sydney METRO | city & southwest

SYDENHAM TO BANKSTOWN

ENVIRONMENTAL IMPACT STATEMENT

> Technical Paper 3 - Non-Aboriginal heritage impact assessment

NSW GOVERNMENT

Sydney Metro City & Southwest - Sydenham to Bankstown

Technical Paper 3

Non-Aboriginal Heritage Impact Assessment

Report to Transport for NSW

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EXECUTIVE SUMMARY

Overview

Project Background

The New South Wales (NSW) Government is implementing *Sydney's Rail Future* (Transport for NSW, 2012a), a plan to transform and modernise Sydney's rail network so that it can grow with the city's population and meet the needs of rail customers into the future.

Sydney Metro is a new standalone rail network identified in Sydney's Rail Future, providing 66 kilometres of metro rail line and 31 metro stations. The NSW Government is currently delivering the first two stages of Sydney Metro, shown in Figure 1, which consist of Sydney Metro Northwest (between Rouse Hill and Chatswood) and Sydney Metro City & Southwest (between Chatswood and Bankstown).

Sydney Metro Northwest is currently under construction. Sydney Metro Northwest services will start in the first half of 2019, with a metro train running every four minutes in the peak period. Services will operate between a new station at Cudgegong Road (beyond Rouse Hill) and Chatswood Station. Sydney Metro City & Southwest will extend the Sydney Metro system beyond Chatswood to Bankstown, delivering about 30 kilometres of additional metro rail, a new crossing beneath Sydney Harbour, new railway stations in the lower North Shore and Sydney central business district (CBD), and the upgrade of existing stations from Marrickville to Bankstown. City & Southwest trains would run between Sydenham and Bankstown stations in each direction, at least every four minutes in peak periods, averaging around 15 trains per hour.

Sydney Metro City & Southwest comprises two core components (shown in Figure 1):

- the Chatswood to Sydenham project
- the Sydenham to Bankstown upgrade ('the project' and the subject of this document).

The project for which approval is sought

Transport for NSW is seeking approval to construct and operate the Sydenham to Bankstown upgrade component of Sydney Metro City & Southwest (the project).

The project involves upgrading 10 existing stations west of Sydenham (Marrickville to Bankstown inclusive), and a 13 kilometre long section of the Sydney Trains T3 Bankstown Line, between west of Sydenham Station and west of Bankstown Station, to improve accessibility for customers and meet the standards required for metro operations. The project would enable Sydney Metro to operate beyond Sydenham, to Bankstown.

A key element of the project is upgrading stations along the corridor from Marrickville to Bankstown, to allow better access for more people by providing new concourses, level platforms, and lifts at stations. These upgrades aim to provide a better, more convenient, and safer experience for public transport customers, by delivering:

- stations that are accessible to people with a disability or limited mobility, the elderly, people with prams, and people travelling with luggage
- upgraded station buildings and facilities for all transport modes that meet the needs of a growing population

- interchanges that support an integrated transport network and allow seamless transfers between different modes for all customers.

The project is subject to assessment and approval by the NSW Minister for Planning under Part 5.1 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act).

The project

Location

The location of the project is shown in Figure 2.

The key elements of the project are located mainly within the existing rail corridor, from about 800 metres west of Sydenham Station in Marrickville, to about one kilometre west of Bankstown Station in Bankstown. The project is located in the Inner West and Canterbury-Bankstown local government areas.

The term 'project area' is used throughout this document to refer to the area where the physical works for the project would be undertaken. This area encompasses the existing rail corridor (as described above), the 10 existing stations within the corridor, and areas surrounding the rail corridor as shown in Figure 1.

Key features

The key features of the project are summarised below and are shown in Figure 2.

Works to upgrade access at stations

The project includes upgrading the 10 stations from Marrickville to Bankstown as required, to meet legislative requirements for accessible public transport, including the requirements of the *Disability Discrimination Act 1992* and the *Disability Standard for Accessible Public Transport 2002*. The proposed works include:

- works to platforms to address accessibility issues, including levelling and straightening platforms
- for some stations a new station concourse and station entrance locations, including:
  - new stairs and ramps
  - new or relocated lifts
- provision of additional station facilities as required, including signage and canopies.

Works would also be undertaken in the areas around the stations to better integrate with other modes of transport, improve travel paths, and meet statutory accessibility requirements. This would include provision of pedestrian, cyclist, and other transport interchange facilities; as well as works to the public domain, including landscaping.

Works to convert stations and the rail line to Sydney Metro standards

Station works

In addition to the station upgrades to improve accessibility, works to meet the standards required for metro services would be carried out, including:

- installation of platform screen doors
- provision of operational facilities, such as station services buildings.

Track and rail system facility works

Upgrading the track and rail systems to enable operation of metro services would include:

- track works where required along the 13 kilometre long section of the rail corridor, including upgrading tracks and adjusting alignments, between west of Sydenham Station and west of Bankstown Station
- new turn back facilities and track crossovers
- installing Sydney Metro rail systems and adjusting existing Sydney Trains rail systems
- overhead wiring adjustments.

Other works

Other works proposed to support Sydney Metro operations include:

- upgrading existing bridges and underpasses across the rail corridor
- installation of security measures, including fencing
- installation of noise barriers where required
- modifications to corridor access gates and tracks
- augmenting the existing power supply, including new traction substations and provision of new feeder cables
- utility and rail system protection and relocation works
- drainage works to reduce flooding and manage stormwater.

Active transport corridor and surrounding development

The project would also provide for:

- parts of an active transport corridor where located within the station areas or surplus rail corridor land, to facilitate walking and cycling connections to each station and between Marrickville and Bankstown
- enabling works to support possible future development at Campsie Station (future development would be subject to a separate approvals process).

Temporary works during construction

During construction, the project would involve:

- provision of temporary facilities to support construction, including construction compounds and work sites
- implementation of alternative transport arrangements for light rail customers during possession periods and/or station closures, guided by the proposed Temporary Transport Strategy.

Timing

Construction

Construction of the project would commence once all necessary approvals are obtained (anticipated to be in 2018), and would take about five years to complete.

The T3 Bankstown Line would remain operational for the majority of the construction period. However, to ensure the station and infrastructure upgrade works are completed as efficiently and safely as possible, and to accommodate works that cannot be undertaken when trains are operating, it would be necessary to undertake some work during rail possession periods, when trains are not operating. It is anticipated that these rail possession periods would comprise the routine weekend maintenance possessions, together with some longer possession periods during periods of reduced patronage such as school holidays.

A final, longer possession of about three to six months would also be required. This would involve full closure of the line to enable conversion to metro operations. This would include works such as the installation of new signalling, communication systems, and platform screen doors.

During each possession period, alternative transport arrangements would be implemented to ensure that customers can continue to reach their destinations.

Operation

Sydney Metro City & Southwest would be fully operational by 2024, with the opportunity of operation commencing in two phases. Initially, Sydney Metro Northwest services would be extended by the City & Southwest project, and would operate from Chatswood Station to Sydenham Station. Some months later, metro operations would extend from Sydenham Station to Bankstown Station, with both phases planned to be completed before the end of 2024. The opportunity for phased opening of the project would enable metro trains to operate from Cudgegong Road Station to Sydenham Station prior to the final conversion of the T3 Bankstown Line to metro operations.

Once the project is operational, Sydney Trains services would no longer operate along the T3 Bankstown Line between Sydenham and Bankstown stations. Customers would be able to interchange with Sydney Trains services at Sydenham and Bankstown stations. Sydney Trains services to and from Bankstown to Liverpool and Lidcombe stations would not be affected.

Purpose and scope of this report

This report has been prepared to support the Environmental Impact Statement for the project. The Environmental Impact Statement has been prepared to accompany the application for approval of the project, and addresses the environmental assessment requirements of the Secretary of the Department of Planning and Environment ('the Secretary's environmental assessment requirements').

This report:

- Identifies items and areas of heritage significance that would be materially affected by the project during construction and operation, by field survey and research, including any buildings, works, relics, views, or places of heritage significance
- Considers of the potential impacts on the values, settings and integrity of heritage areas and items and archaeological resources located near the project, including items both above and below ground and, where such potential exists, the likely significance of those impacts

- Outlines the proposed mitigation and management measures (including measures to avoid significant impacts and an evaluation of the effectiveness of the mitigation measures) in accordance with relevant best practice guidelines.

The assessment is based on a desktop review of information available for the existing environment and a site visit. Information available for the project at the time of this report included preliminary drawings, reports, flood modelling data, and construction information.

Overview Statement of Heritage Impact

Impact summary

Five State Heritage Register (SHR) items, thirty-two items of local significance and two heritage conservation areas are located within the study area. The project area includes three SHR items, thirteen local heritage items and one heritage conservation area. The buffer zone includes two SHR items, nineteen local heritage items and one heritage conservation area.

Assessment of heritage items within the project area considered direct, visual, and potential direct (vibration) impacts. An archaeological assessment and assessment of impact was provided for the entire project area. Assessment for heritage items in the buffer zone considered visual, and potential direct (vibration) impacts. All construction sites are included in the project area.

Among the five SHR items in the study area, it was assessed that the project would result in a major direct impact to one item (Marrickville Railway Station Group), moderate direct impacts to two items (Canterbury Railway Station Group and Belmore Railway Station Group), and neutral direct impacts to two items (Sewage Pumping Station 271 and Old Sugarmill). The project would result in moderate visual impacts to three SHR items (Marrickville Railway Station Group, Canterbury Railway Station Group and Belmore Railway Station Group), and negligible visual impacts to two items (Sewage Pumping Station 271 and Old Sugarmill). All SHR items would continue to meet the threshold for State significance.

Among the thirty-two local items and two heritage conservation areas in the study area, four would have major direct impacts and four major visual impacts. Among the four items of local significance to have major impacts, two would no longer meet the threshold for local significance and would likely be delisted. Among the heritage items and conservation areas located within the buffer zone, impacts would range from neutral to minor with a majority of impacts being neutral or negligible, and temporary as a result of operation of construction sites.

Residual impacts

Heritage impacts caused by the project would be mitigated by implementing management measures such as photographic archival recording, salvage schemes, interpretation and moveable heritage items strategies, preparation of a Construction Environmental Management Plan (CEMP) and site remediation, as well as sensitive design and re-use/relocation of significant elements where possible. However, impacts assessed as major would not be fully mitigated and there would be some residual impacts.

Residual impacts would include items proposed for removal where the function and condition of the item would not easily enable re-use or interpretation in any meaningful way. More generally, the historic character of the line, a late nineteenth-century to early twentieth century railway line with layers of inter-war development, would be altered by the contemporary Metro infrastructure.

Bankstown Line heritage impacts

Impact summary

The Bankstown Line was constructed in three stages between 1880 and 1939. The Marrickville to Belmore section was first constructed between 1880 and 1895. The second phase of development of the line was between 1896 and 1909, where the rail corridor cut through undeveloped country estate and farm land to Bankstown. The early twentieth century saw the addition of platform buildings, overhead booking offices, footbridges and overbridges at existing railway stations. The line was electrified in 1926, marking a significant change in the railway network system. The third phase of development of the line occurred between 1928 and 1939 when it reached Regents Park via Yagoona and Birrong. Wiley Park opened in 1938 as an infill station on the Marrickville to Bankstown section and Dulwich Hill Station was redeveloped in 1935, both stations showing examples of Inter-War railway architecture. The development of the line can be recognised across the line as a whole, with phases of building, platform and station types. It can also be appreciated within a single station, such as at Dulwich Hill which has retained layers of development.

Each railway station within the project area is listed as a heritage item at a State or local level as well as being listed under the RailCorp Section 170 Heritage & Conservation Register. Marrickville, Canterbury, and Belmore railway stations are listed on the State Heritage Register. Other heritage items listed under the RailCorp s170 register within the project area include underbridges at Hurlstone Park and Canterbury and the parcels office at Bankstown. Most railway stations comprise several elements of significance including wayside or island platforms, platform buildings, overhead booking offices, footbridges and overbridges. A few stations include a parcels office, evidencing the role of rail in transportation. A signal box is located at Canterbury station.

Among the ten heritage railway stations located on the Marrickville to Bankstown section of the Bankstown Line, the project would result in major direct impact to five stations, one of which is listed on the SHR: Marrickville. There would be moderate direct impacts to five stations, two of which are listed on the SHR: Canterbury and Belmore. Four stations would be subject to major visual impacts. Five stations would be subject to a moderate visual impact, three of which are listed on the SHR: Marrickville, Canterbury and Belmore. Two locally-listed stations, Wiley Park and Punchbowl, would no longer meet the threshold for local significance and would likely be delisted. All SHR stations would continue to meet the threshold for State significance.

Overall, all ten stations would be subject to moderate to major direct and visual impacts. Direct and visual impacts to three railway underbridges would be negligible to moderate. There would be major direct impacts to the Illawarra Road overbridge at Marrickville, which is within the station's SHR curtilage. As there would be impacts to significant elements at all listed stations along the line, conservation management plans (CMPs) for SHR listed stations and Conservation Management Strategies (CMS) for s170 items of local significance would be prepared by the Metro Operator. These documents would address any changes to the item including updated assessment of significance of elements and recommendations on curtilage changes, for example a possible reduction in curtilage at Marrickville Station as a result of impacts to the Illawarra Road overbridge. The CMP would also provide suggested site specific exemptions or management policies.

Station types

The ten railway stations within the project area could be divided into three main station types: the first layer of development of the Bankstown Line: Marrickville, Dulwich Hill (although fully redeveloped), Hurlstone Park, Campsie, Canterbury and Belmore; the second layer of development of the line: Lakemba, Punchbowl and Bankstown; and the inter-war development phase with the infill station at Wiley Park and the fully redeveloped Dulwich Hill station.

Stations constituting the first layer of development of the line would generally be retained, Dulwich Hill being excluded from this group as it was fully redeveloped in 1935. All platform buildings and general station configurations would be conserved at Marrickville, Hurlstone Park, Campsie, Canterbury and Belmore except for the Platform 1 building at Hurlstone Park which are required to be removed.

Stations constituting the second layer of development of the line would mostly be conserved in their existing states. Lakemba and Bankstown's island platform configurations and platform buildings would be retained. Punchbowl Station would be subject to greater impacts as it would be fully redeveloped.

The inter-war layer of the Bankstown Line would be impacted with Wiley Park Station being fully redeveloped, constituting the loss of the only example of Inter-War Railway Domestic station on the line. The inter-war phase of redevelopment of Dulwich Hill station would also be altered with the loss of the overhead booking office and major visual impacts on the station building, although the latter, and the island platform configuration would be conserved.

The most significant stations on the line at Marrickville, Canterbury and Belmore dated from the first phase of development would retain their significant near-identical brick buildings of exceptional significance. The intermediate stations of the first phase of development have more modest brick buildings dated 1915 including Campsie and Hurlstone Park station. Campsie would retain its original configuration and buildings whilst Hurlstone Park would be subject to greater impacts with the more prominent of two platform buildings being removed. The configuration of two stations at Punchbowl and Wiley Park would be fully modified from island platforms to wayside platforms. The configuration at Bankstown Station would be retained and the station extended to the east.

Station elements

The Bankstown Line would conserve examples of each significant platform building type found on the Marrickville to Bankstown portion of the line. Examples of 1895 Type 11 buildings of exceptional significance would be conserved at Marrickville, Canterbury and Belmore stations. Several examples of 1911-1919 Type 11 buildings would be conserved at Marrickville, Hurlstone Park, Canterbury, Campsie, Lakemba and Bankstown to evidence the second historical layer of the line. Evidence of the transitional style of Inter-War railway architecture would be retained at Dulwich Hill, although the Inter-War domestic style buildings at Wiley Park would be lost.

A good example of an overhead booking office would be conserved at Belmore, whilst good to fair examples included in a Transport for NSW study of overhead booking offices would be removed at Dulwich Hill, Wiley Park and Punchbowl stations[1]. The platform booking office at Marrickville which is of exceptional significance would be retained. A significant portion of original footbridges already impacted would be removed to meet the requirements of the new Metro concourses. A footbridge assessed to be of high significance within the NSW railway collection in a Sydney Trains' footbridge conservation strategy would be removed at Dulwich Hill, as would three footbridges of moderate significance at Hurlstone Park, Canterbury and Wiley Park.[2]

Original platforms along the line would be removed to meet accessibility and operational requirements for straight platforms, except for the platforms at Bankstown Station which would be mostly retained. This would result in a substantial loss of curved wayside and island platforms, and of brick vertical and battered platform walls along the Bankstown Line. General platform configuration would be

[1] Australian Museum Consulting 2014. Railway Overhead Booking Offices Heritage Conservation Strategy. Prepared for Transport for NSW.
[2] NSW Government Architect's Office Heritage Group 2016. Railway Footbridges Heritage Conservation Strategy. Prepared for Sydney Trains.

retained apart from at Punchbowl and Wiley Park where original island platform configuration would be changed to two wayside platforms.

Overbridges on the line have generally been impacted over time. The majority of the overbridges would be conserved for upgrade and continued use, with the exception of the Illawarra Road overbridge which would be removed and replaced.

Archaeological impacts

Overall the study area has a nil-low potential to contain significant archaeological remains. There was limited development across the study area prior to development of the rail line. Construction of the railway stations and rail line in the late nineteenth and early twentieth century would have required a considerable amount of ground disturbance and excavation.

There are four locations that have the potential to contain significant archaeological remains, the Marrickville Station Catchment, the Canterbury Station Catchment and construction site, the Lakemba Station Catchment and Belmore Station Catchment. Other locations across the line may contain archaeological 'works' such as remains of culverts, former platforms (within existing remodelled platforms), and infrastructure such as drains.

Marrickville Station Catchment
There is a moderate-high potential for potentially local significant archaeological remains associated with the railway station to be impacted by the proposed works.

Canterbury Station Catchment and construction site
Although the location of the Old Sugarmill and former associated structures is to the east of the station, there is a moderate – high potential that remains associated with this period of occupation may also extend into the station catchment and construction site to the south of the rail line, adjacent to the Old Sugarmill SHR item. These remains would have local or State significance depending on their nature and intactness.

The former Canterbury Township is located to the east of Canterbury Station. Any subsurface works within the rail corridor and construction site have a moderate – high potential to impact any associated intact archaeological remains. These remains would have local significance.

Lakemba Station Catchment
There is a low potential for locally significant archaeology associated with the early settlement of Lakemba including structures associated with the Taylor House (Lakemba) such as outbuildings and stables and archaeological features associated with farming activities, domestic and agricultural structures, refuse pits and drains or culverts. Works within the station catchment have the potential to impact any associated intact archaeological remains.

Belmore Station Catchment
There is a low-moderate potential for locally significant archaeological remains associated with the railway station goods shed and goods platform to be impacted by the proposed works.

Construction compounds impact

The construction compounds impact assessment considered impacts of temporary construction compounds on the heritage items located within the project area. Overall, impacts of construction sites would be minor and temporary. Provided that mitigation measures are implemented to remediate the sites following the completion of the project, overall impacts from the construction of the project on the current Bankstown Line would be negligible.

Conclusion

The contrasting contemporary design of the Metro stations would generally be distinguishable from the heritage character of the historic stations and provide enhanced views of significant platform buildings. The new Metro line would be read as the latest phase of development of the Bankstown Line and would enable the line to function in its original use within a modern railway infrastructure context. The continued use of the stations in their historic function, the retention of a majority of platform buildings for re-use and enhanced views of significant buildings would constitute positive heritage impacts in the context of the project and its requirements.

Mitigation and Management Measures

Specific mitigation and management measures were provided for each station catchment. These would be implemented to address heritage impacts on non-Aboriginal heritage sites and areas of archaeological potential within the study area.

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1. INTRODUCTION

1.1 Overview

1.1.1 Project background

The New South Wales (NSW) Government is implementing *Sydney's Rail Future* (Transport for NSW, 2012a), a plan to transform and modernise Sydney's rail network so that it can grow with the city's population and meet the needs of rail customers into the future.

Sydney Metro is a new standalone rail network identified in Sydney's Rail Future, providing 66 kilometres of metro rail line and 31 metro stations. The NSW Government is currently delivering the first two stages of Sydney Metro, shown in Figure 1, which consist of Sydney Metro Northwest (between Rouse Hill and Chatswood) and Sydney Metro City & Southwest (between Chatswood and Bankstown).

Sydney Metro Northwest is currently under construction. Sydney Metro Northwest services will start in the first half of 2019, with a metro train running every four minutes in the peak period. Services will operate between a new station at Cudgegong Road (beyond Rouse Hill) and Chatswood Station. Sydney Metro City & Southwest will extend the Sydney Metro system beyond Chatswood to Bankstown, delivering about 30 kilometres of additional metro rail, a new crossing beneath Sydney Harbour, new railway stations in the lower North Shore and Sydney central business district (CBD), and the upgrade of existing stations from Marrickville to Bankstown. City & Southwest trains would run between Sydenham and Bankstown stations in each direction, at least every four minutes in peak periods, averaging around 15 trains per hour.

Sydney Metro City & Southwest comprises two core components (shown in Figure 1):

- the Chatswood to Sydenham project
- the Sydenham to Bankstown upgrade ('the project' and the subject of this document).

1.1.2 The project for which approval is sought

Transport for NSW is seeking approval to construct and operate the Sydenham to Bankstown upgrade component of Sydney Metro City & Southwest (the project).

The project involves upgrading 10 existing stations west of Sydenham (Marrickville to Bankstown inclusive), and a 13 kilometre long section of the Sydney Trains T3 Bankstown Line, between west of Sydenham Station and west of Bankstown Station, to improve accessibility for customers and meet the standards required for metro operations. The project would enable Sydney Metro to operate beyond Sydenham, to Bankstown.

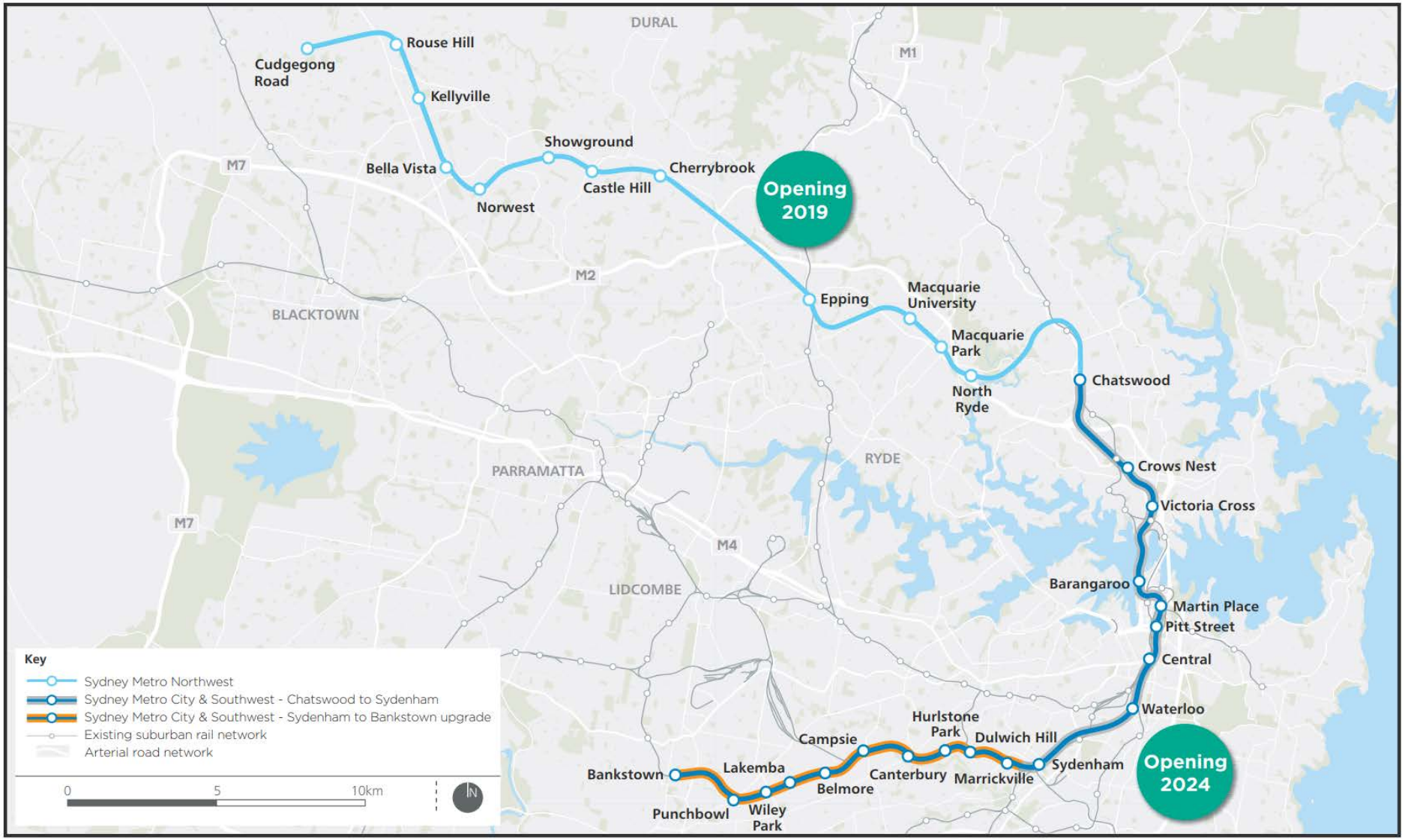
A key element of the project is upgrading stations along the corridor from Marrickville to Bankstown, to allow better access for more people by providing new concourses, level platforms, and lifts at stations. These upgrades aim to provide a better, more convenient, and safer experience for public transport customers, by delivering:

- stations that are accessible to people with a disability or limited mobility, the elderly, people with prams, and people travelling with luggage
- upgraded station buildings and facilities for all transport modes that meet the needs of a growing population

- interchanges that support an integrated transport network and allow seamless transfers between different modes for all customers.

The project is subject to assessment and approval by the NSW Minister for Planning under Part 5.1 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act).

Figure 1: The Sydney Metro network



1.2 The project

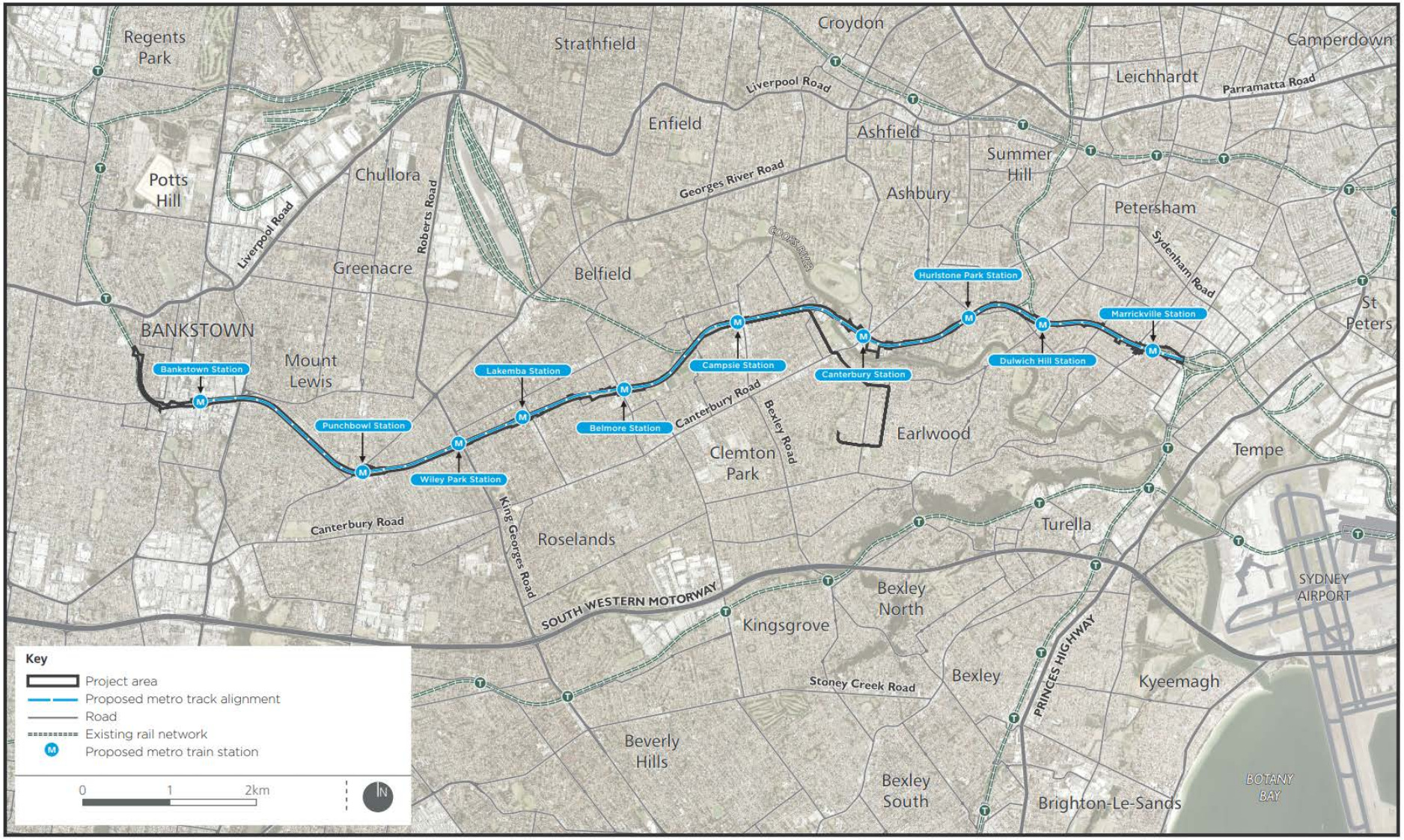
1.2.1 Location

The location of the project is shown in Figure 2.

The key elements of the project are located mainly within the existing rail corridor, from about 800 metres west of Sydenham Station in Marrickville, to about one kilometre west of Bankstown Station in Bankstown. The project is located in the Inner West and Canterbury-Bankstown local government areas.

The term ‘project area’ is used throughout this document to refer to the area where the physical works for the project would be undertaken. This area encompasses the existing rail corridor (as described above), the 10 existing stations within the corridor, and areas surrounding the rail corridor as shown in Figure 1.

Figure 2: Overview of the project



1.2.2 Key features

The key features of the project are summarised below and area shown in Figure 2.

Works to upgrade access at stations

The project includes upgrading the 10 stations from Marrickville to Bankstown as required, to meet legislative requirements for accessible public transport, including the requirements of the *Disability Discrimination Act 1992* and the *Disability Standard for Accessible Public Transport 2002*. The proposed works include:

- works to platforms to address accessibility issues, including levelling and straightening platforms
- new station concourse and station entrance locations, including:
  - new stairs and ramps
  - new or relocated lifts
- provision of additional station facilities as required, including signage and canopies.

Works would also be undertaken in the areas around the stations to better integrate with other modes of transport, improve travel paths, and meet statutory accessibility requirements. This would include provision of pedestrian, cyclist, and other transport interchange facilities; as well as works to the public domain, including landscaping.

Works to convert stations and the rail line to Sydney Metro standards

Station works

In addition to the station upgrades to improve accessibility, works to meet the standards required for metro services would be carried out, including:

- installation of platform screen doors
- provision of operational facilities, such as station services buildings.

Track and rail system facility works

Upgrading the track and rail systems to enable operation of metro services would include:

- track works where required along the 13 kilometre long section of the rail corridor, including upgrading tracks and adjusting alignments, between west of Sydenham Station and west of Bankstown Station
- new turn back facilities and track crossovers
- installing Sydney Metro rail systems and adjusting existing Sydney Trains rail systems
- overhead wiring adjustments.

Other works

Other works proposed to support Sydney Metro operations include:

- upgrading existing bridges and underpasses across the rail corridor
- installation of security measures, including fencing
- installation of noise barriers where required

- modifications to corridor access gates and tracks
- augmenting the existing power supply, including new traction substations and provision of new feeder cables
- utility and rail system protection and relocation works
- drainage works to reduce flooding and manage stormwater.

Active transport corridor and surrounding development

The project would also provide for:

- parts of an active transport corridor where located within the station areas or surplus rail corridor land, to facilitate walking and cycling connections to each station and between Marrickville and Bankstown
- enabling works to support possible future development at Campsie Station (any future development would be subject to a separate approvals process).

Temporary works during construction

During construction, the project would involve:

- provision of temporary facilities to support construction, including construction compounds and work sites
- implementation of alternative transport arrangements for rail customers, during possession periods and/or station closures, guided by the proposed Temporary Transport Strategy.

1.2.3 Timing

An overview of the construction and operation timing of the project is outlined below.

Construction

Construction of the project would commence once all necessary approvals are obtained (anticipated to be in 2018), and would take about five years to complete.

The T3 Bankstown Line would remain operational for the majority of the construction period. However, to ensure the station and infrastructure upgrade works are completed as efficiently and safely as possible, and to accommodate works that cannot be undertaken when trains are operating, it would be necessary to undertake some work during rail possession periods, when trains are not operating. It is anticipated that these rail possession periods would comprise the routine weekend maintenance possessions, together with some longer possession periods during periods of reduced patronage such as school holidays.

A final, longer possession of about three to six months would also be required. This would involve full closure of the line to enable conversion to metro operations. This would include works such as the installation of new signalling, communication systems, and platform screen doors.

During each possession period, alternative transport arrangements would be implemented to ensure that customers can continue to reach their destinations.

Operation

Sydney Metro City & Southwest would be fully operational by 2024, with the opportunity of operation commencing in two phases. Initially, Sydney Metro Northwest services would be extended by the City & Southwest project, and would operate from Chatswood Station to Sydenham Station. Some months later, metro operations would extend from Sydenham Station to Bankstown Station, with both phases planned to be completed before the end of 2024. The opportunity for phased opening of the project would enable metro trains to operate from Cudgegong Road Station to Sydenham Station prior to the final conversion of the T3 Bankstown Line to metro operations.

Once the project is operational, Sydney Trains services would no longer operate along the T3 Bankstown Line between Sydenham and Bankstown stations. Customers would be able to interchange with Sydney Trains services at Sydenham and Bankstown stations. Sydney Trains services to and from Bankstown to Liverpool and Lidcombe stations would not be affected.

1.3 Purpose and scope of the report

This report has been prepared to support the Environmental Impact Statement for the project. The Environmental Impact Statement has been prepared to accompany the application for approval of the project, and addresses the environmental assessment requirements of the Secretary of the Department of Planning and Environment ('the Secretary's environmental assessment requirements').

This report:

- Identifies items and areas of heritage significance that would be materially affected by the project during construction and operation, by field survey and research, including any buildings, works, relics, views, or places of heritage significance
- Considers of the potential impacts on the values, settings and integrity of heritage areas and items and archaeological resources located near the project, including items both above and below ground and, where such potential exists, the likely significance of those impacts
- Outlines the proposed mitigation and management measures (including measures to avoid significant impacts and an evaluation of the effectiveness of the mitigation measures) in accordance with relevant best practice guidelines.

The assessment is based on a desktop review of information available for the existing environment and a site visit. Information available for the project at the time of this report included preliminary drawings, reports, flood modelling data, and construction information.

1.4 Secretary's Environmental Assessment Requirements

The Secretary's Environmental Assessment Requirements (SEARs) relating to non-Aboriginal heritage, and where these requirements are addressed in this report, are outlined in Table 1 below.

Table 1: Secretary's environmental assessment requirements – non-Aboriginal heritage

Secretary's environmental assessment requirements	Where addressed
General standard SEARs	
3. Assessment of key issues 2. For each key issue the Proponent must: (a) describe the biophysical and socio-economic environment, as far as it is relevant to that issue;	Sections 6 and 7.
(b) describe the legislative and policy context, as far as it is relevant to the issue;	Section 4.
(c) identify, describe and quantify (if possible) the impacts associated with the issue, including the likelihood and consequence (including worst case scenario) of the impact (comprehensive risk assessment), and the cumulative impacts;	Sections 6, 7, 8 and 9.
(d) demonstrate how potential impacts have been avoided (through design, or construction or operation methodologies);	Section 5 discusses project justification and design development in regard to heritage conservation outcomes
(e) detail how likely impacts that have not been avoided through design will be minimised, and the predicted effectiveness of these measures (against performance criteria where relevant); and	Impacts would be managed through the detailed design process which is subject to management measures such as involvement of a heritage architect. Management of any impacts not minimised is discussed in section 10.
(f) detail how any residual impacts will be managed or offset, and the approach and effectiveness of these measures.	Sections 6, 7, 8 and 9 discuss impacts to heritage significance. Cumulative and residual impacts are discussed. Management of residual impacts included archival recording, reuse of structures and heritage interpretation.
3. Where multiple reasonable and feasible options to avoid or minimise impacts are available, they must be identified and considered and the proposed measure justified taking into account the public interest.	Section 5 discusses project justification and design development in regard to heritage conservation outcomes.
Key issue requirements	
7. Heritage 1. The Proponent must identify and assess any direct and/or indirect impacts (including cumulative impacts) to the heritage significance of:	
(a) Aboriginal places and objects, as defined under the National Parks and Wildlife Act 1974 and in accordance with the principles and methods of assessment identified in the current guidelines;	Technical Paper 4 – Aboriginal heritage assessment.
(b) Aboriginal places of heritage significance, as defined in the Standard Instrument – Principal Local Environmental Plan;	
(c) environmental heritage, as defined under the *Heritage Act 1977*; and	

Secretary's environmental assessment requirements	Where addressed
(d) items listed on the National and World Heritage lists.	Sections 6, 7, 8 and 9. Direct, visual and potential direct (vibration) impacts are identified for each heritage listed item. For listed stations, impacts are assessed at an element level. Impacts to the Bankstown Railway Line are considered as part of the cumulative impact discussion (Section 9).
2. Where impacts to State or locally significant heritage items are identified, the assessment must: (a) include a statement of heritage impact for all heritage items (including significance assessment);	Section 6. Significance assessments adapted from existing listings and detailed statements of heritage impact, in accordance with the required guidelines, are provided for each listed item.
(b) consider impacts to the item of significance caused by, but not limited to, vibration, demolition, archaeological disturbance, altered historical arrangements and access, visual amenity, landscape and vistas, curtilage, subsidence and architectural noise treatment (as relevant)	Sections 6, 7 and 8. Direct, visual and potential direct (vibration) impacts are identified for each heritage listed item. Listed stations impacts are assessed at an element level. Impacts to potential archaeology are assessed in Section 7. Impacts from construction compounds are assessed in Section 8. A cumulative impact assessment is provided in Section 9. Changes to curtilages would be assessed in a Conservation Management Plan (CMP) or Conservation Management Strategy (CMS) as outlined in Section 10.
(c) outline measures to avoid and minimise those impacts in accordance with the current guidelines; and	Section 10. Management and mitigation measures are provided in accordance with the current guidelines. Guidelines are discussed in Section 2.
(d) 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).	Section 1.5 for brief CVs.
(e) have regard to the specific and broader values of historic structures (such as footbridges, overhead booking offices, platforms and platform buildings) and conservation approaches provided in the relevant conservation strategies and design guides and conservation management plans, as applicable; and	Sections 6, 7, 8 and 9. Heritage Council and Sydney Trains current guidelines have been used to inform impacts assessments. For example in all cases where footbridges or overhead booking offices are to be impacted they are assessed in relation to the findings of the Sydney Trains conservation strategies as listed in the current guidelines. Impacts have been assessed against conservation management plans where applicable. Design has considered heritage guidelines as outlined in Section 2.2.2 and Section 5.3.

Secretary's environmental assessment requirements	Where addressed
(f) identify potential uses for heritage items to be retained within the corridor.	Retained buildings would be used for rail operational purposes such as storage or staff amenities. Discussed throughout impact assessments, and in mitigation measures in Section 10.
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).	Technical Paper 4 – Aboriginal heritage assessment.
4. Where impacts to Aboriginal objects and/or places are proposed, consultation must be undertaken with Aboriginal people in accordance with the current guidelines. The significance of cultural heritage values for Aboriginal people who have a cultural association with the land must be addressed.	

Use of the current guidelines referred to in the SEARs are discussed in Section 2.0.

1.5 Authors

This report was prepared by Shona Lindsay (Heritage Consultant), Emmanuelle Fayolle (Senior Heritage Consultant) and Sandra Wallace (Director), with management input and review by Sandra Wallace. The report was reviewed by James Phillips (Weir Phillips) who provided comment from the perspective of a heritage architect. Relevant qualifications are provided in Table 2 below.

Table 2: Authors of this report and relevant qualifications

Authors	Qualifications
Sandra Wallace	**Director – Artefact Heritage** **Qualifications** PhD (Archaeology) University of Sydney BA (Honours First Class - Prehistoric and Historical Archaeology) University of Sydney. **Professional affiliations** Australian Association of Consulting Archaeologists (AACAI): Full Member Australian Archaeological Association: Member
Emmanuelle Fayolle	**Senior Heritage Consultant – Artefact Heritage** **Qualifications** MSc Architectural Conservation (2011) University of Edinburgh, UK BA History and Languages (2008) University Stendhal Grenoble III, France **Professional affiliations** Member of the International Council on Monuments and Sites (Australia ICOMOS).
Shona Lindsay	**Heritage Consultant – Artefact Heritage** **Qualifications** MA Artefact Studies (2014) University College London, UK

Authors	Qualifications
	BA (First Class Honours) Archaeology and Ancient History (2011) University of Queensland, Australia **Professional affiliations** Member of the International Committee for the Conservation of Industrial Heritage (TICCIH)
James Phillips (review)	**Director – Weir Phillips Architects** **Qualifications** M. Heritage Conservation (Hons), Heritage University of Sydney B.Sc. (Arch) B. Arch, Landscape Architecture University of NSW.

1.6 Limitations

- This report provides an assessment of non-Aboriginal (historical) built heritage and potential archaeological resources only and does not provide an Aboriginal heritage assessment.
- Potential heritage items and heritage conservation areas considered for addition to the environmental schedules of the Marrickville and Canterbury Local Environmental Plans have not been assessed in detail this report. It is understood that Planning Proposals are currently under assessment by the DP&E.
- It is assumed the proposed 33 kilovolt high voltage feeder would not impact on heritage items or potential archaeology as it would be through existing road reserves and use horizontal directional drilling (HDD) in certain areas.

2. ASSESSMENT METHODOLOGY

This section outlines the methodologies used to prepare this heritage assessment. The methodologies used in assessing heritage significance for built heritage and non-Aboriginal archaeology are also provided, along with the methodology used in assessing heritage impact.

2.1 Identification of study elements

2.1.1 Study area

The indicative alignment for the project is shown in Figure 1. The alignment runs from Marrickville Station to Bankstown Station, with ancillary works extending to the west of Bankstown Station. The project area consists of the alignment and contains all construction sites.

For the purpose of this investigation, the study area boundary has been defined as a 25-metre buffer around the project area. The project area and the buffer are collectively referred to as the study area in this report unless otherwise stated.

The application of a buffer helps to identify heritage items potentially located within the visual catchment of the project and where potential visual impacts on that item may occur. It also supports assessment of other potential impacts on heritage fabric (for example, as a result of vibration).

Archaeological potential has not been assessed within the buffer as it is assumed subsurface impacts would only occur within the project area.

2.1.2 Heritage-listed items

Heritage listed items were identified through a search of relevant State and federal statutory heritage registers:

- World Heritage List
- Commonwealth Heritage List
- National Heritage List
- State Heritage Register
- Marrickville Local Environmental Plan (LEP) 2011
- Canterbury LEP 2012
- Bankstown LEP 2015
- Section 170 Heritage and Conservation Registers for Sydney Water, Roads and Maritime, RailCorp, Ausgrid and Department of Housing.
- NSW State Heritage Inventory database

Non-statutory registers were not included in the search.

Items listed on these registers have been previously assessed against the NSW Heritage Assessment guidelines (as outlined in section 2.2.1). Statements of heritage significance, based on the NSW Heritage Assessment guidelines, as they appear in relevant heritage inventory sheets and documents, are provided throughout this assessment. No additional assessment of significance has been undertaken, apart from in relation to archaeology and where recent changes to the item (such as in regard to Sydney Trains upgrades, have affected the relevant information provided in the existing statement. Assessments of levels of significance of elements of listed items have been taken where available from the statutory listings, Conservation Management Plans (CMPs) or previous

studies. Where no assessment of elements was available, levels have been assessed in relation to the criteria provided in Table 4. Where recent impacts may have altered documented levels of significance of elements, a revised level has been provided with the date and nature of the impacts to the element noted.

Where relevant, CMPs and other heritage management documents, guidelines and previous assessments have been utilised to provide additional information regarding heritage significance and management.

Unlisted built heritage items were not assessed as part of this investigation as it was assumed existing heritage studies which informed inclusion on LEP schedules and the s170 register would have captured all relevant items.

It is noted that this methodology is consistent with the Sydney Metro City and Southwest - Chatswood to Sydenham Environmental Impact Statement and associated technical report.

2.2 Built heritage assessment

2.2.1 NSW heritage assessment guidelines

Determining the significance of heritage items or a potential archaeological resource is undertaken by utilising a system of assessment centred on the *Burra Charter* of Australia ICOMOS. The principles of the charter are relevant to the assessment, conservation and management of sites and relics. The assessment of heritage significance is outlined through legislation in the NSW Heritage Act 1977 and implemented through the *NSW Heritage Manual* and the *Archaeological Assessment Guidelines*.[3]

If an item meets one of the seven heritage criteria, and retains the integrity of its key attributes, it can be considered to have heritage significance. The significance of an item or potential archaeological site can then be assessed as being of local or State significance. If a potential archaeological resource does not reach the local or State significance threshold, then it is not classified as a relic under the Heritage Act.

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

'Local heritage significance', in relation to a place, building, work, relic, moveable object or precinct, means significance to an area in relation to the historical, scientific, cultural, social, archaeological, architectural, natural or aesthetic value of the item.[4]

The assessment of significance will result in a succinct statement of heritage significance that summarises the values of the place, site, resource, deposit or feature. The heritage significance assessment criteria are as follows:

Table 3: NSW heritage assessment criteria

Criteria	Description
A – Historical Significance	An item is important in the course or pattern of NSW's or the local area's cultural or natural history.

[3] NSW Heritage Office 1996; 25-27
[4] This section is an extract based on the Heritage Office Assessing Significance for Historical Archaeological Sites and Relics 2009:6.

Criteria	Description
B – Associative Significance	An item has strong or special associations with the life or works of a person, or group of persons, of importance in NSW's or the local area's cultural or natural history.
C – Aesthetic Significance	An item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW or the local area.
D – Social Significance	An item has strong or special association with a particular community or cultural group in NSW or the local area for social, cultural or spiritual reasons.
E – Research Potential	An item has potential to yield information that will contribute to an understanding of NSW or the local area's cultural or natural history.
F – Rarity	An item possesses uncommon, rare or endangered aspects of NSW's or the local area's cultural or natural history.
G - Representativeness	An item is important in demonstrating the principal characteristics of a class of NSW's or the local area's cultural or natural places, or cultural or natural environments.

This report includes an assessment of the relative contributions of individual elements of heritage items to its heritage value. These assessments were based on the standard grades of significance set out in the NSW Heritage Office publication *Assessing Heritage Significance* shown in Table 4.[5] Where significance of elements is discussed in listings or CMPs, these grades are used unless additional information has been presented (such as change in condition or removal), that would justify a change.

