

M4-M5 Link

Environmental Impact Statement

August 2017

Appendices U to X





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Volume 2J

Appendices

| | |
|--------|--|
| U..... | Technical working paper: Non-Aboriginal heritage |
| V..... | Technical working paper: Aboriginal heritage |
| W..... | Detailed greenhouse gas calculations |
| X..... | Climate change risk assessment framework |



Appendix



Technical working paper: Non-Aboriginal heritage



Roads and Maritime Services

WestConnex – M4-M5 Link

Technical working paper: Non-Aboriginal heritage

August 2017

Prepared for

Roads and Maritime Services

Prepared by

GML Heritage Pty Ltd

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Contents

| | |
|---|-------|
| Glossary of terms and abbreviations | x |
| Executive summary | xiii |
| Background..... | xiii |
| Summary of findings | xiii |
| Project context | xiii |
| Built heritage and landscape | xiv |
| Ground movement | xvii |
| Historical archaeology | xviii |
| Cumulative heritage impacts | xviii |
| Management of impacts | xix |
| 1 Introduction | 1 |
| 1.1 Overview of WestConnex and related projects..... | 1 |
| 1.2 Purpose of this report | 4 |
| 1.3 SEARs and Agency comments | 4 |
| 2 The project | 8 |
| 2.1 Project location..... | 8 |
| 2.2 Project features | 8 |
| 2.3 Construction activities..... | 12 |
| 2.4 Heritage study areas..... | 18 |
| 3 Assessment methodology..... | 44 |
| 3.1 Relevant legislation | 44 |
| 3.2 Relevant guidelines and policies | 44 |
| 3.3 Overview | 44 |
| 3.4 Field survey..... | 45 |
| 3.5 Assessment of heritage significance | 45 |
| 3.6 Archaeological assessment | 46 |
| 3.7 Assessment of heritage impact | 46 |
| 3.8 Alternative locations and design options | 47 |
| 3.9 Previous reports | 47 |
| 3.10 Limitations..... | 48 |
| 3.11 Authors..... | 48 |
| 4 Historical overview..... | 50 |
| 4.1 Introduction | 50 |
| 4.2 Area 1 – Haberfield/Ashfield heritage study area..... | 50 |
| 4.3 Area 2 – Leichhardt heritage study area..... | 62 |
| 4.4 Area 3 – Rozelle, Lilyfield and Annandale (Rozelle Rail Yards, The Crescent, Rozelle Bay and Victoria Road) heritage study area | 71 |
| 4.5 Area 4 – Iron Cove heritage study area..... | 87 |
| 4.6 Area 5 – Annandale (around Pymont Bridge Road and Parramatta Road) heritage study area | 100 |
| 4.7 Area 6 – St Peters heritage study area | 113 |
| 5 Historical archaeology | 114 |
| 5.1 Preamble..... | 114 |
| 5.2 Overview of approach..... | 114 |

| | | |
|------|--|-----|
| 5.3 | Area 1 – Haberfield/Ashfield (C1–C3) | 116 |
| 5.4 | Area 2 – Leichhardt (C4)..... | 119 |
| 5.5 | Area 3 – Rozelle, Lilyfield and Annandale (Rozelle Rail Yards, The Crescent, Rozelle Bay and Victoria Road) project footprint (C5, C6 and C7)..... | 123 |
| 5.6 | Area 4 – Iron Cove (C8) and bioretention facility | 135 |
| 5.7 | Area 5 – Annandale (around Pymont Bridge Road and Parramatta Road) project footprint (C9) | 141 |
| 5.8 | Area 6 – St Peters project footprint (C10)..... | 147 |
| 6 | Built and landscape heritage..... | 148 |
| 6.1 | Introduction | 148 |
| 6.2 | Overview of approach..... | 148 |
| 6.3 | General impacts | 149 |
| 6.4 | Summary heritage impacts – all heritage study areas | 149 |
| 6.5 | Area 1 – Haberfield/Ashfield heritage study areas (Option A: C1a, C2a and C3a) and (Option B: C1b, C2b and C3b) | 154 |
| 6.6 | Area 2 – Leichhardt heritage study area (C4)..... | 161 |
| 6.7 | Area 3 – Rozelle, Lilyfield and Annandale (Rozelle Rail Yards, The Crescent, Rozelle Bay and Victoria Road) heritage study area (C5, C6 and C7)..... | 166 |
| 6.8 | Area 4 – Iron Cove heritage study area (C8) | 195 |
| 6.9 | Area 5 – Annandale (around Pymont Bridge Road and Parramatta Road) heritage study area (C9)..... | 201 |
| 6.10 | Area 6 – St Peters Heritage Study Area (C10) | 209 |
| 6.11 | Potential vibration impacts | 213 |
| 6.12 | Detailed heritage impact assessment..... | 214 |
| 6.13 | Ground movement..... | 218 |
| 6.14 | Other heritage items and HCAs along the route | 219 |
| 7 | Assessment of cumulative impacts | 234 |
| 7.1 | | 234 |
| 7.2 | WestConnex projects..... | 234 |
| 7.3 | Major Roads and Maritime and other transport projects | 236 |
| 7.4 | Conclusion | 237 |
| 8 | Management of impacts | 238 |
| | References | |

Annexures

Annexure A – WestConnex M4-M5 Link – Buildings subject to heritage assessment

List of Tables

| | |
|---|-----|
| Table E-1-1 Overall heritage impacts of WestConnex projects | xix |
| Table 1-1 WestConnex and related projects..... | 1 |
| Table 1-2 Relevant SEARs addressed in this report..... | 4 |
| Table 1-3 Relevant agency comments addressed in this report..... | 6 |
| Table 2-1 Overview of construction activities..... | 12 |
| Table 2-2 Indicative construction program..... | 15 |
| Table 3-1 Ranking of heritage impact..... | 46 |
| Table 3-2 Consultant qualifications and experience..... | 48 |

| | |
|---|-----|
| Table 5-1 Summary of past disturbance..... | 117 |
| Table 5-2 Summary of past disturbance..... | 120 |
| Table 5-3 Summary of past disturbance..... | 124 |
| Table 5-4 Summary of past disturbance..... | 136 |
| Table 5-5 Summary of past disturbance..... | 142 |
| Table 6-1 Summary of potential impacts (type and ranking) on listed heritage items and HCAs within the study areas..... | 150 |
| Table 6-2 Summary of potential impacts on potential heritage items within the study area..... | 153 |
| Table 6-3 Statutory heritage listings for heritage items in the Haberfield/Ashfield heritage study area. Items with no shading may be subject to indirect impacts..... | 155 |
| Table 6-4 Heritage significance assessment and impact assessment for potential heritage item..... | 159 |
| Table 6-5 Heritage significance assessment and impact assessment for potential heritage item..... | 159 |
| Table 6-6 Heritage significance assessment and impact assessment for potential heritage item..... | 159 |
| Table 6-7 Heritage significance assessment and impact assessment for potential heritage item..... | 160 |
| Table 6-8 Heritage significance assessment and impact assessment for potential heritage item..... | 161 |
| Table 6-9 Statutory heritage listings for heritage items in the Leichhardt heritage study area. Items with no shading may be subject to indirect impacts. | 162 |
| Table 6-10 Heritage significance assessment and impact assessment for Leichhardt (Charles Street) Underbridge | 164 |
| Table 6-11 Statutory heritage listings for heritage items in the Rozelle, Lilyfield and Annandale (Rozelle Rail Yards, The Crescent, Rozelle Bay and Victoria Road) heritage study area. | 167 |
| Table 6-12 Heritage significance assessment and impact assessment for Brennan's Estate HCA .. | 171 |
| Table 6-13 Heritage significance assessment and impact assessment for Easton Park HCA..... | 172 |
| Table 6-14 Heritage significance assessment and impact assessment for Easton Park..... | 174 |
| Table 6-15 Heritage significance assessment and impact assessment for Sewage Pumping Station No.6 (SP0006)..... | 175 |
| Table 6-16 Heritage significance assessment and impact assessment for Hornsey Street HCA | 177 |
| Table 6-17 Heritage significance assessment and impact assessment for Whites Creek Stormwater Channel No 95 | 178 |
| Table 6-18 Heritage significance assessment and impact assessment for Arched Bridge, Whites Creek | 180 |
| Table 6-19 Heritage significance assessment and impact assessment for Street trees – row of Palms | 181 |
| Table 6-20 Heritage significance assessment and impact assessment for Avenue of <i>Phoenix canariensis</i> | 182 |
| Table 6-21 Heritage significance assessment and impact assessment for White Bay Power Station | 182 |
| Table 6-22 Heritage significance assessment and impact assessment for Annandale (Railway Parade) Railway Bridge | 185 |
| Table 6-23 Heritage significance assessment and impact assessment for Annandale (Johnston Street) Underbridge | 187 |
| Table 6-24 Heritage significance assessment and impact assessment for Stormwater Canal | 188 |
| Table 6-25 Heritage significance assessment and impact assessment for 'Cadden Le Messurier' .. | 189 |
| Table 6-26 Heritage significance assessment and impact assessment for Former Hotel..... | 190 |
| Table 6-27 Heritage significance assessment and impact assessment for potential heritage item... | 191 |
| Table 6-28 Heritage significance assessment and impact assessment for potential heritage item... | 192 |
| Table 6-29 Heritage significance assessment and impact assessment for potential heritage item... | 193 |
| Table 6-30 Heritage significance assessment and impact assessment for potential heritage item... | 194 |
| Table 6-31 Statutory heritage listings for heritage items in the Iron Cove heritage study area. Items with no shading may be subject to indirect impacts. | 196 |
| Table 6-32 Heritage significance assessment and impact assessment for Iron Cove Bridge..... | 198 |
| Table 6-33 Heritage significance assessment and impact assessment for Iron Cove HCA..... | 199 |

| | |
|---|-----|
| Table 6-34 Heritage significance assessment and impact assessment for potential heritage item... | 200 |
| Table 6-35 Heritage significance assessment and impact assessment for potential heritage item... | 200 |
| Table 6-36 Heritage significance assessment and impact assessment for potential heritage item... | 201 |
| Table 6-37 Statutory heritage listings for heritage items in the Annandale (around Pymont Bridge Road and Parramatta Road) heritage study area. Items with no shading may be subject to indirect impacts..... | 202 |
| Table 6-38 Heritage significance assessment and impact assessment for Kerb and gutter | 204 |
| Table 6-39 Heritage significance assessment and impact assessment for Warehouse, including interiors | 205 |
| Table 6-40 Heritage significance assessment and impact assessment for Former Grace Bros Repository including interiors | 206 |
| Table 6-41 Heritage significance assessment and impact assessment for Bridge Road School (former), including interiors | 208 |
| Table 6-42 Heritage significance assessment and impact assessment for heritage item..... | 209 |
| Table 6-43 Statutory heritage listings for heritage items in the St Peters heritage study area..... | 210 |
| Table 6-44 Heritage significance assessment and impact assessment for Terrace group including interiors | 212 |
| Table 6-45 Heritage items subject to potential vibration impacts..... | 214 |
| Table 6-46 Heritage impact assessment for heritage item | 215 |
| Table 6-47 Heritage impact assessment for heritage item | 217 |
| Table 6-48 Heritage items and HCAs on local, State and S170 Registers | 219 |
| Table 8-1 Environmental management measures – non-Aboriginal heritage..... | 238 |

List of Figures

| | |
|---|----|
| Figure 1-1 Overview of WestConnex and related projects | 3 |
| Figure 2-1 Overview of the project | 11 |
| Figure 2-2 Overview of construction footprint and ancillary facilities | 17 |
| Figure 2-3 Overview of heritage study areas | 19 |
| Figure 2-4 Construction ancillary facility layout at Haberfield (Option A) | 20 |
| Figure 2-5 Construction ancillary facility layout at Haberfield/Ashfield (Option B) | 21 |
| Figure 2-6 Construction ancillary facility layout at Leichhardt..... | 23 |
| Figure 2-7 Looking west along Darley Road from the intersection with James Street..... | 25 |
| Figure 2-8 Looking northwest at the c.1960s brick warehouse facing onto Darley Road | 25 |
| Figure 2-9 Looking northeast at the western half of the c1960s brick warehouse facing onto Darley Road | 25 |
| Figure 2-10 Looking northeast at the western half of the c1960s brick warehouse facing onto Darley Road | 25 |
| Figure 2-11 Looking northeast towards the yard/car park within the study area from the intersection of Charles Street and Darley Road | 25 |
| Figure 2-12 Looking southeast at the late twentieth century warehouse in the northern half of the study area. | 25 |
| Figure 2-13 Looking southeast at the eastern half of the late twentieth century warehouse on Darley Road | 26 |
| Figure 2-14 Looking east across the Leichhardt North tram stop. | 26 |
| Figure 2-15 Looking southeast at the steps into the Leichhardt North tram stop. | 26 |
| Figure 2-16 Looking southeast across the car park at the eastern end of the Darley Road study area | 26 |
| Figure 2-17 Looking west across the eastern car park of the Darley Road study area | 26 |
| Figure 2-18 Looking west along the stormwater culvert visible in the southeast corner of the Darley Road study area | 26 |

| | |
|---|----|
| Figure 2-19 Construction ancillary facility layout at Rozelle, Lilyfield and Annandale (Rozelle Rail Yards, The Crescent, Rozelle Bay and Victoria Road)..... | 27 |
| Figure 2-20 Looking southwest across Easton Park | 29 |
| Figure 2-21 Looking east along Lilyfield Road on the southern side of Easton Park..... | 29 |
| Figure 2-22 Looking east along Lilyfield Road towards Easton Park in background | 29 |
| Figure 2-23 An area of exposed sandstone bedrock observed along Lilyfield Road | 29 |
| Figure 2-24 Looking southeast at the warehouses within the light industrial area in the northern part of the project footprint..... | 29 |
| Figure 2-25 The stormwater canal which runs through the light industrial area | 29 |
| Figure 2-26 Looking west along Lilyfield Road from the intersection with Gordon Street..... | 30 |
| Figure 2-27 Looking northeast across an open grassed area within the White Bay Power Station site | 30 |
| Figure 2-28 Grassed and tarmac surfaces at White Bay Power Station which characterises much of the Rozelle project footprint | 30 |
| Figure 2-29 Evidence of quarrying of the sandstone bedrock within the White Bay Power Station site | 30 |
| Figure 2-30 Southern penstock with safety fence enclosure | 30 |
| Figure 2-31 Remaining foundations of the former White Bay Hotel, with the White Bay Power Station in the background..... | 30 |
| Figure 2-32 White Bay Power Station showing proposed location of construction..... | 31 |
| Figure 2-33 View southeast across the parkland on the northern side of the City West Link which characterises the western part of the project footprint | 31 |
| Figure 2-34 Construction ancillary facility layout at Ion Cove | 32 |
| Figure 2-35 Looking north along Springside Street towards the rear of 212-218 Victoria Road (at left) | 34 |
| Figure 2-36 Looking west along Victoria Road; the car park at 212-218 Victoria Road is visible at left | 34 |
| Figure 2-37 Looking east at the side of 224 Victoria Road on Callan Street showing the stepping down of the building floor level | 34 |
| Figure 2-38 Looking north at the southwest corner of 224 Victoria Street | 34 |
| Figure 2-39 Looking north along Toelle Street towards Victoria Road and at the rear of 238 Victoria Road | 34 |
| Figure 2-40 Looking west along the unnamed lane behind 242–248 Victoria Road showing the variation in ground level | 34 |
| Figure 2-41 Looking south towards the raised garden behind 242 Victoria Road | 35 |
| Figure 2-42 Shop on the corner of Toelle Street and Victoria Road | 35 |
| Figure 2-43 Looking west along Victoria Road outside the car yard 258 Victoria Road | 35 |
| Figure 2-44 View of the eastern side of 260 Victoria Road showing the concrete slab on which the house is built | 35 |
| Figure 2-45 View of the front steps leading up to 264 Victoria Road | 35 |
| Figure 2-46 View of the western wall of 264 Victoria Road showing the underlying bedrock on which the house has been constructed | 35 |
| Figure 2-47 View of the bedrock foundations beneath 270 Victoria Road | 36 |
| Figure 2-48 Looking north across the park towards the westbound section of Iron Cove Bridge..... | 36 |
| Figure 2-49 Looking northeast across the park on the southern side of Victoria Road. | 36 |
| Figure 2-50 Looking northwest from the edge of King George Park towards the site of the proposed bioretention facility..... | 36 |
| Figure 2-51 Looking south from the intersection of Byrnes Street and Manning Street towards the site of the proposed bioretention facility..... | 36 |
| Figure 2-52 Looking east from the continuation of Byrnes Street towards the site of the proposed bioretention facility..... | 36 |

| | |
|---|----|
| Figure 2-53 Construction ancillary facility layout at Annandale (around Pymont Bridge Road and Parramatta Road)..... | 37 |
| Figure 2-54 Looking northwest towards 160 Parramatta Road on southeast corner of Study Area C8 | 39 |
| Figure 2-55 Looking northwest at 164–172 Parramatta Road forming the southern boundary of Study Area C8..... | 39 |
| Figure 2-56 Looking north towards 174–180 Parramatta Road on the southern boundary of Study Area C8..... | 39 |
| Figure 2-57 Looking north towards 182–186 Parramatta Road forming the southwest corner of Study Area C8..... | 39 |
| Figure 2-58 Looking south at 93–95 Pymont Bridge Road and the entrance to Bignell Lane in the northwest of the Study Area C10 | 39 |
| Figure 2-59 Looking south at the western end of 79 Pymont Bridge Road..... | 39 |
| Figure 2-60 Looking along façade of 79 Pymont Bridge Road, situated in the northern third of Study Area C8..... | 40 |
| Figure 2-61 View west taken approximately halfway along Bignell Lane..... | 40 |
| Figure 2-62 Looking across the basement level car park beneath 166–172 Parramatta Road (Camperdown Fitness) | 40 |
| Figure 2-63 The street level car park accessed from Bignell Lane at the rear of 164 Parramatta Road | 40 |
| Figure 2-64 Looking down into the car park beneath 166–172 Parramatta Road (Camperdown Fitness) from Parramatta Road showing the depth below street level..... | 41 |
| Figure 2-65 Looking east along Bignell Lane at the rear of 182–186 Parramatta Road | 41 |
| Figure 2-66 Construction ancillary facility layout at St Peters..... | 42 |
| Figure 4-1 Parish Map showing on the early land grants on both sides of Parramatta Road | 53 |
| Figure 4-2 1885 subdivision of the land east of Wattle Street, including Walker Street (formerly The Avenue) and Alt Street (formerly Tenandra Street)..... | 54 |
| Figure 4-3 1905 plan of the Haberfield No. 3 Subdivision dated May 1905 | 55 |
| Figure 4-4 1930 aerial showing development along Parramatta Road around the study area | 56 |
| Figure 4-5 1943 aerial showing development along Parramatta Road around the study area | 57 |
| Figure 4-6 1859 subdivision of the Ashfield Park Estate | 58 |
| Figure 4-7 Site of the Ashfield Infants Home, c1890..... | 59 |
| Figure 4-8 1920 subdivision of the eastern portion of the Ashfield Infants Home site, including the study area at the intersection of Alt Street and Parramatta Road..... | 60 |
| Figure 4-9 1882 Subdivision of the Camellia Grove (Underwood's Nursery) Ashfield..... | 61 |
| Figure 4-10 Development on southern side of Parramatta Road between Alt Street and Chandos Street, 1892..... | 62 |
| Figure 4-11 Captain John Piper's landholdings in Leichhardt | 66 |
| Figure 4-12 'Helsarmel' Estate, as purchased by George William Lord..... | 67 |
| Figure 4-13 Subdivision plan of Helsarmel Estate, Leichhardt, 1886 | 67 |
| Figure 4-14 Sydney Metropolitan plans, 1891–1893..... | 68 |
| Figure 4-15 Detail from 'Leichhardt, Sheet 53', dated March 1889..... | 68 |
| Figure 4-16 Detail from 'N.S.W.R. Wardell Road to Glebe Island & Darling Harbour Land Plan', 1917 | 69 |
| Figure 4-17 Plan of the Leichhardt Goods Yard, dated 1917 | 69 |
| Figure 4-18 Plan of the Leichhardt Goods Yard, dated September 1922 | 70 |
| Figure 4-19 1943 aerial photograph showing the project footprint in Leichhardt..... | 70 |
| Figure 4-20 Looking west towards the Leichhardt Goods Yard, dated 1964..... | 71 |
| Figure 4-21 Detail of the 1852 Balmain Estate subdivision lots in the Rozelle area, with proposed street alignments that were not realised..... | 75 |
| Figure 4-22 1885 Gibbs and Shallard Map of the City of Sydney & Suburbs showing streams from Rozelle Bay | 76 |

| | |
|---|----|
| Figure 4-23 Photograph of Rozelle Bay in the late 1800s, showing industrial and maritime development along the foreshore..... | 76 |
| Figure 4-24 Detail from the Plan of the Municipality of Balmain in 1882, showing the original shoreline (dotted) and the mixture of Hitchcock's subdivision lots, and small residential lots..... | 77 |
| Figure 4-25 An 1890 plan showing development on the project footprint prior to the construction of the Rozelle Goods Line, and the Rozelle Marshalling Yard in 1916. | 77 |
| Figure 4-26 Plan of Lilyfield Road (then Storey Street) between Gordon Street and Victoria Road, in the early twentieth century | 78 |
| Figure 4-27 Plan of properties on Lilyfield Road and Gordon Street in the early twentieth century | 78 |
| Figure 4-28 Alston Soap and Candle Co on Abattoir Road (now Lilyfield Road) in 1890 | 79 |
| Figure 4-29 The central portion of the project footprint in part of Rozelle Bay in 1888, to the south of Abattoir Road | 79 |
| Figure 4-30 View of Easton Park, looking east towards Lilyfield Road in the early twentieth century . | 80 |
| Figure 4-31 Eastern portion of the project footprint in part of Rozelle Bay in 1888 and residential development, prior to demolition for the construction of White Bay Power Station | 80 |
| Figure 4-32 View of the White Bay Power Station, across Victoria Road, showing the White Bay Hotel in the foreground, and the railway siding | 81 |
| Figure 4-33 1929 plan showing the usage of the Rozelle Rail Yards at this time..... | 81 |
| Figure 4-34 Rozelle Rail Yards viewed from Lilyfield Road near the Catherine Street overbridge in 1951 | 82 |
| Figure 4-35 An early image of the Rozelle Rail Yards looking west towards Catherine Street Bridge (undated)..... | 82 |
| Figure 4-36 A 1960s view of the Rozelle Rail Yards depot looking west toward Catherine Street overbridge. | 83 |
| Figure 4-37 Rozelle Rail Yards in March 1968, showing infrastructure and condition of the heritage study area during its use..... | 83 |
| Figure 4-38 Detail from the 1917 plan showing the areas of land resumed for the construction of the goods line, a dedicated freight rail network between Wardell Road and Glebe Island | 84 |
| Figure 4-39 The westernmost end of the project footprint in 1888, showing Whites Creek, and three small buildings (outside the heritage study area)..... | 84 |
| Figure 4-40 Plan showing Cohen Park and the industrial development in the central portion of the heritage study area..... | 85 |
| Figure 4-41 A 1943 aerial photograph of the Rozelle heritage study area showing the project footprint | 85 |
| Figure 4-42 Plan showing the area of Cohen Park in the central portion of the heritage study area, now occupied by the Rozelle Goods Yard in c1913..... | 86 |
| Figure 4-43 Photograph looking east along Lilyfield Street, showing the Swadling and Sons Timber Yards, c1952 | 87 |
| Figure 4-44 1882 plan showing the later subdivision of the Iron Cove project footprint..... | 90 |
| Figure 4-45 An 1890 Metropolitan plan showing early development along Weston Road (now Victoria Road) from Iron Cove to Callan Street | 91 |
| Figure 4-46 An 1890 Metropolitan Plan showing development along Weston Road (now Victoria Road). Compared to Figure 3, nearly all the allotments between Callan and Springside Street are occupied..... | 91 |
| Figure 4-47 1895 plan of the Iron Cove Heritage study area, from Iron Cove to Callan Street..... | 92 |
| Figure 4-48 1895 plan showing the project footprint between Callan Street and Springside Street, and further to east along Victoria Road (then Weston Road)..... | 92 |
| Figure 4-49 Page 35 of 1909 Field Survey Book No. 355, showing 264 (bottom) and 266 (top) Victoria Road, Rozelle..... | 93 |
| Figure 4-50 Page 23 of 1909 Field Survey Book No. 355, showing 250 (top) and 248 (bottom) Victoria Road, Rozelle..... | 93 |
| Figure 4-51 Page 22 of 1909 Field Survey Book No. 355, showing 246 Victoria Road, Rozelle | 94 |

| | |
|---|-----|
| Figure 4-52 Page 21 of 1909 Field Survey Book No. 355, showing 244 Victoria Road, Rozelle | 94 |
| Figure 4-53 Page 6 of 1909 Field Survey Book No. 355, showing 234 Victoria Road, Rozelle | 95 |
| Figure 4-54 Page 39 of 1909 Field Survey Book No. 355, showing 6 Byrne Street, Rozelle..... | 95 |
| Figure 4-55 c1910 photograph of King George Park with Iron Cove Bridge in the background..... | 96 |
| Figure 4-56 c1933 plan showing the allotments from Iron Cove to Callan Street are now occupied... | 96 |
| Figure 4-57 Undated plan (ranging from c1922–1961) of Iron Cove heritage study area between Callan Street and Springside Street..... | 97 |
| Figure 4-58 1943 aerial showing the corner of Victoria Road and Clubb Street, where there appears to be large sheds on the corner with log piles in the centre of the site | 97 |
| Figure 4-59 1943 aerial of the project footprint and King George Park..... | 98 |
| Figure 4-60 1943 aerial, showing possibly trenches at the headlands by Iron Cove Bridge | 98 |
| Figure 4-61 1965 aerial showing the expansion of Victoria Road, following the construction of Gladesville Bridge in 1964 | 99 |
| Figure 4-62 2009 aerial photograph of the headlands between Iron Cove Bridge and Byrnes Street. | 99 |
| Figure 4-63 2011 aerial photograph of the headlands between Iron Cove Bridge and Byrnes Street. | 100 |
| Figure 4-64 1835 plan of environs of Sydney by PL Bemis showing Bligh's land holdings on the north side of Parramatta Road, Camperdown | 104 |
| Figure 4-65 1841 subdivision plan of Bligh's Camperdown Estate | 104 |
| Figure 4-66 Detail of c1885 sale of villa allotment subdivisions in Camperdown and Annandale | 105 |
| Figure 4-67 Detail of a c1890 parish map showing the subdivision of the project footprint | 105 |
| Figure 4-68 c1890 Metropolitan plan for Camperdown, sheet 11. Didliston can be seen in the centre of the block, facing Parramatta Road (identified as George Street on the plan)..... | 106 |
| Figure 4-69 1912 Metropolitan Board of Water Supply & Sewerage Field Book No. 656, showing the Annandale project footprint..... | 106 |
| Figure 4-70 1930 aerial of the Camperdown aerial..... | 107 |
| Figure 4-71 Blueprint of the lot to be purchased by Bank of NSW..... | 108 |
| Figure 4-72 1936 plan of Bank of NSW, building elevations | 109 |
| Figure 4-73 1936 plan of Bank of NSW, cross-section plan..... | 109 |
| Figure 4-74 1943 aerial showing corner of Parramatta Road, Pyrmont Bridge Road and Mallett Street | 110 |
| Figure 4-75 1948 Civic Survey of the Annandale heritage study area, showing most of the allotments have been built upon and are dominantly commercial | 110 |
| Figure 4-76 1956 City Building Surveyor's Detail Sheets showing the commercial occupants and little change in the project footprint..... | 111 |
| Figure 4-77 1912–1962 Blackwattle plan of project footprint..... | 111 |
| Figure 4-78 1975 aerial showing a new warehouse/showroom on the corner of Pyrmont Bridge Road and Mallett Street | 112 |
| Figure 4-79 1984 plan of 188 Parramatta Road and 95 Pyrmont Bridge Road, which was purchased by Hahn Brewery by 2010 in order to expand its operations | 112 |
| Figure 4-80 1994 aerial showing Camperdown Fitness which has moved in next door to former Bank of NSW building along Parramatta Road..... | 113 |
| Figure 5-1 Historical Archaeological Management Unit within the Haberfield/Ashfield (Option B) project footprint (showing HAMU 1)..... | 118 |
| Figure 5-2 Historical Archaeological Management Unit within the Leichhardt (Darley Road) project footprint (showing HAMU 2) | 121 |
| Figure 5-3 Historical Archaeological Management Units within the Rozelle, Lilyfield and Annandale (Rozelle Rail Yards, The Crescent, Rozelle Bay and Victoria Road) project footprint (showing HAMUs 3 to 7)..... | 125 |
| Figure 5-4 Areas of archaeological potential within HAMU 3 | 127 |
| Figure 5-5 Areas of archaeological potential within HAMU 6 | 134 |
| Figure 5-6 Areas of archaeological potential within HAMU 7 | 135 |

| | |
|---|-----|
| Figure 5-7 Historical Archaeological Management Units within the Iron Cove project footprint (showing HAMUs 8 to 9)..... | 137 |
| Figure 5-8 Areas of archaeological potential within HAMU 9 | 141 |
| Figure 5-9 Historical Archaeological Management Units within the Annandale (around Pyrmont Bridge Road and Parramatta Road) project footprint..... | 142 |
| Figure 5-10 Areas of archaeological potential within HAMU 10..... | 145 |
| Figure 5-11 Areas of archaeological potential within HAMU 11..... | 147 |
| Figure 6-1 Haberfield/Ashfield project footprint (Option A and Option B) with heritage study area shown..... | 155 |
| Figure 6-2 Haberfield/Ashfield project footprint (Option A and Option B) with heritage study area shown..... | 156 |
| Figure 6-3 Leichhardt project footprint with heritage study area shown..... | 162 |
| Figure 6-4 Statutory heritage listings for heritage items in the vicinity of the Leichhardt study area . | 163 |
| Figure 6-5 Rozelle project footprint with Rozelle, Lilyfield and Annandale (Rozelle Rail Yards, The Crescent, Rozelle Bay and Victoria Road) heritage study area shown..... | 166 |
| Figure 6-6 Rozelle project footprint with heritage items and HCAs shown..... | 169 |
| Figure 6-7 Iron Cove project footprint with heritage study area shown (Source: Google Maps with GML overlay)..... | 195 |
| Figure 6-8 Iron Cove project footprint with heritage items shown..... | 196 |
| Figure 6-9 Project footprint at Annandale (around Pyrmont Bridge Road and Parramatta Road) with heritage study area shown..... | 202 |
| Figure 6-10 Statutory heritage listings for heritage items in the Annandale (around Pyrmont Bridge Road and Parramatta Road) study area..... | 203 |
| Figure 6-11 St Peters project footprint with heritage study area shown (Source: Google maps with GML overlay)..... | 210 |
| Figure 6-12 Statutory heritage listings for heritage items in the St Peters study area. | 211 |
| Figure 6-13 Statutory heritage listings for heritage items and conservation areas located above the tunnel alignment – Map 1..... | 226 |
| Figure 6-14 Statutory heritage listings for heritage items and conservation areas located above the tunnel alignment – Map 2..... | 227 |
| Figure 6-15 Statutory heritage listings for heritage items and conservation areas located above the tunnel alignment – Map 3..... | 228 |
| Figure 6-16 Statutory heritage listings for heritage items and conservation areas located above the tunnel alignment – Map 4..... | 229 |
| Figure 6-17 Statutory heritage listings for heritage items and conservation areas located above the tunnel alignment – Map 5..... | 230 |
| Figure 6-18 Statutory heritage listings for heritage items and conservation areas located above the tunnel alignment – Map 6..... | 231 |
| Figure 6-19 Statutory heritage listings for heritage items and conservation areas located above the tunnel alignment – Map 7..... | 232 |
| Figure 6-20 Statutory heritage listings for heritage items and conservation areas located above the tunnel alignment – Map 8..... | 233 |

Glossary of terms and abbreviations

| Term | Definition |
|--|---|
| AA | Archaeological assessment |
| AECOM | AECOM Australia Pty Ltd |
| Alignment | The geometric layout (eg of a road) in plan (horizontal) and elevation (vertical). |
| CBD | Central business district |
| CHL | Commonwealth Heritage List |
| CMP | Conservation management plan |
| Campbell Road civil and tunnel site | A construction ancillary facility for the M4-M5 Link project at St Peters |
| Concept design | Initial functional layout of a road/road system or other infrastructure. Used to facilitate understanding of a project, establish feasibility and provide basis for estimating and to determine further investigations needed for detailed design |
| Construction | Includes all physical work required to construct the project |
| Construction ancillary facilities | Temporary facilities during construction such as construction sites (civil and tunnel), sediment basins, temporary water treatment plants, precast yards and material stockpiles, laydown areas, parking, maintenance workshops and offices |
| Contributory item | Place within a Heritage Conservation Area that contributes to its heritage significance |
| CoS | City of Sydney |
| Cumulative impact | Impacts that, when considered together, have different and/or more substantial impacts than a single impact assessed on its own |
| Cut-and-cover | A method of tunnel construction whereby the structure is built in an open excavation and subsequently covered |
| Darley Road civil and tunnel site | A construction ancillary facility for the M4-M5 Link project located at Leichhardt |
| DCP | Development control plan |
| Detailed design | The phase of the project following concept design where the design is refined, and plans, specifications and estimates are produced, suitable for construction |
| DP&E | NSW Department of Planning and Environment |
| EIS | Environmental impact statement |
| Enabling works | Works which are required to enable the commencement of the main construction works |
| EP&A Act | <i>Environmental Protection and Assessment Act 1979 (NSW)</i> |
| EPBC Act | <i>Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)</i> |
| GML | GML Heritage Pty Ltd |
| Haberfield civil and tunnel site/Haberfield civil site | Construction ancillary facilities for the M4-M5 Link project located at Haberfield |
| HAMU | Historical archaeological management units |
| HARD | Historical archaeological research design |
| HCA | Heritage Conservation Area |
| Heritage Act | <i>Heritage Act 1977 (NSW)</i> |
| Heritage Council | Heritage Council of NSW |
| Heritage Division | NSW Heritage Division of the NSW Office of Environment and Heritage |
| Heritage item | Any place, building or object listed on a statutory heritage register |
| HIA/HIS | Heritage Impact Assessment/Heritage Impact Statement |
| Inner West subsurface interchange | A subsurface interchange at Leichhardt and Annandale that would link the mainline tunnels with the Rozelle interchange and the Iron Cove Link |

| Term | Definition |
|--|---|
| Intrusive item | Place within a Heritage Conservation Area that detracts from its heritage significance |
| Iron Cove Link | Around one kilometre of twin tunnels that would connect Victoria Road near the eastern abutment of Iron Cove Bridge and Anzac Bridge |
| Iron Cove Link civil site | A construction ancillary facility for the M4-M5 Link project located at Rozelle |
| LEP | Local environmental plan |
| LGA | Local government area |
| LPI | NSW Land and Property Information Office |
| M4 East | M4 East Motorway |
| Mainline tunnels | The M4-M5 Link mainline tunnels connecting with the M4 East at Haberfield and the New M5 at St Peters |
| National Trust Register | Register of the National Trust of Australia (NSW) |
| Neutral item | Place within a Heritage Conservation Area that does not contribute to or detract from its heritage significance |
| New M5 | A component of the WestConnex program of works. Located from Kingsgrove to St Peters (under construction) |
| NHL | National Heritage List |
| NLA | National Library of Australia |
| Northcote Street civil site | A construction ancillary facility for the M4-M5 Link project located at Haberfield |
| NPWS Act | <i>National Parks and Wildlife Act 1974 (NSW)</i> |
| NSW | <i>New South Wales</i> |
| OEH | NSW Office of Environment and Heritage |
| Parramatta Road East civil site | A construction ancillary facility for the M4-M5 Link project at Haberfield |
| Parramatta Road ventilation facility | A ventilation facility located on the south-eastern corner of the Parramatta Road / Wattle Street intersection (referred to as the Eastern ventilation facility in the M4 East project EIS). The facility is being built as part of the M4 East project. As part of the M4-M5 Link project, fitout works would be carried out on a section of this facility |
| Parramatta Road West civil and tunnel site | A construction ancillary facility for the M4-M5 Link project at Ashfield |
| Potential heritage item | Place identified in this report as potentially having heritage significance, which is not recognised on a heritage register |
| POM | Plan of Management |
| Project | A new multi-lane road link between the M4 East Motorway at Haberfield and the New M5 Motorway at St Peters. The project would also include an interchange at Lilyfield and Rozelle (the Rozelle interchange) and a tunnel connection between Anzac Bridge and Victoria Road, east of Iron Cove Bridge (Iron Cove Link). In addition, construction of tunnels, ramps and associated infrastructure to provide connections to the proposed future Western Harbour Tunnel and Beaches Link project would be carried out at the Rozelle interchange |
| Project footprint | The land required to construct and operate the project. This includes permanent operational infrastructure (including the tunnels), and land required temporarily for construction |
| Pymont Bridge Road tunnel site | A construction ancillary facility for the M4-M5 Link project at Annandale |
| REF | Review of Environmental Factors |
| Roads and Maritime | NSW Roads and Maritime Services |
| Rozelle civil and tunnel site | A construction ancillary facility for the M4-M5 Link project located at Lilyfield and Rozelle |
| Rozelle interchange | A new interchange at Lilyfield and Rozelle that would connect the M4-M5 Link mainline tunnels with City West Link, Anzac Bridge, the Iron Cove Link and the proposed future Western Harbour Tunnel and Beaches Link |

| Term | Definition |
|-------------------------------------|--|
| Rozelle Rail Yards | The Rozelle Rail Yards is bound by City West Link to the south, Lilyfield Road to the north, Balmain Road to the west, and White Bay to the east. Note that the project only occupies part of the Rozelle Rail Yards site |
| RTA | Former NSW Roads and Traffic Authority (now NSW Roads and Maritime Services) |
| S170 | State Agency Section 170 Heritage and Conservation Register. Section 170 of the <i>Heritage Act 1977</i> (NSW) requires NSW Government agencies to keep a register of heritage items/assets owned, occupied or managed by that government agency |
| SEARs | Secretary's Environmental Assessment Requirements. Requirements and specifications for an environmental assessment prepared by the Secretary of the Department of Planning and Environment under section 115Y of the <i>Environmental Planning and Assessment Act 1979</i> (NSW) |
| SHI | NSW State Heritage Inventory database |
| SHR | State Heritage Register |
| SLNSW | State Library of NSW |
| SMC | Sydney Motorway Corporation |
| SREP | Sydney Regional Environmental Plan |
| SREP SHC | Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005 |
| SREP 26 | Sydney Regional Environmental Plan No. 26 – City West |
| SSI | State significant infrastructure |
| St Peters interchange | A component of the New M5 project, located at the former Alexandria Landfill site at St Peters. Approved and under construction as part of the New M5 project. Additional construction works proposed as part of the M4-M5 Link project |
| The Crescent civil site | A construction ancillary facility for the M4-M5 Link project located at Annandale |
| Ventilation facility | Facility for the mechanical removal of air from the mainline tunnels, or mechanical introduction of air into the tunnels. May comprise one or more ventilation outlets |
| Ventilation outlet | The location and structure from which air within a tunnel is expelled |
| Victoria Road civil site | A construction ancillary facility for the M4-M5 Link project located at Rozelle |
| Wattle Street civil and tunnel site | A construction ancillary facility for the M4-M5 Link project located above and below ground along Wattle Street at Haberfield, between Parramatta Road and Ramsay Street |
| Wattle Street interchange | An interchange to connect Wattle Street (City West Link) with the M4 East and the M4-M5 Link tunnels. Approved and under construction as part of the M4 East project. Additional construction works proposed as part of the M4-M5 Link project |
| WestConnex program of works | A program of works that includes the M4 Widening, King Georges Road Interchange Upgrade, M4 East, New M5 and M4-M5 Link projects |

Executive summary

Background

GML Heritage Pty Ltd (GML) has been commissioned by NSW Roads and Maritime Services (Roads and Maritime) to prepare a non-Aboriginal heritage impact assessment (HIA) for the M4-M5 Link project (the project). This non-Aboriginal HIA has been prepared to inform the environmental impact statement (EIS) for the project.

Approval is being sought under Part 5.1 of the *Environmental Planning and Assessment Act 1979* (NSW) (EP&A Act) for the project. A request has been made for the NSW Minister for Planning to specifically declare the project to be State significant infrastructure and also critical State significant infrastructure. Revised Secretary's Environmental Assessment Requirements (SEARs) for the EIS were issued by the NSW Department of Planning and Environment (DP&E) on 3 May 2017. This HIA addresses the SEARs specific to non-Aboriginal heritage, including historical archaeology, as well as relevant agency comments received during the preparation of the SEARs.

Summary of findings

The report makes the following findings in relation to impacts of the project on the built and landscape heritage:

The project directly affects five listed heritage items across the study areas, which are:

- Demolition of three statutory heritage items of local heritage significance, being:
 - Stormwater canal at Rozelle
 - 'Cadden Le Messurier' at Rozelle
 - Former hotel at Rozelle
- Partial demolition of one statutory heritage item of local heritage significance, being the Whites Creek Stormwater Channel No. 95
- The project temporarily encroaches into the south western boundary of the curtilage of the White Bay Power Station which is a State Heritage Register (SHR) listed item. The minor encroachment occurs during the construction phase of the project as a result of the alignment of the temporary Victoria Road bridge. However, the works would be some distance from the Power Station building itself and the building would not be physically impacted by the project.

Twenty-one other statutory heritage items of State or local heritage significance and heritage conservation areas (HCAs) would be subject to indirect impacts through potential vibration, settlement and visual setting. The project also directly affects nine individual buildings/structures assessed as being potential local heritage items which would be fully demolished. One landscape feature assessed as being a potential local heritage item would be partially demolished, being the sandstone cutting at Rozelle Rail Yards.

One structure assessed as being a potential heritage item of State significance would be indirectly impacted through vibration which is the southern penstock associated with the White Bay Power Station. Six other individual buildings/structures assessed as being potential local heritage items would be subject to indirect impacts through potential vibration, settlement and visual setting.

Project context

The project is located within the Inner West (amalgamation of former Ashfield, Leichhardt and Marrickville local government areas (LGAs)) and City of Sydney LGAs. The HIA is structured around the following six areas that would be subject to surface impacts along the project corridor:

- Area 1 – Haberfield/Ashfield (Option A around Wattle Street and Option B around Alt Street and Bland Street)
- Area 2 – Leichhardt

- Area 3 – Rozelle and Lilyfield (Rozelle Rail Yards, The Crescent, Rozelle Bay and Victoria Road, excluding Iron Cove which comprises Area 4)
- Area 4 – Iron Cove (around Victoria Road)
- Area 5 – Annandale (around Pyrmont Bridge Road and Parramatta Road)
- Area 6 – St Peters.

