Nil - Low (north half) Moderate - High (foreshore)	Archaeological evidence associated with the development of the ferry service and boatbuilding industry in Blues Point.	Local
	3 (1900 – 1932)	Nil - Low (north half) Moderate - High (foreshore)	Continued development of the wharfage in the early 20 th century.	Local
BP 3	1 (1788 – 1850s)	Moderate	Archaeological evidence associated with Billy Blue's ferry service or the pre-1850 Blue Estate.	State
	2 (1850s – 1900)	Moderate – High	Archaeological evidence associated with the development of the ferry service and boatbuilding industry in Blues Point.	Local
	3 (1900 – 1932)	Moderate – High	Continued development of the wharfage in the early twentieth century (including vehicular ferry).	Local
BP 4	1 (1788 – 1850s)	Low	Archaeological evidence of the initial layout of Blues Point Road.	Local

Figure 5-18: Areas with potential significant archaeology at Blues Point temporary site



5.4 Archaeological Impacts

5.4.1 Proposed Works

The Blues Point temporary site would be established to enable the retrieval of the cutter heads and shields of the tunnel boring machines (TBMs) from the Chatswood dive site and from Barangaroo.

Construction works at this site would involve the excavation of a shaft to the tunnels below resulting in around 8,000 cubic metres of spoil being removed through the site. The cutter heads and shield of the tunnel boring machines from the northern portal and from Barangaroo would be retrieved through this shaft. During retrieval of the tunnel boring machine components, this site would expand to encompass the current car parking on Blue Point Road adjacent to the reserve and the end of Blues Point Road to gain access to the existing wharf.

Access and egress to and from the site would be left in from Blues Point Road and left out to Henry Lawson Drive. It may also be feasible to transport the tunnel boring machines via barge using the wharf at the end of Blues Point Road. This opportunity would be further investigated during detailed design.

Construction impact

Construction impacts at the Blues Point temporary site include:

- Bulk excavation of ground down to a depth of over 20 metres for the retrieval shaft
- Construction of the temporary site compound and facilities would involve ground disturbance. This would likely involve benching or areas of cut and fill. However, the nature and extent of any excavation and below ground impacts is not yet known.

5.4.2 Potential Archaeological Impacts

The Blues Point temporary site generally has a moderate-high potential for archaeological remains associated with former wharf and industry dating from the 1850s. Remains of buildings, yards and work areas, and maritime infrastructure are expected in many areas of the site.

Bulk excavation for the retrieval shaft in Site BP 1 would removal all potential archaeological remains of former occupation dating from c.1850s.

Full details of construction impact elsewhere are not yet known. However, benching and cut/fill landscaping to create level working platforms across the rest of the site also have potential to impact significant archaeological remains in Sites BP 1, part BP 2 and BP 3.

As there is lower potential for archaeological remains in north part of Sites BP 2 and BP 4, there is less potential for impact to significant archaeological resources in these areas.

Figure 5-19 Potential archaeological impacts - Blues Point temporary site



5.5 Archaeological Management

Archaeological impact mitigation is required at Blues Point temporary site (Table 5-4). A program of test/salvage excavation should be undertaken prior to retrieval shaft bulk excavation in Site BP 1. Archaeological mitigation would also be required in the rest of Sites BP 1, BP 2 and BP 3. This would involve monitoring, testing or salvage depending on the extent of excavation to create level working platforms and site facilities.

Table 5-4: Summary of archaeological mitigation for Blues Point temporary site

Site Code	Potential archaeology	Impact	Mitigation
BP 1	Moderate potential for locally significant archaeology associated with the 19 th century occupation and development of the ferry service and boatbuilding industry in Blues Point	Direct impact – retrieval shaft excavation Potential direct impact – landscaping (benching or cut/fill etc.) and construction of site amenities	<ul style="list-style-type: none"> AMS Test/Salvage in bulk excavation area Monitoring or Test/Salvage of other ground works
BP 2 BP 3	Moderate-High potential for archaeological evidence associated with the 19 th century development of the ferry service and boatbuilding industry in Blues Point (State and local)	Potential direct impact – landscaping and construction of site amenities	<ul style="list-style-type: none"> AMS Monitoring or Test/Salvage
BP 4	Low potential for locally significant remains	Potential direct impact – demolition and construction of site amenities	<ul style="list-style-type: none"> Unexpected Finds Procedure

5.5.1 Archaeological Methodology

The following archaeological methodology for the Blues Point temporary site is based on impacts known at EIS stage. Explanation and further details regarding the archaeological process and methodologies identified below are provided in Section 12.0.

- An AMS would be prepared prior to commencement of construction works at Blues Point temporary site. The AMS would:
 - Review detailed design, scope of works, construction program and methodology, and confirm potential for impacts to significant archaeological resources in Sites BP 1, BP 2 and BP 3
 - Identify opportunity for in situ conservation of archaeological remains outside the retrieval shaft bulk excavation area
 - Reconcile contamination / remediation requirements and archaeological mitigation
 - Identify and implement appropriate archaeological mitigation (monitoring or test/salvage) for Sites BP 2 and BP 3, and BP 1 outside retrieval shaft bulk excavation area
 - Outline how Aboriginal archaeological investigation program would be included
 - Outline how public information regarding the archaeological investigation would be disseminated.
- A test/salvage excavation would be undertaken in Site BP 1 (retrieval shaft bulk excavation footprint). This two-step archaeological process involves the following:

- Test excavation to clarify the extent of archaeological remains
- Salvage excavation of significant archaeological remains prior to bulk excavation impact.
- Unexpected finds procedure would apply to Sites BP 2 (north part) and BP 4.
- A preliminary results report would be written once archaeological fieldwork has been completed.
- Post-excavation analysis of fieldwork results, artefacts, samples and other archaeological data would be undertaken and included in a final archaeological investigation report.
- Significant archaeological findings would be considered for inclusion in heritage interpretation for the project.

5.5.2 Research Questions

Historical themes for the Blues Point study area is presented in Table 5-5.

Table 5-5: Historical themes associated with the Blues Point temporary site

Australian theme	NSW theme	Explanatory Notes	Comments
3. Developing local, regional and national economies	Environment – cultural landscapes	Activities associated with the interactions between humans, human societies and the shaping of their physical surroundings	<p>The Blues Point foreshore was extensively modified with sea and retaining walls in order to provide boat access to the foreshore. Several phases of landscaping occurred during the 19th and 20th centuries.</p> <p>The foreshore at Blues Point underwent several phases of land reclamation during the 19th and 20th centuries.</p>
3. Developing local, regional and national economies	Industry	Activities associated with the manufacture, production and distribution of goods	Boatbuilding facilities were established in the study area during the 19 th century and continued in use until the mid-20 th century.
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	William (Billy) Blue operated a ferry service from Blues Point in the early 19 th century and Blues Point continued as a popular ferry terminal up until the 1930s with the construction of the Sydney Harbour Bridge.
9. Marking the phases of life	Persons	Activities of, and associations with, identifiable individuals, families and communal groups	The development of the Blues Point area is strongly associated with William (Billy) Blue, a well-known former convict, who used the study area from the 1810s until the 1830s. His descendants continued to operate the Blues Point ferry service he established until the mid-19 th century.

The following research questions would guide archaeological investigations in the Blues Point study area.

- Are there material remains associated with the former maritime industry related buildings and infrastructure present within the study area?

- To what extent has the natural topography and foreshore of Blues Point been altered by land reclamation and seawalls over time? Can successive phases of land reclamation be identified?
- What is the nature of the reclamation fill and how successful was the reclamation?
- Are there structural remains of earlier wharves and jetties present within the study area? Can modifications and adaption to new technologies be identified?
- Do structural and archaeological remains of seawalls at Blues Point show demonstrable differences in construction techniques over time?
- Do the maritime engineering techniques at this site display unique qualities and adaption to the local environment?
- Is there intact and recognisable structural and artefactual evidence of boat building and repair facilities in the Blues Point study area? How does the material evidence of boat repair and building change over time with technological and economic changes?
- Can structural and artefactual remains identify the sandstone building in the north-west of the study area as a residential building? Given its location in the boat yard area, is there evidence of other mercantile or other activities within this building?
- Is there any artefactual or structural evidence present that can be identified as relating to Billy Blue or his descendants?
- Can the first ferry terminal be recognised in the archaeological record?
- How do the archaeological remains compare to other maritime industrial sites in the Sydney area, in particular recent archaeological results at Balmain East wharf and Darling Harbour/Barangaroo?
- What is the significance and research potential of the archaeological resource considering the number of nineteenth century foreshore sites which have been archaeologically salvaged in recent years?

Note: additional research questions may be developed during archaeological investigations depending on the findings.

6.0 BARANGAROO STATION

6.1 Site Location

The new Barangaroo Station will be located beneath Hickson Road at its northern extent, in the suburbs of Barangaroo and Millers Point, in the City of Sydney LGA. While the station platform will be located below Hickson Road, access points and ancillary areas are located to the west of Hickson Road. The PIR includes discussion of additional works associated with a tunnel cross over just to the north of Barangaroo Station, including removal of spoil from the project site for transport on a barge. The site location for this assessment is based on the total area encompassed by construction works. This area will be referred to as the Barangaroo Station site.

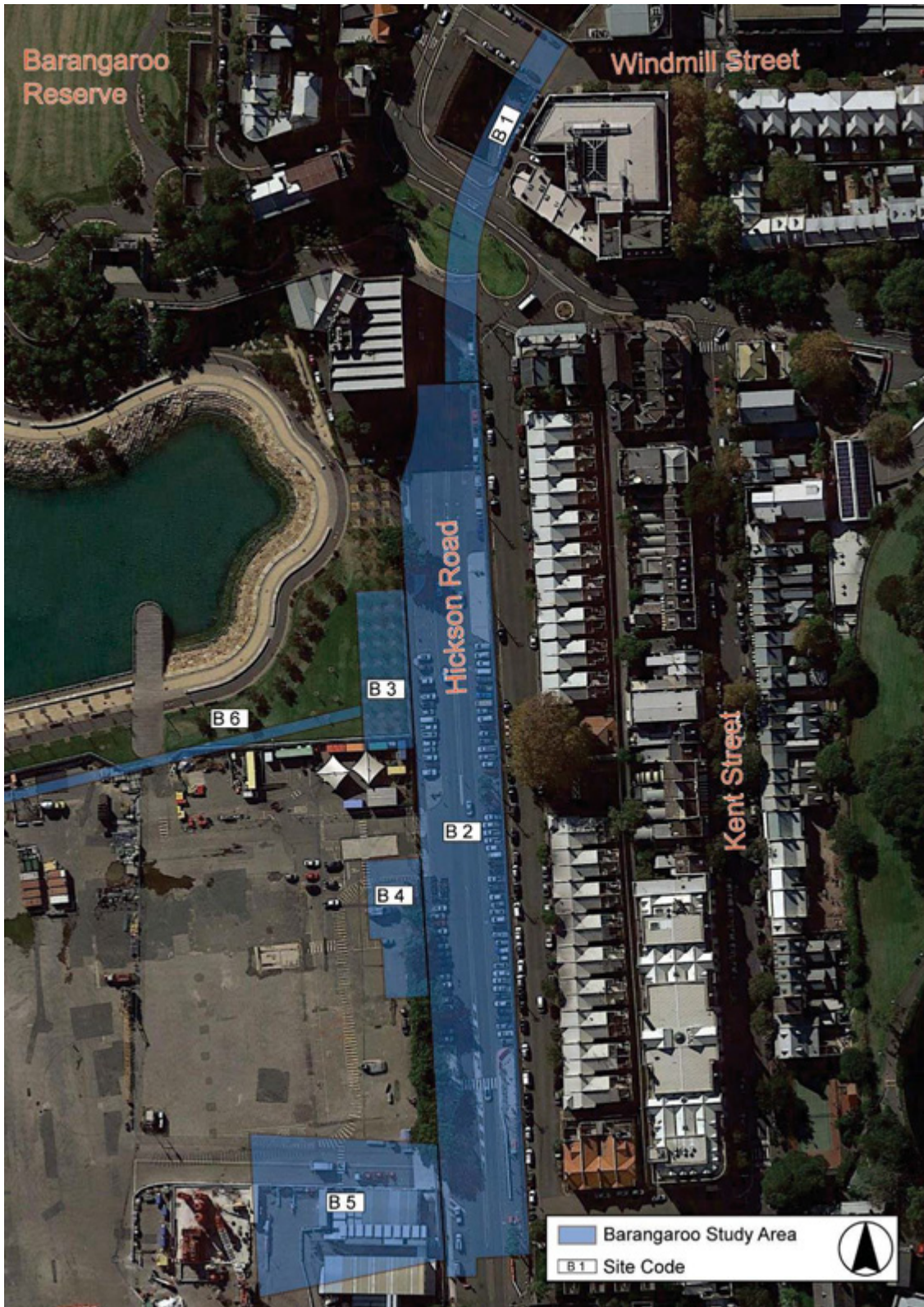
6.1.1 Land Parcels

The Barangaroo Station site is predominately located on Hickson Road with additional areas to the west. The study area has been subdivided into different areas for clarity which are presented in Table 6-1 and illustrated in Figure 6-1.

