NSW GOVERNMENT

Transport for NSW

Erskineville Station Upgrade

Review of Environmental Factors

Artist's impression of the Erskineville Station Upgrade, subject to detailed design

March 2021

Erskineville – TAP3 Review of Environmental Factors

Transport Access Program
Ref–6548591

Contents

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Figures

Tables

Abbreviations

Term	Meaning
AHD	Australian Height Datum
AHIMS	Aboriginal Heritage Information Management System
APS	Access to Premises (Disability Standards)
ARI	Average Recurrence Interval
ASA	Asset Standards Authority (refer to Definitions)
ASS	Acid Sulfate Soils
BCA	Building Code of Australia
BC Act	*Biodiversity Conservation Act 2016* (NSW)
CBD	Central Business District
CCTV	Closed Circuit TV
CEMP	Construction Environmental Management Plan
CLM Act	*Contaminated Land Management Act 1997* (NSW)
CNVMP	Construction Noise and Vibration Management Plan
CNVS	*Construction Noise and Vibration Strategy* (Transport for NSW, 2019)
CPTED	Crime Prevention Through Environmental Design
CTMP	Construction Traffic Management Plan
DAWE	Department of Agriculture, Water and the Environment (Cwlth)
DBH	Diameter Breast Height
DBYD	Dial Before You Dig
D&C	Design & Construct
DDA	*Disability Discrimination Act 1992* (Cwlth)
DoE	Commonwealth Department of the Environment
DP&E	NSW Department of Planning and Environment
DPIE	NSW Department of Planning, Industry and Environment
DSAPT	*Disability Standards for Accessible Public Transport (2002)*
DSI	Detailed Site Investigation (Phase II Contamination Investigation)

Term	Meaning
ECM	Environmental Controls Map
EES	NSW Environment, Energy and Science (Division of Department of Planning Industry and Environment) (formerly OEH)
EMS	Environmental Management System
EPA	Environment Protection Authority
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW)
EP&A Regulation	*Environmental Planning and Assessment Regulation 2000* (NSW)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cwlth)
EPI	Environmental Planning Instrument
EPL	Environment Protection Licence
ESD	Ecologically Sustainable Development (refer to Definitions)
ETS	Electronic Ticketing System
FM Act	*Fisheries Management Act 1994* (NSW)
Heritage Act	*Heritage Act 1977* (NSW)
HV	High Voltage
ICNG	*Interim Construction Noise Guideline* (Department of Environment and Climate Change, 2000).
Infrastructure SEPP	*State Environmental Planning Policy (Infrastructure) 2007* (NSW)
IS rating	Infrastructure Sustainability rating under ISCA rating tool (v 1.2)
ISCA	Infrastructure Sustainability Council of Australia
LCZ	Landscape Character Zone
LEP	Local Environmental Plan
LGA	Local Government Area
LoS	Level of Service
LV	Low Voltage
MCA	Multi-criteria analysis
MTMS	More Trains More Services program
NES	National Environmental Significance
NML	Noise Management Level

Term	Meaning
NPW Act	*National Parks and Wildlife Act 1974* (NSW)
NSW	New South Wales
OEH	Formerly NSW Office of the Environment and Heritage
OHWS	Overhead Wire Structure
OOHW	Out of hours works
PA system	Public Address system
PCT	Plant Community Type
PDP	Public Domain Plan
POEO Act	*Protection of the Environment Operations Act 1997* (NSW)
PNTL	Project Noise Trigger Level
RailCorp	(former) Rail Corporation of NSW
RAP	Remediation Action Plan
RBL	Rating Background Level
REF	Review of Environmental Factors (this document)
Roads Act	*Roads Act 1993* (NSW)
Roads and Maritime	NSW Roads and Maritime Services (formerly Roads and Traffic Authority)
SEPP	State Environmental Planning Policy
SHR	State Heritage Register
SoHI	Statement of Heritage Impact
TAHE	Transport Asset Holding Entity
TCP	Traffic Control Plan
TfNSW	Transport for NSW
TGSI	Tactile Ground Surface Indicators (“tactiles”)
TMP	Traffic Management Plan
TPZ	Tree Protection Zone
TVM	Ticket Vending Machine
UDP	Urban Design Plan
WARR Act	*Waste Avoidance and Resource Recovery Act 2001* (NSW)