The built heritage and landscape assessment has focused on a broader study area applied to each of these six areas, comprising an appropriate buffer surrounding the project footprint (the heritage study area). This is to ensure indirect impacts are appropriately assessed (ie visual impacts). This assessment has also included consideration of potential vibration and settlement impacts on heritage items and HCAs above underground works (ie mainline tunnel alignment).

The archaeological assessment has focused on the six areas outlined above to identify where key archaeological resources may exist and may be impacted by the project, including by tunnel entry and exit portals and associated infrastructure. As the driven tunnels would be generally located from 20 metres to greater than 65 metres below the ground these works would not have an impact on historical archaeological remains and have therefore not been considered further.

Built heritage and landscape

This HIA report makes findings regarding impacts of the project on built and landscape heritage within the study area. The following summaries include for each area:

- A description of the proposed works within the area
- An overview of identified heritage items including HCAs
- An overview of any potential heritage items identified
- A summary of the heritage impacts (direct or indirect) that arise from the project.

Area 1 – Haberfield/Ashfield (Option A around Wattle Street and Option B around Alt Street and Bland Street)

As identified in the WestConnex M4 East Non-Aboriginal Heritage Impact Assessment (GML 2015), Haberfield contains a high number of heritage items and an HCA listed on the Ashfield Local Environmental Plan 2013 (Ashfield LEP). Almost the entire suburb of Haberfield, from Dobroyd Canal (Iron Cove Creek) to Hawthorne Canal and northwest to Iron Cove, but excluding properties along Parramatta Road, is listed as a HCA of local significance on the Ashfield LEP and potential State significance.

Impacts associated with the demolition of heritage and contributory items within the Haberfield HCA, and construction of new motorway infrastructure (including the Parramatta Road ventilation facility) at Haberfield have already been assessed in the M4 East Non-Aboriginal Heritage Impact Assessment (GML 2015) for the M4 East project.

Within Area 1 – Haberfield/Ashfield, the M4-M5 Link project works are limited to connecting to the underground M4 East mainline tunnels, fitout of the dive structures and cut and cover tunnels at the Wattle Street interchange; and fitout of the Parramatta Road ventilation facility, which are all being constructed as part of the M4 East project, and some minor amendments to the surface road network.

The concept design considers two possible combinations for construction ancillary facilities around Haberfield and Ashfield. These are described and assessed in this EIS as Option A and Option B. The construction ancillary facilities that comprise these options have been grouped together and are denoted by the suffix *a* (for Option A) or *b* (for Option B) eg Wattle Street civil and tunnel site (C1a).

Option A at Haberfield for the M4-M5 Link project would use the Wattle Street civil and tunnel site (C1a), Haberfield civil and tunnel site (C2a) and Northcote Street civil site (C3a), currently being used by the M4 East project for construction of that project.

There are no additional property acquisitions or demolition of buildings in Haberfield as a result of Option A, nor were any new heritage assessments undertaken to identify potential items, as all items were previously identified and assessed as part of the M4 East project. The indirect and cumulative

impact on the Haberfield HCA from Option A of the M4-M5 Link project would primarily result from the extension of time associated with using the existing M4 East construction ancillary facilities for the M4-M5 Link project.

Option B at Haberfield/Ashfield for the M4-M5 Link project would require new construction ancillary facilities on the east and west sides of Parramatta Road, around the intersections of Alt Street and Bland Street. These would comprise the Parramatta Road West civil and tunnel site (C1b) and Parramatta Road East civil site (C3b) in addition to the Haberfield civil site (C2b) which is subject to the assessment undertaken in the M4 East project as explained above. The Parramatta Road sites are outside of the Haberfield HCA and were not specifically assessed as part of the M4 East project.

Construction work associated with the M4-M5 Link project at these sites would involve the demolition of existing commercial premises. Owing to the location, scale, type and temporary nature of construction activity at these new construction sites, no new statutory heritage items or conservation areas were identified as needing further impact assessment (additional to the assessment undertaken for the M4 East project and as part of Option A). However, additional heritage assessments were undertaken to identify potential heritage items within and in the vicinity of these new construction ancillary facilities (C1b and C3b).

The indirect and cumulative impact on the Haberfield HCA from Option B of the M4-M5 Link project would result from the expansion of the construction areas further east along Parramatta Road. This option would allow most of the M4 East construction ancillary facilities (aside from C2a/b) to be rehabilitated and delivery of the M4 East Urban Design Landscape Plan and Residual Land Management Plan to be delivered earlier.

There are also a number of potential heritage items of local significance which would be subject to indirect impacts through potential vibration, settlement and visual setting. The assessment identifies a neutral impact on these potential heritage items.

Area 2 – Leichhardt

Within Area 2 – Leichhardt, the project would use a site at Darley Road as a civil and tunnel site (C4). This site is adjacent to the Leichhardt (Charles Street) Underbridge which is a heritage item listed under RailCorp's State Agency Section 170 Heritage and Conservation Register (S170 Register) under the *Heritage Act 1977*. The bridge would be subject to minor and temporary indirect (setting and vibration) impacts as a result of the adjacent site being demolished and used for tunnelling.

No buildings within the study area were identified as potential heritage items therefore no heritage assessments were required.

Area 3 – Rozelle, Lilyfield and Annandale (Rozelle Rail Yards, The Crescent, Rozelle Bay and Victoria Road)

Within Area 3 – Rozelle and Lilyfield, the project would comprise the establishment of the Rozelle civil and tunnel site, The Crescent civil site, Victoria Road civil site and the construction of the Rozelle interchange, and local street upgrades/works. Heritage items in the Rozelle, Lilyfield and Annandale study area are listed under the Leichhardt LEP, the Sydney Regional Environmental Plan No. 26 – City West (SREP 26), State heritage register and S170 registers.

The Rozelle interchange would be constructed within and around the Rozelle Rail Yards with underground connections from the Rozelle interchange north to the Iron Cove Link and the proposed future Western Harbour Tunnel and Beaches Link, east to Victoria Road and Anzac Bridge, south to the connecting tunnels towards Haberfield/Ashfield and surface connections which link to City West Link and Johnston Street in Annandale. Some tunnel portals and dive structures would be visible from within the Rozelle Rail Yards, as well as a ventilation facility and outlets, and other associated motorway infrastructure. The project includes the construction of connections into the proposed future Western Harbour Tunnel and Beaches Link project, which is subject to separate planning, assessment and approval.

The project also includes modifications to The Crescent and City West Link (including widening, re-alignment and creation of a new left turn lane onto the City West Link) which would necessitate the encroachment into Buruwan Park, removal of existing vegetation and a new/extended bridge over the Whites Creek Stormwater Channel No. 95, and the reshaping of the land immediately to the south of

Whites Creek to increase capacity of the channel and mitigate flood impacts. The project also includes modifications to The Crescent and Johnston Street (for the creation of an additional right turn lane onto Johnston Street) which would necessitate the widening of Johnson Street, realignment of footpath, kerb/guttering, drainage and utilities, and relocation of traffic lights and signage, closer to the piers of the Annandale (Johnston Street) underbridge.

Within the Rozelle and Lilyfield area, the project would result in the full or partial demolition of four statutory heritage items for the construction of the Rozelle interchange and associated works. Direct physical impacts would result from new motorway infrastructure, including ventilation and motorway facilities and the loss or reduction of significant streetscapes. Temporary visual impacts would also result from the establishment of the construction ancillary facilities (Rozelle civil and tunnel site (C5), The Crescent civil site (C6) and Victoria Road civil site (C7).

The project temporarily encroaches into the south western boundary of the curtilage of the White Bay Power Station which is a State Heritage Register (SHR) listed item. The minor encroachment occurs during the construction phase of the project as a result of the alignment of the temporary Victoria Road bridge. However, the works would be some distance from the Power Station building itself and the building would not be physically impacted by the project.

There are also a number of potential heritage items of local significance which would be subject to direct (full or partial demolition) or indirect impacts (potential vibration).

Rozelle Rail Yards site management works

Roads and Maritime has undertaken an assessment under Part 5 of the *Environmental Planning and Assessment Act 1979* (NSW) (EP&A Act) for a suite of site management works on part of the Rozelle Rail Yards. These works would remove rail and rail related infrastructure from the site and allow existing issues at the site such as waste and noxious weeds to be appropriately managed. Key features of the works relevant to this HIA include removal of existing above ground rail infrastructure including gantries, railway lines, ballast, sleeps and buildings (excluding the southern penstock, switching station, transformer and rail infrastructure to the east of the Victoria Road bridge) generally to a depth of 500 millimetres below ground level, except where drainage channels and sediment basins are required. The site management works were assessed in a review of environmental factors (REF) which was approved by Roads and Maritime under Part 5 of the EP&A Act on 10 April 2017.

As part of the REF, a HIA was prepared for the site management works (Rozelle Rail Yards Heritage Impact Assessment (GML 2016), which noted:

The assessment concluded that the most notable impact is to the role that the rail yards has within a broader network of Sydney industrial and freight sites, known as the 'goods lines'. Although successively fragmented, the network still offers a contribution to the local historic landscape, industrial and maritime history and working class character of the area. With regard to heritage impacts on individual items the proposal has been found to have neutral/no impact in the majority of cases. What little impact has been identified is able to be mitigated through a few simple measures.

No listed heritage items are being demolished as part of the site management works. However, the REF HIA identified a number of items of potential local heritage significance in and around the Rozelle Rail Yards site. Some of these items are being demolished as part of the site management works, being a lighting tower and Port Authority building. Mitigation measures including archival recordings of these items and salvage and storage of the lighting tower and rail gantries for potential reuse in future development of the Rozelle Rail Yards were recommended in the REF. These works have commenced. The works do not form part of the M4-M5 Link project and are therefore not assessed as part of this HIA.

Additional items of potential local heritage significance, including the Victoria Road bridge and sandstone cuttings on the northern side of the Rozelle Rail Yards were also identified in the REF HIA and are not directly impacted during the site management works. However, the M4-M5 Link project proposes to demolish the Victoria Road bridge and parts of the sandstone cuttings. This is discussed in **section 6.7.5** of this report.

Area 4 – Iron Cove (around Victoria Road)

Within Area 4 – Iron Cove, the M4-M5 Link project would comprise construction of a connection between the new Rozelle interchange and Victoria Road at the eastern abutment of Iron Cove Bridge (the Iron Cove Link). This necessitates the realignment, widening and resurfacing of Victoria Road. A bioretention facility and car park improvement works are also proposed within King George Park at Rozelle (adjacent to Manning Street).

In this location, construction of the project would result in the demolition of six potential heritage items. No listed heritage items are proposed to be demolished, however two listed heritage items would be indirectly impacted (setting, vibration) from construction activities.

There are also a number of potential heritage items of local significance which would be subject to direct (full demolition) or indirect impacts (potential vibration, setting).

Area 5 – Annandale (around Pyrmont Bridge Road and Parramatta Road)

Within Area 5 – Annandale, the M4-M5 Link project comprises the Pyrmont Bridge Road tunnel site (C9) and associated tunnelling for the Inner West subsurface interchange. In this location, the project would result in the demolition of a potential heritage item (former Bank of NSW). No listed heritage items are proposed to be demolished, however four listed heritage items will be indirectly impacted (setting, vibration) from construction activities.

Area 6 – St Peters

As identified in the New M5 Non-Aboriginal Heritage Impact Assessment (AECOM 2015), St Peters contains a number of heritage items listed on the Sydney Local Environmental Plan 2012 (Sydney LEP) and Marrickville Local Environmental Plan 2011 (Marrickville LEP). Impacts associated with the demolition of heritage and contributory items, resulting from construction of new motorway infrastructure have already been assessed in the New M5 Non-Aboriginal Heritage Impact Assessment (AECOM 2015).

Within Area 6 – St Peters, the project links the St Peters interchange to the M4-M5 Link mainline tunnel entries, and construction of aboveground links to Euston Road, Gardeners Road, Sydney Airport and Port Botany. The project footprint for M4-M5 Link coincides directly with that of the New M5 project.

There would be negligible additional heritage impacts as the result of the construction of a new ventilation facility and construction works at the St Peters interchange. No buildings within Area 6 were identified as potential heritage items therefore no heritage assessments were required.

Ground movement

Heritage items, potential heritage items and HCAs along the tunnel alignment and in the vicinity of construction works may be subject to ground movement (predominantly settlement and vibration caused by the works) during construction. Areas most likely to be affected by settlement are usually where tunnelling is closest to the ground surface (shallowest), around the tunnel portals and on and off-ramps. Settlement impacts vary based on the type of construction activity, ground conditions and the condition of property.

The alignment of the tunnels and the locations of tunnel portals have given regard to maximising the use of the best possible geotechnical conditions. As the driven tunnels would be generally located from 20 metres to greater than 65 metres below the ground these works would not have an impact on historical archaeological remains and have therefore not been considered further.

Potential vibration impacts to heritage items have been assessed, with 11 listed heritage items located within safe working distances of the project that may experience vibration impacts. These items would be managed in accordance with the recommendations of the noise and vibration assessment undertaken for the project (**Appendix J** (Technical working paper: Noise and vibration) of the EIS). Appropriate monitoring and protection of the physical fabric of heritage items to be retained would be undertaken during construction of the project.

Ground movement caused by groundwater drawdown and tunnel-induced movement could also have impacts on heritage items. The groundwater impact assessment undertaken for the project (refer to

Appendix T (Technical working paper: Groundwater) of the EIS determined that small scale dewatering of the alluvium and Hawkesbury Sandstone may be required during construction. This could result in an increase in effective stress, leading to ground settlement. Movement in clay soils between hydrogeological units would cause settlement, which may continue over a long period of time.

Although the groundwater assessment has predicted groundwater drawdown within the alluvium and Botany Sands, it is not considered appropriate to use these regional results to calculate localised ground settlement. The model is a regional groundwater model and is not considered appropriate for use in estimating groundwater induced settlement at a more localised level. A geotechnical model of representative geological and groundwater conditions would be prepared by the construction contractor prior to excavation and tunnelling for the project.

Potential ground movement impacts should be managed in accordance with the relevant mitigation measures for vibration impacts detailed in the EIS, such as undertaking condition surveys prior to construction works commencing and settlement monitoring.

Historical archaeology

This HIA has assessed historical archaeology across the project footprint, allocating Historic Archaeology Management Units (HAMU) to each heritage area according to historical phases, archaeological potential, past construction activities, proposed impacts and management requirements. There are 11 HAMUs located across four of the heritage study areas – one in Area 1 (Haberfield/Ashfield), one in Area 2 (Leichhardt), five in Area 3 (Rozelle), two in Area 4 (Iron Cove) and two in Area 5 (Annandale). The archaeological potential and significance of the study area at Haberfield/Ashfield (within Area 1) and St Peters (within Area 6) have been previously assessed under the M4 East project and New M5 project, respectively, and have therefore not been considered further in this HIA.

The significance of HAMUs which retain archaeological potential are rated as being of local significance only, with the exception of the White Bay Power Station, where the archaeology is of state significance as a contributory element. The identified level of significance for areas of archaeological potential will influence the degree of impact that may be acceptable or the level of investigation and recording that may be required. Consequently, the management guidelines and recommendations have been formulated in accordance with the heritage significance of the potential archaeological resources.

Two HAMUs in Rozelle (HAMU 3 and HAMU 6), one in Iron Cove (HAMU 9) and two in Annandale (HAMU 10 and 11) with locally significant remains will be impacted by the project. The project is likely to have minor to major adverse impacts on the potential historical archaeological resource, dependent upon the nature and integrity of the archaeological remains, and the location and nature of the proposed works in each area.

Based on the detailed design and construction planning, a Historical Archaeological Research Design (HARD) will be prepared before the start of proposed works within identified HAMUs where potential for locally or State significant archaeology has been identified. The HARD would define the methodology and scope for any archaeological investigation required, and be prepared in consultation with NSW Heritage Council.

For this project, archaeological test excavation is considered unlikely to alter the outcome of the assessment in terms of identifying previously unknown and unassessed archaeological relics, and is not recommended at this stage.

Cumulative heritage impacts

The design intent of M4-M5 Link was to place as much infrastructure below ground to avoid and minimise impacts across the project. However, the project would contribute to the overall heritage impacts from the preceding components of WestConnex including the M4 Widening and King Georges Road Interchange Upgrade (both completed construction and open to traffic) and the M4 East and New M5 (both under construction). These projects have collectively resulted in widespread change to the urban fabric of greater metropolitan Sydney, including to items and areas of heritage significance.

Table E-1-1 Overall heritage impacts of WestConnex projects

| WestConnex project | Overall heritage impact ranking |
|---------------------------------------|---------------------------------|
| New M5 | Moderate adverse |
| King Georges Road Interchange Upgrade | Nil |
| M4 Widening | Nil |
| M4 East | Major adverse |
| M4-M5 Link | Moderate adverse |

The overall cumulative impacts of the WestConnex program of works to date on heritage items can be described as major and irreversible given the scale of the construction project. It has had a substantial impact by severing and eroding the legibility of a large part of the Haberfield HCA (which was identified as being of potential State significance); it has removed evidence of subdivision layouts, modest Federation domestic architecture and estate landscaping (gardens, fences and tree lined streets). Elsewhere, the demolition of locally significant heritage items (including the Rudders Bond Store) incrementally diminishes the early and mid-twentieth century industrial building stock from the southern and inner west suburbs of Sydney. However, it should also be recognised that the cumulative impact to heritage has been dramatically reduced by tunnelling and through the site selection process for construction areas.

Further impacts to heritage from the M4-M5 Link project have also been avoided through:

- Design and refinement of the Rozelle interchange
- Avoiding heritage items such as Easton Park, the Sewage Pumping Station No.6, the former State Rail Authority (SRA) cable store and traffic office at Leichhardt
- Retaining important elements of the White Bay Power Station site
- Avoiding impacts to heritage items and HCAs at Camperdown.

The site management works and M4–M5 Link works in the Rozelle Rail Yards would permanently remove evidence of a significant period of rail infrastructure within a broader network of Sydney industrial and freight sites, known as the goods lines, as well as the distinct industrial landscape. However, the M4-M5 Link project will reuse and incorporate heritage elements from some of the items removed during the site management works in the urban design and landscape plan for Rozelle, acknowledging heritage themes and interpretation of impacted sites.

Management of impacts

The detailed design and construction of the project would be managed to ensure, as far as possible, that the identified potential heritage and archaeological impacts are minimised and/or avoided by implementation of a range of general and specific measures. **Chapter 8** of this HIA proposes a range of mitigation measures to avoid, reduce and manage identified potential impacts to non-Aboriginal heritage. These measures would be further developed on a case by case basis during detailed design. The final management measures would be documented in the Construction Heritage Management Plan.

The mitigation measures would include, but is not limited to:

- Preparation of a Construction Heritage Management Plan which would include a HARD
- Preparation and implementation of an interpretation plan
- Undertaking of photographic archival recordings
- Salvaging of historic fabric and features from properties to be demolished
- Managing of potential vibration and settlement impacts
- Implementation of an unexpected finds procedure.

Chapter 8 of the HIA also proposes a range of mitigation measures to avoid and/or minimise impacts on specific heritage items including White Bay Power Station, Hornsey Street HCA and the Whites Creek Stormwater Channel No. 95. The detailed design and construction of the project would need to be managed to ensure that, as far as possible, the identified potential heritage and archaeological impacts are minimised and/or avoided.

1 Introduction

NSW Roads and Maritime Services (Roads and Maritime) is seeking approval to construct and operate the WestConnex M4-M5 Link (the project), which would comprise a new multi-lane road link between the M4 East Motorway at Haberfield and the New M5 Motorway at St Peters. The project would also include an interchange at Lilyfield and Rozelle (the Rozelle interchange) and a tunnel connection between Anzac Bridge and Victoria Road, east of Iron Cove Bridge (Iron Cove Link). In addition, construction of tunnels, ramps and associated infrastructure to provide connections to the proposed future Western Harbour Tunnel and Beaches Link project would be carried out at the Rozelle interchange.

Together with the other components of the WestConnex program of works and the proposed future Sydney Gateway, the project would facilitate improved connections between western Sydney, Sydney Airport and Port Botany and south and south-western Sydney, as well as better connectivity between the important economic centres along Sydney's Global Economic Corridor and local communities.

Approval is being sought under Part 5.1 of the *Environmental Planning and Assessment Act 1979* (NSW) (EP&A Act) for the project. A request has been made for the NSW Minister for Planning to specifically declare the project to be State significant infrastructure and also critical State significant infrastructure. An environmental impact statement (EIS) is therefore required.

1.1 Overview of WestConnex and related projects

The M4-M5 Link is part of the WestConnex program of works. Separate planning applications and assessments have been completed for each of the approved WestConnex projects. Roads and Maritime has commissioned Sydney Motorway Corporation (SMC) to deliver WestConnex, on behalf of the NSW Government. However, Roads and Maritime is the proponent for the project.

In addition to linking to other WestConnex projects, the M4-M5 Link would provide connections to the proposed future Western Harbour Tunnel and Beaches Link, the Sydney Gateway (via the St Peters interchange) and the F6 Extension (via the New M5).

The WestConnex program of works, as well as related projects, are shown in **Figure 1-1** and described in **Table 1-1**.

Table 1-1 WestConnex and related projects

| Project | Description | Status |
|---------------------------------------|---|--|
| WestConnex program of works | | |
| M4 Widening | Widening of the existing M4 Motorway from Parramatta to Homebush. | Planning approval under the EP&A Act granted on 21 December 2014. Open to traffic. |
| M4 East | Extension of the M4 Motorway in tunnels between Homebush and Haberfield via Concord. Includes provision for a future connection to the M4-M5 Link at the Wattle Street interchange. | Planning approval under the EP&A Act granted on 11 February 2016. Under construction. |
| King Georges Road Interchange Upgrade | Upgrade of the King Georges Road interchange between the M5 West and the M5 East at Beverly Hills, in preparation for the New M5 project. | Planning approval under the EP&A Act granted on 3 March 2015. Open to traffic. |

| Project | Description | Status |
|---|--|---|
| New M5 | Duplication of the M5 East from King Georges Road in Beverly Hills with tunnels from Kingsgrove to a new interchange at St Peters. The St Peters interchange allows for connections to the proposed future Sydney Gateway project and an underground connection to the M4-M5 Link. The New M5 tunnels also include provision for a future connection to the proposed future F6 Extension. | Planning approval under the EP&A Act granted on 20 April 2016. Commonwealth approval under the <i>Environment Protection and Biodiversity Conservation Act 1999</i> (Commonwealth) granted on 11 July 2016. Under construction. |
| M4-M5 Link (the project) | Tunnels connecting to the M4 East at Haberfield (via the Wattle Street interchange) and the New M5 at St Peters (via the St Peters interchange), a new interchange at Rozelle and a link to Victoria Road (the Iron Cove Link). The Rozelle interchange also includes ramps and tunnels for connections to the proposed future Western Harbour Tunnel and Beaches Link project. | The subject of this EIS. |
| Related projects | | |
| Sydney Gateway | A high-capacity connection between the St Peters interchange (under construction as part of the New M5 project) and the Sydney Airport and Port Botany precinct. | Planning underway by Roads and Maritime and subject to separate environmental assessment and approval. |
| Western Harbour Tunnel and Beaches Link | The Western Harbour Tunnel component would connect to the M4-M5 Link at the Rozelle interchange, cross underneath Sydney Harbour between the Birchgrove and Waverton areas, and connect with the Warringah Freeway at North Sydney. The Beaches Link component would comprise a tunnel that would connect to the Warringah Freeway, cross underneath Middle Harbour and connect with the Burnt Bridge Creek Deviation at Balgowlah and Wakehurst Parkway at Seaforth. It would also involve the duplication of the Wakehurst Parkway between Seaforth and Frenchs Forest. | Planning underway by Roads and Maritime and subject to separate environmental assessment and approval. |
| F6 Extension | A proposed motorway link between the New M5 at Arncliffe and the existing M1 Princes Highway at Loftus, generally along the alignment known as the F6 corridor. | Planning underway by Roads and Maritime and subject to separate environmental assessment and approval. |

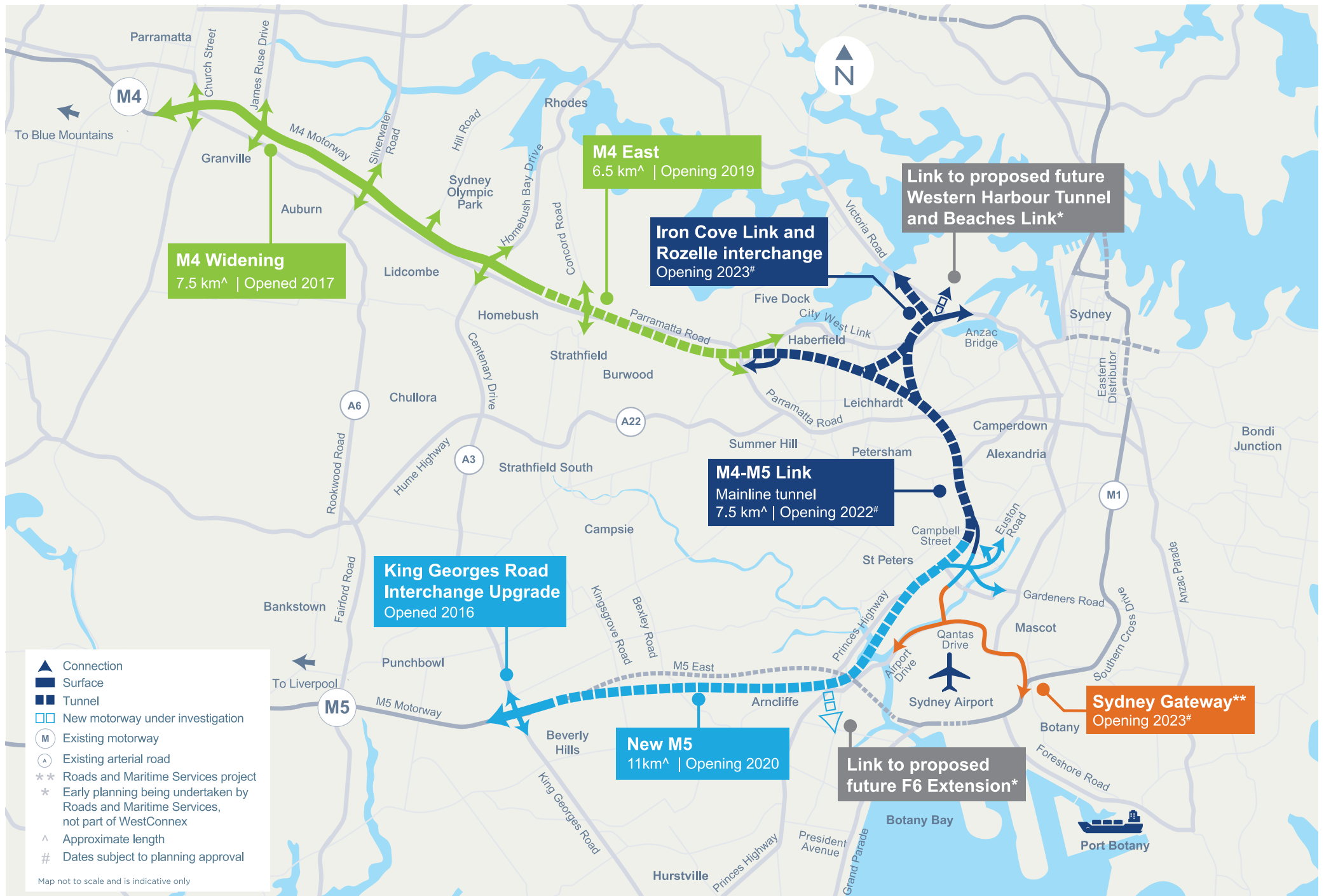


Figure 1-1 Overview of WestConnex and related projects

1.2 Purpose of this report

The NSW Department of Planning and Environment (DP&E) has issued revised Secretary's Environmental Assessment Requirements (SEARs) for the project on 3 May 2017 that inform the EIS. The purpose of this non-Aboriginal heritage impact assessment (HIA) report is to assess the non-Aboriginal heritage impacts of the M4-M5 Link project in response to the revised SEARs.

In particular, the report addresses the heritage impacts of the project on listed heritage items, potential heritage items, and areas of State and local heritage significance and outlines the proposed mitigation and management measures, including an evaluation of the effectiveness of the mitigation measures. There are no heritage items listed on the National or World heritage items in the immediate vicinity of the project footprint. In addition, this report provides an overview of the historical archaeological potential in areas where ground disturbance is proposed and establishes a set of mitigation measures for the management of any impacts on potential or known significant archaeological resources.

1.3 SEARs and Agency comments

Table 1-2 displays the SEARs that are specific to heritage, and also provides a cross reference to the relevant section(s) of this report that address these requirements. Agency comments that are specific to heritage are referenced in **Table 1-3**.

Table 1-2 Relevant SEARs addressed in this report

| SEARs (issued 3 May 2017) | | |
|--|---|---|
| 14. Heritage | | |
| Key Issue and Desired Performance Outcome | | |
| <p>The design, construction and operation of the project facilitates, to the greatest extent possible, the long term protection, conservation and management of the heritage significance of items of environmental heritage and Aboriginal objects and places.</p> <p>The design, construction and operation of the project avoids or minimises impacts, to the greatest extent possible, on the heritage significance of environmental heritage and Aboriginal objects and places.</p> | | |
| Requirement | Section where Addressed in EIS | Current Guidelines |
| 1. The Proponent must identify and assess any direct and/or indirect impacts (including cumulative impacts) to the heritage significance of listed heritage items inclusive of: | Refer to Chapter 21 (Aboriginal heritage) and Appendix V (Technical working paper: Aboriginal heritage) of the EIS. | <i>Guide to investigating, assessing and reporting on Aboriginal Cultural Heritage in NSW</i> (NSW Office of Environment and Heritage (OEH) 2011) |
| (a) Aboriginal places and objects, as defined under the <i>National Parks and Wildlife Act 1974</i> and in accordance with the principles and methods of assessment identified in the current guidelines; | | <i>Aboriginal Cultural Heritage Consultation requirements for proponents</i> (Department of Environment Climate Change and Water (DECCW) 2010) |
| (b) Aboriginal places of heritage significance, as defined in the Standard Instrument–Principal Local Environmental Plan; | Refer to Chapter 21 (Aboriginal heritage) and Appendix V (Technical working paper: Aboriginal heritage) of the EIS. | <i>Code of practice for archaeological investigation of Aboriginal objects in NSW</i> (DECCW 2010) |
| (c) environmental heritage, as defined under the <i>Heritage Act 1977</i> (including potential items of heritage value, conservation areas, built heritage landscapes and archaeology); | Chapter 5 and 6 of this report | <i>NSW Skeletal Remains: Guidelines for</i> |

SEARs (issued 3 May 2017)

14. Heritage

| | | |
|---|--|---|
| (d) items listed on the National and World Heritage lists; and | There are no heritage items listed on the National or World heritage items in the immediate vicinity of the study area. Chapter 6 of this report | <i>Management of Human Remains</i> (Heritage Office 1998) Aboriginal site recording form |
| (e) heritage items and conservation areas identified in local and regional planning environmental instruments covering the project footprint. | Chapter 6 of this report | Aboriginal site impact recording form Aboriginal Heritage Information Management System site registration form |
| 2. Where impacts to State or locally significant heritage items are identified, the assessment must: (a) include a significance assessment and statement of heritage impact for all heritage items (including any unlisted places that are assessed of heritage value); | Chapter 6 of this report | Care agreement application form Criteria for the assessment of excavation directors (NSW Heritage Council 2011) |
| (b) provide a discussion of alternative locations and design options that have been considered to reduce heritage impacts; | Chapter 3 of this report | <i>NSW Heritage Manual</i> (Heritage Office and Department of Urban Affairs and Planning 1994) |
| (c) in areas identified as having potential archaeological significance, undertake a comprehensive archaeological assessment in line with Heritage Council guidelines which includes a methodology and research design to assess the impact of the works on the potential archaeological resource and to guide physical archaeological test excavations and include the results of these excavations; | Chapter 5 of this report | <i>Assessing Heritage Significance</i> (NSW Heritage Office 2001) <i>The Australia ICOMOS Burra Charter</i> (2013 edition) |
| (d) consider impacts to the item of significance caused by, but not limited to, vibration, demolition, archaeological disturbance, altered historical arrangements and access, increased traffic, visual amenity, landscape and vistas, curtilage, subsidence and architectural noise treatment (as relevant); | Chapter 6 of this report | |
| (e) provide a comparative analysis to inform the rarity and representative value of any heritage places proposed for demolition; | Chapter 6 of this report | |
| (f) outline measures to avoid and minimise those impacts in accordance with the current guidelines; and | Chapter 8 of this report | |

SEARs (issued 3 May 2017)

14. Heritage

| | | |
|---|---|--|
| (g) be undertaken by a suitably qualified heritage consultant(s) (note: where archaeological excavations are proposed the relevant consultant must meet the NSW Heritage Council's Excavation Director criteria). | This Non-Aboriginal HIA has been prepared by suitable qualified heritage consultants; GML Heritage Pty Ltd. Authors are listed in section 3.11 . | |
| 3. Where archaeological investigations of Aboriginal objects are proposed these must be conducted by a suitably qualified archaeologist, in accordance with section 1.6 of the Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW (DECCW 2010). | Refer to Chapter 21 (Aboriginal heritage) and Appendix V (Technical working paper: Aboriginal heritage) of this EIS. | |
| 4. Where impacts to Aboriginal objects and/or places are proposed, consultation must be undertaken with Aboriginal people in accordance with the current guidelines. | Refer to Chapter 21 (Aboriginal Heritage) and Appendix V (Technical working paper: Aboriginal heritage) of this EIS. | |

Table 1-3 Relevant agency comments addressed in this report

Agency letters

Heritage Council

| Requirement | Section where addressed in report |
|---|-------------------------------------|
| <ul style="list-style-type: none"> It is noted that the Iron Cove Link involves surface works in the location of White Bay Power Station, which is listed on the State Heritage Register, and also contains various local heritage items, landscape items and conservation areas. It is understood and methods to reduce any impacts to these places will be addressed throughout the detailed design and in the Environmental Impact Statement. | Section 6.7.4 of this report |
| <ul style="list-style-type: none"> The amended design provides further detail on the project, however does not trigger the need for any SEARs in addition to those previously requested by the Heritage Council on 19 February 2016. It is therefore requested that the recommended SEARs provided by the Heritage Council on 19 February 2016 are considered relevant to this amended design. | Noted |

Sydney Water

| Requirement | Section where addressed in report |
|---|-------------------------------------|
| <ul style="list-style-type: none"> The proponent must assess the impact of the proposed development on existing Sydney Water infrastructure. If the proposed development impacts on Sydney Water infrastructure the proponent may need to complete an options assessment to determine the optimal solution for relocation or deviation of Sydney Water's infrastructure. | Section 6.7.4 of this report |

| Agency letters | |
|---|---|
| Ashfield Council | |
| Requirement | Section where addressed in report |
| <ul style="list-style-type: none"> The SEARs should also specify a requirement for the EIS to address cumulative impacts of the proposal across all major issues – traffic, noise, vibration, social, health, visual, heritage, biodiversity, environmental, climate change, flooding, water quality, etc. | Chapter 7 of this report |
| City of Sydney | |
| Requirement | Section where addressed in report |
| <ul style="list-style-type: none"> The heritage impact assessment should be undertaken for all State and locally listed heritage items and heritage conservation areas identified in Schedule 5 of Sydney Local Environmental Plan 2012 that may be impacted by the project. These items and conservation areas include (but not limited to): <ul style="list-style-type: none"> a) heritage items within the Royal Prince Alfred Hospital site(s); b) heritage items within the Sydney University site(s) including Victoria Park; c) University of Sydney Heritage Conservation Area (C5), Chippendale Heritage Conservation Area (C9), Bishopthorpe Heritage Conservation Area (C27), Glebe Point Road Heritage Conservation Area (C29), Hereford and Forest Lodge Heritage Conservation Area (C33) and Mountain Street Heritage Conservation Area (C68). | Section 6.9 of this report, though the specified heritage items and HCAs are no longer being impacted by the project |
| <ul style="list-style-type: none"> The Proponent must consult directly with the City of Sydney for any proposed works to Parramatta Road and Broadway (including the intersection of Broadway and City Road) that may impact adjacent heritage items. | Work is no longer proposed at the intersection of Broadway and City Road. Works at Pyrmont Bridge Road/Parramatta Road are addressed at section 6.9 of this report |
| <ul style="list-style-type: none"> The Proponent must consult directly with the City of Sydney to determine any items identified for potential future heritage listing that may be impacted by the project. | Section 6.9.2 of this report |
| <ul style="list-style-type: none"> The Proponent must assess the visual impact of the project and any ancillary infrastructure on: <ul style="list-style-type: none"> a) views and vistas; b) streetscapes, key sites and buildings; c) heritage items including Aboriginal places and environmental heritage; d) heritage conservation areas; and e) the local community. | Sections 6.9.3 and 6.9.4 of this report |

2 The project

2.1 Project location

The project would be generally located within the City of Sydney and Inner West local government areas (LGAs). The project is located about two to seven kilometres south, southwest and west of the Sydney central business district (CBD) and would cross the suburbs of Ashfield, Haberfield, Leichhardt, Lilyfield, Rozelle, Annandale, Stanmore, Camperdown, Newtown and St Peters. The local context of the project is shown in **Figure 2-1**.

2.2 Project features

Key components of the project are shown in **Figure 2-1** and would include:

- Twin mainline motorway tunnels between the M4 East at Haberfield and the New M5 at St Peters. Each tunnel would be around 7.5 kilometres long and would generally accommodate up to four lanes of traffic in each direction
- Connections of the mainline tunnels to the M4 East project, comprising:
 - A tunnel-to-tunnel connection to the M4 East mainline stub tunnels east of Parramatta Road near Alt Street at Haberfield
 - Entry and exit ramp connections between the mainline tunnels and the Wattle Street interchange at Haberfield (which is currently being constructed as part of the M4 East project)
 - Minor physical integration works with the surface road network at the Wattle Street interchange including road pavement and line marking
- Connections of the mainline tunnels to the New M5 project, comprising:
 - A tunnel-to-tunnel connection to the New M5 mainline stub tunnels north of the Princes Highway near the intersection of Mary Street and Bakers Lane at St Peters
 - Entry and exit ramp connections between the mainline tunnels and the St Peters interchange at St Peters (which is currently being constructed as part of the New M5 project)
 - Minor physical integration works with the surface road network at the St Peters interchange including road pavement and line marking
- An underground interchange at Leichhardt and Annandale (the Inner West subsurface interchange) that would link the mainline tunnels with the Rozelle interchange and the Iron Cove Link (see below)
- A new interchange at Lilyfield and Rozelle (the Rozelle interchange) that would connect the M4-M5 Link mainline tunnels with:
 - City West Link
 - Anzac Bridge
 - The Iron Cove Link (see below)
 - The proposed future Western Harbour Tunnel and Beaches Link
- Construction of connections to the proposed future Western Harbour Tunnel and Beaches Link project as part of the Rozelle interchange, including:
 - Tunnels that would allow for underground mainline connections between the M4 East and New M5 motorways and the proposed future Western Harbour Tunnel and Beaches Link (via the M4-M5 Link mainline tunnels)
 - A dive structure and tunnel portals within the Rozelle Rail Yards, north of the City West Link / The Crescent intersection
 - Entry and exit ramps that would extend north underground from the tunnel portals in the

Rozelle Rail Yards to join the mainline connections to the proposed future Western Harbour Tunnel and Beaches Link

- A ventilation outlet and ancillary facilities as part of the Rozelle ventilation facility (see below)
- Twin tunnels that would connect Victoria Road near the eastern abutment of Iron Cove Bridge and Anzac Bridge (the Iron Cove Link). Underground entry and exit ramps would also provide a tunnel connection between the Iron Cove Link and the New M5 / St Peters interchange (via the M4-M5 Link mainline tunnels)
- The Rozelle surface works, including:
 - Realigning The Crescent at Annandale, including a new bridge over Whites Creek and modifications to the intersection with City West Link
 - A new intersection on City West Link around 300 metres west of the realigned position of The Crescent, which would provide a connection to and from the New M5/St Peters interchange (via the M4-M5 Link mainline tunnels)
 - Widening and improvement works to the channel and bank of Whites Creek between the light rail bridge and Rozelle Bay at Annandale, to manage flooding and drainage for the surface road network
 - Reconstructing the intersection of The Crescent and Victoria Road at Rozelle, including construction of a new bridge at Victoria Road
 - New and upgraded pedestrian and cyclist infrastructure
 - Landscaping, including the provision of new open space within the Rozelle Rail Yards
- The Iron Cove Link surface works, including:
 - Dive structures and tunnel portals between the westbound and eastbound Victoria Road carriageways, to connect Victoria Road east of Iron Cove Bridge with the Iron Cove Link
 - Realignment of the westbound (southern) carriageway of Victoria Road between Springside Street and the eastern abutment of Iron Cove Bridge
 - Modifications to the existing intersections between Victoria Road and Terry, Clubb, Toelle and Callan streets
 - Landscaping and the establishment of pedestrian and cycle infrastructure
- Five motorway operations complexes; one at Leichhardt (MOC1), three at Rozelle (Rozelle West (MOC2), Rozelle East (MOC3) and Iron Cove Link (MOC4)), and one at St Peters (MOC5). The types of facilities that would be contained within the motorway operations complexes would include substations, water treatment plants, ventilation facilities and outlets, offices, on-site storage and parking for employees
- Tunnel ventilation systems, including ventilation supply and exhaust facilities, axial fans, ventilation outlets and ventilation tunnels
- Three new ventilation facilities, including:
 - The Rozelle ventilation facility at Rozelle
 - The Iron Cove Link ventilation facility at Rozelle
 - The Campbell Road ventilation facility at St Peters
- Fitout (mechanical and electrical) of part of the Parramatta Road ventilation facility at Haberfield (which is currently being constructed as part of M4 East project) for use by the M4-M5 Link project
- Drainage infrastructure to collect surface and groundwater for treatment at dedicated facilities. Water treatment would occur at
 - Two operational water treatment facilities (at Leichhardt and Rozelle)
 - The constructed wetland within the Rozelle Rail Yards
 - A bioretention facility for stormwater runoff within the informal car park at King George Park at

Rozelle (adjacent to Manning Street). A section of the existing informal car park would also be upgraded, including sealing the car park surface and landscaping

- Treated water would flow back to existing watercourses via new, upgraded and existing infrastructure
- Ancillary infrastructure and operational facilities for electronic tolling and traffic control and signage (including electronic signage)
- Emergency access and evacuation facilities, including pedestrian and vehicular cross and long passages and fire and life safety systems
- Utility works, including protection and/or adjustment of existing utilities, removal of redundant utilities and installation of new utilities. A Utilities Management Strategy has been prepared for the project that identifies management options for utilities, including relocation or adjustment. Refer to **Appendix F** (Utilities Management Strategy) of the EIS.

The project does not include:

- Site management works at the Rozelle Rail Yards. These works were separately assessed and determined by Roads and Maritime through a Review of Environmental Factors under Part 5 of the EP&A Act (refer to **Chapter 2** (Assessment process) of the EIS)
- Ongoing motorway maintenance activities during operation
- Operation of the components of the Rozelle interchange which are the tunnels, ramps and associated infrastructure being constructed to provide connections to the proposed future Western Harbour Tunnel and Beaches Link project.