Table 6-1: Land parcels and current conditions in the Barangaroo Station site

Site Code	Location	Lot	Description of Area
B 1	Extent of Hickson Road between 25 Hickson Road, Barangaroo and the underpass under Windmill Street	Includes Lot 3 DP 869022	Bitumen two lane road with street parking. Concrete retaining walls on top of cut sandstone boundary on each side; passes under two overbridges (Windmill Street and Dalgety Road)
B 2	Hickson Road between 25 Hickson Road, Barangaroo in the north and adjacent to 1-1A High Street, Millers Point in the south	Includes Lot 2 DP 869022 Lot 1 DP 863317	Bitumen two lane road with street parking. Concrete retaining wall on top of cut sandstone boundary on eastern side
B 3	Approximate 800m ² area to the west of Hickson Road in the northern part of the study area	Lot 101 DP 1204946	Former Barangaroo shipping terminal hardstand
B 4	Approximate 800m ² area to the west of Hickson Road in the central part of the study area	Lot 101 DP 1204946	Former Barangaroo shipping terminal hardstand
B 5	Approximate 2,800m ² area to the west of Hickson Road in the southern part of the study area	Lot 101 DP 1204946	Former Barangaroo shipping terminal hardstand
B 6	Barging works. West of Hickson Road to waterfront	Lot 101 DP 1204946	Former Barangaroo shipping terminal hardstand

Figure 6-1: Barangaroo Station site showing existing modern development and site codes



6.2 Historical Analysis

6.2.1 Early Land Grants

There is little evidence of occupation of the station site during the early decades of European settlement in Sydney. Occupation was instead focused on the area around Sydney Cove and the Tank Stream while Millers Point formed part of a rocky headland outside of the main town centre. Given its isolation, initial land use of the area was dedicated to activities that were required to be a large distance away from the population. This included land uses such as the observatory established by William Dawe and a number of grants associated with the military. These were located on the ridgeline to the east of the Barangaroo Station site. The station site was originally part of a foreshore which was rocky and steep, and subsequently initially considered less suitable for occupation (Figure 6-2).

While the majority of land was considered unsuitable for occupation the exposed promontory of Millers Point proved a suitable location for the establishment of windmills which provided the first industry within the study area⁷². Additional early industry came in the form of lime kilns taking advantage of the deposits of shell located around Millers Point and Darling Harbour. Lime kilns were in operation by 1822⁷³ (Figure 6-3).

Governor Macquarie ordered the construction of the first wharf within Darling Harbour (then Cockle Bay) in 1811. It was located at the foot of Market Street to the south of the current site and used to service the Parramatta shipping trade.

Official land grants for Millers Point began in the 1830s however a number of occupants had lived on the site for many years prior to grants being made. Grants within the study area varied, with large grants awarded along the waterfront for use in maritime activities and smaller grants higher on the headland for individual dwellings.⁷⁴

Subdivision in Millers Point began before land was officially granted. This included the land of John Leighton whose land which surrounded the windmills was subdivided in the 1830s. Most subdivisions in Millers Point were located on the southern portion of the point (northern portion of the station site). These small buildings formed the hub of the local population with buildings inhabited by a variety of small commercial enterprises and accommodation for the maritime population who worked on the wharves⁷⁵.

During the 1830s the colonial government aimed to improve the roads in the area. To do this, quarrymen were given the right to cut into the western face of the hill which was blocking Kent Street. By 1839 Kent Street was passable along its whole length to Argyle Street⁷⁶. Numerous small quarries developed along Millers Point in the early nineteenth century with many of the local buildings gaining permission from the government to utilise the local sandstone in their construction⁷⁷.

⁷² Austral Archaeology 2013, Proposed Services on Dalgety & Hickson Roads, Barangaroo Northern Headland, Historical Archaeological Assessment, Statement of Heritage Impact & Research Design, p. 18

⁷³ Higginbotham Consultant Archaeological Service 1991, The Rocks and Millers Point Archaeological Management Plan, p. 18

⁷⁴ Austral Archaeology 2010, Barangaroo Archaeological Assessment and Management Plan, p. 24

⁷⁵ Kass 1987, A Socio Economic History of Millers Point, p. 8

⁷⁶ Ibid, p. 6

⁷⁷ Ibid, p. 40

Figure 6-2 Development as of 1802 with no structures in the Barangaroo area ⁷⁸

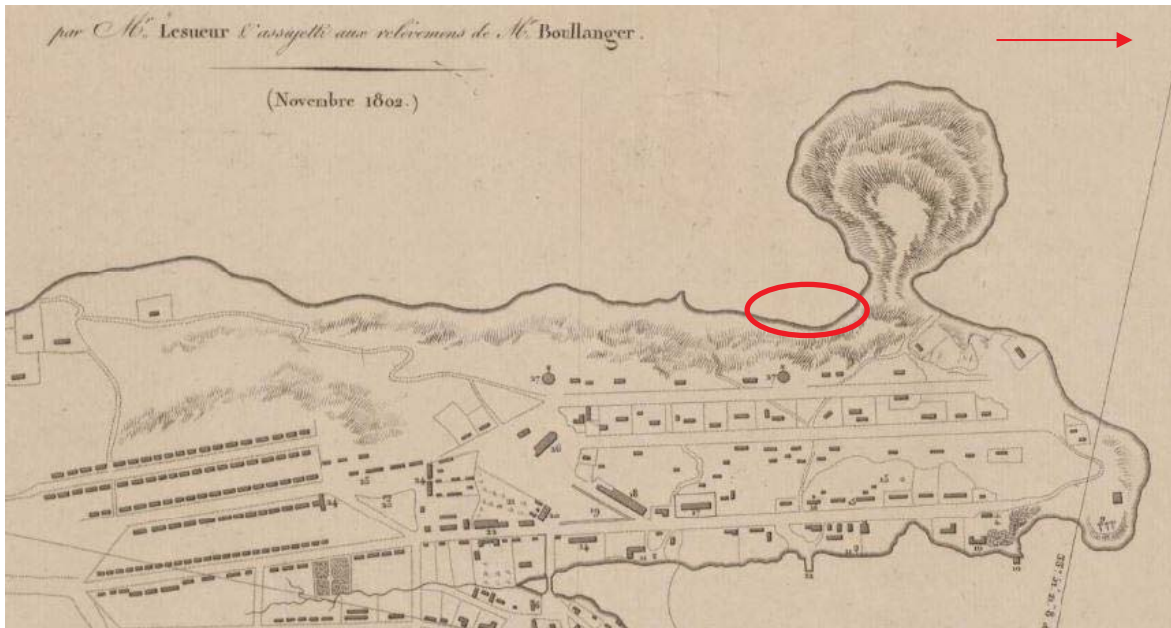
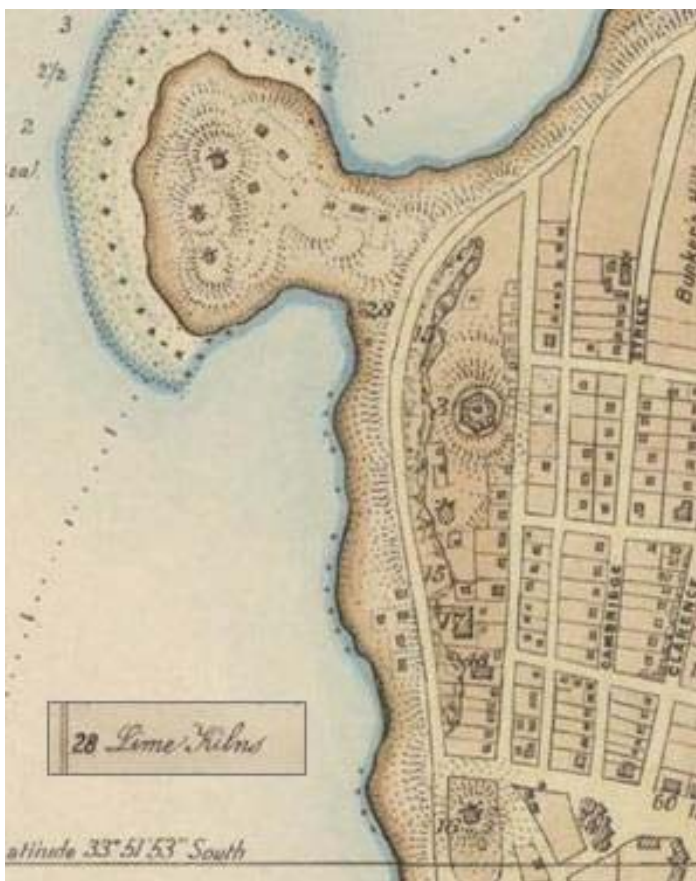


Figure 6-3: Plan dating to 1822 identifying lime kilns in the northern part of the study area (28 lime kilns)⁷⁹



⁷⁸ Lesueur 1802, Map of Sydney, The Capital of the British Colonies, available at <http://mapco.net/sydney1802/sydneyb.htm>

⁷⁹ Extract from 'Plan of the town and suburbs of Sydney, August, 1822', NLA MAP F 107

6.2.2 Shipbuilding, Wharfage and Industrial Use

Millers Point was an important centre for small-scale shipbuilding during the early nineteenth century. The earliest shipbuilding yards in the area were established by James Munn in the 1820s. Munn's grant appears to be just north of study area (Figure 6-5). Munn's ship building establishment operated between 1825 until the 1840s. Munn's facilities included a floating dry dock 130 feet long by 50 feet wide⁸⁰.

After Munn's death, Lawrence Corcoran took over his yard and built a number of ships. The property was later acquired by John Cuthbert in 1856. In 1849 he had bought the waterfront land to the south of Munn's land. By 1865 Cuthbert had extended his shipping yard from Millers Point in the north and almost as far as the gas works to the south. Cuthbert's yard was among the most extensive in the colony employing up to 250 men in the 1860s⁸¹. Cuthbert's yards built a variety of ships ranging from those for government and local firms to those for the British government.

The success of whaling and pastoral development prompted many firms to establish private warehouses and wharves away from Sydney Cove. Millers Point was subject to piecemeal wharf and warehouse development by private entrepreneurs rather than from the government. Little development is recorded in the area and none in the study area in the 1820s (Figure 6-4). By the 1830s there was a surge in wharf building as merchants sought to extend usable space (Figure 6-5). Wharfs were created mainly through the infilling of the existing shoreline⁸². Maritime activity in the nineteenth century was generally export-orientated, focusing on timber, whaling and sealing, and wool⁸³.