Table 4: Standard grades of significance

Grading	Justification	Status
Exceptional (E)	Rare or outstanding element directly contributing to an item's local and State significance	Fulfils criteria for local or State listing
High (H)	High degree of original fabric. Demonstrates a key element of the item's significance. Alterations do not detract from significance.	Fulfils criteria for local or State listing
Moderate (M)	Altered or modified elements. Elements with little heritage value, but which contribute to the overall significance of the item.	Fulfils criteria for local or State listing
Little (L)	Alterations detract from significance. Difficult to interpret.	Does not fulfil criteria for local or State listing
Intrusive (I)	Damaging to the item's heritage significance.	Does not fulfil criteria for local or State listing

2.2.2 Sydney Trains current guidelines

The following Sydney Trains strategies have been used in this assessment:

- Railway Footbridges Heritage Conservation Strategy, by NSW Government Architect's Office (August 2016).

[5] Heritage Division 2002. Assessing Heritage Significance.

- Railway Overhead Booking Offices Heritage Conservation Strategy. Prepared for Transport for NSW (2014).
- Heritage Platforms Conservation Management Strategy. Prepared for Sydney Trains (2015).

The Canopies and Shelters, Design Guide for Heritage Stations, by Sydney Trains (December 2016) and Design in Context Guidelines for infill Development in the Historic Environment, by NSW Heritage Office (June 2006) have informed the development of the design principles for the project. As they are design guidelines, not assessment frameworks or conservation strategies, they have not been used explicitly in this assessment but as they inform design they have been accounted for.

2.2.3 Heritage studies

For precedence, this report considered the Non-Aboriginal Heritage Impact Assessment prepared for Phase 1 of the Metro City & Southwest project as well as several heritage investigations undertaken within, or close to, the study area that provide evidence which assists in evaluating the heritage significance of heritage items within the study area.

Artefact Heritage 2016. *Sydney Metro City & Southwest: Chatswood to Sydenham, Non-Aboriginal Heritage Impact Assessment*. Prepared for Jacobs/Arcadis/RPS.

The technical paper considered the construction and operational impacts on listed heritage items and potential archaeological resources within the study area and included identification of items and areas of heritage significance that would be materially affected by the project, consideration of the potential impacts on the values, settings and integrity of heritage items and archaeological resources located within the project area and an outline of the proposed mitigation and management measures in accordance with relevant best practice guidelines.

Artefact Heritage 2013. *Punchbowl Railway Station Stair Replacement Statement of Heritage Impact.* Prepared for GW Hyder Consulting.

This report investigated the proposed replacement of two flights of stairs at Punchbowl Station in 2014.

Australian Museum Business Services 2012. *Bankstown Railway Station Upgrade. Statement of Heritage Impact.* Prepared for Transport for New South Wales.

This report assessed a TAP upgrade which was undertaken on the footbridge and overhead booking office in 2012.

Australian Museum Consulting 2014. *Railway Overhead Booking Offices Heritage Conservation Strategy.* Prepared for Transport for NSW.

Five stations located in the study area were investigated in the *Railway Overhead Booking Offices Heritage Conservation Strategy* prepared by Australian Museum Consulting in 2014, including Dulwich Hill, Wiley Park, Punchbowl, Belmore, and Campsie. This report looked at 16 early-twentieth century overhead booking offices within the NSW rail network. It found that there are only 12 extant examples of overhead booking offices that have good or fair integrity and representative value. In particular, Dulwich Hill and Wiley Park were highlighted as having high significance and possibly reaching the State significance threshold. The report outlines strategies to conserve the significance of the overhead booking offices, such as retention, adaptive reuse, and mitigation when impacts are required.

Australian Museum Consulting 2015. *Heritage Platforms Conservation Management Strategy.* Prepared for Sydney Trains.

The conservation management strategy looked at 624 passenger platforms located at 254 stations. The report investigated the various types of platforms at stations within the Sydney Trains assets. It discussed platforms at stations within the study area including: Marrickville, Dulwich Hill, Campsie, Belmore, and Wiley Park. It also provided strategies for conserving platforms.

RPS 2013. *Marrickville Station Upgrade. Statement of Heritage Impact.* Prepared for Transport for NSW.

The Marrickville TAP project was conducted with upgrades to the station including the installation of two new stairs and lifts, new concourse buildings, new canopies, and adaptive reuse of station buildings. The 1917 booking office was relocated along Platform 2.

David Scobie Architects Pty Ltd 2016. *Marrickville Railway Station Conservation Management Plan.* Prepared for TfNSW and Arenco.

The CMP was prepared following the TAP upgrades to Marrickville Station. It outlines conservation management policies and implementation strategies to ensure the conservation of the heritage significance of Marrickville Station. The CMP is currently at draft stage and has not been endorsed by Heritage Council, although the policies have been referred to in this report for the assessment of Marrickville Station.

NSW Government Architect's Office Heritage Group 2016. *Railway Footbridges Heritage Conservation Strategy.* Prepared for Sydney Trains.

The heritage conservation strategy investigated 68 railway footbridges in the Sydney Trains portfolio, providing specific strategies for conserving footbridges depending on the significance. This report covered eight of the stations in the study area: Dulwich Hill, Hurlstone Park, Canterbury, Campsie, Lakemba, Wiley Park, Punchbowl, and Bankstown. The significance of the footbridges as an element of the station listings is adapted from this report.

Office of Rail Heritage 2012. *Conservation Guide: Railway Station Platform Furnishings.*

Although not specific to the stations within the study area, this document provides a guide to conserving station platform furnishings such as the original bubbler at Belmore Station. It provides an outline for identifying the different types of heritage platform furnishings, and appropriate conservation methods.

Simpson Dawbin Associates 2002. *Campsie Railway Station: Statement of Heritage Impact for easy access and upgrading development.* Prepared for Rail Development State Rail Authority.

Part of the TAP program at Campsie included a new overhead concourse. Remnant elements of the original booking office building were retained within the concourse and the Dutch gable roof profile was reinstated at the street elevation. The original booking hall and northern section of building were removed; as were the ticket windows, ticket collector's cabin; and the majority of doors and windows.

Sydney Water 2005. *Sewage Pumping Station SP0271. Conservation Management Plan.* Prepared for Sydney Water.

The CMP was commissioned by Sydney Water to provide a conservation and management framework for the Sewage Pumping Station SP0271 to facilitate its continued operation and conservation of its heritage values. The report provides a contextual history of Sydney Water and the legislative background to the management of heritage assets, as well as an assessment of significance and conservation policies specific to the site. The CMP was consulted to understand the

elements that constitute the significance of the site and how these would be affected by the project. The project was assessed against the relevant conservation policies of the CMP. The CMP was endorsed by the Heritage Council in 2004 for a period of five years and has since expired.

2.2.4 Direct and visual impacts assessment

This Heritage Impact Assessment has been informed by the document *Statement of Heritage Impact* 2002, prepared by the NSW Heritage Office, contained within the *NSW Heritage Manual,* as a guideline. In accordance with this guide, assessment is based on levels of impact to significance of the heritage item and its elements.

Impacts are identified as either:

- Direct impacts, resulting in the demolition or alteration of fabric of heritage significance
- Visual impacts, resulting in changes to the setting or curtilage of heritage items or places, historic streetscapes or views
- Potential direct impact, resulting in impacts from vibration and demolition of adjoining structures.

Once levels of all three types of impacts are assessed, adverse and positive impacts to aspects of significance are balanced to assess an overall level of impact to the heritage significance of the listed item as a result of the project. Where impacts to heritage significance are assessed as major, discussion is provided on whether the item will continue to meet the threshold of significance necessary for heritage listing.

From a heritage perspective, impacts are only acceptable if sufficient justification is provided, and options which would avoid harm have been explored and discounted. Where impacts are proposed, justifications including information on optioneering has been included in accordance with the *Statement of Heritage Impact* 2002 document. Information on options assessment and justification is provided in Section 5.3. Additional information on how the design was developed taking into account impacts to heritage is provided in Chapter 7 of the Environmental Impact Statement.

Specific terminology and corresponding definitions are used in this assessment to consistently identify the magnitude of the project's direct, visual or potential direct impacts on heritage items or archaeological remains. The terminology and definitions are based on those contained in guidelines produced by the International Council on Monuments and Sites (ICOMOS)[6] and are shown in Table 5. It is assumed that all direct and potential direct impacts are a result of construction. Visual impacts are assumed to be operational unless specified as temporary in which case they are related to construction.

Table 5: Terminology for assessing the magnitude of heritage impact

Magnitude	Definition
Major	Actions that would have a long-term and substantial impact on the significance of a heritage item. Actions that would remove key historic building elements, key historic landscape features, or significant archaeological materials, thereby resulting in a change of historic character, or altering of a historical resource. These actions cannot be fully mitigated.
Moderate	This would include actions involving the modification of a heritage item, including altering the setting of a heritage item or landscape, partially removing archaeological resources, or the alteration of significant elements of fabric from historic structures. The impacts arising from such actions may be able to be partially mitigated.

[6] Including the document *Guidance on Heritage Impact Assessments for Cultural World Heritage Properties*, ICOMOS, January 2011.

Magnitude	Definition
Minor	Actions that would result in the slight alteration of heritage buildings, archaeological resources, or the setting of an historical item. The impacts arising from such actions can usually be mitigated.
Negligible	Actions that would result in very minor changes to heritage items.
Neutral	Actions that would have no heritage impact.

2.2.5 Potential direct impact assessment

Vibration arising from construction or excavation work has the potential to impact on the fabric of heritage items, potentially causing subsidence, or affecting structural integrity.

In locations where heritage items are adjacent to demolition, construction or excavation works, an assessment of potential impact through vibration has been undertaken. This is provided in Section 8.0 of this report.

A conservative vibration damage screening level of 7.5 millimetres per second peak particle velocity has been adopted for the project. This screening level has been established with reference to the minor cosmetic damage criteria in *British Standard BS 7385:2 – 1993*. The vibration levels specified in this standard are designed to minimise the risk of threshold or cosmetic surface cracks, and are set well below the levels that have potential to cause damage to the main structure.

The recommended screening level of 7.5 millimetres per second peak particle velocity is also applicable to heritage items unless it is known that the item is already structurally unsound – in which case, a lower screening level may be applicable.

Potential vibration impacts would be assessed by applying the following methodology:

- Where vibration levels are predicted to be below the relevant vibration screening level, potential vibration impacts are considered negligible and no further assessment of vibration-related impacts on that structure would be required
- Where vibration levels are predicted to be at or above the vibration screening level, further investigation would be undertaken to ensure vibration levels remain below appropriate limits for that structure, including:
  - A more detailed assessment of the structure
  - Attended vibration monitoring would be undertaken from the structure's closest point to the vibration source
- Where the building is a heritage building, and the predicted vibration level is above the vibration screening level, the more detailed assessment of the structure would be undertaken that specifically considers the heritage values of the structure and sensitive heritage fabric in consultation with a heritage specialist to ensure it is adequately monitored and managed.

2.2.6 Station building types

The following is based on Sydney Trains' definition of station building types.[7] This terminology is used throughout this assessment when describing station buildings.

[7] Sydney Trains n.d. *Overview of Railway Station Buildings (1856-2009) for S170*

Table 6: Station building types

Type	Description
Type 3: Second class station buildings	Known as 'Second Class Station Buildings', these structures were constructed 1859 – 1890 mostly at metropolitan locations in the 1880s. The common features for these buildings are a large central brick building flanked by attached or detached wing structures. Roofs are generally simple hip and valley roof structures with multiple brick chimneys and sometimes with a transverse gable. The general layout of the building is symmetrical with a central waiting room. The platform awning is supported by timber or cast iron columns, usually with decorative bracketing.
Type 4: Third class station buildings	Known as 'Third Class Station Buildings' or 'Standard Roadside Station Buildings', these structures were constructed 1857 – 1894 mostly at smaller Metropolitan or Regional locations in the 1880s. Metropolitan types were constructed mostly of brick, and Regional types of timber. Common features include: • Roof – Gable sometimes with centre transverse gable; • Floor Plan – Central building with symmetrical layout and wings at one or both ends; • Awning Support – timber or metal posts.
Type 11: Initial island/side platform buildings	These buildings represent the standard plans that were introduced from the 1900s and reissued again in 1913. Most examples date from 1910/20s although some earlier examples exist dating from as early as 1887 which formed the basis for the standard design. All buildings are linear and feature gabled roofs with awnings supported on fabricated metal brackets or timber braces, most with a timber valance to awning ends. The buildings can be grouped as follows: • Pre-1900 Standard buildings: Although displaying similar arrangements to later standard designs, these buildings feature different detailing and awning brackets. • A1 – A4 Standard Buildings: These are small timber wayside buildings predominantly used in country locations. The smallest building was the A1 which had a gabled roof and continuous awning. The building was timber clad with a single waiting room. A2 – A4 were larger versions of the A1 with additional rooms and elements such as fireplaces and internal lining. • A8 – A10 Standard Buildings: These are larger brick island buildings and were the common design used at metropolitan locations during the 1910/20s. A8 was the simplest design featuring a linear building with all rooms contained under the single gable roof with awning extensions at either side. The A9 was a larger version of the A8, with the A10 being the largest with an extension of the gable at one end for covering signalling levers.
Type 13: Second island/ side platform buildings	Constructed 1929 – 1956, with most dating from the Interwar period, these buildings represent a stylistic change from the earlier standard platform buildings (Type 11) of the 1910/20s. The styles of the buildings include Functionalist and simple Art Deco detailing. Many of the buildings have stylistic similarities to other buildings along the same line as many were constructed for new lines completed during the period or for upgrades to existing lines. A 2002 study of Interwar Station buildings groups the station buildings into the following further categories: • Railway Domestic: Distinguished by hipped roofs (usually with Marseille-pattern terra cotta tiles) and domestic building proportions. Some designs also illustrate the Mediterranean influence by the use of coloured terra cotta tiles and arched openings. • Railway Eclectic: Distinguished by the incorporation of Federation-style windows (with coloured glass in the upper sashes), crow stepped gables or other imported influences. • Railway Functionalist: Distinguished by the use of projecting parapets to conceal the roof form, curves in the plan form, cantilevered awnings, steel–framed windows (usually arranged in horizontal or vertical strips of glazing), horizontal string courses, stacked forms and distinct Dudok influences. • Railway Stripped Functionalist: Distinguished by the use of steel-framed windows, projecting gables, cantilevered awnings, banded brickwork (header and soldier courses) and Art Deco influenced features, but without the stacked forms, strip windows or curves in plan.

Type	Description
Type 19: Overhead booking offices (OHBO)	The Overhead Booking Office (OHBO) is a structure located above the platforms and connected via a set of stairs. This structure allowed the platforms to be cleared of existing ticketing facilities and also as a means to monitor the platforms below. Although previously grouped together, there are two distinct types of OHBO: • The earliest of these structures date from 1891, and are small brick buildings located on an overbridge and connected to the platforms by stairs. • The second type of OHBO dates from the 1910 - 1950s and is a timber structure located on a steel footbridge or overbridge.

2.3 Archaeological assessment

2.3.1 Archaeological potential

Historical archaeological potential is defined as the potential of a site to contain historical archaeological relics, as classified under the NSW *Heritage Act 1977*. The assessment of historical archaeological potential is based on the identification of former land uses and evaluating whether subsequent actions (either natural or human) may have impacted on archaeological evidence for these former land uses. Knowledge of previous archaeological investigations, understanding of the types of archaeological remains likely to be associated with various land uses, and the results of site inspections are also taken into consideration when evaluating the potential of an area to contain archaeological remains.

The assessment of archaeological potential contained in this Heritage Impact Assessment is based on analysis of historical plans and readily available secondary sources (refer to section 2.3.3) and archaeological investigations undertaken in the vicinity of the study area.

The assessment is informed by the NSW Heritage Division's 2009 guidelines *Assessing Significance for Historical Archaeological Sites and Relics.*

2.3.2 Research potential

In 1984, Bickford and Sullivan examined the concept and assessment of archaeological research potential; that is, the extent to which archaeological resources can address research questions. They developed three questions which can be used to assess the research potential of an archaeological site:

- 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?
  - Other substantive questions relating to Australian history?
  - Other major research questions?

In the 2009 guidelines *Assessing Significance for Historical Archaeological Sites and 'Relics'*, the NSW Heritage Division provided a broader approach to assessing the archaeological significance of sites, which includes consideration of a site's intactness, rarity, representativeness, and whether many similar sites have already been recorded, as well as other factors. This document acknowledges the difficulty of assessing the significance of potential subsurface remains, because the assessment must rely on predicted rather than known attributes.[8]

[8] NSW Heritage Branch 2009

A site can have high potential for archaeological remains, and yet still be of low research potential, if those remains are unlikely to provide significant or useful information.

2.3.3 Archaeological assessment

An archaeological assessment has been prepared by station catchment (Section 7.0). An assessment of archaeological potential based on previous land use and subsequent disturbance levels has been included, along with an assessment of potential significance for areas of potential.

2.3.4 Archaeological studies

For precedence, this report considered the Non-Aboriginal Heritage Impact Assessment prepared for Phase 1 of the Metro City & Southwest project and several historical archaeological investigations undertaken within, or close to, the study area that provide evidence which assists in evaluating the potential historical archaeological resource of the study area. In addition, portions of the study area were evaluated in various archaeological zoning and management plans.

Artefact Heritage 2016. *Sydney Metro City & Southwest: Chatswood to Sydenham, Non-Aboriginal Heritage Impact Assessment*. Prepared for Jacobs/Arcadis/RPS.

The technical paper considered the construction and operational impacts on listed heritage items and potential archaeological resources within the study area. It included identification of items and areas of heritage significance that would be materially affected by the project, with consideration of the potential impacts on the values, settings and integrity of heritage items and archaeological resources located within the project area. The paper outlined proposed mitigation and management measures in accordance with relevant best practice guidelines.

Artefact Heritage 2016. *Sydney Metro City & Southwest: Chatswood to Sydenham, Historical Archaeological Assessment & Research Design*. Prepared for Jacobs/Arcadis/RPS.

This report provided a detailed archaeological assessment of potential archaeological resources within the study area, potential impacts from the proposed works, and mitigation measures. Detailed archaeological management units were discussed and mapped for future management of archaeology in the study area. Research questions were provided to form the basis of managing the potential archaeology.

GML 2002. *153-159 Canterbury Road, Canterbury archaeological assessment and research design*. Prepared for ALDI Stores.

Godden Mackay Logan prepared an Archaeological Assessment and Research Design for 153-159 Canterbury Road, Canterbury in October, 2002. 153-159 Canterbury Road, Canterbury is located approximately 55 metres northeast of the study area. It was originally part of the Canterbury Farm Estate, granted to Reverend Richard Johnson between 1793 and 1799. The land was used for farming and sheep grazing until it was sold to Robert Campbell in 1803. It was then occupied by the Rising Sun Inn from c1848 to 1922.

The archaeological assessment concluded that the entire site of the Rising Sun Inn had potential to contain archaeological deposits associated with its occupation including wells and cisterns that were once located at the rear of the building. Archaeological remains associated with the inn were assessed as having high local significance. The report recommended test trenching with potential further investigations if substantial deposits or intact features were identified.

Higginbotham, E. 2000. *Historical and archaeological assessment of the Australian Sugar Company mill, Sugar house Road (formerly Church Street), Canterbury, NSW.* Prepared for Gold Abacus Developments & Whhohouse & Danks Pty Ltd.

Edward Higginbotham and Associates prepared a historical and archaeological assessment of the Australian Sugar Company Mill, Sugar House Road (Formerly Church Street, Canterbury, NSW) in May, 2000. The report focussed on land directly east of the current study area, to the west of Hutton and Church Streets, Canterbury. The Mill was established on 1840 and closed in 1855. Prior to this it was part of Robert Campbell's 'Canterbury Estate'. The site was then left empty until 1884 when it was used as an ironworks by an engineering firm for the railways. The ironworks closed in 1890 and the site used as a butter factory. A large portion of the original property was then resumed for the railway in 1897. The newly dissected property was then used as a bacon factory (1900-08) and then a ham and bacon curing factory (1908-1983). It was during this later phase that many original outbuildings associated with the Old Sugarmill were demolished.

The assessment outlined the various structures associated with the site and its many phases of development. It concluded that there was potential for archaeological remains of the Mill and associated outbuildings to exist within the area. These were assessed as having associative, social and historic significance.

Stedinger Associates 2003. *Additional excavations at the Canterbury Sugar Mill, NSW.* Prepared for Grosvenor Residential Pty Ltd.

Stedinger Associates prepared an addendum report for archaeological monitoring and recording of excavations at the site of the former Australian Sugar Company Mill, Canterbury in 2003. These were carried out 14 metres west of the mill site and approximately 30 metres east of the study area. Excavations uncovered several unrelated fill layers likely associated with each occupation phase at the site. The earliest occupation phase identified being 1884-1890.

A meat hook (associated with a meatworks [bacon and ham factory] that occupied the site between 1900-1908) and several large cast-iron objects were uncovered during excavations. The latter was likely associated with an ironmongery that occupied the site in the late nineteenth century, and are likely to be parts of machinery and offcuts. In addition, a north-south oriented sandstone drain was identified in the westernmost portion of the site. This was assessed as being built during the meatworks occupation of the site or the Australian Sugar Company Mill. The drain was preserved in situ.

2.4 Construction sites assessment

Impact assessment related to construction sites for the project is provided in Section 8.0 of this report. This assessment relates to individual heritage items, with archaeological impacts related to construction sites being assessed in the archaeological assessment in Section 7.0. The impacts of construction sites on built heritage items is provided separately due to the temporary nature of the impacts.

Construction sites for the project would include individual compounds and worksites. The direct and visual impacts of construction sites are assessed in Section 8.0 of this report. This section considers the direct impact of compounds and worksites where these would be located within the curtilage or in the vicinity of heritage items. The assessment also considers temporary visual impacts of construction sites. A description of the proposed construction sites and relevant maps are provided in Section 8.1 of this report.

3. HISTORICAL BACKGROUND

This section provides a historical background for the project area. This will include an overview of early exploration of the area's region, an account of the development of the Bankstown rail line and of the seven key areas comprising the ten localities constituting the project area. The seven key areas are based on original land grants and are as follows:

- Sydenham, Marrickville and Dulwich Hill
- Hurlstone Park
- Canterbury
- Campsie
- Belmore
- Lakemba, Wiley Park and Punchbowl
- Bankstown

Sydenham is included for historical context of the development of the Bankstown Line, although the area is not included in this assessment.

3.1 General history

3.1.1 Early exploration of the region

Exploration to the west of Sydney Cove began soon after first settlement, as it was found that the sandstone soils of coastal Sydney were unsuited to cultivation and it was necessary to find more fertile land.

In 1788, a government farm was established on the banks of the Parramatta River at Parramatta (initially named Rose Hill). A government house was built near the farm, which prompted the development of the town of Parramatta, which was laid out in 1790. Initially the river was the main form of transport to and from Parramatta, but an overland track between Parramatta and Sydney was cleared through the bush between 1789 and 1791. This track formed the basis for 'the road to Parramatta', which was laid out in 1797. By the early 19th century, Parramatta Road was a major thoroughfare for the colony.

The first European exploration of the Cook's River region was led by Captain John Hunter in 1789. Hunter travelled a distance of five miles up the river, and later commented that it was "all shoal water". Later that year Lieutenant Bradley was sent to examine the north-west branch of Botany Bay. He described the eight-mile-long creek he encountered as a "winding shoal channel ending in a drain to a swamp, all shoal water".[9] The river appears to have been named prior to 1798, when Governor Hunter sent a map to England naming the Cook's River.

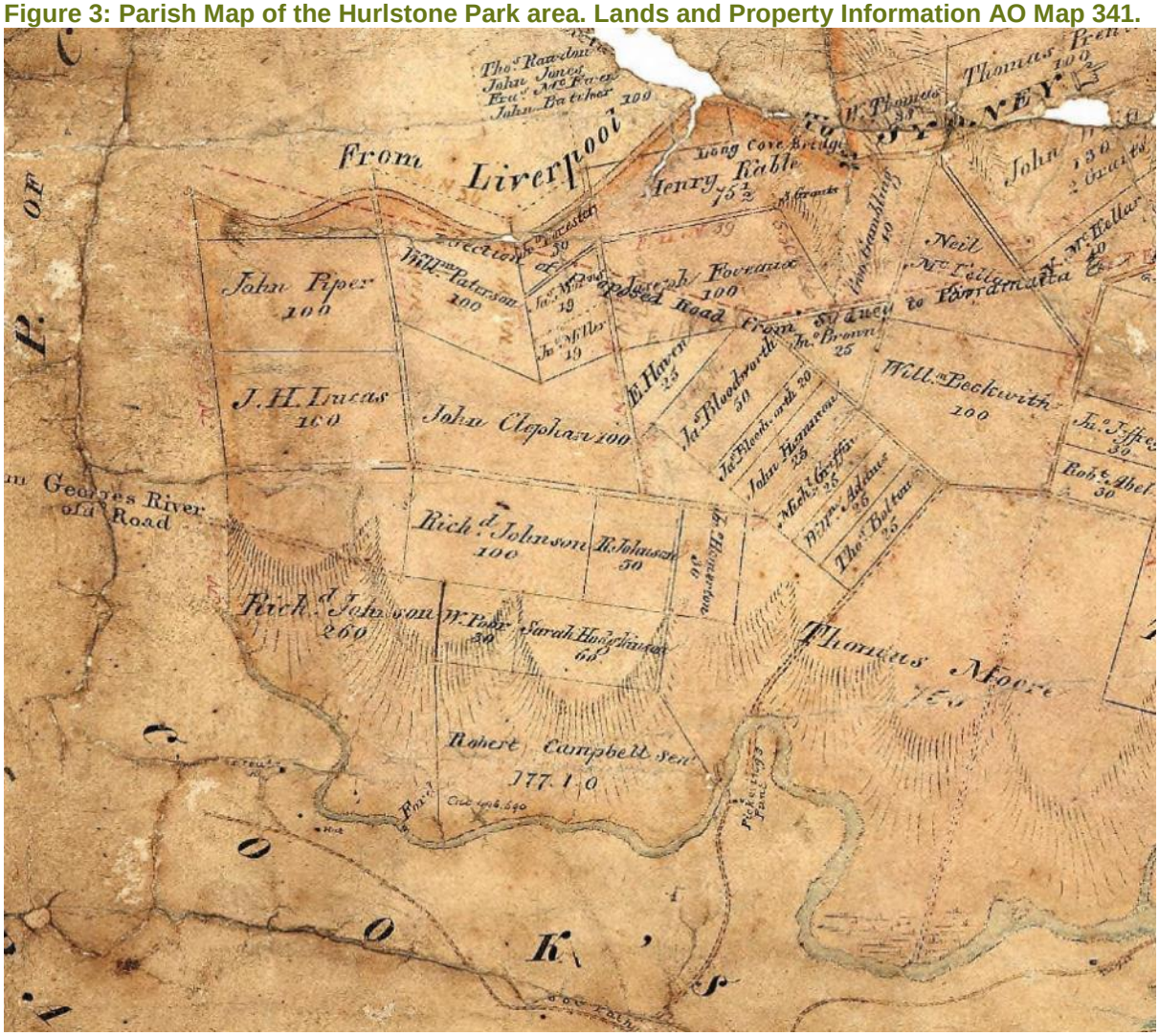
Development of the area north of the Cooks River was relatively slow until the arrival of the railway. The introduction of the railway shifted the mode of settlement from one that was primarily guided by topography to one that was guided by infrastructure. Early parish maps show that the progression of land grants north of the Cooks River (and the relative size of those grants) was primarily guided by the quality of the soil and the development of the road to Liverpool (Parramatta Road) (Figure 3). These maps indicate that the study area ran through Richard Johnston, Thomas Moore and Robert Campbell Senior's land grants, which fronted onto the Cooks River. Although some subdivision occurred, by the advent of the 1880s the landscape was little changed from 50 years previous. Large

[9] Jervis 1951: 14.

landholdings still dominated the area, reflecting the low yield of the land and its lack of rural usability in smaller parcels, despite the growing demand for property in Sydney.

The construction of the Bankstown Line in 1880 changed the nature of the development in the area, and dramatically increased its use value. Despite relative stagnation for much of the nineteenth century, subdivision of the surrounding grants was seemingly epidemic after the construction of the railway. New residential lots were carved out in rapid succession, radiating out from the arterial railway line. Previous focus on rural land use was no longer a decisive factor in the value of the land. Subdivisions were now advertised in terms of their proximity to the railway and its stations.

Figure 3: Parish Map of the Hurlstone Park area. Lands and Property Information AO Map 341.



3.1.2 Development of the Bankstown railway line

Projects to build railways in New South Wales first emerged in 1841. In 1848 a public meeting was held to present a surveyor's report for a route from Sydney to Goulburn. In 1849 the Sydney Railway Company was formed, and the first Sydney station constructed in 1855. The first railway line, linking Sydney to Parramatta, was constructed in 1855. By 1860 the Sydney to Parramatta line had reached Blacktown.

The primary aim of the colony's railways was to allow inland producers to effectively transport their produce to the port of Sydney for export and to open the country up for closer settlement. Improved transport for urban residents was a low priority. A lack of transport was the main drawback for the development of the areas north and west of the Cooks River. From 1880, land speculators began to

purchase farmland in the area south of Cooks River. They petitioned for the government to build a railway to the district to encourage subdivision of the land.[10]

The Sydenham to Bankstown Railway was opened with the initial terminus station at Belmore on 1 February 1895. The line had its origins in Railway Commissioner Goodchap's 1882 recommendation that an additional line was needed between Newtown and Liverpool to relieve traffic on the Southern Line, and to encourage agriculture and suburban settlement. The railway was initially planned as a Loop Line to run from St Peters to Liverpool through the valley of Cup and Saucer Creek south of Canterbury Road (Figure 4).[11] This was intended to relieve crowding at the stations of Homebush and Granville.[12] Other proposals made in the 1880s included Sanderson's line along Wolli Creek and Kennedy's line along the north bank of the Cooks River.[13] These plans did not eventuate, with political interests influencing the decision for a shorter version of Kennedy's line.

Lobbying by local interest groups and land speculators achieved Parliamentary approval by 1890 and construction commenced in 1892.[14] The Bankstown Line was constructed in three stages between 1892 and 1939. The Sydenham to Belmore section was completed in 1895. Sydenham Station had been previously built for the Illawarra line, and was extended to accommodate the new Bankstown Line. This section included Marrickville, Dulwich Hill, Hurlstone Park (originally named Fernhill Station), Campsie, Canterbury and Belmore stations.[15] The line was the first solely suburban line to be built in Sydney.

The construction of the line was undertaken by Proudfoot and Company, who completed the 5.4 miles of railway within eighteen months. The development of the railway line prompted subdivision and business in the region to shift closer to the stations. Shanty towns of tents sprang up along the line, particularly at Canterbury, Campsie Park and Burwood Road. These makeshift villages accommodated navvies, blacksmiths, labourers and their families. During the 1930s, the shanty towns also accommodated those who had been made homeless by the Depression, who were eager to obtain work.[16]

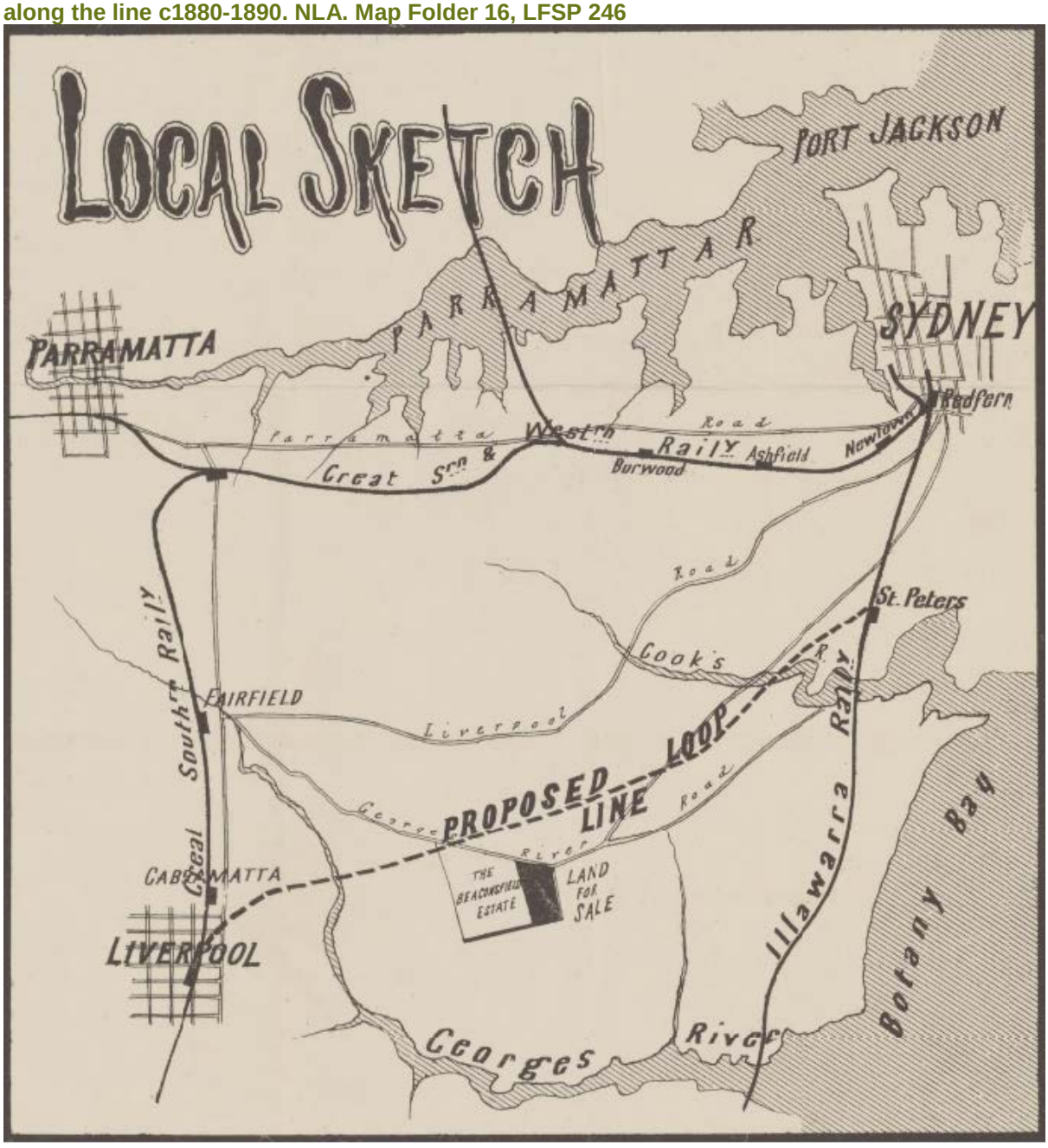
The most important stations on the line, Belmore, Canterbury and Marrickville, were built with impressive near-identical brick buildings (Figure 5). The intermediate stations (Campsie, Dulwich Hill and Hurlstone Park) receiving more modest timber buildings, possibly due to the economic austerity required by the onset of the depression of the 1890s. These were later replaced with brick buildings. The depression also suppressed the profitability of the line and the extension to Liverpool did not proceed. However, suburban development followed in the early twentieth century, particularly during the interwar period when many War Service homes were built west of Canterbury.

The construction contract for the Belmore to Bankstown section was awarded to Monie Bro on 13 November 1907. Bankstown Station was opened as a terminal on 14 April 1909, with Lakemba and Punchbowl Stations also opening at the same date. The extension of the line to Bankstown triggered a huge real estate boom in the area from 1909 until the late 1920s. In 1926, the Bankstown Line was electrified and a maintenance depot was constructed at Punchbowl. A station was constructed at Wiley Park in 1928. In the same year, the line was extended to Regents Park (outside the current

[10] Madden and Muir 2009. *Belmore*
[11] Madden and Muir 2009. *Belmore*
[12] Muir 2013
[13] Muir 2013
[14] State Heritage Inventory "Bankstown Railway Station Group" NSW Heritage Branch, Office of Environment and Heritage, Parramatta NSW. Accessed 10 July 12016.
[15] State Heritage Inventory 'Marrickville Railway Station' NSW Heritage Branch, Office of Environment and Heritage, Parramatta NSW. Accessed 8 July 2016.
[16] Madden and Muir 1988: 28.

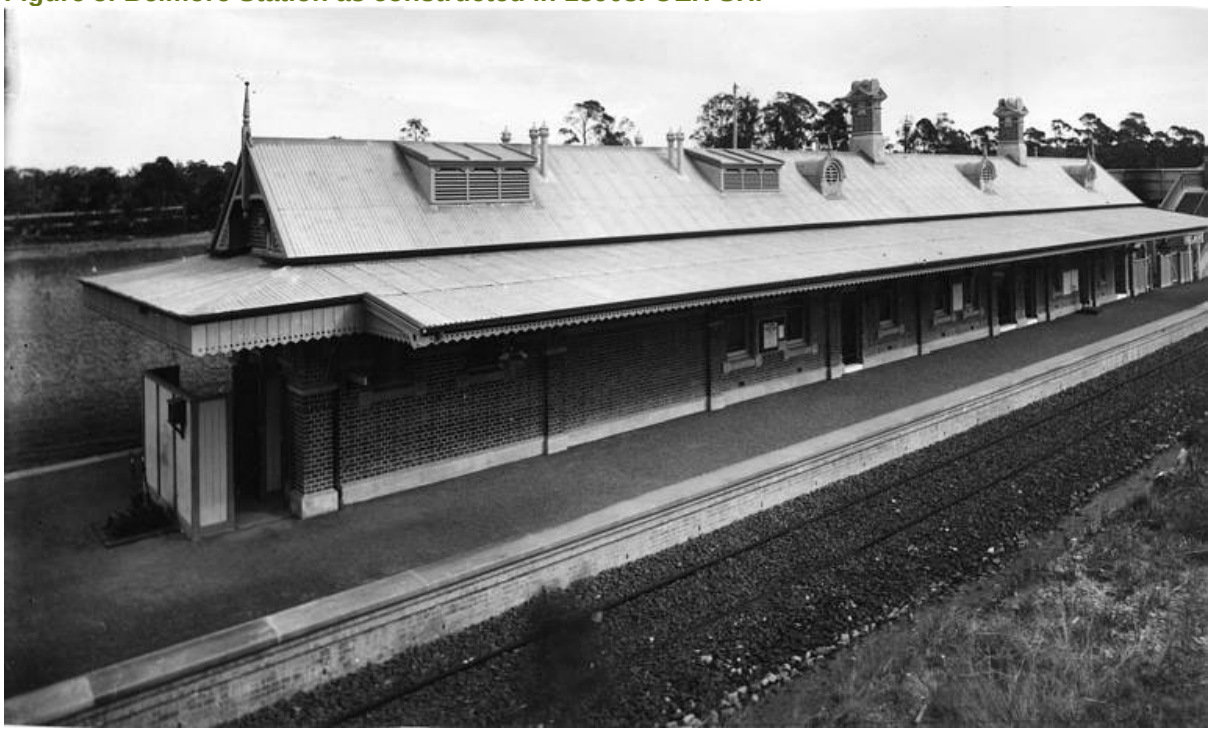
study area) in 1928, making it part of the loop line through Lidcombe, and servicing booming suburban development.[17] Electrification of the line was extended to Regents Park in 1939.

Figure 4: Proposed loop line between St Peters and Liverpool which prompted subdivision along the line c1880-1890. NLA. Map Folder 16, LFSP 246



[17] State Heritage Inventory 'Marrickville Railway Station' NSW Heritage Branch, Office of Environment and Heritage, Parramatta NSW. Accessed 8 July 2016.

Figure 5: Belmore Station as constructed in 1890s. OEH SHI



3.2 Key areas of development

3.2.1 Marrickville and Dulwich Hill

Most of Marrickville was previously part of Gumbramorra Swamp. Marrickville contained large residential estates and farms from an early date. During the 1830s and 1840s the outer lying suburbs of Newtown, St Peters, Tempe and Petersham became desirable locations for the construction of rural retreats, due to increasing land prices in the city.[18] In 1799 Thomas Moore received a grant of 470 acres adjoining the swamp and in 1803 a further grant of 700 acres. Moore also purchased adjoining land and by 1807 held 1920 acres, making him one of the largest landowners in the area (Figure 6). His holdings incorporated much of present day Marrickville, Petersham and Dulwich Hill.[19] Douglas Farm, as Moore's Farm was named, was utilised for the growing of maize and wheat and for its valuable stands of timber. Moore was appointed Master Boat Builder in the dockyard at Port Jackson and it is likely that some of the timber from the property went to his shipbuilding yard.

Moore sold his land holdings to Dr Robert Wardell on the 21st of July, 1830.[20] At this time the estate extended from Parramatta Road to Cooks River. Wardell was a flamboyant figure, hosting lavish parties at his home, Sara Dell (originally located on Parramatta Road in the vicinity of the Fort Street High School), and stocking his property with imported English deer for hunting.[21] In September 1834 Wardell stumbled across the camp of three escaped convicts whilst riding along the Cooks River and was murdered. The estate was divided amongst his sisters, Anne Fisher, Margaret Fraser and Jane Isabella Priddle.[22] Wardell's death opened the way for the first era of subdivision in the area[23] and parts of his land began to be sold off soon after his death.[24]

[18] Cashman and Meader 1990: 108.
[19] Cashman and Meader 1990, 40
[20] Cashman and Meader 1990, 40
[21] Meader 2008
[22] Cashman and Meader 1990, 88
[23] *Ibid*.
[24] *Ibid*, 42.

Figure 6: Undated plan of the Parish of Petersham, showing Thomas Moore's grant of 470 acres. The study area was located within this grant. NSW Lands & Property Information, AO Map 341.

Marrickville

Following the subdivision of Wardell's estate, Marrickville became a popular location for farms and market gardens due to the proximity of ample water supplies in the Gumbramorra Swamp. Stonemasons mined the sandstone cliffs along the Cooks River and ridge lines of the Marrickville valley and numerous small dairy farms were established (Figure 7).[25]

In 1855 Thomas Chalder subdivided his 60 acre Marrick Estate, establishing the street grid for what would become the village of Marrickville. Municipal buildings, shops, churches and residences soon followed, bounded by the present-day Illawarra Road, Chapel Street, Fitzroy Street and Sydenham Road. Parts of Marrickville remained well timbered and the area continued to be referred to as Wardell's Bush.[26] By the mid-19th century Marrickville was a thriving rural suburb with a diverse population that included small agricultural properties, residences and grand estates owned by wealthy professionals. An 1895 real estate plan indicates that many of the small residential lots were occupied prior to the construction of Marrickville Station (Figure 8).

By the late nineteenth century many of the market gardens had been replaced by small-scale brick making pits. This brickmaking industry at the time provided greater profits than market gardening, and the loamy soil was mined throughout the Marrickville area to produce, initially, hand-made bricks, and,

[25] Meader 2008a.
[26] *Ibid*.

as technology advanced, steam and machine-made bricks.[27] The area took on an increasingly industrial character, as earlier large residences were demolished, numerous large brickmaking businesses were established, and estates subdivided to provide affordable housing for workers.[28] Other industrial enterprises included woollen mills, steel and metal operations and automotive industries. As a result, the population of the area surged to meet the demand for workers.[29]

As the clays of the area were depleted, the large pits were abandoned, and left to fill with water. Drowning tragedies occurred throughout the district as a result. In the early twentieth century, many of these earlier pits were resumed by the Marrickville Council and turned into public parks.[30]

The process of deindustrialisation began in the 1970s when many of the larger companies moved to cheaper areas or closed down.

Marrickville Station

Marrickville Station was constructed on the first section of the Bankstown Line between 1894 and 1895. The station was constructed to relieve congestion on the Main South Line, and to encourage the suburban development and agricultural development of the area (Figure 9).

The Marrickville Station buildings were designed by the NSW Government Railways and constructed by Alexander Scouller. The platform building represents a period of architectural transition in railway building construction, from the boom time of the 1880s to the standardisation of NSW railway building design from the 1890s onwards (Figure 10, Figure 11, Figure 12).[31]

Some changes were made to the station layout with construction of the Metropolitan Goods Line in 1917. A new Up platform and building were built with overhead booking office, and the Up side of the island platform was withdrawn from use as one of the goods lines now passed it (Figure 13). The platforms were also lengthened at this time.[32] In 1926 the electrification of the railways resulted in smaller changes to the layout of the station. In 1944 the booking office on Platform 2 was altered, and in 1985 a set of stairs from Illawarra Road were constructed.

The opening of the station stimulated residential and commercial development in the immediate area, including the residential subdivision of the Marrickville Heights to the south (Figure 14), Marrickville Station Estate to the north (Figure 15), and Riverdale Estate to the southeast (Figure 15).

[27] *Ibid*
[28] Meader 2008
[29] Meader 2008
[30] Meader 2008
[31] State Heritage Inventory 'Marrickville Railway Station' NSW Heritage Branch, Office of Environment and Heritage, Parramatta NSW. Accessed 8 July 2016.
[32] State Heritage Inventory 'Marrickville Railway Station group' NSW Heritage Branch, Office of Environment and Heritage, Parramatta NSW. Accessed 8 July 2016.

Figure 7: Dairy at the corner of Carrington Road and Ruby Street, Marrickville 1899. Source: Marrickville Council Library and History Services.

Figure 8: 1895 Chapman & Hazlewood plan of Marrickville: valuable business positions, desirable villa and cottage sites. NLA MAP Folder 100, LFSP 1480.

Figure 9: Detail of c.1885-90 plan of Marrickville, showing Marrickville (now Sydenham) Station, and the proposed rail line on which the present-day Marrickville Station would be constructed. City of Sydney Archives, Historical Atlas of Sydney, Atlas of the Suburbs of Sydney ca 1885-1890 – Marrickville.

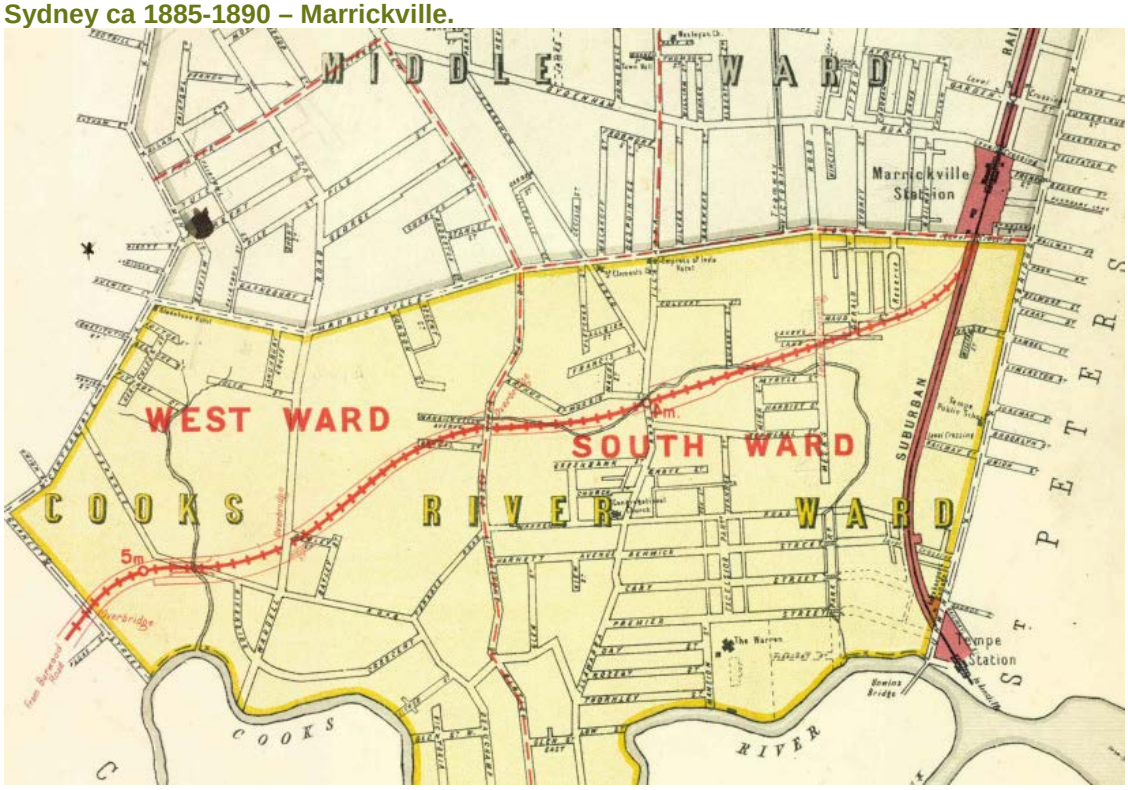


Figure 10: Group portrait at Marrickville Station, c. 1890. NLA nla.pic-vn4697485.