Temporary construction ancillary facilities and temporary works to facilitate the construction of the project would also be required.

2.2.1 Staged construction and opening of the project

It is anticipated the project would be constructed and opened to traffic in two stages:

Stage 1 would include:

- Construction of the mainline tunnels between the M4 East at Haberfield and the New M5 at St Peters, stub tunnels to the Rozelle interchange (at the Inner West subsurface interchange) and ancillary infrastructure at the Darley Road motorway operations complex (MOC1) and Campbell Road motorway operations complex (MOC5)
- These works are anticipated to commence in 2018 with the mainline tunnels open to traffic in 2022. At the completion of Stage 1, the mainline tunnels would operate with two traffic lanes in each direction. This would increase to generally four lanes at the completion of Stage 2, when the full project is operational.

Stage 2 would include:

- Construction of the Rozelle interchange and Iron Cove Link including:
 - Connections to the stub tunnels at the Inner West subsurface interchange (built during Stage 1)
 - Ancillary infrastructure at the Rozelle West motorway operations complex (MOC2), Rozelle East motorway operations complex (MOC3) and Iron Cove Link motorway operations complex (MOC4)
 - Connections to the surface road network at Lilyfield and Rozelle
 - Construction of tunnels, ramps and associated infrastructure as part of the Rozelle interchange to provide connections to the proposed future Western Harbour Tunnel and Beaches Link project
- Stage 2 works are expected to commence in 2019 with these components of the project open to traffic in 2023.

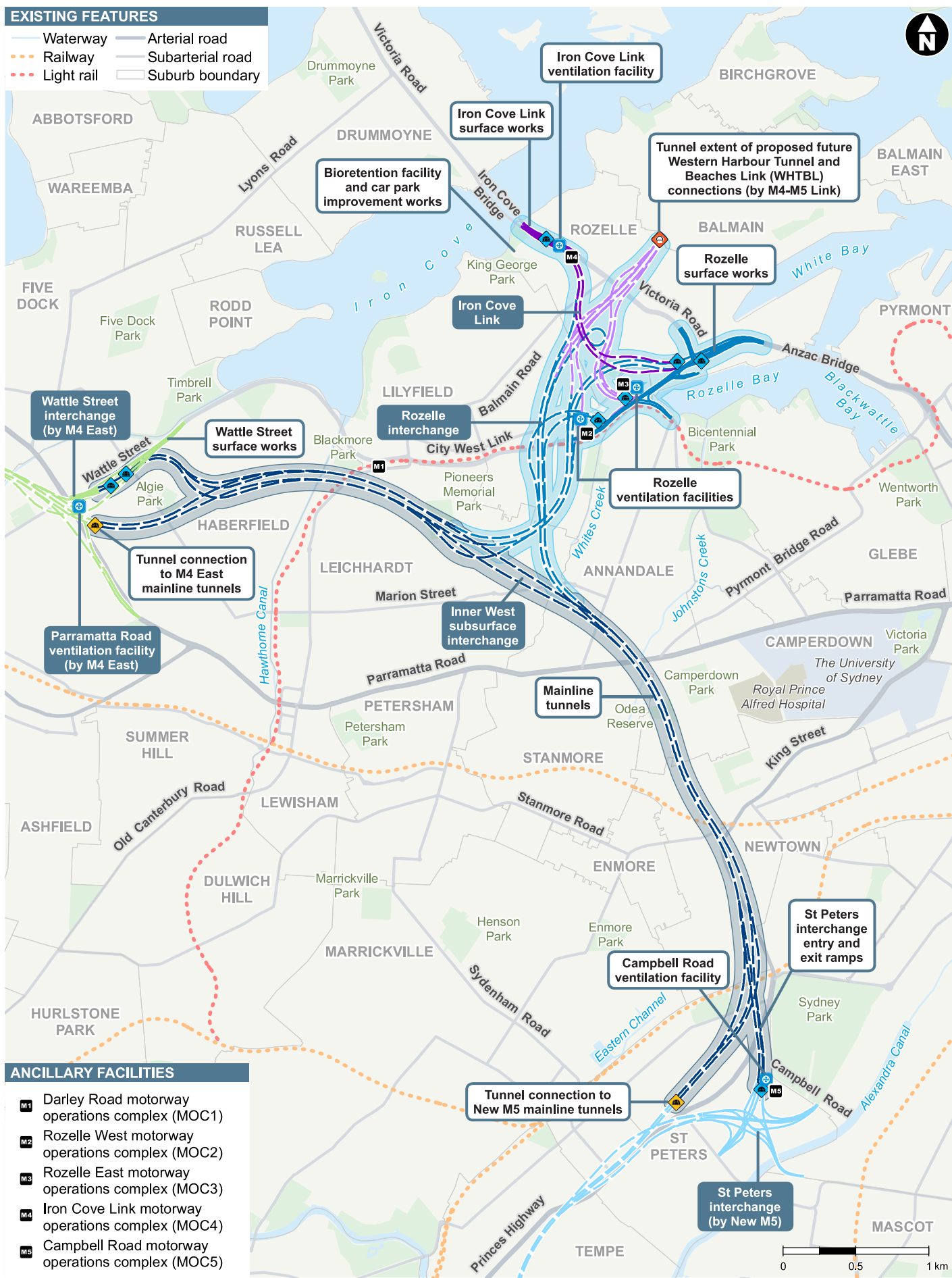


Figure 2-1 Overview of the project

2.3 Construction activities

An overview of the key construction features of the project is shown in **Table 2-1** and would generally include:

- Enabling and temporary works, including provision of construction power and water supply, ancillary site establishment including establishment of acoustic sheds and construction hoarding, demolition works, property adjustments and public and active transport modifications (if required)
- Construction of the road tunnels, interchanges, intersections and roadside infrastructure
- Haulage of spoil generated during tunnelling and excavation activities
- Fitout of the road tunnels and support infrastructure, including ventilation and emergency response systems
- Construction and fitout of the motorway operations complexes and other ancillary operations buildings
- Realignment, modification or replacement of surface roads, bridges and underpasses
- Implementation of environmental management and pollution control facilities for the project.

A more detailed overview of construction activities is provided in **Table 2-1**.

Table 2-1 Overview of construction activities

| Component | Typical activities |
|---------------------------------------|--|
| Site establishment and enabling works | <ul style="list-style-type: none"> • Vegetation clearing and removal • Utility works • Traffic management measures • Install safety and environmental controls • Install site fencing and hoarding • Establish temporary noise attenuation measures • Demolish buildings and structures • Carry out site clearing • Heritage salvage or conservation works (if required) • Establish construction ancillary facilities and access • Establish acoustic sheds • Supply utilities (including construction power) to construction facilities • Establish temporary pedestrian and cyclist diversions |
| Tunnelling | <ul style="list-style-type: none"> • Construct temporary access tunnels • Excavation of mainline tunnels, entry and exit ramps and associated tunnelled infrastructure and install ground support • Spoil management and haulage • Finishing works in tunnel and provision of permanent tunnel services • Test plant and equipment |
| Surface earthworks and structures | <ul style="list-style-type: none"> • Vegetation clearing and removal • Topsoil stripping • Excavate new cut and fill areas |

| Component | Typical activities |
|----------------------------------|--|
| | <ul style="list-style-type: none"> Construct dive and cut-and-cover tunnel structures Install stabilisation and excavation support (retention systems) such as sheet pile walls, diaphragm walls and secant pile walls (where required) Construct required retaining structures Excavate new road levels |
| Bridge works | <ul style="list-style-type: none"> Construct piers and abutments Construct headstock Construct bridge deck, slabs and girders Demolish and remove redundant bridges |
| Drainage | <ul style="list-style-type: none"> Construct new pits and pipes Construct new groundwater drainage system Connect drainage to existing network Construct sumps in tunnels as required Construct water quality basins, constructed wetland and bioretention facility and basin Construct drainage channels Construct spill containment basin Construct onsite detention tanks Adjustments to existing drainage infrastructure where impacted Carry out widening and naturalisation of a section of Whites Creek Demolish and remove redundant drainage |
| Pavement | <ul style="list-style-type: none"> Lay select layers and base Lay road pavement surfacing Construct pavement drainage |
| Operational ancillary facilities | <ul style="list-style-type: none"> Install ventilation systems and facilities Construct water treatment facilities Construct fire pump rooms and install water tanks Test and commission plant and equipment Construct electrical substations to supply permanent power to the project |
| Finishing works | <ul style="list-style-type: none"> Line mark to new road surfaces Erect directional and other signage and other roadside furniture such as street lighting Erect toll gantries and other control systems Construct pedestrian and cycle paths Carry out earthworks at disturbed areas to establish the finished landform Carry out landscaping Closure and backfill of temporary access tunnels (except where these are to be used for inspection and/or maintenance purposes) |

| Component | Typical activities |
|-----------|--|
| | <ul style="list-style-type: none"> Site demobilisation and preparation of the site for a future use |

Twelve construction ancillary facilities are described in this EIS (as listed below). To assist in informing the development of a construction methodology that would manage constructability constraints and the need for construction to occur in a safe and efficient manner, while minimising impacts on local communities, the environment, and users of the surrounding road and other transport networks, two possible combinations of construction ancillary facilities at Haberfield and Ashfield have been assessed in this EIS. The construction ancillary facilities that comprise these options have been grouped together in this EIS and are denoted by the suffix a (for Option A) or b (for Option B).

The construction ancillary facilities required to support construction of the project include:

- Construction ancillary facilities at Haberfield (Option A), comprising:
 - Wattle Street civil and tunnel site (C1a)
 - Haberfield civil and tunnel site (C2a)
 - Northcote Street civil site (C3a)
- Construction ancillary facilities at Ashfield and Haberfield (Option B), comprising:
 - Parramatta Road West civil and tunnel site (C1b)
 - Haberfield civil site (C2b)
 - Parramatta Road East civil site (C3b)
- Darley Road civil and tunnel site (C4)
- Rozelle civil and tunnel site (C5)
- The Crescent civil site (C6)
- Victoria Road civil site (C7)
- Iron Cove Link civil site (C8)
- Pymont Bridge Road tunnel site (C9)
- Campbell Road civil and tunnel site (C10).

The number, location and layout of construction ancillary facilities would be finalised as part of detailed construction planning during detailed design and would meet the environmental performance outcomes stated in the EIS and the Submissions and Preferred Infrastructure Report and satisfy criteria identified in any relevant conditions of approval.

The construction ancillary facilities would be used for a mix of civil surface works, tunnelling support, construction workforce parking and administrative purposes. Wherever possible, construction sites would be co-located with the operational footprint to minimise property acquisition and temporary disruption. The layout and access arrangements for the construction ancillary facilities are based on the concept design only and would be confirmed and refined in response to submissions received during the exhibition of this EIS and during detailed design.

2.3.1 Construction program

The total period of construction works for the project is expected to be around five years, with commissioning occurring concurrently with the final stages of construction. An indicative construction program is shown in **Table 2-2**.

Table 2-2 Indicative construction program

| Construction activity | Indicative construction timeframe | | | | | | | | | | | | | | | |
|---|-----------------------------------|----|----|----|------|----|----|----|------|----|----|----|------|----|----|----|
| | 2018 | | | | 2019 | | | | 2020 | | | | 2021 | | | |
| | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| Mainline tunnels | | | | | | | | | | | | | | | | |
| Site establishment and establishment of construction ancillary facilities | | | | | | | | | | | | | | | | |
| Utility works and connections | | | | | | | | | | | | | | | | |
| Tunnel construction | | | | | | | | | | | | | | | | |
| Portal construction | | | | | | | | | | | | | | | | |
| Construction of permanent operational facilities | | | | | | | | | | | | | | | | |
| Mechanical and electrical fitout works | | | | | | | | | | | | | | | | |
| Establishment of tolling facilities | | | | | | | | | | | | | | | | |
| Site rehabilitation and landscaping | | | | | | | | | | | | | | | | |
| Surface road works | | | | | | | | | | | | | | | | |
| Demobilisation and rehabilitation | | | | | | | | | | | | | | | | |
| Testing and commissioning | | | | | | | | | | | | | | | | |
| Rozelle interchange and Iron Cove Link | | | | | | | | | | | | | | | | |
| Site establishment and establishment of construction ancillary facilities | | | | | | | | | | | | | | | | |
| Utility works and connections and site remediation | | | | | | | | | | | | | | | | |
| Tunnel construction | | | | | | | | | | | | | | | | |
| Portal construction | | | | | | | | | | | | | | | | |
| Construction of surface road works | | | | | | | | | | | | | | | | |
| Construction of permanent operational facilities | | | | | | | | | | | | | | | | |
| Mechanical and electrical fitout works | | | | | | | | | | | | | | | | |
| Establishment of tolling facilities | | | | | | | | | | | | | | | | |

| Construction activity | Indicative construction timeframe | | | | | | | | | | | | | | | |
|-------------------------------------|-----------------------------------|----|----|----|------|----|----|----|------|----|----|----|------|----|----|----|
| | 2018 | | | | 2019 | | | | 2020 | | | | 2021 | | | |
| | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| Site rehabilitation and landscaping | | | | | | | | | | | | | | | | |
| Demobilisation and rehabilitation | | | | | | | | | | | | | | | | |
| Testing and commissioning | | | | | | | | | | | | | | | | |

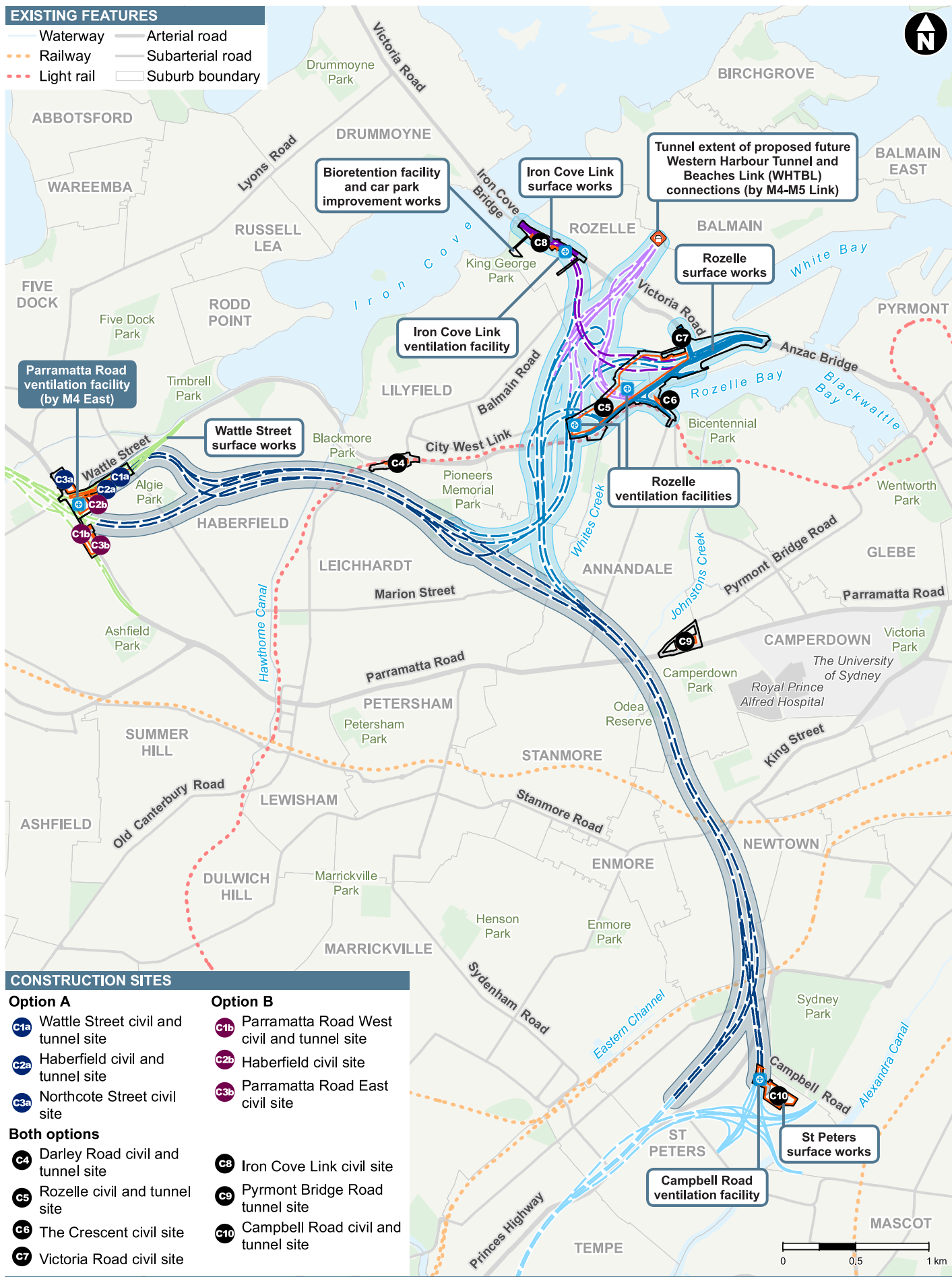


Figure 2-2 Overview of project footprint and ancillary facilities

2.4 Heritage study areas

The study area for the HIA comprises the project footprint and a surrounding buffer determined by the character and visual corridors surrounding the project footprint to ensure indirect impacts are appropriately assessed (ie visual impacts). The study area is separated into six areas that would be subject to surface disturbance as part of the project and the area above the mainline tunnel alignment. The six areas of surface disturbance comprise:

- Area 1 – Haberfield/Ashfield (Option A around Wattle Street, and Option B around Alt Street and Bland Street)
- Area 2 – Leichhardt
- Area 3 – Rozelle, Lilyfield and Annandale (Rozelle Rail Yards, The Crescent, Rozelle Bay and Victoria Road, excluding Iron Cove which comprises Area 4)
- Area 4 – Iron Cove (around Victoria Road)
- Area 5 – Annandale (around Pyrmont Bridge Road and Parramatta Road)
- Area 6 – St Peters.

The six heritage study areas that were the focus of this assessment are shown in **Figure 2-3**.

The historical archaeological assessment in **Chapter 5** has focused on the project footprint in six areas and where tunnel entry and exit portals from the mainline tunnels reach the surface (at Haberfield, Ashfield, Rozelle and St Peters), to identify where key archaeological resources may exist and may be impacted by the project, ie those areas that will be subject to surface works only (ie cut and cover, dive structures, portals, ancillary structures). As the driven tunnels would be generally located from 20 metres to greater than 65 metres below the ground these works would not have an impact on historical archaeological remains and have therefore not been considered further.

The built heritage and landscape assessment has focused on a broader study area applied to each of these six areas, comprising an appropriate buffer surrounding the project footprint (the study area). This is determined by the character and visual corridors surrounding each area. This is to ensure that the assessment includes heritage items, potential heritage items and HCAs adjacent to the project footprint that may be subject to visual or vibration impacts, and has been determined on a case by case basis when undertaking site inspections of the areas. This broader study area is referred to as the heritage study area in this report. A description of these areas and the works proposed are set out in this section.

Section 6.14 of the HIA also addresses potential vibration and settlement impacts on heritage items and HCAs located above the tunnels but which are not included within the six areas subject to surface impacts as listed above.

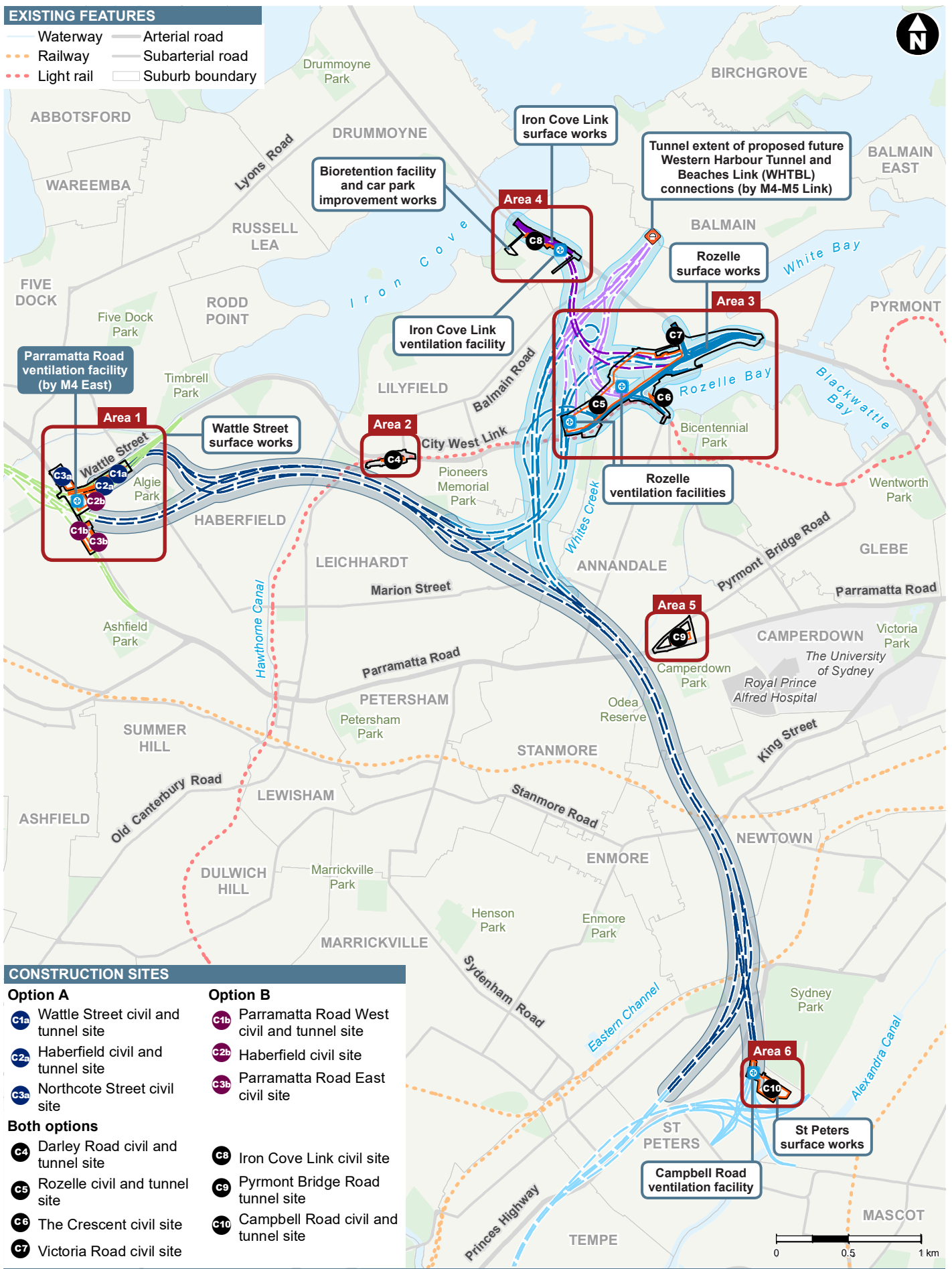


Figure 2-3 Overview of heritage study areas

2.4.1 Area 1 – Haberfield/Ashfield

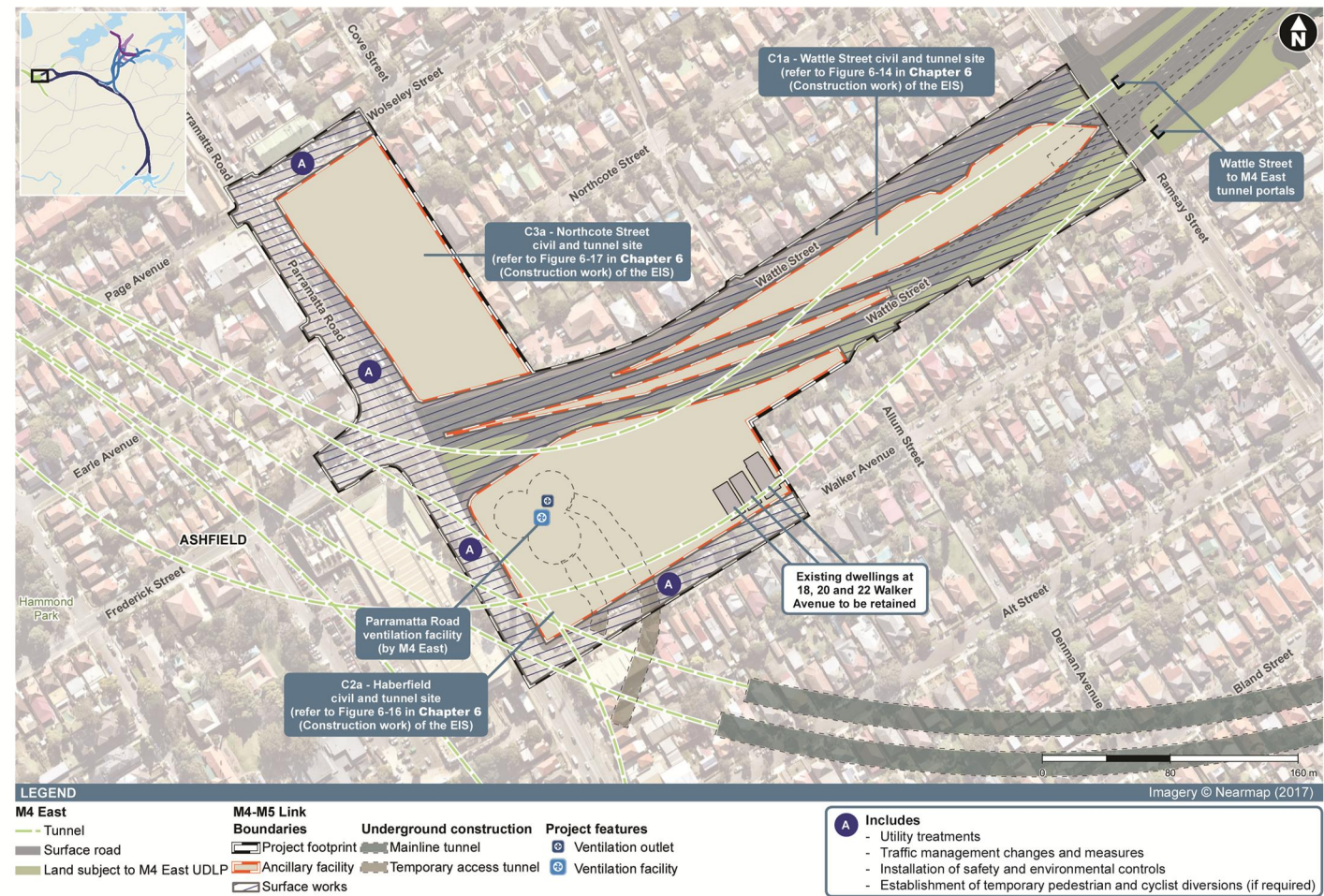


Figure 2-4 Construction ancillary facility layout at Haberfield (Option A)



Figure 2-5 Construction ancillary facility layout at Haberfield/Ashfield (Option B)

Haberfield is located around seven kilometres west of Sydney's CBD, with historic character which retains a largely intact subdivision layout dating from the Federation-era and a high number of heritage listed items. This area extends from the corner of Wattle and Ramsay streets in the east to the corner of Parramatta Road in the west. Almost the entire suburb of Haberfield, from Dobroyd Canal (Iron Cove Creek) to Hawthorne Canal and northwest to Iron Cove, but excluding the properties along Parramatta Road, is listed as a HCA of local significance under Ashfield Local Environmental Plan 2013 (Ashfield LEP) and potential State significance.

Haberfield is Australia's first fully planned and developed 'garden suburb', with the form, materials, scale and setbacks of the predominantly brick Federation and interwar period houses and their landscaped gardens. The suburb's tree-lined streets provide consistent and aesthetically significant streetscapes.

The M4 East project included the demolition of 53 properties within the Haberfield HCA. The heritage impacts of these works have been assessed as part of the M4 East HIA and were found to be major adverse and unable to be fully mitigated. The M4-M5 Link project would utilise some of the construction compounds currently being utilised by the M4 East project, however some for different uses.

Within Area 1 – Haberfield, Option A for the M4-M5 Link project works are limited to connecting to the underground M4 East mainline tunnels, connections to and fitout of the dive structures and cut and cover tunnels at the Wattle Street interchange; and fitout of the Parramatta Road ventilation facility on the corner of Parramatta Road and Walker Avenue, which are all being constructed, and were assessed and approved, as part of the M4 East project.

For Option B at Haberfield/Ashfield, the M4-M5 Link project will require new construction ancillary facilities on the east and west sides of Parramatta Road, around the intersections of Alt Street and Bland Street. These would comprise the Parramatta Road West civil and tunnel site (C1b) and Parramatta Road East civil site (C3b) in addition to the Haberfield civil site (C2b) which is subject to the assessment undertaken in the M4 East project as explained above. The Parramatta Road sites are outside of the Haberfield HCA and were not assessed as part of the M4 East project.

2.4.2 Area 2 – Leichhardt

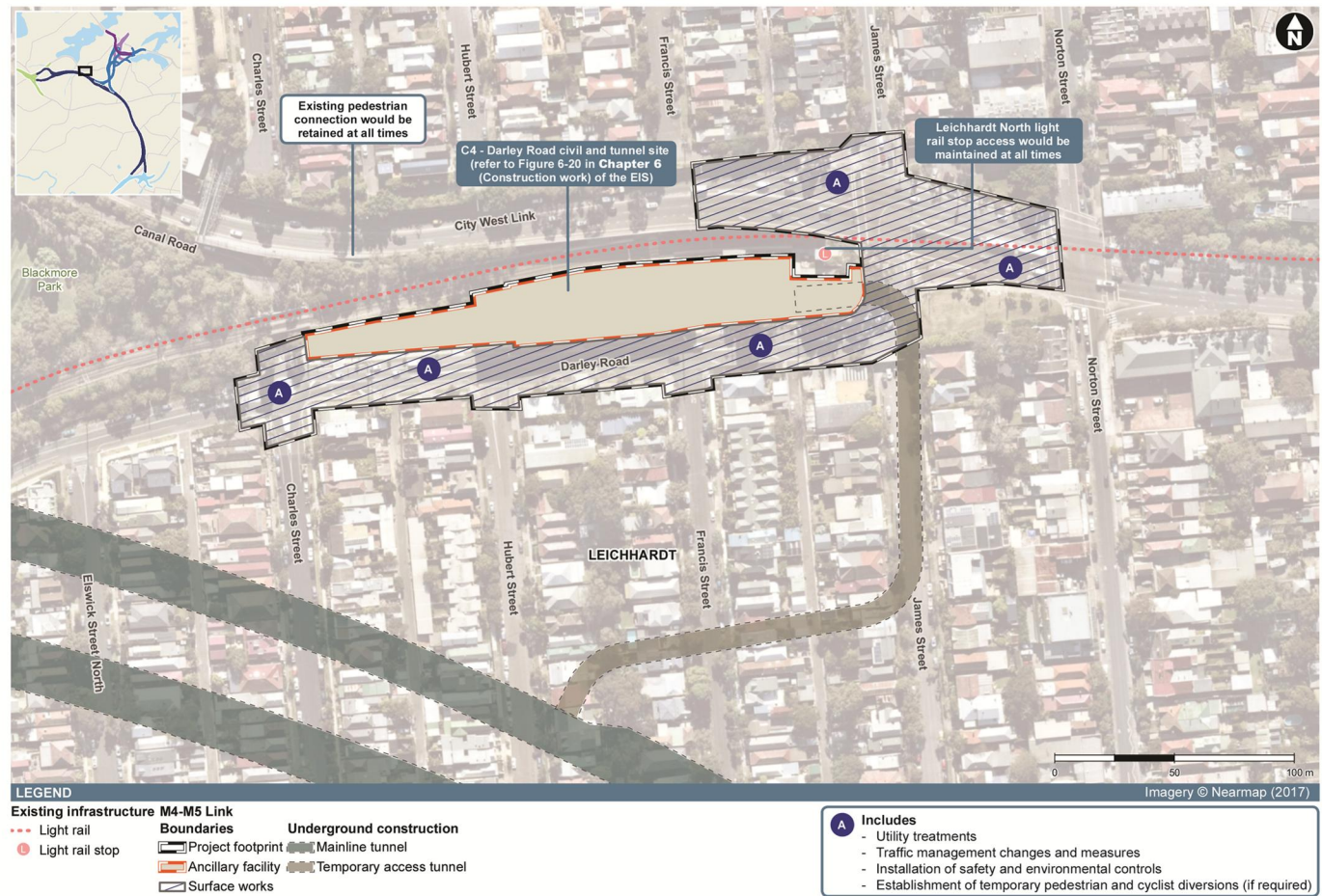


Figure 2-6 Construction ancillary facility layout at Leichhardt

Leichhardt is a suburb around six kilometres west of Sydney's CBD. The mid-point civil and tunnel site at Darley Road (C4) is shown on **Figure 2-6**.

The Darley Road civil and tunnel site (C4) is bounded by the Light Rail Line to the north and Darley Road to the south. Further to the north is the City West Link and the suburb of Rozelle. The residential development along Darley Road and cross streets is characterised by a broad range of architectural styles and typologies dating from the Victorian-era to the present day, with a high degree of alterations and modifications to most properties. The Leichhardt heritage study area (Area 2) is oriented around the alignment of the former Rozelle-Darling Harbour Goods Line, which has resulted in significant modifications to the landscape. Views of Darley Road civil and tunnel site (and its local context) are shown in **Figure 2-7** to **Figure 2-18**. The photos in **Figure 2-7** to **Figure 2-18** were taken in 2016, prior to the refurbishment of the commercial building.



Figure 2-7 Looking west along Darley Road from the intersection with James Street. The study area is visible in the background (Source: GML 2016)



Figure 2-8 Looking northwest at the c.1960s brick warehouse facing onto Darley Road (Source: GML 2016)



Figure 2-9 Looking northeast at the western half of the c1960s brick warehouse facing onto Darley Road (Source: GML 2016)



Figure 2-10 Looking northeast at the western half of the c1960s brick warehouse facing onto Darley Road (Source: GML 2016)



Figure 2-11 Looking northeast towards the yard/car park within the study area from the intersection of Charles Street and Darley Road (Source: GML 2016)



Figure 2-12 Looking southeast at the late twentieth century warehouse in the northern half of the study area. The light rail tracks are visible in the foreground (Source: GML 2016)



Figure 2-13 Looking southeast at the eastern half of the late twentieth century warehouse on Darley Road

(Source: GML 2016)



Figure 2-14 Looking east across the Leichhardt North tram stop.

The cutting for the rail line is visible on the left side of the image (Source: GML 2016)



Figure 2-15 Looking southeast at the steps into the Leichhardt North tram stop.

The cutting into the sandstone is visible behind the fence (Source: GML 2016)



Figure 2-16 Looking southeast across the car park at the eastern end of the Darley Road study area

(Source: GML 2016)



Figure 2-17 Looking west across the eastern car park of the Darley Road study area

(Source: GML 2016)



Figure 2-18 Looking west along the stormwater culvert visible in the southeast corner of the Darley Road study area

(Source: GML 2016)

2.4.3 Area 3 – Rozelle, Lilyfield and Annandale (Rozelle Rail Yards, The Crescent, Rozelle Bay and Victoria Road)

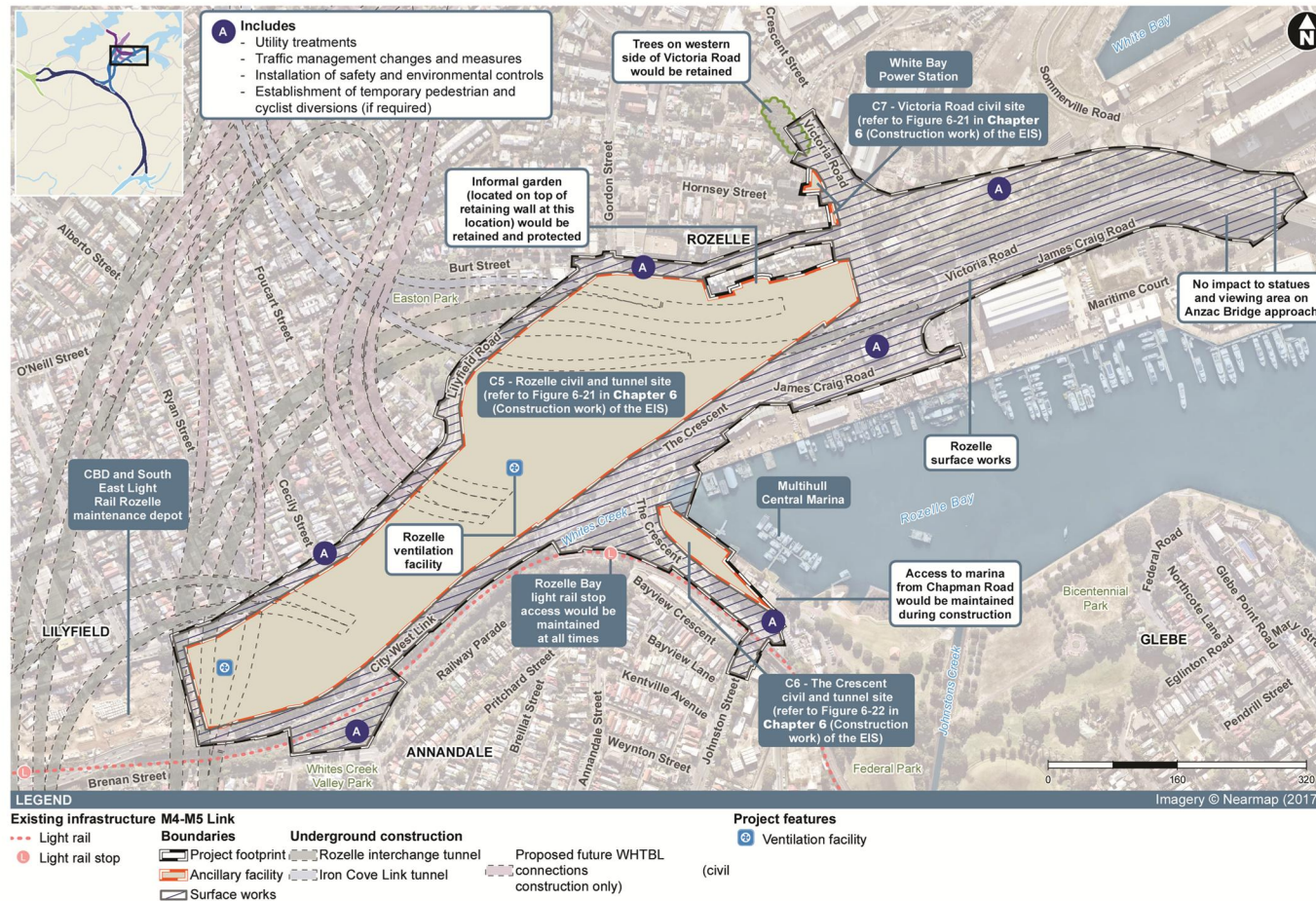


Figure 2-19 Construction ancillary facility layout at Rozelle, Lilyfield and Annandale (Rozelle Rail Yards, The Crescent, Rozelle Bay and Victoria Road)

The Rozelle, Lilyfield and Annandale (Rozelle Rail Yards, The Crescent, Rozelle Bay and Victoria Road) (Area 3) heritage study area is located around four kilometres west of Sydney's CBD and contains a number of linking roadways which connect the suburbs of Rozelle, Pyrmont, Annandale and Lilyfield. The project footprint in this area comprises the eastern end of the City West Link, the southern section of Victoria Road, The Crescent, an area around White Creek's eastern extent towards Rozelle Bay, and a portion of the White Bay Power Station. Anzac Bridge lies outside the eastern end of the project footprint. An overview of the project footprint is shown in **Figure 2-19**.

The area is characterised by light industrial development interspersed with parkland constructed above areas of nineteenth century reclamation and bisected by the network of modern roadways. Late nineteenth century residential developments surround the northern boundary of the project footprint. Views and features of the Rozelle, Lilyfield and Annandale (Rozelle Rail Yards, The Crescent, Rozelle Bay and Victoria Road) heritage study area are shown in **Figure 2-20** to **Figure 2-33**.



Figure 2-20 Looking southwest across Easton Park

The Sewage Pumping Station is visible in the background at left (Source: GML 2016)



Figure 2-21 Looking east along Lilyfield Road on the southern side of Easton Park

(Source: GML 2016)



Figure 2-22 Looking east along Lilyfield Road towards Easton Park in background

(Source: GML 2016)



Figure 2-23 An area of exposed sandstone bedrock observed along Lilyfield Road

(Source: GML 2016)



Figure 2-24 Looking southeast at the warehouses within the light industrial area in the northern part of the project footprint

(Source: GML 2016)



Figure 2-25 The stormwater canal which runs through the light industrial area

(Source: GML 2016)



Figure 2-26 Looking west along Lilyfield Road from the intersection with Gordon Street
(Source: GML 2016)



Figure 2-27 Looking northeast across an open grassed area within the White Bay Power Station site

The Power Station is visible in the background at left. Disused railway tracks are visible in the image foreground (Source: GML 2016)



Figure 2-28 Grassed and tarmac surfaces at White Bay Power Station which characterises much of the Rozelle project footprint
(Source: GML 2016)



Figure 2-29 Evidence of quarrying of the sandstone bedrock within the White Bay Power Station site
(Source: GML 2016)



Figure 2-30 Southern penstock with safety fence enclosure
(Source: GML 2016)



Figure 2-31 Remaining foundations of the former White Bay Hotel, with the White Bay Power Station in the background
(Source: GML 2016)



Figure 2-32 White Bay Power Station showing proposed location of construction
 (Source; GML 2016)



Figure 2-33 View southeast across the parkland on the northern side of the City West Link which characterises the western part of the project footprint
 (Source: GML 2016)

2.4.4 Area 4 – Iron Cove



Figure 2-34 Construction ancillary facility layout at Iron Cove

Iron Cove Bridge links the suburb of Rozelle to the suburb of Drummoyne to its northwest. Area 4 is oriented along Victoria Road, a major thoroughfare located around four kilometres to the west of Sydney's CBD. The residential development, which fronts on to Victoria Road and occupies the adjacent cross streets, is predominantly late nineteenth century workers housing. The area is a small scale, irregular subdivision which demonstrates a variety of building types and construction methods including single-fronted cottages, two-storey terraces, free-standing timber and stone single storey cottages most with small front gardens.

The project footprint at Iron Cove is shown on **Figure 2-34**. This includes the proposed bioretention facility and car park improvement works at King George Park, adjacent to Manning Street, in the block between the southern end of Byrnes and Clubb streets. This area is currently grassed with a few bollards, and used as an informal parking area. There is a slope across the site from the north (Manning Street) to the south (King George Park).

Views within Area 4 are shown in **Figure 2-35** to **Figure 2-52**.