Term	Meaning
WM Act	*Water Management Act 2000* (NSW)

Definitions

Term	Meaning
Average Recurrence Interval	The likelihood of occurrence, expressed in terms of the long-term average number of years, between flood events as large as or larger than the design flood event. For example, floods with a discharge as large as or larger than the 100-year ARI flood will occur on average once every 100-years.
Asset Management Branch	The Asset Management Branch is a section within Transport for NSW, responsible for engineering governance, assurance of design safety, and ensuring the integrity of transport and infrastructure assets. Design Authority functions formerly performed by Assets Standards Authority are now exercised by the Asset Management Branch.
Design and Construct Contract	A method to deliver a project in which the design and construction services are contracted by a single entity known as the Contractor. The Contractor completes the project by refining the concept design presented in the REF and completing the detailed design so that it is suitable for construction (subject to Transport for NSW acceptance). The Contractor is therefore responsible for all work on the project, both design and construction.
Detailed design	Detailed design broadly refers to the process that the Contractor undertakes (should the Proposal proceed) to refine the concept design to a design suitable for construction (subject to Transport for NSW acceptance).
Disability Standards for Accessible Public Transport	The Commonwealth *Disability Standards for Accessible Public Transport 2002* ("Transport Standards") (as amended) are a set of legally enforceable standards, authorised under the Commonwealth *Disability Discrimination Act 1992* (DDA) for the purpose of removing discrimination 'as far as possible' against people with disabilities. The Transport Standards cover premises, infrastructure and conveyances, and apply to public transport operators and premises providers.
Ecologically Sustainable Development	As defined by clause 7(4) Schedule 2 of the EP&A Regulation. Development that uses, conserves and enhances the resources of the community so that ecological processes on which life depends are maintained, and the total quality of life, now and in the future, can be increased.
Feasible	A work practice or abatement measure is feasible if it is capable of being put into practice or of being engineered and is practical to build given project constraints such as safety and maintenance requirements.
Interchange	Transport interchange refers to the area/s where passengers transit between vehicles or between transport modes. It includes the pedestrian pathways and cycle facilities in and around an interchange.
Noise sensitive receiver	In addition to residential dwellings, noise sensitive receivers include, but are not limited to, hotels, entertainment venues, pre-schools and day care facilities, educational institutions (e.g. schools, TAFE colleges), health care facilities (e.g. nursing homes, hospitals), recording studios and places of worship/religious facilities (e.g. churches).
NSW Trains	From 1 July 2013, NSW Trains became the new rail provider of services for regional rail customers.
Opal card	The integrated ticketing smartcard being introduced by Transport for NSW.