In the second half of the nineteenth century, changes in shipping technology, including the transition from sail to steam and increase in trade and industrial activity, resulted in the requirement for larger facilities. Beginning in the 1870s some of the older wharves were demolished in order to construct larger, more modern facilities⁸⁴ (Figure 6-6 to Figure 6-9). Cuthbert's shipyard was the first large land parcel to be redeveloped. The property was taken over by Thomas Dibbs, who rebuilt the entire property in the 1870s for large-scale wharfage and goods storage. During the 1870s and 1880s most of the small boat builders left the area as the demand for wharfage grew⁸⁵.

Millers Point was predominantly developed in response to private enterprise with exception of the Australian Gas Light Company's works established in 1843⁸⁶. The Australian Gas Light Company purchases land along the southern end of the study area in 1839. Construction of the gas works involved extensive quarrying both to level the yard and as part of the development of two gas holders. Between 1869 and 1882 a major expansion of the gas works was undertaken. The government acquired the gas works in 1912 which was subsequently cleared in 1922. The former Gas Company site is located to the south of the station site.

⁸⁰ Ibid, p. 35

⁸¹ Austral Archaeology 2013, p. 36

⁸² Higginbotham 1991, p. 37

⁸³ Austral Archaeology 2013, p. 19

⁸⁴ Austral Archaeology 2013, p. 19.

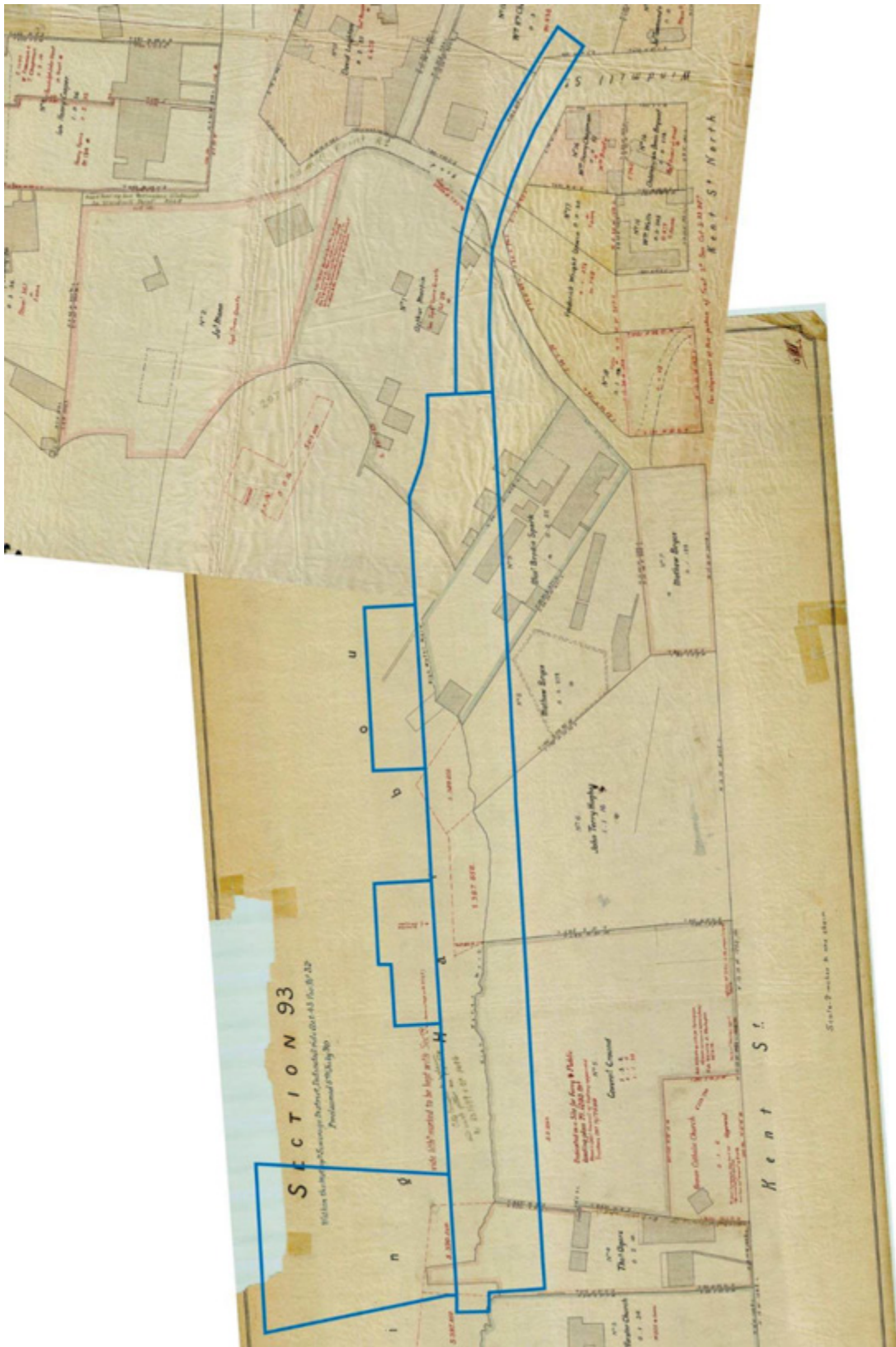
⁸⁵ Kass 1987, p. 36.

⁸⁶ Austral Archaeology 2010, p. 24.

Figure 6-4: Overlay of study area with Harper's 1823 plan. Note the study area is indicative as due to inaccuracies in the early map

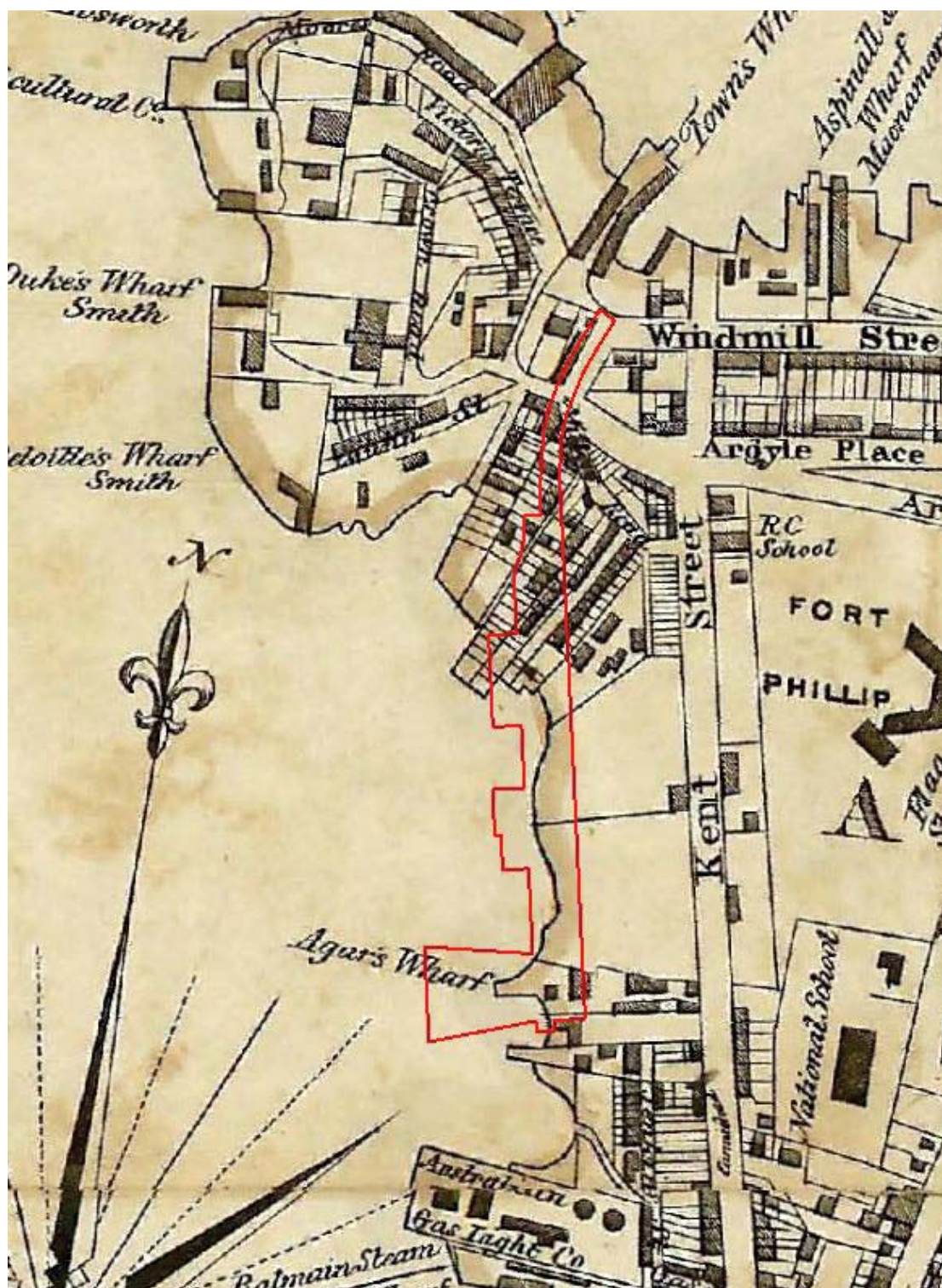


Figure 6-5 Early land grants along Millers Point foreshore (1833)⁸⁷



⁸⁷ City Section Survey Plan 1833, Section 93, available at http://www.photosau.com.au/CosMaps/maps/pdf/CSSP/Section_93.pdf