Figure 2-35 Looking north along Springside Street towards the rear of 212-218 Victoria Road (at left)
(Source: GML 2016)



Figure 2-36 Looking west along Victoria Road; the car park at 212-218 Victoria Road is visible at left
(Source: GML 2016)



Figure 2-37 Looking east at the side of 224 Victoria Road on Callan Street showing the stepping down of the building floor level
(Source: GML 2016)



Figure 2-38 Looking north at the southwest corner of 224 Victoria Street
The rear wall of the building has been constructed directly above bedrock (visible beneath the red brick section) (Source: GML 2016)



Figure 2-39 Looking north along Toelle Street towards Victoria Road and at the rear of 238 Victoria Road
(Source: GML 2016)



Figure 2-40 Looking west along the unnamed lane behind 242-248 Victoria Road showing the variation in ground level
(Source: GML 2016)



Figure 2-41 Looking south towards the raised garden behind 242 Victoria Road

(Source: GML 2016)



Figure 2-42 Shop on the corner of Toelle Street and Victoria Road

(Source: GML 2016)



Figure 2-43 Looking west along Victoria Road outside the car yard 258 Victoria Road

(Source: GML 2016)



Figure 2-44 View of the eastern side of 260 Victoria Road showing the concrete slab on which the house is built

(Source: GML 2016)



Figure 2-45 View of the front steps leading up to 264 Victoria Road

(Source: GML 2016)



Figure 2-46 View of the western wall of 264 Victoria Road showing the underlying bedrock on which the house has been constructed

(Source: GML 2016)



Figure 2-47 View of the bedrock foundations beneath 270 Victoria Road

(Source: GML 2016)



Figure 2-48 Looking north across the park towards the westbound section of Iron Cove Bridge

(Source: GML 2016)



Figure 2-49 Looking northeast across the park on the southern side of Victoria Road.

The house on the corner of Victoria Road and Byrnes Street is visible in the background
(Source: GML 2016)



Figure 2-50 Looking northwest from the edge of King George Park towards the site of the proposed bioretention facility

(Source: GML 2016)



Figure 2-51 Looking south from the intersection of Byrnes Street and Manning Street towards the site of the proposed bioretention facility

(Source: GML 2016)



Figure 2-52 Looking east from the continuation of Byrnes Street towards the site of the proposed bioretention facility

(Source: GML 2016)

2.4.5 Area 5 – Annandale (around Pyrmont Bridge Road and Parramatta Road)

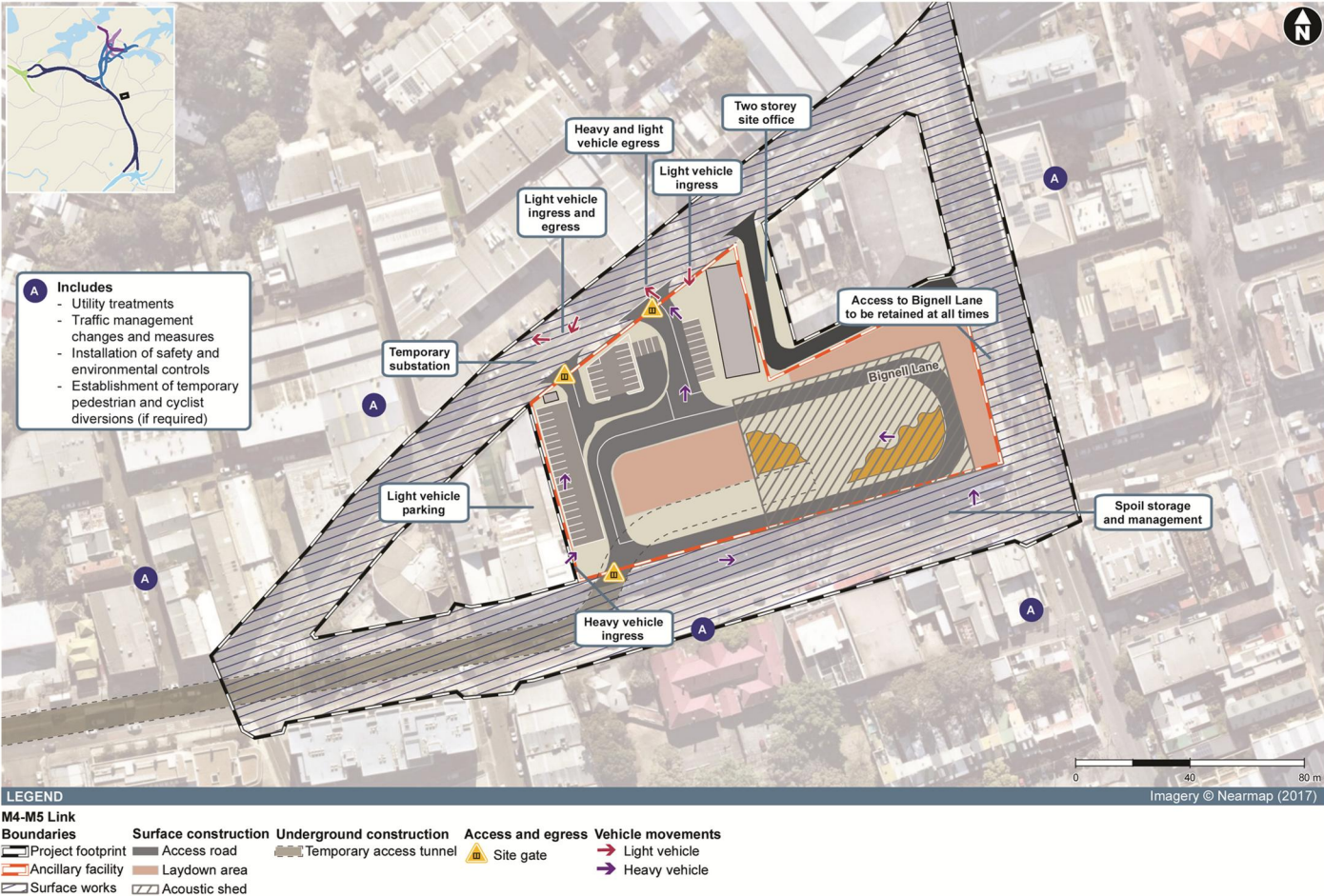


Figure 2-53 Construction ancillary facility layout at Annandale (around Pyrmont Bridge Road and Parramatta Road)

Within Area 5 – Annandale, the project comprises the Pyrmont Bridge Road tunnel site (C9) (a construction ancillary facility, shown in **Figure 2-53**) and associated tunnelling for the Inner West subsurface interchange.

Annandale is located around three kilometres from Sydney's CBD and is characterised as a mixed use commercial/residential area oriented around Parramatta Road and Pyrmont Bridge Road. The area is generally occupied by medium density development of predominantly industrial character. Buildings date primarily from the early to mid-twentieth century punctuated by contemporary apartment development. Views showing the local context within Area 5 are provided in **Figure 2-54** to **Figure 2-65**.

The project footprint is bound by Parramatta Road to the south, Pyrmont Bridge Road to the north and Bignell Lane and Mallett Street to the east.



Figure 2-54 Looking northwest towards 160 Parramatta Road on southeast corner of Study Area C8

(Source: GML 2016)



Figure 2-55 Looking northwest at 164-172 Parramatta Road forming the southern boundary of Study Area C8

(Source: GML 2016)



Figure 2-56 Looking north towards 174-180 Parramatta Road on the southern boundary of Study Area C8

(Source: GML 2016)



Figure 2-57 Looking north towards 182-186 Parramatta Road forming the southwest corner of Study Area C8

(Source: GML 2016)



Figure 2-58 Looking south at 93-95 Pyrmont Bridge Road and the entrance to Bignell Lane in the northwest of the Study Area C10

(Source: GML 2016)



Figure 2-59 Looking south at the western end of 79 Pyrmont Bridge Road

The entrance to Bignell Lane is visible on the right
(Source: GML 2016)



Figure 2-60 Looking along façade of 79 Pyrmont Bridge Road, situated in the northern third of Study Area C8

(Source: GML 2016)



Figure 2-61 View west taken approximately halfway along Bignell Lane

(Source: GML 2016)

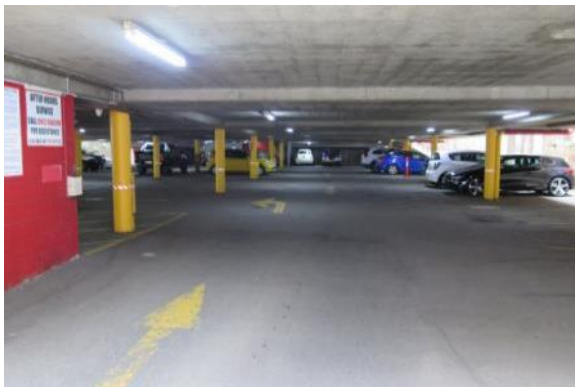


Figure 2-62 Looking across the basement level car park beneath 166–172 Parramatta Road (Camperdown Fitness)

(Source: GML 2016)



Figure 2-63 The street level car park accessed from Bignell Lane at the rear of 164 Parramatta Road

(Source: GML 2016)



Figure 2-64 Looking down into the car park beneath 166–172 Parramatta Road (Camperdown Fitness) from Parramatta Road showing the depth below street level

(Source: GML 2016)



Figure 2-65 Looking east along Bignell Lane at the rear of 182–186 Parramatta Road

(Source: GML 2016)

2.4.6 Area 6 – St Peters

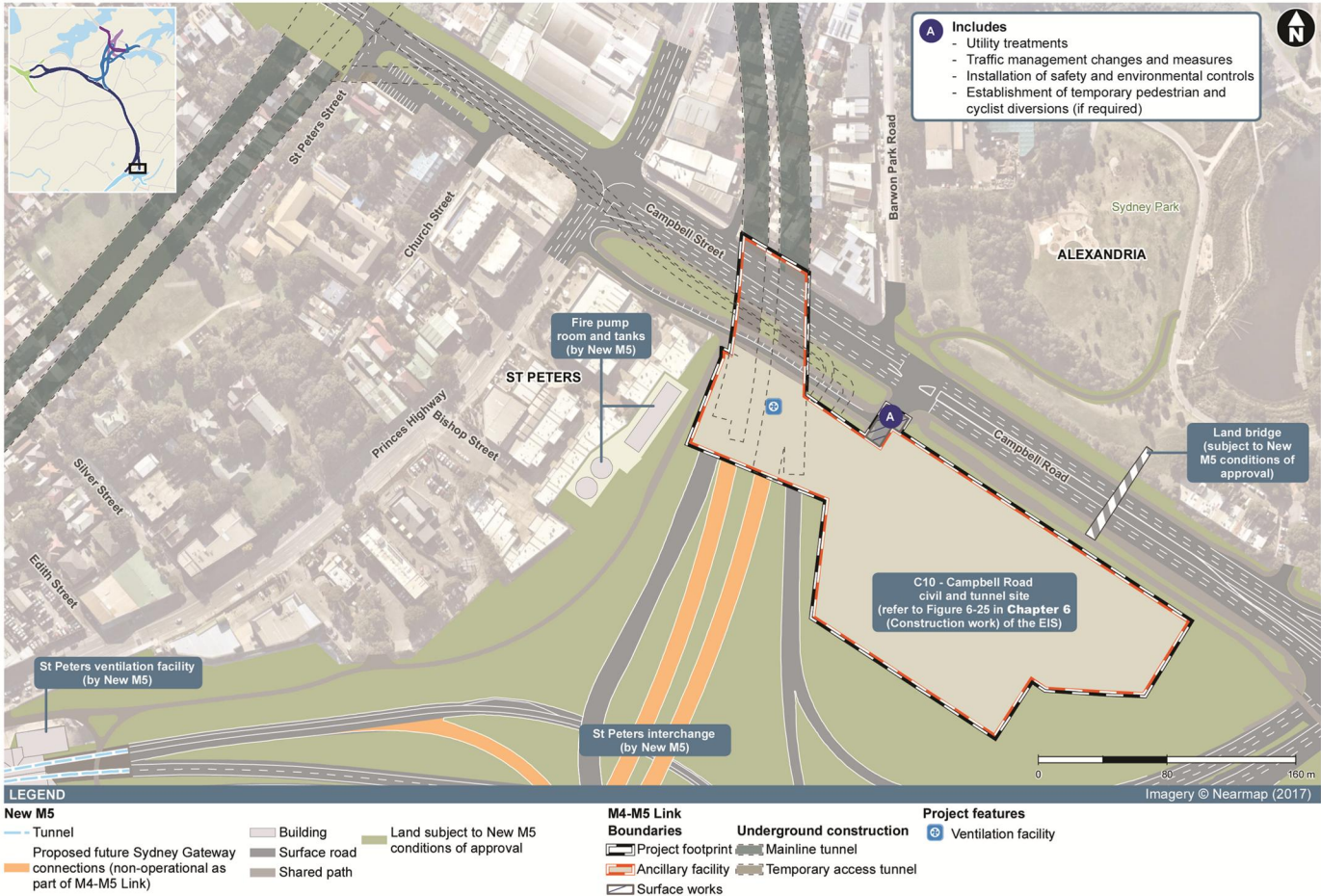


Figure 2-66 Construction ancillary facility layout at St Peters

The Campbell Road civil and tunnel site (C10) at St Peters (shown on **Figure 2-66**) is located around six kilometres south of Sydney's CBD and comprises a cleared construction compound (being used currently for the New M5 project) bounded by Campbell Road in the north, Holland Street in the south and Albert Street in the northwest.

Within Area 6, the project comprises linking the St Peters interchange to the M4-M5 Link mainline tunnel entries, construction of St Peters motorway operations complex (MOC5) and ventilation facility, and construction of above ground links to Euston Road, Gardeners Road, Sydney Airport and Port Botany. This area has previously been assessed for heritage impacts as part of the New M5 project (at the St Peters interchange). Current work on the construction of the New M5 has already resulted in the demolition of buildings within the M4-M5 Link project footprint.

3 Assessment methodology

3.1 Relevant legislation

This HIA has referred to the following statutory planning instruments/legislation relevant to heritage management in NSW:

- *Heritage Act 1977* (NSW) (Heritage Act)
- *Environmental Planning and Assessment Act 1979* (NSW) (EP&A Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (Commonwealth)
- Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005 (SREP Sydney Harbour Catchment)
- Sydney Local Environmental Plan (LEP) 2012 (Sydney LEP)
- Ashfield Local Environmental Plan (LEP) 2013 (Ashfield LEP)
- Leichhardt Local Environmental Plan (LEP) 2013 (Leichhardt LEP)
- Marrickville Local Environmental Plan (LEP) 2011 (Marrickville LEP)
- Sydney Regional Environmental Plan 26 (SREP 26) – City West (SREP 26).

3.2 Relevant guidelines and policies

This HIA has referred to the following key guidelines and policies relevant to heritage management in NSW:

- Heritage Branch of the NSW Department of Planning *Assessing Heritage Significance for Historical Archaeological Sites and 'Relics'* (2009)
- NSW Heritage Office *Historical Archaeology Code of Practice* (2006)
- NSW Heritage Office *Skeletal Remains: Guidelines for Management of Human Remains* (1998)
- NSW Heritage Council *Criteria for the assessment of excavation directors* (2011)
- Heritage Office and Department of Urban Affairs and Planning, *NSW Heritage Manual* (1994)
- NSW Heritage Office *How to Prepare Archival Records of Heritage Items* (2003)
- Heritage Council of NSW *Assessing Heritage Significance* (2002)
- Heritage Council of NSW *Statements of Heritage Impact* (2002)
- NSW Heritage Office *Archaeological Assessments: Archaeological Assessment Guidelines* (1996)
- Heritage Council of NSW *Historical Archaeological Sites: Investigation and Conservation Guidelines* (1993)
- *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance 2013* (the Burra Charter).

3.3 Overview

The following methodology has been adopted in preparing this report:

- Review of statutory heritage lists, including the State Heritage Register (SHR), heritage schedules on LEPs, heritage schedules on Sydney Regional Environmental Plans, State Agency Section 170 Heritage and Conservation Registers (S170 Registers), the National Heritage List (NHL) and Commonwealth Heritage List (CHL)
- Review of relevant heritage reports, archaeological zoning plans and archaeological assessments previously prepared for relevant items and areas within the project footprint and the heritage study area, as available

- Field survey of the study area defined in **section 2.4** to inspect listed heritage items, HCAs and potential archaeological sites and to identify potential heritage items that may be affected by the project
- Desktop research and historical research to inform the impact assessment, including review of relevant conservation management plans (CMPs) and other plans of management.

3.4 Field survey

Known non-Aboriginal heritage items and areas identified as having the potential to be impacted (either directly or indirectly) by the project were subjected to a targeted inspection to determine their current condition. Items of potential heritage significance were also identified during these inspections. Results from these inspections were used to inform an assessment of potential impacts on non-Aboriginal heritage values. This process comprised:

- Review of mapped non-Aboriginal heritage listings to identify those properties with the potential to be directly or indirectly impacted during the construction or operation of the project
- Compilation of available information of potentially impacted non-Aboriginal heritage listings, including past inspection photographs, as a point of comparison
- Field inspections of the identified listings, which involved recording the current condition of each site. Each listed item was photographed and compared to past descriptions/photos. Interior features or the condition of the interior of each site, if relevant to the listing, were based on the details provided within the database
- Field investigation of other potential items of non-Aboriginal heritage, additional to those recorded listing locations that may be impacted by the project
- Updates to existing background information with results of the field inspections.

Field inspections were undertaken and included a pedestrian and vehicle survey from the public domain with the project footprint. Sites marked on parish plans or identified as part of the survey were inspected and:

- The structure and/or features identified at each site were recorded
- The structures/features were then assessed for historical significance
- Photographs were taken of the structures/features with details maintained in a photo log.

3.5 Assessment of heritage significance

The statements of significance for the assessed heritage items have been drawn from the following local, state and federal statutory and non-statutory heritage registers:

- State Heritage Register
- NSW State Heritage Inventory database
- Ashfield LEP
- Leichhardt LEP
- Marrickville LEP
- Sydney LEP
- S170 Registers for Sydney Water, Roads and Maritime, Sydney Ports, RailCorp and Ausgrid
- SREP 26.

Additional information on significance, including heritage curtilages, has been drawn from conservation reports, such as CMPs, conservation plans and heritage impact statements, where available. These documents are cited in the footnotes to this report.

The methodology for assessments of heritage significance is based on the NSW heritage criteria as set out in the NSW Heritage Manual guideline, *Assessing Heritage Significance*, prepared by the

NSW Heritage Office in 2001. Assessments of potential heritage significance for items identified during field survey were undertaken in accordance with NSW Heritage Manual guidelines.

3.6 Archaeological assessment

The evaluation of the historical archaeological potential associated with various phases of history within the project footprint is based on consideration of the physical evidence observed at the sites, identified areas of previous disturbance, historical information about the development and occupation of the sites and previous archaeological assessments and excavations. Consequently, a broad approach to the identification of the potential archaeological resource has been adopted and is based on a predictive model that assumes that historical archaeological remains are generally located close to occupation and activity areas.

The historical background and significance assessment of individual sites within the project footprint has been primarily based on previous historical archaeological assessment and excavations, as well as historical information gathered for this HIA from a range of primary and secondary sources, presented in **Chapter 4**. A field survey of the project footprint has been undertaken to assess the general condition and locations of known and potential historical archaeological sites. Further detail is provided in **Chapter 5**.

3.7 Assessment of heritage impact

This HIA has been prepared with reference to the guideline document *Statements of Heritage Impact* (2002), prepared by the NSW Heritage Office and contained within the NSW Heritage Manual. It is also consistent with the relevant principles and guidelines of the Burra Charter, which defines the principles and procedures to be followed in the conservation of Australian heritage places.

In order to clarify the potential impacts of the proposed works, GML has developed a ranking for measuring the level of potential impacts on heritage values (see **Table 3-1**). This methodology was developed for the CBD and South East Light Rail Heritage Impact Assessment prepared by GML in 2013, and the M4 East Non-Aboriginal Heritage Impact Assessment prepared by GML in 2015, and is applied consistently in this report. The methodology used to rate the impact level is explained below.

These rankings are applied throughout this report using an item by item approach. The impact ranking is not related to the significance of the heritage item. The impact ranking relates to the effect of the proposed actions/works on the identified heritage values of the individual item/area rather than indexed against the overall impacts of the project.

Table 3-1 Ranking of heritage impact

| Ranking | Definition |
|------------------|---|
| Major adverse | Actions that would have a severe, long-term and possibly irreversible impact on a heritage item. Actions in this category would include partial or complete demolition of a heritage item or addition of new structures in its vicinity that destroy the visual setting of the item. These actions cannot be fully mitigated. |
| Moderate adverse | Actions that would have an adverse impact on a heritage item. Actions in this category would include removal of an important part of a heritage item's setting or temporary removal of significant elements or fabric. The impact of these actions could be reduced through appropriate mitigation measures. |
| Minor adverse | Actions that would have a minor adverse impact on a heritage item. This may be the result of the action affecting only a small part of the place or a distant/small part of the setting of a heritage place. The action may also be temporary and/or reversible. |
| Neutral | Actions that would have no heritage impact. |
| Minor positive | Actions that would bring a minor benefit to a heritage item, such as an improvement in the item's visual setting. |

| Ranking | Definition |
|-------------------|--|
| Moderate positive | Actions that would bring a moderate benefit to a heritage item, such as removal of intrusive elements or fabric or a substantial improvement to the item's visual setting. |
| Major positive | Actions that would bring a major benefit to a heritage item, such as reconstruction of significant fabric, removal of substantial intrusive elements/fabric or reinstatement of an item's visual setting or curtilage. |

3.8 Alternative locations and design options

Chapter 4 (Project development and alternatives) of the EIS details the alternatives for the M4-M5 Link project (eg improvements to existing arterial road networks, investment in alternative transport modes, demand management, and the 'do nothing'/'do minimum' case), as well options that were considered as part of the design development process for the M4-M5 Link project.

Specific components of the M4-M5 Link project which were removed, which avoided or minimised heritage impacts include:

- Removal of the Camperdown interchange at Camperdown which avoided direct and indirect impacts on HCAs and heritage items such as the University of Sydney and Victoria Park (both subject to an application for State significance) and on the locally listed sandstone retaining wall on the northern side of Parramatta Road
- Removal of Easton Park as a compound site which avoided direct impact to the locally listed park, reduced impacts on the Easton Park HCA, as well as allowing the retention of the locally listed Sewage Pumping Station No.6
- Removal of the proposed Angel Street/Railway Lane, Newtown site from the construction footprint which avoided direct impact (demolition) on the former Newtown Tram Sheds (of State significance)
- Removal of Derbyshire Road as a mid-point tunnel and civil site and as a workforce parking site which avoided direct impact (demolition) of one local heritage item which consisted of two buildings; former State Rail Authority (SRA) cable store and traffic office at Leichhardt.

Other aspects of the project which could have potentially impacted heritage items or HCAs, which have had alternatives considered included:

- The location of the ventilation facilities and outlets for the project, and in particular for the Iron Cove Link
- The location of bioretention facilities in Leichhardt.

3.9 Previous reports

GML has reviewed the following reports in the preparation of this HIA:

- GML Heritage Pty Ltd, 2016, Rozelle Rail Yards Heritage Impact Assessment, prepared for Roads and Maritime Services
- GML Heritage Pty Ltd, 2015, WestConnex M4 East Non-Aboriginal Heritage Impact Assessment, prepared for WestConnex Delivery Authority
- AECOM Australia Pty Ltd and GHD Pty Ltd, 2015, WestConnex M4 East Environmental Impact Statement, prepared for WestConnex Delivery Authority
- AECOM Australia Pty Ltd, WestConnex 2015, New M5 Non-Aboriginal Heritage Impact Assessment, prepared for Roads and Maritime Services
- AECOM Australia Pty Ltd, WestConnex 2015, New M5 Environmental Impact Statement, prepared for Roads and Maritime Services.

Heritage reports, such as CMPs and archaeological assessments, referred to in the preparation of this HIA, are acknowledged in the endnotes for each section.

3.10 Limitations

Only those areas subject to surface works/infrastructure and their immediate vicinities were surveyed in the preparation of this HIA. As the driven tunnels would be generally located from 20 metres to greater than 65 metres below the ground these works would not have an impact on historical archaeological remains and have therefore not been considered further. Where tunnels are closer to the surface – ie following on from or leading to cut-and-cover tunnels and construction of tunnel portals and ramps – there may be potential for possible damage from the effects of construction vibration. These have been assessed and there are management measures for potential vibration impacts to properties in the vicinity of the works and above the tunnel alignment.

Properties of potential heritage values that are proposed to be demolished for the project, which are not listed as heritage items or within HCAs, were subject to heritage significance assessments to identify whether they have potential heritage values.

3.11 Authors

This HIA has been prepared by the GML consultants listed in the following table. Unless otherwise noted, all photographs were taken by GML on various site inspections as part of the preparation of this HIA.

Table 3-2 Consultant qualifications and experience

| Consultant | Qualification | Experience |
|--|--|---|
| Julian Siu, Associate; project manager, was the primary author of the built heritage impact assessment | Master of Heritage Conservation, University of Sydney (currently undertaking) Master of Architecture, University of Sydney Bachelor of Design (Architecture/Urban Design and Planning), University of Sydney | Julian is a built heritage expert with extensive experience in providing heritage conservation advice, undertaking heritage assessments and preparing various heritage management reports. He has also developed strategic heritage management frameworks for key development and industrial sites. |
| Emma McGirr, Consultant; assisted with the built heritage impact assessment | Master of Urban Planning, University of NSW Bachelor of Arts (Art History), University of Sydney | Emma is a heritage specialist with a background in historical, curatorial and cultural studies as well as experience in urban planning. |
| Jane McMahon, Senior Consultant; prepared the historical archaeological assessment | Bachelor of Arts (Honours), University of Sydney | Jane has five years of experience in historical archaeology and heritage interpretation. |
| Sophie Jennings, Consultant; assisted with the historical archaeological assessment | Bachelor of Arts (Archaeology, Heritage Studies), University of Sydney Bachelor of Arts (Honours) (Archaeology), University of Western Australia | Sophie has eight years' experience as a professional archaeologist working in the heritage sector, and has undertaken archaeological projects in both Australia and England. |
| Angela So, Consultant; prepared the historical overview | Master of Arts (Research), University of Sydney Bachelor of Arts (Honours), University of Sydney | Angela has over 10 years' experience in archaeology, historical research and interpretation planning. |

| Consultant | Qualification | Experience |
|--|--|--|
| Claire Nunez, Associate; project director and provided overall guidance and input to the project and reviewed the report | Diploma of Project Management, University of New England Partnerships Bachelor of Cultural Heritage Studies, University of Canberra | Claire has extensive experience working on heritage assessments, management planning documents and liaising with a wide variety of stakeholders including Australian federal and state government agencies, as well as international organisations, community groups and industry representatives. |
| Peter Romey, Special Adviser; provided input to the project and reviewed the report | Elected Associate by the Royal Australian Institute of Architects Bachelor of Architecture, NSW Institute of Technology | Special Adviser and former Partner of GML Heritage, Peter has more than 30 years' experience in heritage conservation. He has worked in consultancy firms, government organisations and in private practice. |

4 Historical overview

4.1 Introduction

This section provides an overview of historical development of the land within the project footprint and provides further detail on the heritage study areas:

- Area 1 – Haberfield/Ashfield (Option A around Wattle Street and Option B around Alt Street and Bland Street) (around Wattle Street)
- Area 2 – Leichhardt
- Area 3 – Rozelle, Lilyfield and Annandale (Rozelle Rail Yards, The Crescent, Rozelle Bay and Victoria Road, excluding Iron Cove which comprises Area 4)
- Area 4 – Iron Cove (around Victoria Road)
- Area 5 – Annandale (around Pyrmont Bridge Road and Parramatta Road)
- Area 6 – St Peters.

4.1.1 Historical resources

Historical research was undertaken for the heritage study areas Leichhardt, Rozelle Rail Yards, Iron Cove and Annandale. The histories are based on primary and secondary sources. Research and archival material was retrieved from the following institutions:

- Australian Railway Historical Society (NSW)
- City of Sydney Archives
- Inner West Council Local Studies Library
- Land, Property and Information Office (LPI)
- National Library of Australia (NLA)
- State Library of NSW (SLNSW)
- Sydney Water/Water NSW Historical Research and Archives Facility
- Transport Heritage NSW
- Westpac Banking Group Archives.

The historical information for the Haberfield and St Peters study areas has been provided in the M4 East Non-Aboriginal Heritage Impact Assessment (GML 2015) and New M5 Non-Aboriginal Heritage Impact Assessment (AECOM 2015) respectively.

4.2 Area 1 – Haberfield/Ashfield heritage study area

Land on the northern side of Parramatta Road between Dobroyd Parade and O'Connor Street, Haberfield, was originally part of the 480-acre Dobroyd Estate granted to Nicholas Bayley in 1803. Land opposite this on the southern side of Parramatta Road from Page Avenue to Ashfield Park was originally part of 280 acres granted to Augustus Alt (see **Figure 4.1**).

4.2.1 Dobroyd Estate

A grant of 480 acres to Ensign Nicholas Bayley in 1803 comprised all land north of Parramatta Road from the shores of Iron Cove to Long Cove (**Figure 4.1**). The property was known as Sunning Hill Farm; however, there is no evidence that Bayley farmed or built a dwelling there during his tenure. The boundaries of this land form the present day suburb of Haberfield.

Simeon Lord, emancipist and successful Sydney businessman, purchased Sunning Hill in 1805 and renamed it 'Dobroyd'. His daughter Sarah Anne married Dr David Ramsay in 1825, and the couple were given the Dobroyd Estate as a component of Sarah's dowry.ⁱ

The Ramsay's built a timber cottage and garden on the property in 1826, named Dobroyd House. It was outside the study area on the western side of Dalhousie Street near Parramatta Road. During this phase of development, the property was used for grazing and agricultural activities, with associated outbuildings situated closer to the Dobroyd residence and farm complex. An additional house was constructed on the Dobroyd Estate west of Dobroyd House in 1855 following the marriage of Mary Louisa Ramsay (David and Sarah Anne's daughter) to Alexander Learmonth. Mary and Alexander called their house Yasmar.ⁱⁱ

4.2.2 Subdivision of the Dobroyd Estate

While most of the Dobroyd Estate remained undeveloped until 1901, the land east of Wattle Street between Parramatta Road and Ramsay Street was subdivided in 1885. Owned by Isabella Ramsay, this subdivision included Walker and Alt Street (then named The Avenue) and Tenandra Street (now Alt Street) (**Figure 4-2**). A sale notice from October 1885 had some of the lots shaded indicating they had already been sold however the Sands Directory records only one occupant within this subdivision, on Tenandra (Alt) Street until 1910. Between 1910 and 1915 a few more occupants appeared in Wattle Street, The Avenue (Walker Avenue) and Alt Street plus one occupant along the Parramatta Road frontage, but by 1915 most of this subdivision had been developed including the properties fronting Parramatta Road which were all residential at this time.

From 1901 the other Ramsay siblings began selling their land. Local real estate entrepreneur and early town planning advocate Richard Stanton had a vision for this as yet undeveloped land and initially the Ramsay children sold their land directly to Stanton. Haberfield is the tangible evidence of his vision. The suburb's name arose from Mrs Stanton (nee Nicholls) family's connection with Lord Haberfield, Mayor of Bristol in the early nineteenth century.ⁱⁱⁱ

Stanton was inspired by an early town planning movement which sought to regulate uses and building types, an example he had seen in England and the USA. From the first subdivision in 1901, Haberfield was marketed as the 'Model Suburb' and, being based upon the City Beautiful Movement, was also known as the 'Garden Suburb'. This model suburb included sewerage, (thereby no longer needing rear lanes) and provided public infrastructure of nature strips, public trees, stone curbs and gutters. Houses were to have cavity brick walls to rid the salt damp. Stanton controlled all aspects from subdivision-providing finance and buyer terms and building materials through to designing the gardens and houses. His first architect was Wormal, while J Spencer Stansfield is accredited with designing the bulk of all the Stanton estate houses.^{iv}

The land from eastern side of Alt Street to eastern side of Bland Street was inherited by Mary Louisa Ramsay and contained Yasmar House. She sold the portion containing the study area to Joseph and Albert Grace who subdivided it in 1905, as the Haberfield No.3 Subdivision (**Figure 4-3**). This subdivision was developed between 1910 and 1915.

By the 1930s Haberfield had been completed with house types from the earlier Queen Ann and Arts and Crafts styles, followed by early Inter-war Bungalow style (**Figure 4-4**).

4.2.3 The Underwood Estate

Baron August Alt, first surveyor general of the new colony, was granted 100 acres at Ashfield on the western side of Iron Cove Creek (**Figure 4-1**). He named this land Hermitage Farm and built for himself a house with orchard where Croydon Station now lies. Robert Campbell jnr purchased Alts 280 acres in 1813 and named this property Ashfield Park. The Ashfield Park Estate was then sold to Joseph Underwood in 1817 and in 1818 he added to his land holdings Alt's original 100-acre Hermitage Farm.^v When Joseph died in 1833 his widow Elizabeth took over the management of the Ashfield Park Estate, including the completion of a large family home. Joseph had in 1833 begun the construction of a house on his Estate but had only laid the foundation stones. He had however built a magnificent stables block and Elizabeth stopped all work on the house and converted the stables into a large family home. This house was located outside the study area.

4.2.4 Subdivision of the Ashfield Park Estate

Elizabeth began to subdivide her land in 1838 forming the beginnings of the Village of Ashfield. The study area formed part of Block 5 (**Figure 4-5**). The remaining lands were kept by Elizabeth until her death in 1858, when they were also subdivided. In 1859 these heavily timbered 500 acres of Ashfield

Park Estate, extending from Parramatta Road to Liverpool Road, were subdivided and sold. The blocks of land in this subdivision were large' one to five acres, attracting wealthier clientele and with the arrival of the railway in 1855 with a station at Ashfield, this area prospered.^{vi} Mansions for some wealthy merchants and professional men were constructed and the dense with the iron bark forest began to disappear. These well to do residents also bought up extra land in this area waiting for further subdivision in the next building boom.

The block of land bound by Frederick, Henry, Alt Streets and Parramatta Road was purchased in 1859 by Thomas Wild from the Ashfield Estate subdivision. Wild purchased Lots 33, 34, 35, 36, 37 and 42, 43, 44 of Section 2. In the 1860s Wild built a house on his land which he called 'Gordon'. There were also several out-buildings, a three storey stable, a double coach house with hayloft above, grooms rooms, storeroom, harnesses and saddle room.^{vii} The buildings were all located at the rear of the site near Henry Street (**Figure 4-7**).

In 1876 the entire site was purchased by Thomas Walker for the establishment of the Ashfield Infants Home. The Home's aim was for the shelter and care of foundling and orphaned children. This home remains on the site and the complex has, over the years, been enlarged with the construction of additional structures. No significant development was undertaken on the northern portion of the block fronting Parramatta Road. Plans from the 1890s indicate a small creek ran through the middle of the site, with a dam in the centre of the block, and bridges at Frederick Street and Alt Street. Two gates provided entry to the property from Parramatta Road (**Figure 4-7**).

In 1920 the eastern portion of the site was sold and then subdivided for residential development (**Figure 4-8**). The blocks within the current study area are marked as unoccupied at this time. Development within this subdivision was completed by 1930 (**Figure 4-5**). The remaining land fronting Parramatta Road was sold in 1935 to Peak Freans (Australia) Ltd Biscuit Manufacturers for the construction of their biscuit factory.^{viii}

On the eastern side of Alt Street lay the Underwood Nursery (Camellia Grove) originally established by Joseph Underwood with John Treseder as the nursery man. In 1882 land surrounding the nursery along Parramatta Road and Bland Street was offered for sale (**Figure 4-9**). The portion within the study area is marked as forming part of the orchard. By 1890 a Sydney Water plan shows that no development had occurred on the Parramatta Road lots but four houses (outside the study area) are shown fronting Bland Street (**Figure 4-10**).

The Parramatta Road frontage was developed in the early 1920s and was an early commercial strip. Businesses along this strip in 1924 included two grocers, a hairdresser, a motor garage (one of the earliest of many that would occupy parts of Parramatta Road), a timber yard, an electrician and a draper (**Figure 4-5**).^{ix}

Post-1980s development along Parramatta Road

With the increasing ownership of cars in Sydney and the spreading suburbs, dealerships and garages began to spread along Parramatta Road. Much of the land along Parramatta Road at Haberfield was redeveloped from the 1980s as industrial sites including several car dealerships which remain the main business in this area. Within the study area, most residential buildings have been demolished and replaced with open car parking, or dealership showrooms. On the west side of Parramatta Road, this has included deep excavation into the slope of the site to the southwest. A row of early twentieth century buildings remain on the corner of Parramatta Road and Bland Street.



Figure 4-1 Parish Map showing on the early land grants on both sides of Parramatta Road

To the south, the land granted Augustus Alt. Land on the northern side of Parramatta Road formed the Dobroyd Estate and is now the suburb of Haberfield. (Source: Department of Lands)

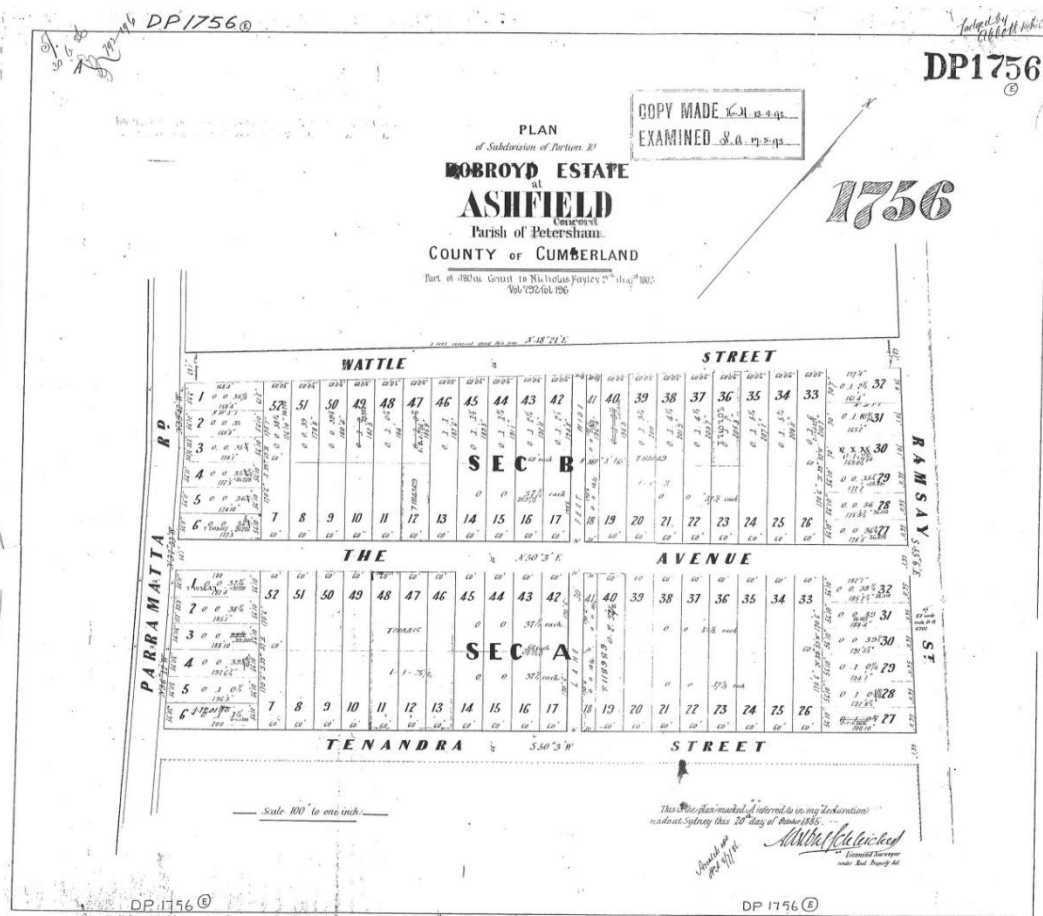


Figure 4-2 1885 subdivision of the land east of Wattle Street, including Walker Street (formerly The Avenue) and Alt Street (formerly Tenandra Street)
(Source: DP1756 Department of Lands)

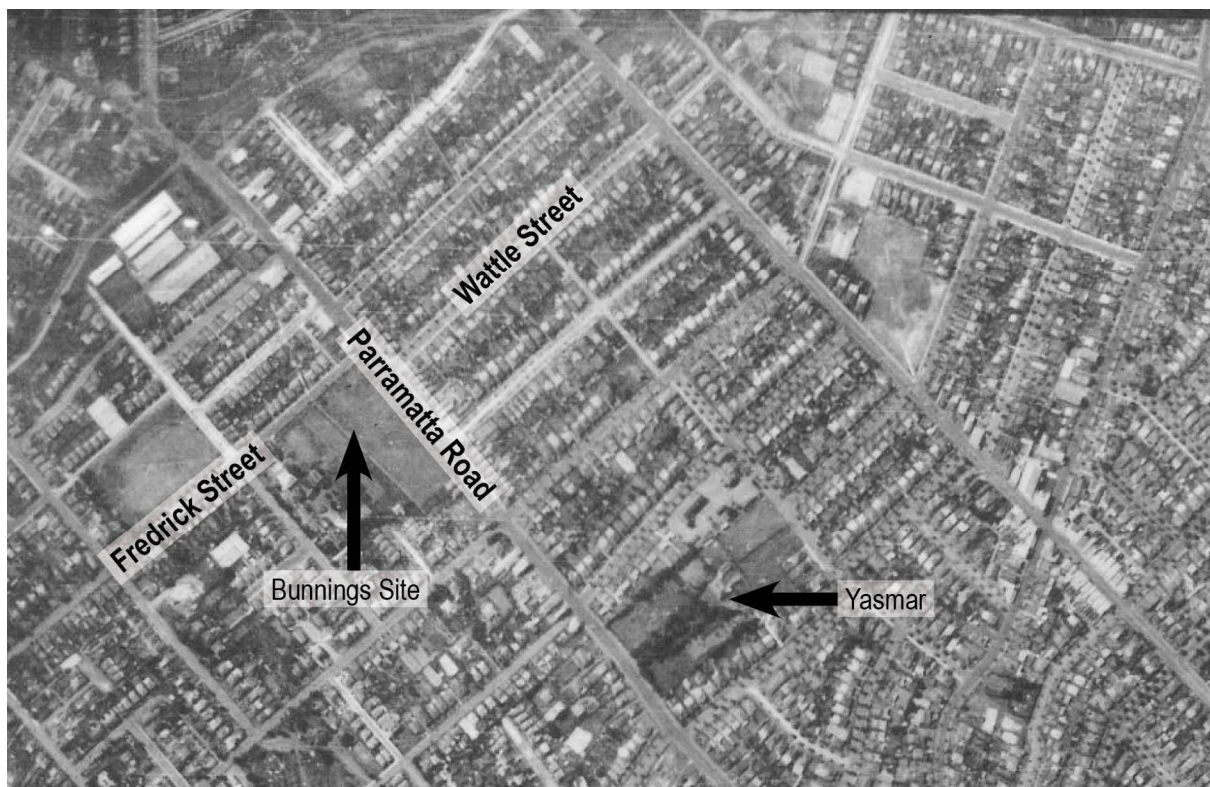


Figure 4-4 1930 aerial showing development along Parramatta Road around the study area