Term	Meaning
Out of hours works	Defined as work *outside* standard construction hours (i.e. outside of 7am to 6pm Monday to Friday, 8am to 1pm Saturday and no work on Sundays/public holidays).
Proponent	A person or body proposing to carry out an activity under Division 5.1 of the EP&A Act - in this instance, Transport for NSW.
Rail possession / shutdown	Shutdown is the term used by railway building/maintenance personnel to indicate that they have taken possession of the track (usually a section of track) for a specified period, so that no trains operate for a specified time. This is necessary to ensure the safety of workers and rail users.
Reasonable	Selecting reasonable measures from those that are feasible involves making a judgment to determine whether the overall benefits outweigh the overall adverse social, economic and environmental effects, including the cost of the measure.
Scoping design	The scoping design is the preliminary design presented in this REF, which would be refined by the Contractor (should the Proposal proceed) to a design suitable for construction (subject to Transport for NSW acceptance).
Sensitive receivers	Land uses which are sensitive to potential noise, air and visual impacts, such as residential dwellings, schools and hospitals.
Sydney Trains	From 1 July 2013, Sydney Trains replaced CityRail as the provider of metropolitan train services for Sydney.
Tactiles	Tactile tiles or Tactile Ground Surface Indicators (TGSIs) are textured ground surface indicators to assist pedestrians who are blind or visually impaired. They are found on many footpaths, stairs and train station platforms.
The Proposal	The construction and operation of the Erskineville TAP3 station upgrade.
Vegetation Offset Guide	The Transport for NSW guide that applies where there is vegetation clearing proposed, and where the impact of the proposed clearing is not deemed 'significant' for the purposes of section 5.5 of the EP&A Act. The Guide provides for planting of a minimum of eight trees for each large tree with a diameter at breast height (DBH) of more than 60 cm, four trees where the DBH is 15-60 cm, or two trees where DBH is less than 15 cm.

Executive summary

Overview

The NSW Government is upgrading Erskineville Station to improve accessibility and to prepare for service improvements to the T3 Bankstown line. The Erskineville Station Upgrade (the Proposal) forms part of two NSW Government initiatives:

- the Transport Access Program, which aims to provide a better experience for public transport customers by delivering accessible, modern, secure and integrated transport infrastructure. Under this program, work is proposed to provide a station precinct at Erskineville that is accessible to people with a disability, limited mobility, parents/carers with prams and customers with baggage.
- the More Trains, More Services Program that over the next ten years will transform the rail network and provide customers with more reliable, high capacity turn up and go services. This program includes a network reconfiguration strategy that will result in customers boarding and alighting trains at Erskineville Station from Platforms 3 and 4 instead of Platforms 1 and 2.

The Proposal would provide:

- a new southern station entrance off Bridge Street including a new footbridge with three new lifts and stairs connecting to all platforms
- extension of the existing northern footbridge with a new lift and lift landing to the western side of Platform 1 (whilst retaining the existing overhead booking office, footbridge and stairs)
- one new kiss and ride area and one accessible parking space at the northern terminus of Bridge Street providing an accessible path of travel to the existing (northern) station entrance
- a new kiss and ride area with capacity for two cars and a new pedestrian crossing on Bridge Street opposite the new southern station entrance
- new canopies on the platforms to provide weather protection
- a new family accessible toilet, female ambulant toilet and male ambulant toilet within the Platform 2/3 building
- modifications to the family accessible toilet on Platform 1 for improved accessibility
- upgrade work along the footpaths approaching the northern and southern station entrances
- kerb modifications and line marking at the southern station entrance to provide access to the new kiss and ride areas
- improvements to customer information and communication systems including wayfinding modifications, public address (PA) system modifications and new hearing induction loops
- localised platform regrading and the installation of new tactiles along the platforms
- improvements to station lighting and CCTV to improve safety and security
- landscaping work, tree removal and adjustments to wayfinding
- electrical upgrades for the new infrastructure and service relocations.

Transport for NSW (TfNSW) is the government agency responsible for the delivery of major transport infrastructure projects in NSW and is the proponent for the Proposal.

This Review of Environmental Factors (REF) has been prepared to assess all matters affecting or likely to affect the environment by reason of the construction and operation of the Proposal under the provisions of Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

Subject to approval, construction is expected to commence in 2021 and take around 24 months to complete. A detailed description of the Proposal is provided in Chapter 3 of this REF. An overview of the Proposal is shown in Figure ES-1.