Figure 6-6: 1854 Plan with the Barangaroo Station construction site⁸⁸



⁸⁸ Woolcroft and Clarke 1854

Figure 6-7: 1865 Trigonometric plan with Barangaroo Station construction site

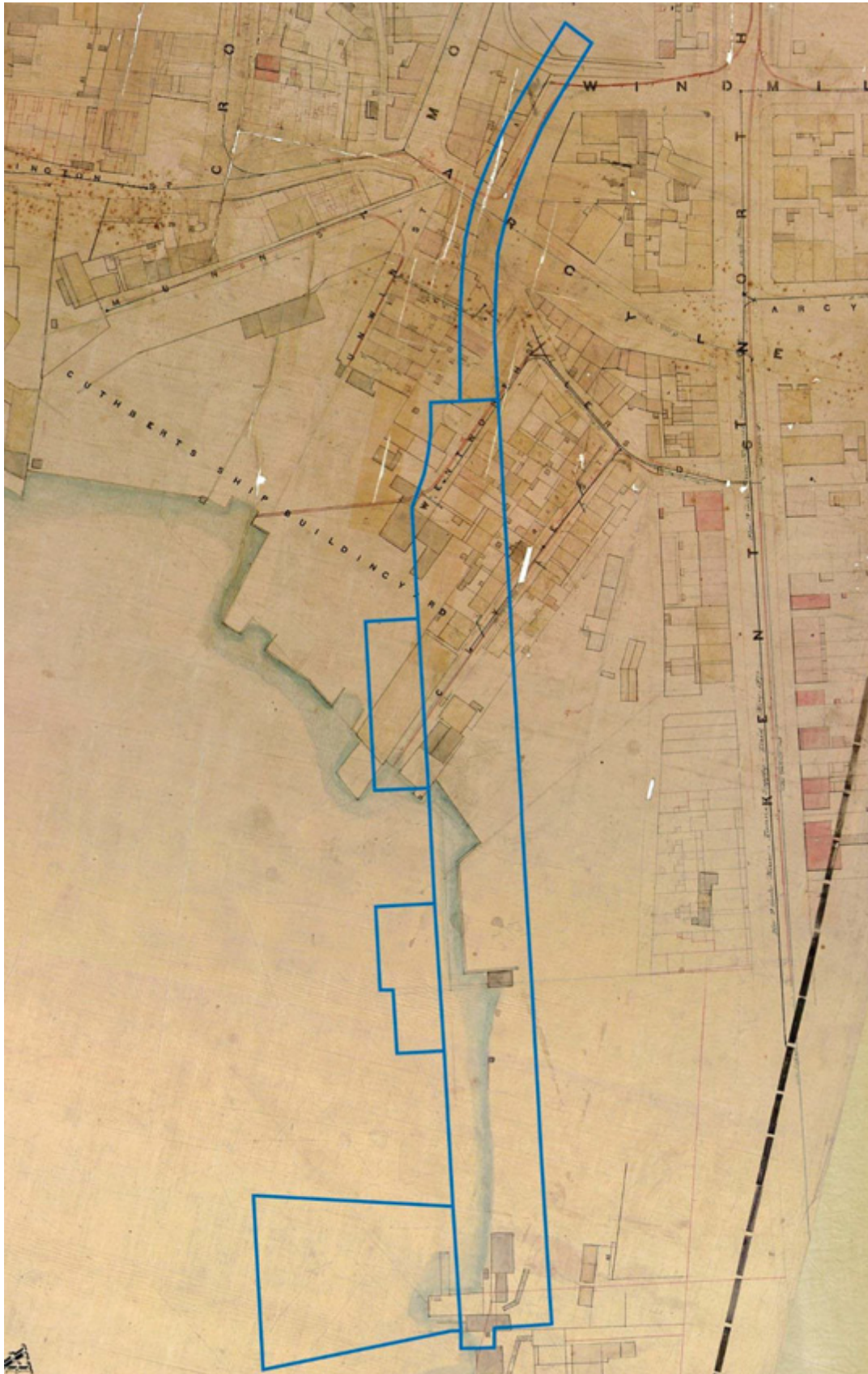
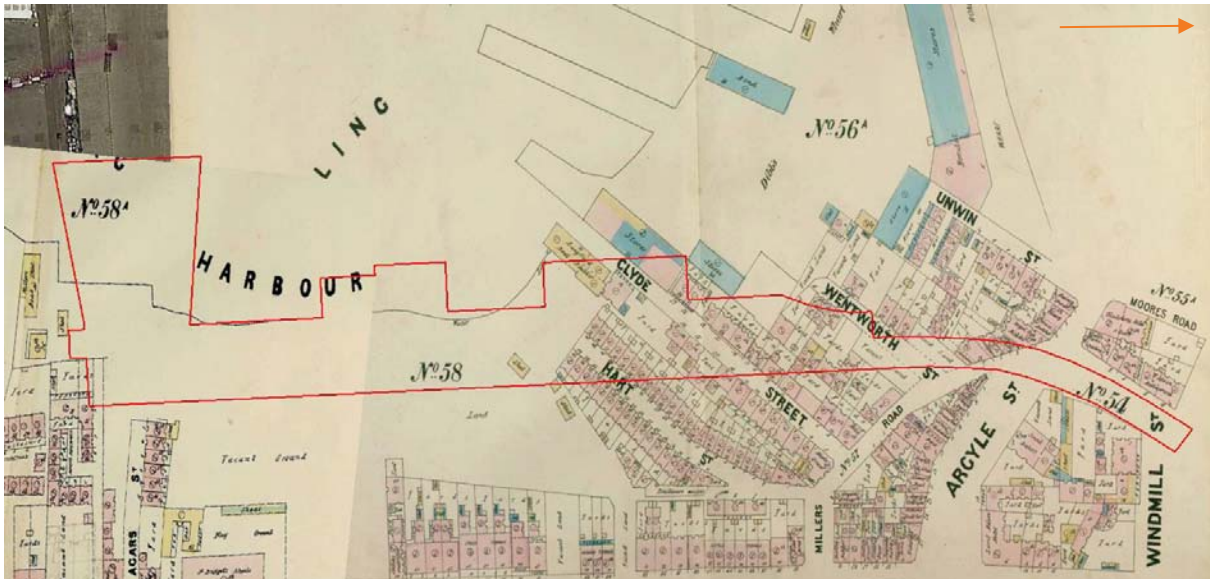


Figure 6-8 View of Cuthbert's Shipyard, 1870⁸⁹Figure 6-9 Established housing developed along Clyde, Hart and Wentworth Street⁹⁰

6.2.3 Foreshore Resumption and Construction of Hickson Road

By the end of the nineteenth century most of the wharves within Darling Harbour were both unsuitable for modern shipping and in a dilapidated condition. The spread of Bubonic Plague in 1900 resulted in harbour side areas including the Rocks, Millers Point and Darling Harbour being put under quarantine⁹¹. The government used the quarantine as the impetus to resume the suburbs and demolish housing and wharfs which were deemed substandard (Figure 6-11). The consolidation of land allowed the government to redevelop the land along the Darling Harbour Foreshore which had previously been restricted by multiple property boundaries in private ownership.

The Sydney Harbour Trust substantially altered the original landscape of the Millers Point with complete redevelopment of a number of areas within Millers Point. As part of this a number of older homes within the area were demolished including homes in Clyde and Merriman Streets in 1901.

⁸⁹ Austral 2010, p. 45

⁹⁰ Doves Plan of Sydney 1880, Blocks 54-58a, available at http://www.photosau.com.au/CosMaps/maps/pdf/DP/Block_54_55A_56A_57_58.pdf

⁹¹ Austral Archaeology 2010, p. 19

Additional demolition occurred in 1910 with 40 buildings removed from Thornton, Munn and Argyle Streets to provide additional space for further wharf expansion⁹².

From 1908, the Sydney Harbour Trust carried out a number of improvements in north Darling Harbour, including the construction of Hickson Road which began in 1909. Hickson Road would link the new wharves at Walsh Bay with new and existing wharves at Darling Harbour.

Hickson Road was envisioned to eliminate the need for hydraulic cart lifts. The levelling would allow the separation of incoming and outgoing cargo through the development of road access to both upper and lower levels of adjacent cargo sheds. Development involved the substantial cutting down of Munn and Pottinger Street to the present street level.

The construction of Hickson Road required the pouring of a six-inch thick concrete foundation over a four-inch thick foundation of blue metal, in areas without solid bedrock foundations.

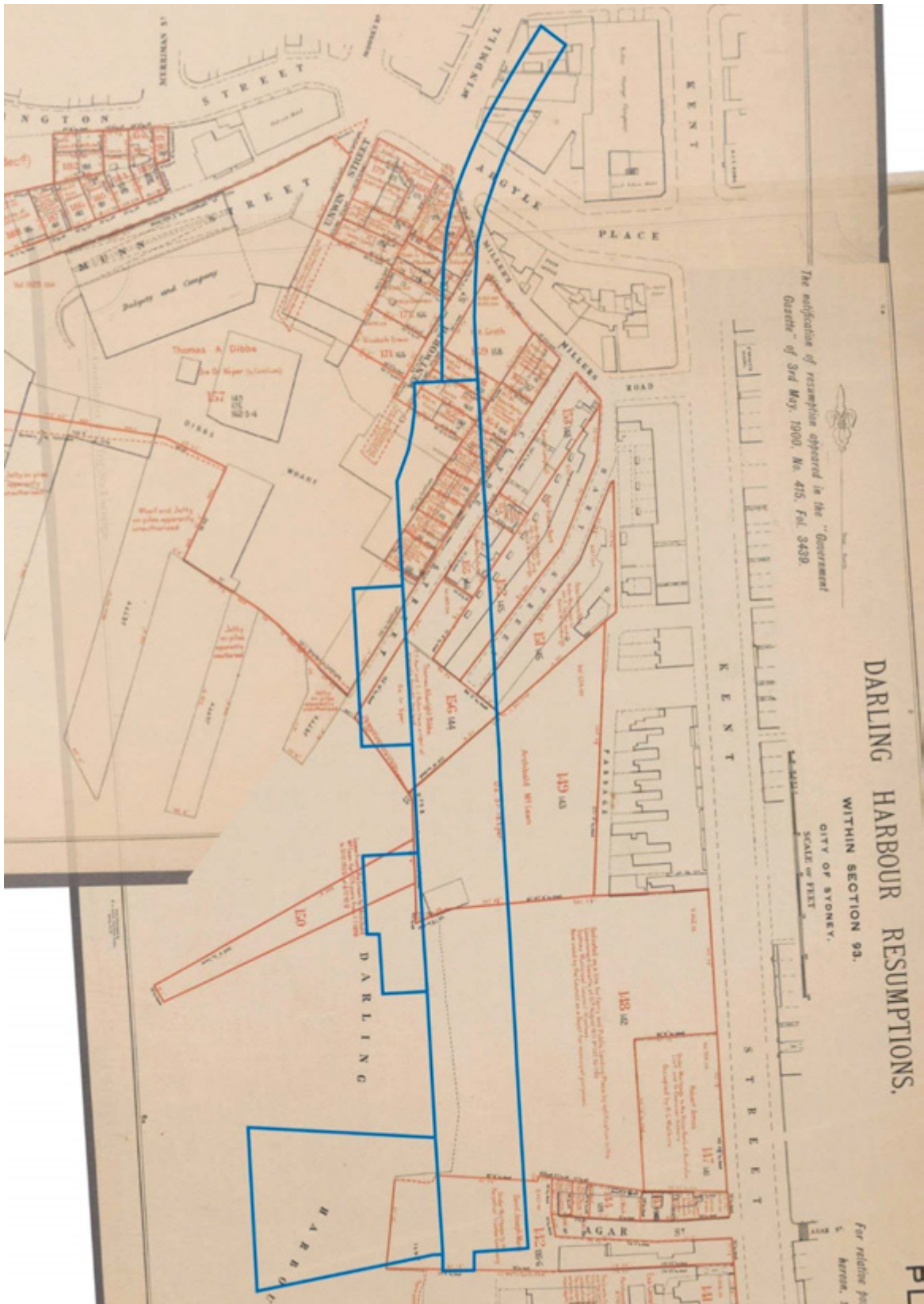
Figure 6-10 View of cutting on Hickson Road and warehouses on the wharf⁹³



⁹² Kass 47

⁹³ Hickson Road 1926, City of Sydney Archives, available at <http://www.photosau.com.au/cos/scripts/ExtSearch.asp?SearchTerm=071259>

Figure 6-11: 1900 Resumption Plan with the Barangaroo Station construction site



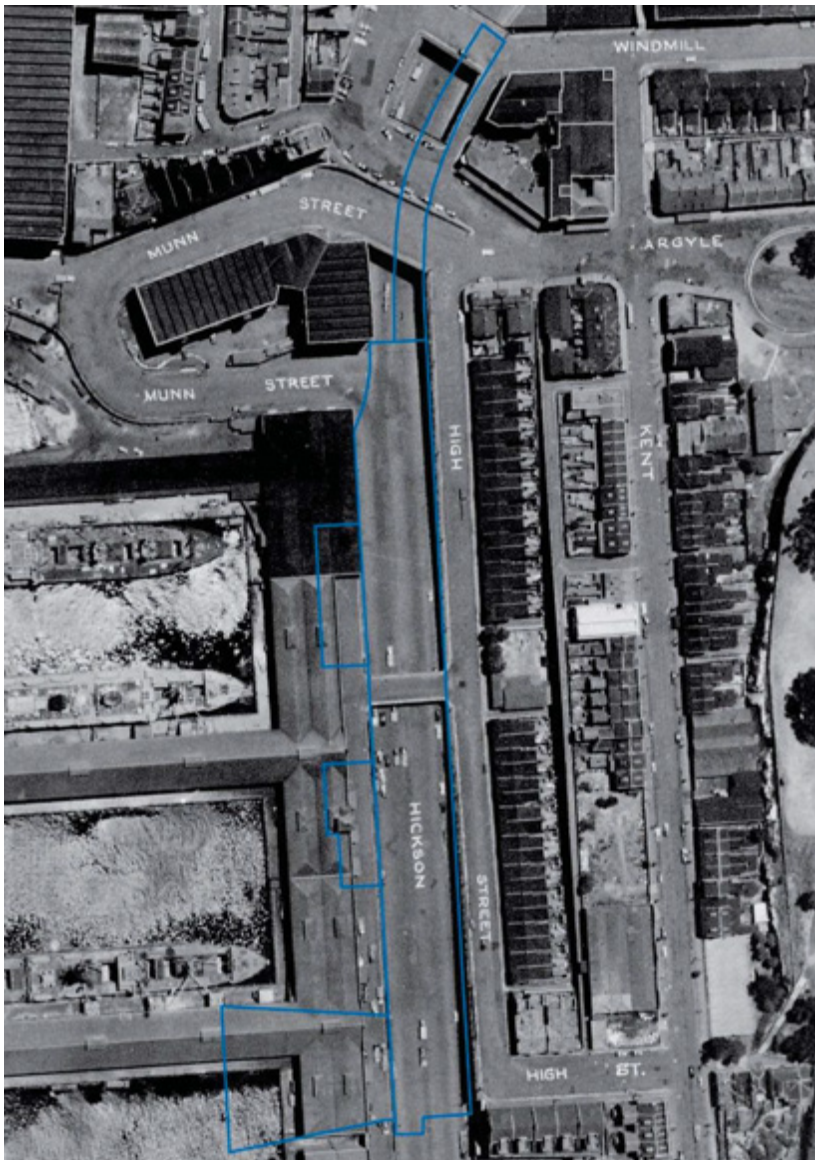
6.2.4 Barangaroo Container Terminal and Commercial Redevelopment