Figure 11: Marrickville Station in 1899. Marrickville Library and History Services.

Figure 12: n.d. unidentified rail worker at signal box of Marrickville Station. Marrickville Library and History Services.

Figure 13: c.1887 Richardson & Wrench Brian's Estate, on the Heights at the Marrickville Railway Stn. NLA MAP Folder 99, LFSP 1457.

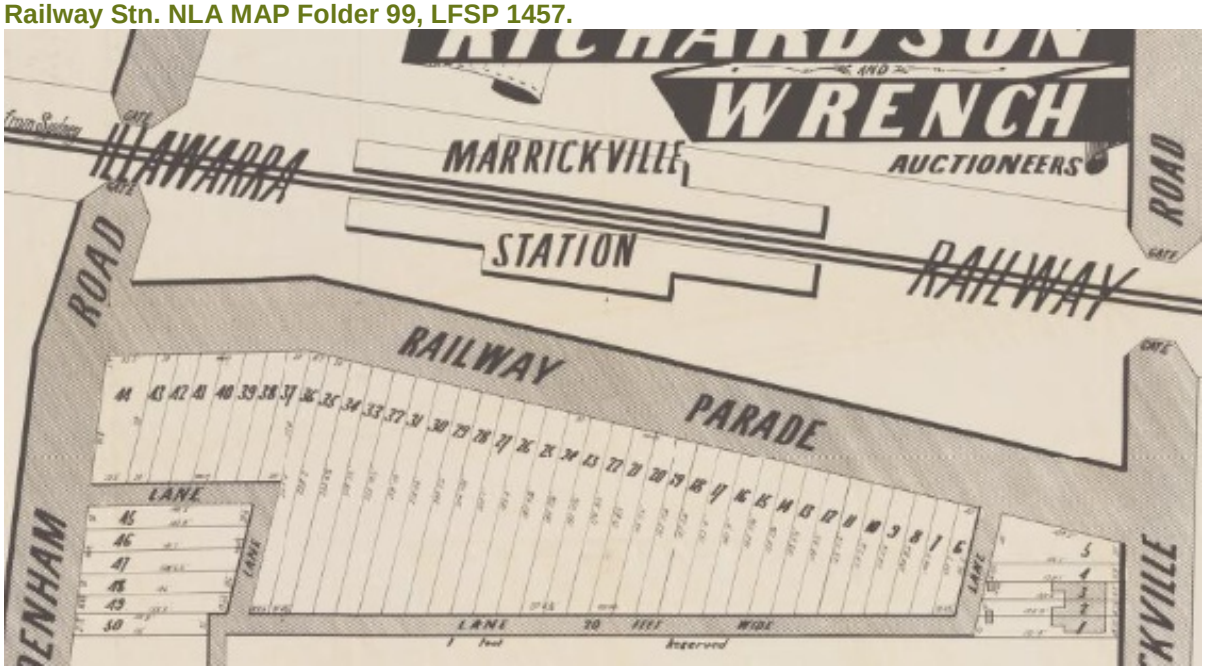


Figure 14: H.W. Horning & Co c.1907 Marrickville Station Estate. NLA MAP Folder 100, LFSP 1499.

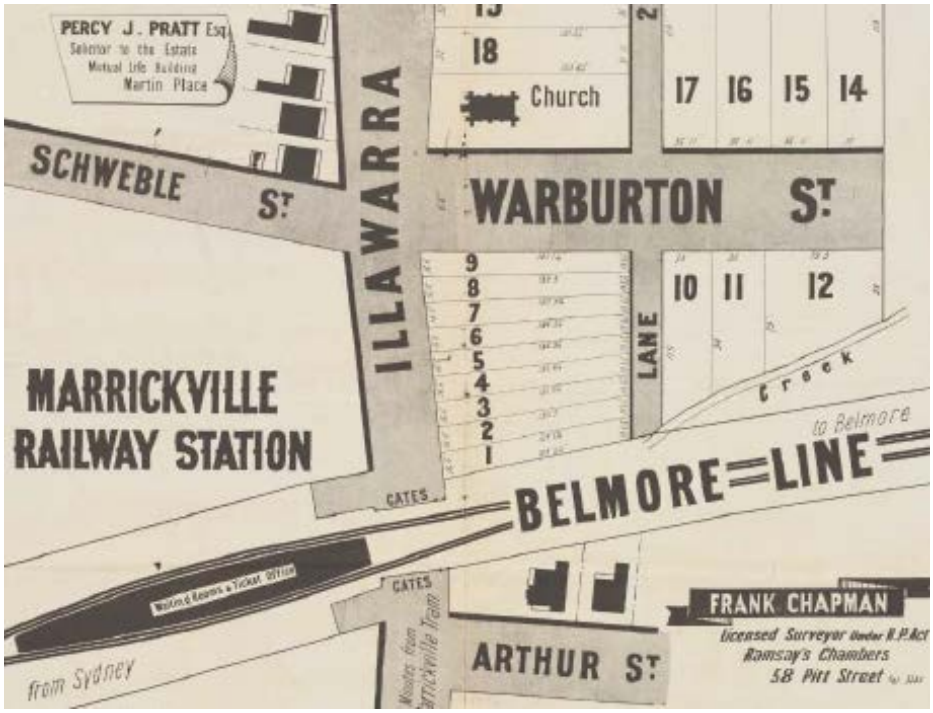


Figure 15: c. 1920 Hardie & Gorman Pty. Ltd Riverdale Estate, Marrickville: 58 allotments: adjoining Marrickville Station. NLA MAP Folder 100, LFSP 1504.

Dulwich Hill

Much of Dulwich Hill, like Sydenham and Marrickville, was originally part of Thomas Moore's 1799 land grant (Figure 6), and later part of Wardell's substantial property. The area was known as Wardell's Bush or Wardell's Hill into the late nineteenth century.

The name 'Dulwich Hill' came from the smaller subdivision of the Dulwich Grove and Dulwich Estate.[33] Like neighbouring Marrickville, Dulwich Hill had a good water supply due to the proximity of the Cooks River and Long Cove Creek. By the mid nineteenth century market gardens, orchards, small brickmakers and potteries dominated the area.

[33] Meader 2008b.

By the late nineteenth century the commercial centre of Dulwich Hill had been established on New Canterbury Road, in the vicinity of the 1889 steam tram and horse-bus that provided transport to Sydney. The storefronts included blacksmiths, butchers, tobacconists, a chemist, produce store and harness makers.[34] Marrickville Road was dominated by large residential estates and gardens, including Marcus Clark's Sefton Hall. When Sefton Hall was demolished in the early twentieth century, the land was subdivided, and several blocks of shops constructed on Marrickville Road.[35]

Dulwich Hill became increasingly industrialised following the opening of the goods line in 1913, and factories such as the Great Western Milling Company, the Western Timber Mill and Sidney Williams & Co Pty Ltd took advantage of the ability to move their goods efficiently.[36] Like Marrickville, the employment opportunities provided by these large factories attracted numerous workers to the area, and land was further subdivided to provide housing (Figure 16). As factories shut down and producers moved to more affordable locations on the suburban fringe, houses, apartments, schools and parks were constructed in their place.

Figure 16: C.1936 photograph of Canonbury Grove, a typical street in Dulwich Hill, north of the railway line. Marrickville Library Service.

A number of the streets in the vicinity of present-day Dulwich Hill (then Wardell Road) railway station were subdivided around 1910, including Challis Avenue, Anderson Street (renamed Kays Avenue), Tamar Street, Albermarle Street and School Parade. The proximity of the railway line made the subdivisions popular, and the lots were sold quickly and were soon built upon.[37] O.S.R. Andrews, a local builder, was very active at this time, building many of the houses in Kays Avenue.

The last extensive subdivision of land in the Marrickville LGA occurred in 1928 at Dulwich Hill. This was the Abergeldie Estate, property of Sir Hugh Dixson, tobacco tycoon and philanthropist, located to the north of the railway line (Figure 17).

[34] *Ibid.*
[35] *Ibid.*
[36] *Ibid.*
[37] State Heritage Inventory 'South Dulwich Hill Heritage Conservation Area' NSW Heritage Branch, Office of Environment and Heritage, Parramatta NSW. Accessed 8 July 2016.

Figure 17: Abergeldie House and gardens which was demolished in the 1920s. Source: Inner West Council 'History of Suburbs – Dulwich Hill.'

Dulwich Hill Station

Dulwich Hill Station opened on 1 February 1895 as Wardell Road railway station. It was renamed 'Dulwich Hill' in 1920. The station itself was located some distance to the south from the main shopping strip of Dulwich Hill on New Canterbury Road. This area was originally known as West Marrickville.[38]

In 1935 the original 1895 timber station buildings were replaced. Historic plans dated 1935 show the demolition of the original platform building and the construction of a new brick platform building; a new overhead weatherboard booking and parcels office and bookstall; and the relocation of the stairs to the platform to accommodate modifications.[39] The layout of the station after these changes is evident in an aerial photograph dating to 1943 (Figure 18).

[38] Meader, 2008b.
[39] State Heritage Inventory 'Dulwich Hill Railway Station group' NSW Heritage Branch, Office of Environment and Heritage, Parramatta NSW. Accessed 8 July 2016.

Figure 18: Dulwich Hill Station in 1943. Lands and Property Information, SIX Maps.

3.2.2 Hurlstone Park

The suburb of Hurlstone Park was originally part of a 673 acre estate belonging to Sydney Merchant Robert Campbell. In 1846 Campbell's daughter Sophia inherited the estate, and in 1865 it was subdivided into four large farms.[40] The farms fronted cart tracks that were originally formed by quarrymen accessing sandstone quarries used in the construction of large early buildings in Canterbury, including the Sugarworks (constructed in 1840) and St Paul's Church (constructed in 1859). These roads are today known as Floss Street, Burnett Street and Ford Avenue.[41]

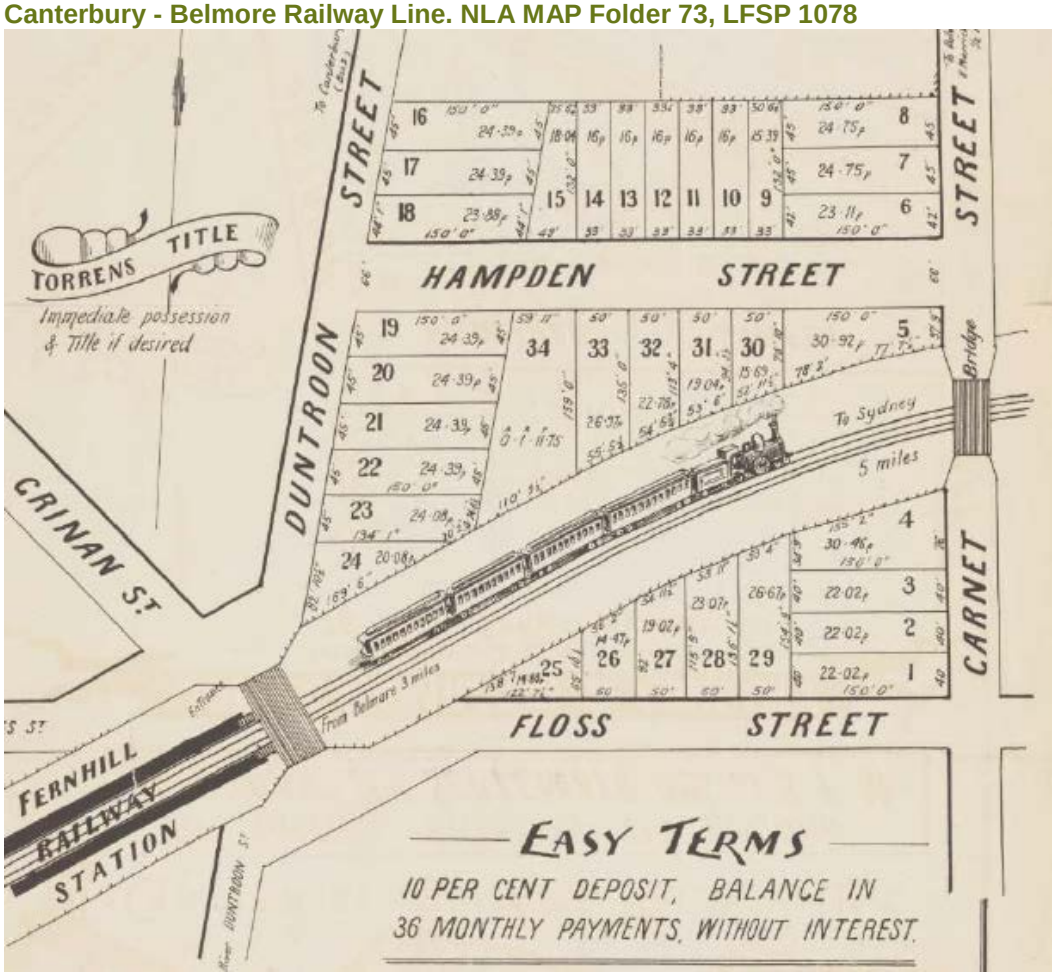
In 1874 the Campbell estate was further subdivided into a number of smaller farms, and Dunstaffenage, Duntroon, Kilbride, Melford and Crinan Streets were formed and named for Scottish castles and landmarks associated with the family.[42] A small creek was originally located at the end of present-day Crinan Street. By the end of the nineteenth century, the land on the south side of Crinan Street from Dunstaffenage Street to the creek was part of Pendlebury's brickworks. Blamire's brickworks, in operation from about 1833, was located on the north side of Crinan Street. Figure 19 shows one of the first subdivisions on the new railway line, in the vicinity of newly formed Crinan Street and within land formerly belonging to Blamire's brickworks. The area appears to be sparsely populated at this time, with only two of the lots, on the corner of Dunstaffenage and present-day Barre Streets, containing cottages. Many of the allotments remained unsold until the Marrickville to Belmore railway was approved. A photograph from the 1890s demonstrates the landscape at the time (Figure 20). Hurlstone Park Station was originally known as Fernhill Station, named for Sophia Campbell's home in England (Figure 21).[43]

[40] Muir and Madden 2008.
[41] *Ibid.*
[42] *Ibid.*
[43] *Ibid.*

Figure 19: c.1880-1899 plan by Arnold W. Love, showing Allotments at Marrickville, Sydney, one of the first subdivisions on the new railway line. NLA.obj-229979389.

Figure 20: A view of the Cook's River in the 1890s, from Canterbury, looking east towards the area that would become Hurlstone Park (centre left of image). City of Canterbury Local History Photo Collection file no. 050\050554.

Figure 21: Detail from the 1895 John C. Hamilton & Company, Fernhill Station Estate, on the Canterbury - Belmore Railway Line. NLA MAP Folder 73, LFSP 1078



At the end of the nineteenth century the primary industries of the area were dairy farming and brickmaking. William Pendlebury built the first shop near the railway station about 1903, and the shopping centre grew rapidly from that time (Figure 22). By 1916, there were about twenty-five shops in Hurlstone Park, including two banks, two estate agents, three confectioners and a pastrycook, three grocers, two butchers, a ham and beef shop, three fruiterers, two drapers, a ladies' outfitter and a seller of musical instruments (Figure 23).

The area expanded rapidly between 1900 and 1918. At this time many of the small farms were subdivided into residential housing estates, stimulating a building boom in the area.[44] The extension of the tramline into the suburb in 1913 also encouraged the development of shops around the terminus on New Canterbury Road, resulting in the development of two shopping centres for the suburb. Prior to this, the primary form of public transport was by horse-drawn bus (Figure 24).

The locality became known as Hurlstone after a local referendum in 1910, when the Postmaster General's Department insisted that the name of the area be changed as there were already two post offices with the same name.[45] 'Hurlstone' was taken from the name of a college that was located on the site of present-day Yeo Park in Ashfield, and is now part of Trinity Grammar School. The suburb became 'Hurlstone Park' to avoid confusions with the Hillston railway station in western NSW.[46]

[44] Muir and Madden, 2008.
[45] *Ibid.*
[46] *Ibid.*.

Figure 22: c. 1903 Richardson & Wrench Jeffreys Estate, Fernhill, Marrickville & Belmore Railway Line, 1st subdivision. NLA MAP Folder 100, LFSP 1491.

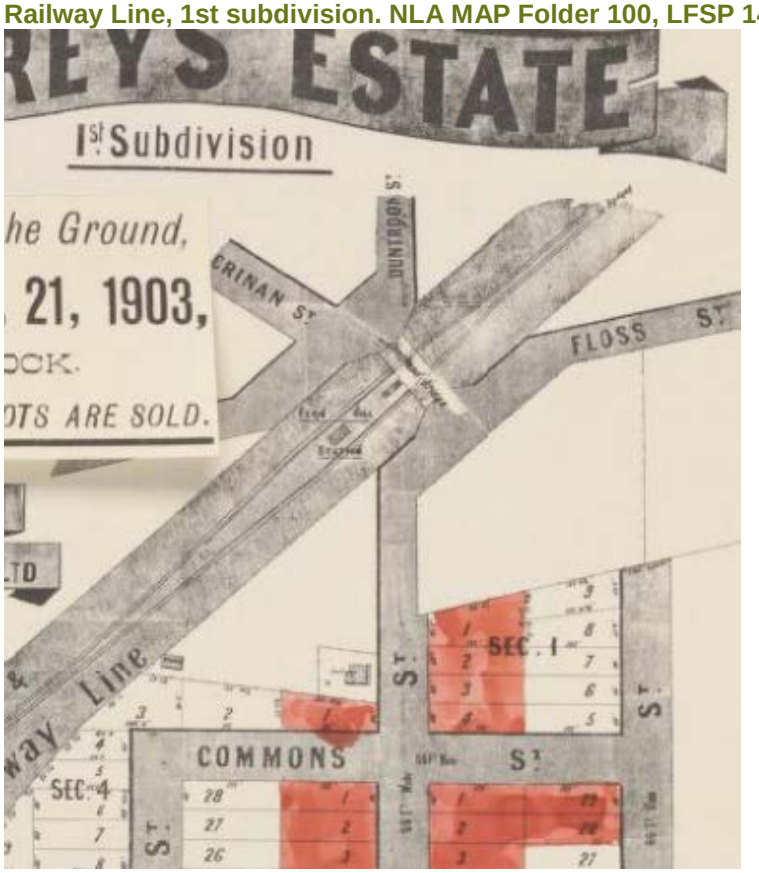


Figure 23: Shops on Crinan Street in Hurlstone Park, looking south-east towards the station, c.1920. State Library of NSW call no. At Work and Play – 02341.

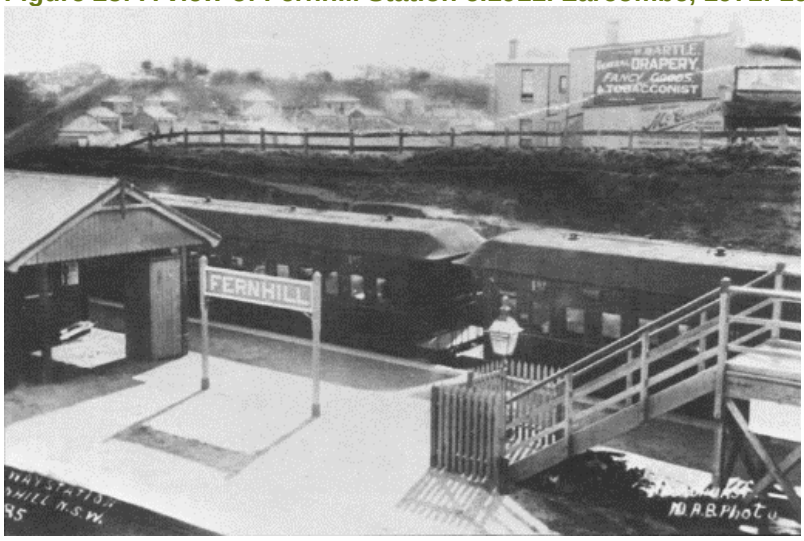
Figure 24: Horse drawn bus on Canterbury Road, Hurlstone Park in 1908. City of Canterbury Local History Photo Collection file no. 050\050249.

Hurlstone Park Station

Hurlstone Park Station was opened as Fern Hill on 27 November 1894 (Figure 25). It was renamed Hurlstone Park on 19 August 1911. In this year the Metropolitan Goods line was built past the station and a new Down platform was built. In 1915 the original timber station building was replaced by brick buildings on both platforms and an overhead booking office. The latter was replaced in the 1980s by a new booking office.[47]

[47] State Heritage Inventory 'Hurlstone Park Railway Station' Accessed 11 July 2016.

Figure 25: A view of Fernhill Station c.1911. Larcombe, 1971: 197.



3.2.3 Canterbury

1788-1841: Early Settlement and Farming

The suburb of Canterbury north of the Cooks River was originally part of land granted to Reverend Richard Johnson (Figure 26 and Figure 27). This grant, initially of 100 acres, was periodically added to throughout the late eighteenth century. Named 'Canterbury Vale,' Johnson successfully farmed the land with the assistance of convicts and hired men until it was sold to Lieutenant William Cox in 1800. At this time the property consisted of 600 acres of land, including two acres of vineyards, an orchard, 150 sheep, a mare, three fillies and some horned cattle.[48] The study area was located at the southern edge of the grant, near the banks of the Cooks River.

William Cox hired Joseph Holt to assist him in maintaining the property. In Holt's memoirs, he refers to his commencing construction of a grand house for Cox, although it is unclear whether this house was completed. By October, 1800, the farm had 24 acres under crop. Three shepherds were employed on the farm, suggesting that Cox was breeding sheep. Two sawyers, three carpenters, two stone cutters and 20 labourers were also employed on the farm.[49]

In 1803 Cox sold his 900 acre Canterbury Farm to the merchant Robert Campbell. In 1812 Campbell offered the estate for rent. At this time the property contained, in addition to Canterbury Farm, nine farms. Canterbury Farm was listed as being mostly cleared, and containing a house and other buildings. Campbell does not seem to have been successful in finding a tenant, and in 1814 the property, now consisting of 1040 acres, was offered for sale. A purchaser was presumably not found, and throughout the 1820s the farms were used for the grazing of Government bullocks.[50] The Campbell's held the land for many years, and when it was finally subdivided and sold off throughout the nineteenth century, it extended from the Cook's River at Canterbury to the Liverpool Road in Ashfield.

The Village of Canterbury dates to 1841, when 66 allotments of Campbell's Canterbury Estate were offered for sale (Figure 26). By November of that year the village contained a school, a building used as a chapel, and a store. Remaining lots for sale were said to be cleared and fenced. A brick kiln was also located on the estate. The under-sheriff of Sydney, Cornelius Prout, constructed Prout's Bridge over the Cook's River in 1841 using convict labour (Figure 28). Prior to this he had operated a punt

[48] Jervis 1951: 17.
[49] Jervis 1951: 18.
[50] *Ibid*: 20.

between Canterbury village and his farm in the south side of the river. The railway station at Canterbury would later be constructed partially within Prout's property (Figure 32).

1841-1855 Establishment of Canterbury and the Australasian Sugar Company

In the second half of the nineteenth century Canterbury was dotted with palatial colonial mansions on large estates. During these years, the area had experienced very little industrial development, and residential development was largely limited to that at Canterbury village itself (Figure 27). The first series of subdivisions began in the 1840's, but were more concerned with dividing the early large land grants into smaller farms.[51]

The primary industry of the area was timber cutting, brick making and sugar works, constructed between 1840 and 1842 for the Australasian Sugar Company on 60 acres of Robert Campbell's original property (Figure 26, Figure 27 and Figure 28). The study area dissects part of the southern extent of the company's land as shown in Figure 27. A number of outbuildings associated with the sugar works were located in this area, although the main mill structure is located outside of the current study area boundary. The Old Sugarmill (located at 2-4 Sugar House Road, Canterbury) is one of the last remaining elements of the site within the landscape today.

An 1841 plan showing '95 proposed allotments adjoining the Australasian Sugar Company's works includes nine buildings and a circular feature labelled 'spot where the coal miners are at work', west of the sugar work's property boundary. Some of these are located within the study area, at the site of the proposed Canterbury Station Catchment construction worksite (shown in Figure 26). A number of structures within the mill's property are also shown to occupy land within the study area and an area now occupied by the current rail line.

Later plans prepared in 1843 and c1850 show a number of buildings occupying what is now Canterbury Road and Church Street (originally George Street and Sugar Mill Road respectively), as well as Robert, Broughton and Close Streets (Figure 29 and Figure 30). Some are located within the study area although they are likely to have been resumed and demolished to make way for the railway in 1895.

[51] Larcombe 1971: 172.

Figure 26: 1841 Plan of 95 allotments at Canterbury adjoining the Australasian Sugar Company's works by W. H. Wells Land Surveyor, showing location of the mill, nearby structures and mining area. Source. National Library of Australia. Note. Plan shows approximate location of structures and may not be an accurate representation.

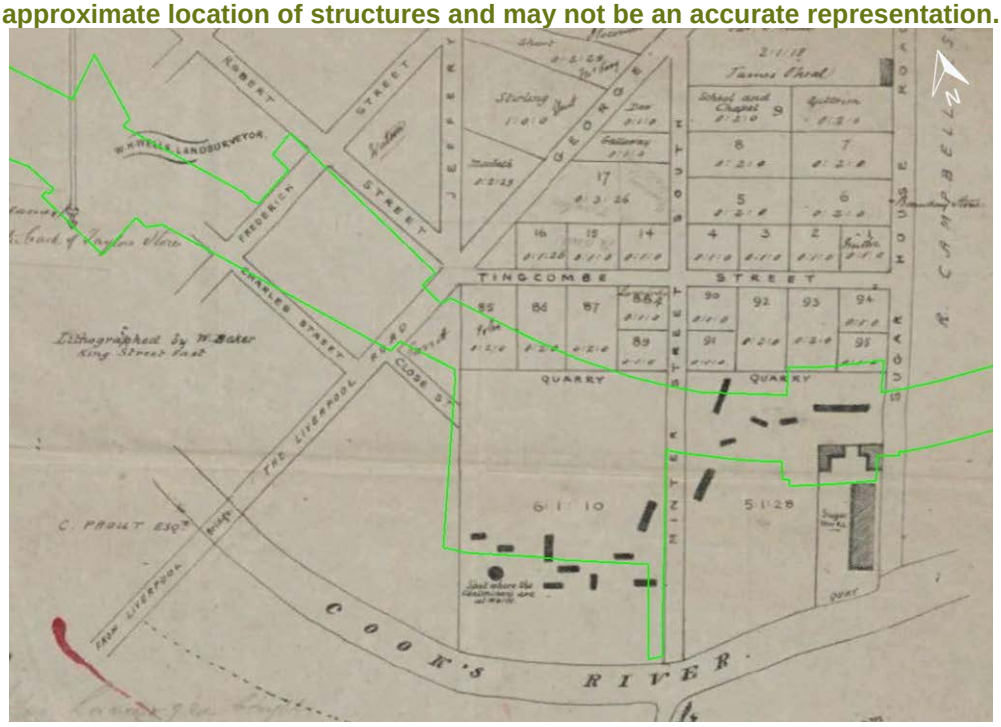


Figure 27 1842 Plan of the Canterbury estate showing land occupied by the Australasian Sugar Company and associated structures. Study area outlined in green. Source. State Library of NSW. Note. Plan shows approximate location of structures and may not be an accurate representation.

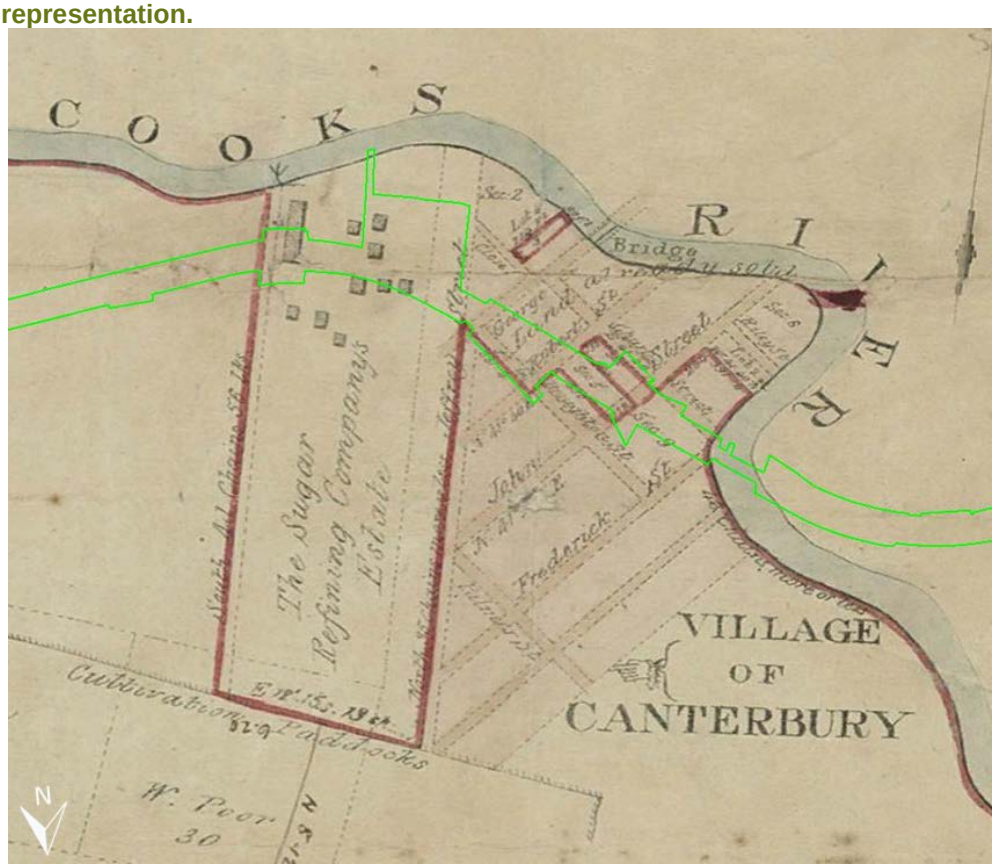


Figure 28 c.1859 Canterbury & Prout's Bridge on Cooks River by Henry Grant Lloyd, showing the Sugar works to the right of the painting. The cottages on the far side of the river to the left of the image are in the vicinity of Robert Street and present day Canterbury Road (George Street). Source. State Library of New South Wales [a5894078 / DL PX 42] (Dixson Library).

Figure 29. 1843 Plan of the Village of Canterbury showing various structures fronting onto what is now Canterbury Road and Robert, Broughton and Close Streets. Source. State Library of NSW. Note. Plan shows approximate location of structures and may not be an accurate representation.

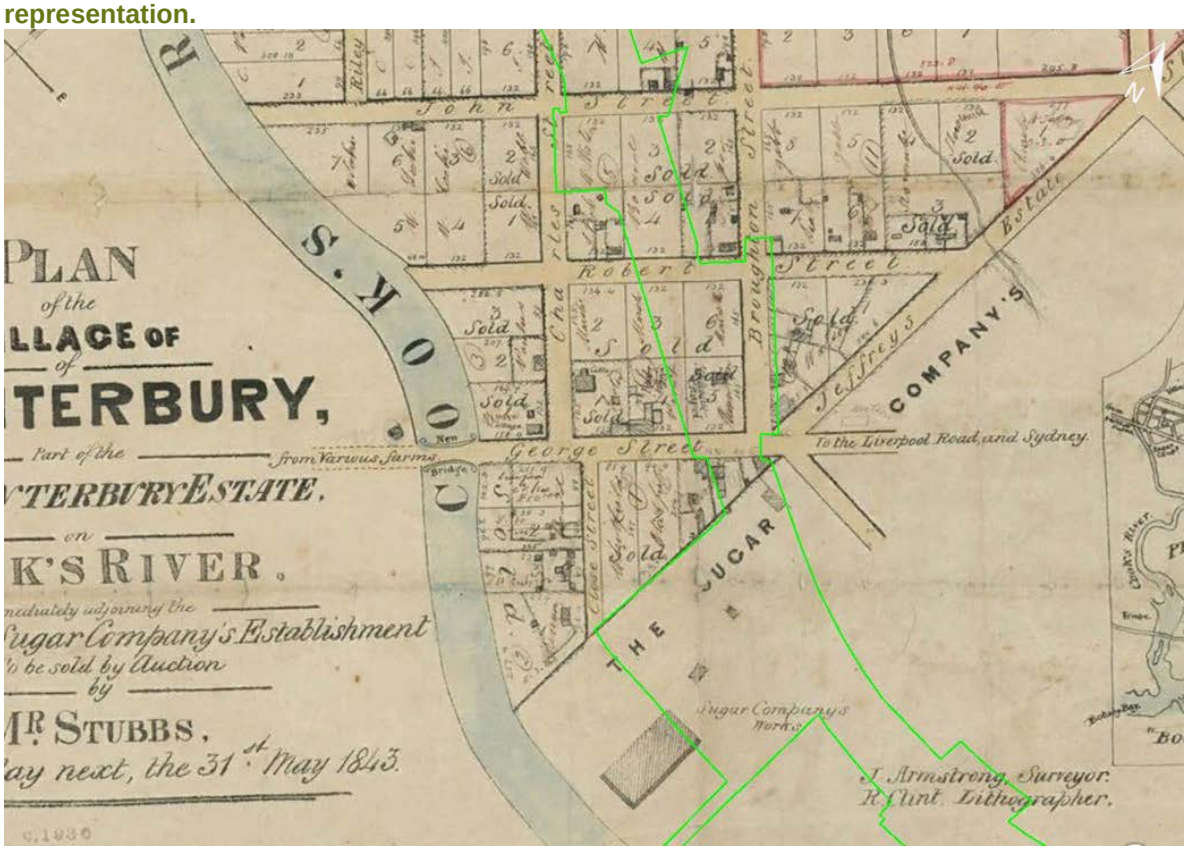
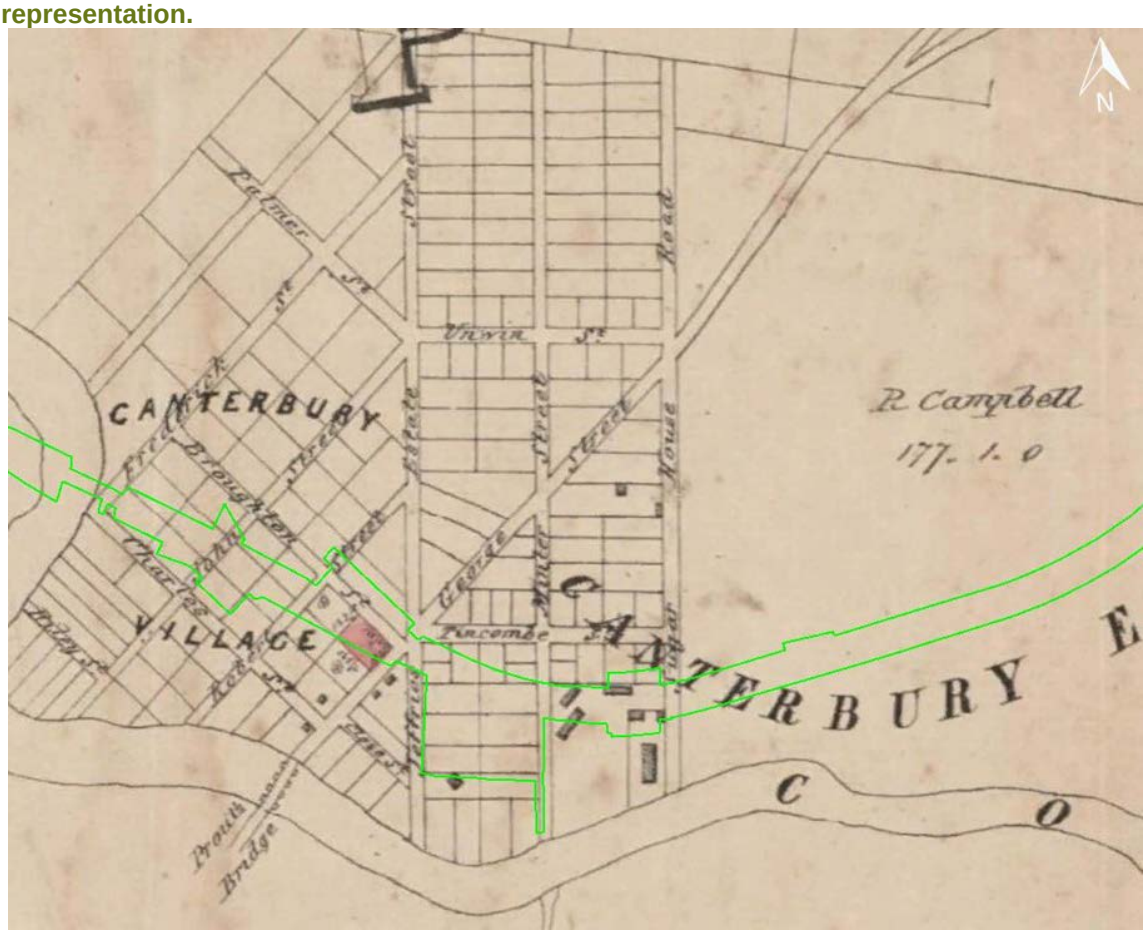


Figure 30: c1850 sketch showing Canterbury estate and Canterbury village with various buildings along what is now Canterbury and Church Street. Source. National Library of Australia. Note. Plan shows approximate location of structures and may not be an accurate representation.



1855-1895: Urban Development

The Australasian Sugar Company's works closed in 1855, and the site was not used again until 1884. This had a negative economic impact on the area, and little development occurred for the next two decades, although a wool washing establishment was later opened on the south side of the Cook's River in 1868 (south of the study area).

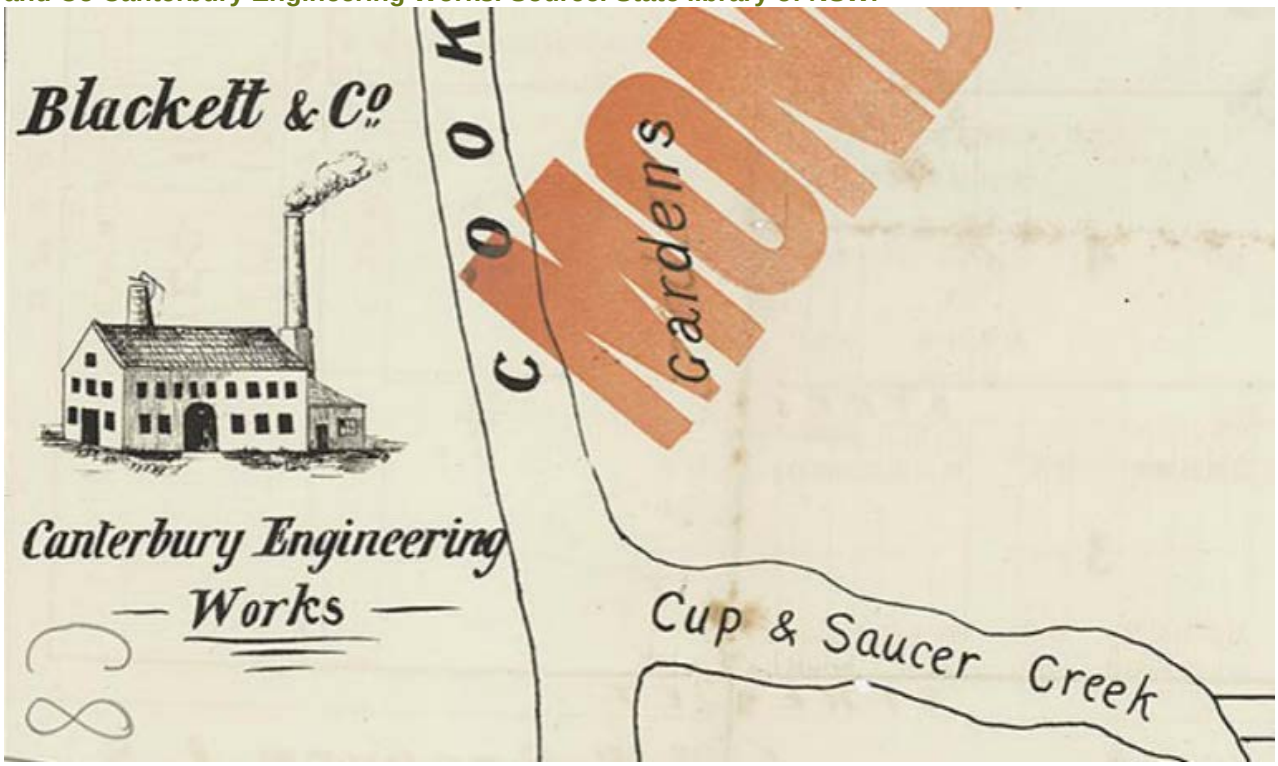
Canterbury changed dramatically in the 1880s, when Sydney experienced a surge in urban development. Initially, sales in the suburb were slow. The poor state of its roads and lack of public transport were accentuated when compared with areas on the rail and tram networks.[52] The first post office opened in 1858, and the first official public school in 1878, and the district slowly developed. Canterbury Race Course, on the northern bank of the Cooks River has been one of Sydney's major racetracks since 1871.

Between 1880 and 1892 the population of Canterbury rose by only 1500, indicating that the area is likely to have retained much of its rural character. Journalists at the time commented on the nature of the area, stating that the large house blocks and older-style residences made it appear 'old-fashioned'. In 1888 it was noted that the residents did not wish for water to be pumped into their homes due to the expense, and continued to use tank and wells.[53]

[52] *Ibid*: 176.
[53] Jervis 1951: 32.

In 1881, the site of the Australasian Sugar Company's works (now consisting of 11 acres, 2 roods and 28 perches, and an adjacent parcel of land containing 2 acres, 2 roods and 26 perches) was purchased by Edward Cox. This was then mortgaged by Edward Clissold, who conveyed the site to Owen Blackett. Blackett then established the Blackett & Co Canterbury Engineering Works on the property. This specialised in producing ironwork for the railways.[54] The ironworks set up production within the original sugar works mill building, as shown in Figure 31. Whether the additional outbuildings extended west into the study area is unknown. The company declared bankruptcy in 1886 although may have continued to operate until 1890.[55]

Figure 31: 1884 Redmans Canterbury Allotments Subdivision Plan showing detail of Blackett and Co Canterbury Engineering Works. Source. State library of NSW.



1895-1943: Canterbury Station, Resumptions and Development

Prior to the arrival of the railway in 1895, Canterbury remained relatively undeveloped due to its isolation from the rest of the city, and much of the study area west of the Old Sugarmill remained occupied by small cottages. To accommodate a rail line through Canterbury, land was resumed and the original street layout slightly altered as evidenced by plans shown in Figure 33 and Figure 34. The original property boundary of the Robert Campbell's estate and Australian Sugar Company works was dissected, and several properties along, and west of, Canterbury Road resumed. It is possible that the area west of the sugar works, that had once been occupied by outbuildings and mining operations was cleared at this time, as they do not appear on later plans.

The opening of Canterbury Station on February 1, 1895, encouraged land sales throughout the area (Figure 33 and Figure 34). The subdivision catering to the new station was called the Silver Park Estate. The station consisted of two impressive polychromatic brick platform buildings (Figure 35). A branch line leading to sidings used on race days at the Canterbury Racecourse was also constructed (since demolished; Figure 36). Extensive cuttings within the existing bedrock took place at this time in

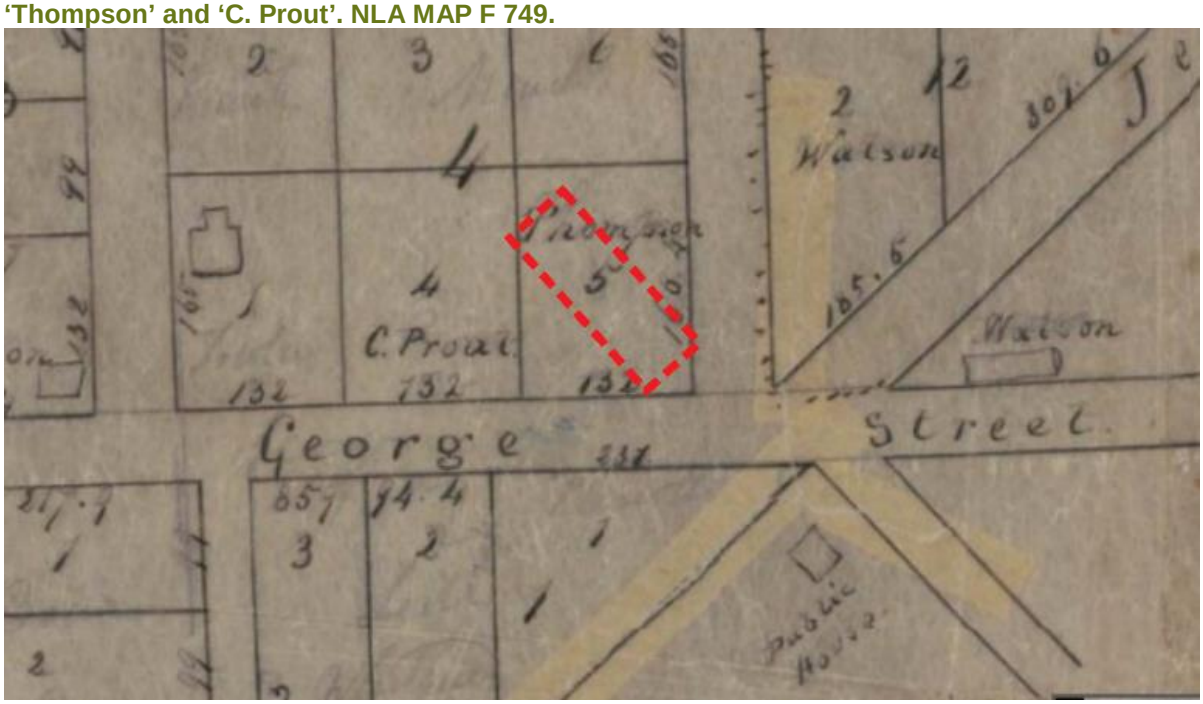
[54] Edward Higginbotham and Associates, May 2000. Historical and Archaeological Assessment of the Australian Sugar Company Mill, Sugar House Road (Formerly Church Street, Canterbury, NSW. Prepared for Gold Abacus Development and Woodhouse and Danks Pty Ltd, pp.12-13.
[55] Edward Higginbotham and Associates, May 2000, p. 15.

order to accommodate the rail line. These are likely to have removed evidence of some structures associated with part of the Canterbury Sugar Company works.