Note the Bunnings site is still shown as vacant land. Almost all the subdivisions discussed in this study have been fully developed. (Source: Department of Lands)



Figure 4-5 1943 aerial showing development along Parramatta Road around the study area
Almost all the lots within the study area have been developed. (Source: Department of Lands)

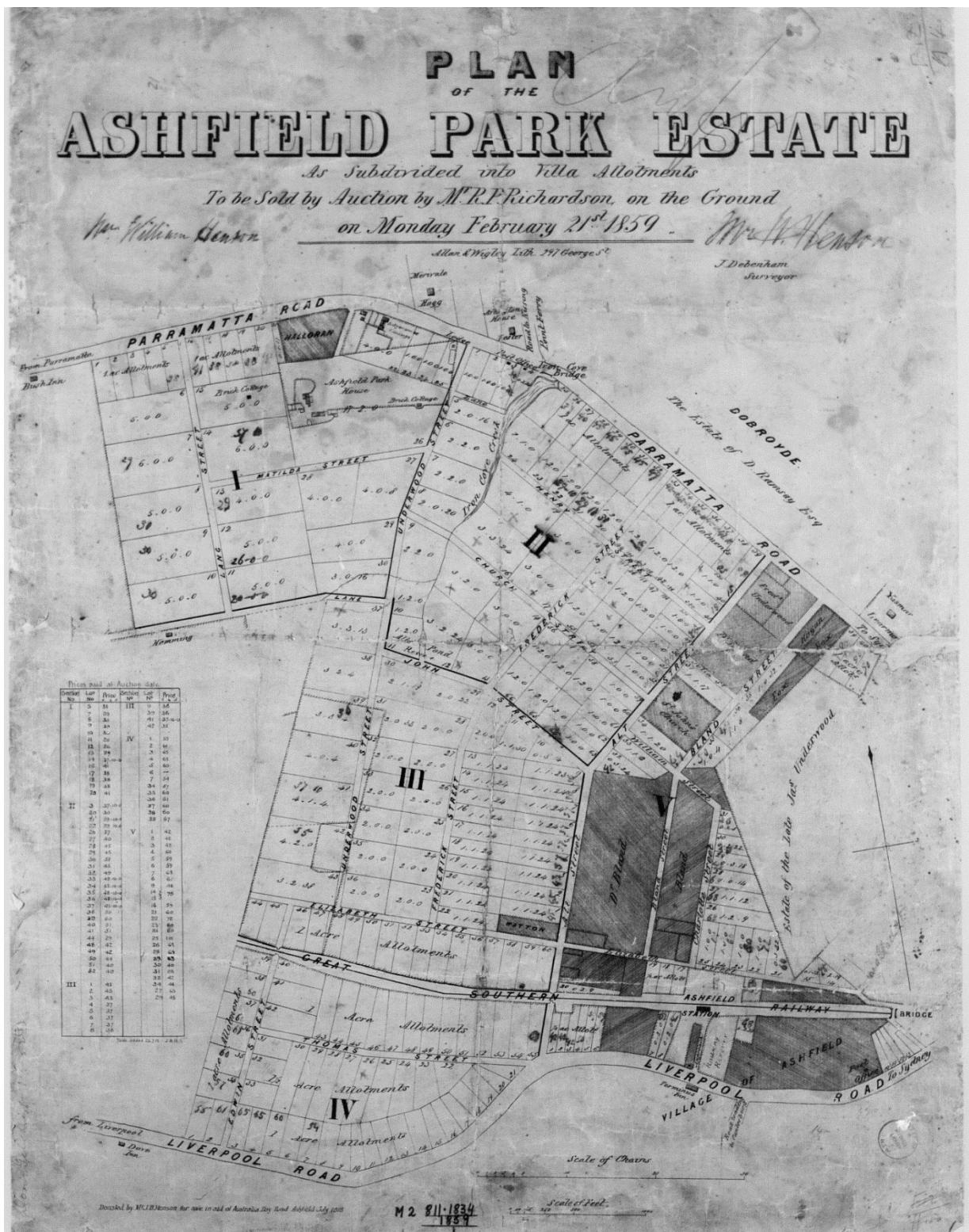


Figure 4-6 1859 subdivision of the Ashfield Park Estate

(Source: SLNSW ZM2 811.1834/1859/1)

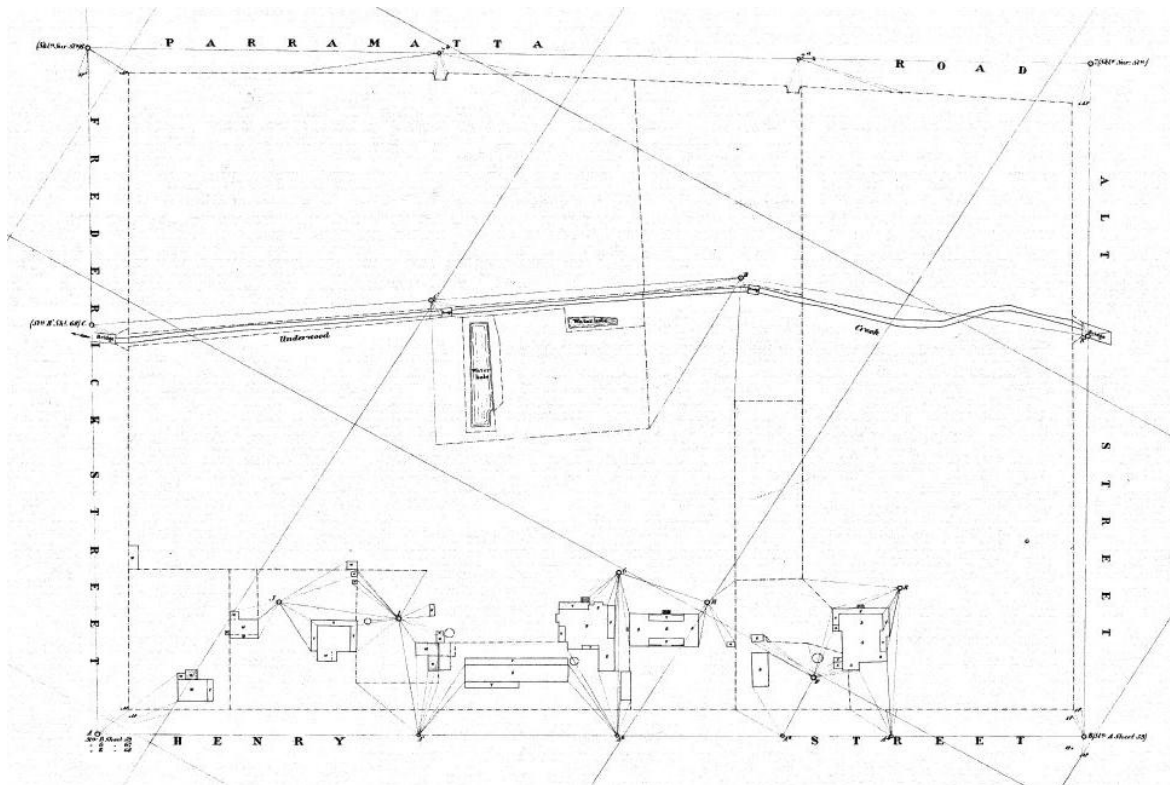


Figure 4-7 Site of the Ashfield Infants Home, c1890

The land on the corner of Parramatta Road and Frederick Street would later be occupied by the Peak Frean Biscuit Factory, now Bunnings. (Source: Sydney Water Plan Room)

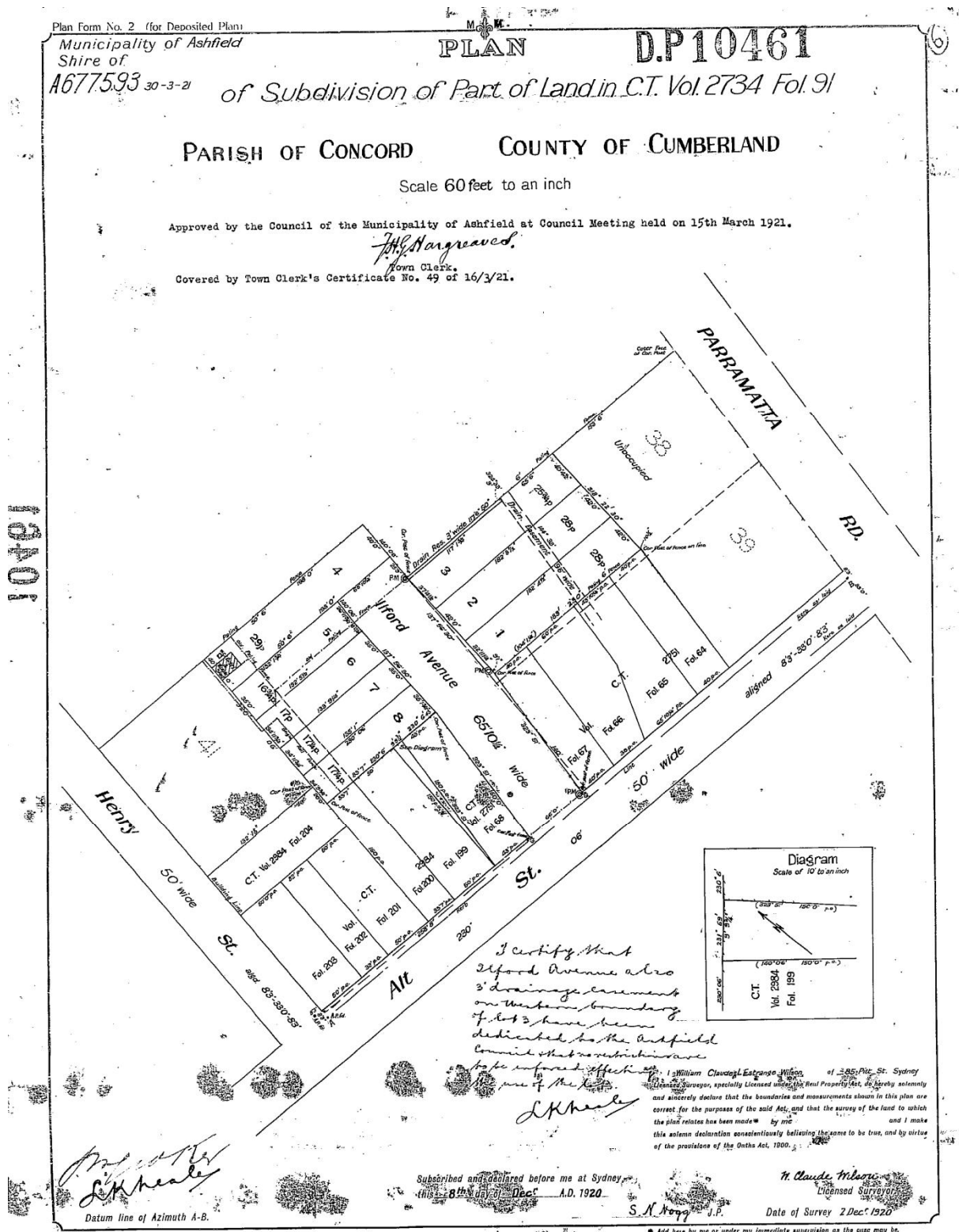


Figure 4-8 1920 subdivision of the eastern portion of the Ashfield Infants Home site, including the study area at the intersection of Alt Street and Parramatta Road

(Source: DP 10461, Department of Lands)

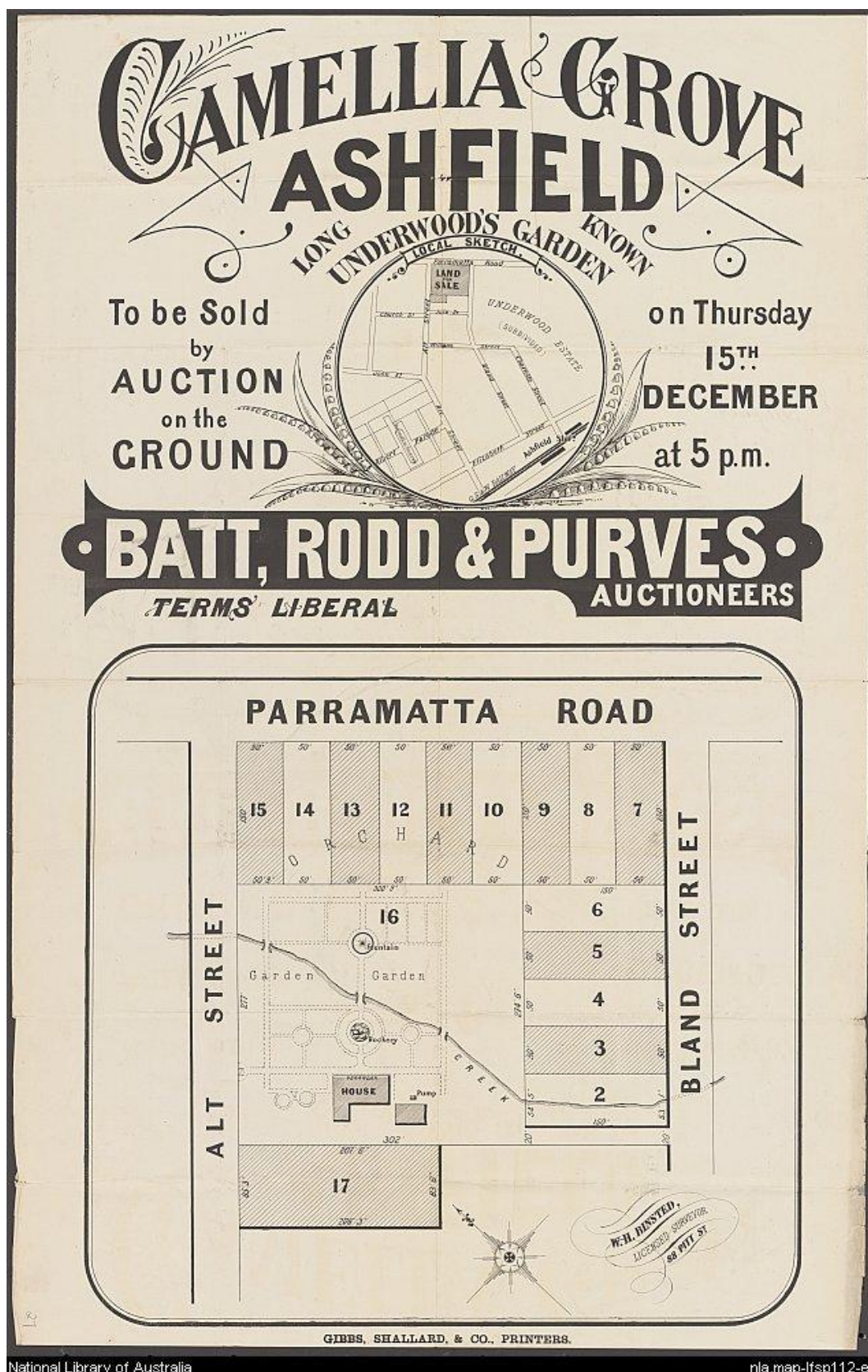


Figure 4-9 1882 Subdivision of the Camellia Grove (Underwood's Nursery) Ashfield
(Source: NLA)

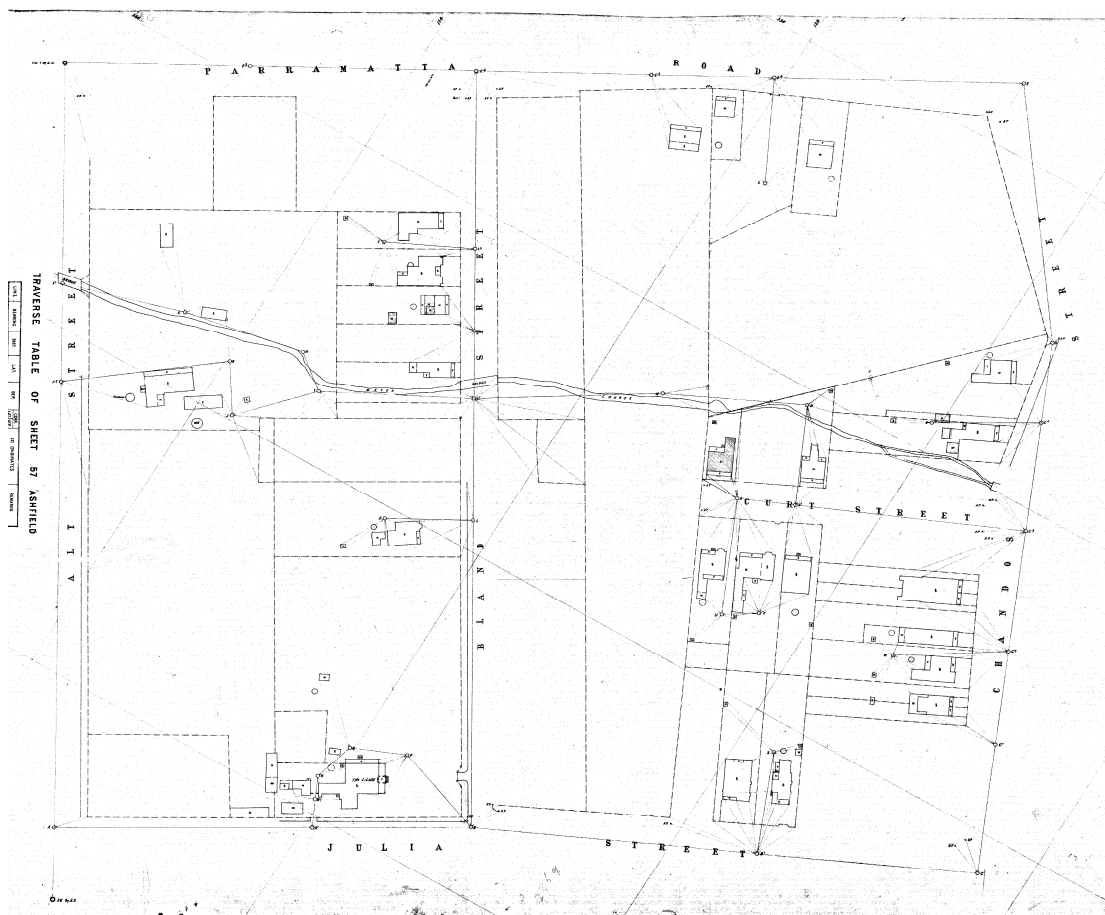


Figure 4-10 Development on southern side of Parramatta Road between Alt Street and Chandos Street, 1892

(Source: Sydney Water Plan Room)

4.3 Area 2 – Leichhardt heritage study area

4.3.1 Early land grant: 1811–1832

The Darley Road construction sites originally formed part of a 270-acre grant to Ensign Hugh Piper in 1811, which he named 'Macquarie Gift'.¹⁰ Ensign Piper arrived in NSW after 1799 as an officer of the NSW Corps. His older brother Captain John Piper, also of the NSW Corps, had been in NSW since 1792. Captain Piper was also granted in 1811 the 165 acres adjacent to Ensign Piper's grant which he named 'Piperston'.¹¹

Ensign Piper left NSW with his regiment in 1812 and never returned to Australia. Captain Piper remained in the colony and retired from the army. In 1814, he was appointed to the position of Naval Officer and continued to acquire land across NSW and Van Diemen's Land, including at Vacluse, Woollahra, Point Piper and Bathurst. In 1820 Captain Piper purchased James Darbyshire's 30 acres adjoining 'Macquarie Gift' to the north and in 1822, he purchased John Prentice's 100 acres 'Hampton Farm' to the south and completed building his official residence 'Henrietta Villa', at Point Piper.¹² By 1832, Captain Piper had assumed ownership of 'Macquarie Gift' and also owned Thomas Bigger's 30-acre 'Biggers Farm', located between 'Macquarie Gift' and 'Piperston'. By now, Captain Piper owned over 595 acres—the majority of the current suburb of Leichhardt.¹³ However, during this time a government inquiry was undertaken into his administration as Naval Officer, a position responsible for collecting customs duties, and it was found that Captain Piper had embezzled £12,000. He was required to sell most of his properties in order to pay back the government. Once the debt was settled, Captain Piper retreated with his family to Bathurst and died at his property 'Westbourne' in 1851.¹⁴

4.3.2 The Helsarmel estate—phase 1: 1832–1844

Captain Piper's land in Leichhardt was sold off in four separation portions. The Darley Road and Blackmore Park sites are located within the 92 acres purchased by Jean Charles Prosper de Mestre in 1832 (**Figure 4-11**). The 92 acres comprised Darbyshire's 30 acres and 62 acres of 'Macquarie Gift', which de Mestre named 'Helsarmel'. This name was derived from the first three letters of the names of his three eldest daughters – Helen, Sarah and Melanie.¹⁵

De Mestre was an American-French merchant who arrived in NSW in 1818. He began working in Sydney as an importer and was active in the commercial affairs of the colony. He eventually became a director of the Bank of NSW, serving from 1826 to 1842. He was also director at several other companies including the Marine Assurance Co in the 1830s and a founder of the Mutual Fire Insurance Co of Sydney in 1840. Prior to purchasing in Leichhardt, de Mestre already owned a small farm, 'Terara' at Bargo, and was granted 1300 acres on the Shoalhaven River in 1829. He also owned several houses in Sydney, including his residence in George Street and later in Liverpool Street. De Mestre became insolvent in 1843 and died later that year at 'Terara'.¹⁶

4.3.3 The Helsarmel Estate—phase 2: 1844–1883

There is currently no historical evidence that shows what de Mestre did with 'Helsarmel' while it was in his ownership. It is possible that he occasionally resided there but his main residence was in Sydney. After his death, 'Helsarmel' was purchased by Henry Alfred Hindson.¹⁷

Hindson kept the property for 11 years and sold it to James Henderson in February 1856, who six months later sold it to George William Lord, son of wealthy emancipist Simeon Lord (**Figure 4-12**). In October 1856, there was an advertisement by George William Lord for the lease of Helsarmel, which stated:

TO BE LET, Helsarmel, the present residence of the undersigned [George William Lord]. It is situated on the Balmain-road, adjoining Messrs. Norton and Beames, and consists of dwelling-house, coach-house, stables, and all necessary appurtenances, large garden and orchard together with ninety acres of land divided into paddocks, with large frontage to the salt water.

George William Lord died in 1880 and 'Helsarmel' was inherited by his son, Herbert Edward Lord. In 1882, Herbert Edward Lord, TA Dibbs and George Lee Lord were listed as joint owners of 'Helsarmel'.¹⁸ In 1883, 'Helsarmel' was sold to Anglo-Australian Investment Finance and Land Company Ltd and separated into two parts—Helsarmel East and Helsarmel West.

4.3.4 Development of Leichhardt: 1871–1890

In 1871, the suburbs of Leichhardt, Lilyfield and Annandale were incorporated in the Municipality of Leichhardt. The municipality covered an area of 1300 acres and a population of 614 people. Leichhardt was already well serviced by horse-drawn buses but there was mounting public pressure for steam trams. The tram network, which extended from the city into Leichhardt along Norton Street to Short Street, was completed in 1884 (**Figure 4-13**). It was further extended north along Norton Street in 1889. The Abbotsford line was opened in 1890 and started at Norton Street and went along Marion Street. The trams were electrified by 1905.¹⁹

Subdivision – Helsarmel East: 1884

Over 61 acres of the eastern part of the Helsarmel Estate were subdivided into eight sections with 564 lots. Nine new streets were created to provide access to the lots. They were Charles, Hubert, Francis, James, Henry, William and Augustus Streets and Park Road, with Norton Street extending northwards. Sale of the lots began in 1884 and were mainly purchased by the future occupants, establishing their homes, with some houses built by speculators. Streets and allotments were laid out regardless of topography resulting in some lots not being able to be built upon without extensive draining and filling.²⁰ Many of the unusable allotments were later resumed between 1910 and 1912 for construction of the goods railway.

The Darley Road construction site lies within the Helsarmel East subdivision running perpendicular to the primary street layout as shown in the 1891–1893 Sydney Metropolitan plans (**Figure 4-14**). These show three properties built along Francis Street. The line of a creek which originally drained into Long

Cove Creek (now Hawthorne Canal) runs through the heritage study area. The culvert beneath James Street lies between the two parts of the heritage study area. By 1917 two additional houses were constructed: a third house on the western side of Francis Street and a second on James Street (**Figure 4-15**).

Subdivision – Helsarmel West: 1884

The remaining 31 acres located in the western part of the Helsarmel Estate were not offered for sale until 1888. This part was subdivided into five sections with 318 lots, and extensions were made to Elswick, Piper, Augustus, Charles and William Streets and Park Road. Allotments closer to the swampy grounds along the Long Cove shoreline were more difficult to sell (**Figure 4-16**).

4.3.5 The Goods Railway Line and Leichhardt Goods Yard: 1910–1916

By the turn of the century, increasing traffic of both freight and passengers was causing congestion on suburban railway lines. A scheme to develop separate railways for goods trains was implemented. The goods line would run from Darling Harbour–Glebe Island to Dulwich Hill, via Leichhardt. The new line was laid parallel to the Hawthorne Canal and diverted eastward to Glebe Island, and was constructed along land reclaimed as part of the canal construction, in addition to a number of private properties acquired between 1910 and 1912 by the Commissioner of Railways. The majority of the land purchased formed part of the original Helsarmel subdivisions.²¹ A plan dated to December 1917 shows the extent of the land resumed for construction of the rail line along the eastern side of the Hawthorne Canal and cutting across the Helsarmel subdivision (shaded red on **Figure 4-16**). The houses within the larger heritage study area were demolished to accommodate the railway.

The goods line officially opened in 1916. Adjacent to the goods line, the Charles Street Goods Siding was opened in 1918 within the larger heritage study area.²² A detailed plan dated to August 1916 shows the layout of the adjacent Charles Street railway siding and goods yard situated on the southern side of the goods railway line (**Figure 4-17**). A small shed is shown on the southern side of the railway towards the eastern end of the yard—this is identified as a goods shed on a plan dated to 1922 (

Figure 4-18); the separate goods siding line is also identified.

4.3.6 Construction of Darley Road: 1919–1923

The original section of Darley Road was initially named Park Road and ran along the eastern side of the Hawthorne Canal turning eastwards as far as Charles Street, to the west of the heritage study area. Between 1919 and 1920, the government acquired land on the southern side of the goods line for an extension to Darley Road.²³ The first extension ran parallel to the railway from Loftus Street to Hubert Street, and was extended to James Street in 1923. These later extensions to Darley Road required additional reclamation along the creek bed which drained the area as late as 1923 to facilitate construction.²⁴

4.3.7 Operation of the Leichhardt Goods Yard: 1916–present

The Charles Street Goods Siding and Yard continued in operation throughout most of the twentieth century. An aerial photograph of the heritage study area in 1943 shows the goods line, siding and yard within the heritage study area. Piles of timber visible in the western half of the goods yard likely indicates the continued private use of this area. The Charles Street signal box was decommissioned on 23 June 1966, and an agreement was made with Geoff Penny in 1968 for the use of the siding.²⁵ A photo of the heritage study area taken in 1964 shows that the goods yard remained in use for timber storage at this time. It is probable that the existing warehouses situated within the heritage study area were constructed after Geoff Penny leased the site in 1968. The Charles Street Goods Siding was renamed after Geoff Penny in 1970, and then changed shortly afterwards to Fielder's Siding, after George Fielder, in 1972.²⁶ The siding went out of use in 1994; the railway line outside the northern edge of the heritage study area was acquired for the Inner West Light Rail Extension and the Leichhardt North tram stop (situated outside the heritage study area) was opened in March 2014.²⁷ The goods yard remains extant containing two large warehouses which are currently leased to private tenants.

4.3.8 City West Link: 2000–present

Construction of the railway goods line had limited impact on the eastern portion of the heritage study area. The 1943 aerial photograph (**Figure 4-19**) shows three buildings within the heritage study area. Based on the size and outline of the western buildings on James Street it is likely that these are the late nineteenth century buildings. The pair of buildings on Norton Street are both two storeys high and an extension has been added to the rear of the southern building. It is not clear from the aerial if the late nineteenth century houses remain extant at this time. Along the northern edge of the smaller heritage study area a fence demarcates the edge of the railway land sloping northwards down to the rail line which was cut into the landscape. This section of the railway line now lies below the City West Link roadway.

A study by the Leichhardt Historical Society in 1988 shows that the four properties were still standing at this time.²⁸ The buildings at 350 and 352 Norton Street were in use as shops, while the properties at 109 and 111 James Street consisted of single storey brick houses.

Construction of the City West Link roadway commenced in 1991 with construction of an underpass beneath Victoria Road. The stretch of the new roadway running parallel to the northern side of the heritage study areas forms the last section of the new roadway and was opened in December 2000. It is probable that the late nineteenth century buildings on James and Norton Street were demolished to facilitate construction of the new road. A title search on Lot 1 DP 919865 indicates that it was purchased by Roads and Maritime in July 1993; Lot 17 DP 653807 is also owned by Roads and Maritime although the date of purchase is not known.²⁹ The eastern heritage study area remains undeveloped land and is currently grassed over.

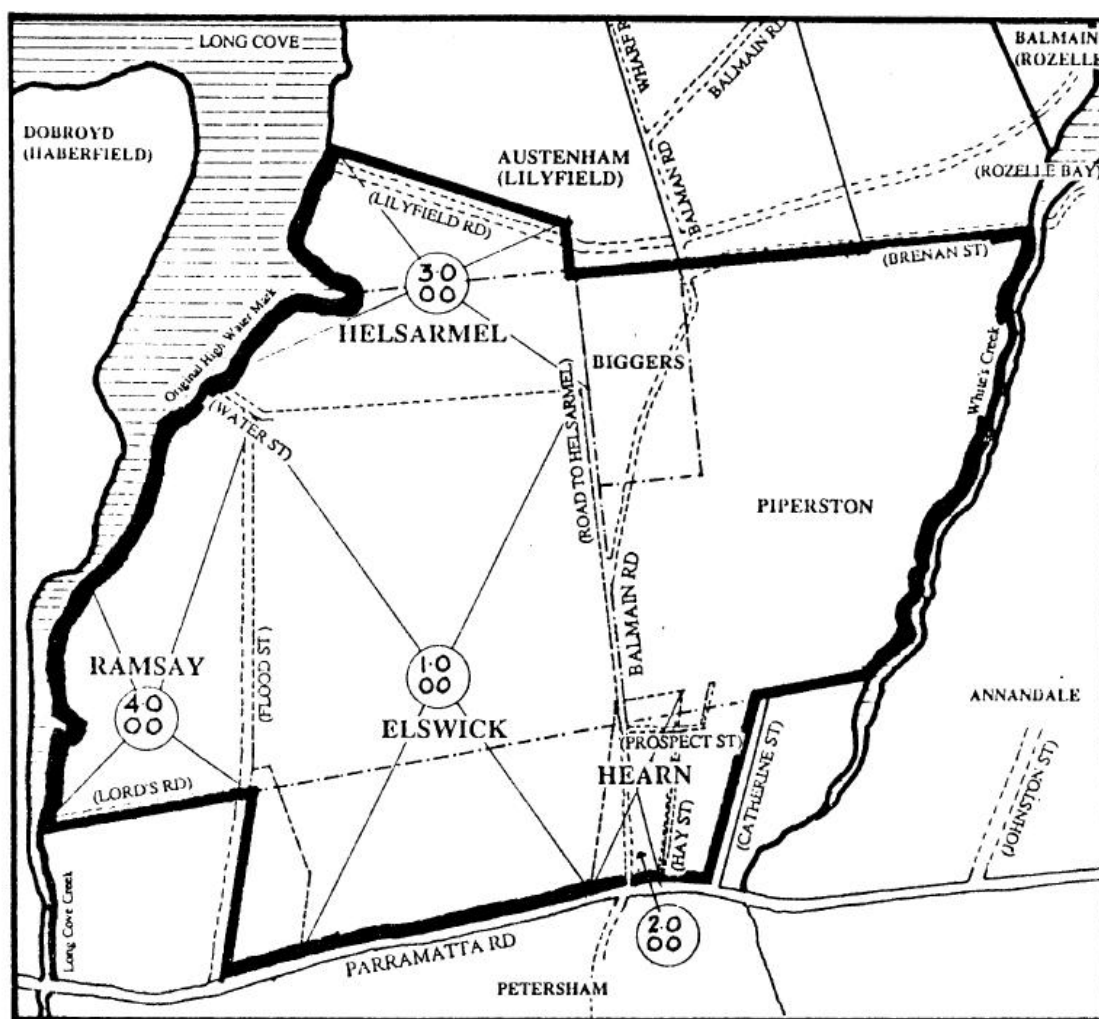


Figure 4-11 Captain John Piper's landholdings in Leichhardt

From 1831–1832, Captain Piper was forced to sell most of his properties to settle a debt. His Leichhardt landholdings were sold in four separation portions. The Darley Street site is located within the portion that became known as the Helsarmel Estate (northwestern portion) (Source: Cusick, A 1989, 'Leichhardt West: Original Land Grants and Subdivisions', *Leichhardt Historical Journal* June 1889, vol 16, figure 4)

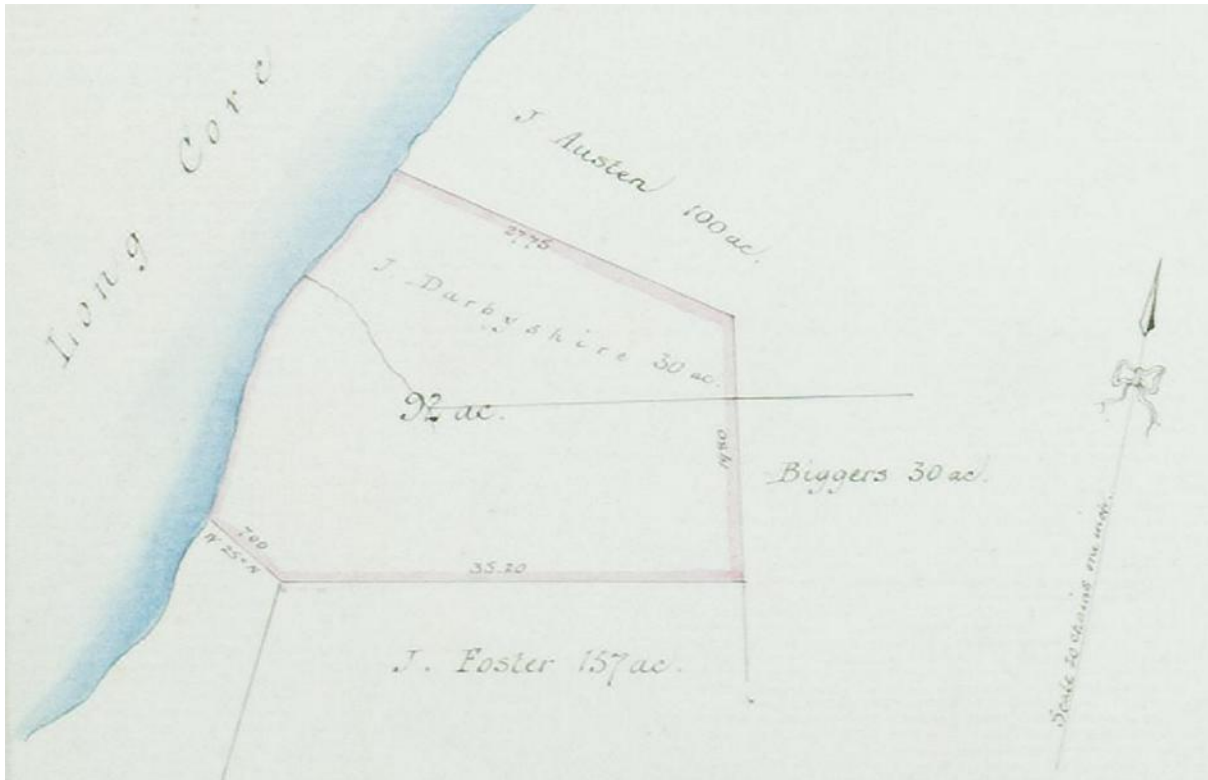


Figure 4-12 'Helsarmel' Estate, as purchased by George William Lord
(Source: CT 1-109, LPI NSW)

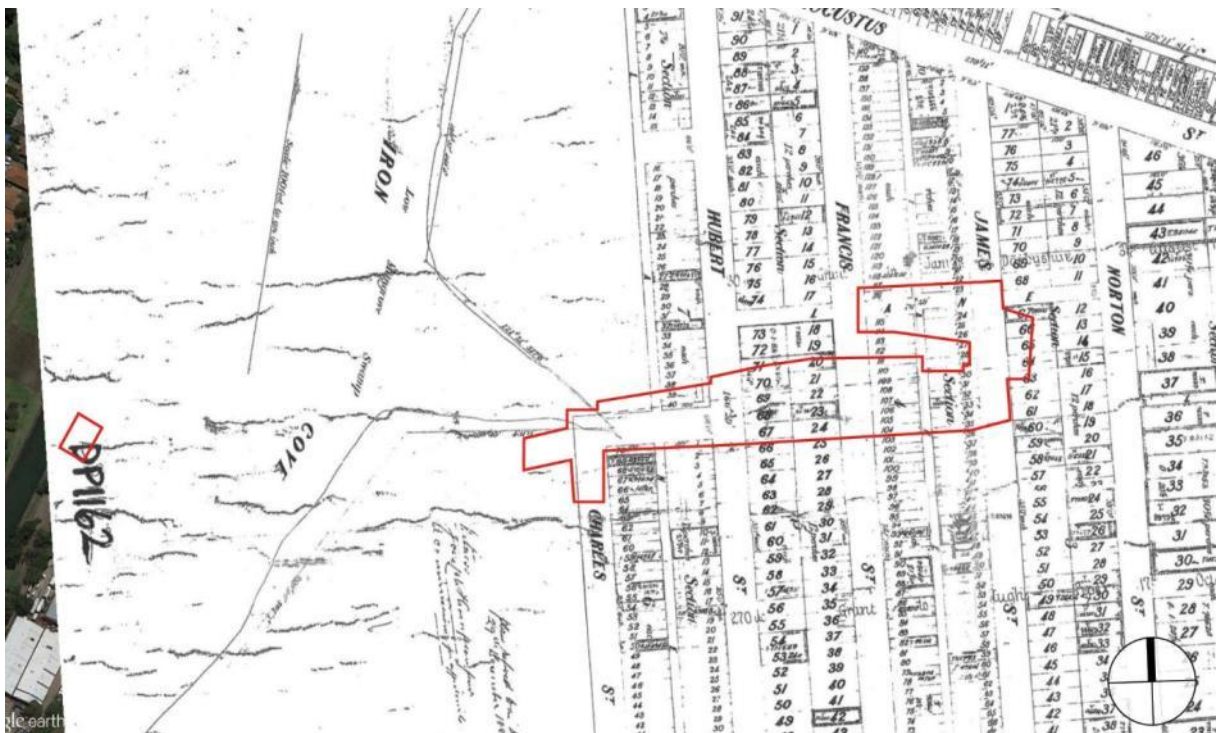


Figure 4-13 Subdivision plan of Helsarmel Estate, Leichhardt, 1886
(Source: DP1162, LPI NSW, with GML overlay 2016)

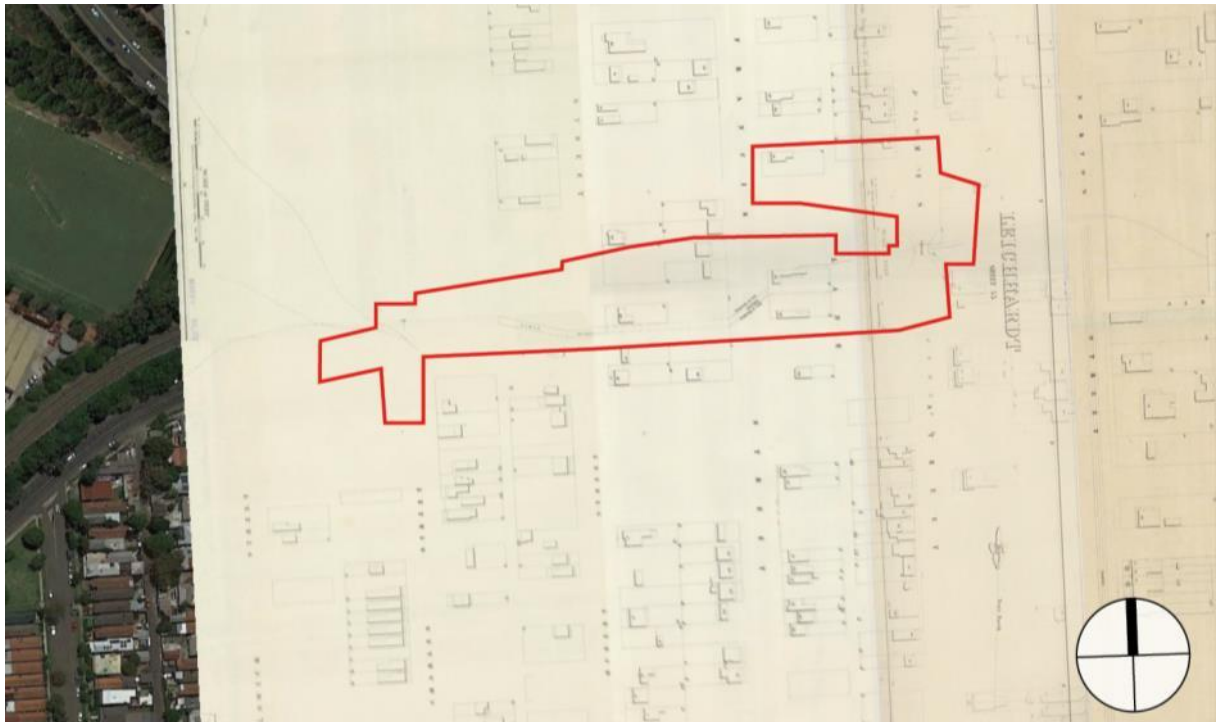


Figure 4-14 Sydney Metropolitan plans, 1891–1893

(Source: SLNSW with GML overlay 2016)