In the post war period cargo transport by road, rail and container ship became more prevalent in lieu of the former smaller shipping vessels. The shift to containers to move shipping allowed faster loading and unloading of cargo, as well as reducing the need for warehouse space. With the shift to containerisation, the port of Sydney required larger, mechanised shipping terminals.

In the 1950s the existing finger wharves (Figure 6-12) were infilled to create a berth suitable for container shipping. The infilling involved the creation of concrete decking as well as cranes and lighting suitable for the larger shipping facilities. The container terminal at Barangaroo operated until the site was shut down in 2006.

The redevelopment of the Barangaroo foreshore was conducted from 2008 onwards, with substantial construction to the south and landscaping of the headland conducted after the removal of the port hardstand. The area is now a mixed used urban precinct, incorporating public parkland and commercial buildings. Development at 'Barangaroo Central' (former Gas Company site) is yet to commence.

Figure 6-12: 1949 aerial photograph with Barangaroo Station construction site



6.3 Archaeological Potential

6.3.1 Previous Archaeological Studies

A number of archaeological assessments and investigations have been undertaken in the vicinity of the Barangaroo study area.

Casey & Lowe undertook archaeological excavation at Barangaroo South, to the south of the current Barangaroo study area, between January 2011 and August 2012. The site was located to the west of Hickson Road, and within the first 40 metres of the hardstand area. Parts of the original shoreline were uncovered, followed by successive phases of seawall and wharf construction, and reclamation. Evidence of former warehouses and other maritime industrial features were recorded. The archaeological remains dating from the 1830s to 1900s were found to have a high degree of intactness as they were preserved below reclamation and redevelopment infilled rather than excavated.

Austral Archaeology undertook extensive archaeological investigations associated with the development of Barangaroo Headland, to the north and north-west of the study area, between 2012 and 2015. Extensive remains dating from the 1830s to 1900s were found, including evidence of foreshore modification, Munn's and Cuthbert's shipyards and maritime infrastructure. The archaeological work extended from the former hardstand to the streets around the headland. Evidence of the large-scale landscape modifications in the early twentieth century was found. Remains of former roads, bond stores and warehouses, and terrace housing were archaeologically excavated. The final excavation reports are not yet available.

Austral Archaeology⁹⁴ also completed a historical archaeological assessment of both Hickson and Dalgety Roads as part of service upgrades for Barangaroo Headland project in 2013. As part of this assessment, they assessed archaeological potential across the entirety of the Barangaroo Station site, including assessment of several service trenches for archaeological material. The assessment of archaeological potential highlighted three zones of potential, two of which are located in the Barangaroo Station site. Zone 2 was anticipated to contain remains relating to early maritime industry associated with Cuthbert's Shipyard. Zone 3 is located in the southern portion of the Barangaroo Station study area and was assessed as containing potential remains relating to the Australian Gas Company. Service test trenches located along Hickson Road revealed stratigraphic layering consisting of concrete overlaying sand and gravel bedding over bedrock. Based on the test pitting Austral considered the eastern side of Hickson Road to contain little potential to retain archaeological evidence. Austral however considered the western portion of Hickson Road has archaeological potential based on the tendency of land reclamation and fill as opposed to removal. The results of the subsequent archaeological monitoring of the new high voltage and sewer trenches are not available. However, it is believed archaeological remains were identified in parts of the western side of Hickson Road.

6.3.2 Land Use Summary

European occupation of the Barangaroo study area has been divided into four distinct phases of historical activity, which are discussed below.

- Phase 1 (1788 – 1830) informal use and early wharf development. Early land use associated with informal occupation, lime burning and kilns. Development of wharf facilities in the area around 1830.

⁹⁴ Austral Archaeology 2013

- Phase 2 (1830 – 1900) shipbuilding, wharfage and industrial use. Further development of study area for commercial wharf facilities, including foreshore land reclamation at northern and southern ends and continued timber boat shed and jetty construction; construction of terrace residential housing and commercial warehouses in northern part of study area. Nineteenth century foreshore changes illustrated in Figure 6-13.
- Phase 3 (1900 – 1950) foreshore resumption and construction of Hickson Road. Foreshore land reclamation and large-scale earthworks to construct Hickson Road through the centre of the study area; construction of brick warehouses and new commercial wharves.
- Phase 4 (1950 – Present) Barangaroo container terminal and commercial redevelopment. Further foreshore land reclamation to construct Barangaroo container terminal. Construction of hardstand surface on reclaimed land for container terminal. Decommission of container terminal and re-excavation of reclaimed foreshore to landscape Nawi Cove.

6.3.3 Previous Impacts

Prior to the European settlement, the majority of the study area was located on steep, rocky ground, rising from the foreshore to Kent Street in the east. In the west, a thin spit of sand was located on the foreshore. The sandstone escarpment in this area meant that the majority of the study area, until the Hickson Road construction works, was not significantly developed, due to the difficult local topography.

The construction of Hickson Road involved the removal of nearly the entirety of this sandstone escarpment within the study area. This excavation was up to ten metres deep and would have removed all potential archaeological remains in the eastern portion of the study area. The Hickson Road corridor in the north (largely aligning with Site B-1) was entirely excavated through sandstone bedrock in the early 1900s and all prior archaeological deposits would have been removed.

The western portion of the study area, aligning with the area to the west of the original sandstone escarpment, has been predominantly affected by land resumption and infilling activities. Phases of reclamation involved the deposition of local and imported spoil, with later construction of structures on top of these reclaimed areas. The resumption of land for the Barangaroo container terminal in the 1950s involved a significant expansion of land resumption in the study area. These reclamation episodes may have buried archaeological deposits underneath layers of imported fill.

Because of this, archaeological potential would be limited to the western portion of the study area, and may be buried at an uncertain depth. Infill materials may also include debris from former structures in the area, however the recovery of remains in infilled deposits would be largely acontextual. In situ deposits may remain at depth in these areas however.

New utilities were installed in Hickson Road as part of the Barangaroo Headland project. This involved excavation of a narrow linear trench on the western side of Hickson Road for a high voltage line and a sewer line (and pits) in the centre of the road. These excavations would have resulted in localised impacts to buried archaeological remains.

Figure 6-13: Indicative shorelines at Barangaroo in the nineteenth century



6.3.4 Potential Archaeological Remains

Phase 1: 1788 – 1830

Due to the steep topography along the northern Darling Harbour foreshore, the study area was not highly developed during the early period of European occupation. Plans from 1802 and 1807 show that no significant structures had been recorded present in the study area, with nearby buildings consisting of windmills on the higher bluff on Kent Street to the east and Millers Point to the north.

There is high potential along the western half of Hickson Road to encounter the original shoreline. Historical accounts and archaeological investigation have demonstrated the original shoreline was mostly steep and rocky, however small sandy coves were also present. There is potential for

archaeological remains associated with the early environment and its initial use and modification along the western half of Hickson Road. Remains could include harbour sand and accumulated deposits containing ecofacts (pollens etc.), scattered artefacts either from rubbish dumping events or harbour flotsam, evidence of quarrying of the rock outcrops and shoreline.

One of the earliest industries in the study area was the construction of lime kilns, involving the burning of seashells to create lime, predominantly for use in cement and as fertiliser. A plan of Sydney from 1822 shows the existence of lime kilns in the northern portion of the study area. Archaeological remains associated with former lime kilns involve brick and stone hearth remains, charcoal and ash deposits, and residual seashell deposits. However, the precise location of these lime kilns is not shown, and they cannot be confirmed to be located within the study area. If they exist within the study area, they would be located in an area that was soon developed into wharf frontages on the narrow strip of level ground on the foreshore of Darling Harbour.

There is evidence for early wharfs and jetties at the southern and northern ends of the study area. Plans from 1833 show that a number of isolated structures associated with these early wharfs had been established by that time, on the land parcels attributed to Alexander Sparks and Thomas Agars. By this time Alexander Sparks had a jetty or pier, a boat shed and a number of warehouses, located on the relatively flat foreshore at the northern end of the study area. Thomas Agar's land, at the southern end of the study area, had a jetty and several boatsheds or warehouses.

Archaeological remains associated with early nineteenth century waterfronts would include timber piles and post-holes, stone footings, artefact deposits and stone seawalls and retaining walls. Subsequent reclamation of the foreshore in this area would likely have buried any remains so there is potential for remains of early waterfront activity and development.

Earthworks associated with the construction of Hickson Road in the early 1900s would have resulted in a wide degree of disturbance, particularly in the eastern part of the study area. As such, archaeological remains would only be expected to be found in the western part of the study area.

Phase 2: 1830 – 1900

Cuthbert's shipyard was opened in 1856 on the former land grants of Alexander Sparks, Arthur Martin, Mathew Bryce and James Munn, in the northern end of the study area. The expansion of the shipyard involved the reclamation of land into Darling Harbour, and a variety of workshops were established at the yard to support the shipbuilding industry (blacksmiths, rope makers, sail makers, carpenters and a steam saw mill). The shipyard closed in the 1870s before being redeveloped for wharfage for Thomas Dibbs. Archaeological remains associated with Cuthbert's shipyard would include sandstone and brick footings, sandstone seawalls and retaining walls, timber piles and postholes, yard and working surfaces and the possibility of remains of nineteenth century industrial plant. Also reclamation fills containing artefacts and other accumulated deposits associated with the shipyard activities, and artefacts related to ship building and repairs.

Much of Cuthbert's shipbuilding yard was constructed on reclaimed land, and there is some continuity of use of boatsheds and buildings from Spark's wharf facilities in the 1830s to Cuthbert's in the 1860s. Subsequent reclamation of land and the earthworks involved in building Hickson Road in the 1900s would have caused significant ground disturbance, both with excavation and reposition of spoil. However, archaeological features associated with the shipyard are likely to remain underneath or within fill deposits.

With the growth of shipbuilding and mercantile industries in the Millers Point and Darling Harbour areas, there was an increase in domestic housing nearby, particularly for the dockyard workers who staffed these industries. Behind Cuthbert's shipbuilding yard, two streets – Clyde Street and Wentworth Street – were laid out and the adjoining land used for the construction of terraced row-houses. The majority of these houses are located in a part of the study area that was excavated into

sandstone bedrock to construct Hickson Road in the early 1900s. However, a small area of housing may still be preserved in the north-western part of the study area, underneath or within fill deposits. Archaeological remains associated with these housing structures would include brick footings, underfloor deposits, deep subsurface features such as cesspits, and artefact deposits.