A new building was constructed on Platform 3 in 1915 when the station was expanded in conjunction with the Metropolitan Goods Line. In 1916 a goods line was constructed. This was associated with a goods line and goods shed, to the south of the station. In 1927 the track was realigned. The Down Bankstown track alongside a new Down side platform; the Up Bankstown track alongside the old Up island platform; the Down Goods track replacing the middle storage siding and the Up Goods track replacing the racecourse siding; No 1 to No 7 car sidings at the racecourse were opened and all were electrified (Figure 37).[56] The goods shed and additional buildings were still present in 1943 (Figure 38).

In 1900, land associated with the Old Sugarmill, now consisting of 3 acres and 2 roods was conveyed to Edward Williams Denham, who established the Canterbury bacon Factory. This too occupied the original Old Sugarmill building, east of the current study area. The factory was then sold to J C Hutton, who established 'Hutton's Bacon Factory' (Figure 39). It is unknown if any structures were erected within the study area or more specifically the site of the Canterbury Station Catchment construction site.

Figure 32: Detail from c.1840s plan of Cooks River, Jeffreys allotments, Sydney, with approximate location of Canterbury Station (red dashed line) within lots belonging to 'Thompson' and 'C. Prout'. NLA MAP F 749.



[56] State Heritage Inventory 'Canterbury Railway Station Group' accessed 9 July 2016.

Figure 33: Detail of c.1885-90 plan of Canterbury, showing the rail line and location of Canterbury Station. City of Sydney Archives, Historical Atlas of Sydney, Atlas of the Suburbs of Sydney ca 1885-1890 – Canterbury.

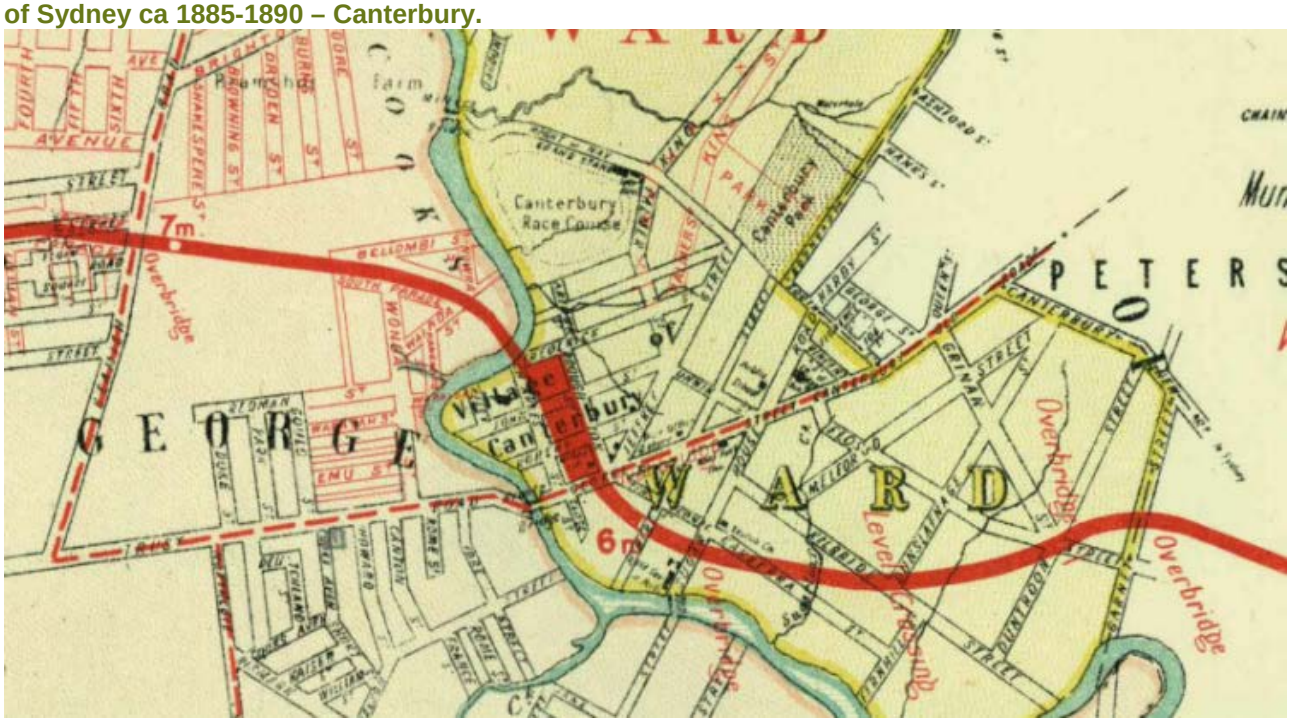


Figure 34: Railway acquisition in the vicinity of Bellombi Street and South Parade, between Canterbury and Campsie stations. The new subdivision either side of the line would be called the Silver Park Estate. SLNSW call no. Z/ SP/ C8.

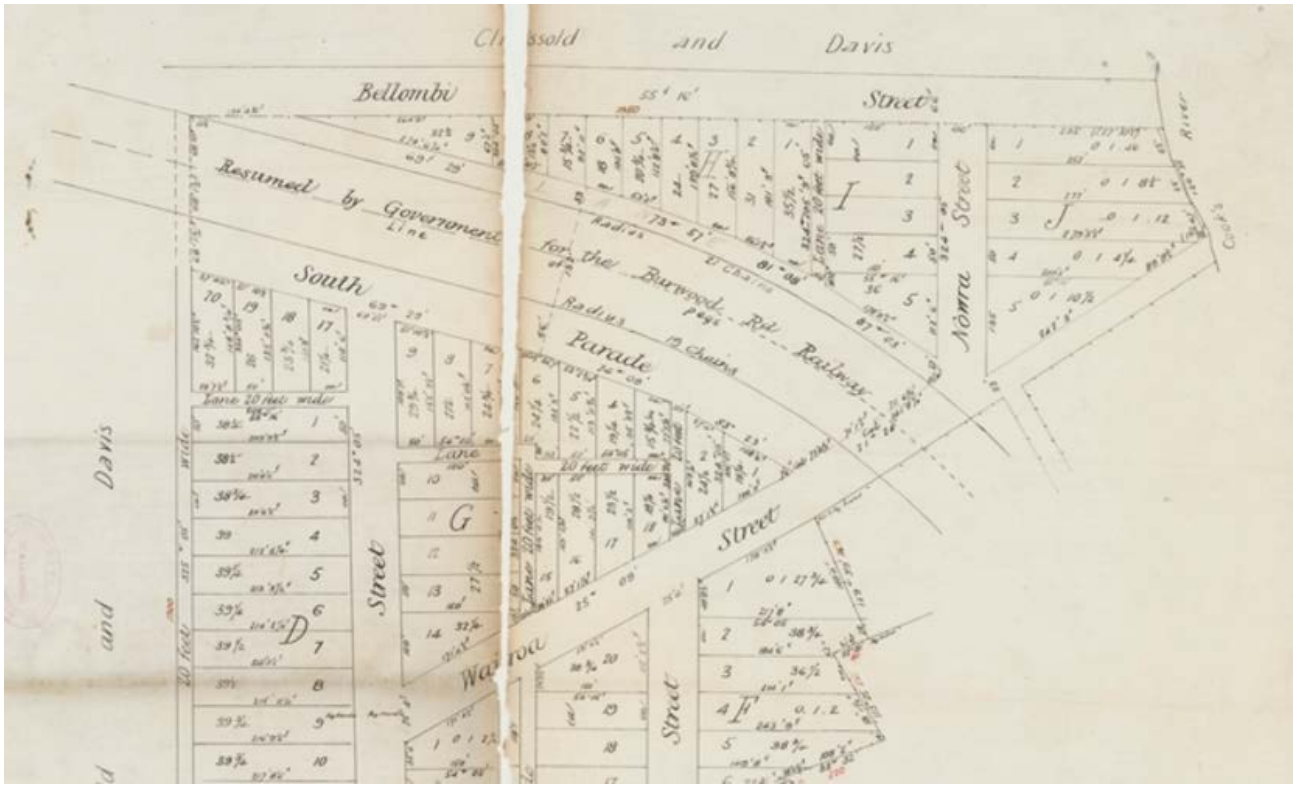


Figure 35: Canterbury Station between in 1916 and 1927. State Heritage Inventory 'Canterbury Railway Station Group'.

Figure 36: Configuration of Canterbury Station with goods platform, race platform and earlier cottages. SLNSW call no. Z/ SP/ C8.

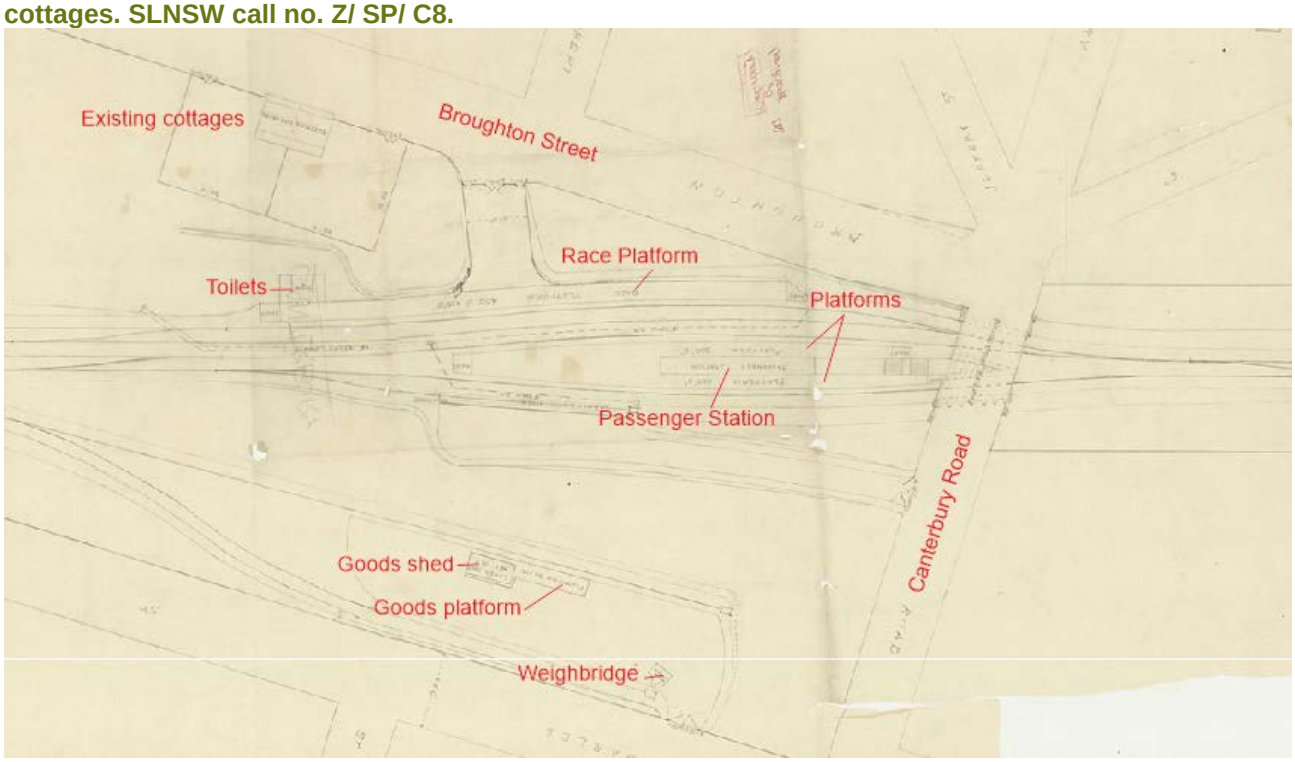


Figure 37: Electrification of the railway line c.1926, Canterbury Station. SLNSW call no. Z/ SP/ C8.

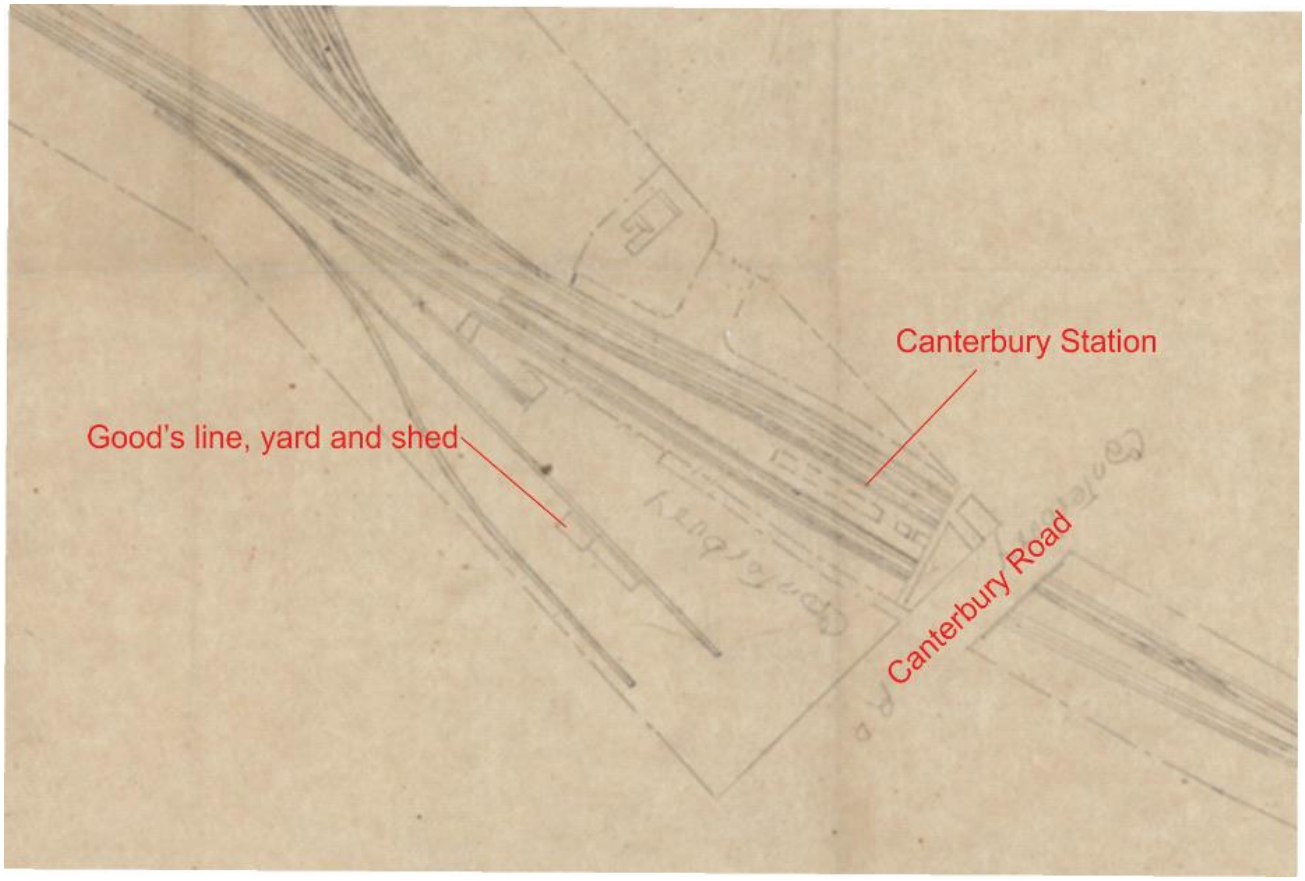
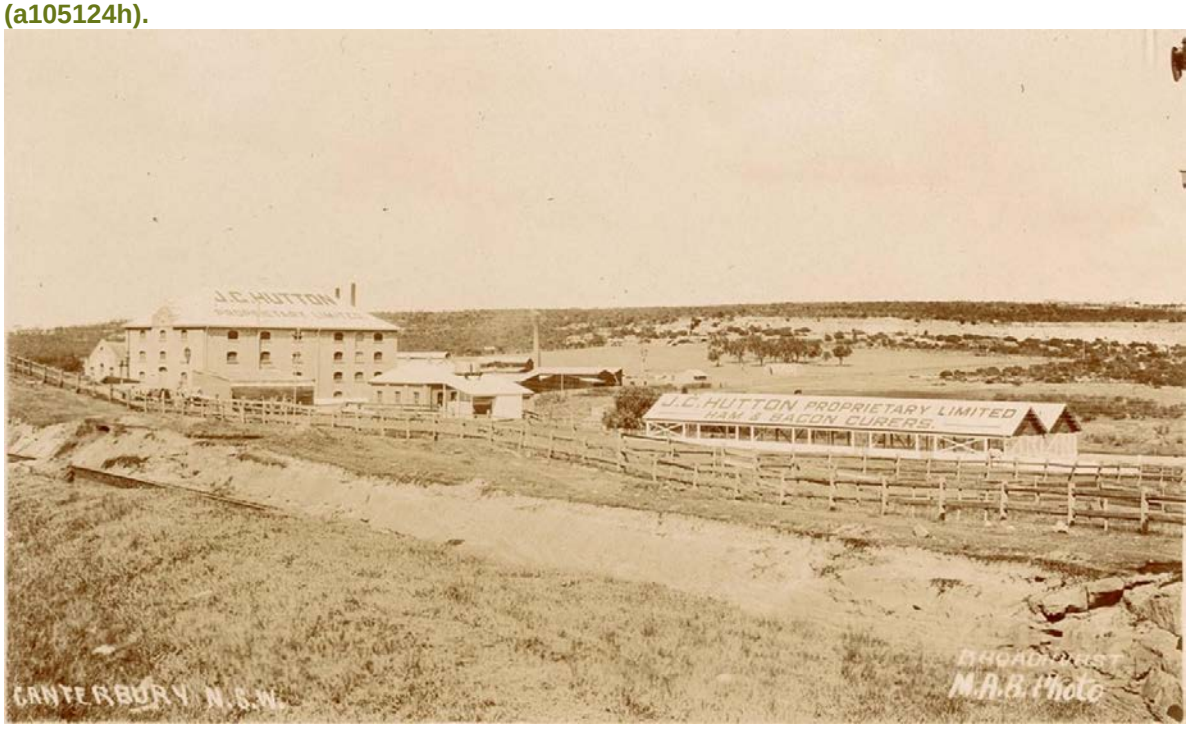


Figure 38: 1943 aerial of Canterbury Station. Source. SixMaps.

Figure 39. Canterbury, N.S.W. showing the J.C. Hutton Bacon Factory and outbuildings, just east of the study area. Likely taken from near the railway line. Source. State Library of NSW (a105124h).



1943-Present: Suburban and Urban Development

By 1943, the majority of Canterbury had been settled and was associated with late nineteenth and early twentieth century suburban subdivisions (Figure 40). Land that had once been occupied by outbuildings and for the sugar works (shown in the 1841 plan) had been cleared and was now occupied by a grassed park bounded by the rail line to the north and Close Street to the south. Buildings associated with the sugar works and later industries continued to occupy land to the east of the study area. Aside from the railway line and station, no structures occupied the study area at this time.

At present, a warehouse and carpark have been constructed within the once empty grassed park. This fronts onto Close Street and is located within the Canterbury Station Catchment construction site. The remaining parkland continues to remain unoccupied and no development or evidence of ground disturbing works have occurred.

Land to the west of Canterbury Road, north and south of the rail line has also been developed since 1943, and appears to be associated with small scale industrial activities. Rapid development has also taken place along Canterbury Road within the last decade, consisting mainly of modern apartments and commercial enterprises (Figure 41).

Figure 40. 1943 aerial showing Canterbury at the time. Land to the west, north and south of the rail line is unoccupied and residential subdivisions take up the majority of land to the north. The original location of the Australian Sugar Company Works is outlined in red. Source. SixMaps.

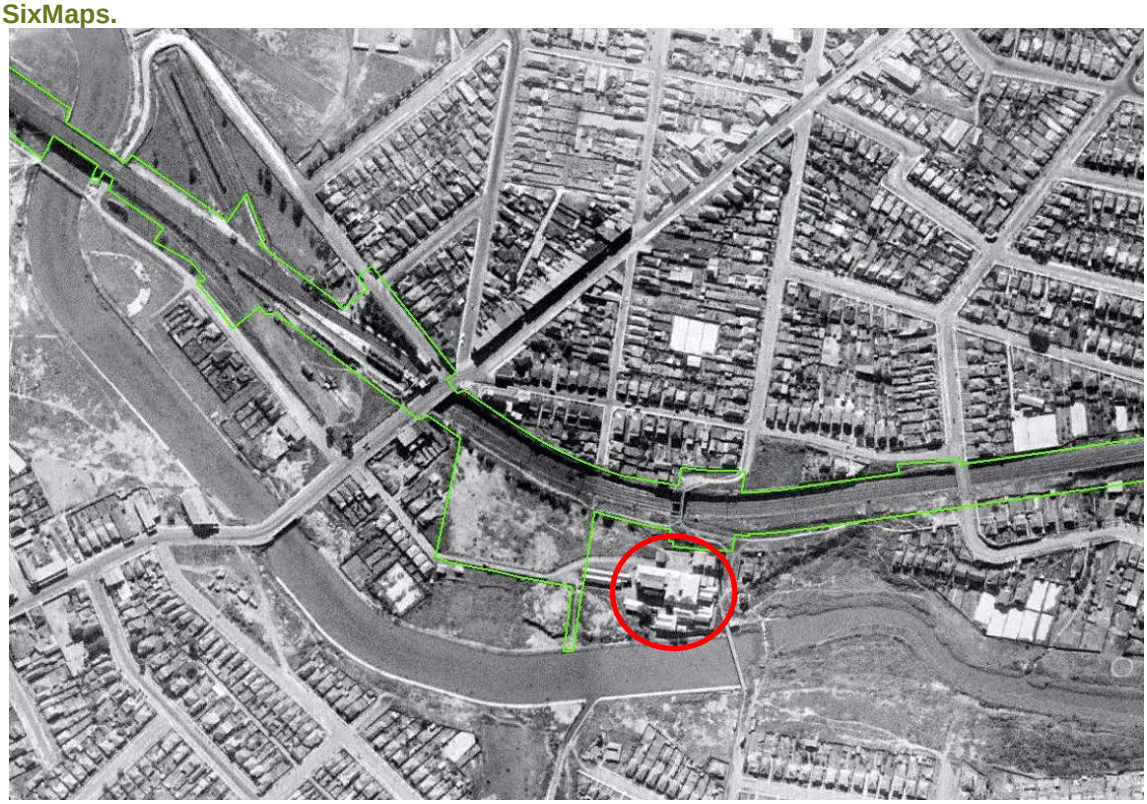


Figure 41. Satellite image showing Canterbury in 2016. Source. Google Earth.

3.2.4 Campsie

The suburb of Campsie is located within Hannah Laycock's 1804 grant of 500 acres. Its northern boundary was today's William Street. A hundred acres were also granted to Laycock's sons William and Samuel. They called their farms "Northumberland Farm" and "Percy Ville" (Figure 42; Figure 44). Laycock called her property "King's Grove Farm."[57] The Laycock's built a house and cleared an access road, which is todays Beamish Street, which cuts through the study area.

The early alignment of Beamish Street, as it would become known in the 1870s, defined the boundaries of the land grants in the area. The study area was originally associated with grants given to John Bentley, John Redman, William Bennett, John Wall and John Price as shown (Figure 42). John Redman, the Chief Constable in Sydney, was granted 100 acres west of Beamish Street in 1809. He called his property "John Farm" and later, in 1817, he bought the northern adjoining farm, called "Stoneless Bay" from Thomas Capon (Figure 43). Capon never inhabited the land, and was based in Hobart.[58] By 1822 Redman's holdings would total 500 acres. The large eucalypts on Redman's farm, cleared by convict labour, supplied the Sydney gaol with firewood for many years.[59] The 1828 census shows that the farmhouse on "John Farm" was tenanted by the sawyer, John Ryan, his family and employees.[60]

Redman died in 1837, and his property was divided amongst his sons. "John Farm" was sold, "St Claire" was kept and "Stoneless Bay" was leased to his widow, Mary, by her son Robert, for a nominal rent. The house she leased remained standing on Harcourt Avenue until the 1970s.[61] In 1846 "John Farm" was purchased by Robert and Hugh Scott, who renamed it "Campsie Farm" (Figure 44).

Figure 42: c.1860s Campsie Parish Map. Lands and Property Information AO Map

[57] Madden and Muir 1988: 2.
[58] Larcombe 1971: 39.
[59] Madden and Muir 1988: 2.
[60] *Ibid*: 6.
[61] *Ibid*: 8.

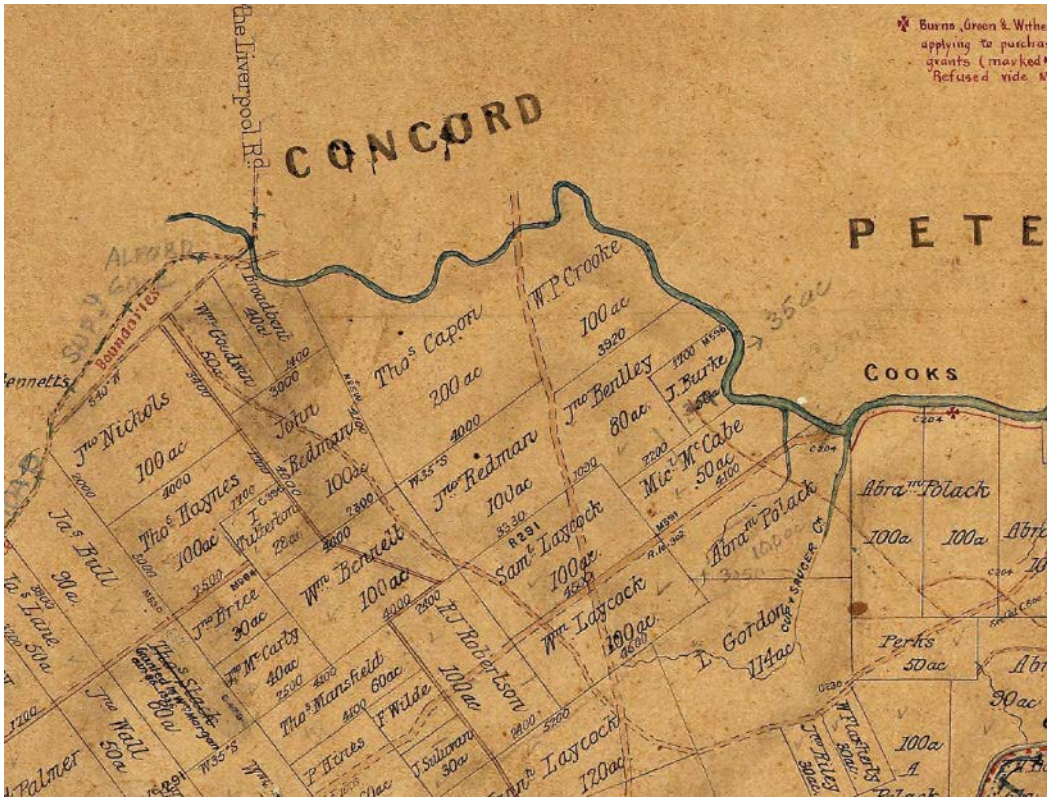


Figure 43: Pre-1822 plan, showing the 'Govt. Road' (Beamish Street). John Redman would later purchase Capon's land grant. State Library of NSW Z/SP/C8.

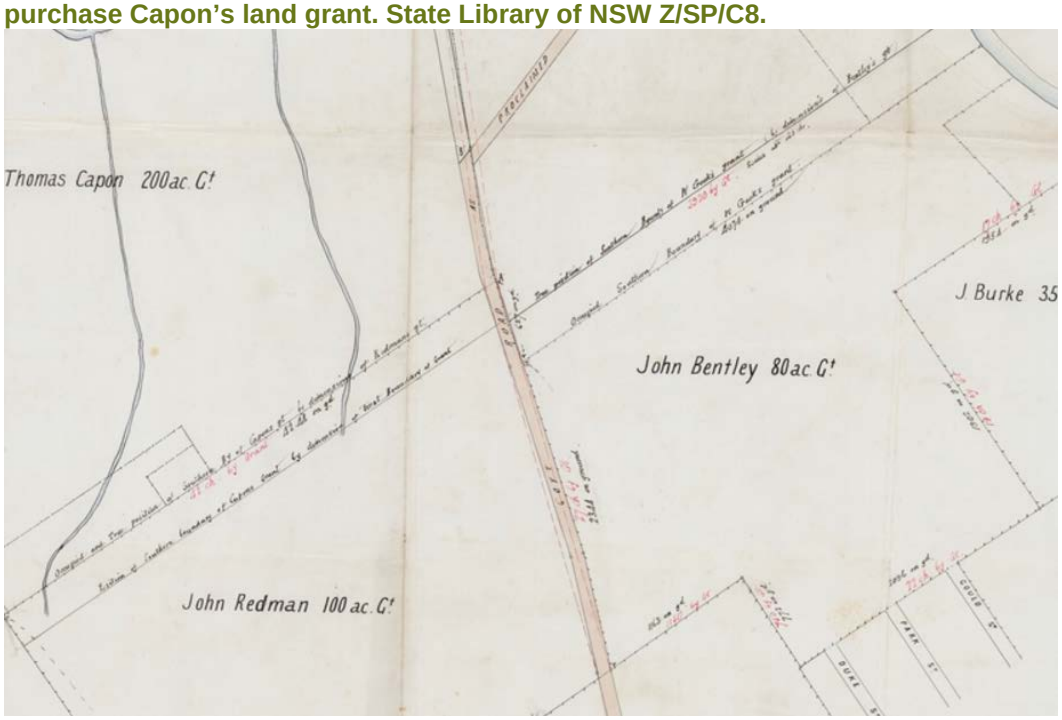
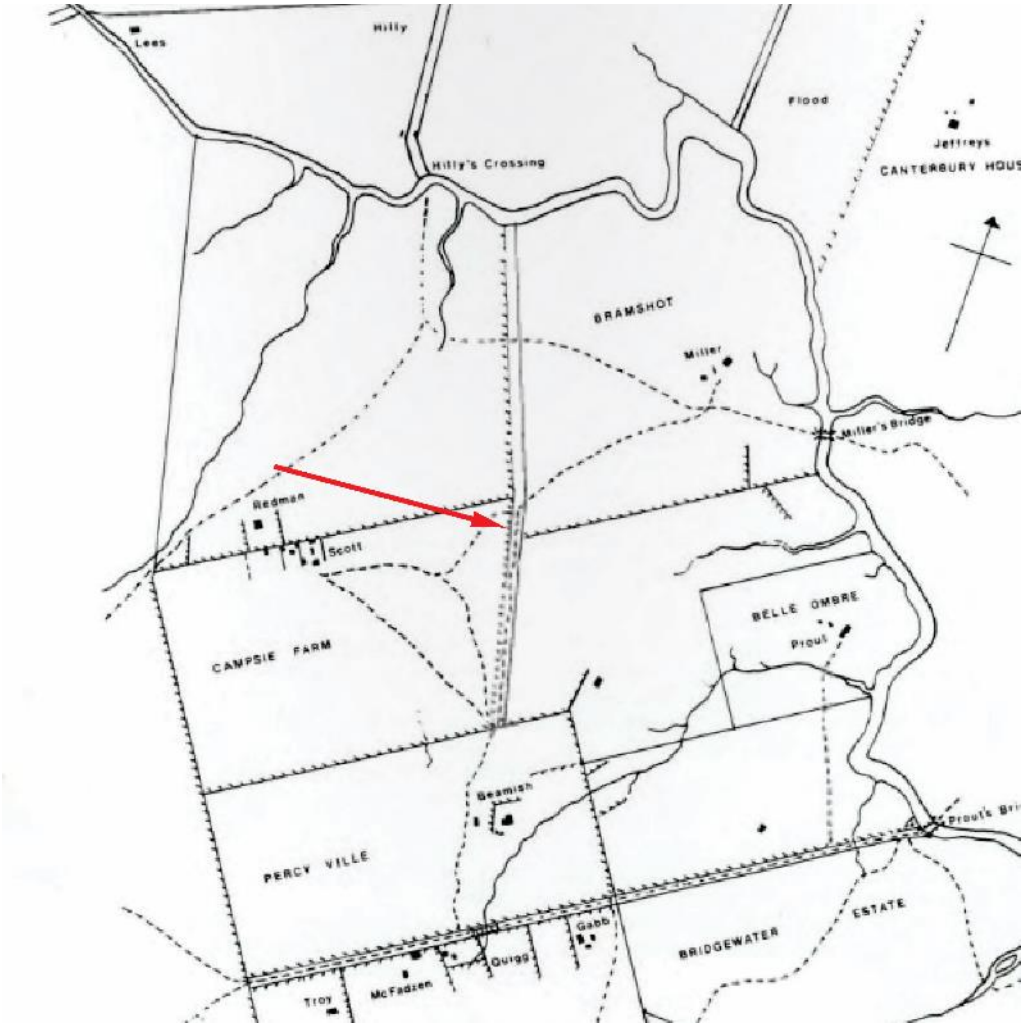


Figure 44: Campsie Farms between 1850 and 1860. The approximate location of Campsie Station is arrowed. Muir in Madden and Muir 1988; 12.



In the 1880s “Campsie Farm” was purchased and subdivided by the Anglo-Australian Investment, Finance and Land Company Ltd, and called the “Campsie Park Estate” (Figure 45). This was typical of many such subdivisions by various building companies operating in Sydney at the time. In January of 1885 a new railway survey line was commissioned, passing directly through the Campsie Park Estate. The Anglo-Australian Company cleared the estate and marked out streets and allotments. The first advertisement in the Sydney Morning Herald for the Campsie Park Estate appeared on 13th October, 1885. The area was depicted in the sale booklet by Gibbs, Shallard and Co. as being rural and idyllic (Figure 46). The subdivision plan at this time did not show the railway line, although buyers were assured in the text that it would be built. The allotments, however, did not sell, presumably due to the lack of certainty over the rail line.

When the rail line from Sydenham to Belmore was built, it passed through the Campsie Park Estate. The estate was then re-subdivided (Figure 47 and Figure 48) and by 1910 the majority of lots within the estate had been purchased and built upon (Figure 49).

Figure 45: Detail of undated plan illustrating the Campsie Park Estate and the proposed railway route. Larcombe 1971: 40-1.

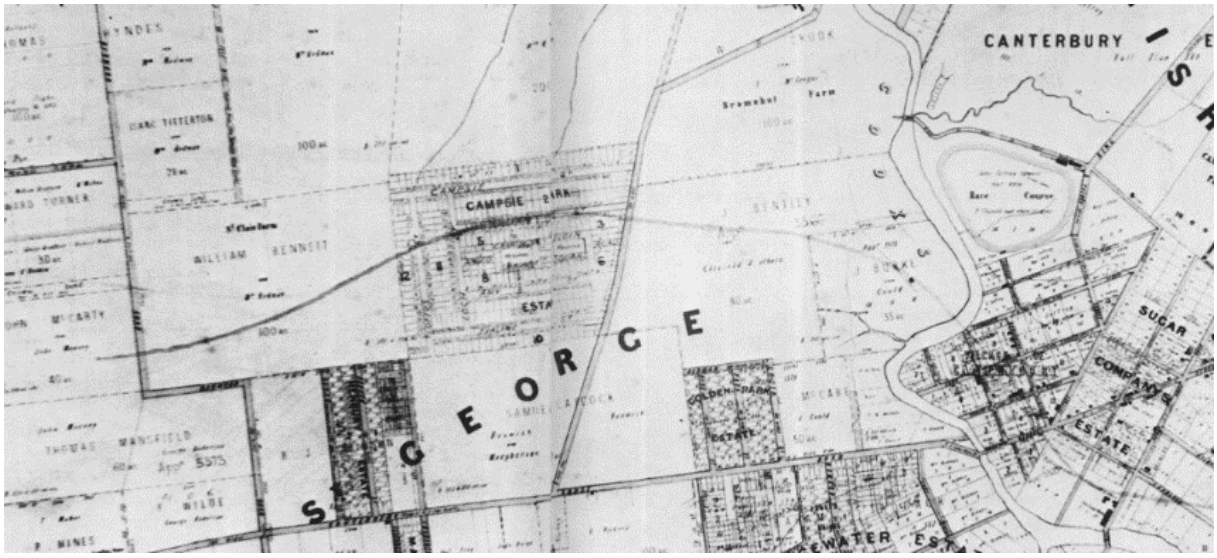


Figure 46: Illustrations from real estate pamphlet for the Campsie Park subdivision, showing Beamish Street (L) and a cottage and orchard adjoining the estate (R). SLNSW call no. Z/SP/C6.

Figure 47: NSW Railways plan showing property acquisitions in the line of the new railway from Marrickville to the Burwood Road. SLNSW call no. Z/SP/C6.

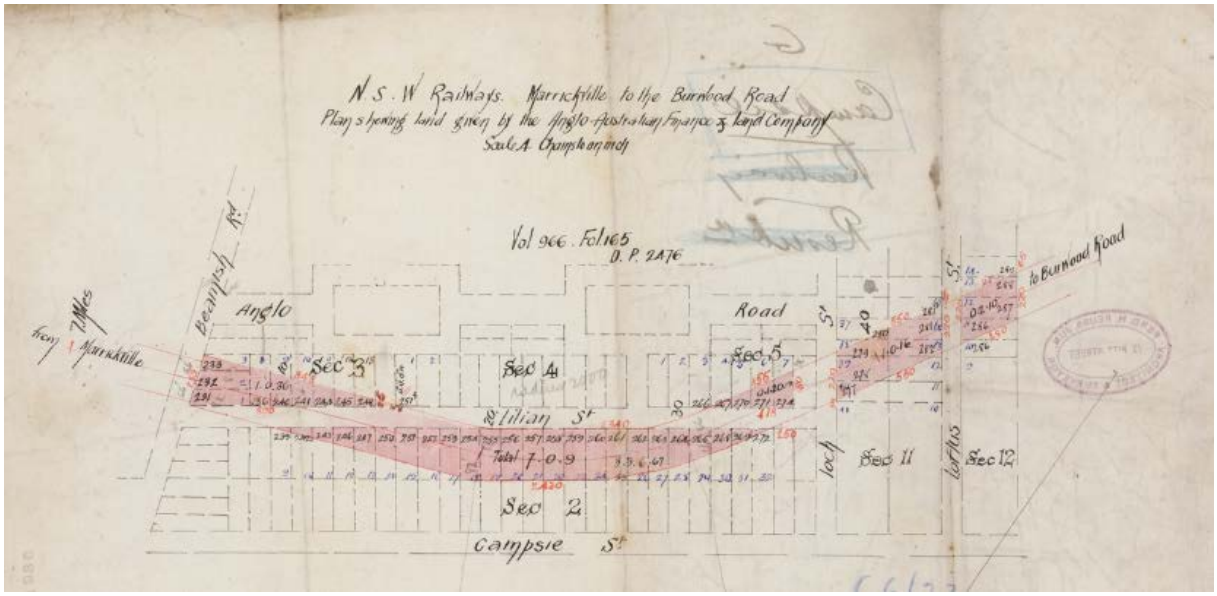


Figure 48: Re-subdivision of the Campsie Park Estate following land resumption for the railway line. SLNSW call no. Z/SP/C6.

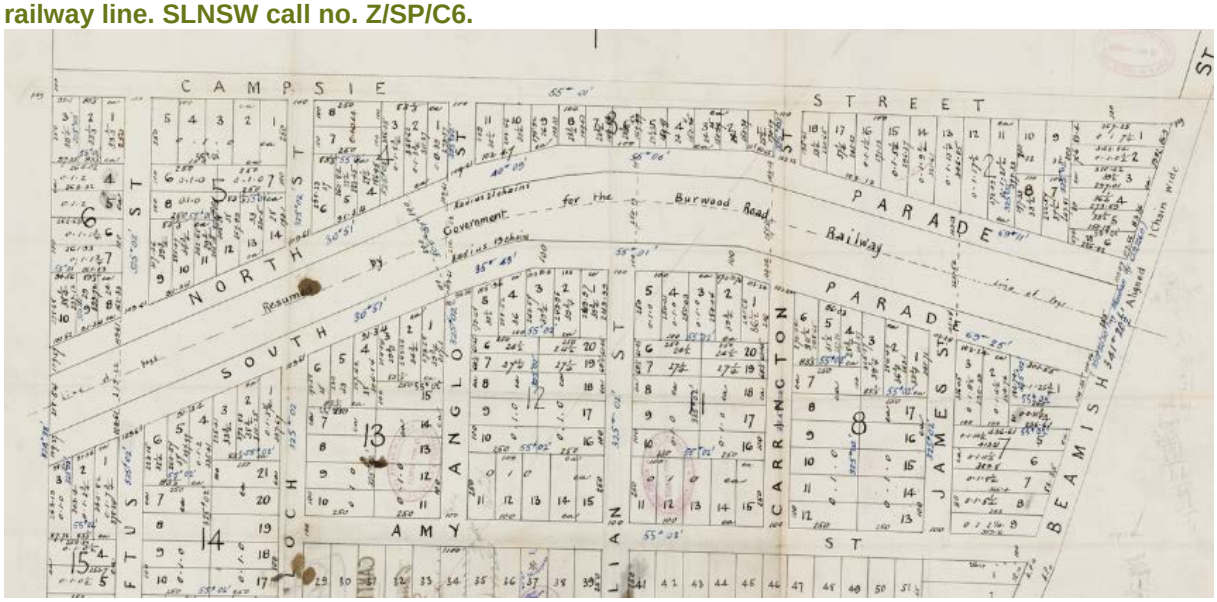
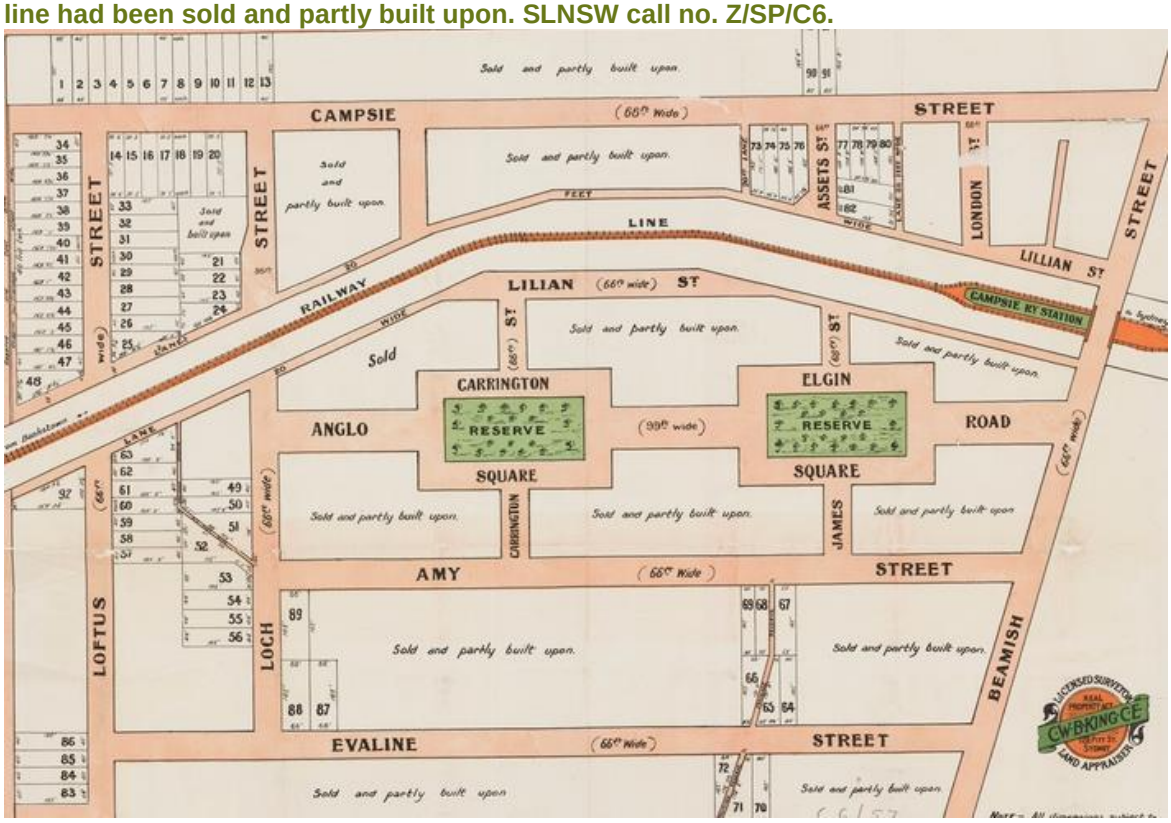


Figure 49: 1910 sales poster indicating that the majority of house lots adjacent to the railway line had been sold and partly built upon. SLNSW call no. Z/SP/C6.



Whilst the railway stimulated some commercial and residential development, overall, development in Campsie was slow.[62] It was not until the early twentieth century that the suburb began to expand, partially due to the opening of schools, banks and churches. The increase in population was also attributed to the many railway workers who had settled in the area following the completion of the line.[63] By 1920 Campsie had about 30 shops, and Beamish Street contained a number of businesses including a pastry cook, fish shop, stationer, painter and decorator, a butcher and ice works, confectioners, drapers, grocers, a fruiterer, plumber, boot maker, bicycle repairer, an estate agent and a hairdresser and tobacconist.

The suburb retained a rural character, however, and slaughterhouses operated on the southern side of Canterbury Road, market gardens were located on the Cooks River, and there were many dairies and orchards throughout the region. Beamish Street itself was not asphalted until the 1930s.[64]

Campsie Station

Unlike the brick platform buildings at Marrickville, Canterbury and Belmore station, Campsie Station consisted of a timber waiting shed 28 feet by 12 feet in diameter (Figure 50). The platform was accessed via an overbridge and steps. A new booking office was constructed in 1905 and the platform extended in 1906 (Figure 51 and Figure 52).

[62] City of Canterbury Library 'Campsie NSW' Accessed 9 July 2016.
[63] Madden and Muir 1988: 38.
[64] City of Canterbury Library 'Campsie NSW' Accessed 9 July 2016.

Figure 50: Plan of Campsie Station. SLNSW call no. Z/SP/C6.

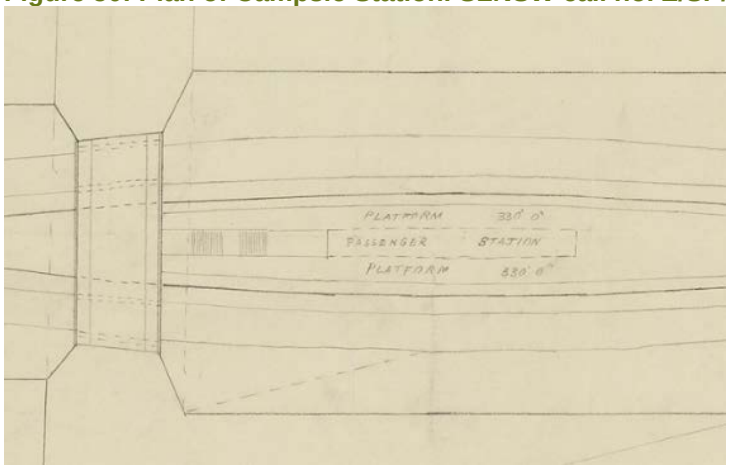


Figure 51: 1908 painting of Campsie Station. Canterbury City Council, Pictorial Canterbury image no. 011001.