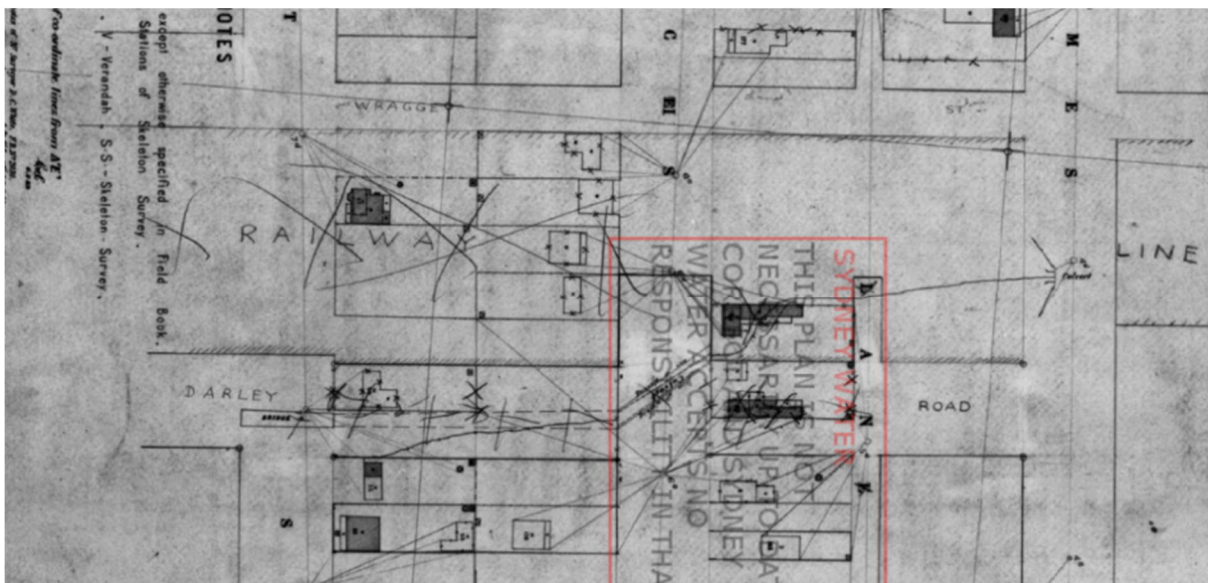


Figure 4-15 Detail from 'Leichhardt, Sheet 53', dated March 1889

(Source: Sydney Water Archives with GML overlay)



Figure 4-16 Detail from 'N.S.W.R. Wardell Road to Glebe Island & Darling Harbour Land Plan', 1917
(Source: Crown Plan 4389-3000, LPI NSW with GML overlay 2016)



Figure 4-17 Plan of the Leichhardt Goods Yard, dated 1917
(Source: Transport Heritage NSW with GML overlay 2016)

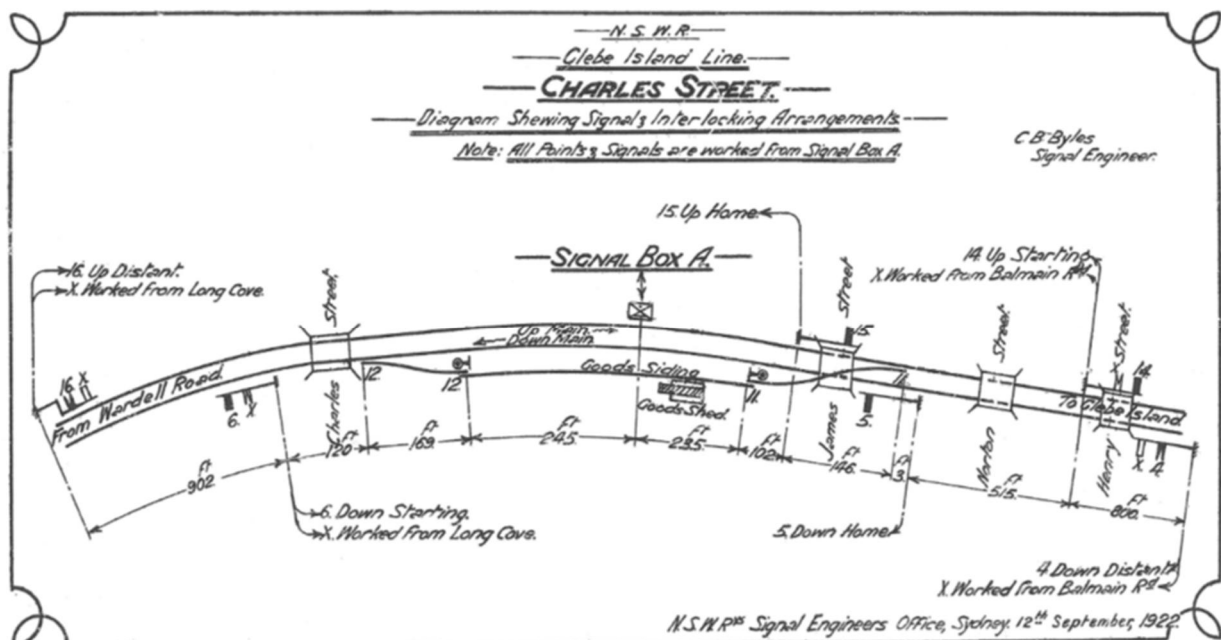


Figure 4-18 Plan of the Leichhardt Goods Yard, dated September 1922

(Source: ARHS [NSW] Track and Signals Diagram 11506 with GML overlay, 2016)



Figure 4-19 1943 aerial photograph showing the project footprint in Leichhardt

(Source: LPI NSW)

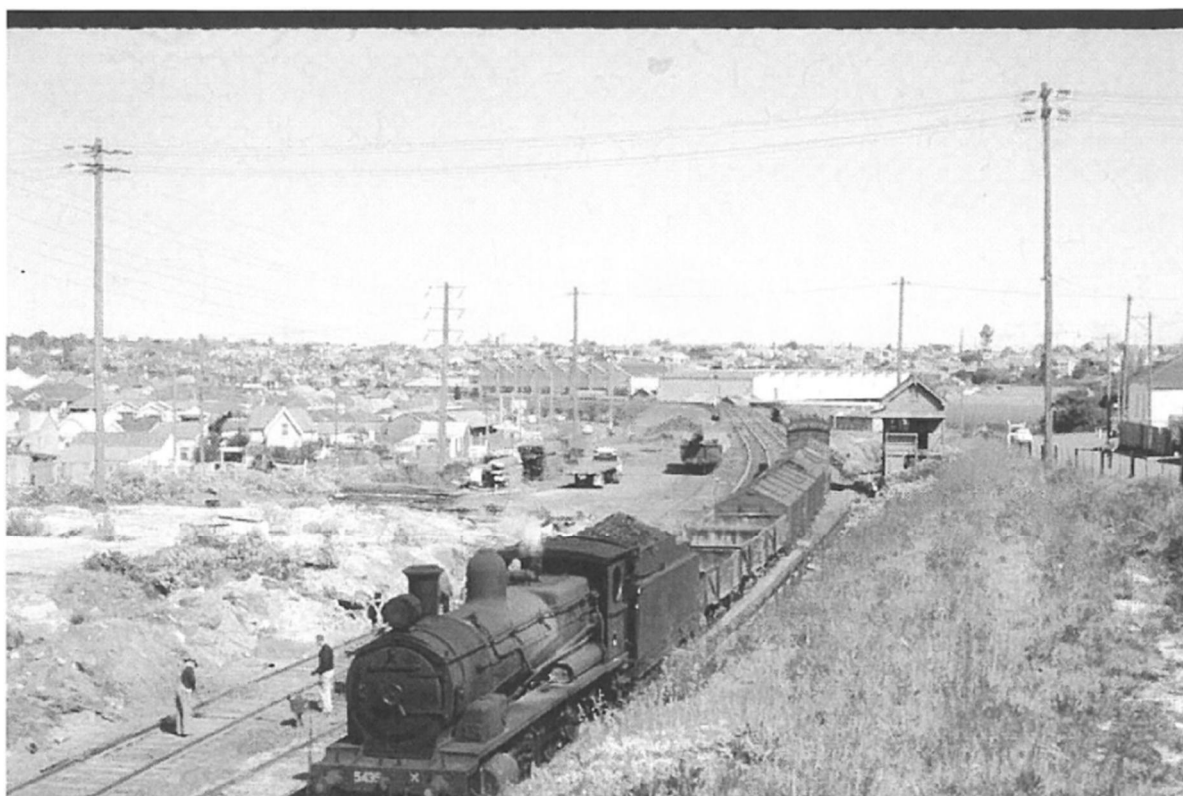


Figure 4-20 Looking west towards the Leichhardt Goods Yard, dated 1964

(Source: ARHS [NSW] image No. 00868)

4.4 Area 3 – Rozelle, Lilyfield and Annandale (Rozelle Rail Yards, The Crescent, Rozelle Bay and Victoria Road) heritage study area

4.4.1 European land grant

The Rozelle heritage study area was originally part of the 550-acre Balmain Estate granted to the colony's principal surgeon, William Balmain, in 1800 (see **section 4.4.1**).³⁰ The southern portion of the heritage study area occupies reclaimed land which was once part of the estuary of Rozelle Bay.³¹ **Figure 4-21** shows the original shoreline, and the multiple creeks which flowed through the heritage study area. This area, known as West Balmain, was relatively undeveloped until the 1880s when Alfred Hitchcock subdivided large portions of the land, and sold small, modestly priced plots to working class families (**Figure 4-22** and **section 4.5.3**).³²

4.4.2 Industrialisation of Rozelle

In the early nineteenth century the waterfronts around White Bay and Blackwattle Bay proved attractive to industries that had been forced to relocate from inner Sydney. The first of these was the abattoir set up on Glebe Island in 1860, followed by other noxious industries. By the mid-late 1800s, the shoreline was well developed with a range of industries utilising the ready access to ships (**Figure 4-23**).

Plans from 1890 show a number of industries located within the heritage study area (the area currently occupied by 68–76 Lilyfield Road), including a meat preserving works, preparing a variety of products using the meat and offal coming from the abattoirs, while Alston Hutchinson's soap works (established in 1876) used the tallow and gelatine extracted from the carcasses (**Figure 4-25** to **Figure 4-28**). In addition to these, other industries included glassworks, a saw mill and later, a box making works. Comparison of the shoreline suggests some areas of the foreshore were reclaimed to

create even working surfaces, and to manage the disease believed to be caused by the swampy mangroves of the various creek estuaries in this area (**Figure 4-27**). Odour and pollution caused by the discharge of industrial waste products into Rozelle and White Bay no doubt contributed to this, and the generally unhealthy reputation of the area.³³

The properties along Lilyfield Road to the west of Gordon Street were largely part of Rozelle Bay until the heritage study area was reclaimed in the late 1800s and the small creek running through what is now Easton Park was enclosed. It appears that there were two small cottages located facing Abattoir Road in 1890 (**Figure 4-29**).

4.4.3 Early residential development

With the spread of industry, there was pressure to develop the land with housing for workers. Prior to this, only a small number of structures are noted on the 1852 plan of the Balmain Estate (**Figure 4-21**) in the area of Easton Park. By the 1880s the basic street layout of the peninsula was established, with Catherine, Burt, Brennan and Gordon Streets shown in **Figure 4-22**.³⁴ The street along the northern edge of Rozelle Bay is referred to first as Storey Street, and later Abattoir Road.

Easton Park was partially reclaimed from 'five acres of low-lying probably flood liable land'.³⁵ It was resumed for recreation ground in 1889 and proclaimed as Easton Park in 1890. Located close to the foreshore, it was the sole public space for recreation in Rozelle until additional lands were reclaimed at Rozelle Bay, White Bay and Iron Cove, and parkland created in the early 1900s (**Figure 4-30**).

Plans from the 1890s show terraces and freestanding houses built along Lilyfield Road (previously Abattoir and Storey Street); and along a portion of Gordon Street (**Figure 4-25** to **Figure 4-27**). A number of these mid-nineteenth century buildings remain today, including Floods Hotel, located on the corner of Gordon Street and Lilyfield Road. A series of terraces were constructed along Lilyfield Street, including 10–20, 56–66, and 61–65 Lilyfield Street and the cottage at 6 Lilyfield Road.

4.4.4 The White Bay Power Station

The closure of the abattoir in 1912 led to the larger-scale industrialisation of the neighbourhood. The waterfront was levelled for the construction of wharves, including what became the Glebe Island Container terminal, and the Rozelle Bay wharves. The waterfront became dominated by various cargo handling enterprises including rail.³⁶ The White Bay Power Station was built by the NSW Rail Commissioners on a number of amalgamated residential lots and the reclaimed mudflats of White Bay (**Figure 4-31**).³⁷ These properties were progressively resumed from 1911 and all previous structures and vegetation cleared from the site.³⁸ The cutting and railway siding from goods line to Glebe Island was constructed to assist with coal and plant delivery and ash disposal.³⁹ The power station was originally built to power the rapidly expanding tramway network; but after becoming fully operational in 1917, it gradually produced more and more power for the electrified rail network, and then general use.⁴⁰ It underwent multiple phases of modification and expansion after World War II and between 1950 and 1958, with additional structures added until a reduction in demand saw its closure in 1983 (**Figure 4-32**).

Although it was used as a substation for some time, it was decommissioned and later stripped of all elements except a representative sample of the power generation operational systems identified for heritage conservation.⁴¹ However, through its location, massing, design, machinery and associated archives the complex is still able to demonstrate the early power-generating technology in Sydney.⁴² The closure of the power station also resulted in the decline of the White Bay Hotel, an establishment regularly frequented by workers from the power station and nearby waterfront industries. It was built in 1916 by Tooth and Co,⁴³ fronting the newly configured Victoria Road on the site of earlier residential buildings. It was well known in the area as the neighbourhood's only venue with a licence. It closed in 1992 and was left unused until it was destroyed by fire in 2008. The site was purchased by Sydney Harbour Foreshore Authority (SHFA) and cleared of all structural remains.

4.4.5 Establishment and use of the Rozelle Rail Yards: 1916–1996

In June 1916, the Rozelle Rail Yards (then known as the Rozelle Marshalling Yard) was created as part of the Goods Railway Line.⁴⁴ The Rozelle Marshalling Yard was designed as a holding yard for traffic proceeding to Darling Harbour, which was Sydney's main goods yard at this time. Following the

closure of the Glebe Island Abattoir, grain and coal handling facilities and wharves were developed at White Bay near the Rozelle Marshalling Yard facility.⁴⁵

The Rozelle Rail Yards were created by filling in much of the White Creek estuary, and through the quarrying of the rugged sandstone outcrops which are shown along the foreshore in **Figure 4-23**. This also removed what previous structures there were along the shoreline (**Figure 4-29**). The Crescent was built as a bridge, over the open channel of the Whites Creek Storm Water Channel.

Two large brick overbridges, the Catherine Street overbridge and the Victoria Road overbridge, were constructed in the 1920s as part of a larger rollout of overbridges across the goods rail network. They functioned to carry vehicular traffic across the newly opened goods yard and likely used bricks from the State Brickworks in Homebush.⁴⁶

By 1928, a plan of the Rozelle Rail Yards shows the huge number of lines operating from there (**Figure 4-33**), and this is confirmed by photographs (**Figure 4-34** and **Figure 4-35**). The Rozelle Rail Yards were a locomotive depot until World War II with an engine shed, 75-foot (23m) turntable, water columns and coal storage facilities. The Rozelle signal box, erected to control the rail connection from the eastern end of the yard, was removed in July 1931.

During World War II, the Rozelle Rail Yards became a storage area for the American Army and the locomotive depot was removed. Trains would sometimes turn up at the yard during the war years loaded with soldiers bound for active service overseas.⁴⁷ **Figure 4-41** shows the Rozelle Rail Yards in 1943.

Since World War II the goods yard has held a variety of freight. Trainloads of wheat, barley, and other grains came in from numerous country branch lines and were transferred to silos for storage before being loaded onto the ships.⁴⁸

Coal exports from the 1960s saw many trains loaded with coal move through an unloader and then move along to the departure road once emptied.⁴⁹ During 1967, the railway from Dulwich Hill to Rozelle was electrified. This allowed the movement of electrically-hauled freight trains from the Blue Mountains and Gosford to Rozelle (**Figure 4-37**).

Very few members of the public were allowed access to the Rozelle Rail Yards, because electric passenger trains were incompatible with the tracks, which were wired specifically for the use of electric locomotives. The Australian Railway Historical Society ran a Metropolitan Goods Line mystery tour in 1986 and another in 1987. In June 1988, the 'last' train of export grain arrived from Parkes in the Rozelle Rail Yards.⁵⁰ In 1996 the goods line from Pymont to Rozelle closed, bringing an end to 80 years of use at the yards, for marshalling trains and goods on their way into and out of the city. In 2000, the light rail to Lilyfield opened using the tracks from the Rozelle Rail Yards near Brennan Road. For a few years, the yard was used irregularly, including for the unloading of wheat and storage of concrete, but was completely closed around 2007.⁵¹

4.4.6 Changes throughout the twentieth century

As part of the construction of the Rozelle Rail Yards in 1915, areas of the 1880s' residential subdivision were resumed and streets realigned (**Figure 4-38**). This included straightening Catherine Street across the new rail bridge, and sections of both White Street and Abattoir Road were removed, including the residential properties at the western end of Rozelle Bay (**Figure 4-39**). The remaining portion of Abattoir Road was renamed Lilyfield Road, and connected to a new road running west towards Haberfield. The 1800s houses located along both Weston Street and Barnes Street were demolished for the realignment of Weston Road to what is now Victoria Road.

By 1915, the residential development of the area had increased dramatically.⁵² More allotments within the heritage study area began to be occupied from early twentieth century onwards. The southern side of Abattoir Road was developed with the one and two storey terraces, now 6–66 Lilyfield Street. The two shops (present day at 78 Lilyfield Street) were also constructed at this time. A 1926 plan (**Figure 4-40**) shows the land south of Easton Park was for a short time known as Cohen Park, while the remainder of this area was developed.

By 1943, Rozelle was fully developed (**Figure 4-41**), with the mixed industrial and residential character that the heritage study area demonstrates today. Some of the industrial sites have undergone changes, with new structures added and removed over time. For instance, in 1930, the

1880s houses located at 68–76 Lilyfield Road were cleared. By 1943 this land was also occupied by large warehouse buildings which were replaced with the present day industrial park in the late twentieth century. The warehouse at 90 Lilyfield Road now occupied by Ironwood Australia was constructed in the mid-twentieth century, on what was originally part of the rail yards and was operating as a rail siding (**Figure 4-42**). In 1914, the land at 92–94 Lilyfield Road was owned by Arthur William Swadling, where he operated a timber yard. The family continue to operate the business from Rozelle, where a range of warehouses have been built and modified during 100 years of business, and other locations across Sydney (**Figure 4-43**).

During the early twentieth century, much of the infrastructure in Rozelle was also established. The open portion of Lilyfield Street Canal was constructed c1915, to channelise the creek running through Easton Park, after this land was resumed (**Figure 4-42**). Substation 1435 on Burt Street was constructed in 1934. The Interwar Stripped Classical style building was purpose designed and built by the private Electric Light and Power Supply Corporation (ELPSC) as a distribution substation. It was supplied with power from the now demolished Balmain Power Station.⁵³

As discussed in **section 4.4.5**, the character of the area changed in the late twentieth century through gentrification. These changes in the area, and across Sydney, also required large scale modifications to the road systems in this area. A key element of this was the construction of the new Anzac (formerly Glebe Island) Bridge which opened in 1995.⁵⁴ It bypassed the old Glebe Island Bridge to connect the western distributor with Victoria Road, and the City West Link, which was completed in stages during the 1990s. While they caused wide scale impacts at the time, these projects created a highly important interchange between the local network of smaller roads in the surrounding area, and the large arterial roads which connected the inner west with the city, and beyond.

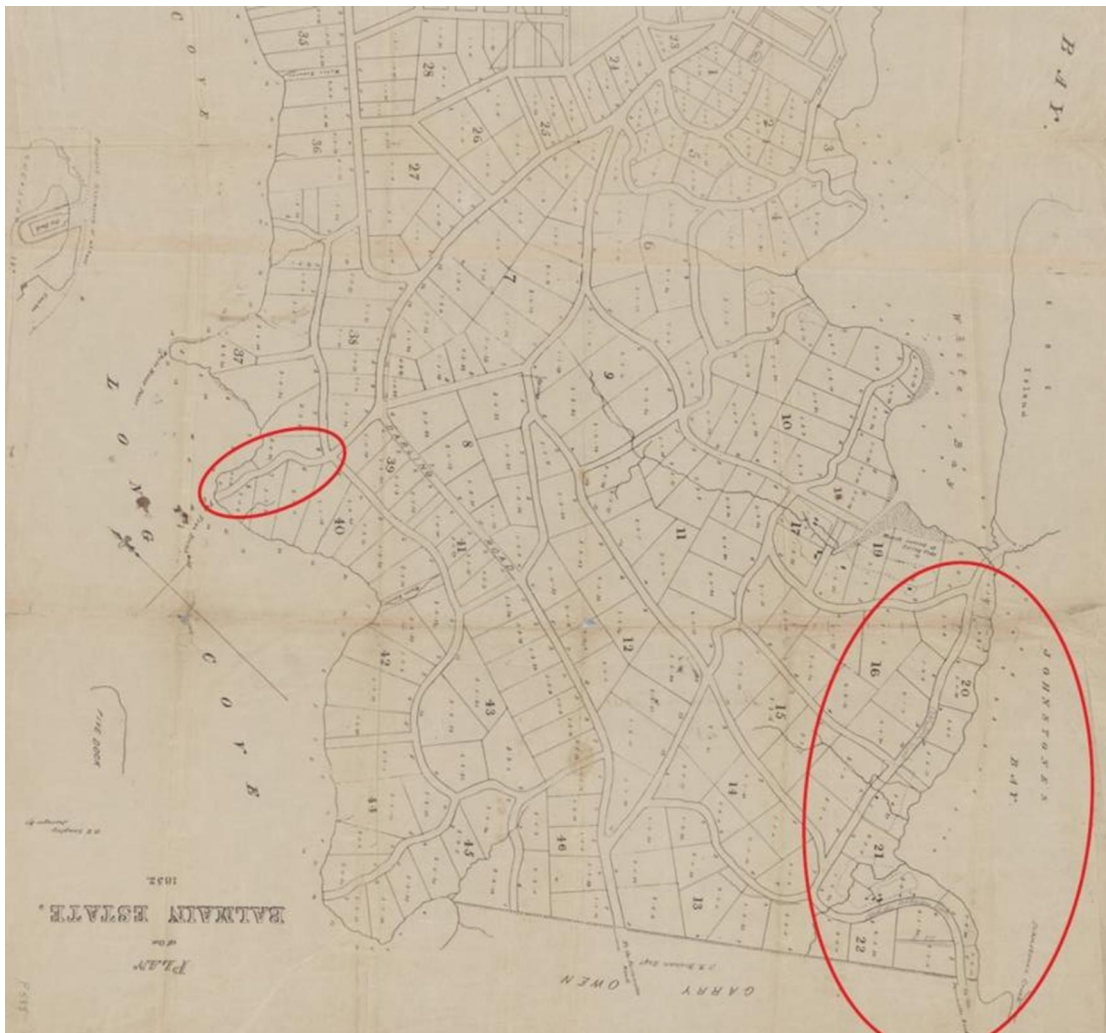


Figure 4-21 Detail of the 1852 Balmain Estate subdivision lots in the Rozelle area, with proposed street alignments that were not realised

(Source: CE Langley Surveyor, NLA)

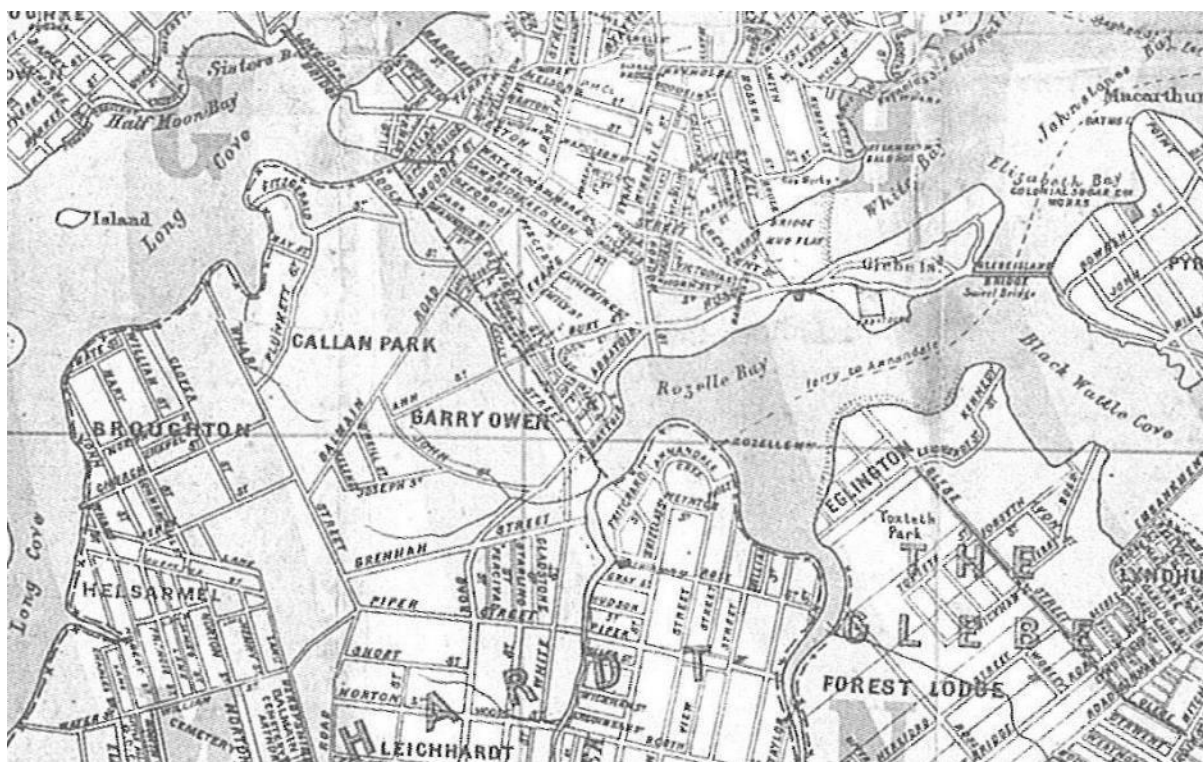


Figure 4-22 1885 Gibbs and Shallard Map of the City of Sydney & Suburbs showing streams from Rozelle Bay

The streams flow across the western extremity of the heritage study area, and the original shoreline along Abattoir Road (now Lilyfield Road). White Street and Catherine Street have been constructed (Source: Ashton, P and Waterson, D 2000, *Sydney Takes Shape*, p 36)



Figure 4-23 Photograph of Rozelle Bay in the late 1800s, showing industrial and maritime development along the foreshore.

The natural foreshore topography can be seen at the right of the image (Source: Powerhouse Museum)

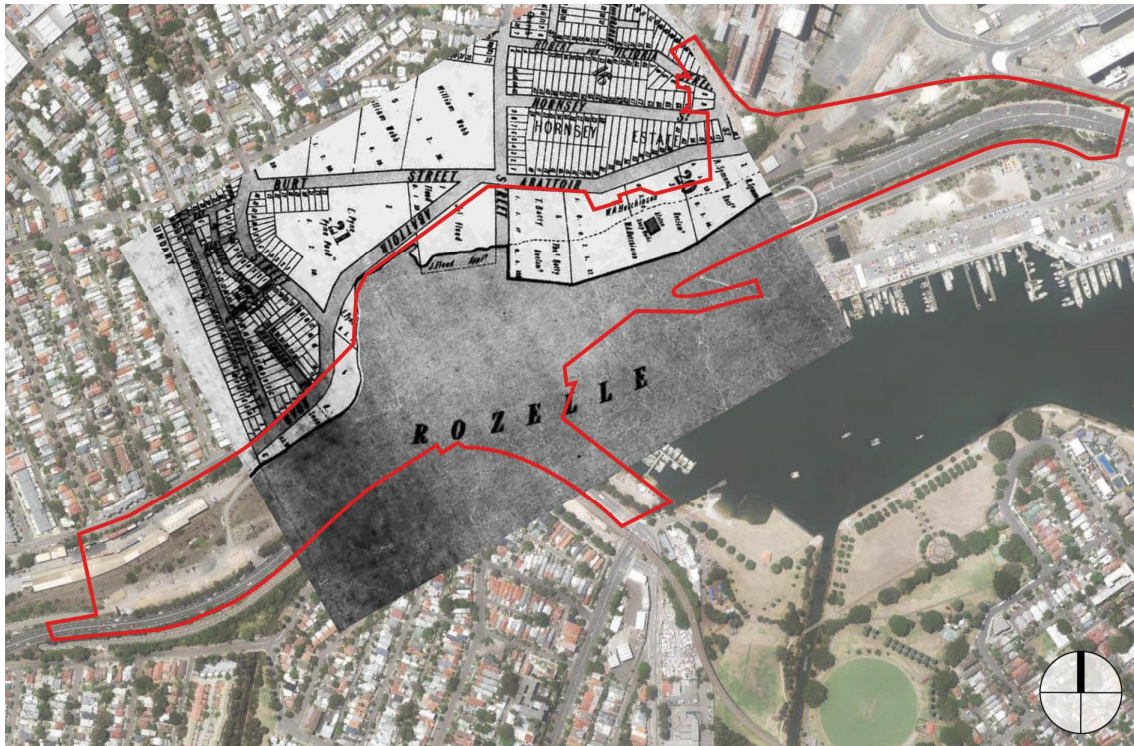


Figure 4-24 Detail from the Plan of the Municipality of Balmain in 1882, showing the original shoreline (dotted) and the mixture of Hitchcock's subdivision lots, and small residential lots

(Source: Inner West Council Local Studies Library with GML overlay)



Figure 4-25 An 1890 plan showing development on the project footprint prior to the construction of the Rozelle Goods Line, and the Rozelle Marshalling Yard in 1916.

Abattoir Road is now called Lilyfield Road, and some of the terraces shown still remain today (Source: Sydney Water, Metropolitan Detail, Balmain Sheet 70, SLNSW)



Figure 4-26 Plan of Lilyfield Road (then Storey Street) between Gordon Street and Victoria Road, in the early twentieth century

(Source: Sydney Water Archives)



Figure 4-27 Plan of properties on Lilyfield Road and Gordon Street in the early twentieth century

(Source: Sydney Water Archives)



Figure 4-28 Alston Soap and Candle Co on Abattoir Road (now Lilyfield Road) in 1890

(Source: Inner West Council Local Studies Library)



Figure 4-29 The central portion of the project footprint in part of Rozelle Bay in 1888, to the south of Abattoir Road

(Source: Sydney Water, Metropolitan Detail, Balmain Sheet 70-72, SLNSW)



Figure 4-30 View of Easton Park, looking east towards Lilyfield Road in the early twentieth century
(Source: Inner West Council Archives)



Figure 4-31 Eastern portion of the project footprint in part of Rozelle Bay in 1888 and residential development, prior to demolition for the construction of White Bay Power Station
(Source: Sydney Water, Metropolitan Detail, Balmain Sheet 51, SLNSW)



Figure 4-32 View of the White Bay Power Station, across Victoria Road, showing the White Bay Hotel in the foreground, and the railway siding

(Source: City of Sydney Archives)

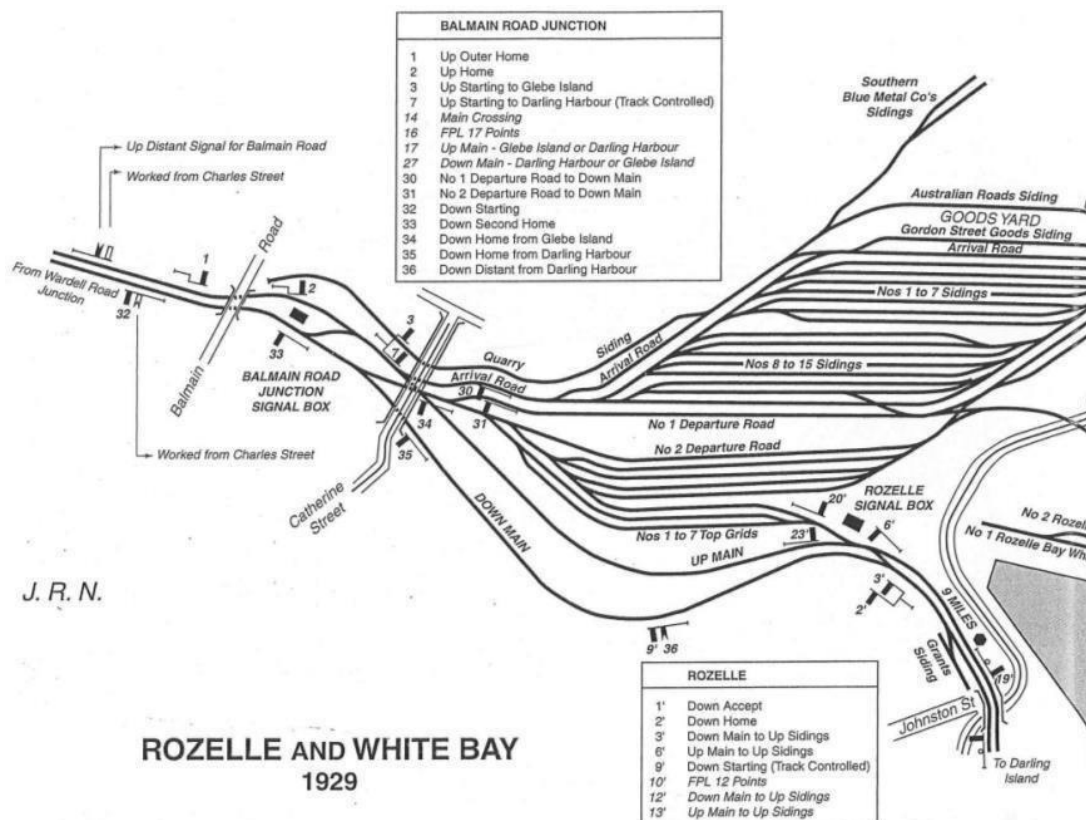


Figure 4-33 1929 plan showing the usage of the Rozelle Rail Yards at this time

(Source: Oakes J 2002, *Sydney's Forgotten Goods Railways*, Australian Railway Historical Society, p 46)



Figure 4-34 Rozelle Rail Yards viewed from Lilyfield Road near the Catherine Street overbridge in 1951
 (Source: Oakes J, 2002, *Sydney's Forgotten Goods Railways*, Australian Railway Historical Society, p 49)



Figure 4-35 An early image of the Rozelle Rail Yards looking west towards Catherine Street Bridge
 (undated)

Brennan Street, now the City West Link, is to the left of the image (Source: Oakes J, 2002, *Sydney's Forgotten Goods Railways*, Australian Railway Historical Society, p 43)

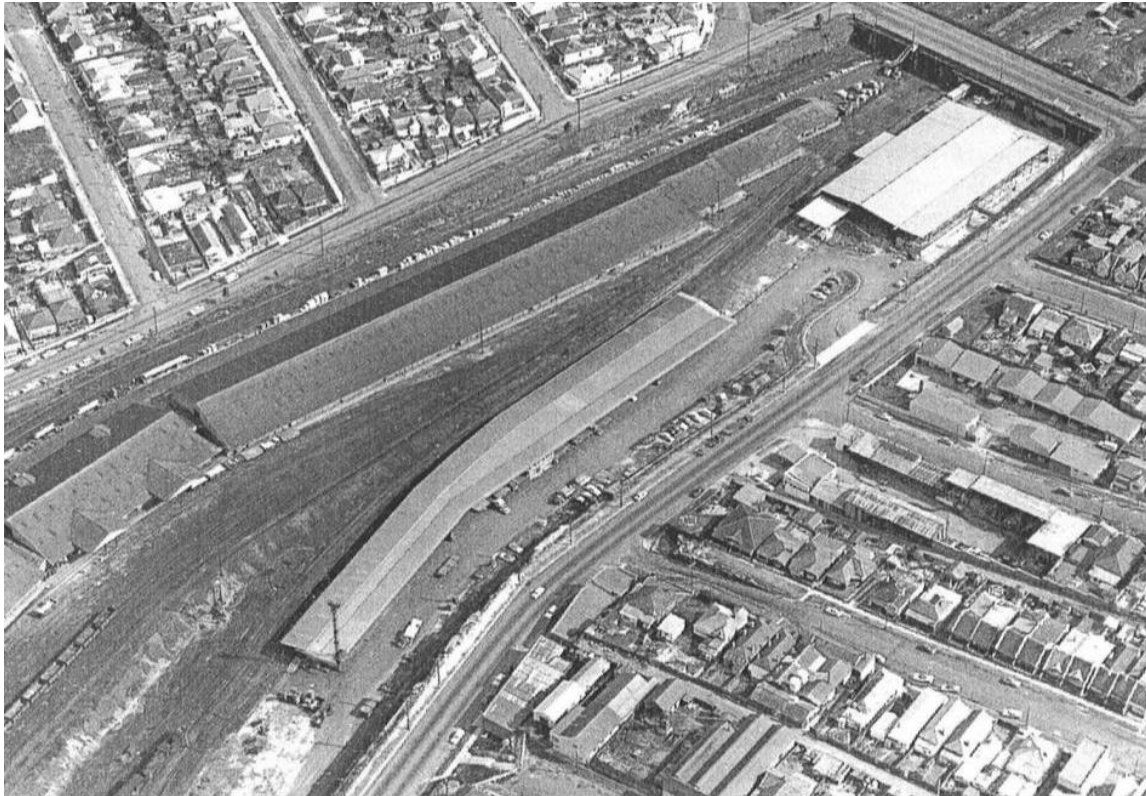


Figure 4-36 A 1960s view of the Rozelle Rail Yards depot looking west toward Catherine Street overbridge.

Brennan Street (now City West Link) is to the top left of the image and Lilyfield Road is in the foreground. The Up and Down lines to Darling Harbour (now the tracks for the Sydney Light Rail) are located at the far boundary of the yard just below Brennan Street and the arrival and departure roads are located between the two lines of sheds (Source: Oakes J 2002, *Sydney's Forgotten Goods Railways*, Australian Railway Historical Society, p 48)



Figure 4-37 Rozelle Rail Yards in March 1968, showing infrastructure and condition of the heritage study area during its use

(Source: Oakes J 2002, *Sydney's Forgotten Goods Railways*, Australian Railway Historical Society, p 102)



Figure 4-38 Detail from the 1917 plan showing the areas of land resumed for the construction of the goods line, a dedicated freight rail network between Wardell Road and Glebe Island

(Source: Crown Plan 4389-3000, LPI NSW)



Figure 4-39 The westernmost end of the project footprint in 1888, showing Whites Creek, and three small buildings (outside the heritage study area)

(Source: Sydney Water, Metropolitan Detail, Leichhardt Sheet 62, SLNSW)

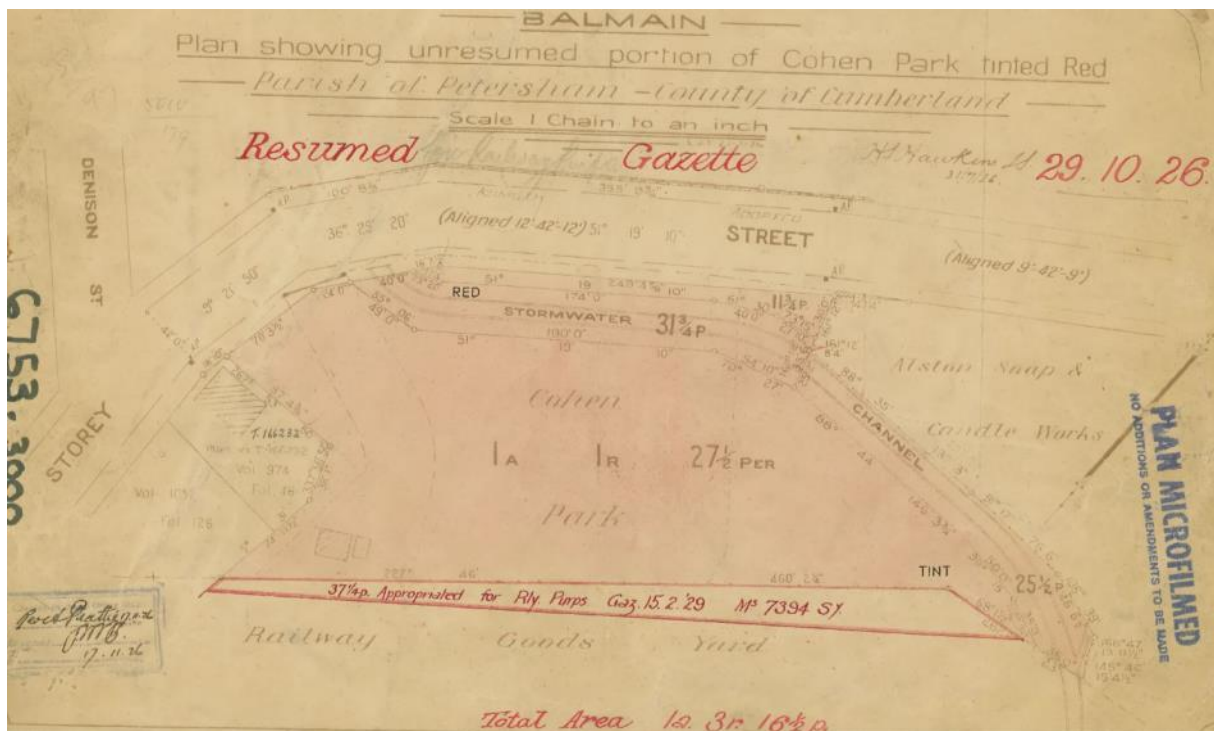


Figure 4-40 Plan showing Cohen Park and the industrial development in the central portion of the heritage study area

(Source: Crown Plan R479290, LPI NSW)

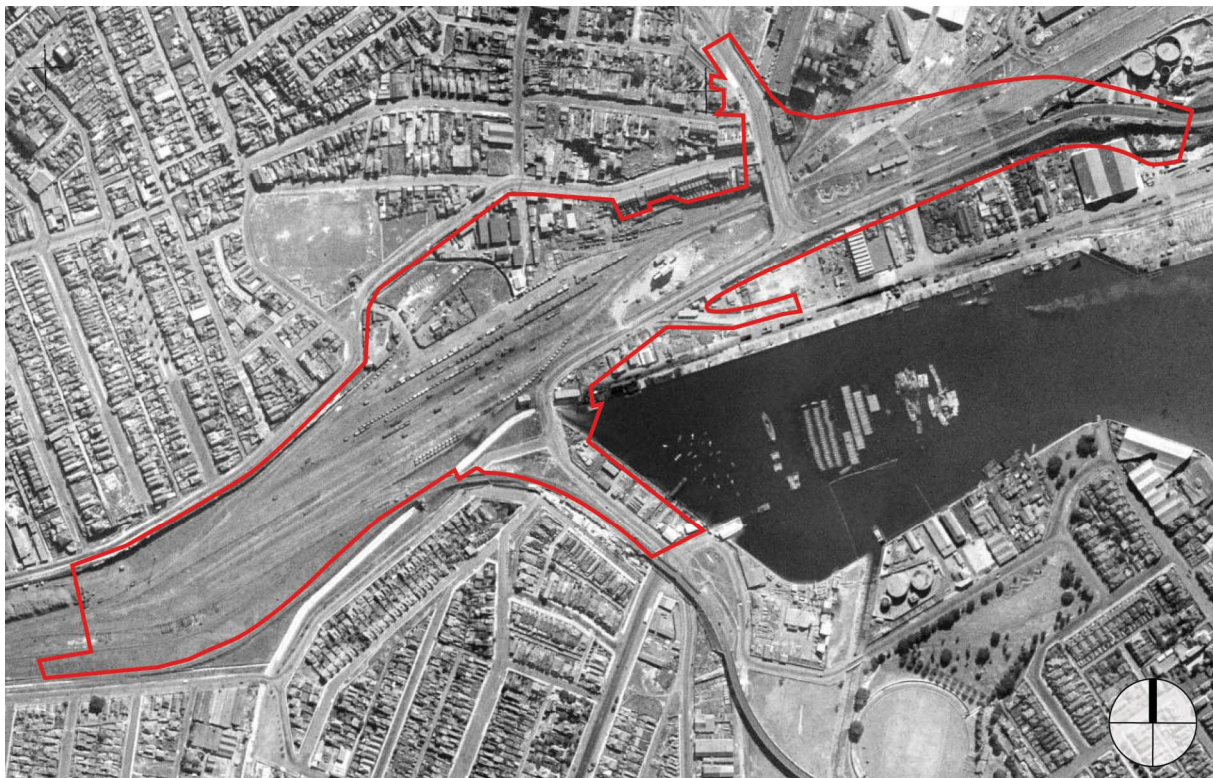


Figure 4-41 A 1943 aerial photograph of the Rozelle heritage study area showing the project footprint

(Source: LPI NSW)

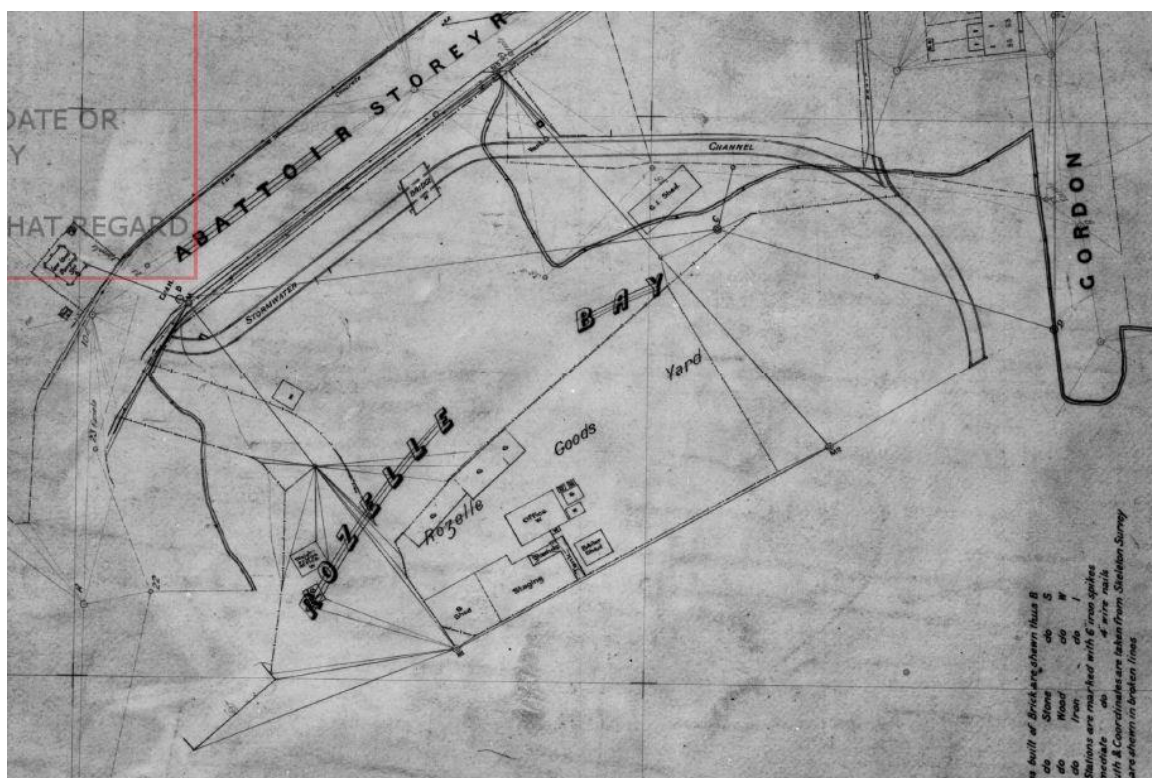


Figure 4-42 Plan showing the area of Cohen Park in the central portion of the heritage study area, now occupied by the Rozelle Goods Yard in c1913

(Source: Sydney Water Archives)



Figure 4-43 Photograph looking east along Lilyfield Street, showing the Swadling and Sons Timber Yards, c1952

(Source: Leon Manny, photographs of the Tramways of Leichhardt Municipality, Tramway Museum and Leichhardt Library)

4.5 Area 4 – Iron Cove heritage study area

4.5.1 European land grant

The Iron Cove heritage study area is located in the southwestern corner of a 550-acre grant to colonial surgeon Dr William Balmain (1762–1803) made in 1800 (**Figure 4-21**). A year after the grant was made, Balmain sold his entire holding for five shillings to John Bothwick Gilchrist in order to settle a debt. Balmain returned to England and this transaction remained unknown to Balmain's family until after his death. The legality of the land transfer from Balmain to Gilchrist was challenged by Balmain's descendants and further development of the area was initially blocked. The area subsequently became known as 'Gilchrist's place', although court documents refer to the area as the 'Balmain Estate'. In 1823 Gilchrist tried to sell the land but failed to attract a buyer. Eventually Gilchrist appointed Frederick Parbury in 1833 to act as his attorney and to subdivide and sell the 'Balmain Estate'. The first land was sold in 1835.⁵⁵

4.5.2 Early development of Balmain West

From the 1830s to 1850s, Balmain developed as a suburb with a strong maritime industry. Along its coastline were boat yards, slipways, ships and wharves. Balmain also became connected to the city via regular ferry connections and horse drawn omnibuses.⁵⁶ In 1857, Blackbutt Bridge, which linked Pyrmont to Glebe Island across Johnston Bay, was opened and provided quick connection via a road to the city. Blackbutt Bridge was replaced by Glebe Island Bridge in 1903.