Agar's Wharf in the south of the study area underwent a change in use during this time. While originally used as a wharf with a boatshed in the 1830s, by the late 1850s the wharf was advertised for use as a bath-house. By the 1860s the area was advertised as a boat shed again, with an additional use as an auction house.

Archaeological remains associated with Agar's Wharf are only likely to survive in areas where significant earthworks and levelling has not occurred; in this case, in the western part of the study area. Potential archaeological remains include timber piles, beams and postholes, stone and brick footings, yard and workshop surfaces and isolated artefactual deposits. Due to the landscaping associated with the construction of Hickson Road, archaeological remains are only likely to be present in the western part of the study area, underneath or within later fill deposits.

There is also potential for several phases of wharf development from the 1830s to 1900s along the western half of the study area. This would include remains of former seawalls, timber wharf or stone jetties. Archaeological excavations at Barangaroo South uncovered remains of temporary stone structures which were constructed to aid reclamation.

Phase 3: 1900 – 1950

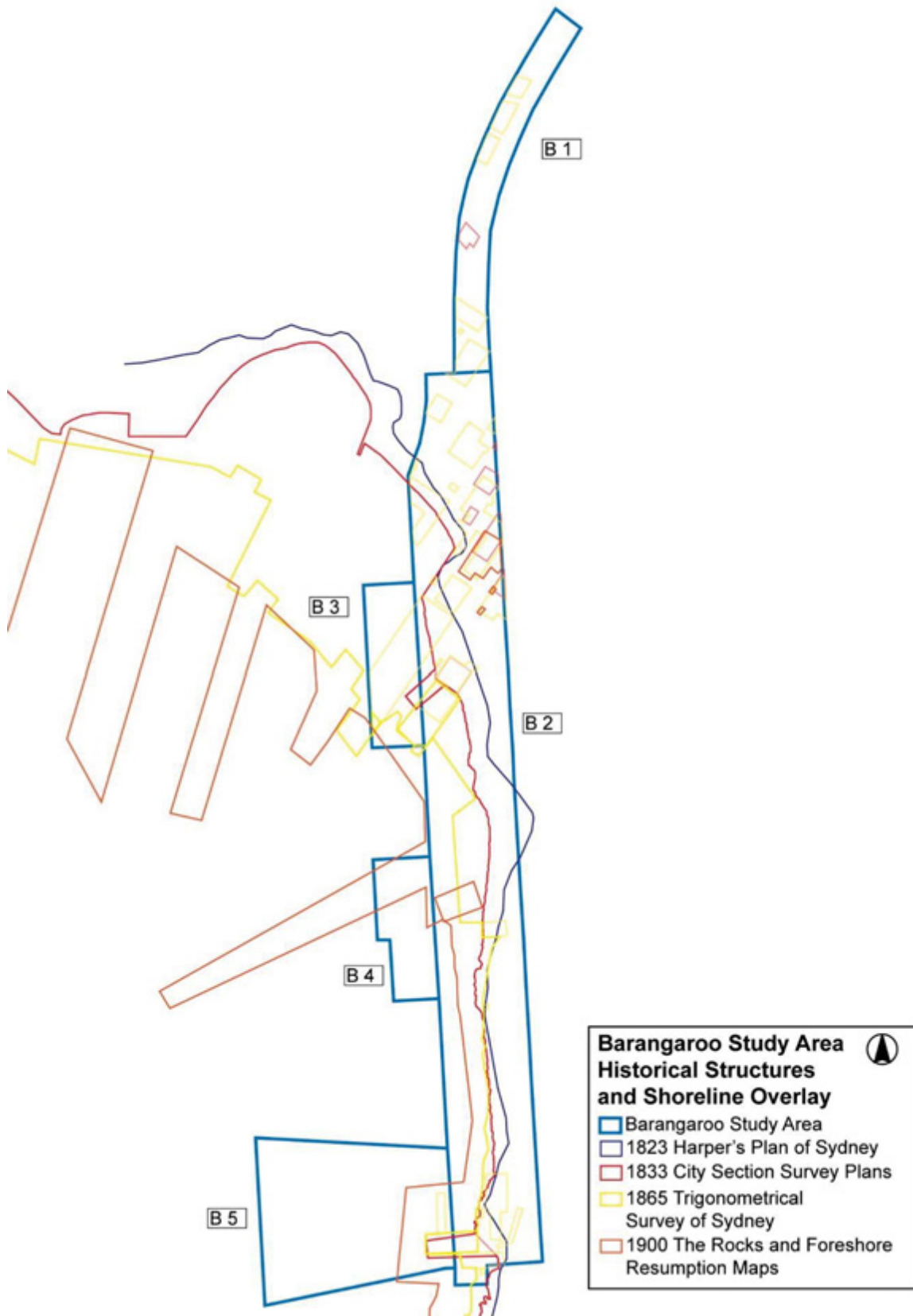
The most significant construction works undertaken during this phase was the excavation and construction of Hickson Road. The extent of excavation required to level the ground at the foreshore of Darling Harbour would have removed most of the archaeological deposits in the eastern part of the study area.

After the construction of Hickson Road, new wharf and warehouse facilities were constructed along the foreshore. Archaeological remains associated with these facilities include steel, concrete and timber piles, industrial plant, brick footings for warehouse buildings and yard and workshop surfaces.

Phase 4: 1950 – Present

The expansion of the shipping terminal at Barangaroo in the 1950s involved the importation of large amounts of spoil and fill to reclaim land for the container terminal hardstand. Archaeological remains associated with the container port include concrete, bitumen and hardstand surfaces and rail and plant infrastructure.

Figure 6-14: Historical features and shoreline overlay



6.3.5 Summary of Archaeological Potential

Based on historical information, land use data and evidence of sub-surface impacts, a summary of the potential archaeological remains in the Barangaroo Station site is illustrated in Figure 6-14 and provided in Table 6-2 below.

Table 6-2: Summary of potential archaeological remains at the Barangaroo Station site

Site Code	Phase	Likely archaeological remains	Potential
B 1	3 (1900 - 1950)	Excavation of Hickson Road corridor into sandstone bedrock. Removed all archaeological remains.	Nil
	1 (1788 - 1830)	Potential for recovering evidence of early lime kilns in north-western side of study area: stone and brick hearths, charcoal and ash deposits, seashell deposits.	Low - Moderate
		Potential for recovering evidence of early wharf facilities in north western side of study area: wooden postholes, timber beams, reclamation fills, artefact deposits, surfaces, early stone seawalls.	
B 2 (western side only)	2 (1830 - 1900)	Rocky headland and location for early wharf facilities in south-western portion of area (Agar's wharf). Potential for timber piles and postholes for buildings and sheds, reclamation fills, artefact deposits, stone seawalls, surfaces.	Moderate
		Remains of Cuthbert's Shipyard may remain at uncertain depth in the north-western part of the study area. Potential for sandstone and brick footings, timber postholes, shipbuilding and industrial plant, yard and working surfaces, seawalls, timber structures, harbour deposits, reclamation fills, artefacts relating to maritime activity and ship building and repair.	
		Remains of mid-nineteenth century residences may exist in the north-western part of the study area. Remains would include: brick footings, underfloor deposits and isolated artefact deposits.	
	3 (1900 - 1950)	Expansion of Agar's wharf facilities in south-western portion of area, use as bath-house and boat-sheds. Potential for timber piles, postholes, brick and sandstone footings, isolated artefact deposits, early stone sea- and retaining walls.	Low
		Excavation of Hickson Road corridor into sandstone bedrock on eastern side. Western side deposited infill for continued land reclamation of the foreshore. Potential for sandstone rubble, demolition fill, redeposited building and archaeological material. Concrete, steel, brick and stone building remains, surfaces and drainage features, timber piles and other wharf related items.	High
		Area was predominately undeveloped shore and tidal margin. Potential for stone jetty remains, timber postholes, early stone sea- and retaining walls.	Nil - Low
B 3	2 (1830 - 1900)	Remains of Cuthbert's Shipyard may remain at uncertain depth in the north-western part of the study area. Potential for sandstone and brick footings, timber postholes, shipbuilding and industrial plant, yard and working surfaces, seawalls, timber structures, harbour deposits, reclamation fills, artefacts relating to maritime activity and ship building and repair.	Low - Moderate
	3 (1900 - 1950)	Potential for concrete, steel and brick structural remains, industrial plant remains, yard and workshop surfaces, timber wharf.	High

Site Code	Phase	Likely archaeological remains	Potential
B 4	4 (1950 – Present)	May have been archaeologically excavated as part of the Barangaroo Headland development in 2013 – 2015 (results not available). Likely to remain below modern landscaping.	Nil or Moderate
	1 (1788 – 1830)	Area was located in Darling Harbour tidal margin. Potential for harbour deposits containing artefacts.	Nil - Low
	2 (1830 – 1900)	Area was located in Darling Harbour tidal margin. Potential for harbour deposits and accumulations containing artefacts, evidence of reclamation.	Nil - Low
	3 (1900 – 1950)	Potential for concrete, steel and brick structural remains, industrial plant remains, yard and workshop surfaces, timber wharf.	High
B 5	1 (1788 – 1830)	Rocky headland and location for early wharf facilities (Agar's wharf). Potential for timber piles and postholes or footings for buildings and sheds; reclamation fills, artefact deposits, stone seawalls, harbour deposits and artefacts relating to maritime industry.	Low-Moderate
	2 (1830 – 1900)	Expansion of Agar's wharf. Potential for timber piles, postholes, isolated artefact deposits, early stone sea- and retaining walls.	Moderate
	3 (1900 – 1950)	Potential for concrete, steel and brick structural remains, industrial plant remains, yard and workshop surfaces, timber wharf.	High
B 6		Potential for remains of timber wharf piles and fills dating from the 1950s/1960s	High

6.4 Archaeological Significance

The Barangaroo Station site has a moderate potential for archaeological remains associated with waterfront activity and development dating from the early nineteenth century to the 1900s (mostly along the western part of Site B 2, Site B 3 and a small area of Site B 5). There are also areas of high potential for evidence of wharf redevelopment from the 1900s to 1950s (western half of Sites B 2, B 4 and B 5).

6.4.1 Assessment of Archaeological Significance

Research Potential (Criterion E)

There has been a considerable amount of archaeological excavation of the Barangaroo foreshore in recent years. The investigations have demonstrated the high level of archaeological survival in nineteenth century foreshore sites. Coupled with historic records, analysis of the archaeological data can contribute to research regarding modification of the natural foreshore and development of maritime infrastructure, industry, trade and economy of Sydney during the nineteenth century.

Investigation of Cuthbert's shipyard could add to the archaeological record which already exists and contribute to research questions developed for that excavation (Barangaroo Headland, Austral 2013-2015). Investigation of other foreshore areas and wharf development could contribute to research questions developed for the Barangaroo South excavations (Casey & Lowe 2010-2012). There is potential that the archaeological data would be a duplicate of what has already been investigated. However, the specific way in which the owners within the study area adapted their maritime infrastructure and industry to the local topography would be different and provide an interesting comparative analysis.

Archaeological evidence relating to c. 1830s Spark's and Agar's wharf would be a relatively rare archaeological resource. These wharves were some of the earliest commercial shipping ventures in this area of the colony. The potential archaeological remains could be compared with archaeological evidence of Munn's shipyard (Austral 2013-2015) or Girard's and Bass's wharf to the south (Casey & Lowe 2010-2012), or indeed Barker's wharf further south toward the mudflats (Casey & Lowe 2008-2010 Darling Quarter excavations).