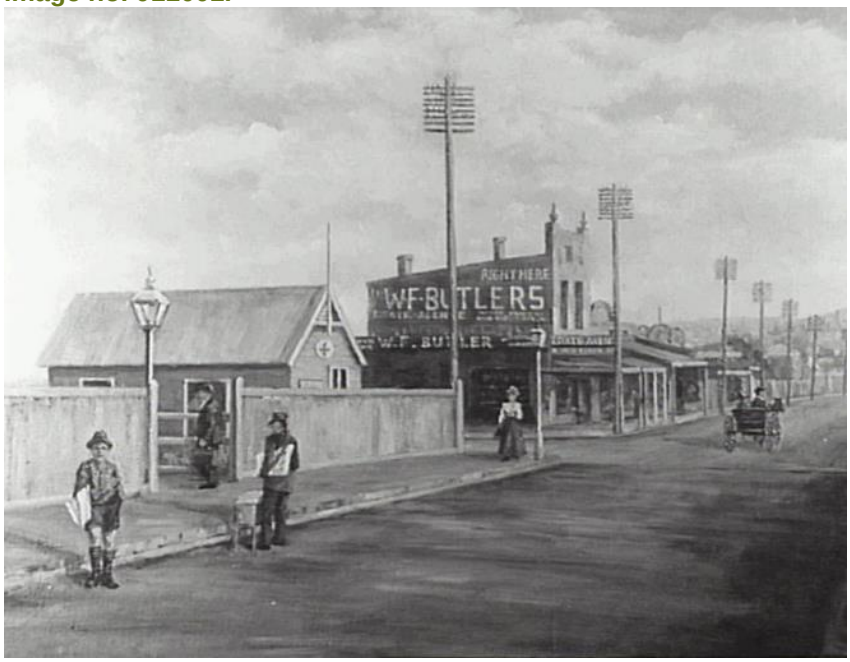
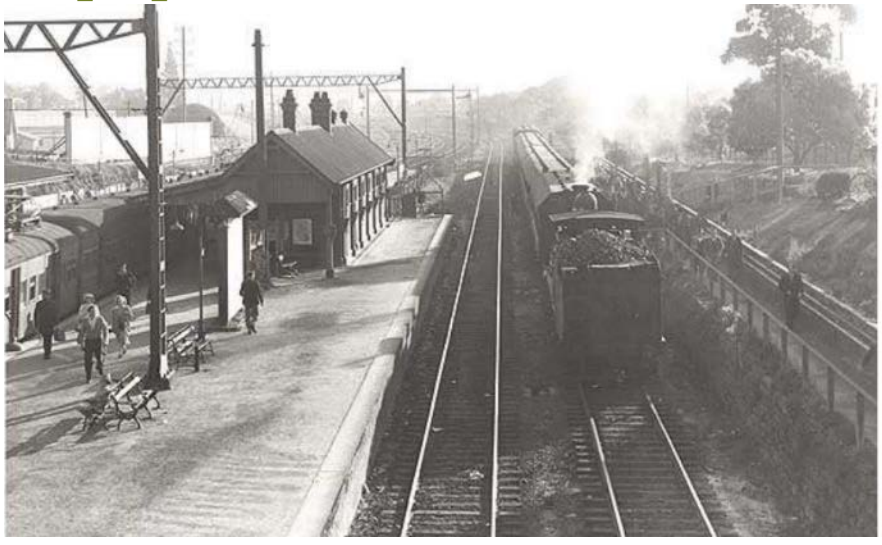


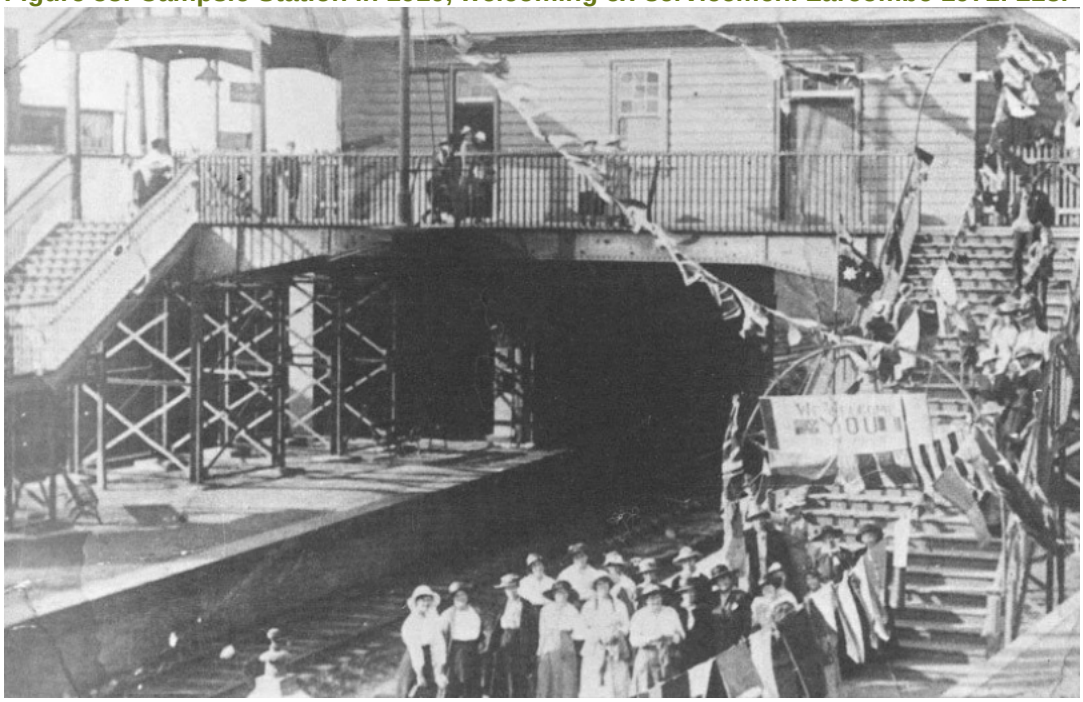
Figure 52: 1909 photograph of Campsie Station. Source: State Records of NSW, item 17420_a014_a014000815.



The present station layout and station buildings date from 1915 and were constructed for the opening of the Goods Lines in 1916 (Figure 529). The new buildings replaced all previous platform structures. The brick and stone retaining wall on the south was also constructed at this time to accommodate the new Down platform. A new jack-arch overbridge also replaced a previous timber bridge to carry Beamish Street across the four railway lines.[65]

A northern side platform was also constructed in 1916 for the Goods line and was used by railway employees so that they could travel to and from the Enfield/ Chullora workshops area. The existing concrete platform and stairs date from c1950. An overhead parcels office was constructed on the footbridge at this time. This was demolished and replaced in 2000.

Figure 53: Campsie Station in 1919, welcoming ex-servicemen. Larcombe 1971: 213.



3.2.5 Belmore

In the early nineteenth century the most direct route between the Cooks and Georges Rivers was via the Punchbowl/Milperra Road, which also served as a convenient access road from Sydney to Reverend Johnson's Canterbury Farm. At this time a track, todays Burwood Road, connected Punchbowl Road with King's Grove Farm to the south-east. The track passed through the area that would become known as Belmore.

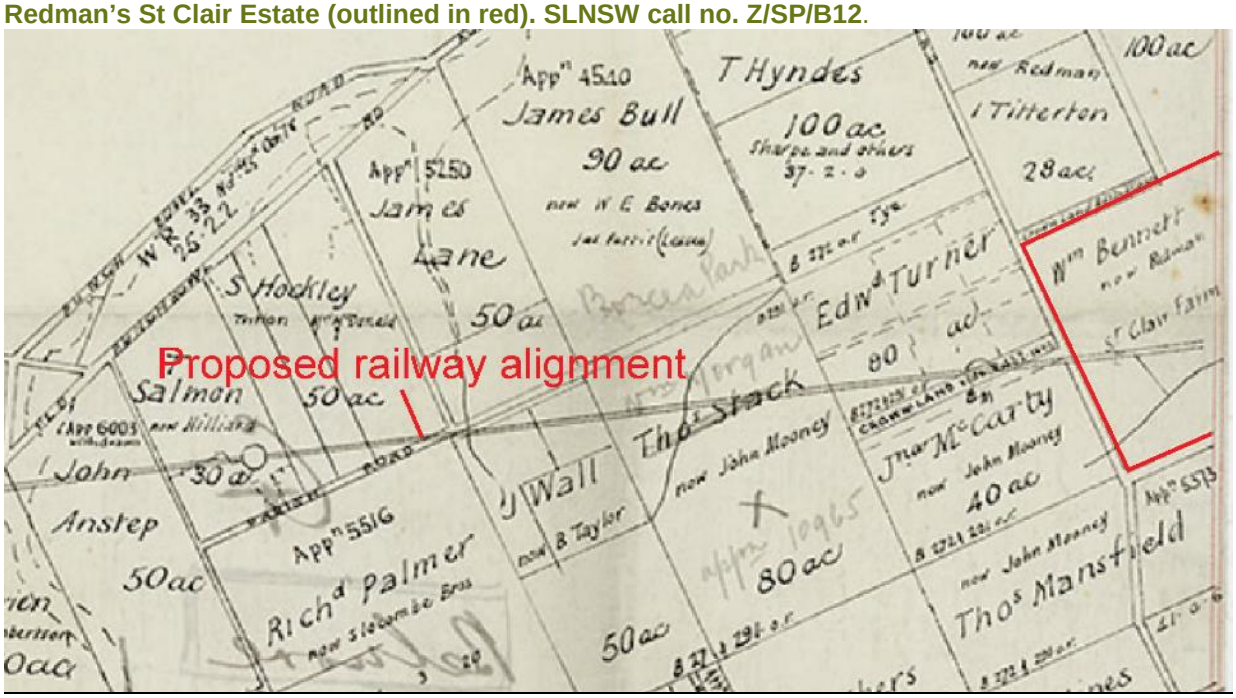
A number of land grants were located in the vicinity, and the timber they provided was cut to supply Sydney with firewood and railway sleepers.[66] Following the clearance of the land, numerous farms were established. Blossom Farm, to the north-west of the present-day railway station, was owned by the Bradburn family. St Clair Farm, to the east of the railway station, was owned by William Redman (son of John Redman of "Johns Farm" near Campsie) and contained a vineyard and grazing paddocks (Figure 54). No known structures occupied the property. A number of small poultry farms were also located throughout the area.[67]

[65] State Heritage Inventory 'Campsie Railway Station Group" Accessed 9 July 2016.
[66] Muir and Madden, 2009.
[67] Muir and Madden, 2009.

1880-1920

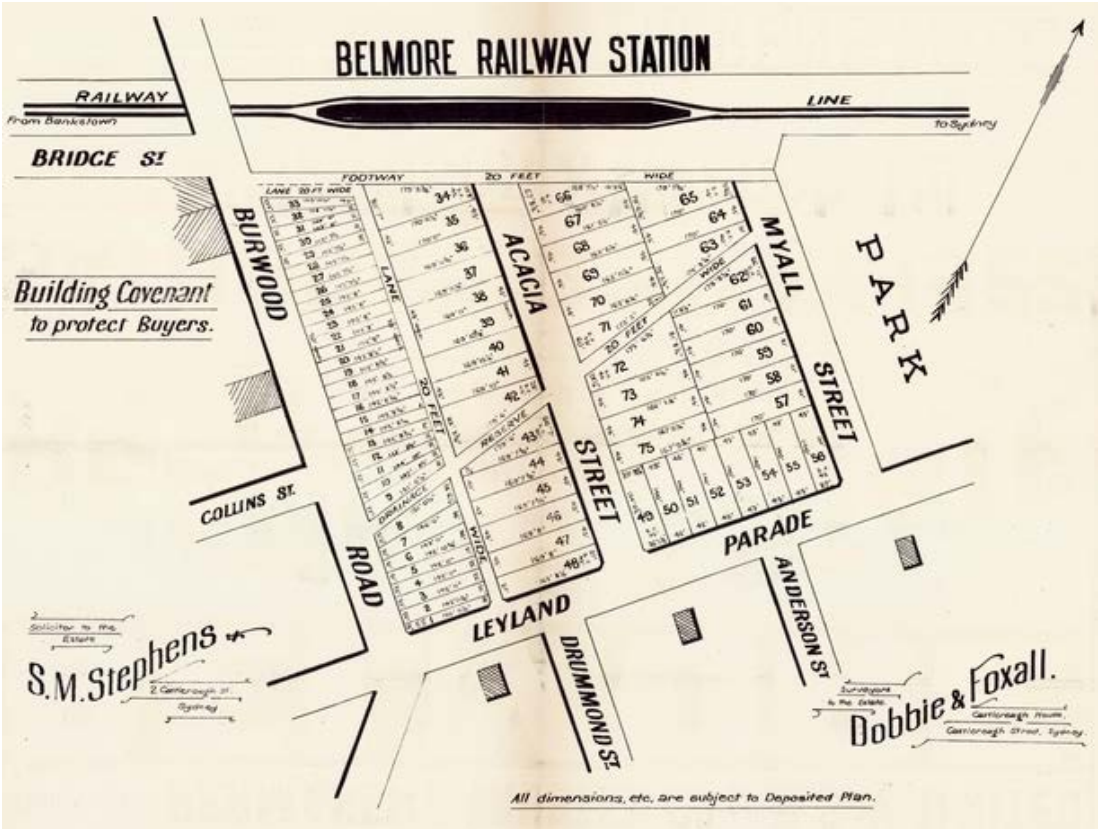
Subdivision of the large estates and farms began around 1880, and accelerated with the opening of the railway line, the first stage of which terminated at Burwood Road. Early subdivisions occurred at Blossom Farm, referred to as the Terminus Estate, immediately north-west of Belmore railway station. In the centre of Belmore, Redman's estates (Figure 55) and Collins' Clear, immediately north-east and south of the station, were not subdivided until after 1911. These early subdivisions consisted of large suburban blocks. There was, however, a shortage of subdivided land in the immediate vicinity of the station, and the suburb centre developed relatively slowly as a result.[68]

Figure 54: Undated plan showing approximate alignment of the proposed railway, and Redman's St Clair Estate (outlined in red). SLNSW call no. Z/SP/B12.



[68] Muir and Madden, 2009

Figure 55: 1922 plan of Redman's Estate subdivision, showing that development on the southern side of the railway line consists or larger blocks of land at this time. SLNSW call no. Z/SP/B12.



1920-present

Following the First World War, between 1920 and 1925, a number of returned servicemen were settled in Belmore, with housing financed by the War Service Homes Commission. Many of the men found work at the new railway yards in Enfield.[69]

The commercial centre of Belmore developed rapidly from this time, with the Post Office opening in 1924, and the Belmore Hotel in 1928. In the latter half of the twentieth century many of the early residences were demolished to make way for apartment blocks.

Belmore Station

Belmore Station is located on the Sydenham to Bankstown Railway line and was opened as the initial terminus station on 1 February 1895 (Figure 56 and Figure 57). Its initial construction name was Burwood Road but it was named Belmore on opening.[70]

The station was built when Belmore was still rural. The station layout featured a typical brick station building on an island platform (Figure 58). A station master's residence was built in 1895 and is still extant at 346 Burwood Road, opposite the station, but is now in private ownership. The original layout of the station catchment is illustrated in a plan dated to 1895, shown in Figure 59.Figure 59[71] A goods shed was also part of the station catchment and located to the north of the line, near today's Wortley Avenue, within the proposed Belmore Compound Area. What may be a goods platform is

[69] Muir and Madden, 2009.
[70] State Heritage Inventory 'Belmore Railway Station Group' Accessed 9 July 2016.
[71] *Ibid*

located on the opposite side of the rail line, near Bridge Road and within a what is now a modern carpark.

The station was built when Belmore was still rural. The station layout featured a typical brick station building on an island platform (Figure 58). A station master's residence was also built in 1895 and is still extant at 346 Burwood Road, opposite the station, but is now in private ownership Figure 59.[72]

Prior to 1909 there were sidings for the storage of locomotives due to the railway terminating at Belmore. Suburban development intensified post World War I when many War Service homes were built in the area. Sidings at the station were extended during the 1920s for Belmore and Canterbury Councils for the purposes of unloading timber and other material for house construction and municipal works.[73]

Figure 56: c.1900 photograph of Belmore Station. City of Canterbury Local History Photograph Collection.

[72] *Ibid*
[73] State Heritage Inventory 'Belmore Railway Station Group' Accessed 9 July 2016.

Figure 57: Belmore Station in 1901. Canterbury City Council.

Figure 58: Configuration of the Belmore Station. SLNSW call no. Z/SP/B12.

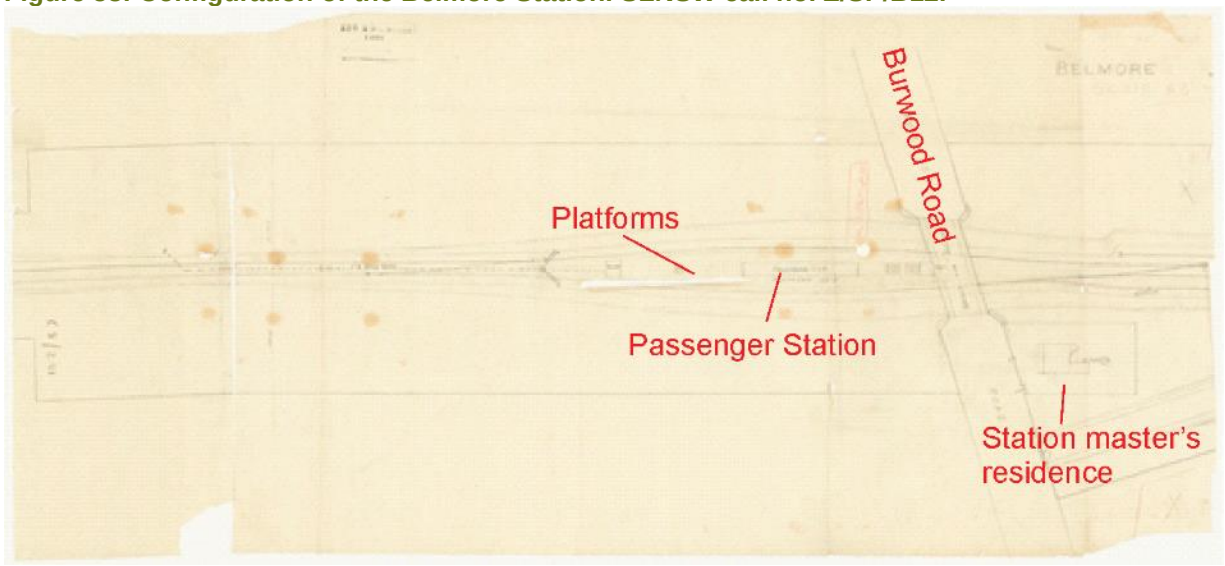
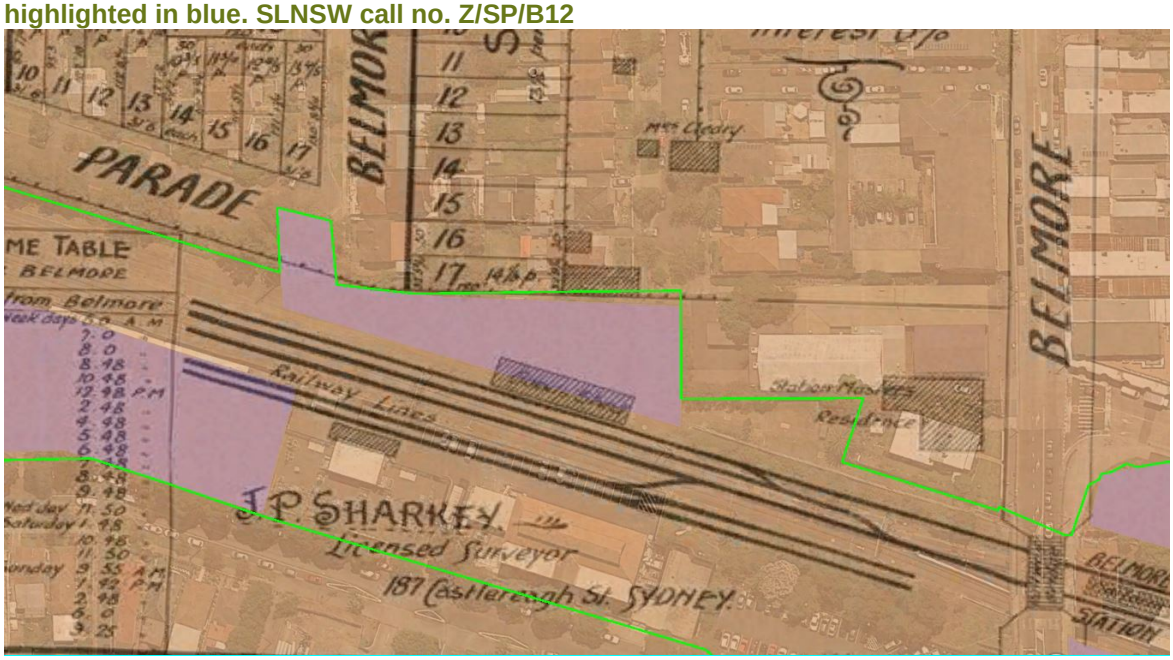


Figure 59: 1895 plan of the Terminus Estate subdivision, showing location of the goods shed, sidings, platform and station master's residence at Belmore Station. Compound areas are highlighted in blue. SLNSW call no. Z/SP/B12



In 1925-26 a number of works were undertaken in preparation for electrification of the line including a sub-station and platform extension. The sub-station is now used as a signals training facility.

The overhead timber booking office at Belmore was constructed c.1937 at the top of the steps fronting onto the down side of Burwood Road to take the ticket selling and parcel functions. The change was also made to most other stations built to a similar configuration. The station master's office remained in the platform building for another forty years, but this function too has now moved to the street level building and the platform building remains largely unused.[74]

3.2.6 Lakemba, Wiley Park and Punchbowl

Lakemba

The suburb of Lakemba was originally located within John Wall's 1831 grant of 50 acres, called "Ashford". In August 1881 Ben Taylor leased "Ashford", before purchasing the property in 1890 (Figure 60). Figure 61 shows Taylors house on this grant prior to the construction of the railway line, consisting of a house and stable building. Additional outbuildings may have occupied land around the main property, and therefore within the study area.

In 1883, Taylor married his second wife Lucy Annie Johnston, the granddaughter of missionaries based on Lakeba Island in Fiji (pronounced Lakemba).[75] Soon after their marriage, Taylor named his house "Lakemba," and by the 1920s it was a substantial two-storey residence to the south of the study area (Figure 62 and Figure 63).

It is possible the stables were demolished to make way for the construction of Railway Crescent/The Boulevarde in the early twentieth century. After the arrival of the railway "Lakemba" was located on the corner of Haldon Street and the newly formed Railway Crescent/The Boulevarde.

[74] State Heritage Inventory 'Belmore Railway Station Group' Accessed 9 July 2016.
[75] City of Canterbury Library, Madden 2014 "Lakemba - Name Origin" Accessed 8 July 2016.

Taylor was a staunch Methodist, and donated the land for the Methodist (now Uniting) Church on the south eastern corner of Haldon Street and The Boulevarde (Figure 63 and Figure 64). “Lakemba” was demolished in the late 1920s or early 1930s to make room for shops.

Figure 60: Undated plan showing approximate alignment of the proposed railway. Wall and Taylor’s grant has been outlined in red. SLNSW call no. Z/SP/B12.

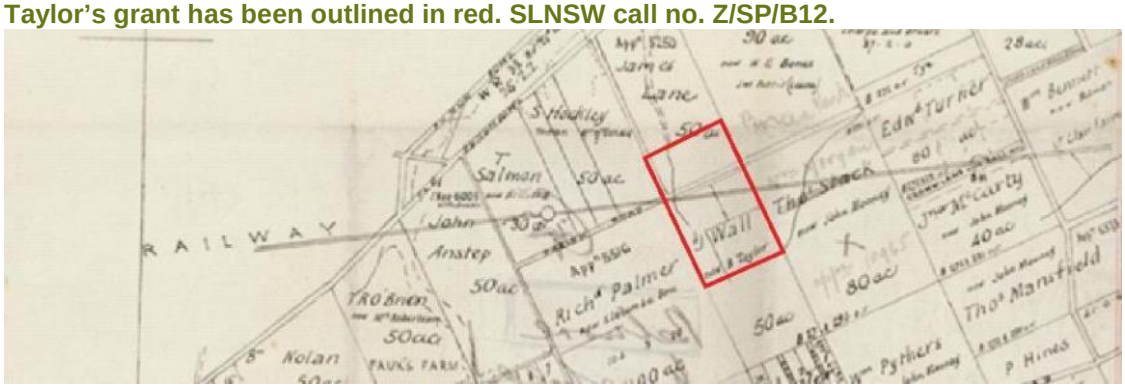


Figure 61: Plan showing the subdivision of the Lakemba Park Estate in 1895, prior to the construction of the railway line and Lakemba Station (outlined in green), showing location of Ben Taylor’s house and stables. SLNSW call no. Z/SP/B12.

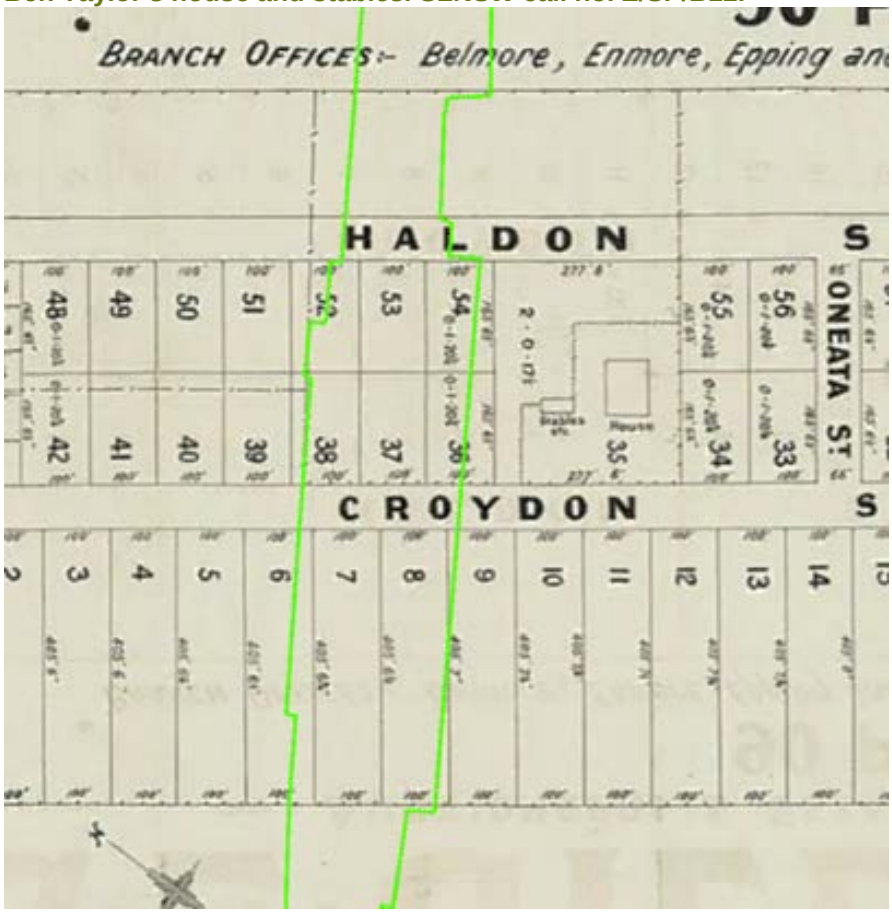


Figure 62: Ben Taylor's "Lakemba" in 1921, during the Anzac Day March on Haldon Street. City of Canterbury, Pictorial Canterbury, image no. 020227.

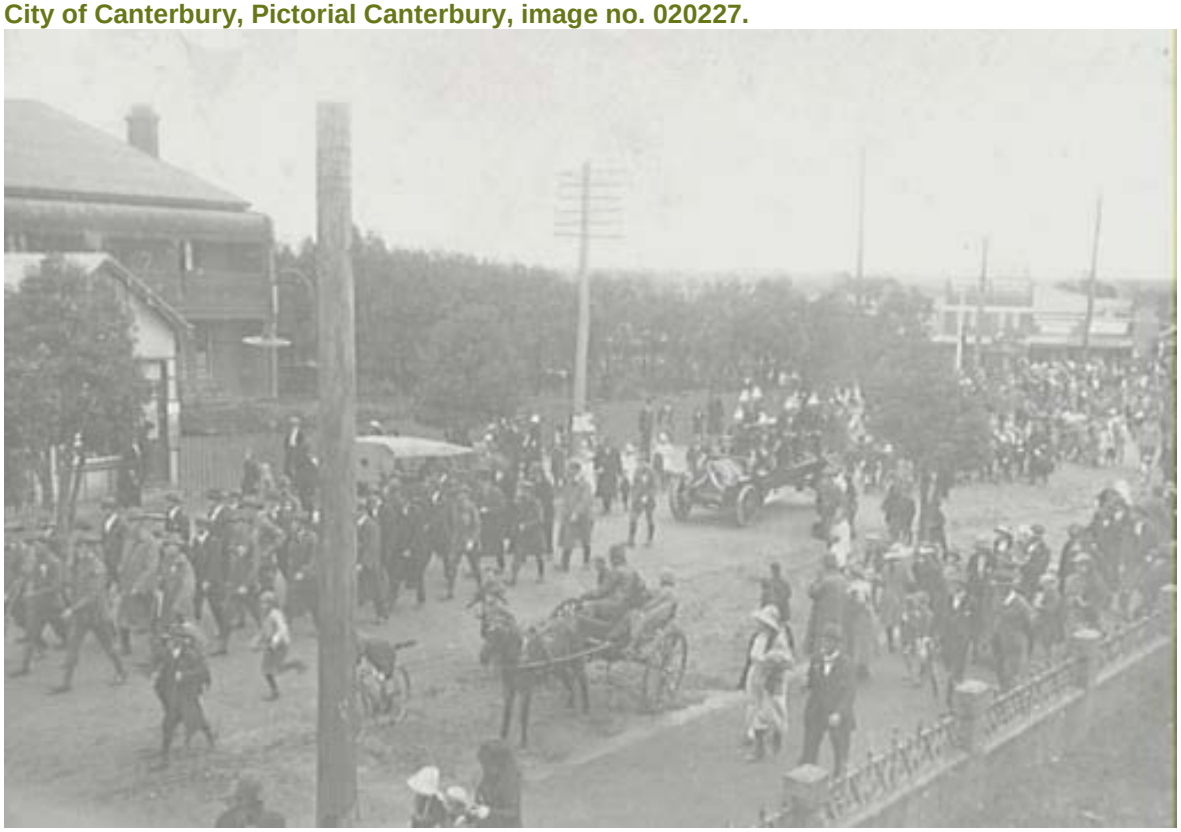


Figure 63: The Methodist Church during construction c.1920, with Taylor's "Lakemba" house in the background. City of Canterbury, Pictorial Canterbury, image no. 210002.

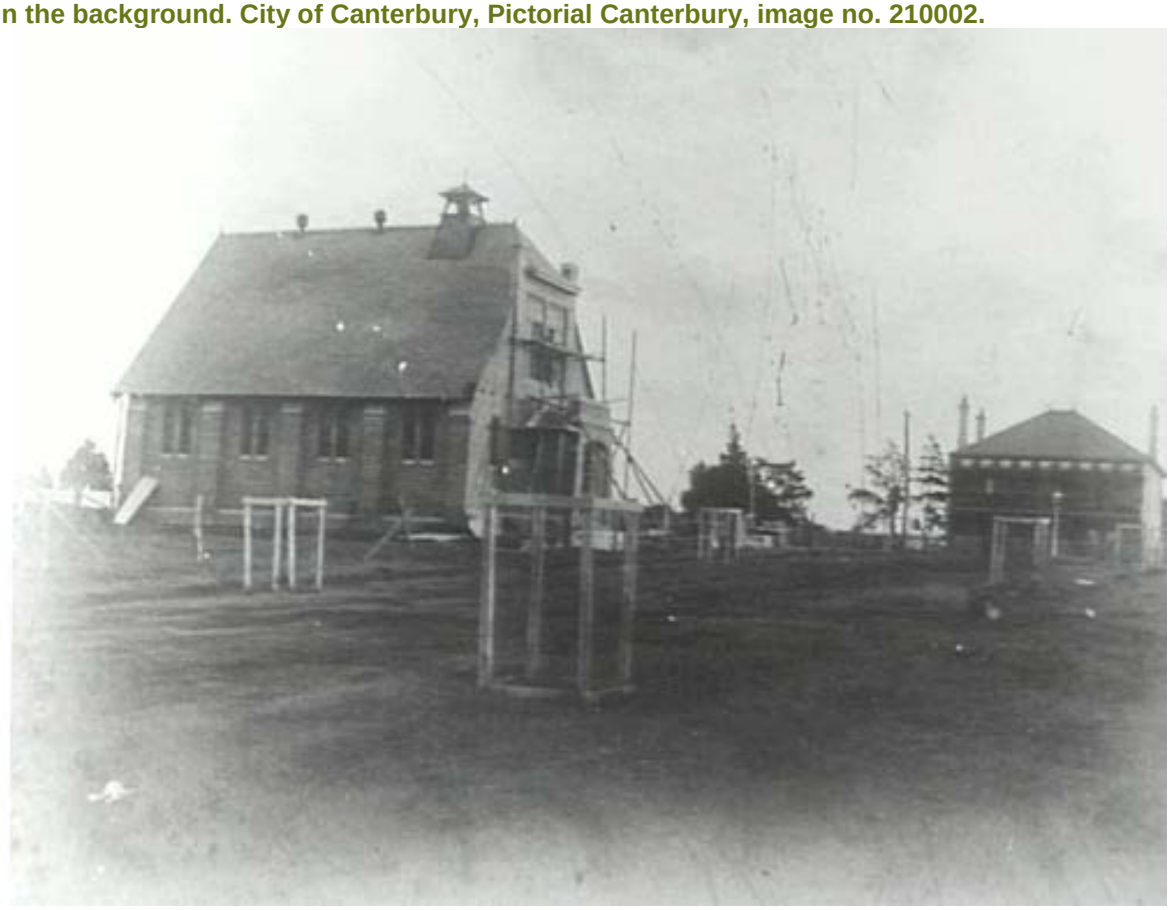
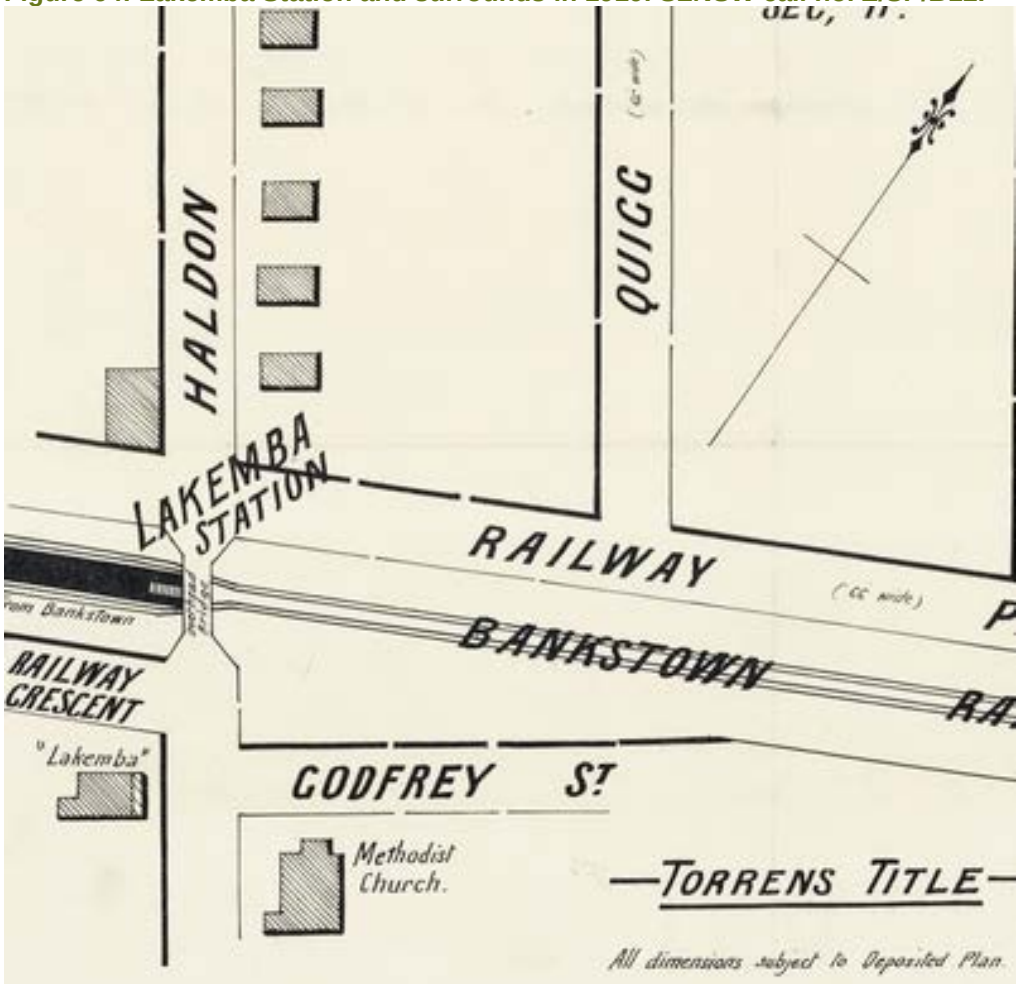


Figure 64: Lakemba Station and surrounds in 1919. SLNSW call no. Z/SP/B12.



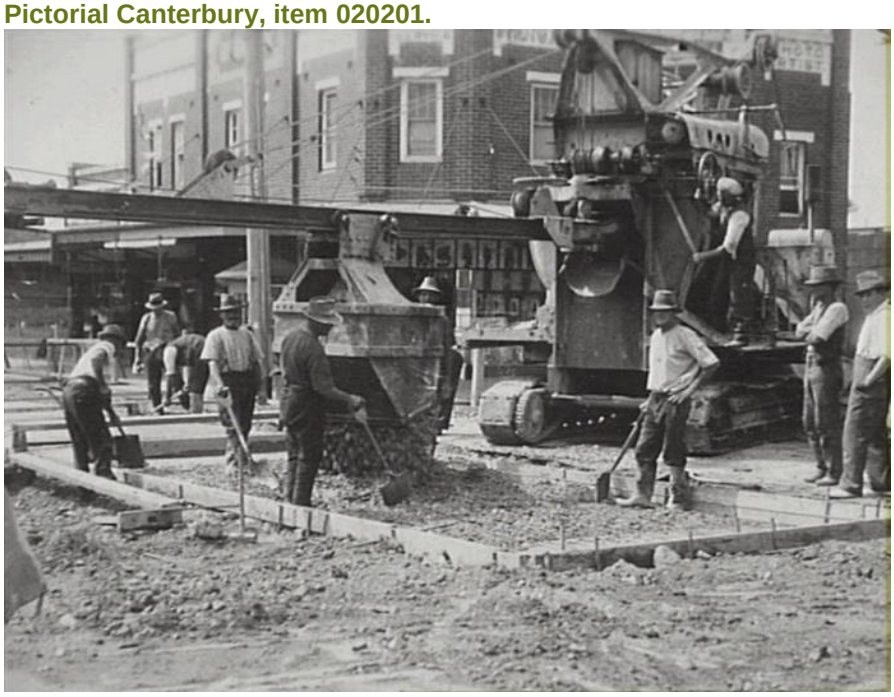
Prior to the arrival of the railway, the surrounding area consisted predominantly of bushland dotted with the occasional small homestead. Early industry included a tannery in Wangee Road, charcoal burning and brickmaking.[76] Commercial nurseries, such as Horton's, and small poultry farms, were also located throughout the area. A piggery was originally located on Haldon Street.[77]

Land values, however, rose dramatically after the construction of Lakemba Station, and shopfronts on Haldon Street were highly sought after by the mid-1920s (Figure 65). In 1932 the Chamber of Commerce (established in 1922), suggested that Haldon Street be concreted, as befitting its status as a busy commercial street (Figure 66).

[76] Jervis 1951: 92.
[77] City of Canterbury Library "Lakemba NSW" Accessed 8 July 2016.

Figure 65: Lakemba c.1920, looking south down Haldon Street from the junction with The Boulevarde. Bankstown Library Collection via Pictorial Canterbury, item 020214.

Figure 66: Lakemba c.1932, concreting Haldon Street. Bankstown Library Collection via Pictorial Canterbury, item 020201.



Lakemba Station

Lakemba Station was opened on 14 April 1909. The original station at Lakemba had an island platform with entrance steps from the Haldon Street overbridge. A small timber station building with a ticket and parcels office was at the Belmore end with a small signal frame on the Bankstown side of the building (Figure 67).

On 24 December 1919, a new brick platform building with cantilever awnings replaced the earlier timber structure (Figure 68) and a signal box was opened at the Bankstown end of the station.

The station was modified for electrification in 1926 and a haunched beam footbridge with overhead booking office erected (Figure 69).[78] The booking office was demolished after fire damage and replaced by a modern metal and glass structure in 2002.

Figure 67: Lakemba Station in c.1910. Bankstown Library Collection via Pictorial Canterbury, items 020204(L) and 020215 (R).

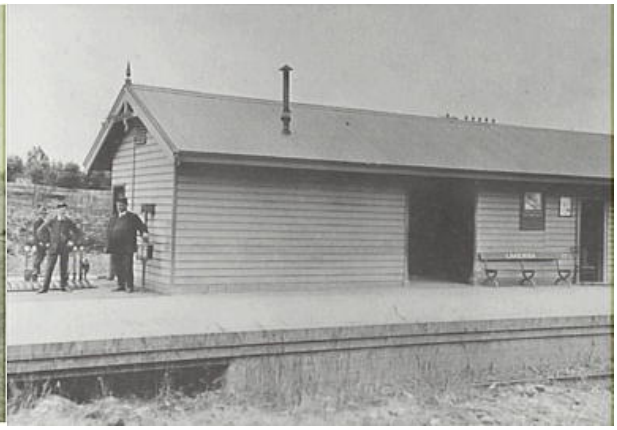
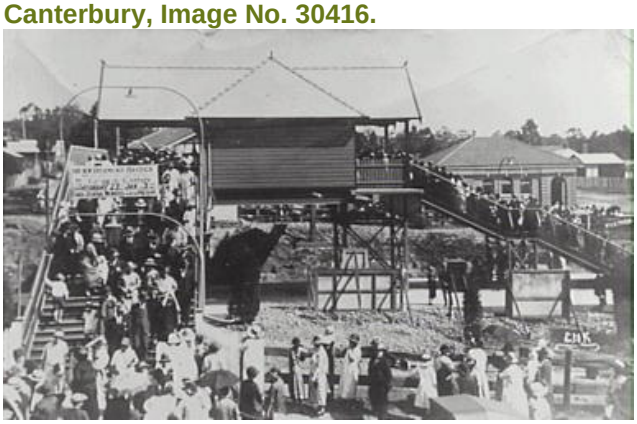


Figure 68: Lakemba Station c.1920. Source National Library of Australia nla.pic-vn4543845-v.

Figure 69: Opening of the overhead bridge. City of Canterbury Library Collection via Pictorial Canterbury, Image No. 30416.



Wiley Park

The present-day suburb of Wiley Park was partially located within 50 acres granted to Johnson (bounded by Defoe Street, Hillcrest Street, King Georges Road and Punchbowl Road). A potter by trade, Johnson was one of the few grantees in the area to live on his grant, named "Pipemaker's Hall".[79] Johnson made a living producing clay pipes made from the white clay found near the property. When Johnson died in 1824, the farm was granted to John Anslep. Neighbouring properties included T. R. O'Brien's "Faux's Farm" (50 acres), 30 acres to T. Salmon and 100 acres to Richard Palmer (Figure 70). Anslep did not occupy the property himself, but leased it to Benjamin Maddocks, who was involved in the clay pipe industry for a short time.

Woodcutting continued to be a lucrative business in the area, with a number of woodcutters moving into the area in the 1860s, including Frederick Pobje, who worked Anslep's grant. These workers lived in slab houses and formed the nucleus of a pioneer settlement. [80]

Wiley Park itself was originally part of a 60 acre grant to Robert Wilkinson dating 1832. The Wiley family obtained the land in 1862. In 1895 John F. Wiley bequeathed 20 acres of the land to

[78] State Heritage Inventory 'Lakemba Railway Station Group' Accessed 8 July 2016.
[79] Madden and Muir 1985.
[80] *Ibid*.

Canterbury Council, to be kept as a new park (Figure 71). As there were few residents in the area at this time, many councillors objected to accepting the land due to the cost of its upkeep.[81]

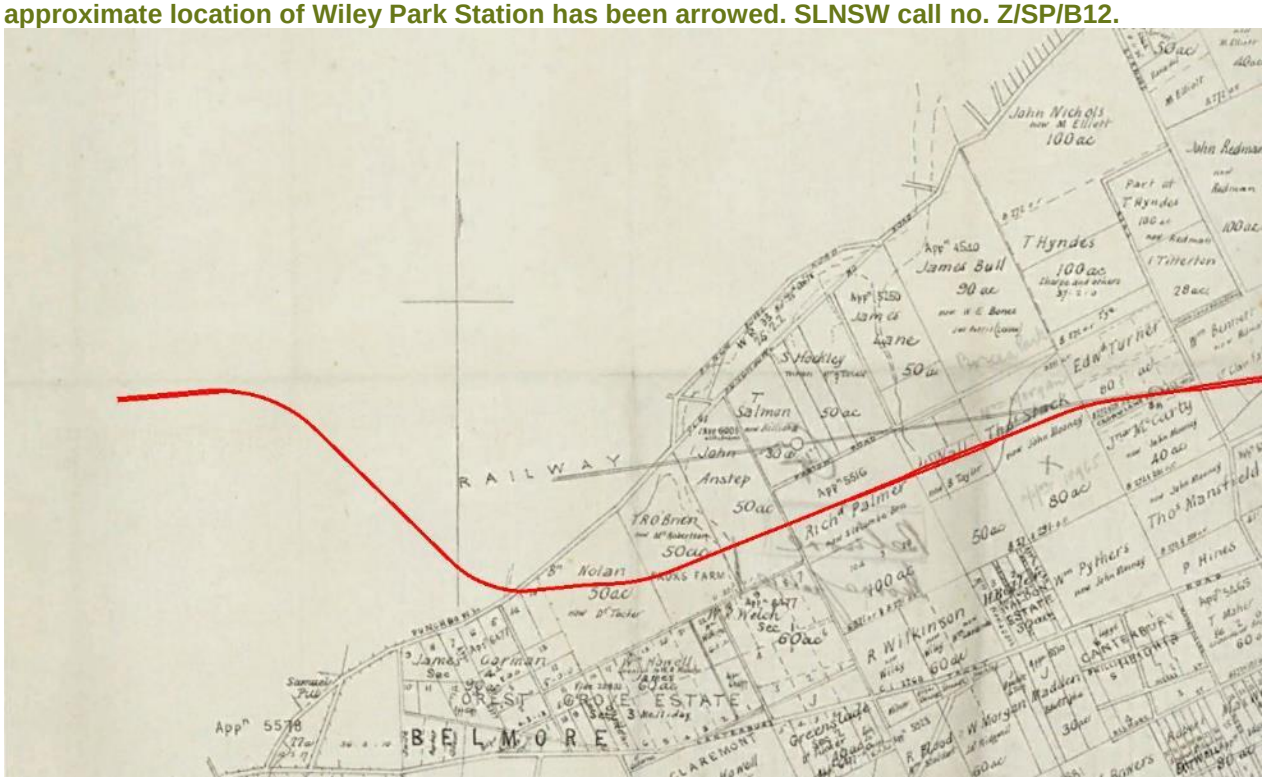
The suburb became known as Wiley Park after the railway was constructed in 1938, following an increase in the population of the area (Figure 72). The new station was constructed on Wiley's Avenue (near King George's Road), which ran from Wiley's original property to the intersection of Canterbury Road and Punchbowl Road (Figure 73).[82] Wiley Park is a predominantly residential area, as can be seen in a 1943 aerial photograph of the area surrounding the station (Figure 74), with a small shopping strip developing on King George's Road in the early twentieth century.