While Balmain, particularly around Darling Street, was quickly being developed, Balmain West (now known as Rozelle) remained relatively unpopulated. Balmain Council was incorporated in 1860.⁵⁷ During the early 1860s, Dr George Robinson Elliot, a chemist, with his brothers Frederick and James

opened Australia's first chemicals, pharmaceuticals and later glassworks factory along the Iron Cove foreshore. Off the opposite coast of the Balmain peninsula, abattoir works began in 1860 at Glebe Island. The abattoir remained there until 1912 when it was moved to Homebush.⁵⁸

In 1873, the Government purchased Callan Park, located on the west of the Balmain boundary line, for the purpose of constructing a mental health hospital. (Callan Park is identified as 'Garry Owen' in **Figure 4-30**.) The Callan Park Hospital was to provide relief of overcrowding and additional resources for the Gladesville Hospital for the Insane (operating since 1838 and later known as Gladesville Mental Hospital).

The first patients from Gladesville were transferred to Callan Park in 1877 and housed in the Garry Owen House (constructed in c1840). From 1880 to 1885, 33 new buildings were constructed across the asylum grounds. The Callan Park for the Insane was officially opened in 1885.⁵⁹

At the same time as the construction of the Callan Park Mental Hospital, Iron Cove Bridge was also being built in order to connect Drummoyne and Rozelle. The original bridge was constructed of wrought-iron lattice girders and opened in 1882.⁶⁰ Iron Cove Bridge was connected to Weston Road (now Victoria Road) on the Rozelle side.

4.5.3 'Homes for the People'

Alfred Hancock, a real estate agent and Balmain alderman (serving 1873–1882 and 1884–1886), recognised the need for housing for the people who was working on the construction of the hospital and Iron Cove Bridge. Hancock acquired large land portions for subdivision in the vicinity of these developments and encouraged others, including WH and RJ Paling and Dr L Foucart, to do the same (**Figure 4-44**).

Hancock's real estate advertising slogan was 'Homes for the People'.⁶¹ The allotments were sold at modest prices and easy terms, which encouraged a high turnover of small residential lots. From 1880 to 1882, the overall population of the Balmain peninsula doubled from 8000 to over 16,000. An 1890 plan of the Iron Cove heritage study area shows a quarry between Iron Cove and Byrne Street and only a handful of houses between Byrnes and Callan Streets along Victoria Road, including today's 232 Victoria Road. Another house at the end of Byrnes Street is also shown facing south into the bay. (**Figure 4-45**). Between Callan and Springside Streets nearly all the allotments were occupied (**Figure 4-46**). Some of the allotments in the area south of the heritage study area, between Victoria Road and Callan Park, are also occupied, including 6, 8, 10 Toelle Street and 8 Callan Street (**Figure 4-45**).

After years of petitioning, a post office to service Balmain West was opened in 1894. It was officially named Rozelle Post Office and the suburb adopted the name.

4.5.4 Industrialisation of Rozelle

In 1892, the first steam tramline to run through Rozelle was opened. It was an extension of the Forest Lodge line to the city and ran from Bridge Road, Glebe, to Darling Street and Merton Streets, via Victoria Road.⁶²

An 1895 plan of the Rozelle shows only one house was constructed within the heritage study area—between Clubb Street (then known as Cove Street) and Toelle Street at today's 256 Victoria Road (**Figure 4-47** and **Figure 4-48**). While development was slow along Victoria Road, more of the allotments to the south, near Callan Park, were occupied by 1895.

Heavy industries continued to be established in Rozelle. In 1897, the Lever Brothers Limited established a factory at White Bay that extracted oil from copra. They also manufactured glycerine and Sunlight Soap. Balmain Power Station, located on the eastern side of Iron Cove Bridge, was opened in 1909 and White Bay Power Station opened in 1917.

The tramline was electrified in 1902.⁶³ More allotments began to be occupied along Victoria Road from the early twentieth century onwards. Based on the 1909 survey field book of the Rozelle heritage study area, two more dwellings (now numbered as 264 and 266 Victoria Road) were constructed between Byrnes Street and Clubb Street (**Figure 4-49**). These two allotments and the adjacent allotments (now 260 and 262 Victoria Road) were all owned by Johan Alfred Anderson in 1909.⁶⁴ Two more cottages were constructed on 260 and 262 Victoria Road soon after and all four cottages were

occupied by 1911.⁶⁵ Also in the 1909 field book were five more dwellings between Clubb Street and Toelle Street, including 244 to 250 Victoria Road (**Figure 4-50** and **Figure 4-51**); and two more between Toelle Street and Callan Street – 232 Victoria Road and 234 Victoria Road⁶⁶ (**Figure 4-52** and **Figure 4-53**). Away from Victoria Road, 8 Byrnes Street had also been constructed (**Figure 4-54**).

Land reclamation around the Balmain Peninsula began to occur from the 1890s onward. At Iron Cove, the mud flats were reclaimed and in 1910 extended out to the currently existing sea wall. The progress of these works is shown in **Figure 4-47** with reclamation around the boatshed and house on the southern shore. Later, the house located within the bioretention facility study area was demolished, and this reclaimed land was proclaimed as King George Park in 1912 (**Figure 4-55**).

The foreshore of Rozelle Bay was also reclaimed and by the 1920s the bay had become one of the largest timber handling wharves in Sydney.⁶⁷ In c1915, G Folster and H Bourne established a timber yard on the corner of Clubb Street and Victoria Road.⁶⁸ In 1922, Glebe Island Grain Silo began operations and railways sidings were completed. Dotted throughout Rozelle were also broom and brush makers.

Hancock claimed the growing industries and tram networks made Rozelle a worthwhile investment. However, the increasing pollution brought down the value and desirability of the area and Rozelle was known as a working class area and slum.⁶⁹

4.5.5 Changes throughout the twentieth century

By the 1940s, all the allotments within the Iron Cove heritage study area were occupied, including 8 Callan Street (constructed in c1922) and 236 Victoria Road (constructed in 1930s) (**Figure 4-56** and **Figure 4-57**). Located on the corner of Clubb Street and Victoria Road at the G Folster and H Bourne timberyard, there appears to be large sheds – possibly for housing cut timber (**Figure 4-58**).

While predominantly used as recreational field and parklands, King George Park was the site of United States service men encampment during World War II.⁷⁰ Possibly related to the encampment at King George Park, there appears to be air raid trenches, visible as a zig zag to the south of Victoria Road dug into the headlands by Iron Cove (**Figure 4-59** and **Figure 4-60**). The bioretention facility study area remained empty in this period.

Since the 1920s, there had been discussion to widen Victoria Road to accommodate its rapidly increasing population. This did not occur until the 1888 Iron Cove Bridge was replaced in 1955 with the existing Art Deco steel truss bridge.⁷¹ In 1959, Ampol Petroleum Limited purchased 222 to 206 Victoria Road (between Callan Street and Springside Street).⁷² The buildings within these allotments were demolished and a petrol station and car park was constructed in this location. This site has been leased by Liquorland since 1994. In 1964, the Gladesville Bridge was opened and, to cope with increased traffic, Victoria Road was widened again to a six lane carriage way from Gladesville to White Bay⁷³ (**Figure 4-61**).

Rozelle's reputation as a slum began to change during the 1970s and in the 1980s. There was a local movement to gentrify the area, noticeably through improvement of homes. In the early 1990s, maritime and heavy industries relocated to other areas which left open a number of prime vacant waterfront sites. In 1992, the State Planning Minister approved a regional development plan that allowed for high rise high density development at the adjoining Balmain Power Station and Monsanto Chemical sites at Iron Cove.

This decision was opposed by the community as the new plan allowed for large scale development without proportionate provision of public open space. Leichhardt Council (which amalgamated with Balmain, Annandale and Glebe Councils in 1949⁷⁴) challenged this decision in the NSW Land and Environment Court and lost, but later won on appeal. The Balmain Power Station site has been redeveloped as Bridgewater Park and is connected via a footpath to Callan Park via King George Park. Callan Park Hospital had become Rozelle Hospital in 1975 and was closed in 1994. From 1996 to 2016, Rozelle Hospital was home to University of Sydney's Sydney College of the Arts.⁷⁵

In 2009, works began on constructing a second bridge over Iron Cove. The headland to the west of Iron Cove Bridge appears to have been used as a construction compound for these works

(Figure 4-62). The duplicate bridge was completed and opened in 2011 (Figure 4-63). The parkland was restored at the same time.

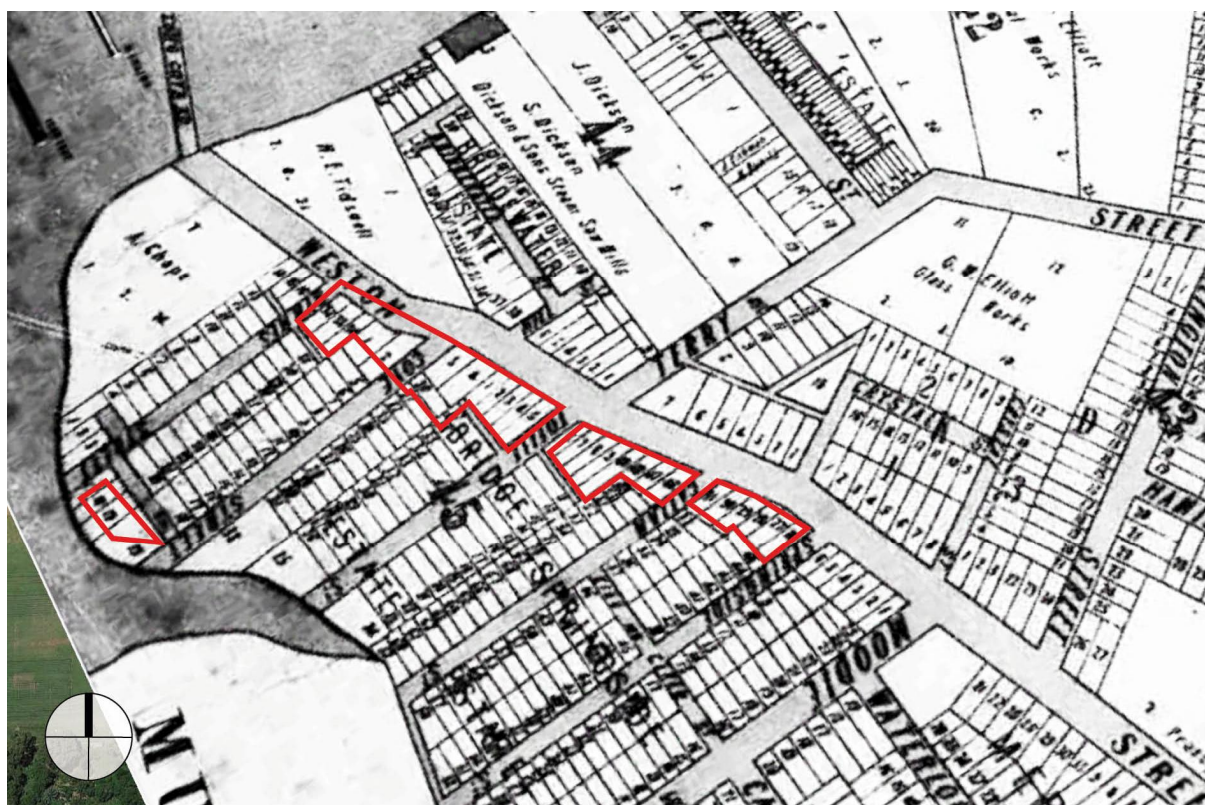


Figure 4-44 1882 plan showing the later subdivision of the Iron Cove project footprint
(Source: Inner West Council Local Studies Library with GML overlay)



Figure 4-45 An 1890 Metropolitan plan showing early development along Weston Road (now Victoria Road) from Iron Cove to Callan Street

(Source: Metropolitan Detail, Balmain Sheet 62, SLNSW with GML overlay)



Figure 4-46 An 1890 Metropolitan Plan showing development along Weston Road (now Victoria Road). Compared to Figure 3, nearly all the allotments between Callan and Springside Street are occupied

(Source: Metropolitan Detail, Balmain Sheet 63, SLNSW)

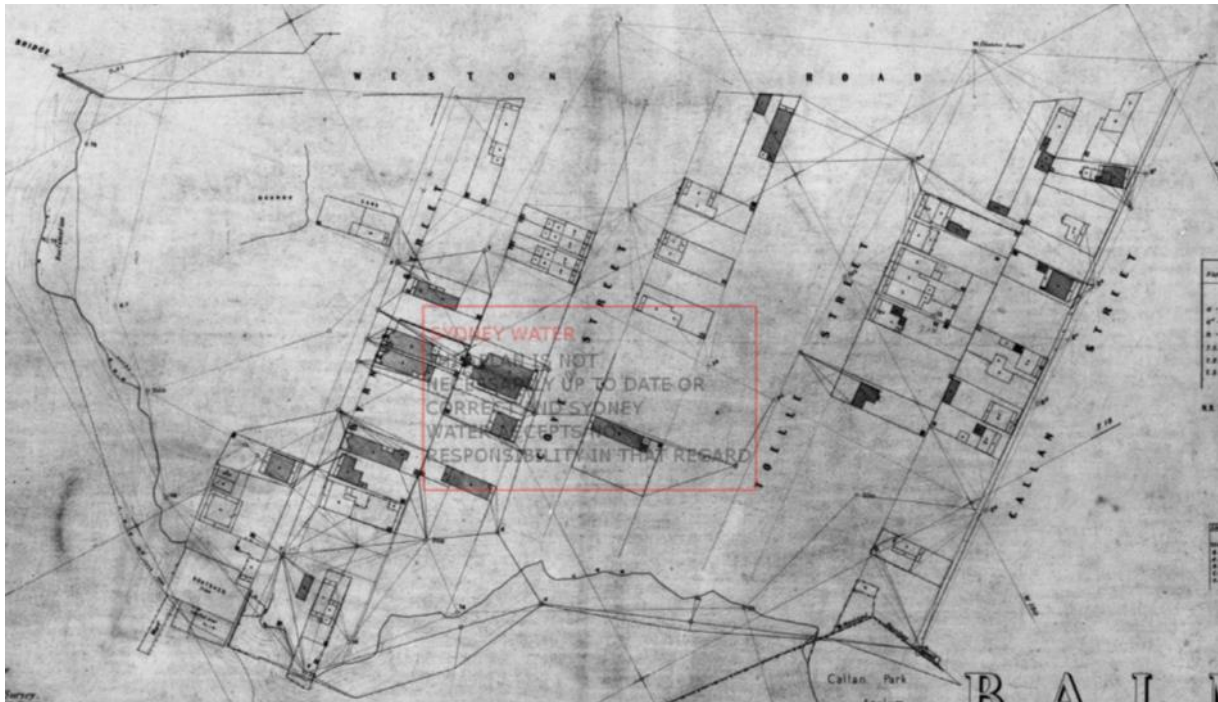


Figure 4-47 1895 plan of the Iron Cove Heritage study area, from Iron Cove to Callan Street.

Only one more house was constructed in five years along Victoria Road between Cove Street (now Clubb Street) and Toelle Street, at today's 256 Victoria Road. There were also more allotments occupied between the project footprint and Callan Park (Source: Sydney Water Archives)

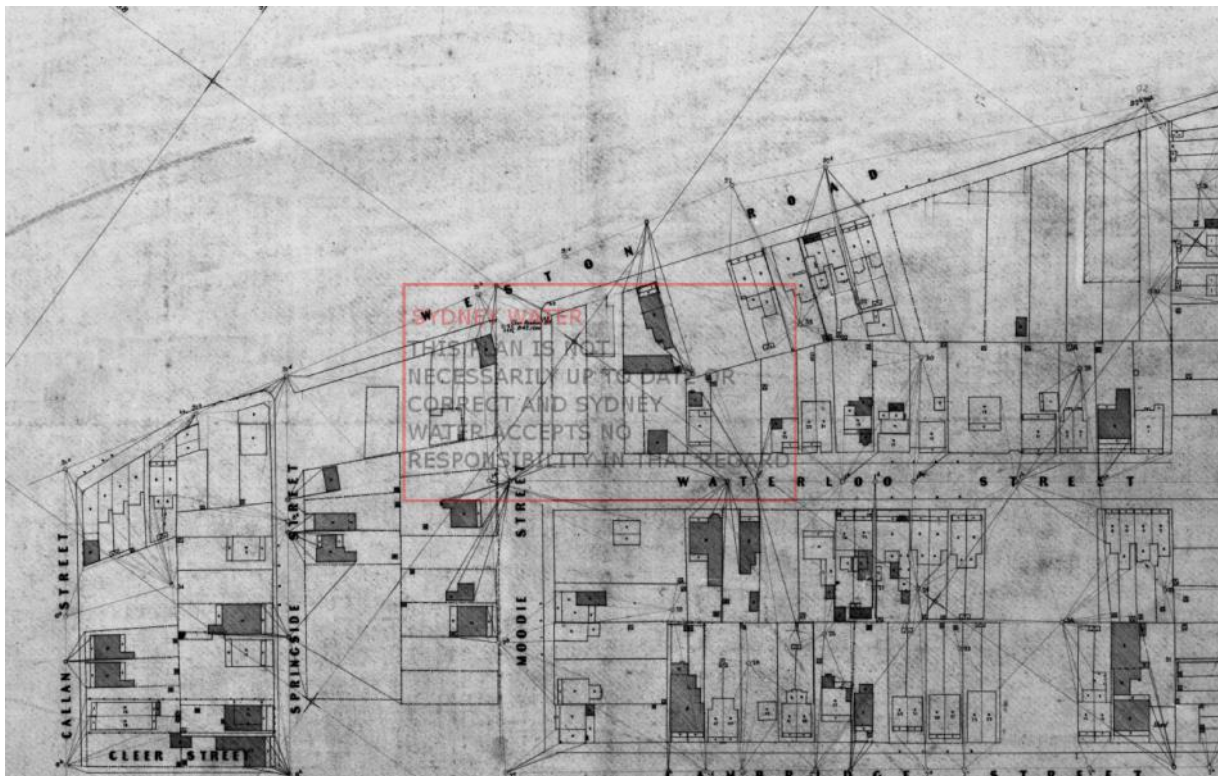


Figure 4-48 1895 plan showing the project footprint between Callan Street and Springside Street, and further to east along Victoria Road (then Weston Road)

(Source: Sydney Water Archives)

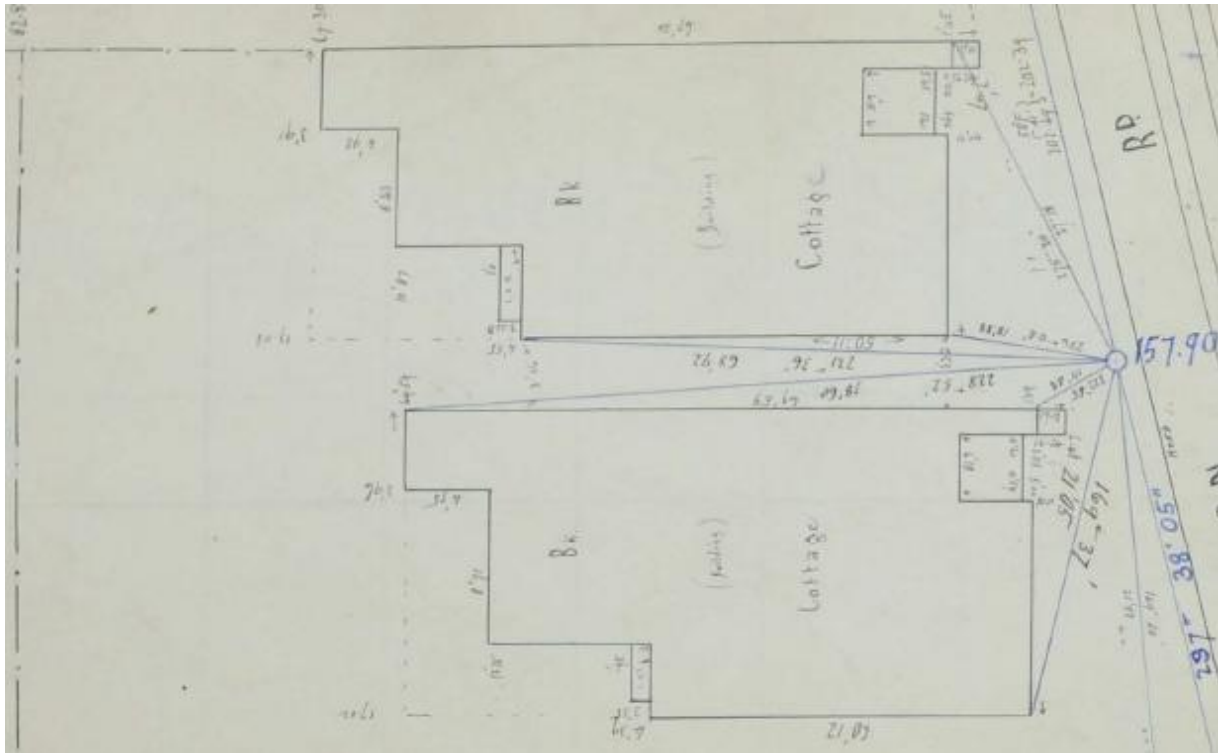


Figure 4-49 Page 35 of 1909 Field Survey Book No. 355, showing 264 (bottom) and 266 (top) Victoria Road, Rozelle

(Source: Sydney Water Archives)

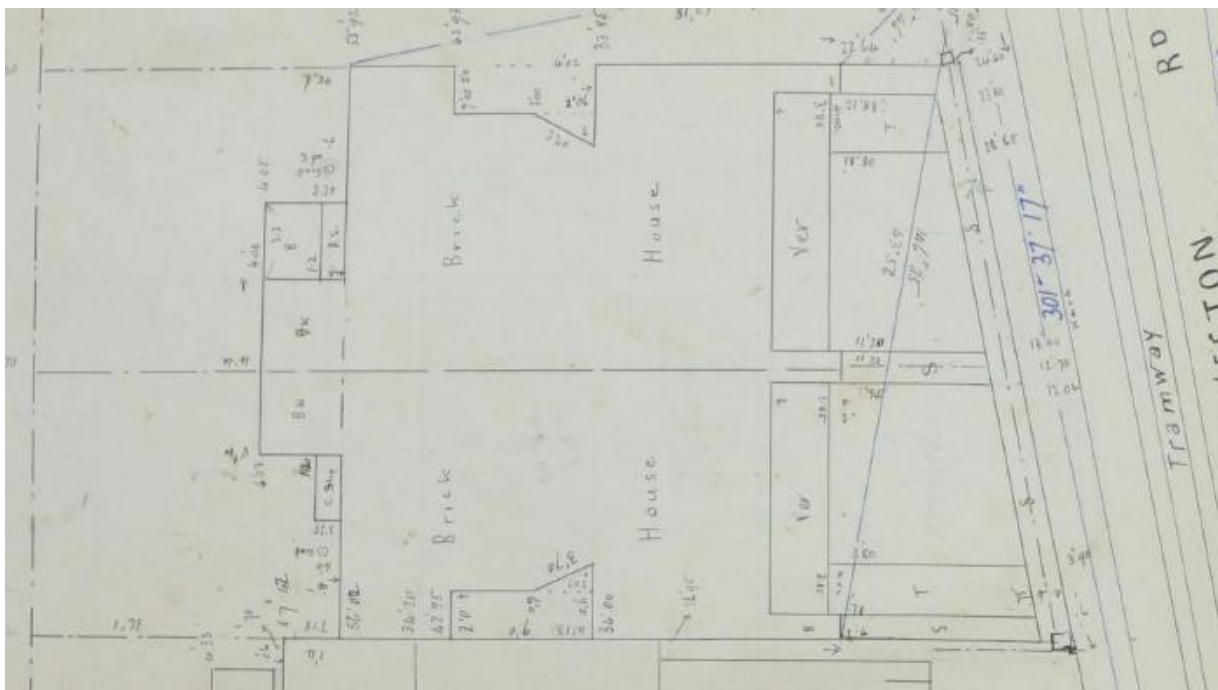


Figure 4-50 Page 23 of 1909 Field Survey Book No. 355, showing 250 (top) and 248 (bottom) Victoria Road, Rozelle

(Source: Sydney Water Archives)

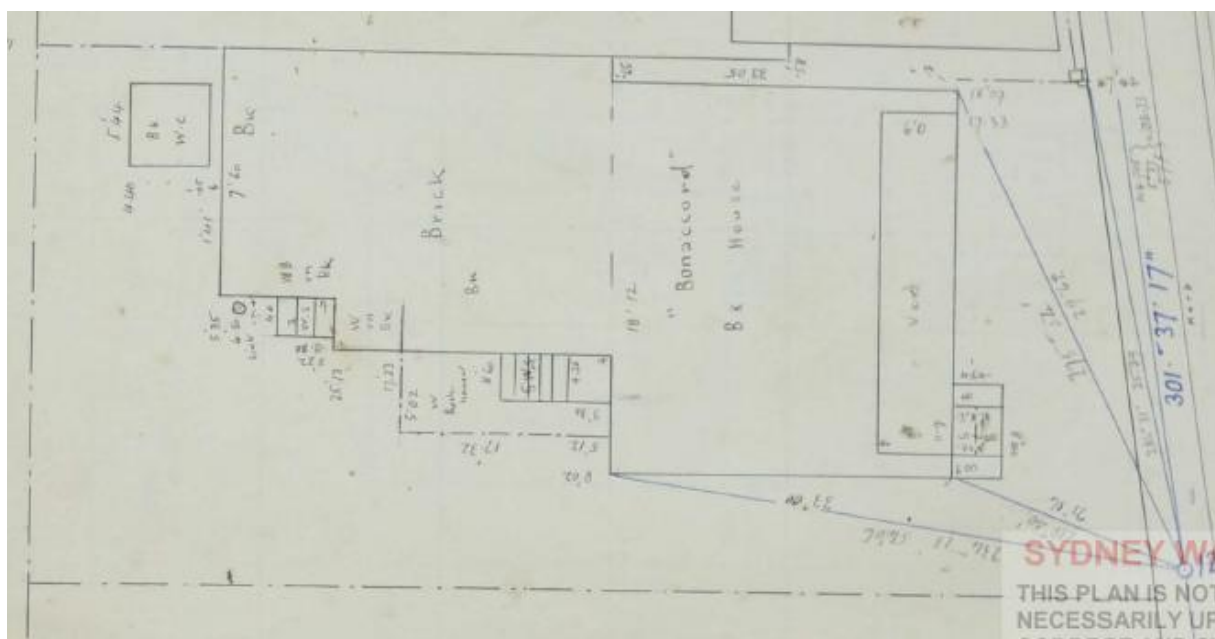


Figure 4-51 Page 22 of 1909 Field Survey Book No. 355, showing 246 Victoria Road, Rozelle
(Source: Sydney Water Archives)

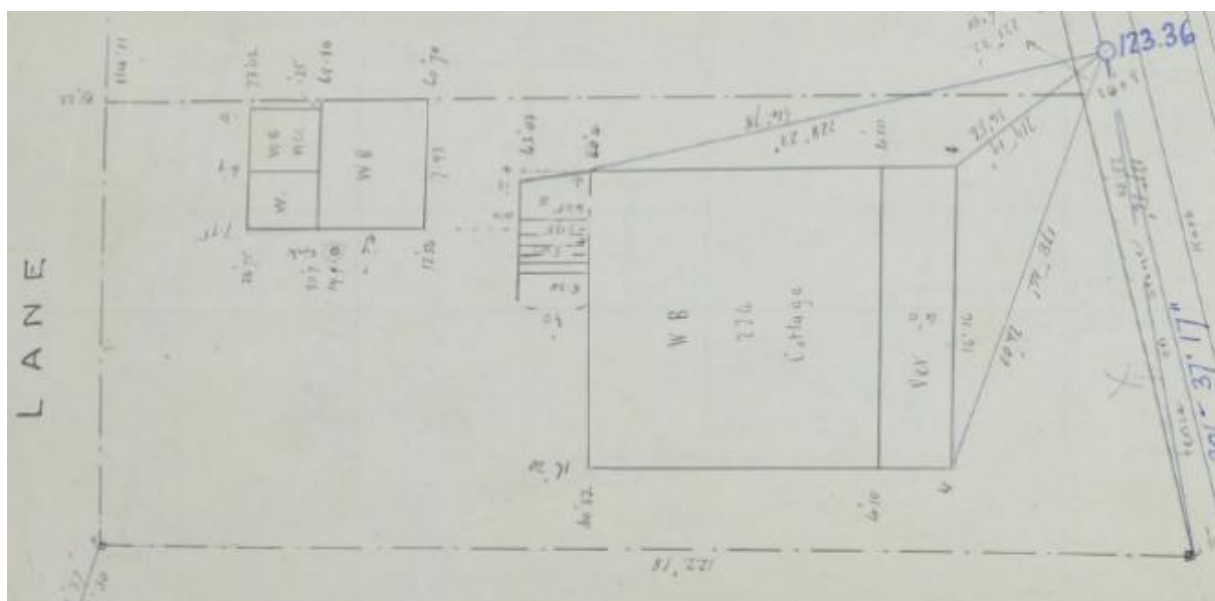


Figure 4-52 Page 21 of 1909 Field Survey Book No. 355, showing 244 Victoria Road, Rozelle
(Source: Sydney Water Archives)

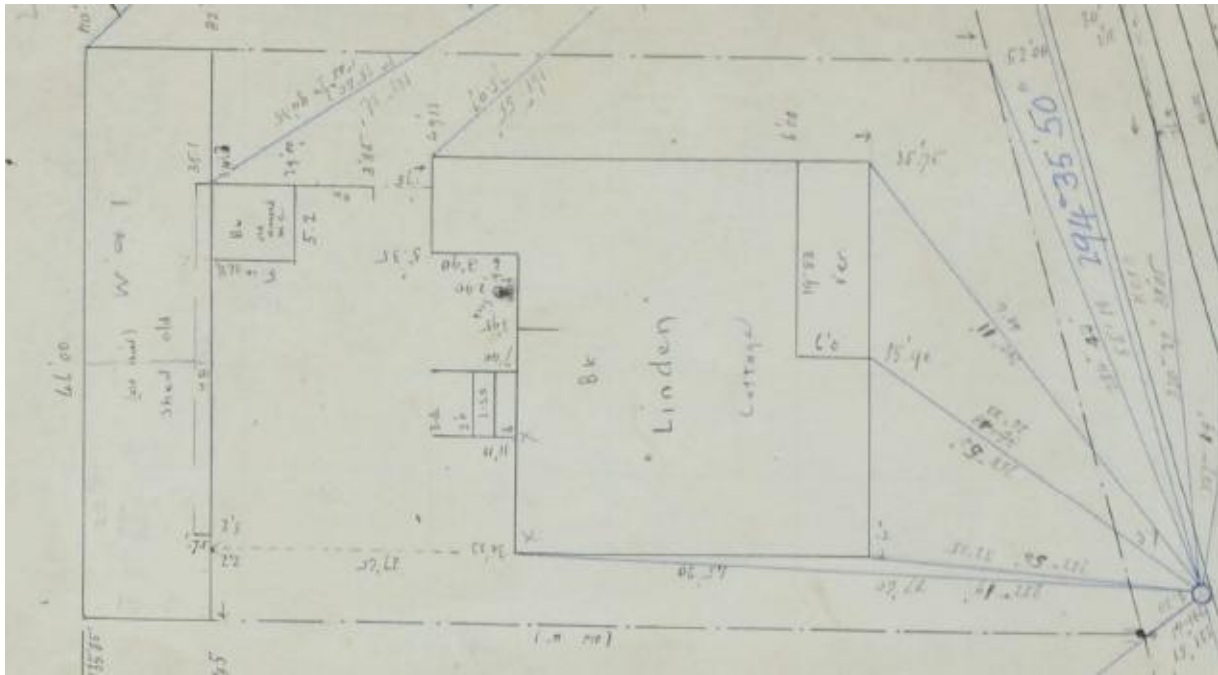


Figure 4-53 Page 6 of 1909 Field Survey Book No. 355, showing 234 Victoria Road, Rozelle
(Source: Sydney Water Archives)

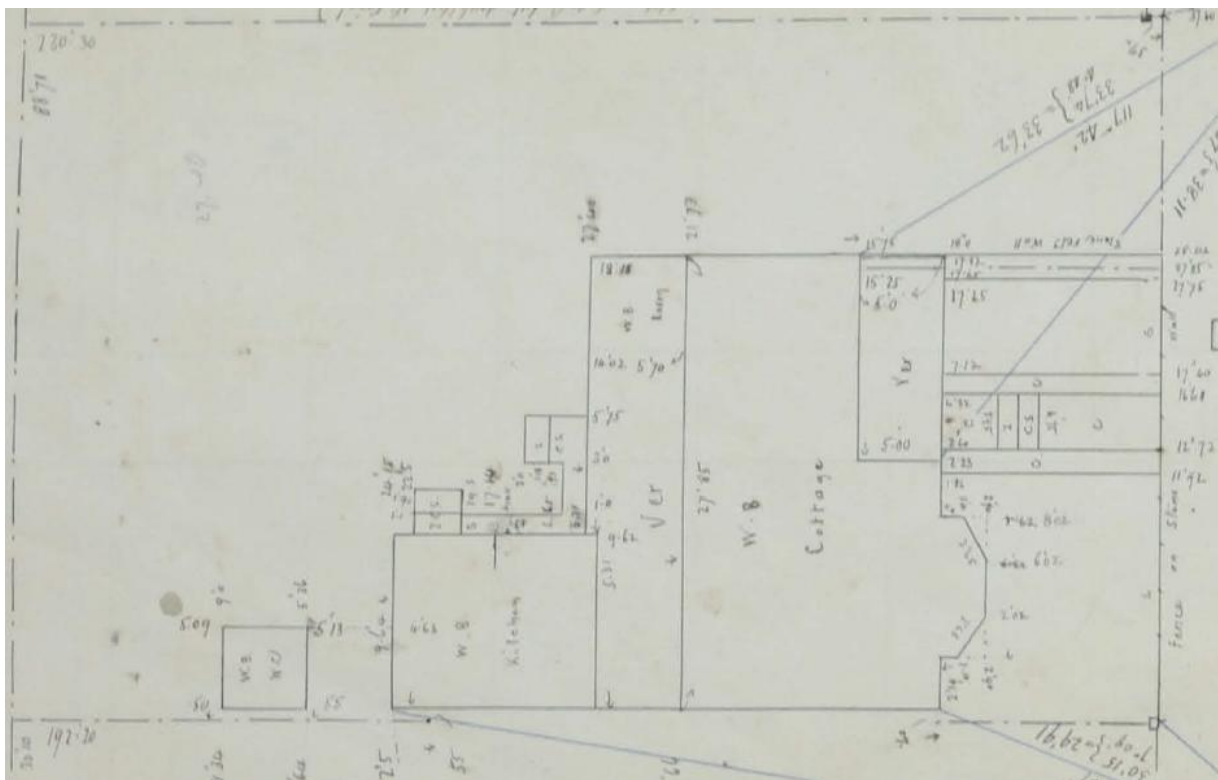


Figure 4-54 Page 39 of 1909 Field Survey Book No. 355, showing 6 Byrne Street, Rozelle
(Source: Sydney Water Archives)

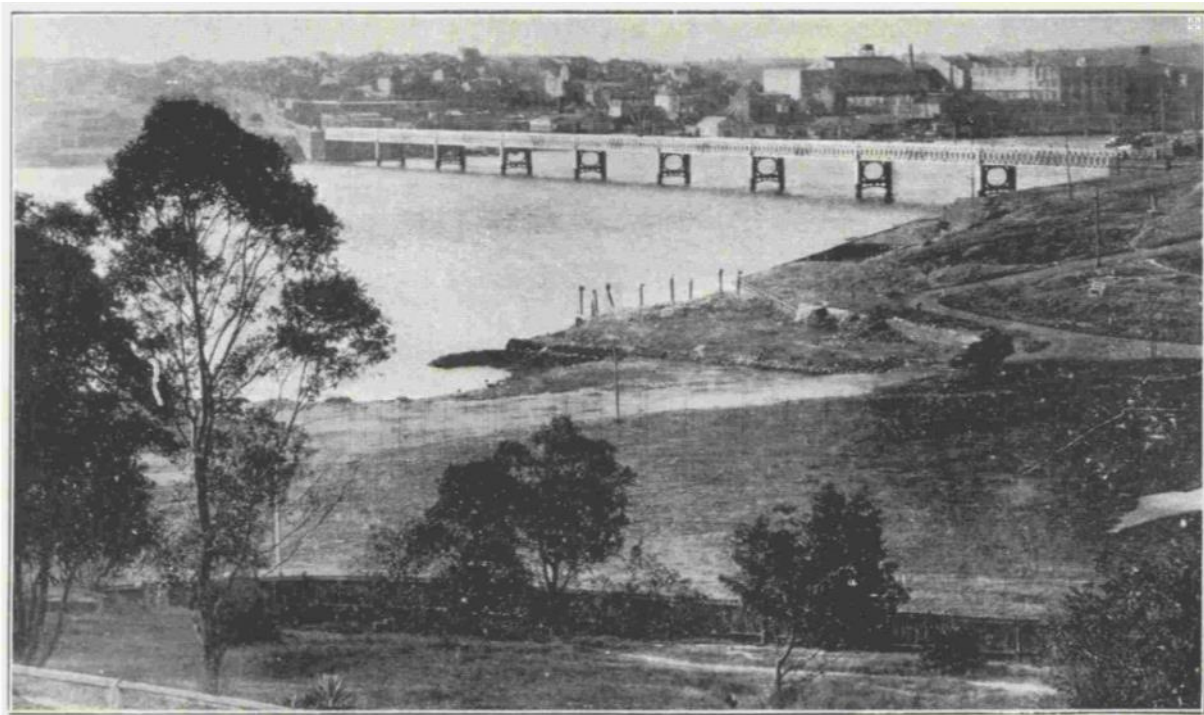


Figure 4-55 c1910 photograph of King George Park with Iron Cove Bridge in the background
 (Source: Inner West Council Local Studies Library)



Figure 4-56 c1933 plan showing the allotments from Iron Cove to Callan Street are now occupied
 (Source: Sydney Water Archives)

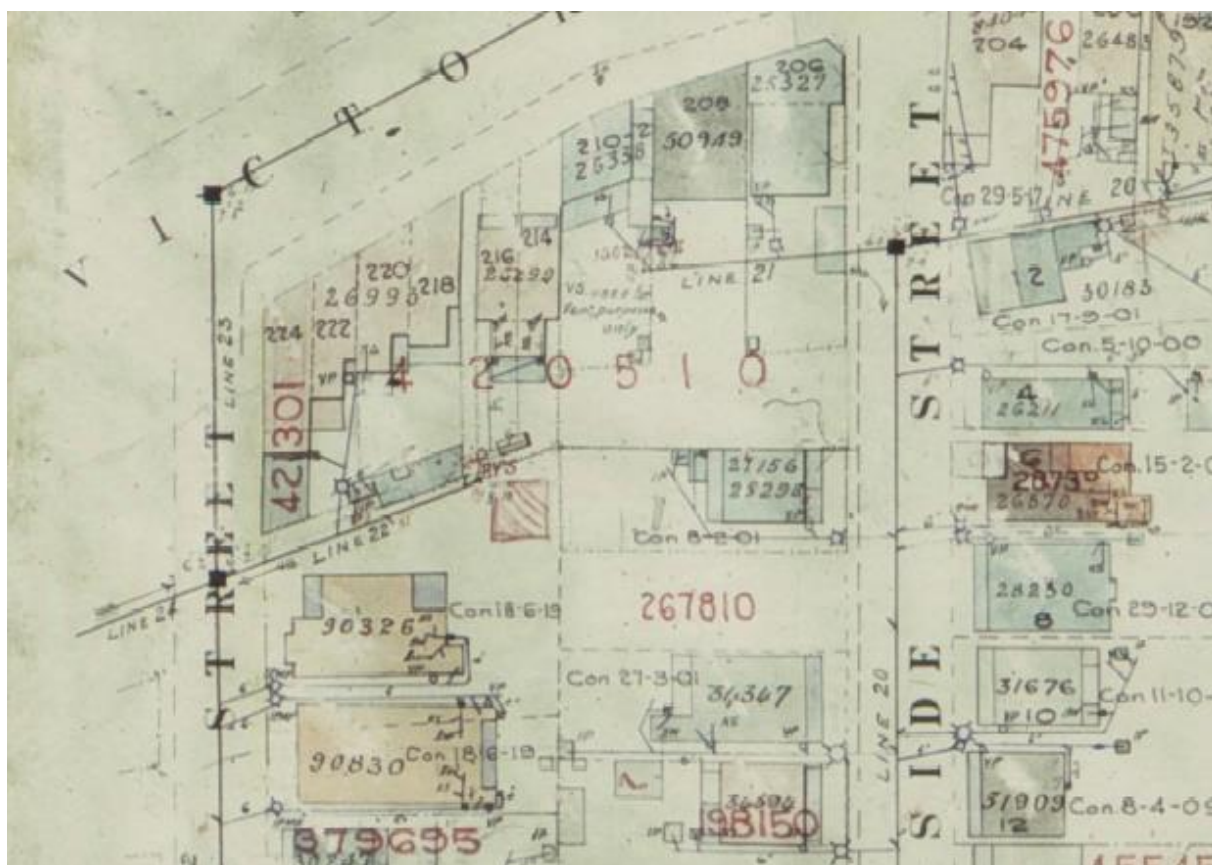


Figure 4-57 Undated plan (ranging from c1922–1961) of Iron Cove heritage study area between Callan Street and Springside Street

(Source: Sydney Water)



Figure 4-58 1943 aerial showing the corner of Victoria Road and Clubb Street, where there appears to be large sheds on the corner with log piles in the centre of the site
(Source: LPI NSW)

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Roads and Maritime Services
Technical working paper: Non-Aboriginal heritage



Figure 4-59 1943 aerial of the project footprint and King George Park.
The United States service men encampment can be seen on this photograph (Source: LPI NSW)



Figure 4-60 1943 aerial, showing possibly trenches at the headlands by Iron Cove Bridge
(Source: LPI NSW)



Figure 4-61 1965 aerial showing the expansion of Victoria Road, following the construction of Gladesville Bridge in 1964

(Source: LPI NSW)



Figure 4-62 2009 aerial photograph of the headlands between Iron Cove Bridge and Byrnes Street.