Cuthbert's shipyards were constructed on property that was amalgamated from several wharf frontages in Millers Point. Out of these allotments, a significant level of foreshore reclamation took place, on which a series of workshops, steam saw mills and shipyards were constructed. This shipyard was responsible for employing a large local work force and had a number of trades working on the site. Intact archaeological remains relating to Cuthbert's shipyards are likely to have a high level of research potential relating to the large-scale mid-nineteenth century maritime construction activity.

There is also some potential for evidence of the early environment and lime production in the study area. Analysis of pollens and other ecofacts contained within harbour deposits and accumulations from the late eighteenth and early nineteenth century could inform research around environmental change, pollution and adaptation in the early years of the colony. Lime kilns were established on the foreshores of Port Jackson and Botany Bay in the late eighteenth and nineteenth centuries. The paucity of limestone deposits in the immediate Sydney region led to lime kilns using available seashells on foreshores, including Aboriginal midden deposits, to burn to create lime. Lime, as an essential ingredient in cements, and also of important use as a fertiliser, would have been an important resource during the early phase of agricultural and construction in the colony. The need for the colony to achieve self-sufficiency, particularly agriculturally prior to the 1800s, means that lime kilns formed an important part of the development of the colony's early economy.

Association with Individuals, Events or Groups of Historical Importance (Criteria A, B and D)

The potential archaeological remains are associated with the historical development of the maritime and shipping industries of Sydney. By the mid-late nineteenth century, Darling Harbour had developed into the main hub for shipping and trade activities. However, the port facilities varied in quality and were often not kept in good shape or regulated. Better rail and road connections allowed for goods to be transported to and from the wharves. However industrial activities moved away from the city centre in the late nineteenth and early twentieth century. Massive redevelopment following the resumptions in 1900 allowed for more regulated and better facilities to be constructed, prolonging the life and importance of Darling Harbour in trade and shipping. Advances in technology and the rise of containerised shipping resulted in major redevelopment in the mid twentieth century, before the area declined as a shipping hub.

The potential archaeological remains are associated with Alexander Brodie Spark and Cuthbert. Spark was a prominent shipping and property magnate who lived and worked in Sydney from the 1820s to the 1850s. The wharf facilities he operated on Darling Harbour, just south of Millers Point, were only one part of his mercantile and property enterprises. Having opulent residences on the Cooks River, in Woolloomooloo, and large estates on the Hunter River, it is not likely that Spark spent a considerable quantity of time at the wharf facilities. Cuthbert's shipyard was a large enterprise that was pivotal for the development of the local Millers Point economy. The potential archaeological remains would be directly associated with his important shipyard and the development of that industry in Sydney.

Evidence of environmental change and modification is associated with the earliest years of the colony. Lime burning prior to the 1820s would have been conducted predominantly by convict labour and individual convicts who worked these were largely undocumented in archival records. The relationship of the products of convict labour with the government-controlled economy is a process of historical significance.

Aesthetic of Technical Significance (Criterion C)

The potential archaeological remains may survive relatively intact, with remains of wharfs, seawalls and other maritime related features, buried below successive phases of reclamation and filling. These remains would provide a tangible connection to the past history of the site and could have aesthetic value if preserved or interpreted.

Evidence of multiple phases of maritime infrastructure development is likely to provide information regarding construction techniques, engineering capabilities, adaptation to the local conditions, and technological change over time. Redevelopment phases of industrial foreshore areas are distinct and can be easily linked to changes in shipping technology, from sail to steam for example. Rebuilding of wharf was necessary to facilitate the increased drafts and berth requirements. Reclamation and rebuilding the wharf at an increased height above low tide level was required. The potential archaeological remains have potential to demonstrate technological advances in maritime infrastructural engineering, and also shipping technology and engineering.

A number of nineteenth century lime kilns are still extant in New South Wales and in Tasmania, with a lime kiln from the late eighteenth century still present at Norfolk Island.⁹⁵ The majority of these existing kilns are brick-constructed. However, a common lime kiln in the earliest stages of the colony consisted of a heap-burning or pit-burning process, whereby shells and flammable material was stacked together and burned in the open.

Documentary sources do not state the type of kilns that were established on the foreshores of Cockle Bay by 1822. In the event that these kilns were permanent brick kilns, the technical details of their construction would be considered significant depending on the precise design. Heap-burning kilns, if identified, would be considered technically significant as an example of the expeditious adaptation of convict labour to the economic needs of the new colony.

Ability to Demonstrate the Past through Archaeological Remains (Criteria A, C, F and G)

It is expected that the potential archaeological remains will survive to moderate degree of intactness. The nature by which the areas of potential were formed ensures a greater level of survival, as each phase is covered and filled rather than completely demolished and excavated. The potential archaeological resources would be able to demonstrate the changes to the natural environment following the establishment of the colony and town of Sydney. They would also demonstrate modification of the foreshore and development of multiple phases of wharf from the early nineteenth century to the twentieth. Such wharf facilities were essential for the industrial and economic development of Sydney.

Significance Level

The potential archaeological resource at the Barangaroo Station site is of both State and local significance. The earliest phase of wharf development by Agar and Spark likely dates to the end of the 1820s and early 1830s, making it some of the earliest maritime infrastructural development in NSW. It is also now a rare resource considering recent developments along Darling Harbour foreshore. Phase 1 remains would be of state significance under Criteria A, B, E and F.

Mid to late nineteenth century archaeological remains would be considered of local heritage significance as there are other examples of this type of archaeology in Sydney area, and more other historical information available (Criteria A, C and E). Archaeological remains associated with Cuthbert's shipyard relate to later maritime industrial development. These are expected to be of local significance. However, should intact remains directly associated with shipbuilding activities exist within the study area they would be of state significance (Criterion B and C).

⁹⁵ Pearson, M. 1990. "The Lime Industry in Australia – an Overview", *Australian Historical Archaeology* v8, pp. 28 – 29.

6.4.2 Other archaeological remains within the Barangaroo Station site

The development of residential housing in the northern part of the station site (Site B 1) in the mid- to late-nineteenth century is related to the growth of maritime industry in Millers Point and along the Darling Harbour foreshore. Much of this housing was inhabited by the semi-skilled labour force that worked at the shipbuilding and mercantile industries in this area of Sydney. However, archaeological remains relating to the lives of these workers is not likely to have been preserved due to the substantial landscape modifications in the northern part of the study area. It is unlikely that significant archaeological resources are present in Site B 1.

Archaeological remains of later nineteenth and twentieth century timber wharves and piers are likely to consist of truncated timber piles (Site B 6). These do not have research potential and would not reach the local significance threshold. Reclamation fills from the twentieth century also do not reach the threshold for local significance due to lack of research potential (Sites B 4, B 5 and B 6).

6.4.3 Statement of Archaeological Significance

Archaeological remains are expected to be present in areas with the western part of Hickson Road. The potential archaeological resources of the Barangaroo study area are associated with the nineteenth century and early twentieth century development of Darling Harbour's wharf facility and shipping industry. The remains are associated with the transformation and modification of the natural foreshore to an industrial hub. Investigation of the potential archaeological resources would contribute to knowledge of environmental change, landscape modification, maritime infrastructural engineering capabilities and changing technologies, and working lives and conditions of the wharfs and shipyards. The results would provide a dataset for comparative analysis with results from Darling Quarter (Casey & Lowe 2008-2010), Barangaroo South (Casey & Lowe 2010-2012), Barangaroo Headland (Austral 2013-2015) and Balmain East (Artefact 2016).

The potential archaeological remains are associated with Spark and Cuthbert, prominent individuals in the nineteenth century development of Sydney. Cuthbert's shipyard was an important business in this part of Darling Harbour. Recent redevelopment of Darling Harbour has resulted in the excavation of many of these early waterfront properties, and as an archaeological resource they are becoming rarer.

Archaeological remains associated with early-mid twentieth century wharf development and occupation are not considered to have research potential and would not meet the local significance threshold.

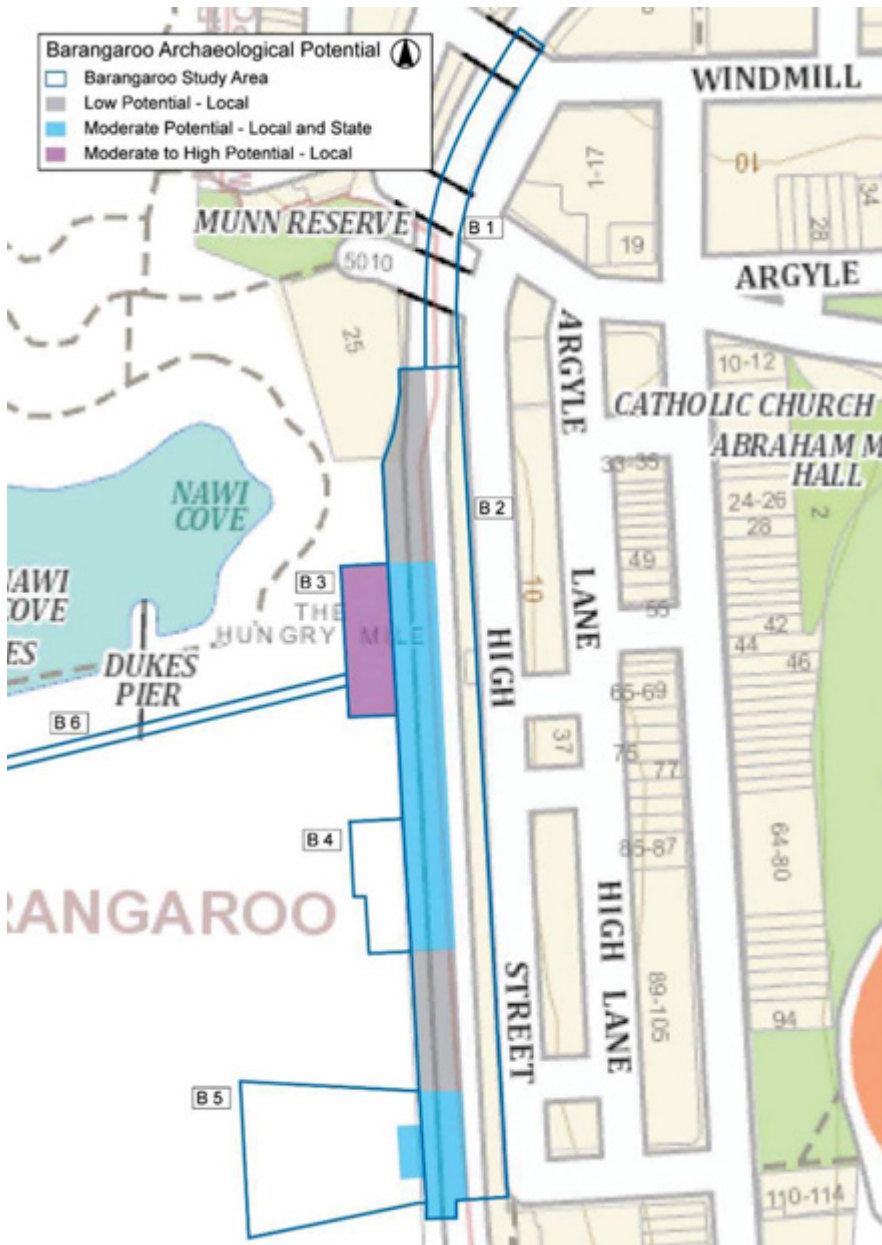
A summary of the areas of potential significant archaeological remains and their locations are presented in Table 6-3 and illustrated in Figure 6-15.