Wiley Park Station

Wiley Park Station was opened on 19 June 1938, much later than other stations on the line. The station was constructed to service growing suburban development in the area during the 1930s and accommodate the need for an interchange at King Georges Road. The station was financed and constructed by the local council (Canterbury Council) and handed over to the NSW Government Railways after completion.

The station was built with an overhead booking office as the major building with ramps leading down to the two side platforms and their small platform shelters (Figure 73). The building on the Up platform appears to have been rebuilt in recent years, and the interior of the booking office has been refurbished.[83]

Figure 70: Undated plan showing approximate alignment of the proposed railway. The approximate location of Wiley Park Station has been arrowed. SLNSW call no. Z/SP/B12.



[81] City of Canterbury Library history pages 'Wiley Park NSW' accessed 10 July 2016.
[82] *Ibid*.
[83] State Heritage Inventory 'Wiley Park Railway Station group' Accessed 8 July 2016.

Figure 71: Men constructing a playground at Wiley Park, c.1920. Bankstown City Library Collection via Pictorial Canterbury, image no. 20203.

Figure 72: Looking south down Denman Avenue, c. 1940s. City of Canterbury, Pictorial Canterbury, image no. 200212.

Figure 73: Wiley Park overhead booking office. Undated photograph. State Heritage Inventory: Wiley Park Railway Station Group".

Figure 74: Wiley Park Station in 1943. Lands and Property Information, SIX Maps.

Punchbowl

The last group of farms to be granted in the Punchbowl area, the “western farms” were granted to William and Henry Howell. Immediately east of the Howell grants was the farm of William Bruce and James Greenslade, who rapidly sold the property to William Richard Welch.[84] At this time, the area was known as Belmore.

In the late 1830s Welch consolidated his farm with the neighbouring property of William Howell, creating his “Forest Grove Farm”. Welch had established a nursery in Pitt Street, Sydney around 1817, and was known as a nurseryman, seedsman and gardener. The Forest Grove farm operated as a large market garden and orchard, watered by large dams located between present-day Beauchamp and Rawson Streets. The Welch’s occupied a cottage on the property, located opposite the end of present-day Tucker Street, south of Wiley Park Station, for the next 35 years (marked as ‘the homestead’ on Figure 75).[85]

In 1841 James Gorman, a publican, purchased 96 acres adjacent to Forest Grove farm (Figure 75). Numerous ironbark trees grew on the property, which became known as “Iron Bark Farm”.[86] After Gorman's death the farm was leased as a grazing run to Henry Kelly who owned extensive property north of Georges River Road.

The population of the area grew slowly until the Canterbury Road was cut through from the Cooks River to join the Punch-Bowl Road in 1855. Timber felling continued to be a lucrative business in the region.

In 1874 Gorman and Welch’s properties were purchased and consolidated by George Alfred Tucker. The possibility of a railway line in the district encouraged numerous land owners to subdivide, and Tucker’s property became known as “Dr Tucker’s Model Farm” when it was subdivided in 1880 (Figure 75 and Figure 79). Many of the allotments were purchased by other land speculators, and Welch’s market gardens were neglected.[87]

As the terminus of the 1895 railway line had been called “Belmore”, when the extension of the line to Bankstown was opened in 1909, a new name had to be found for the railway station serving the district which had been called “Belmore”. “Punch bowl”, the name given to the ford where the George’s River road crossed the Cook’s River, was an old name in the region. The railway station became known as Punchbowl, and the surrounding area also became known by this name (Figure 82).[88]

In 1909, with the opening of the railway line imminent, Arthur Rickard subdivided a portion of the Forest farm into the Emerald Hills Estate (Figure 77). At this time a single house was located on Matthews Street (Figure 77). By 1915, the Sydney Morning Herald was claiming 'The climatic conditions, especially in the district of Punchbowl... are of the best, and many a working man and his family who were once cooped up in the overcrowded suburbs immediately surrounding the city... have been able to secure their little cottage, with plenty of room to keep a few fowls and a vegetable garden large enough to more than supply the family with vegetables free of cost all the year round. The children... have now plenty of room to run about and to drink in the health-giving qualities derived from the pure air obtainable on the Bankstown Line'. Further subdivision of Dr Tucker's old Estate took place between 1912 and 1921, while land further west was settled in the 1920s.[89]

[84] Madden and Muir 1985.
[85] Madden and Muir 1985.
[86] *Ibid*.
[87] *Ibid*
[88] *Ibid*
[89] *Ibid*

Throughout the 1920s and 30s, more new buildings were built in the Canterbury Municipality than in any other local government area in Sydney, despite the onset of the Depression. Despite this electricity and sewerage were late the region.

Figure 75: Plan of Forest Grove, Dr Tucker's Model Farm, Punchbowl, 1880. Lesley Muir via Pictorial Canterbury, item 030245.

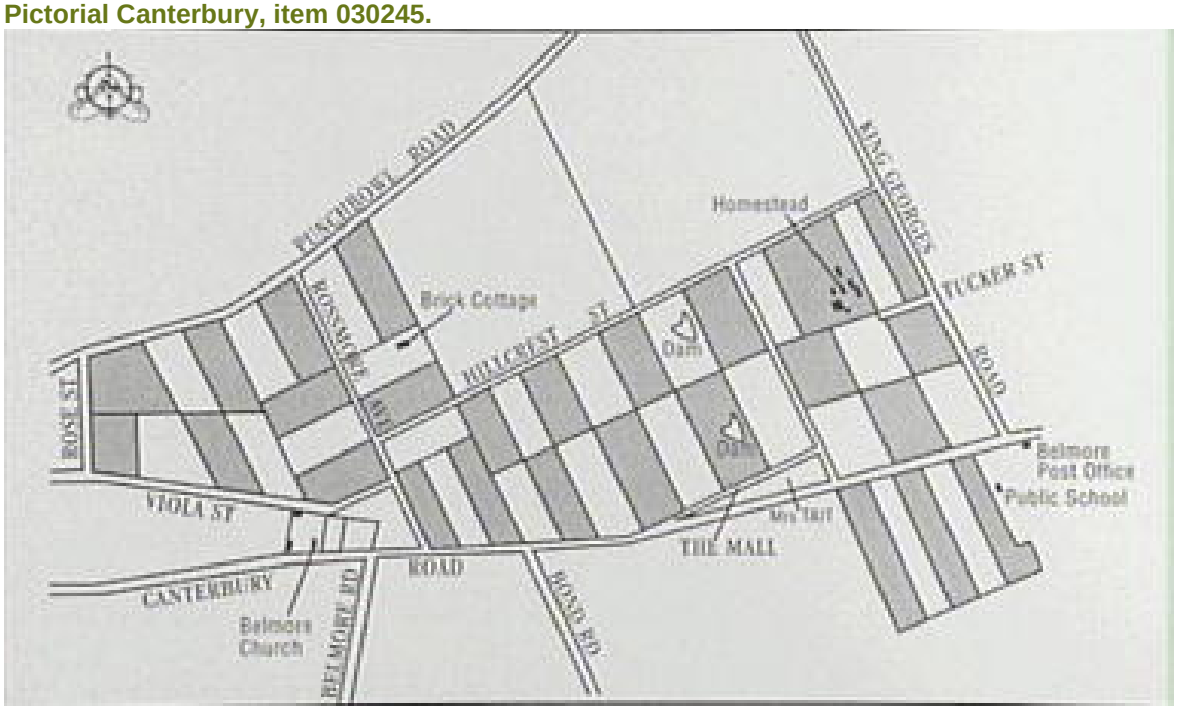


Figure 76: Undated plan showing approximate alignment of the proposed railway. The approximate location of Punchbowl Station, within allotment 14, has been arrowed. SLNSW call no. Z/SP/B12.

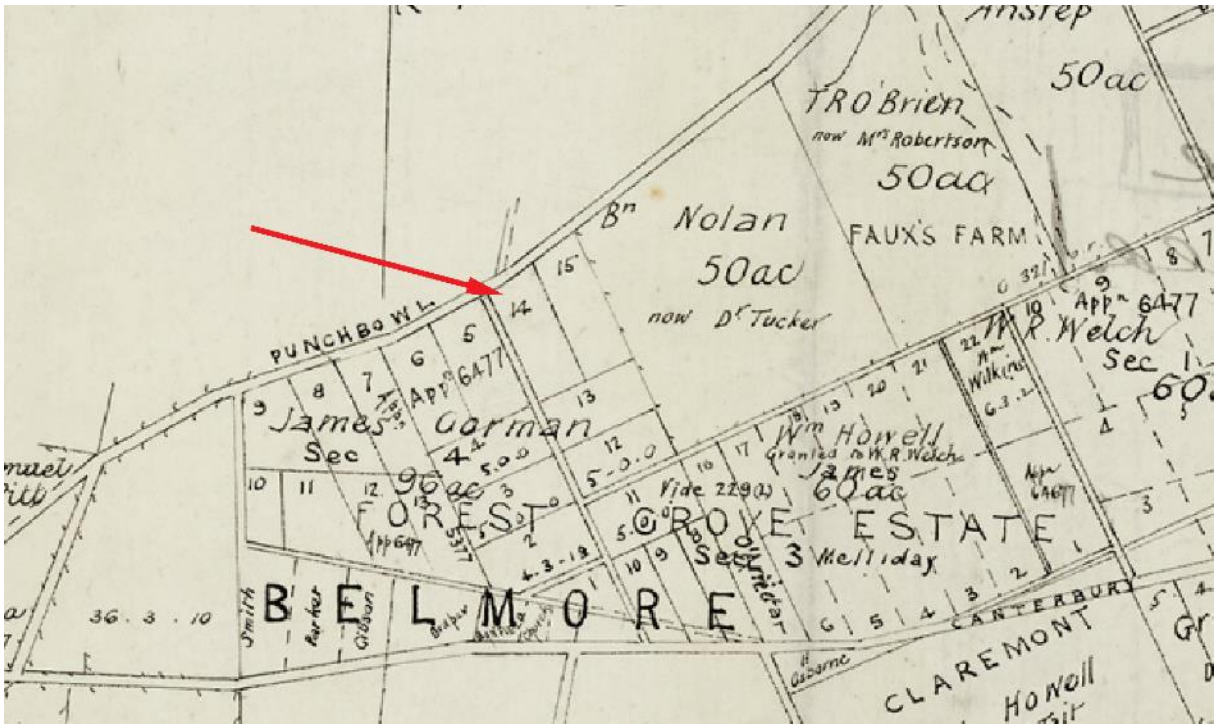


Figure 77: The Emerald Hills subdivision, Punchbowl. SLNSW call no. Z/SP/B12.

Punchbowl Station

Punchbowl Station was opened along with the line extension on 14 April 1909 (Figure 78), at the same time as Bankstown and Lakemba. The contract for construction of station buildings was awarded to G Leggo of Paddington.[90]

A goods siding was built at the station in 1919 (removed 1981), and a station building awning was added in 1924. The Bankstown Line was electrified in 1926, and in the twenties and thirties, the line was one of the busiest in Sydney. Wiley Park Station opened in 1938 to help deal with the influx of commuters.

In 1929, an overhead booking office was built, the platforms were lengthened and the stairway to the Punchbowl Road overbridge was removed. There were further developments in the 1940s, with the construction of a new lamp room and a new parcels office.[91]

A notable railway development in proximity of the station was the opening of an electric train depot in 1926. The depot closed in 1995.

Figure 78: Punchbowl Station c.1909. City of Canterbury Library, Pictorial Canterbury, image no. 15073 ns.

3.2.7 Bankstown

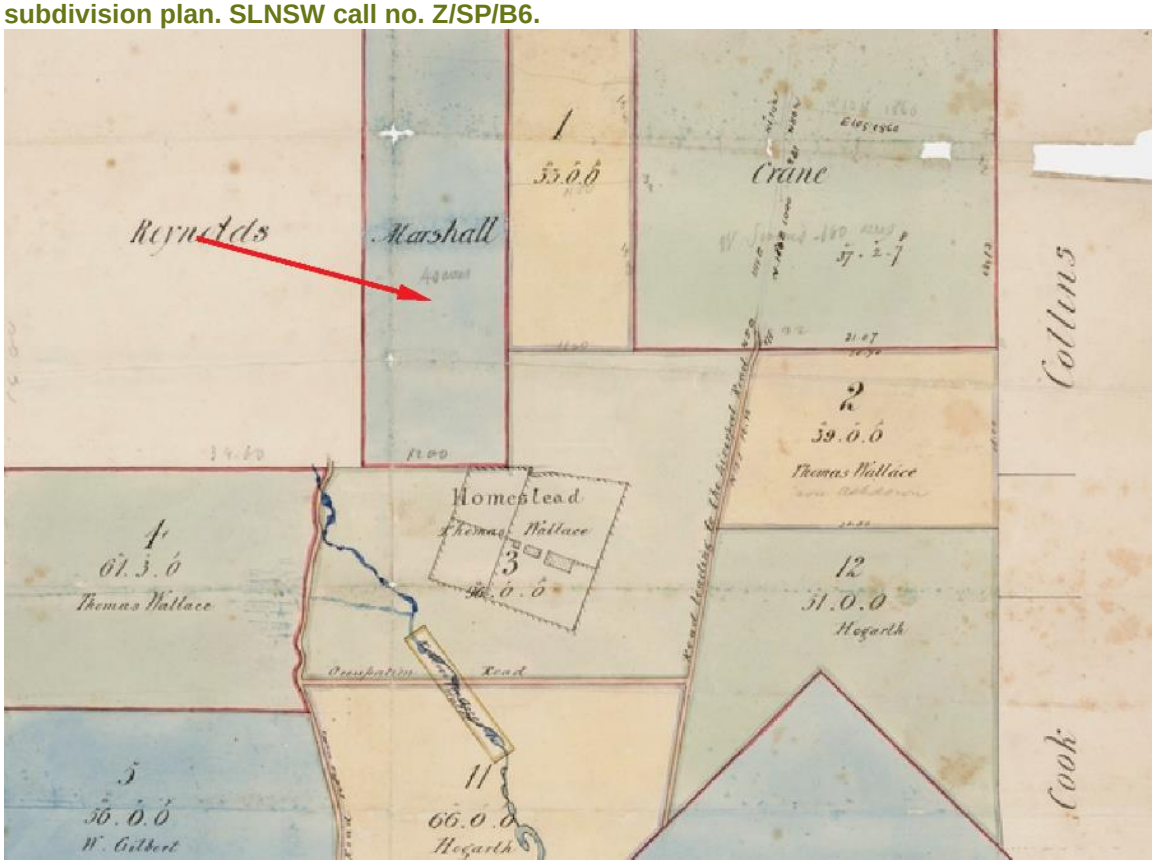
In 1795, Matthew Flinders and George Bass explored the Georges River beyond what had been previously surveyed, and reported favourably to Governor Hunter on the region. In 1798, after visiting the region, Governor Hunter selected a site near the Georges River for a town, naming it “Banks Town”. The town was named after Sir Joseph Banks (1743-1820), the botanist that sailed with Captain James Cook.

[90] State Heritage Inventory “Punchbowl Railway Station Group” Accessed 10 July 2016.
[91] *Ibid*

By 1828 over 2800 hectares had been granted in the districts of Botany Bay, Cooks River and Banks' Town, but only 360 hectares had been cleared and 240 hectares cultivated. Figure 79 indicates that few grantees were occupying their land, with only Thomas Wallace's grant occupied at the time. Wallace, a farmer, died at his property in 1891.[92] The main access roads were the Liverpool and Georges River Roads. The most frequently used river crossing was where the Georges River met the Cooks River at a wide shallow and almost circular valley called The Punch Bowl.

Bankstown's limited population declined during the 1850s gold rush, as men deserted Sydney for the goldfields. Despite the low population, those that remained built churches, schools and a post office. Like the surrounding areas of Canterbury and Belmore, the region was timbered, and consisted of large farms containing scattered homesteads. An 1897 plan of the Adelaide Park Estate subdivision depicts what is likely to have been the common arrangement, a residence with outbuildings on a large block of land (Figure 80). The economy of the region was based on timber cutting, small scale saw-milling, brick and pottery making, the occasional slaughter yard and farming.[93]

Figure 79: Approximate location of present-day Bankstown Station. Undated Bankstown subdivision plan. SLNSW call no. Z/SP/B6.



Bankstown Station was opened in 1909, stimulating a building and population boom. Previously, the town centre had been established at the intersection of Liverpool Road and Chapel Street, located approximately one kilometre to the north. Land in the vicinity of the station became increasingly valuable. The 1909 Greenacre Park Estate subdivision plan (the first subdivision in the area) indicates whilst a number of lots north of the railway line were occupied at the time, including an accommodation house and shop while the southern side of the new line was undeveloped (Figure 89). By 1912, additional lots were offered for sale. Between 1920 and 1930 around 22000 new building sites were created by subdividing thousands of acres of rural land. Speciality stores were being built by the mid-1920s. Despite this growth, much of the region retained its rural nature. A

[92] New South Wales Government Gazette, 10 Feb 1891. Accessed via NLA Trove, 10 July 2016.
[93] Rosen 1996: 72, 78-79.

series of photographic panoramas showing the construction of homes and roads in the Bankstown area were completed between 1917 and 1946 by EB Studios. The photographs suggest that the area remained rural into the early to mid-twentieth century (Figure 82; Figure 83).

Figure 80: The Adelaide Park Estate, with the line of the proposed railway. SLNSW call no. Z/SP/B6.

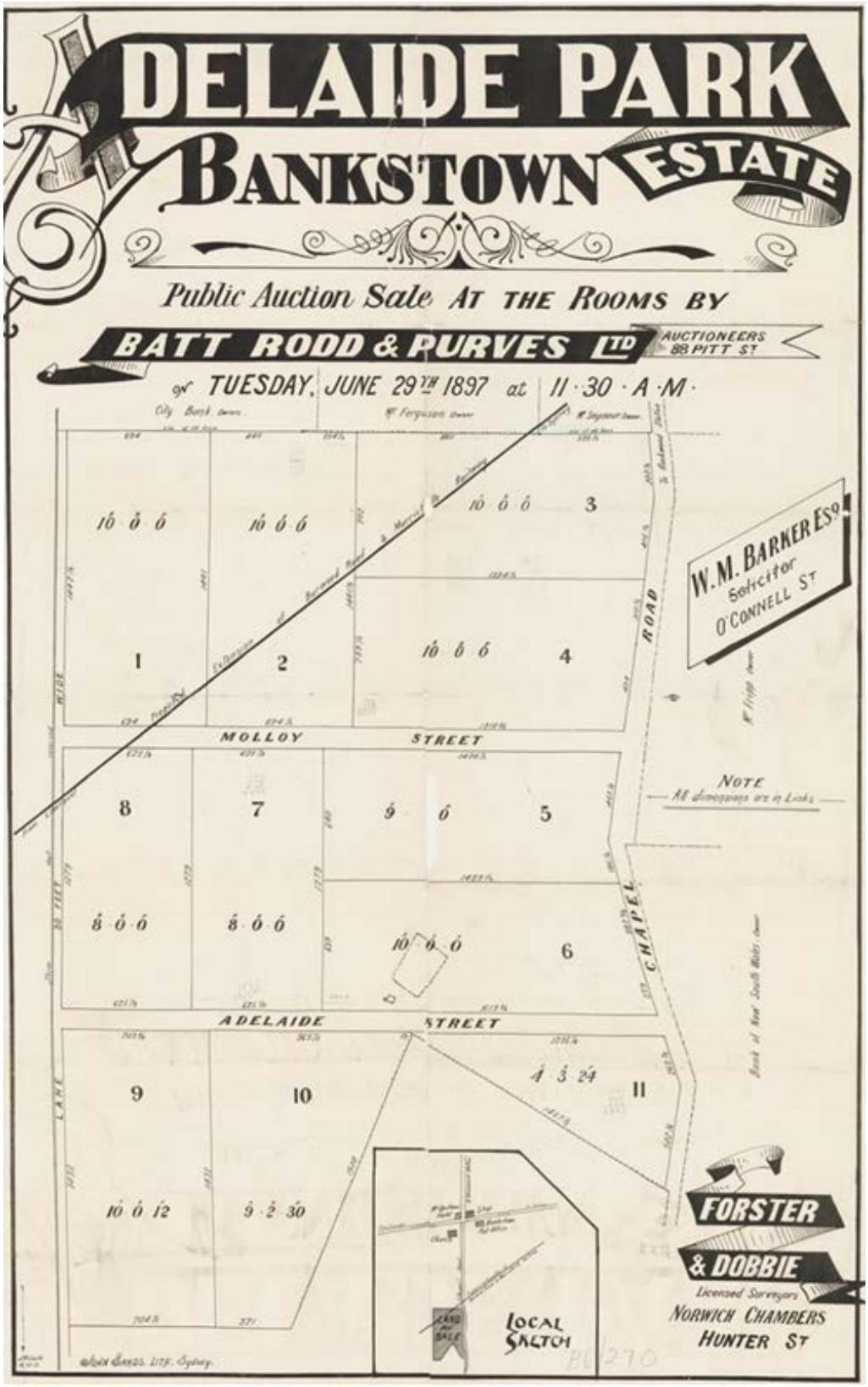


Figure 81: Detail of 1909 plan of the Greenacre Park subdivision plan, showing that a number of lots north of the railway line were occupied at the time, including an accommodation house and shop. State records of NSW, Bankstown Subdivision Plans, call no. Z/SP/C8.

Figure 82: Detail of panorama showing a family inspecting a recently cleared lot. PIC P865/236/6 LOC Nitrate store.

Figure 83: Clearing land for the Bankstown Soldiers Settlement, 1921. State Records NSW, item 8095_a016_a016000001.

Bankstown Station

In February 1901, it was proposed that the Sydenham to Belmore line could be extended to Chapel Road, Bankstown, at a reasonable cost (after having been previously dismissed as too expensive). In 1906 construction on the extension of the railway line commenced, and the new line opened on 14 April 1909. The line was further extended to Regents Park in the 1920s, making it part of a loop line through Lidcombe. Its justification by then being the servicing of suburban development.[94]

The construction contract for the Belmore to Bankstown section was awarded to Monie Bro on 13 November 1907. Bankstown Station was opened as a terminal on 14 April 1909, with Lakemba and Punchbowl stations were also opened at the same date (Figure 84, Figure 85, Figure 86, Figure 87). The extension of the line to Bankstown triggered a huge real estate boom in the area from 1909 until the late 1920s. [95]

The original platform at Bankstown was 145 metres in length (Figure 87 and Figure 88). The tender for the construction of the brick platform buildings was awarded to George Albert Leggo in August 1908. A contract was also awarded around this time for the construction of a Station Master's Residence, which was located on the northern side of the tracks, near the goods yard and a goods shed built to the west of the old Chapel Road overbridge (Figure 89).[96]

During 1910 a single tier water tank on a steel stand was erected on the south side, at the western end of the platform, near the overbridge, for the use of locomotives off terminating trains. The tank was removed in c1970s. In the early 1920s, a pillar water tank and ash pit were provided for the Up track locomotives.[97]

As Bankstown developed into a major centre, the station was extended and modified. A parcels office was opened in 1915 (Figure 90; replaced by a new office in 1925), and platform extensions were constructed when the line was electrified in 1926.[98] In 1948 the Overhead Booking Office, footbridge and existing former Parcels Office were constructed (Figure 91).

Figure 84: Opening of Bankstown Station in 1909. Source: State Records of NSW, 17420_a014_a0140001092.

Figure 85: The opening of the Bankstown Station in 1909. Source: State Records of NSW, 17420_a014_a014001091.

[94] State Heritage Inventory "Bankstown Railway Station Group" Accessed 10 July 2016.
[95] *Ibid*.
[96] *Ibid*.
[97] *Ibid*.
[98] *Ibid*

Figure 86: The opening of the Bankstown Station in 1909. Source: State Records of NSW, 17420_a014_a0140001093.

Figure 87: Bankstown Station in 1909. Source: State Records of NSW, 17420_a014_a0140001094.

Figure 88: Bankstown Station, 1910. State Records NSW, item 17420_a014_a0140001090.

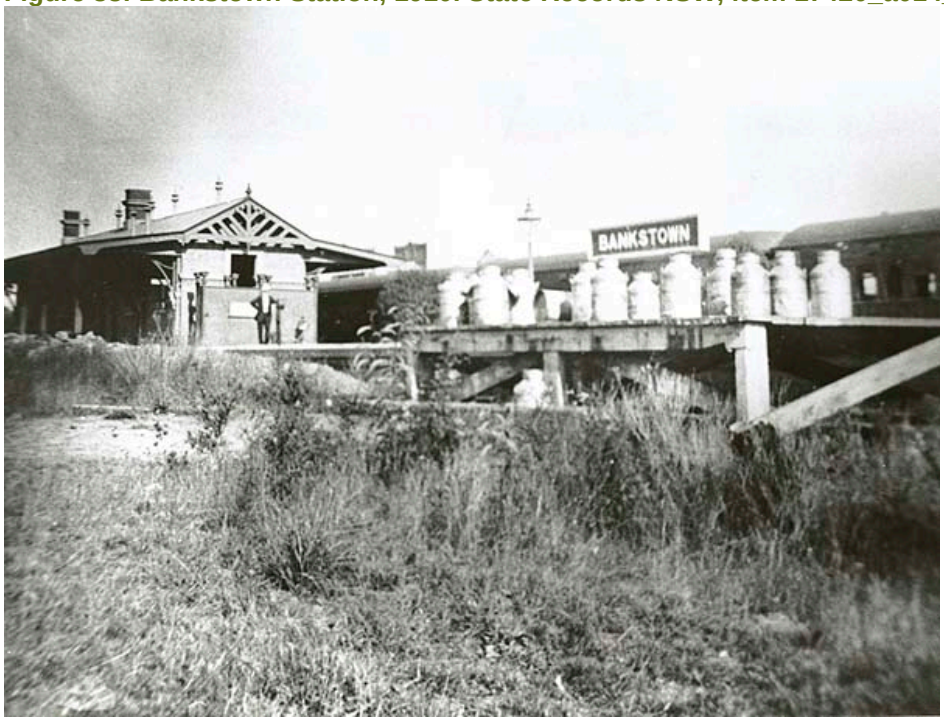


Figure 89: Detail of 1916 plan of the Bankstown Township Estate, illustrating a station masters residence and goods yard. State records of NSW, Bankstown Subdivision Plans, call no. Z/SP/C8.

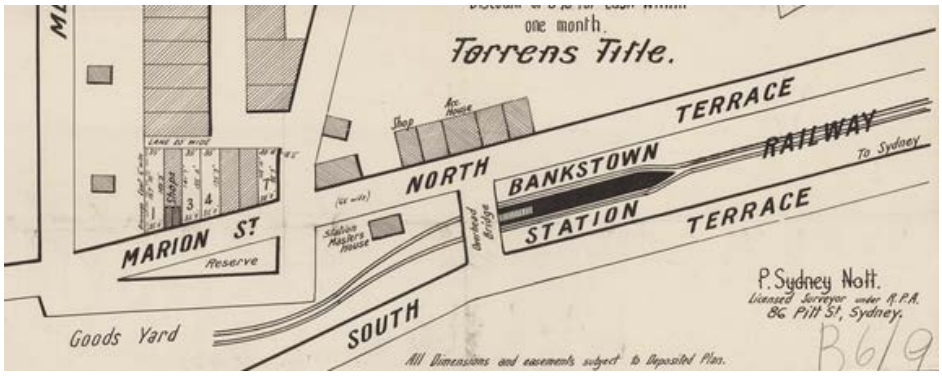


Figure 90: 1923 plan of the platform building and parcels office. Railcorp archive.

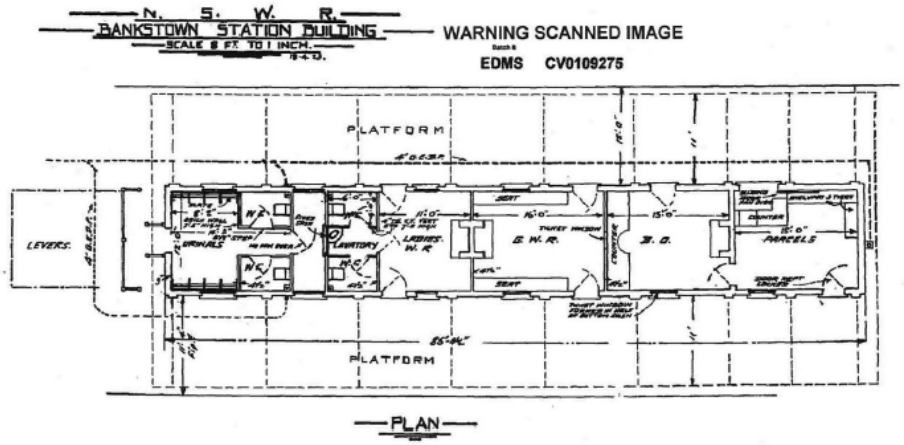
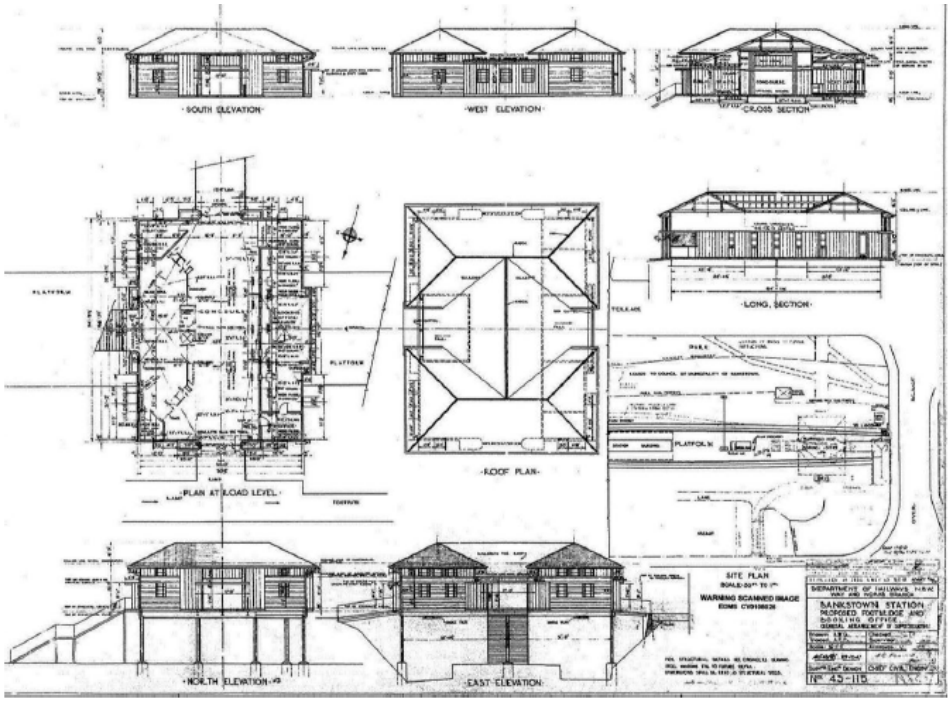


Figure 91: 1947 plans and elevation for the proposed footbridge and booking office. Railcorp archive.



4. STATUTORY CONTEXT

An overview of heritage legislation is provided below along with the register search results applicable to the study area. This outlines the statutory heritage constraints applicable to the project and provides a base format for the heritage assessment in Section 5.0 of this report.

4.1 Heritage legislation

There are several items of legislation, heritage registers and heritage management guidelines that are relevant to the project. A summary of these Acts and the potential legislative implications for the project follow.

4.1.1 Environmental Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) provides a legislative framework for the protection and management of matters of national environmental significance, that is, flora, fauna, ecological communities and heritage places of national and international importance. Heritage items are protected through their inclusion on the World Heritage List, Commonwealth Heritage List or the National Heritage List.

The EPBC Act stipulates that a person who has proposed an action that will, or is likely to, have a significant impact on a World, National or Commonwealth Heritage site, must refer the action to the Department of the Environment and Energy and Minister for the Environment (hereafter Minister). The Minister will then determine if the action requires approval under the EPBC Act. If approval is required, an environmental assessment would need to be prepared. The Minister would approve or decline the action based on this assessment.

A significant impact is defined as “an impact which is important, notable, or of consequence, having regard to its context or intensity.” The significance of the action is based on the sensitivity, value and quality of the environment that is to be impacted, and the duration, magnitude and geographic extent of the impact. If the action is to be undertaken in accordance with an accredited management plan, approval is not needed and the matter does not need be referred to the Minister.

Commonwealth Heritage List

The Commonwealth Heritage List has been established to list heritage places that are either entirely within a Commonwealth area, or outside the Australian jurisdiction and owned or leased by the Commonwealth or a Commonwealth Authority. The Commonwealth Heritage List includes natural, Indigenous and historic heritage places which the Minister is satisfied have one or more Commonwealth Heritage values.

National Heritage List

The National Heritage List has been established to list places of outstanding heritage significance to Australia. It includes natural, historic and Indigenous places that are of outstanding national heritage value to the Australian nation.

4.1.2 New South Wales Heritage Act 1977

The NSW *Heritage Act 1977* (Heritage Act) provides protection for items of ‘environmental heritage’ in NSW. ‘Environmental heritage’ includes places, buildings, works, relics, movable objects or precincts considered significant based on historical, scientific, cultural, social, archaeological, architectural, natural or aesthetic values. Items considered to be significant to the State are listed on the State Heritage Register and cannot be demolished, altered, moved or damaged, or their significance altered without approval from the Heritage Council of NSW.

Archaeological relics

The Heritage Act also provides protection for 'relics', which includes archaeological material or deposits. Section 4 (1) of the Heritage Act (as amended in 2009) defines a relic as:

> *"...any deposit, artefact, object or material evidence that:*
>
> *(a) relates to the settlement of the area that comprises New South Wales, not being Aboriginal settlement, and*
> *(b) is of State or local heritage significance"*

Sections 139 to 145 of the Heritage Act prevent the excavation or disturbance of land known or likely to contain relics, unless under an excavation permit. Section 139 (1) states:

A person must not disturb or excavate any land knowingly or having reasonable cause to suspect that the disturbance or excavation will or is likely to result in a relic being discovered, exposed, damaged or destroyed unless the disturbance is carried out in accordance with an excavation permit.

Excavation permits are issued by the Heritage Council of NSW, or its Delegate, under Section 140 of the Heritage Act for relics not listed on the State Heritage Register or under Section 60 for relics listed on the State Heritage Register. An application for an excavation permit must be supported by an Archaeological Research Design (ARD) and Archaeological Assessment prepared in accordance with the NSW Heritage Division archaeological guidelines. Minor works that would have a minimal impact on archaeological relics may be granted an exception under Section 139 (4) or an exemption under Section 57 (2) of the Heritage Act.

Definition of works

The Heritage Act defines 'works' as being in a separate category to archaeological 'relics'. 'Works' refer to past evidence of infrastructure. 'Works' may be buried, and therefore archaeological in nature, however, exposure of a 'work' does not trigger reporting obligations under the Act. The following examples are commonly considered to be 'works': former road surfaces or pavement, kerbing, evidence of former infrastructure (such as drains or drainage pits where there are no relics in association), tram and train tracks and ballast and evidence of former rail platforms.

As the Sydney Metro City and Southwest project is subject to Part 5.1 (State Significant Infrastructure) of the EP&A Act, excavation or exception permits would not be required.

State Heritage Register

The State Heritage Register was established under Section 22 of the Heritage Act and is a list of places and objects of particular importance to the people of NSW, including archaeological sites. The State Heritage Register is administered by the Heritage Division of the Office of Environment and Heritage (OEH) and includes a diverse range of over 1500 items, in both private and public ownership. To be listed, an item must be deemed to be of heritage significance for the whole of NSW.

Section 170 registers

Under the Heritage Act all government agencies are required to identify, conserve and manage heritage items in their ownership or control. Section 170 of the Heritage Act requires all government agencies to maintain a Heritage and Conservation Register that lists all heritage assets and an assessment of the significance of each asset. They must also ensure that all items on its list are maintained with due diligence in accordance with State Owned Heritage Management Principles approved by the Government on advice of the NSW Heritage Council. These principles serve to protect and conserve the heritage significance of items and are based on NSW heritage legislation and guidelines.

4.1.3 Environmental Planning and Assessment Act 1979

The EP&A Act establishes the framework for cultural heritage values to be formally assessed in the land use planning, development consent and environmental impact assessment processes. The EP&A Act requires that environmental impacts are considered prior to land development and the level of significance of the impact assessed; this includes impacts on cultural heritage items and places as well as archaeological sites and deposits. The EP&A Act also requires that local governments prepare planning instruments (such as LEPs and Development Control Plans [DCPs]) in accordance with the EP&A Act to provide guidance on the level of environmental assessment required.

The study area falls within the boundaries of the Inner West Council Local Government Area (LGA) and the Canterbury-Bankstown Council LGA. The study area is therefore subject to the Marrickville LEP 2011, Canterbury LEP 2012, and Bankstown LEP 2015.

The aim of the LEP's in relation to heritage is to conserve the heritage significance of heritage items and heritage conservation areas, including associated fabric, settings, views and archaeological sites. The LEP's list items of heritage significance within the LGA and specify aims and objectives to be addressed in any development application.

4.2 Applicable heritage listings

4.2.1 Registers search results

Statutory registers provide legal protection for heritage items. In NSW, the Heritage Act and the EP&A Act provide for heritage listings. The State Heritage Register, the s170 registers, and environmental heritage schedules of LEPs are statutory listings. Places on the National Heritage List and Commonwealth Heritage List are protected under the EPBC Act 1999.

A search of all relevant registers was undertaken on 22 June 2016. The results include both heritage items within the project area and a 25-metre visual buffer (the study area). The items are displayed below in Table 7, and maps of the heritage items are provided from Figure 92 to Figure 97 below.

Table 7: Heritage registers search results (with listed railway stations shaded)

Item	Suburb [99]	Significance	Listing	Within project area?
Marrickville Railway Station Group	Marrickville	State	SHR (01186) RailCorp S.170 Heritage and Conservation Register (4801091) Marrickville LEP 2011 (I89)	Yes
Sewage Pumping Station 271	Marrickville	State	SHR (01342) Sydney Water S.170 Heritage and Conservation Register (4571727) Marrickville LEP 2011 (I67)	No
Stone house, including interiors	Marrickville	Local	Marrickville LEP 2011 (I114)	Yes
Stonewalling, terracing and street planting	Marrickville	Local	Marrickville LEP 2011 (I86)	No

[99] Suburbs as per SHI listing

Item	Suburb [99]	Significance	Listing	Within project area?
Dulwich Hill Railway Station Group	Dulwich Hill	Local	RailCorp S.170 Heritage and Conservation Register (4801909)	Yes
South Dulwich Hill Heritage Conservation Area	Dulwich Hill	Local	Marrickville LEP 2011 (C29)	Yes
Inter-War Heritage Conservation Area Group—Hollands Avenue; Jocelyn Avenue and Woodbury Street	Dulwich Hill	Local	Marrickville LEP 2011 (C35)	No
Gladstone Hall, including interiors	Dulwich Hill	Local	Department of Health S.170 Heritage and Conservation Register (3540048) Marrickville LEP 2011 (I13)	No
Hurlstone Park Railway Station Group	Hurlstone Park	Local	RailCorp S.170 Heritage and Conservation Register (4802051) Canterbury LEP 2012 (I124)	Yes
Hurlstone Park Railway Underbridge	Hurlstone Park	Local	RailCorp S.170 Heritage and Conservation Register (4805737) Canterbury LEP 2012 (I126)	Yes
Canterbury Railway Station Group	Canterbury	State	SHR (01109) RailCorp S.170 Heritage and Conservation Register (4801100) Canterbury LEP 2012 (I67)	Yes
Canterbury (Cooks River) underbridge	Canterbury	Local	RailCorp S.170 Heritage and Conservation Register (4801568) Canterbury LEP 2012 (I72)	Yes
Canterbury (Cooks River/Charles St) Underbridge - Main Line	Canterbury	Local	RailCorp S.170 Heritage and Conservation Register (5062566)	Yes
Old Sugarmill	Canterbury	State	SHR (00290) Canterbury LEP 2012 (I82)	No
Inter-War Hotel (former Hotel Canterbury)	Canterbury	Local	Canterbury LEP 2012 (I68)	No
Federation Post Office Building (former Canterbury Post Office)	Canterbury	Local	Canterbury LEP 2012 (I66)	No

Item	Suburb [99]	Significance	Listing	Within project area?
Electricity substation no. 275	Canterbury	Local	Ausgrid S.170 Heritage and Conservation Register (3430425)	No
Campsie Railway Station Group	Campsie	Local	RailCorp S.170 Heritage and Conservation Register (4801101) Canterbury LEP 2012 (I40)	Yes
Federation commercial building–Coffill's Buildings	Campsie	Local	Canterbury LEP 2012 (I41)	No
Inter-War Commercial Building–Station House	Campsie	Local	Canterbury LEP 2012 (I42)	No
Inter-War Court House (former) Campsie Court House	Campsie	Local	Canterbury LEP 2012 (I44)	No
War Memorial Clock Tower	Campsie	Local	Canterbury LEP 2012 (I34)	No
Federation house	Campsie	Local	Canterbury LEP 2012 (I61)	No
Federation villa	Campsie	Local	Canterbury LEP 2012 (I62)	No
Belmore Railway Station Group	Belmore	State	SHR (No. 01081) RailCorp S.170 Heritage and Conservation Register (4801084) Canterbury LEP 2012 (I11)	Yes
Post-war bus shelter and public lavatories	Belmore	Local	Canterbury LEP 2012 (I29)	Yes
Federation House(former station master's cottage)	Belmore	Local	Canterbury LEP 2012 (I10)	No
Lakemba Railway Station Group	Lakemba	Local	RailCorp S.170 Heritage and Conservation Register (4801916) Canterbury LEP 2012 (I143)	Yes
Federation weatherboard house	Lakemba	Local	Canterbury LEP 2012 (I144)	No
Inter-War post office building - Lakemba Post Office	Lakemba	Local	Canterbury LEP 2012 (I145)	No
Electricity Substation no. 143	Lakemba	Local	Ausgrid S. 170 Heritage and Conservation Register (3430296)	No

Item	Suburb [99]	Significance	Listing	Within project area?
Wiley Park Railway Station Group	Wiley Park	Local	RailCorp S.170 Heritage and Conservation Register (4801946) Canterbury LEP 2012 (I159)	Yes
Inter-War water pumping station– Lakemba Pumping Station (WP0003)	Wiley Park	Local	Sydney Water S.170 Heritage and Conservation Register (4570136) Canterbury LEP 2012 (I158)	No
Punchbowl Railway Station Group	Punchbowl	Local	RailCorp S.170 Heritage and Conservation Register (4802009) Canterbury LEP 2012 (I155)	Yes
War Memorial and street trees	Punchbowl	Local	Canterbury LEP 2012 (I152)	No
Post-war Civic Building (former Punchbowl Baby Health Centre)	Punchbowl	Local	Canterbury LEP 2012 (I154)	No
Bankstown Railway Station Group	Bankstown	Local	RailCorp S.170 Heritage and Conservation Register (4802067) Bankstown LEP 2015 (I3)	Yes
Bankstown Parcels Office (former)	Bankstown	Local	RailCorp S. 170 Heritage and Conservation Register (4802067) Bankstown LEP 2015 (I4)	Yes
Shop	Bankstown	Local	Bankstown LEP 2015 (I13)	No

4.2.2 Heritage Conservation Areas

The table below provides a summary of the Heritage Conservation Areas (HCA) within the study area. Of the two HCAs identified in Section 4.2.1, South Dulwich Hill HCA is partially located within the project area. Inter-War HCA is located within the 25-metre buffer (study area) and would not be directly impacted by the project.

Table 8: Summary of HCAs located within study area

Item	Suburb	Significance	Listing	Within study area?
South Dulwich Hill Heritage Conservation Area	Dulwich Hill	Local	Marrickville LEP 2011 (C29)	Yes
Inter-War Heritage Conservation Area Group—Hollands Avenue; Jocelyn Avenue and Woodbury Street	Marrickville	Local	Marrickville LEP 2011 (C35)	Yes

4.2.3 Heritage overlays

The following maps provide an overview of the heritage listings applicable to the study area. They have been ordered from east to west, in a city to country direction.