This area appears to be used as a work compound during Iron Cove Bridge duplication works (Source: Google Earth)



Figure 4-63 2011 aerial photograph of the headlands between Iron Cove Bridge and Byrnes Street.

This area has been restored as parkland following completion of Iron Cove Bridge duplication works (Source: Google Earth)

4.6 Area 5 – Annandale (around Pyrmont Bridge Road and Parramatta Road) heritage study area

4.6.1 Early land grant

The Annandale heritage study area is part of Governor William Bligh's 240-acre grant, made to him by Governor Philip Gidley King in 1806 (**Figure 4-64**). Bligh named the estate after a naval battle site he fought in off the coast of Holland. In 1808, Bligh was overthrown as governor by a military coup, which marked the beginning of the 'Rum Rebellion'. The military remained in power until the arrival of Lachlan Macquarie, who assumed the position of governor in 1810. Bligh returned to England that year for the court martial of Major George Johnston, one of the rebellion leaders. Johnston was convicted for his role in the coup but given a light sentence.

After the trial, Bligh remained in England. He was promoted to Rear Admiral and as Vice-Admiral in 1814. Bligh's wife died in 1813 and he died in 1817. His landholdings were passed on to his six surviving daughters.⁷⁶

By the 1840s, the Camperdown Estate was in the ownership of Sir Maurice O'Connell. Maurice was a Lieutenant Colonel in the 73rd Regiment and had married Bligh's widowed daughter, Mary Putland, in 1810. Mary was a headstrong woman who was openly hostile towards her father's opponents. To avoid any further discomfort, Macquarie arranged for the 73rd Regiment, thereby the O'Connells, to leave NSW in 1814.

The O'Connells returned to NSW in 1838. Maurice was now in charge of the colony's military forces. Soon after their arrival, Mary served ejection notices to residents and institutions of Parramatta claiming the land was part of her inheritance. A settlement was eventually reached whereby she would forfeit her claim in Parramatta in exchange for the confirmation of her ownership of other estates within NSW. This included the Camperdown Estate.

In 1842, the Camperdown Estate was subdivided and sold. Most of the blocks were villa allotments, up to two hectares in size but there were also smaller residential lots. The heritage study area is located within lots 34–37, purchased by E Phillips (34), L Gordon (35), and JB Jones (36–37) (**Figure 4-65**).

New streets were also laid out, including a new alignment of George Street – the present day Parramatta Road⁷⁷ (**Figure 4.61**). Parramatta Road was constructed in the first years of the colony to link the two European settlements, Sydney and Rose Hill (later renamed Parramatta). It is highly probable, although no written account confirms it, that the first European-made track between the two settlements followed an Aboriginal pathway. The creation date of the first European made track also remains unknown, but was likely to have been sometime in 1790 or 1791 as it was first mentioned in 1792 by David Collins.⁷⁸ Lieutenant Governor Francis Grose formalised the early track into a road in 1794.⁷⁹ However, Parramatta River continued to be used by wealthier citizens who could afford to pay for passage on private boats which operated between the settlements.⁸⁰

4.6.2 Mid-nineteenth century subdivision

While there was the occasional sale on Parramatta Road, it was not until the 1840s that large-scale subdivisions began to appear along the road and the suburbs developed. The initial impetus for subdividing the estates came from an economic downturn that hit Sydney in 1842, resulting in the declaration of over 600 insolvencies that year.⁸¹ Between 1840 and 1850, major subdivision sales along Parramatta Road occurred at Annandale (Fitzroy Terrace Estate, c1840); on both sides of Parramatta Road at Camperdown (Camperdown Estate, 1841); around Missenden Road (O'Connell Town, 1843); at Concord (Village of Longbottom and Concord, 1843); Burwood (Village of Burwood, 1843); and at Ashfield (Ashfield Village, 1838–1849).

Like the Camperdown Estate, the other newly subdivided estates along Parramatta Road were divided into large and small allotments, purchased for residential and commercial uses. Enoch Fowler, who established a pottery and brickyard on Parramatta Road, opposite the Kent Brewery at Abercrombie Street, expanded his business and moved to Glebe in 1848 and then c1854 to Camperdown. Fowler's Camperdown site was bounded by Parramatta Road, Australia, Denison and Derby Streets. Making tiles, bricks, chimney pots and laundry tubs, Fowlers remained on Parramatta Road until 1919 when the works were relocated to Marrickville and the Parramatta Road site was demolished and replaced by Garratt's motor works and garage – an industrial type that would come to dominate sections of the road in the twentieth century.⁸²

On the opposite side of Parramatta Road, within the Annandale heritage study area, the land appears to have been used for residential occupation. Two houses that can be identified from the mid-late nineteenth century are 'Chester Lodge' and 'Didliston' (**Figure 4-66**).

'Chester Lodge' was constructed in c1857. In October of that year, it was advertised for let:

*To LET at Camperdown, Chester Lodge, a new house, containing eight rooms and kitchen; veranda at back, grates in rooms, and fireplaces in bedrooms. Near Mr J. B. Jones garden.*⁸³

'Didliston' is also mentioned in the newspapers from 1868, as the home of John Booth Jones, most likely the same man mentioned as the neighbour of 'Chester Lodge'.⁸⁴

4.6.3 Opening up of the suburbs

The first omnibuses to head west from the city ran to Glebe from 1846, running between the lower end of George and Bay Streets, Glebe. Despite the often appalling state of the road, sometimes making it impassable to vehicles, the number of omnibuses rose rapidly, with 45 operators recorded in 1867 running buses to Glebe, Forest Lodge and Balmain.⁸⁵ As well as services to Glebe and Balmain, horse buses operated between the city and Leichhardt and to Belmore via Parramatta Road.⁸⁶

In August 1882, the Glebe horse buses were joined by the government operated tramways. The first line ran along Broadway/Parramatta Road to Glebe Point Road, with a continuation heading west down Parramatta Road to Derwent Street where it turned off to Forest Lodge. In 1892, this line was extended on to Johnstone Street, Annandale, and Merton Street in Rozelle. In June 1883, the tram was connected to Trafalgar Street, Annandale, via Parramatta Road, with a double track extension

added in May 1884 to Norton Street. All of these services started as steam trams, with the lines electrified from 1901.⁸⁷

The construction and then extension of the tramways encouraged further subdivision in the estates along Parramatta Road.

4.6.4 Late nineteenth century suburban development

The land surrounding 'Chester Lodge' and 'Didliston' was subdivided for sale in c1885 and the grounds of 'Didliston' was subdivided and sold in c1886⁸⁸ (**Figure 4-67**). By 1890, 'Chester Lodge' was demolished and Booth Street South (now Mallett Street) was laid out (**Figure 4-68**). Along Pymont Bridge Road, the allotments appear to be dominantly residential. In the northern portion of the former 'Chester Lodge' grounds are seven terrace houses facing Pymont Bridge Road, six of which are extant – 67 to 77 Pymont Bridge Road.

'Didliston' is still standing. Along Parramatta Road, between Mallett Street and Gordon Street is a mix of residential and industries including Bignell and Clark's Camperdown steam joinery works (Didliston's neighbour on the east). Bignell and Clark were responsible for building the Sydney Town Hall and Strand Arcade in Pitt Street, Sydney.⁸⁹ They also managed the rebuilding of the Bondi Aquarium after it burnt down in 1891.⁹⁰ Alfred Bignell, son of the establishing partner, served for a year as Alderman in the Camperdown Council in 1899.⁹¹ Bignell Lane is named after the Bignell family.

'Florenceville' was located to the east of Bignell and Clark's Camperdown steam joinery works and occupied by the Pritchard family since at least 1880.⁹² There were also candlestick and soap manufacturers and carpenters along Parramatta Road. At the corner of Pymont Bridge Road and Parramatta Road is John Cahill and Co Australian Soap and Candle works⁹³ (**Figure 4-68**).

4.6.5 Early twentieth century

The trend of mixed residential and commercial use of the Annandale area continued into the early twentieth century. 'Didliston' was converted into two four bedroom residences in c1895.⁹⁴ Bignell and Clark's Camperdown steam joinery works was demolished and the land was referred to as 'Camperdown Stadium' in the 1813 Sands Sydney Directory.⁹⁵ The allotment along Mallett Street, spanning from Pymont Bridge Road to Parramatta Road, was owned by Charles B Vintner since the early 1900s.⁹⁶ Vintner also owned the terraces at 67 to 77 Pymont Bridge Road (**Figure 4-69**).

Vintner established a store along Mallett Street and on the corner of Mallett Street and Parramatta Road was the Government Savings Bank of NSW (**Figure 4-69**). The Government Savings Bank of NSW was incorporated in 1907 to absorb banks established through the Post Office since 1871. It was eventually merged into Commonwealth Bank in 1931.⁹⁷ To the west of Government Savings Bank of NSW was a shop and residential houses with outbuildings, including 'Florenceville'.

To the west of 'Didliston' was Charles Ashdown's coach building workshop and warehouse. At this point in time, Ashdown also occupied the workshop behind that faced on to Pymont Bridge Road.⁹⁸ The Pymont Bridge Road coach workshop was demolished by 1914.⁹⁹ From Ashdown's workshop to Gordon Street are several smaller factories, cottages and blacksmiths facing Parramatta Road.¹⁰⁰ The block on the corner of Pymont Bridge Road and Gordon Street is empty.

By 1921, Vintner had sold his landholdings within the Annandale heritage study area. The buildings along Mallett Street and on Parramatta Road, including the Government Savings Bank of NSW, were sold to Grace Bros. The bank was converted into an office and store. The terraces near the corner of Pymont Bridge Road and Mallett Street were purchased by Patrick Casey. Ashdown had purchased the land on the corner of Pymont Bridge Road and Gordon Street and built a two-storey workshop on the corner lot. Ashdown also leased out his Parramatta Road coach workshop.¹⁰¹

4.6.6 New buildings in the early to mid-twentieth century

By 1924, the residential cottages along Parramatta Road, within the Annandale heritage study area, were being replaced with factories, stores, and shops. Florenceville and its two neighbours to the east were still standing but all the other buildings from Mallett Street to George Road were for commercial use. Didliston had been demolished and the double allotment was now occupied with two shops.¹⁰²

Ashdown's landholdings at the corner of Pyrmont Bridge Road and George Road were now owned by Crane & Watson, who had owned and occupied the adjacent corner block since 1914.¹⁰³

In c1930, Morris (NSW) Limited set up a garage and motor works on corner of Pyrmont Bridge Road and Bignell Lane. On the western side of Bignell Lane, the land was still unoccupied, however, between Pyrmont Bridge Road, George Road and Parramatta Road, the workshops, blacksmith and cottages had been replaced by a series of small warehouses (**Figure 4-70**).

In 1937, Bank of NSW purchased 164 Parramatta Road.¹⁰⁴ Bank of NSW was established by Governor Macquarie in 1817 and was Australia's oldest financial institution. Bank of NSW merged with Commercial Bank of Australia Ltd in 1982 and changed its name to Westpac Banking Corporation.¹⁰⁵

The early buildings on the site, including a c1890 cottage, were demolished and replaced with a purpose built bank and car park (**Figure 4-71**). The building was designed by Spain & Cos Architects and built by Welch Bros (**Figure 4-72** and **Figure 4-73**). Minor alterations of the building were undertaken in 1955 and 1964, with major internal works undertaken by RS Hamilton in 1974. The branch was open until at least 1994.¹⁰⁶

4.6.7 Towards the twenty-first century and beyond

From the 1940s onwards, there has been minimal physical changes to the Annandale heritage study area. A garage was constructed to the rear of the Pyrmont Bridge terraces (**Figure 4-74**). This garage was used by Grace Bros, who still occupied the store located on the corner of Pyrmont Bridge Road and Mallett Street up until the 1960s (**Figure 4-74** to **Figure 4-77**).

By 1975, the Grace Bros-owned store, garage and terrace on the corner of Pyrmont Bridge Road and Mallett Street had been demolished and replaced by a warehouse/store (**Figure 4-78**).

In 1988, Hahn Brewing Company purchased the warehouse on the corner of Pyrmont Bridge Road and George Road.¹⁰⁷ It received financial support from Lion Nathan in 1993 and in 1998, Hahn Brewery was relaunched as Malt Shovel Brewery, after the James Squire original brewery tavern—'The Malting Shovel'.¹⁰⁸ In 2010, Hahn Brewing Company purchased 188 Parramatta Road and 95 Pyrmont Bridge Road, back to back properties, in order to expand their business¹⁰⁹ (**Figure 4-79**). By 1994, the stores and warehouses adjacent to the former Bank of NSW were replaced by one large building, which is presently Camperdown Fitness (**Figure 4-80**). The buildings from 1994 remain externally unchanged today.



Figure 4-64 1835 plan of environs of Sydney by PL Bemi showing Bligh's land holdings on the north side of Parramatta Road, Camperdown

(Source: SLNSW)



Figure 4-65 1841 subdivision plan of Bligh's Camperdown Estate

(Source: SLNSW with GML overlay)



Figure 4-66 Detail of c1885 sale of villa allotment subdivisions in Camperdown and Annandale
(Source: NLA with GML overlay)



Figure 4-67 Detail of a c1890 parish map showing the subdivision of the project footprint
(Source: SLNSW with GML overlay)



Figure 4-68 c1890 Metropolitan plan for Camperdown, sheet 11. Didliston can be seen in the centre of the block, facing Parramatta Road (identified as George Street on the plan).

To the east of Didliston is Bignell and Clark's Camperdown steam joinery works. The third house from Mallett Street (Booth Street South) is Florenceville (Source: SLNSW with GML overlay)



Figure 4-69 1912 Metropolitan Board of Water Supply & Sewerage Field Book No. 656, showing the Annandale project footprint

(Source: Sydney Water Archives – field book has been digitally stitched together by GML, 2016)



Figure 4-70 1930 aerial of the Camperdown aerial

Morris (NSW) Limited has set up a garage on corner of Pymont Bridge Road and Bignell Lane (Source: LPI NSW with GML overlay)



Figure 4-71 Blueprint of the lot to be purchased by Bank of NSW
(Source: Westpac Group Archives)

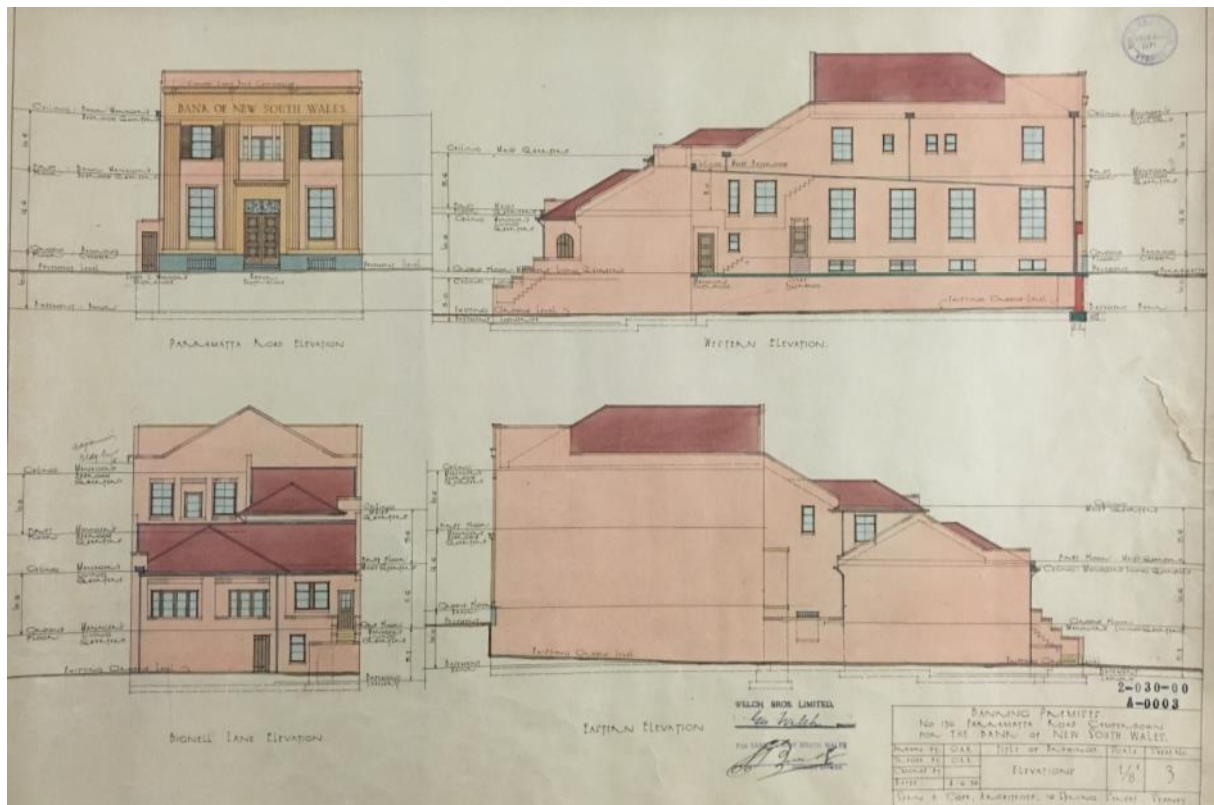


Figure 4-72 1936 plan of Bank of NSW, building elevations
Plans by Spain & Cos, Architects (Source: Westpac Group Archives)

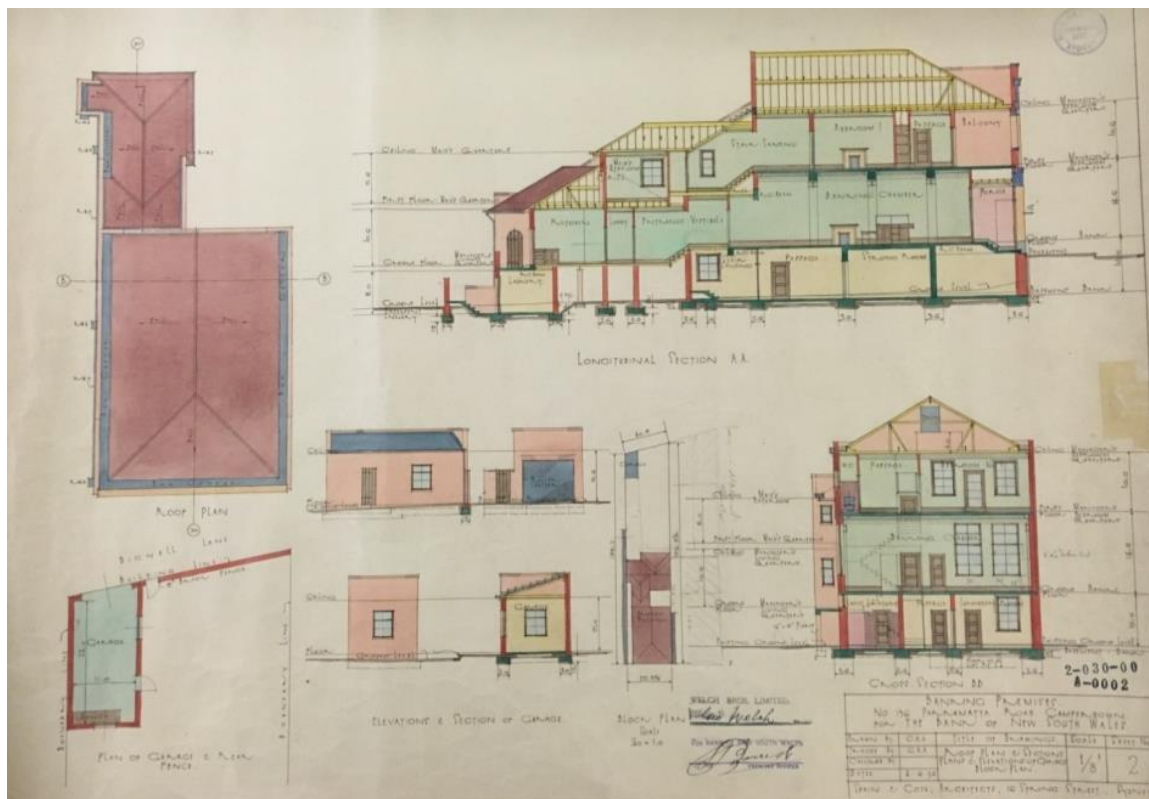


Figure 4-73 1936 plan of Bank of NSW, cross-section plan
Plans by Spain & Cos, Architects (Source: Westpac Group Archives)

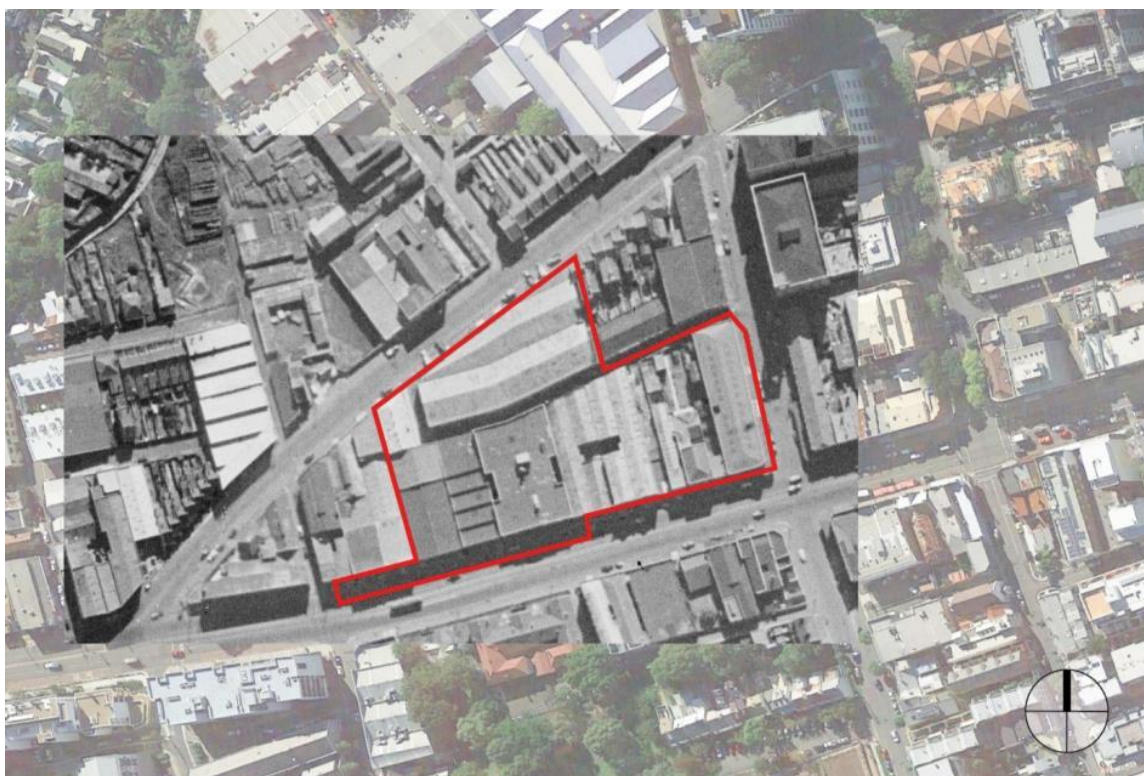


Figure 4-74 1943 aerial showing corner of Parramatta Road, Pyrmont Bridge Road and Mallett Street
(Source: LPI NSW with GML overlay)



Figure 4-75 1948 Civic Survey of the Annandale heritage study area, showing most of the allotments have been built upon and are dominantly commercial
(Source: CoS with GML overlay)

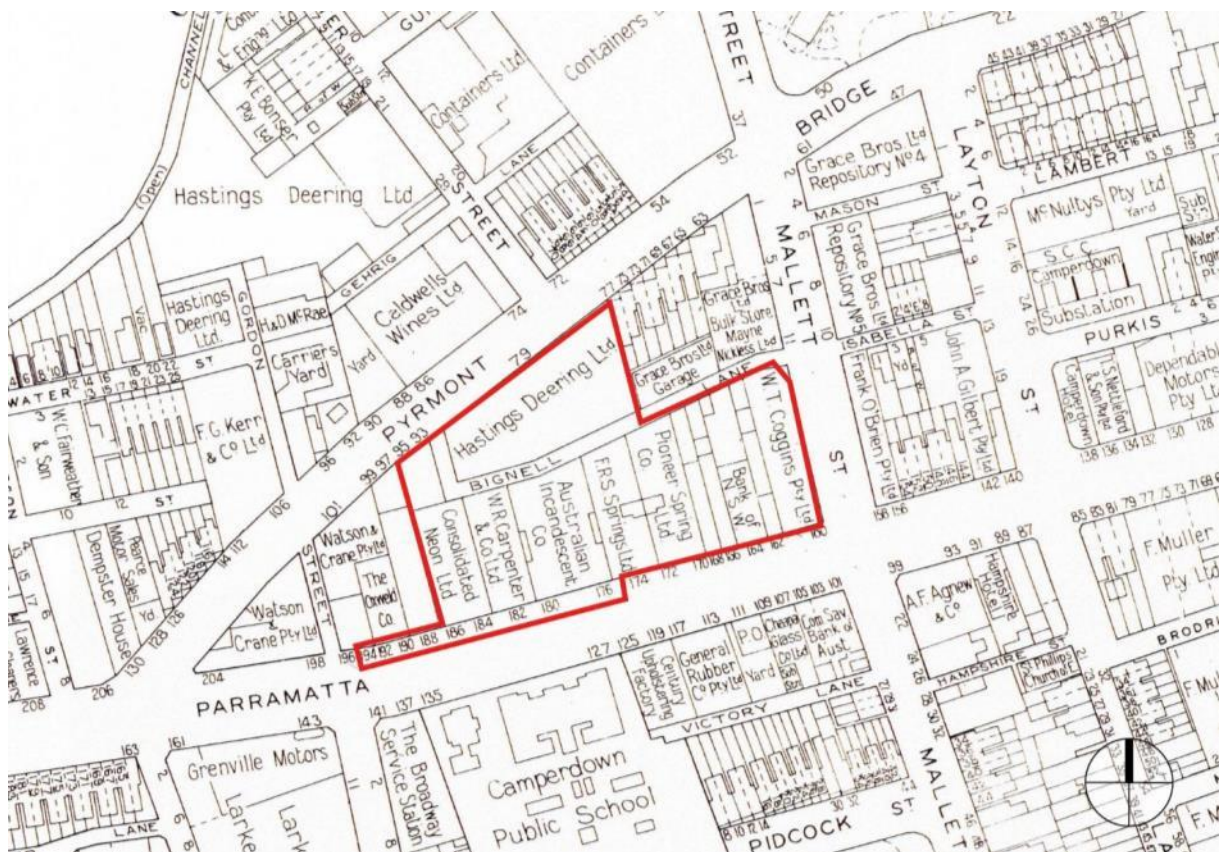


Figure 4-76 1956 City Building Surveyor's Detail Sheets showing the commercial occupants and little change in the project footprint

(Source: CoS with GML overlay)

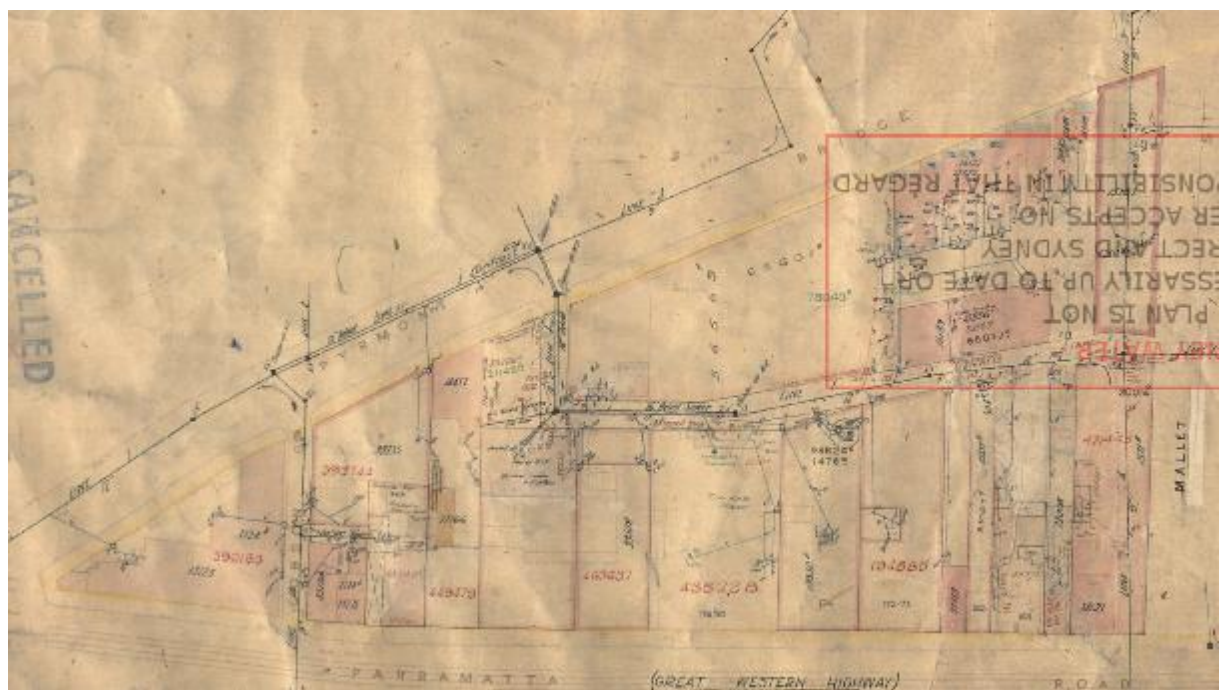


Figure 4-77 1912–1962 Blackwattle plan of project footprint

(Source: Sydney Water Archives)



Figure 4-78 1975 aerial showing a new warehouse/showroom on the corner of Pymont Bridge Road and Mallett Street

(Source: LPI NSW with GML overlay)

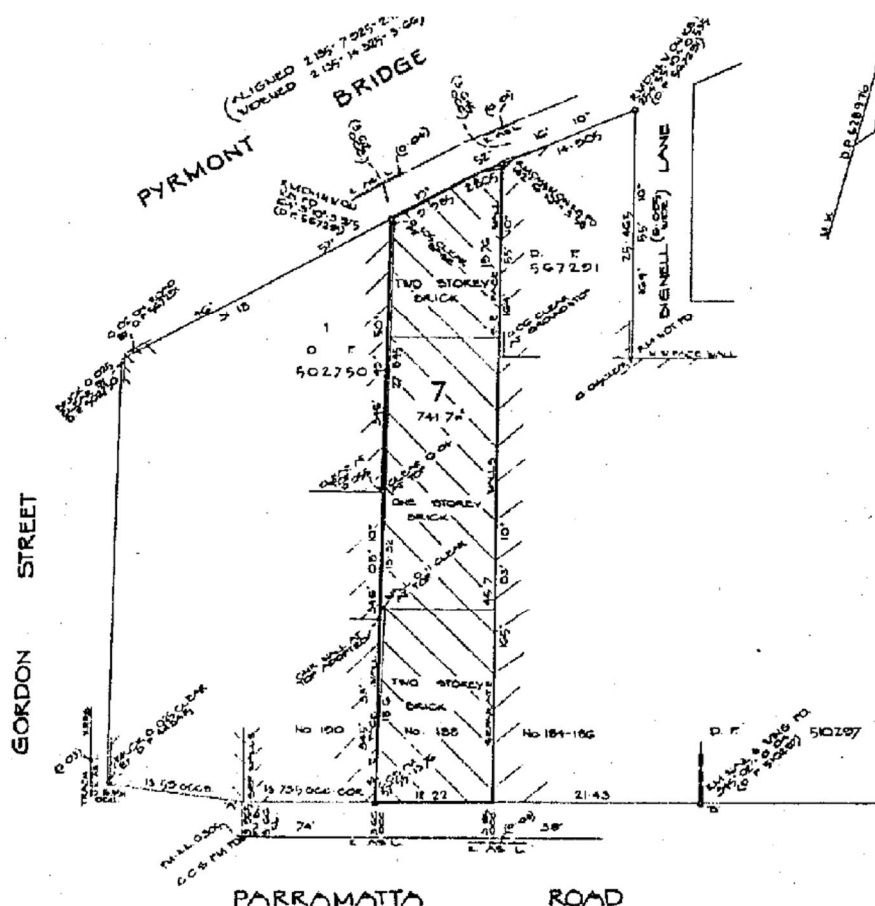


Figure 4-79 1984 plan of 188 Parramatta Road and 95 Pyrmont Bridge Road, which was purchased by Hahn Brewery by 2010 in order to expand its operations (Source: LPI NSW)

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Roads and Maritime Services
Technical working paper: Non-Aboriginal heritage



Figure 4-80 1994 aerial showing Camperdown Fitness which has moved in next door to former Bank of NSW building along Parramatta Road

(Source: LPI NSW)

4.7 Area 6 – St Peters heritage study area

The study area formed part of a large parcel of land granted to William Hutchinson who gave the area the name 'Waterloo'. Subsequently, during the twentieth century was used as a brickwork, and later as a landfill site.

The historical information for the St Peters heritage study area is detailed in the New M5 Non-Aboriginal Heritage Impact Assessment (AECOM 2015).

5 Historical archaeology

5.1 Preamble

This section describes the historical archaeological potential of the six study areas. The heritage significance of each archaeological site has been determined at the state or local level. This section also assesses the potential impact to archaeological resources resulting from construction of the project described in **section 2.3**.

5.2 Overview of approach

The focus of this historical archaeological assessment has been to identify key areas within the project footprint likely to contain significant historical archaeological resources that may be impacted by the project. The historical archaeological assessment has been prepared on the basis of:

- A site inspection of the six areas defined in **section 2.4** which would be subject to surface works
- A review of the SHR, S170 Register, SREP and LEPs for known state and locally listed sites
- The historical overview prepared for the project (**Chapter 4** of this report)
- A review of relevant historical archaeological background documentation, where readily available
- Identification of previous major works that would have impacted on historical archaeological resources within the six areas.

The assessment does not provide a detailed review of all potential archaeological resources across the entire corridor, but rather uses the information extrapolated from the above-mentioned sources in order to initially determine where the key archaeological resources may exist. It also only assesses those areas that would be subject to surface works including tunnel entry and exit portals and infrastructure. As the driven tunnels would be generally located from 20 metres to greater than 65 metres below the ground these works would not have an impact on historical archaeological remains and have therefore not been considered further.

The nature of archaeology is that it is sometimes unpredictable; as such, this assessment is based on currently available knowledge. The level of significance associated with heritage items (State or local) is based on extant values assessments, and comparable sites. Unexpected archaeological finds could hold high value depending upon their nature and extent. The historical research and assessment is considered to be sufficiently robust that testing to confirm the extent location of potential archaeological remains is not required at this stage.

Further, where known and potentially significant archaeological sites have been identified through desktop assessment within the footprint, a program of archaeological test excavation within the project footprint could unnecessarily disturb historical archaeological relics which may not be otherwise impacted as an outcome of the final design. Consequently, archaeological test excavation during the EIS stage of the project could result in a higher level of heritage impact than targeted test excavation undertaken during the early works phase when the final design has been adopted.

A comprehensive historical archaeological research design should be prepared before the start of proposed works within identified Historical Archaeological Management Units (HAMUs) where potential for locally or State significant archaeology has been identified. This way, archaeological monitoring and test excavation activities would only be undertaken in advance of the early works and construction program where archaeological remains are likely to be extant and cannot be conserved in situ for the projects. This approach would facilitate better heritage outcomes.

In summary, the archaeological assessment methodology for the project is commensurate with the level of design and planning that has been undertaken to date. It has followed the assessment and reporting standards on previous recently approved SSI projects including previous stages of the WestConnex program of works. It proposes an appropriate methodology for the management of non-Aboriginal archaeology for the M4-M5 Link project.

5.2.1 Assessment of historical archaeological potential

'Archaeological potential' refers to the level of possibility that physical evidence of past historical phases will survive on a site. It is an assessment made by interpreting the results of historical analysis and the extent of previous physical disturbance at a site to determine the likelihood of historical archaeological remains to survive.

For the purpose of this assessment low, moderate and high levels of disturbance are defined as follows:

- Low disturbance – minimal and/or superficial impact to the landscape which has resulted in little or no disturbance to subsurface remains, characterised by such activities as capping of areas with introduced fill, or construction of roads and pathways
- Moderate disturbance – shallow or localised impacts to the landscape, characterised by excavations for shallow building footings or service trenches
- High disturbance – largely disturbed landscape, characterised by such land use impacts as deep building footings (piled foundations, deep slab foundations), basements, or quarrying.

Correlating the levels of disturbance with the types of archaeological evidence that may remain through analysis of the historical development, determines the level of archaeological potential. This is usually described as low, moderate or high, and is assessed as follows:

- Low – it is unlikely that archaeological evidence associated with this historical phase or feature survives
- Moderate – it is possible that some archaeological evidence associated with this historical phase or feature survive. If archaeological remains survive they may have been subject to some disturbance
- High – it is likely that archaeological evidence associated with this historical phase or feature survives intact.

5.2.2 Assessment of historical archaeological significance

The assessment of significance of historical archaeological relics requires a specialised framework for consideration of their research potential. Generally, relics with a greater research potential will be of higher heritage significance. The most widely used framework for assessing archaeological research potential is three key questions developed by Bickford and Sullivan in 1984¹¹⁰:

- Can the site contribute knowledge that no other resource can?
- Can the site contribute knowledge that no other site can?
- Is this knowledge relevant to general questions about human history or other substantive questions relating to Australian history, or does it contribute to other major research questions?

Use of the Bickford and Sullivan questions provide basic but essential information. In addition to the current NSW Heritage Criteria, the Heritage Branch has prepared a set of guidelines to allow consideration of how an individual archaeological site or relic may be assessed in its own right.

The significance assessment of the identified archaeological resource is carried out by applying criteria expressed in the publication *Assessing Significance for Historical Archaeological Sites and 'Relics'*, prepared by the Heritage Branch, formerly NSW Department of Planning (now the Heritage Division, OEH, NSW Department of Premier and Cabinet) in December 2009.¹¹¹ The criteria as adapted for archaeological remains are:

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