Table 6-3: Summary of areas with potential for significant archaeology at the Barangaroo Station site

Site Code	Phase	Potential	Archaeological resource	Significance
B 2 (western part of Hickson Road only)	1 (1788 – 1830)	Nil - Low	Evidence relating to early lime kilns in the north-west of the study area	State
		Low	Evidence of environmental change, pollution and landscape modification such as quarrying	Local
		Low - Moderate	Potential archaeological resources relating to Spark's wharf and warehouses, in the north-west of the study area	State

Site Code	Phase	Potential	Archaeological resource	Significance
		Low - Moderate	Potential archaeological resources relating to early use of Agar's wharf in the southern part of the study area	State
	² (1830 – 1900)	Moderate	Potential archaeological resources relating to the growth and operation of Agar's and Spark's wharf, and later of Cuthbert's shipyard in the north-west of the study area	Local
B 3	² (1830 – 1900)	Moderate - High	Potential archaeological resources relating to the growth and operation of Cuthbert's shipyard	Local
B 5 (eastern part)	² (1830 – 1900)	Moderate	Potential for timber or stone jetty remains and associated deposits	Local

Figure 6-15: Areas with potential for significant archaeology at Barangaroo Station site



6.5 Archaeological Impacts

6.5.1 Proposed Works

The Barangaroo Station construction site would cover about 13,800 square metres within the road reserve of Hickson Road and the adjacent Barangaroo development area. The site would be used to:

- Launch and support the tunnel boring machine for the Sydney Harbour crossing drive to Blues Point
- Retrieve the cutter heads and shields of the TBMs driven from the Marrickville dive site
- Carry out the excavation and construction of the future Barangaroo Station using a cut-and-cover method.

Construction impacts

The construction impacts at the Barangaroo Station site include:

- Bulk excavation to construction the station and station entrances
- Bulk excavation for a substation in the south of the site
- Minor excavation and piling to construct a spoil conveyor from the station construction site at Hickson Road to the waterfront
- Cavern excavation (within rock) to the north of the station excavation to accommodate rail crossover.

6.5.2 Potential Archaeological Impacts

Bulk excavation for the station and station entrance construction will remove all surviving archaeological remains within its footprint (Figure 6-16). This will include archaeological remains within the western half of Hickson Road (Site B 2) and the station entrance site within the current Barangaroo Headland park and hardstand (Site B 3). The substation construction would remove the potential archaeological remains within its excavation footprint (east part of Site B 5). In general, these areas have moderate and moderate to high potential for locally significant archaeological remains.

Excavation for the southern station entrance (Site B 4) and ground disturbance works for the spoil conveyor (Site B 6) is unlikely to encounter or impact significant archaeological remains. Cavern excavation to the north of the station site would be within rock and would therefore not have any archaeological implications.

Figure 6-16: Potential archaeological impacts – Barangaroo Station site



6.6 Archaeological Management

Archaeological impact mitigation is required at the Barangaroo Station site (Table 6-4). A test/salvage archaeological program should be implemented with the initial bulk excavation works in Sites B 2 and B 5. An archaeological salvage excavation should be undertaken as part of the initial bulk excavation for the northern station entrance (Site B 3).

Table 6-4: Summary of archaeological mitigation for the Barangaroo Station site

Site Code	Potential archaeology	Impact	Mitigation
B 2 (western half)	Moderate potential for local and State significant archaeological evidence associated with 19 th century wharf development and occupation	Direct impact – bulk excavation for station construction	<ul style="list-style-type: none"> AMS Test/Salvage
B 3	Moderate-High potential for locally significant archaeological evidence associated with Cuthbert's shipyard	Direct impact – bulk excavation for station entrance	<ul style="list-style-type: none"> AMS Salvage
B 5 (east only)	Moderate potential for locally significant archaeological evidence associated with 19 th century wharf development and occupation	Direct impact – bulk excavation for substation	<ul style="list-style-type: none"> AMS Test/Salvage
B 1 B 4 B 5 (most)	Nil	Nil	<ul style="list-style-type: none"> Unexpected Finds Procedure

6.6.1 Archaeological Methodology

The following archaeological methodology for the Barangaroo Station site is based on impacts known at project approval stage. Explanation and further details regarding the archaeological process and methodologies identified below are provided in Section 12.0.

- An AMS would be prepared for the Barangaroo station site prior to construction. This would:
 - Review contamination reports and provide details on how archaeological resources would be managed during any remediation at the site
 - Outline how the archaeological program would be undertaken within the construction program
 - Provide archaeological mitigation requirements for demolition, piling and other associated construction works which take place prior to bulk excavation
 - Review contamination reports and provide mitigation requirements for any remediation affecting areas with potential for significant archaeology
 - Provide an environmental sampling strategy for the investigation
 - Outline how Aboriginal archaeological excavation would be incorporated into the program should it be required.
- Salvage excavation would be undertaken at the northern station entrance site (Site B 3). The archaeological program should be co-ordinated after demolition and before the main bulk excavation works.

- A test/salvage excavation would be undertaken along the western half of Hickson Road (Site B 2 western half) and eastern portion of the substation site (Site B 5 east) prior to construction impacts. Given the expected depth and nature of potential archaeological remains at the Barangaroo site, the archaeological program would be undertaken in conjunction with the initial stages of bulk excavation for the station construction. This two-step archaeological process involves the following:
 - Test excavation to clarify the extent and location of archaeological remains within the western part of Hickson Road and eastern part of the substation site
 - Salvage excavation of significant archaeological remains prior to bulk excavation impact.
- Unexpected finds procedure would apply to Sites B 1, B 4 and B 5 (west).
- A preliminary results report would be written once archaeological fieldwork has been completed.
- Post-excavation analysis of fieldwork results, artefacts, samples and other archaeological data would be undertaken and included in a final archaeological investigation report.
- Significant archaeological findings would be considered for inclusion in heritage interpretation for the project.

6.6.2 Research Questions

Historical themes for the Barangaroo Station site is presented in Table 6-5.

Table 6-5: Historical themes associated with the Barangaroo Station site

Australian theme	NSW theme	Explanatory Notes	Comments
1. Tracing the natural evolution of Australia	Environment – naturally evolved	Features occurring naturally in the physical environment which have shaped or influenced human life and cultures	The Barangaroo study area is located on the original foreshore of Cockle Bay, at the base of the original steep west-facing slope.
2. Peopling Australia	Convict	Activities relating to incarceration, transport, reform, accommodation and working during the convict period in NSW (1788 – 1850)	Lime kilns that were operated in the study area would have been the sites of convict labour. Convict settlement at the Rocks is located near to the study area.
3. Developing local, regional and national economies	Commerce	Activities related to buying, selling and exchanging goods and services	The Barangaroo study area was a site of commercial shipping from the early 19 th century up until the late 20 th century.
3. Developing local, regional and national economies	Environment – cultural landscapes	Activities associated with the interaction between humans, human societies and the shaping of their physical surroundings	The Barangaroo foreshore has been extensively modified since European settlement. Land reclamation activities have significantly widened the foreshore. Excavations to construct Hickson Road in the early 20 th century involved extensive modification of the sandstone escarpment along the foreshore of Cockle Bay.

Australian theme	NSW theme	Explanatory Notes	Comments
3. Developing local, regional and national economies	Industry	Activities associated with the manufacture, production and distribution of goods	Early 19 th century plans of the study area show that lime kilns were established along the foreshore of Cockle Bay. Cuthbert's shipyard operated as a boat manufacturing and repair facility during the early and mid-19 th century, and later shipyards operated in the study area until the early 20 th century.
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 facilities in the Barangaroo study area were used for the transhipment of goods both within the colony of New South Wales and internationally. The study area has a history of transport which dates from the early 19 th century up until the late 20 th century.
8. Developing Australia's cultural life	Leisure	Activities associated with recreation and relaxation	Agar's wharf temporarily operated as a private bath-house during the mid-19 th century.

The following research questions would guide archaeological investigations at the Barangaroo Station site.

Landscape Modification and Environmental Change

- What is the nature of the original topography in the area?
- What is the nature and extent of foreshore reclamation in the study area? Can separate phases of reclamation be identified?
- How do the reclamation techniques and success of the early land developers compare with others along the eastern Darling Harbour foreshore?
- Is there evidence of stone quarrying and bedrock removal from the late eighteenth and early nineteenth centuries in the study area?
- Are there intact soil deposits from the late eighteenth century present at the site? Can intact soil deposits provide pollen or other microfossil data that can inform us about the environment and early European use of the foreshore or surrounding area?
- Can the original intertidal margins be recognised in the study area and have they collected material remains from European occupation prior to being reclaimed?
- Has the foreshore area been polluted with industrial and residential waste prior to the reclamation of the foreshore?

Early Lime Kilns

- Are there intact remains of early lime kilns located in the study area? Are these deposits recognisable?
- Were constructed lime kilns heap-burning kilns (which are archaeologically ephemeral) or were they brick kilns which have a better chance of recognisably surviving?

- If lime kilns have survived, what was their design and configuration? How do these compare with other late eighteenth and early nineteenth century kiln designs elsewhere in Australia?
- Do intact ash and charcoal deposits from these kilns survive, and if so, do they contain plant microfossil signatures, specifically plant phytoliths?
- Was limestone used in these lime kilns, or were the kilns only established to exploit local shell deposits?
- Shells collected for early lime kilns were frequently taken from Aboriginal foreshore middens. Are there any Aboriginal artefacts located in lime kiln ash deposits?

Spark's and Agar's Wharf

- Are there intact, recognisable remains related to Spark's and Agar's wharves? Are there remains of jetties, as well as seawalls?
- How do the maritime infrastructural remains compare to contemporary wharf developments along the eastern Darling Harbour foreshore?
- Have recognisable structural remains related to warehouses and boatsheds survived?
- Are structural remains of the former brick and stone buildings in the study area still present? To what extent can they be discriminated against earlier and later construction phases?
- Can artefactual evidence demonstrate the working practices of the people who operated the shipyards and wharves?
- Is there artefactual evidence of artisan's work and manufacturing?
- Are there artefactual deposits related to shipped goods in the study area? Are these items imported or locally manufactured?
- How does the material evidence of mercantile industries from the early nineteenth centuries differ from later mercantile industrial archaeological remains? How do these wharves compare to other mercantile archaeological data sets from other excavations conducted in Barangaroo?
- Agar's wharf is marked in use for over one hundred years, however its use as a wharf, shipbuilding dock and boatshed changed over time. Can these successive phases of use (particularly its brief tenure as a bath-house) be recognised archaeologically?
- Can the stairs that led down to Agar's Wharf (marked on the 1865 Trigonometrical Survey of Sydney) be located in the study area? How do these stairs relate to the extant Agar's Stairs located between the Sydney Observatory and Kent Street?
- Spark's Wharf was superseded by Cuthbert's Shipyard from the 1850s onwards; how much of Spark's Wharf's facilities were incorporated into Cuthbert's Shipyard's facilities?
- How do the maritime engineering techniques change over time and respond to advances in shipping technology (sail to steam for example)?

Cuthbert's Shipyard

- How much of Cuthbert's Shipyard remains in the study area? Are archaeological remains from Cuthbert's Shipyard recognisable from the later adaptation of the area for Dibb's wharf?
- A steam mill was operated on this site in the 1850s and 1860s; can identifiable structural remains related to this mill be located?

- Can the successive phases of foreshore reclamation and sea- and landscaping walls be identified in the study area?
- A number of industries were established at the Shipyard to support boat building (blacksmiths, rope makers, carpenters and sail makers). Are workshops related to these trades intact and recognisable?
- Are there intact remains of the residential brick structures which existed to house the dock workers in the Millers Point area? If so, are there artefactual evidences (underfloor deposits, back-filled cesspits and cisterns) which can demonstrate the occupants' daily and working lives?
- How does the material evidence of the large-scale manufacturing industries at Cuthbert's Shipyard compare to smaller-scale shipbuilding enterprises uncovered archaeologically at Barangaroo and in the Sydney area?
- How do the maritime engineering techniques change over time and respond to advances in shipping technology (sail to steam for example)?
- Can the archaeological results of this part of Cuthbert's Shipyard inform the research questions developed for the Barangaroo Headland archaeological investigations undertaken by Austral Archaeology in 2012-2015?