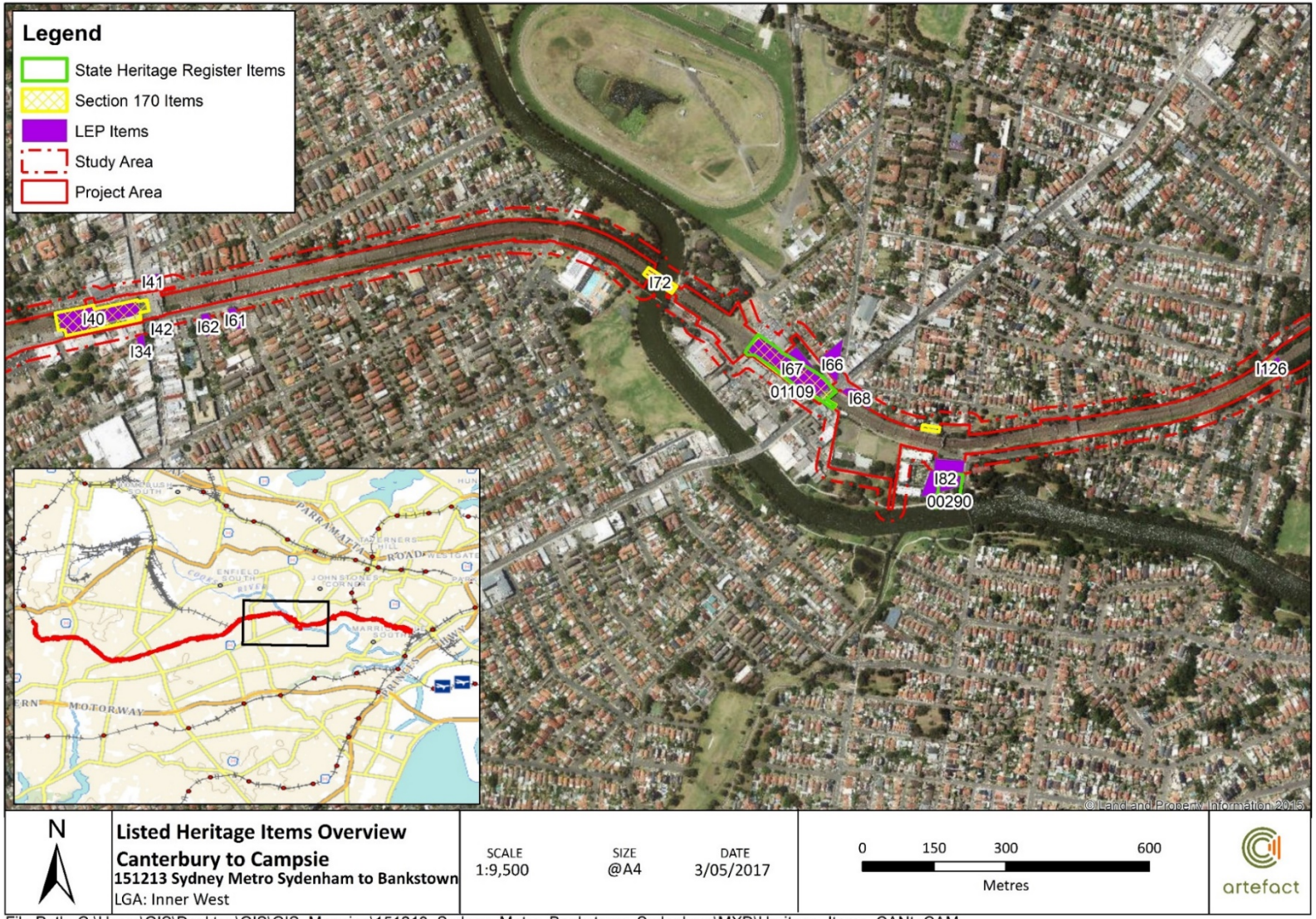
Figure 92: Aerial map showing heritage items within study area: Marrickville

File Path: C:\Users\GIS\Desktop\GIS\GIS_Mapping\151213_Sydney_Metro_Bankstown_Sydenham\MXD\Heritage_Items_SYD

Figure 93: Aerial map showing heritage items within study area: Dulwich Hill to Hurlstone Park

File Path: C:\Users\GIS\Desktop\GIS\GIS_Mapping\151213_Sydney_Metro_Bankstown_Sydenham\MXD\Heritage_Items_DULtoHP

Figure 94: Aerial map showing heritage items within study area: Canterbury to Campsie



File Path: C:\Users\GIS\Desktop\GIS\GIS_Mapping\151213_Sydney_Metro_Bankstown_Sydenham\MXD\Heritage_Items_CANtoCAM

Figure 95: Aerial map showing heritage items within study area: Belmore to Lakemba

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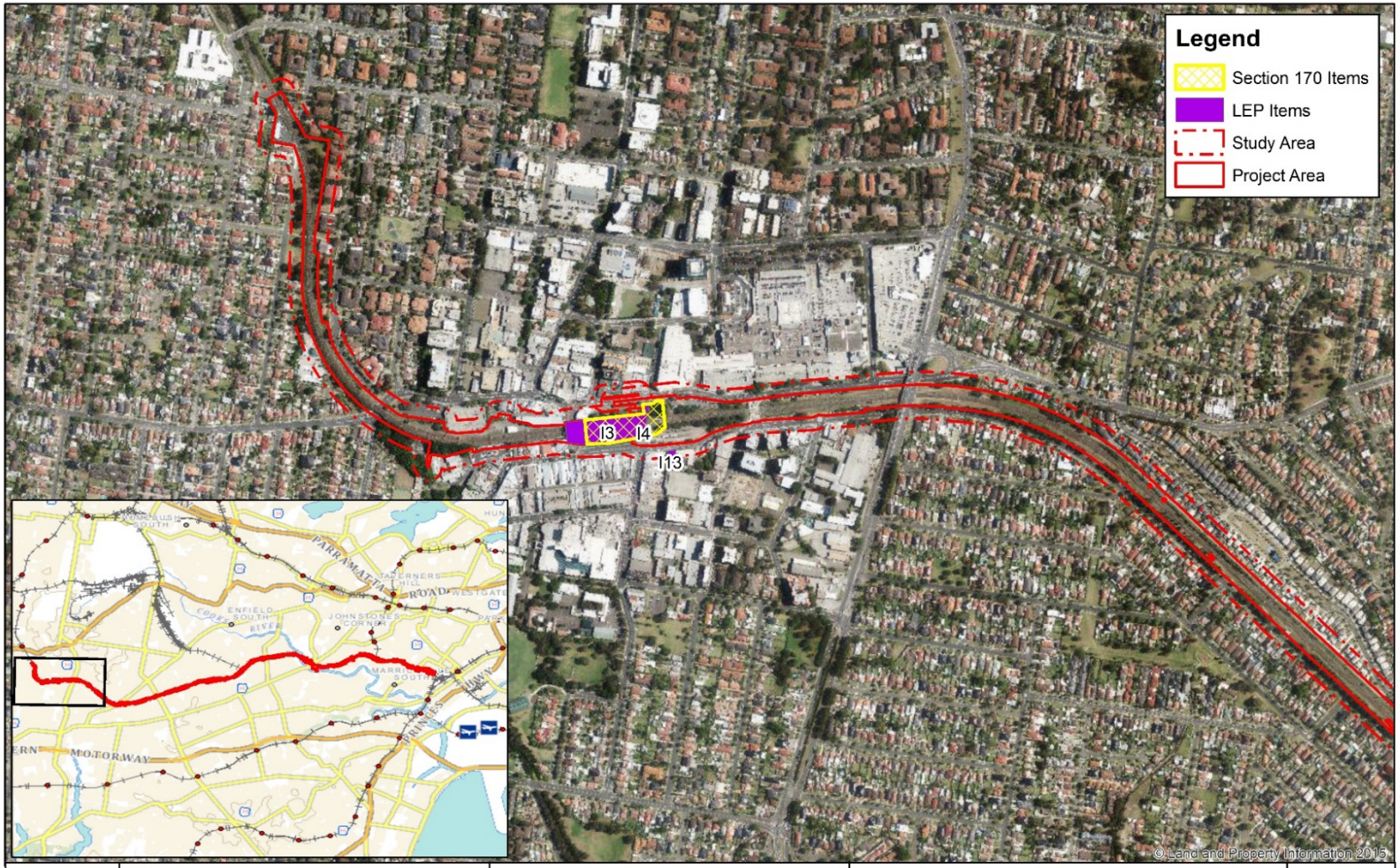
Figure 96: Aerial map showing heritage items within study area: Wiley Park to Punchbowl

File Path: C:\Users\GIS\Desktop\GIS\GIS_Mapping\151213_Sydney_Metro_Bankstown_Sydenham\MXD\Heritage_Items_WPtoPUN

Figure 97: Aerial map showing heritage items within study area: Bankstown



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5. PROJECT DESCRIPTION

This chapter provides a description of the Metro project. The information below provides a planning and design background to assist in understanding the proposed heritage impacts within the project area. Metro requirements and objectives are outlined as well as descriptions, justifications and drawings of the project for each of the ten station catchments constituting the project area. The ten railway station catchments are situated along the Bankstown Line between Marrickville and Bankstown Stations.

5.1 General design

5.1.1 Key features of the project

The key features of the project, once built, are summarised in section 1.2.2. This includes the key features for track and rail system facility works, metro stations, transport network, surrounding development, and ancillary infrastructure and works.

5.1.2 Design principles and guidelines

Design guidelines and standards

Sydney Metro has developed design guidelines, The *Sydney Metro Sydenham to Bankstown Design Guidelines*, to establish the aesthetic standards for the project and respond to strategic directions, urban design strategies, customer needs, and the initiatives of the local councils. The design guidelines provide guidance on:

- the interface between stations and their surrounding locality, including:
  - station entries
  - transport interchange facilities (bicycle facilities, bus stops, kiss-and-ride, taxi ranks and connections to existing transport facilities)
  - landscaping and other public domain elements.
- rail corridor works, rail cuttings and embankments.
- station and service buildings.

Five design objectives have been developed to guide decision-making and the design process for the project:

1. Ensuring an easy customer experience
2. Being part of a fully integrated transport system
3. Being a catalyst for positive change
4. Being responsive to distinct contexts and communities
5. Delivering an enduring and sustainable legacy for Sydney.

The project would be designed, constructed and operated in accordance with the current standards of the following agencies, as applicable:

- Australian Standards
- Building Code of Australia
- Asset Standards Authority

- Transport for NSW
- Council (for the public domain)
- Sydney Trains
- Roads and Maritime Services
- utility companies or asset owners.

The design would only depart from the specified standards with the agreement of the relevant authority.

Urban design

The design of the project would:

- be consistent with the principles and strategies of the *Bankstown to Sydenham Corridor Strategy: Open space* and the Draft *Sydenham to Bankstown Urban Renewal Corridor Strategy* (Department of Planning and Environment, 2016)
- take into account heritage considerations
- provide for an activated public domain, pedestrian connectivity and fully integrated transport system
- provide safe and convenient interchange opportunities
- explore opportunities for new development including re-purposing existing unused rail land
- incorporate sustainable design considerations such as photovoltaics, natural ventilation and light and water sensitive urban design
- enhance the immediate and broader urban context.

The appearance and visual form of the visible features of the project have been considerations in the options assessment and design definition process. The preliminary design for the project has been prepared in accordance with the above principles. The design would continue to be refined during the detailed design phase, which would integrate all relevant considerations, including:

- security and safety (including consideration of crime prevention through environmental design (CPTED) principles)
- functional and operational requirements
- community and stakeholder input
- the role of the project and the objectives of the Draft *Bankstown to Sydenham Corridor Strategy: Open space and recreation strategy* (Government Architect's Office, 2015) and the Draft *Sydenham to Bankstown Urban Renewal Corridor Strategy*
- urban design and visual impacts
- environmental constraints and sustainability
- access and maintenance requirements
- minimising impacts to heritage.

Design principles for metro stations

The metro stations are part of a wider system requiring consistency between station planning, operations and architecture. Station entries, platforms and circulation elements have been designed to meet operational requirements while ensuring an easy customer experience.

The following design principles have been developed to describe the intention of the design objectives for the metro stations:

- Functionality, accessibility and circulation – ensure that access between the stations, catchments and other forms of transport is safe, quick and efficient and available to all members of the community including those with accessibility issues such as parents with prams and those with a disability.
- Customer information and wayfinding – ensure that movement around stations and catchments is made easy with clear signage and that information about metro services are readily available.
- Safety – ensure the safety of all users of stations and catchments.
- Customer comfort and amenity – ensure that stations function in a way that they do not become overcrowded and that suitable furniture is provided on platforms.
- Heritage and archaeology - identify opportunities for heritage conservation to contribute to the celebration of local identity in station design.

Safety and security

A key metro characteristic is to provide a system that is inherently safe for customers on trains, at stations, and at the interface with the public domain. The safety of passengers and the general public has been and will continue to be a key consideration during the design process.

The following metro features would contribute to the safety and security of customers:

- customer service assistants at every station and moving through the network during the day and night
- station and train design allows for good line of sight to enable passive and active surveillance
- stations and catchments that are designed to be highly visible, active spaces with good lighting and amenity
- ensuring customers can see all the way along the train and move easily between carriages, including wide, open walkways between carriages
- providing platform screen doors at stations which keep people and objects away from the edge, improving customer safety and allowing trains to get in and out of stations much faster.

Other station safety features include:

- CCTV cameras linked to the operations control centre
- an appropriate level of lighting
- emergency help points
- passenger information signage.

The design and layout of each station and stabling and maintenance facility would include consideration of crime prevention through environmental design (CPTED) principles.

Fencing of the rail corridor is being provided/upgraded as part of the project to ensure the safety of the general community. A trackside intruder detection system would also be installed.

The design of the project would also incorporate relevant fire and life safety/evacuation requirements.

5.1.3 Sustainability and environmental considerations

Sustainability in design

One of the objectives of EP&A Act is to 'encourage ecologically sustainable development'. Transport for NSW is committed to ensuring that its projects are implemented in a manner that is consistent with the principles of ecologically sustainable development.

Transport for NSW has applied, and will continue to apply, the principles of ecologically sustainable development throughout the development of the project.

Environmental considerations

The approach to design development has included a focus on avoiding and/or minimising the potential for impacts during all key phases of the process.

Strategic assessment undertaken during the initial option selection included consideration of delivery risk, including feasibility of construction and risks in implementation. Following identification of the preferred option the design of the project evolved over a number of stages which incorporated further consideration of environmental constraints. As a result, the design of the project has been influenced by a number of environmental factors and has generally been designed to:

- minimise direct and indirect impacts on heritage items
- minimise direct impact on property
- minimise flooding impact and flood behaviour
- minimise impacts on protected species.

5.1.4 Common station elements

Sydney Metro stations and catchments are being designed to provide safe and efficient interchange between transport modes, including minimising conflicts between pedestrians, cyclists, buses and vehicles.

Station works

Each metro station would have a number of common elements or design features. These include:

- for some stations a new station concourse and station entrance locations, including:
  - new stairs and ramps
  - new or relocated lifts
- platform works and installation of platform screen doors which would open with the train doors once an arriving train has stopped, and close simultaneously with the train doors) (described below)
- signage and wayfinding within the station and catchment

- station service buildings to house services for each station, including communications equipment, signalling equipment, electrical equipment and other rail systems equipment
- station buildings on platforms or at station entrances, including control and communication rooms, toilets, staff facilities (locker room, toilets and meal rooms), storerooms and offices
- new, upgraded or relocated parking and kerb side facilities within the station catchment, including accessible parking, kiss and ride and taxi facilities
- provision of new and/or relocated bicycle parking facilities
- awnings for shade and shelter at stations
- enhancements to the footpaths in the vicinity of the station entries and interchange areas
- landscaping and street furniture to maintain high quality urban design outcomes.

Platform works

The project includes the modification of station platforms at all stations to allow installation of platform screen doors, and ensure platforms meet the minimum requirements (length, height and gap) for metro trains.

The extent of work to platforms at each station would vary. Platform works may include:

- Replacement of existing platforms - existing platforms would be demolished and replaced with new platforms in their existing or slightly adjusted locations. This would occur where existing platforms need to be upgraded due to their age, or where upgrades are required to meet Sydney Metro standards.
- Fixed or mechanical gap fillers on platforms where required – gap fillers would be installed only in instances where platforms are not rebuilt to meet operational requirements. Gap fillers would ensure that the gap and height difference between the platform and the train is minimised. This could include mechanical gap fillers, which incorporate mechanisms that automatically narrow the gap between the platform and the train when the train arrives at the platform.
- Extension or shift of platform position along existing corridor – platforms would be shifted along the rail corridor (in line with the existing corridor/track) to optimise the platform for the metro trains. At these locations, the existing platforms may be extended to provide for the desired length.
- Change in platform alignment – existing platform structures would be replaced with straighter platforms, with associated changes to the position of the track and other infrastructure. The platforms would integrate with the existing station and would generally remain within the existing railway corridor.

Platforms would be fitted with platform screen doors. These operate similarly to lift doors, in that they only open (with the train doors) once an arriving train has stopped, and close simultaneously with the train doors. Platform screen doors provide an enhanced level of customer safety, as they prevent access to the track by providing a solid barrier along the edge of the platform.

Upgraded stations and platforms have been designed to comply with the requirements of the *Disability Discrimination Act 1992* (i.e. DDA compliant) and *Disability Standards for Accessible Public Transport 2002.* This would include, but not be limited to, works such as ensuring that the platforms slope away from the tracks.

Canopies

The metro style of modern, high quality design which is distinguishable from the historic elements has been used across all station catchments. Canopies have been designed to reduce bulk and height, to meet safety and customer requirements and to minimise direct impacts to heritage structures. Where possible views from the concourse to significant structures have been opened up to allow appreciation of the buildings and their setting.

Originally large scale glass and steel canopies were proposed to extend from the concourses, with medium scale canopies across the platforms. Ribbon canopies have now been proposed to reduce bulk and to respond to stakeholder needs. Design has avoided direct impacts to significant platform buildings by canopy elements. Canopies are in general separated from heritage structures by about two metres, with portions of canopy adjacent to heritage structures glazed to maximise opportunity for views from the concourse.

5.1.5 Ancillary railway works

The following work would also be undertaken as part of the track and rail system facility works:

- adjustment of existing track alignments and overhead wiring along the line to meet Sydney Metro operational requirements, Sydney Trains, and freight operational requirements, whilst Sydney Trains and ARTC continue to operate in the corridor
- adjustment of existing Sydney Trains rail systems, including removal of existing junctions to segregate the metro tracks from Sydney Trains tracks, and removal of any redundant Sydney Trains systems (e.g. signalling, communications)
- utility and rail system protection and relocation works within the construction footprint and public areas.

With the exception of the utility protection and relocation works, these utility and rail system works would take place within the rail corridor.

5.1.6 Bridges

A total of 17 road overbridges and three pedestrian footbridges/walkways (excluding those forming part of station concourses) are located within the project area. A number of the overbridges directly adjoin the stations. There are also 10 underbridge structures that support the rail tracks over roadways and waterways.

Upgrades would be required to a number of the bridge structures to meet current design standards, Sydney Metro operation specifications, and in places to suit the amended track alignment. In addition, all overbridges would be provided with parapet throw screens and vehicle collision barriers to provide an improved level of safety and security for customers.

The project would involve works to each of these bridges, however the type of works required would vary and would be confirmed during the detailed design. Changes to the scope may potentially be required based on investigations that would inform the final design. The bridge upgrade works would generally consist of one or more of the following:

- Bridge replacement – full bridge replacement where required due to track realignment, insufficient widths, structural issues, to improve precinct gradients, or to meet metro standards.
- Strengthening works – strengthening of existing bridge piers, abutments, bridge decks and primary steel elements.

- Protection – providing enhance protection to existing bridge piers, over-height vehicle crash protection beams adjacent underbridge structures, vehicle collision protection to overbridge parapets, and installation of parapet throw screens.
- Widening – widening would generally be required where the track alignment has been adjusted. A combination of existing embankment strengthening and new retaining walls may also be required.
- General maintenance – to ensure long-term durability of the bridge structures, maintenance works would include preparation and re-painting of steel elements and, where appropriate, raking out and re-pointing of masonry, and waterproofing works to bridge decks.
- Retaining wall works – replacement of existing retaining walls or installation of new walls.

The project scope includes replacing two bridges:

- Illawarra Road overbridge at Marrickville
- Albermarle Street overbridge at Dulwich Hill.

Protection and maintenance works are proposed at the following footbridges:

- Church Street/Hutton Street footbridge, Canterbury
- Duke Street footbridge, Campsie.

The work to upgrade bridges is provided in Table 9.

Table 9: Works to overbridges and underbridges

Bridge	Replacement	Strengthening	Protection	Widening	Maintenance	Retaining wall
Overbridge						
Illawarra Road overbridge, Marrickville	●					
Livingstone Road overbridge, Marrickville			●		●	
Abermarle Street overbridge, Dulwich Hill	●					
Wardell Road overbridge, Dulwich Hill			●		●	
Garnet Street overbridge, Hurlstone Park			●		●	
Duntroon Street overbridge, Hurlstone Park			●		●	
Church Street/Hutton Street footbridge, Canterbury			●		●	
Melford Street overbridge, Canterbury			●		●	

Bridge	Replacement	Strengthening	Protection	Widening	Maintenance	Retaining wall
Canterbury Road overbridge, Canterbury			●		●	
Beamish Street overbridge, Campsie			●		●	
Duke Street footbridge, Campsie			●		●	
Loch Street overbridge, Campsie			●		●	
Burwood Road overbridge, Belmore			●	●	●	●
Moreton Street overbridge, Belmore					●	
Haldon Street overbridge, Lakemba			●		●	●
Kings Georges Road overbridge, Wiley Park		●	●		●	
Punchbowl Road overbridge, Punchbowl					●	●
Stacey Street overbridge, Bankstown			●		●	●
Chapel Road overbridge, Bankstown			●		●	
Underbridge						
Meeks Drive underbridge, Marrickville		●			●	
Canal 1/M24, Marrickville					●	
Canal 2/M24, Marrickville					●	
Charlotte Avenue underbridge, Marrickville		●	●		●	
Ness Avenue/Terrace Road underbridge, Dulwich Hill			●		●	
Sewer line underbridge, Marrickville					●	
Foord Avenue underbridge, Hurlstone Park					●	
Cooks River/Charles Street underbridge, Canterbury			●		●	
Wairoa Street underbridge, Campsie			●		●	●

Bridge	Replacement	Strengthening	Protection	Widening	Maintenance	Retaining wall
Pedestrian access to Belmore Sports Ground		●		●	●	●
North/South Terrace underbridge, Bankstown				●	●	

The following sections outline the methods that would be used to upgrade bridges and replace road decks on bridges, where required.

Parapet replacement and waterproofing of bridge deck

In general, only partial closures of bridges would be required to replace parapets and waterproof the bridge deck. In some locations, where the roadway is narrow, full closures would be required. Works would be undertaken during possession periods to ensure the safety of workers and customers.

For bridges that would remain partially open during construction, works would involve:

- relocation of services on the bridge to a new alignment (some services would be terminated at the bridge abutments)
- existing parapets removed down to the existing bridge slab
- asphalt surface on bridge removed to the bridge deck
- bridge deck to be cleaned and waterproofed
- precast parapet sections to be positioned with the use of cranes and fixed to the bridge deck, throw screens would be preinstalled prior to installation
- asphalting surface applied to roadway along with any line marking
- bridge tie-ins adjusted to match the new bridge roadway surface levels
- bridge reopened to traffic
- footpaths to be periodically closed to allow for the reinstatement of services within the bridge
- fencing and traffic barriers on either side of the bridge would be adjusted to the new bridge parapets.

Bridge replacement and widening with new abutments

For bridges that would be closed during construction, works would involve:

- relocation of services on the bridge to a new alignment (some services would be terminated at the bridge abutments)
- closure of bridge to all traffic, including pedestrians
- removal of asphalt surface of bridge down to the concrete deck
- installation of new abutment extension piles, using piling rigs. A drill rig would be located on either side of the bridge to improve the program time

- excavation of the new abutment would occur during possession period
- demolition of bridge deck would occur during possession period
- installation of new bridge beams to span the tracks
- installation of concrete slab
- waterproofing of bridge deck once concrete is cured
- installation of bridge parapet
- installation of screens on bridge
- installation of asphalt surfaces
- installation of bridge drainage
- adjustment of road levels on either side of bridge to match the bridge
- installation of line marking
- relocation of services relocated at start of work back to the bridge.
- installation of make up panels at each corner of the bridge from the new bride parapets to the existing alignment fencing.

Bridge replacement works would require closure of the bridge for about three months. Construction would mainly be undertaken during possession periods, however some works would be undertaken outside possession periods.

5.1.7 33 kilovolt high voltage feeder

To provide power supply to the new traction substations, a 33 kilovolt high voltage feeder needs to be constructed between the rail corridor at Campsie Station (connects to the Campsie traction substation) and the existing Ausgrid Canterbury electrical substation, located about one kilometre south of Canterbury Station in Earlwood.

The electricity feeder route would be about 3.5 kilometres long, and would be constructed within the following road reserves:

- Beamish Street
- South Parade
- Phillips Avenue
- Canterbury Road
- Fore Street
- Burlington Avenue
- River Street
- Spark Street
- Mooney Avenue.

The alignment would also traverse Hughes Park to the south of the substation. The indicative alignment is shown on Figure 1.

Construction of the high voltage feeder (as outlined in the EIS Section 7.2.3) would generally be trenched along the alignment. The use of horizontal directional drilling to install the cable would potentially be used in the following locations to minimise impacts:

- at Canterbury Road which is a Roads and Maritime Services road with high traffic volumes
- at Elise Street between River Street and Karool Avenue due to a substantial change in elevation between the two streets.

The alignment also crosses Cup And Saucer Creek on Fore Street, Canterbury, via an existing bridge. This crossing would involve the integration of the feeder into the bridge structure with works within the creek not required. The final design of this crossing would be confirmed further during detailed design.

5.2 Station works

5.2.1 Marrickville Station

Design description

Marrickville Station is located east of the Illawarra Road overbridge. The station area is bound to the north by a multi-storey residential apartment building, located on the corner of Illawarra Road and Byrnes Street, to the south by Station Street and residential dwellings fronting Leofrene Avenue, and to the west by Illawarra Road. The station entrance is on Illawarra Road.

Marrickville Station was recently updated as part of Transport for NSW's Transport Access Program. The key works proposed as part of the project are shown on Figure 98 and summarised in Table 10.

An artist's impression is provided in Figure 99.

Table 10: Marrickville Station key design elements

Feature	Description
Station works	
Station entry/exit	• The existing station entrance from Illawarra Road would be retained and upgraded, including retention of existing lifts. • The existing at-grade entry from Station Street to platform 2 would be retained and upgraded to include a new entry canopy.
Platform details	• The existing heritage listed platforms would be straightened and extended to the east.
Station buildings	• The existing station buildings, including the recently completed elevated concourse would be retained. • New station buildings would be provided on platform 1. • Heritage station buildings on platforms 1 and 2 would be retained . • The former booking office on platform 2 would be retained and relocated to east of the building on platform 2. • New retail space would be provided in Station Street (the use of the space would be subject to a separate approval process).
Station area	

Feature	Description
Public transport integration	• All bus stops would be retained in current location, including southbound stop on Illawarra Road which was recently relocated as part of upgrades to the station.
Access	• A new shared zone in Station Street would be provided, allowing access to the southern station entrance, with this entrance and the shared zone forming a new station plaza. This would form part of an active transport corridor. • Signalisation of Warburton Road, Schwebel Street and Illawarra Road intersection is proposed, including installation of pedestrian crossings. • The existing signalised crossing of Illawarra Road outside the station would be removed. A zebra crossing would be provided on Illawarra Road immediately north of Arthur Street. • The existing cycle route along the southern side of the rail corridor would be rerouted along Schwebel Street, Leofrene Avenue, and Riverdale Avenue. • A new accessible ramp would be provided from the southern station entrance to Schwebel Street along Station Street.
Kerbside uses, bike parking	• New kerbside facilities would be provided within the new Station Street shared zone/plaza area on both the northern and western sections of the new shared zone. • A new bike storage/parking area would be provided along the eastern side of the Station Street plaza with the existing facility retained.
Car parking	• Loss of one on-street parking space due to new kerbside facilities.

Indicative layout

The following drawings provide an indicative layout of Marrickville Station.

Figure 98: Marrickville Station – indicative layout of key design elements

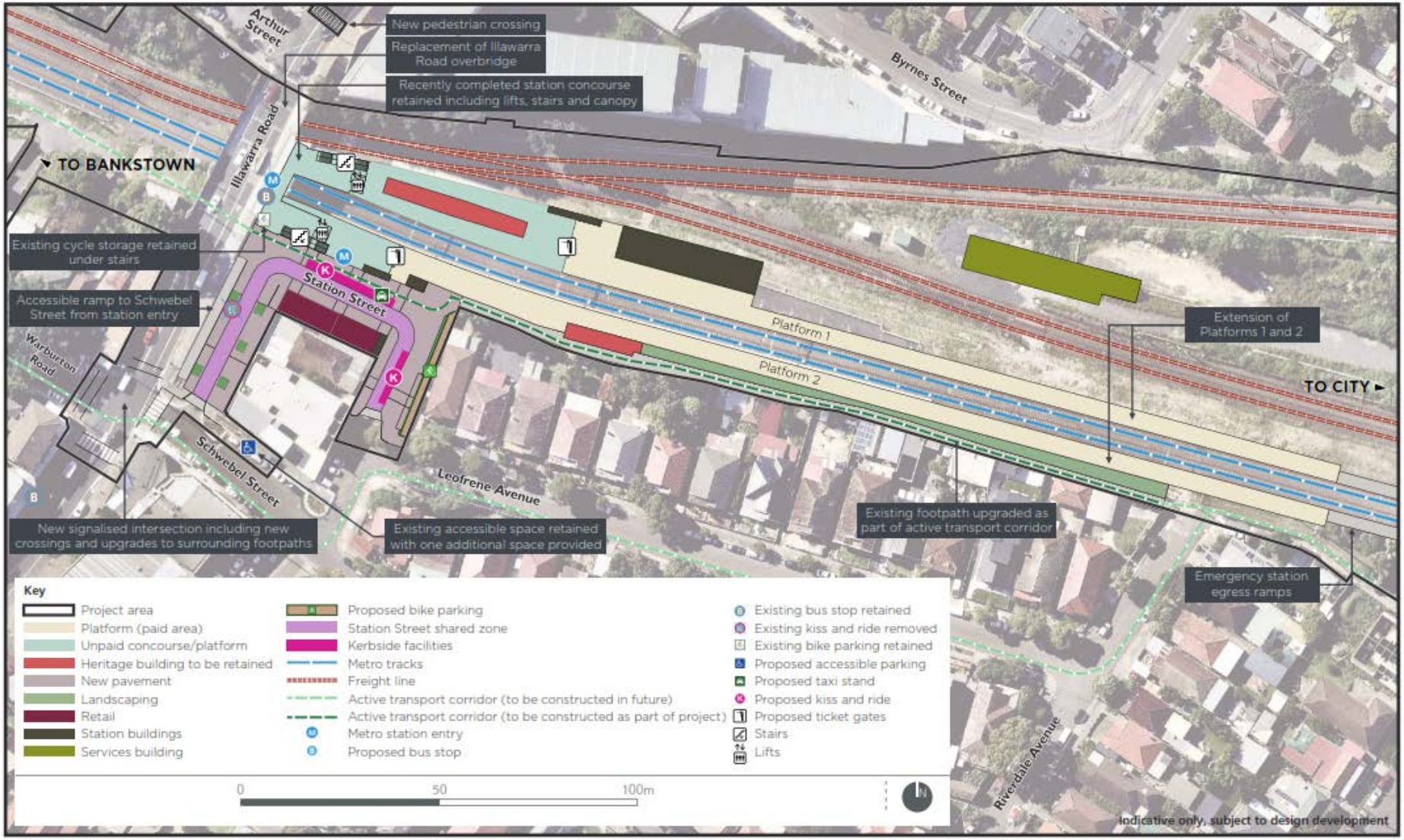

Figure 99: Marrickville Station – artist's impression

5.2.2 Dulwich Hill Station

Design description

Dulwich Hill Station is located west of the Wardell Road overbridge. The station area is bounded by Bedford Crescent to the north, Ewart Lane to the south, and Wardell Road to the east. The station entrance is on Wardell Road.

The key works proposed as part of the project are shown in Figure 100 and summarised in Table 11.

An artist's impression is provided in Figure 101.

Table 11: Dulwich Hill Station key design elements

Feature	Description
Station works	
Station entry/exit	• The existing station entrance would be removed. • A new elevated station concourse would be provided and would connect with the existing stairs and lift to Dulwich Hill Light Rail stop. The concourse would be accessed from two new station entrances at Bedford Crescent (northern side) and adjacent to Ewart Lane (southern side).
Platform details	• The heritage listed platforms would be rebuilt in their current location and extended to the west. A portion of the existing platform east of Wardell Road would be removed.
Station buildings	• New station facilities would be provided within the new concourse structure and within a new building located on the platform. • The heritage listed overhead booking office would be removed as part of the removal of the existing station entrance. • The existing heritage station building on the platform would be retained. • New retail space would be provided within the southern station entrance below the new concourse (the use of the space would be subject to a separate approval process).
Station area	
Public transport integration	• The existing bus stops located in Dudley Street and Wardell Road would be retained. • The new concourse would connect the existing lift and stairs to the Dulwich Hill light rail stop.
Access	• A new public plaza would be provided between the proposed southern station entrance and the existing pedestrian crossing on Wardell Road. • Ewart Lane would be widened/upgraded adjacent to the new southern station entrance to improve vehicular access to the reconfigured Ewart Lane car park. • Pathways would be provided along Ewart Lane, Ewart Street, and Dudley Street, to form part of an active transport corridor.

Feature	Description
Kerbside uses, bike parking	• New kiss and ride, taxi, and accessible parking would be provided on the southern side of Bedford Crescent. • New bike parking facilities would be provided on the upper level of the proposed services building.
Car parking	• Commuter parking on Ewart Lane would be reconfigured with the same number of spaces retained. • Loss of five on-street parking spaces due to new kerbside facilities.

Indicative layout

The following drawings provide an indicative layout of Dulwich Hill Station.

Figure 100: Dulwich Hill Station – indicative layout of key design elements

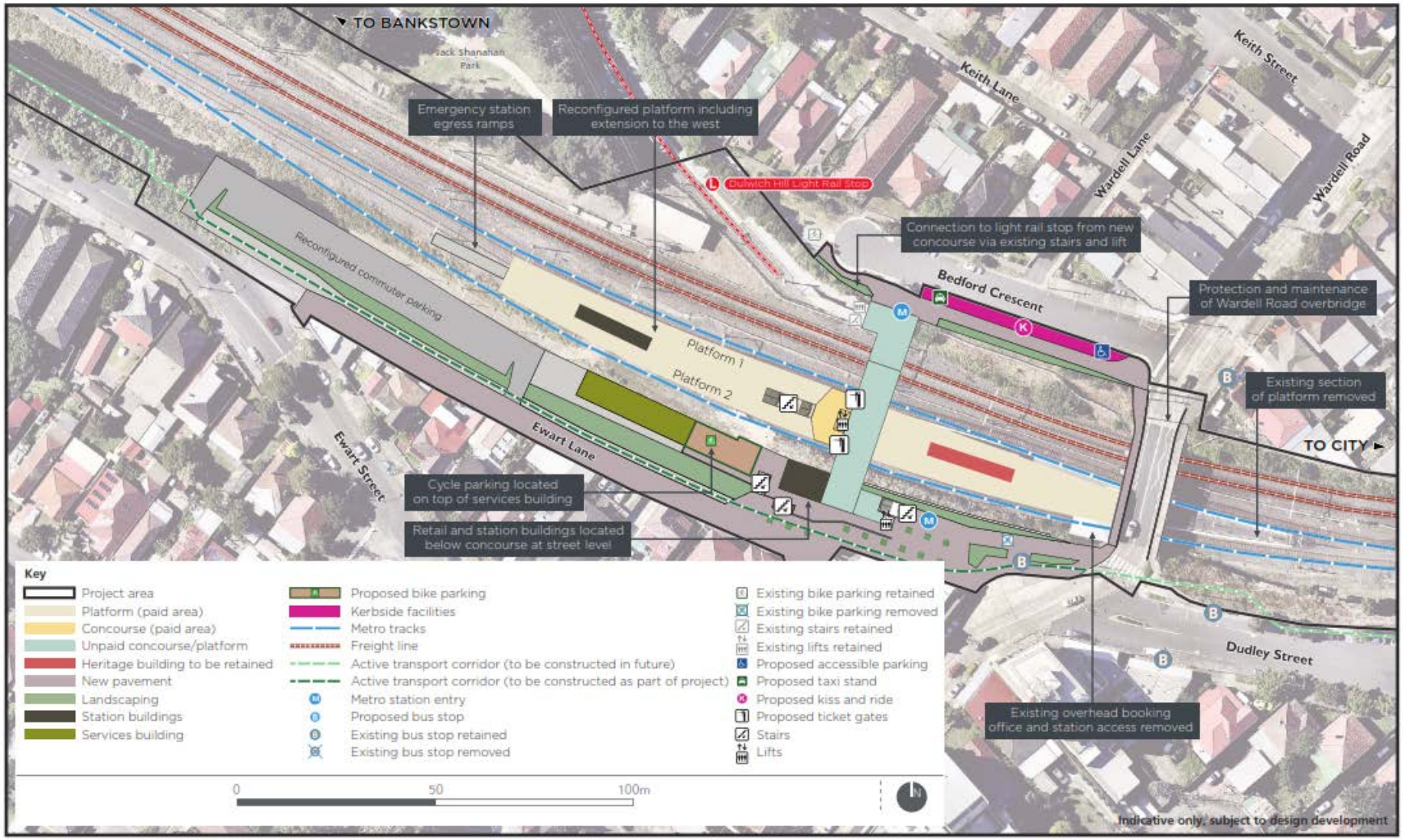

Figure 101: Dulwich Hill Station – artist's impression

5.2.3 Hurlstone Park Station

Design description

Hurlstone Park Station is located to the west of the Duntroon/Crinian Street overbridge. The station area is bounded by Crinian and Floss streets and residential dwellings to the north, Duntroon Street and residential dwellings to the south, and Duntroon/Crinian Street to the west. The station entrance is on the overbridge.

The key works proposed as part of the project are shown in Figure 102 and summarised in Table 12.

An artist's impression is provided in Figure 103.

Table 12: Hurlstone Park Station key design elements

Feature	Description
Station works	
Station entry/exit	• The existing station entrance on the overbridge would be upgraded. • A new enlarged, elevated station concourse would be provided in the same location to provide an enlarged station forecourt area and entry set back from the road.
Platform details	• Heritage listed platforms would be rebuilt, straightened, and extended to the southwest along the rail corridor, generally in their existing locations.
Station buildings	• New station buildings would be located within the concourse and on platforms. • The existing heritage listed overhead booking office and heritage building on platform 1 would be removed. • The existing heritage station building on platform 2 would be retained. • New retail space would be provided as part of the new concourse (the use of the retail space would be subject to a separate approval process).
Station area	
Public transport integration	• The existing bus stops on the overbridge would be retained.
Access	• New pedestrian crossing facilities would be provided adjacent to the new southern station entrance and on Crinan Street just north of Floss Street. • The existing pedestrian crossing on the overbridge would be modified to improve pedestrian flow by including more space on the southwestern side. • Connection to an active transport corridor along the western side of Duntroon Street (south of rail corridor).

Feature	Description
Kerbside uses, bike parking	• New kerbside facilities would be located near the southern station entrance on Floss Street on the eastern side of the overbridge adjacent to the station. • New bike parking areas would be provided in Floss Street on the northern side of the rail corridor. • The existing accessible parking spaces on Floss Street would be retained, and a new accessible space would be provided on Duntroon Street.

Indicative layout

The following drawings provide an indicative layout of Hurlstone Park Station.

Figure 102: Hurlstone Park Station – indicative layout of key design elements

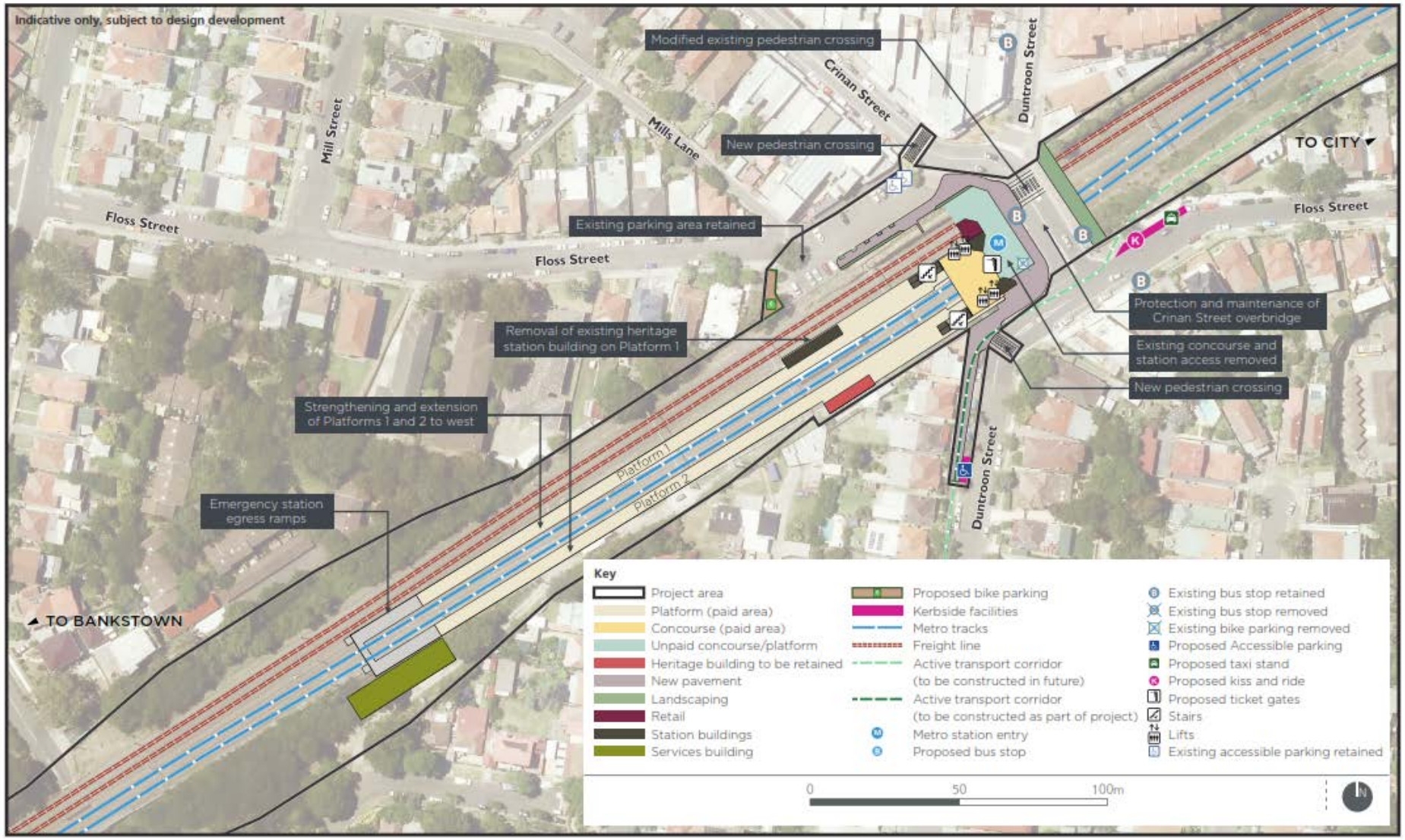

Figure 103: Hurlstone Park Station – artist's impression

5.2.4 Canterbury Station

Design description

Canterbury Station is located to the north-west of the Canterbury Road overbridge. The station area is bounded by Broughton Street to the north, a large mixed use development fronting Charles Street to the south, and Canterbury Road to the east. The station entrance is on Canterbury Road.

The key works proposed as part of the project are shown in Figure 104 and summarised in Table 13.

An artist's impression is provided in Figure 105.

Table 13: Canterbury Station key design elements

Feature	Description
Station works	
Station entry/exit	• The existing station entrance on Canterbury Road would be relocated to the western side of the rail corridor and provide access to platform 2. • A new elevated station concourse would be provided about 150 metres west of Canterbury Road. • A new station entrance would be provided on Broughton Street providing access to platforms 1 and 2. • Futureproofing for a potential future station entrance on Charles Street as part of any future development along Charles Street. This entrance would provide access to platform 2.
Platform details	• The heritage listed platforms would be rebuilt and extended to the northwest.
Station buildings	• The heritage listed footbridge and overhead booking office would be removed. • The heritage listed buildings on platform 1 and 2 would be retained. • The existing heritage listed signal box on the southeastern side of the Canterbury Road overbridge would be retained. • New station buildings would be provided at the station entrance on Broughton Street. • New retail space would be provided at the station entrances at Broughton Street and Canterbury Road (the use of the retail space would be subject to a separate approval process).
Station area	
Public transport integration	• All existing bus stops would be retained, with the exception of one stop on Broughton Street, which is to be relocated to the new Broughton Street entrance. • A new bus shelter would be provided at the station entrance on Broughton Street.
Access	• Connection to an active transport corridor located along Charles Street via Canterbury Road. • New pedestrian crossing on Broughton Street in line with new station entrance.

Feature	Description
Kerbside uses, bike parking	• Kerbside facilities would be provided on Broughton Street adjacent to the new station entry. This would include new accessible parking on Broughton Street. • New bike parking areas would be provided within the new station plaza areas on Broughton Street, Charles street and Canterbury Road.

Indicative layout

The following drawings provide an indicative layout of Canterbury Station.

Figure 104: Canterbury Station – indicative layout of key design elements

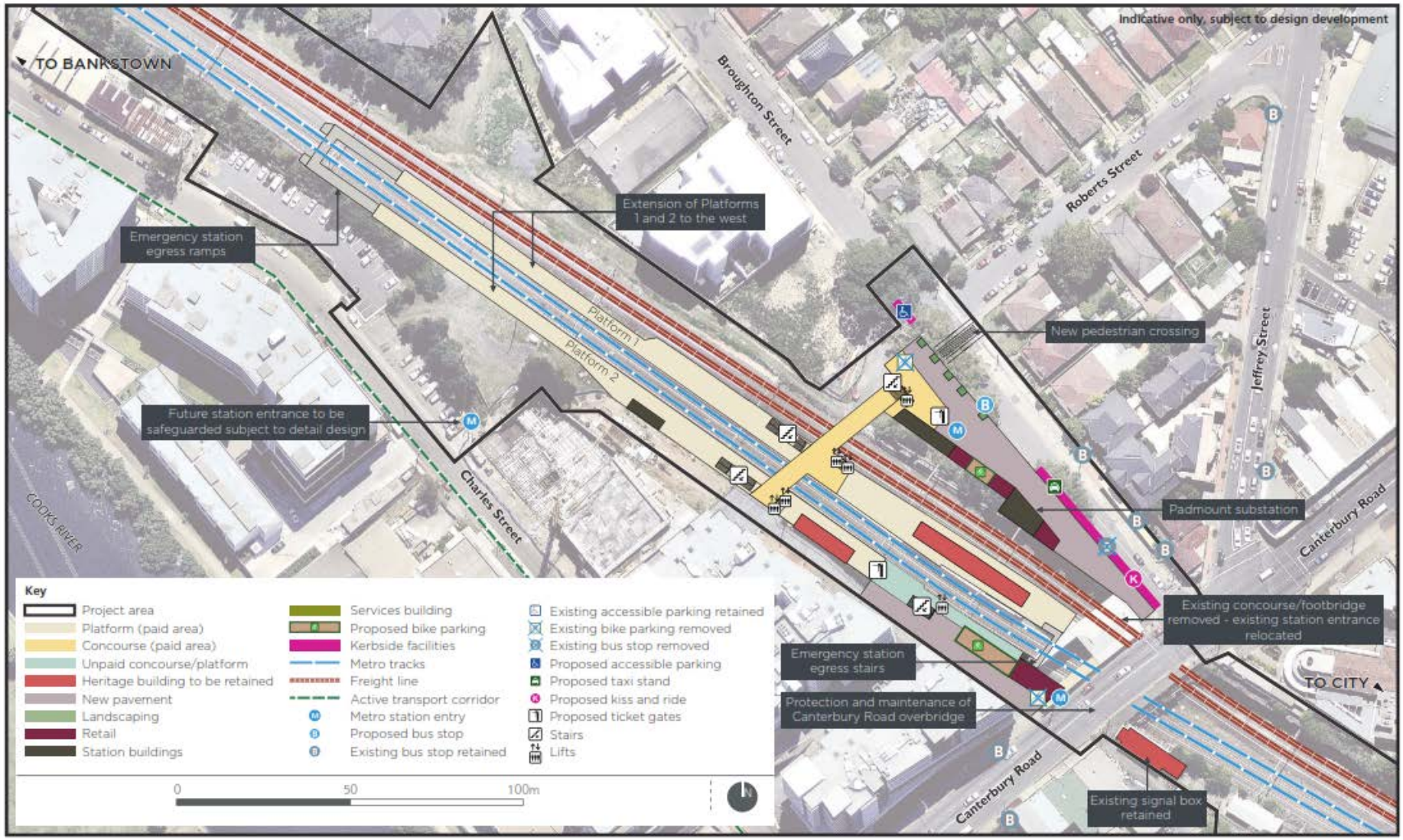

Figure 105: Canterbury Station – artist's impression

5.2.5 Campsie Station

Design description

Campsie Station is located to the west of the Beamish Street overbridge. The station area is bounded by Lilian Lane/South Parade to the south, Wilfred Avenue/North Parade to the north, and Beamish Street to the east. The station entrance is located on the overbridge.

The key works proposed as part of the project are show in Figure 106 and summarised in Table 14.

An artist's impression is provided in Figure 107.

Table 14: Campsie Station key design elements

Feature	Description
Station works	
Station entry/exit	• The existing station entrance at Beamish Street would be upgraded. • A new station entry would be provided on North Parade. • A new enlarged, elevated station concourse would provide more space for pedestrian circulation and pedestrian movement along Beamish Street. The part of the existing concourse built in 2001 would be retained.
Platform details	• The heritage listed platforms would be rebuilt, straightened and extended to the west.
Station buildings	• The heritage listed overhead station concourse and footbridge (except the part built in 2001) would be removed. • The existing heritage listed buildings on platforms 1 and 2 would be retained. • New station facilities would be provided within the new concourse. • New retail space would be provided at the station entrance on North Parade and on the eastern side of Beamish Street (the use of the retail space would be subject to a separate approval process).
Station area	
Public transport integration	• Existing bus stops located in the vicinity of the station would be retained.
Access	• New shared zone would be provided along Lilian Lane between Beamish and Dewar streets. This would form part of an active transport corridor.

Feature	Description
Kerbside uses, bike parking	• New kerbside facilities would be provided on the southern side of North Parade, adjacent to the northern station entrance. • The existing kerb facilities on the northern side of South Parade would be removed. • New kerbside facilities would be provided as part of the new elevated platform on the eastern side of Beamish Street. • The existing accessible parking on North Parade, Wilfred Avenue, and South Parade would be retained. • New bike parking facilities would be provided near the northern station entrance on North Parade, and on the southern side of the station concourse.
Car parking	• The existing parking area along the northern side of Lilian Lane would be reconfigured, which would result in the provision of 80 additional commuter car parking spaces. • The new kerbside facilities would result in the loss of about 20 on-street car parking spaces on North Parade and South Parade.

Indicative layout

The following drawings provide an indicative layout of Campsie Station.

Figure 106: Campsie Station – indicative layout of key design elements

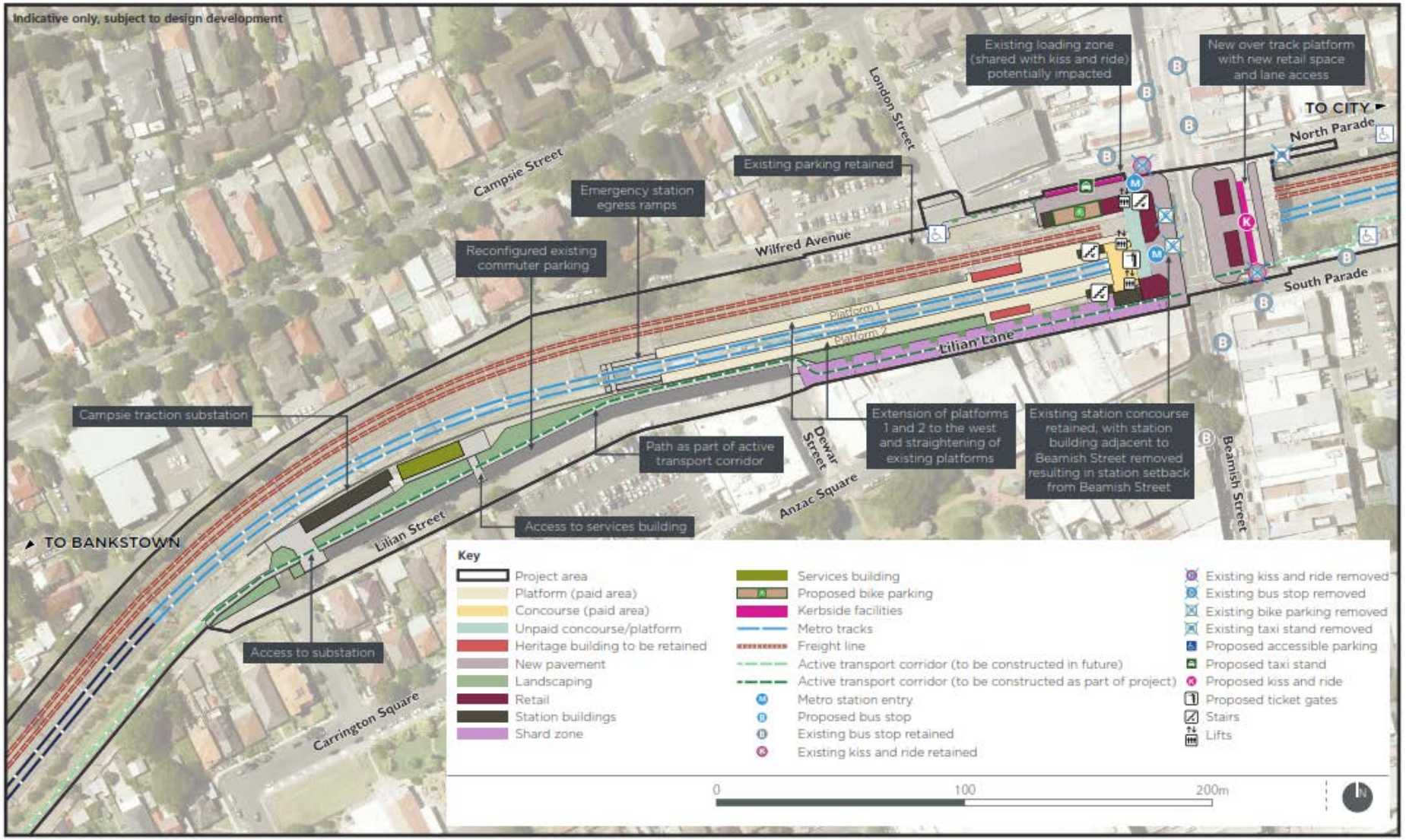

Figure 107: Campsie Station – artist's impression

5.2.6 Belmore Station

Design description

Belmore Station is located to the east of the Burwood Road overbridge. To the north and south, the station area is bounded by commuter car parks fronting Redman Parade and Tobruk Avenue respectively. To the west, the station area is bounded by Burwood Road. The existing station entrance is located on the Burwood Road overbridge.

The key works proposed as part of the project are shown in Figure 108 and summarised in Table 15.

An artist's impression is provided in Figure 109.

Table 15: Belmore Station key design elements

Feature	Description
Station works	
Station entry/exit	• The existing station entrance would be removed. • A new station entrance and plaza would be at Tobruk Avenue to the south and a new entrance provided to Redman Parade to the north. • A new elevated concourse would be provided to the east of the heritage platform building.
Platform details	• The heritage listed platforms would be rebuilt, straightened and extended to the east.
Station buildings	• New station buildings would be provided within the concourse and at the eastern end of the platform. • The existing heritage listed platform building would be retained. • The existing overhead booking office would be retained. Existing stairs from the overhead booking office to the platform would, however, be removed. • Existing heritage buildings located within the car park to the north of the station would be retained. • New retail spaces would be provided within the new plaza on Tobruk Avenue (the use of the space would be subject to a separate approval process).
Station area	
Public transport integration	• The existing northbound bus stop on Burwood Road would be retained. • The southbound stop on Burwood Road would be relocated to the south of Tobruk Avenue.

Feature	Description
Access	• The existing signalised crossing on Burwood Road at the station entrance would be removed, and a new signalised intersection would be provided at the Tobruk Avenue, and Burwood Road intersection. The new signalised intersection would include pedestrian crossings. • New pathways would be provided on Tobruk Avenue to connect to an active transport corridor along Bridge Road, and the existing pathways along the southern side of the rail corridor.
Kerbside uses, bike parking	• Tobruk Avenue would be extended and widened to provide a shared zone, including new taxi and kiss and ride facilities. • A new bike parking area would be provided within the new plaza on Tobruk Avenue.
Car parking	• Potential impacts to commuter parking and council parking on the northern side of existing station due to new northern station entrance. • Removal of existing council off-street car park located south of the station, resulting in the loss of 48 spaces.

Indicative layout

The following drawings provide an indicative layout of Belmore Station.

Figure 108: Belmore Station – indicative layout of key design elements

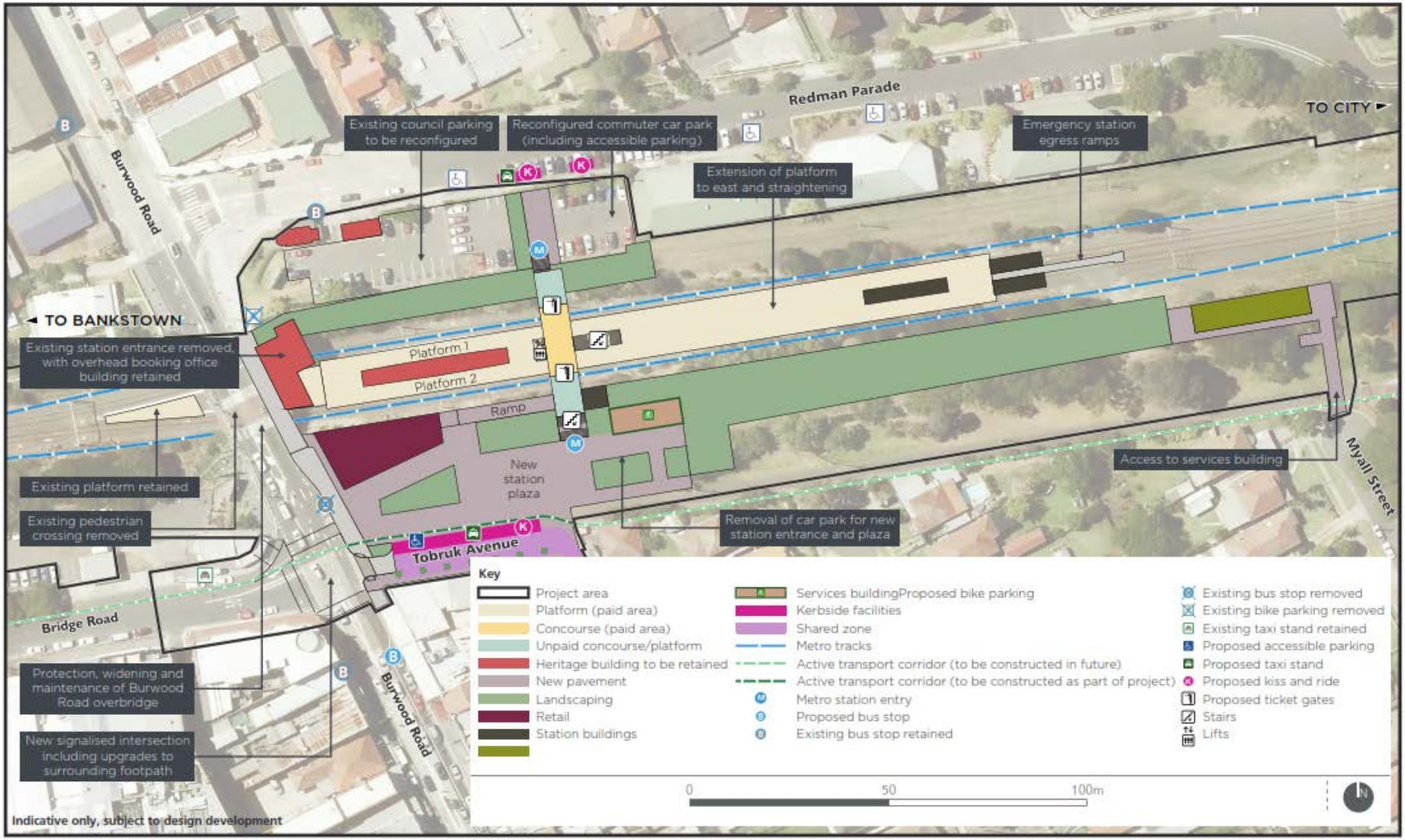

Figure 109: Belmore Station – artist's impression

5.2.7 Lakemba Station

Design description

Lakemba Station is located about 60 metres to the west of the Haldon Street overbridge. The station area is bounded by Railway Parade to the north and The Boulevarde to the south. Access to the station is provided off Railway Parade and The Boulevarde.

The key works proposed as part of the project are shown in Figure 110 and summarised in Table 16.

An artist's impression is provided in Figure 111.

Table 16: Lakemba Station key design elements

Feature	Proposed
Station works	
Station entry/exit	• The existing station entrances on Railway Parade and The Boulevarde would be retained. • The existing elevated concourse would be retained with a minor expansion on the western side to accommodate additional station buildings/facilities.
Platform details	• The platform would be reconstructed to a new straight alignment with extensions to meet metro requirements.
Station buildings	• The heritage station building on the platform would be retrofitted for reuse. • New station buildings would be provided in the concourse, on the platform and would also be provided adjacent to the Railway Parade entrance.
Station area	
Public transport integration	• The existing bus stops located on The Boulevard, Railway Parade, and Haldon Street (south) would be retained.
Access	• Connection to an active transport corridor along The Boulevarde east of Haldon Street, and along the rail corridor boundary east of Haldon Street. • A new footpath is proposed on the southern side of Railway Parade, adjacent to the existing car parking area leading to the station entrance.
Kerbside uses, bike parking	• New kerbside facilities would be provided on Railway Parade and on The Boulevard, east of the new station entrance. • New bike parking areas would be provided on either side of the rail corridor adjacent to the existing station entrances.

Indicative layout

The following drawings provide an indicative layout of Lakemba Station.

Figure 110: Lakemba Station – indicative layout of key design elements

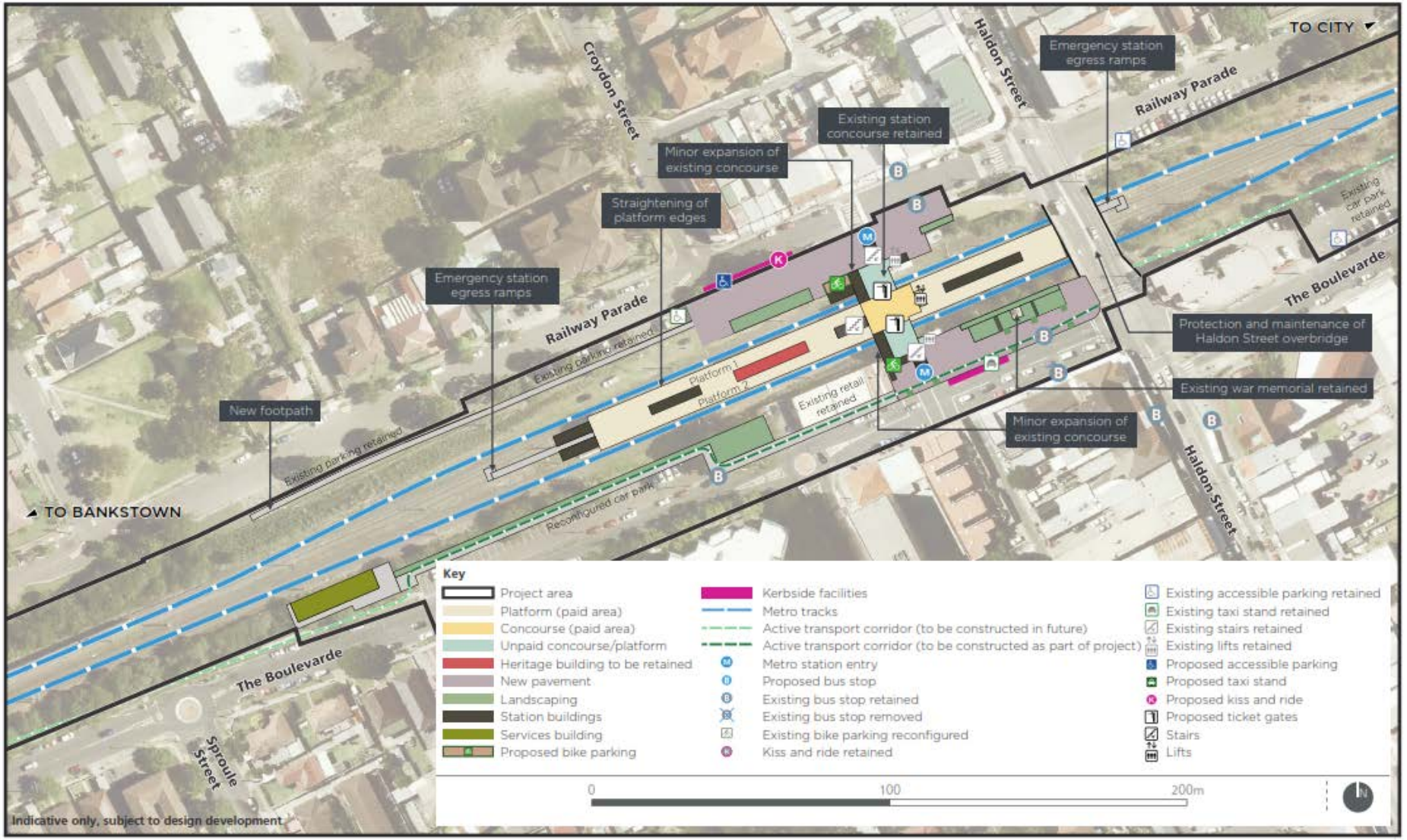

Figure 111: Lakemba Station – artist's impression

5.2.8 Wiley Park Station

Design description

Wiley Park Station is located to the west of the King Georges Road overbridge. The station area is bounded by Stanlea Parade walkway to the north, by King Georges Road to the east and The Boulevarde to the south. The station entrance is located on the overbridge.

The key works proposed as part of the project are shown in Figure 112 and summarised in Table 17.

An artist's impression is provided in Figure 113.

Table 17: Wiley Park Station key design elements

Feature	Description
Station works	
Station entry/exit	• The existing station entrance on King Georges Road would be upgraded. • Two new entrances would be provided on The Boulevarde and from the Stanlea Parade walkway near King Georges Road. • The existing station concourse would be removed but a new structure installed in the same location. • A new elevated concourse would be built to provide more space for pedestrian circulation.
Platform details	• The heritage listed platform would be rebuilt, straightened and extended to the west.
Station buildings	• New station buildings would be provided within the new concourse, on platforms 1 and 2 and adjacent to The Boulevarde. • The existing heritage listed overhead booking office, concourse and platform buildings would be removed to enable the new facilities to be provided. • New retail space would be provided in the new concourse along King Georges Road (the use of the retail space would be subject to a separate approval process).
Catchment works	
Public transport integration	• No changes would be made to existing bus stops.
Access	• Connection to active transport corridor along the southern side of the station along The Boulevarde east of Haldon Street, and along the rail corridor boundary west of Haldon Street.
Kerbside uses, parking	• New bike parking areas would be provided on either side of the corridor adjacent to the platforms • Kerbside facilities would be provided on the northern side of the Boulevarde, east of King Georges Road.

Feature	Description
Car parking	• Land within the rail corridor on the northern side of The Boulevarde would be used to provide replacement off-street parking as part of the King Georges Road clearways project undertaken by Roads and Maritime Services.

Indicative layout

The following drawings provide an indicative layout of Wiley Park Station.

Figure 112: Wiley Park Station – indicative layout of key design elements

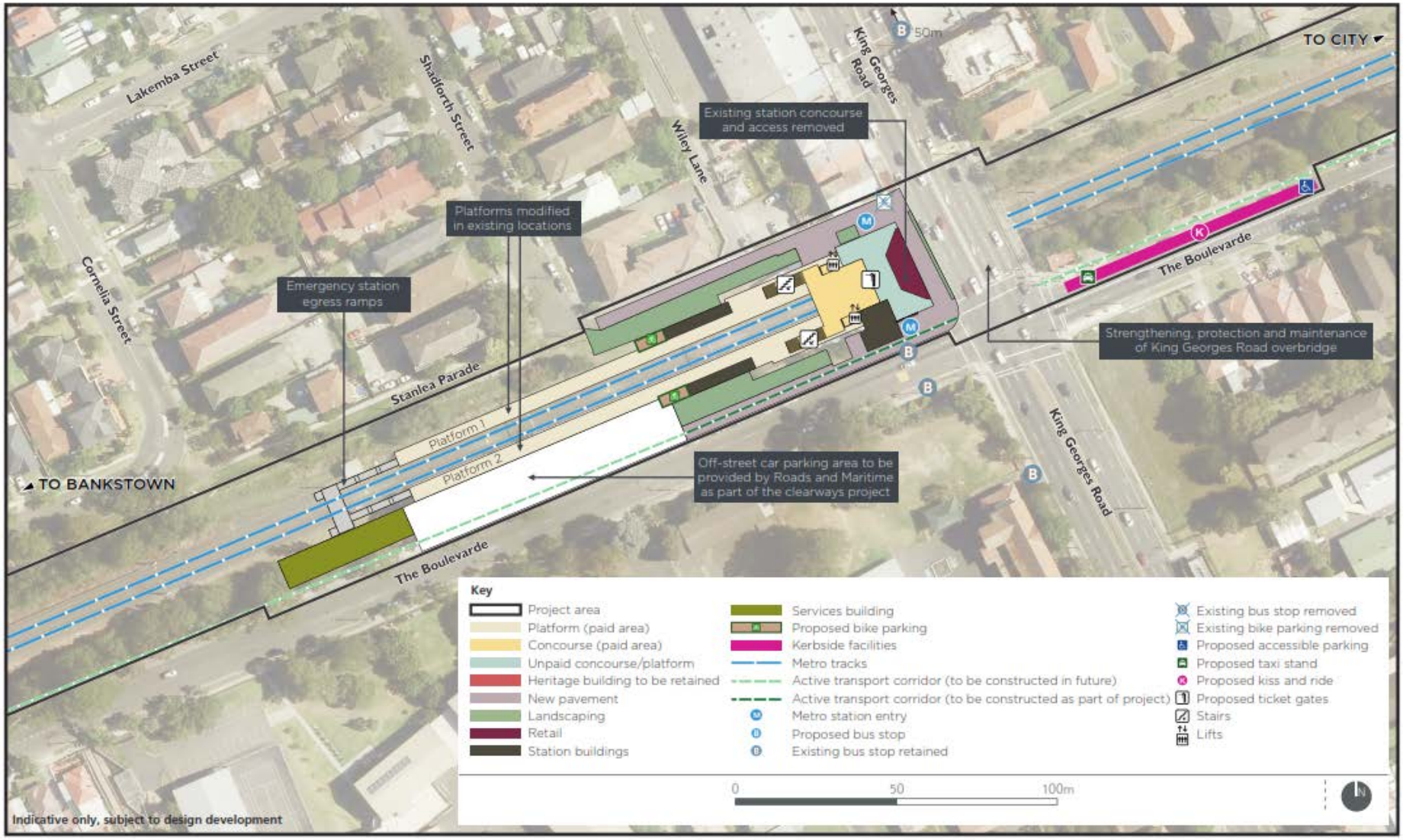

Figure 113: Wiley Park Station – artist's impression

5.2.9 Punchbowl Station

Design description

Punchbowl Station is located to the east of the Punchbowl Road overbridge. The station area is bounded by commercial land uses and a car park fronting The Boulevarde to the south, Warren Reserve and Urunga Parade to the north, and Punchbowl Road to the west. The station entrances are located on Punchbowl Road (via Warren Reserve) to the north, and The Boulevarde to the south.

The key works proposed as part of the project are shown in Figure 114 and summarised in Table 18.

An artist's impression is provided in Figure 115.

Table 18: Punchbowl Station key design elements

Feature	Description
Station works	
Station entry/exit	• The existing station entrance would be removed. • Two new station entrances would be provided from The Boulevarde (to the south) and adjacent to Warren Reserve to the north. The new southern entrance would be located within a new station plaza. • A new elevated bridge would be constructed to provided access between the two platforms.
Platform details	• The heritage listed platform would be rebuilt, straightened and extended to the east. A portion of the existing platform to the west of the new concourse would be removed.
Station buildings	• New station buildings would be provided at the station entrances and platforms. • The heritage listed station buildings and overhead booking office would be removed. Further information on the ability to retain these items is provided in Table 6.3. • New retail space would be provided within the southern station plaza adjacent to The Boulevarde (use of this space would be subject to separate approval).
Station area	
Public transport integration	• The existing bus stops on Punchbowl Road would be retained. • The existing eastbound stop on The Boulevarde would be relocated east of Arthur Street, adjacent to new station entry.
Access	• Paths located in the vicinity of the station between the rail corridor and The Boulevarde would form part of an active transport corridor.

Feature	Description
Kerbside uses, bike parking	• New bike parking areas would be provided on either side of the corridor at the station entrances. • Kerbside facilities would be provided on both sides of The Boulevarde adjacent to the southern station entrance. • Kerbside facilities would be provided along the southern side of Urunga Parade to the east of the northern station entrance. • A new pedestrian crossing would be provided on Punchbowl Road northeast of Bruest Place.
Car parking	• About 30 existing commuter parking spaces located on the northern side of The Boulevarde would be relocated further to the east to provide space for the new station plaza and entrance.

Indicative layout

The following drawings provide an indicative layout of Punchbowl Station.

Figure 114: Punchbowl Station – indicative layout of key design elements

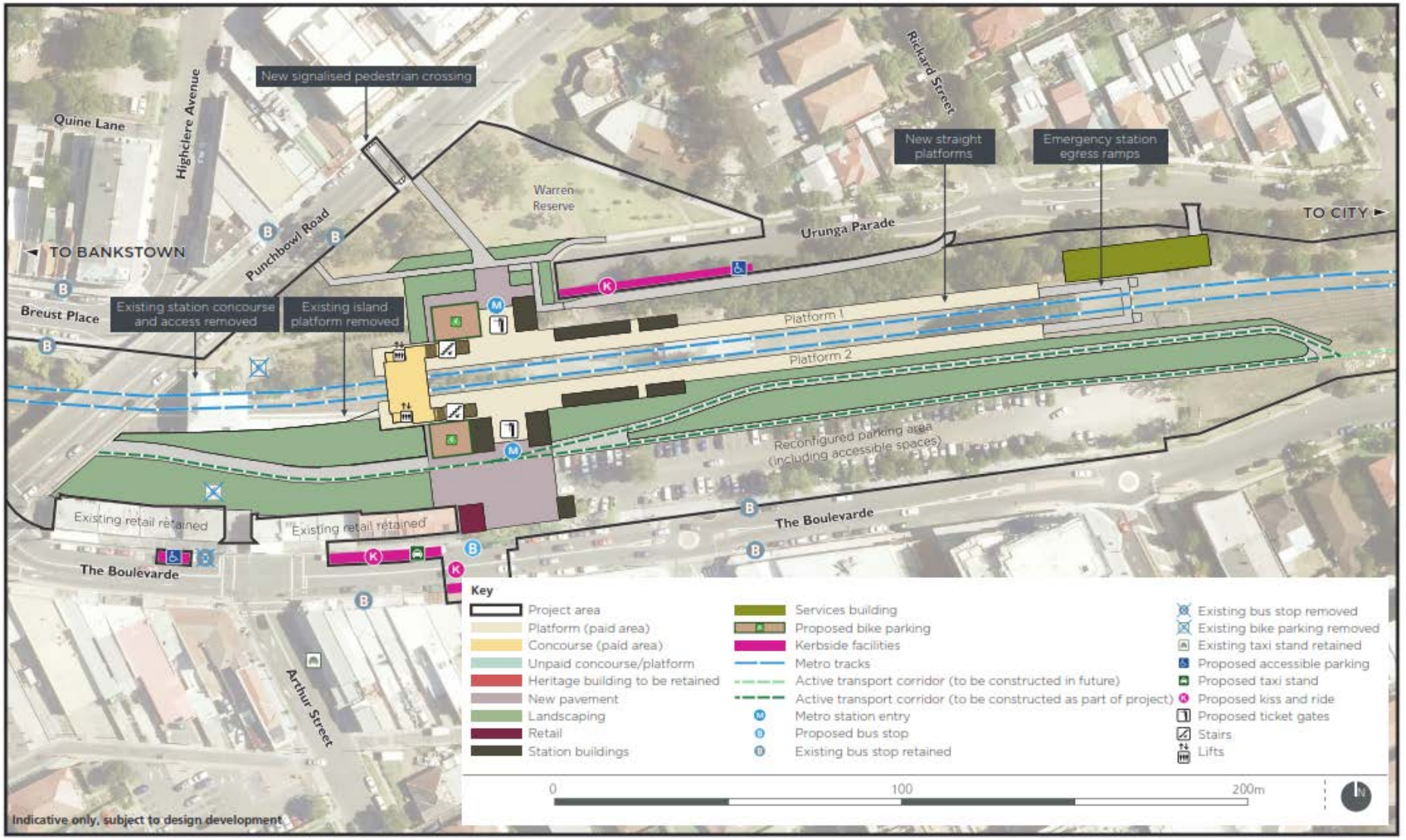

Figure 115: Punchbowl Station – artist's impression

5.2.10 Bankstown Station

Design description

Bankstown Station is located to the east of the Bankstown City Plaza overbridge. The station area is bounded by North Terrace to the north, South Terrace to the south, and Bankstown City Plaza to the west. The station entrance is on Bankstown City Plaza.

A new Sydney Metro station would be constructed to the east and adjoining the existing Sydney Trains Bankstown Station.

The key works proposed as part of the project are shown in Figure 116 and summarised in Table 19.

An artist's impression is provided in Figure 117.

Table 19: Bankstown Station key design elements

Feature	Proposed
Station works	
Station entry/exit	• The existing Sydney Trains station entrance at Bankstown City Plaza would be retained. • A new at-grade corridor crossing would be provided at the eastern end of the existing Sydney Trains platform and would provide access to both Sydney Trains and new Sydney Metro platforms. • New station plazas would be constructed at station entrances on both sides of the rail corridor.
Platform details	• The heritage listed Sydney Trains platforms would be retained with minor modifications required at the eastern end. • New Sydney Metro platforms would be constructed to the east of the new at-grade corridor crossing.
Station buildings	• All station buildings (including the heritage listed station building and Parcels Office) on the Sydney Trains platforms would be retained. • A new canopy would be constructed on the Sydney Trains platform between the new station entrance and the existing platform building.
Station area	
Public transport integration	• The bus layover area off South Terrace would be retained with minor adjustments to accommodate the new station entrance. • The bus interchange area on South Terrace, near the existing station entrance, would be retained. • The existing bus stop on the northern side of station on North Terrace would be retained.
Access	• The pedestrian/shared paths located along South Terrace would form part of an active transport corridor. • An new 'at grade' corridor crossing would be provided at the eastern end of the existing Sydney Trains platform and would provide access to both Sydney Trains and new Sydney Metro platforms.

Feature	Proposed
Kerbside uses, bike parking	• Changes would be made to kerbside facilities and parking along North Terrace, between the new station entrances and the existing entrance. Existing kerbside facilities (i.e. taxi rank) on northern side of North Terrace would be retained. • New bike parking would be provided on both sides of the station within the new station plazas.
Car parking	• Removal of existing car park located adjacent to the Appian Way off North Terrace, resulting in the loss of 10 spaces.

Indicative layout

The following drawings provide an indicative layout of Bankstown Station.

Figure 116: Bankstown Station – indicative layout of key design elements

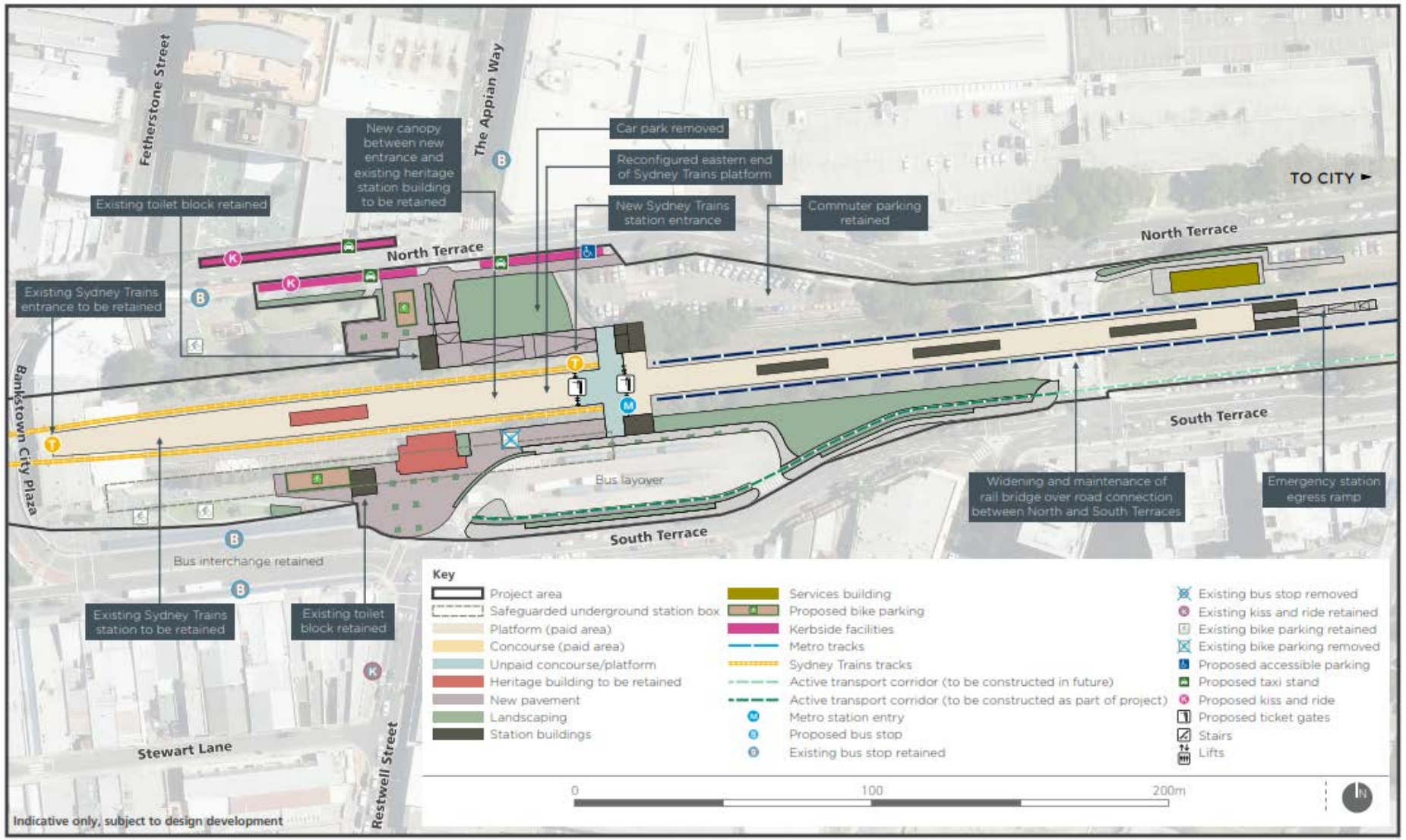

Figure 117: Bankstown Station – artist's impression

5.3 Options and justification

5.3.1 Project need

An overview of project needs is discussed in Chapter 5 of the Environmental Impact Statement.

5.3.2 Design

Table 20 outlines the five design objectives and supporting principles that have been developed for the City & Southwest project and were used to guide the design and decision-making process for the project.

Table 20: Design objectives

Design objective	Design principle
Objective 1: Ensuring an easy customer experience.	Sydney Metro places the customer first. Stations are welcoming and intuitive with simple, uncluttered spaces that ensure a comfortable, enjoyable and safe experience for a diverse range of customers.
Objective 2: Being part of a fully integrated transport system.	Sydney Metro is a transit-oriented project that prioritises clear and legible connections with other public and active transport modes within the wider metropolitan travel network that intersect with this new spine.
Objective 3: Being a catalyst for positive change.	Sydney Metro is a landmark opportunity to regenerate and invigorate the city with new stations and associated development that engage with their catchments, raise the urban quality and enhance the overall experience of the city.
Objective 4: Being responsive to distinct contexts and communities.	Sydney Metro's identity is stronger for the unique conditions of centres and communities through which it passes. This local character is to be embraced through distinctive station architecture and public domain that is well integrated with the inherited urban fabric of existing places.
Objective 5: Delivering an enduring and sustainable legacy for Sydney.	Sydney Metro is a positive legacy for future generations. A high standard of design across the corridor, stations and station catchments, that sets a new benchmark, is vital to ensuring the longevity of the Metro system, its enduring contribution to civic life and an ability to adapt to a changing city over time.

5.3.3 Accessibility and safety requirements

A key influence on the design of the Sydney Metro along the Bankstown Line is the requirement for all stations and interchanges to be accessible, meaning that connections from the transport interfaces with all transport modes (accessible parking, buses, taxis, kiss and ride facilities, and park and ride areas) are to be accessible, easy and intuitive for all customers of the Metro. It also means that there should be equality of access for all people within the stations.

Station and interchange designs and layouts have been developed in accordance with relevant accessibility legislation and guidelines – including the Disability Discrimination Act (DDA), Disability Standards for Accessible Public Transport (DSAPT). An outline of the options considered to meet these requirements is provided below.

5.3.4 Platform geometry and platform edge barriers

Platform edge barriers are required to be constructed on the Sydney Metro system to meet train loading and safety requirements. The existing brick faced platforms cannot accommodate the necessary footings for platform edge barriers.

5.3.5 Station and interchange design

The design of stations and interchange nodes along the project corridor has taken into consideration the following accessibility requirements:

- Stations, plazas, interchanges, walkways, fixtures and fittings and the provisioning for retail precincts are to be designed to meet DDA guideline requirements. Stations have been designed to be accessible including the platform-train interface, platform, concourse, facilities and interchange.
- Interchanges are to incorporate accessible facilities, and accessible paths of travel between station and bus/light rail, taxi and kiss and ride facilities, in accordance with the DSAPT and resting seats are to be provided along pathways in stations and plazas.

The design of station catchments has sought to comply with the DDA and DSAPT as far as practicable and within the Metro project's zone of influence.

5.3.6 Architectural Design Strategy for Stations

Transport for NSW is seeking to establish a Sydney Metro network that has a coherent identity to unify the different sections of the line (Sydney Metro Northwest, Sydney Metro City & Southwest), whilst providing sufficient flexibility to address and celebrate the differences in local context and communities, and the engineering and architecture responses to these differences.

The architectural strategy developed for the Marrickville to Bankstown stations is to introduce elegant, contemporary structures that complement the earlier station buildings, and to ensure that this fourth overlay on the Bankstown Line railway landscape is clearly distinguishable from the earlier heritage fabric. Specifically the design has been developed with reference to the Heritage Design Guidelines prepared for the Reference Design by GML Heritage (February 2017). GML Heritage has worked closely with the design team during the design process preparing advice and providing input into options analysis as well as attending workshops and design review meetings. Detailed design, including final design of architectural forms and fabric, will be prepared in consultation with the design review panel, which includes a Heritage Architect who will oversee development of the design in relation to sensitivity to heritage values.

5.3.7 Retrofitting and reuse

Retrofitting and reuse of significant structures to be retained in accordance with their heritage values has been a key consideration during the design process and will continue to be developed during detailed design. This would be a positive heritage outcome as it would enable public engagement with heritage values within the upgraded stations, conservation of significant elements and would facilitate maintenance and care of structures in use.

The following options for reuse of spaces would be considered during detailed design, although are yet to be confirmed:

- operational
- community
- commercial

- public space / non-public space.

Retrofitting would aim to highlight the heritage values of the structures to the customers, both through sensitive design and fitout and use of heritage interpretation.

Reuse of salvaged significant fabric, such as platform bricks or fittings, could be used as part of design or as public art/interpretation. A salvage strategy would be prepared as a recommendation of this report which would outline strategies for selecting salvaged material.

Reuse and retrofitting would be guided by the Burra Charter, the Heritage Council Guidelines for Altering Heritage Assets, relevant Sydney Trains guidelines, and all relevant Conservation Management Plans and Statements of Significance previously prepared the site.

5.3.8 Heritage Strategy

As indicated above, the introduction of Sydney Metro on the Bankstown Line constitutes the fourth major intervention to this existing railway landscape. The design of the Sydney Metro stations along the Marrickville to Bankstown railway line has been undertaken having regard to the heritage values of the stations and the line, and has sought to:

- recognise and demonstrate the heritage significance of all phases of rail transport development along the Bankstown Railway Line
- retain and conserve, wherever possible, elements of heritage significance so that functional relationships can be understood and interpreted
- remove intrusive station elements that detract from the core heritage values
- adaptively reuse the retained and conserved heritage buildings for station and related functions
- carefully and clearly express the presence of the Sydney Metro with new high quality design elements
- deliver a functionally viable line, stations and catchments while enhancing the legibility of key heritage values.

The design approach adopted to meet the operational requirements of the Sydney Metro system whilst minimising impacts on heritage involves the following:

- Provision of a canopy which would minimise bulk while allowing views of platform buildings, allowing these buildings to viewed in the round as originally intended, without attached awnings and other later additions. The canopy would typically provide weather protection between the concourse and platform buildings.
- New aerial concourses that bridge the rail corridor would be carefully placed so that they directly address heritage platform buildings. This would generally involve the positioning of new stairs from the concourse leading directly down to heritage buildings.
- The design of the concourse needs to accommodate the minimum depth and area required for gatelines and customer requirements at the concourse level.
- In a number of instances, the existing entry to the station is too close to the road and the platform heritage buildings are also in relatively close proximity to the existing entry. In these instances, there is not sufficient space between the existing road overbridges and platform buildings to accommodate the Sydney Metro concourse and accessibility requirements to the platform (i.e. lifts

and stairs). At these locations, in order to retain existing heritage platform buildings, the aerial concourse and station entrance have been relocated away from their traditional location on the adjacent road overbridge.

- Provision of weather protection along the length of the platforms. The strategy is to ensure that a contemporary material provides the link between the existing canopy and a new platform canopy, ensuring that the impact to the existing building is minimised.

5.3.9 Heritage input during design

Through the design of the project to date, significant work has been undertaken to reduce the heritage impacts of the project. GML Heritage has worked closely with the design team during the design process preparing advice and providing input into options analysis. The Sydney Metro Heritage Working Group which includes representatives from Sydney Trains and the NSW Heritage Division (as delegates of the NSW Heritage Council) has been presented with information on the project including discussion around heritage impacts, options to avoid impact and justifications for impact. The members of the Heritage Working Group have had the opportunity to provide comment during this process.

Platforms are required to be reconstructed along the alignment to meet operational requirements including provision of PEBs for safety and for accessibility purposes. This results in an unavoidable impact to platforms at every station along the alignment.

The approach to remaining heritage elements has been to retain where possible existing significant items and/or elements on all heritage registers, with particular focus given to those items listed on the SHR. As part of this process, Transport for New South Wales has had to ensure that the heritage elements retained have a suitable station or operational purpose and that their retention does not compromise the integrity of the station design and layout as well as safety and other customer requirements.

Significant SHR listed masonry platform buildings have been retained at Marrickville, Canterbury and Belmore stations. Belmore Station has also been designed to retain the overhead booking office to be adaptively reused as a retail/ commercial or community building. Transport for New South Wales has worked with heritage stakeholders on some of the options available to reduce impacts on heritage values.

The following table summarises the justification for impacts on those elements at each station which are proposed to be removed as part of the proposed project design.

Table 21: Justification of heritage impacts

Station	Heritage Elements Directly Impacted	Comment/Justification
Marrickville Station	Overbridge	Significant optioneering work has been undertaken to reduce the number of heritage elements impacted, resulting in retention of Platform 1 and 2 buildings and retention of the booking office. Earlier in the design process, these elements were proposed to be removed. The overbridge is required to be replaced as it is past its operational life and damaged as a result. This impact is unavoidable.

Station	Heritage Elements Directly Impacted	Comment/Justification
Dulwich Hill	Overhead booking office	The relocation of the entry and associated concourse to a location east of the platform heritage building are to avoid impacts on the platform building which has high significance. Given a decision was made to change the entry/concourse location to retain the existing platform building, the existing overhead booking office would be physically separated and isolated from the station and have no future rail purpose. The works required to be undertaken to reconstruct the platforms and corridor works mean that it physically cannot remain in situ. In addition the existing support structures are inadequate for its long term retention within an operating rail environment. Retention of the overhead booking office would have significant cost, program and constructability implications. Given it would no longer function for rail purposes, a decision was made to remove this building.
Hurlstone Park	Overhead booking office and footbridge Platform Building 1	The impact on overhead booking office and footbridge is associated with the limited space between Crinan Road and the platform building to accommodate the new relocated entry and concourse. The new entry and concourse provide better integration with surrounding streets and the urban centre, together with improved accessibility throughout the precinct. Platform 1 building is to be removed to provide sufficient safe platform width and accommodate the new Metro tracks whilst retaining the existing Platform 2 building. Retention of the overhead booking office would have significant cost, program and constructability implications. Given it would no longer function for rail purposes, a decision was made to remove this building as it was not in the public interest.

Station	Heritage Elements Directly Impacted	Comment/Justification
Canterbury	Overhead booking office/footbridge	Significant optioneering work has been undertaken to reduce the number of heritage elements impacted at Canterbury Station, resulting in retention of the exceptionally significant rated Platform 1 building and the highly significant Platform 2 building. Earlier in the design development process, these elements were proposed to be removed. The relocation of the concourse/entry to a location west of the Platform 1 building is to avoid impacts on this heritage building (exceptional heritage significance). Given a decision was made to change the entry/concourse location to retain the existing platform building, the existing overhead booking office would be physically separated and isolated from the station and have no future rail purpose. The new entry and concourse locations are consistent with Council and DP&E aspirations to have a new town centre focussed on the junction of Broughton and Robert Street. A new southern entry off Canterbury Road will enable customers to enter a covered activation area which extends from Canterbury Road in front of heritage buildings opening up views to heritage buildings on both platforms.
Campsie	Overhead footbridge with concourse and booking office	The station entry remains on Beamish Street however the entry and concourse is being widened to accommodate the greater patronage of the station anticipated and the pedestrian flows along Beamish Street. This requires removal of the existing overhead footbridge, booking office and concourse to create a safer and improved customer experience. The existing (original) concourse steel structure will be retained and refurbished to ensure compliance with Metro standards.
Belmore	Intrusive modern canopies	Significant optioneering work has been undertaken to develop an option which retains all existing elements of heritage significance except for the station platforms, and removes intrusive modern platform canopy structures. Earlier options proposed removal of the overhead book office and platform building.
Lakemba	Overhead booking office/footbridge with concourse	The existing overhead booking office, footbridge and concourse will be retained with some minor expansion. Earlier options sought removal of these elements..

Station	Heritage Elements Directly Impacted	Comment/Justification
Wiley Park	Overhead booking office/footbridge Platform 1 Building Platform 2 Building	The impact on the overhead booking office and footbridge is associated with the close proximity of the existing station entry to King Georges Road and the poor customer amenity and experience that results from this location. A new entry and concourse is proposed to be constructed requiring the removal of both the existing overhead booking office/footbridge and platform buildings. The existing platform buildings are locally significant from a heritage perspective however their location and size would compromise the new station operation and customer requirements. Retention of the overhead booking office would have significant cost, program and constructability implications. Given it would no longer function for rail purposes, a decision was made to remove this building as it was not in the public interest.
Punchbowl	Overhead booking office/footbridge Platform 1 and 2 Buildings	The tracks are required to be relocated to fit straight platform requirements. This has resulted in a new location for Punchbowl Station slightly to the east of the existing station. This provides a far better relationship with the existing town centre and provides improved accessibility across the rail corridor, supporting future growth of the centre. This outcome results in the removal of all existing heritage elements. If the overhead booking office were to be retained, it would be isolated from the existing station and would not have a rail purpose. It is noted that the existing overhead booking office currently has a poor relationship with Punchbowl Road. Retention of the overhead booking office would have significant cost, program and constructability implications. Given it would no longer function for rail purposes, a decision was made to remove this building as it was not in the public interest.
Bankstown	Platform impacts only	Given it is proposed to introduce new Sydney Metro infrastructure alongside the existing station, there is limited impact on heritage elements at Bankstown Station, involving the straightening and reconstruction of platforms.