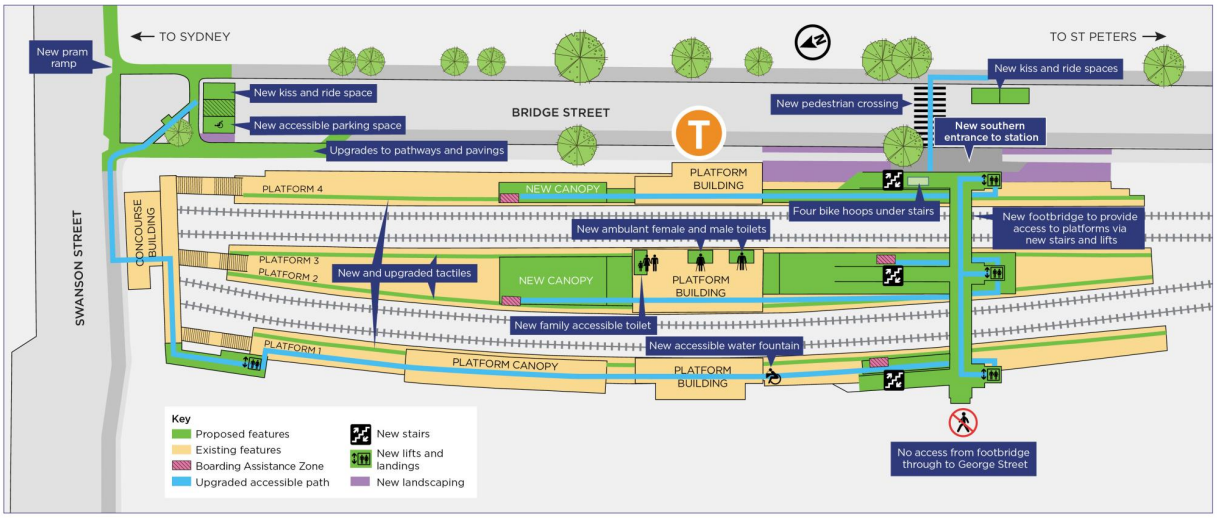

Figure ES-1 Key features of the Proposal

Need for the Proposal

The Proposal would ensure that Erskineville Station would meet legislative requirements under the *Disability Discrimination Act 1992* (DDA) and the *Disability Standards for Accessible Public Transport 2002* (DSAPT). The Proposal would also ensure that customers receive a continuing level of amenity, safety and comfort on all platforms. The canopies proposed for these platforms would encourage customers to spread evenly along these platforms during inclement weather, reducing train dwell times and improving timetable reliability.

The Proposal is designed to drive a stronger customer experience outcome, to deliver improved travel to and between modes, encourage greater public transport use and better integrate interchanges with the role and function of town centres. The Proposal would also assist in responding to forecasted growth in the region and as such would support growth in commercial and residential development.

Chapter 2 of this REF further describes the need for the proposal and outlines the options considered in developing the design.

Community and stakeholder consultation

Community consultation activities for the Proposal would be undertaken during the public display period of this REF with the public invited to submit feedback to help Transport for NSW understand what is important to customers and the community. The REF would be displayed for a period of two weeks. Further information about these specific consultation activities is included in Section 5 of this REF.

During the display period a Project Infoline (1800 684 490) and email address (projects@transport.nsw.gov.au) would also be available for members of the public to make enquiries.

In accordance with the requirements of the *State Environmental Planning Policy (Infrastructure) 2007* (Infrastructure SEPP), consultation is required with local councils and/or public authorities in certain circumstances, including where council managed infrastructure is affected. Consultation has been undertaken with City of Sydney Council and Sydney Trains during the development of design options and the preferred option. Consultation with these stakeholders will continue through the detailed design and construction of the Proposal.

Feedback can be sent to:

- projects@transport.nsw.gov.au
- Transport Access Program – Erskineville Station Upgrade
  Associate Director Environmental Impact Assessment
  Transport for NSW
  PO Box K659Haymarket NSW 1240

Or submitted:

- via transport.nsw.gov.au/erskineville

Transport for NSW would review and assess all feedback received during the public display period, prior to determining whether or not to proceed with the Proposal.

Should the Proposal proceed to construction, the community would be kept informed throughout the duration of the construction period. Figure ES-2 shows the planning approval and consultation process for the Proposal.

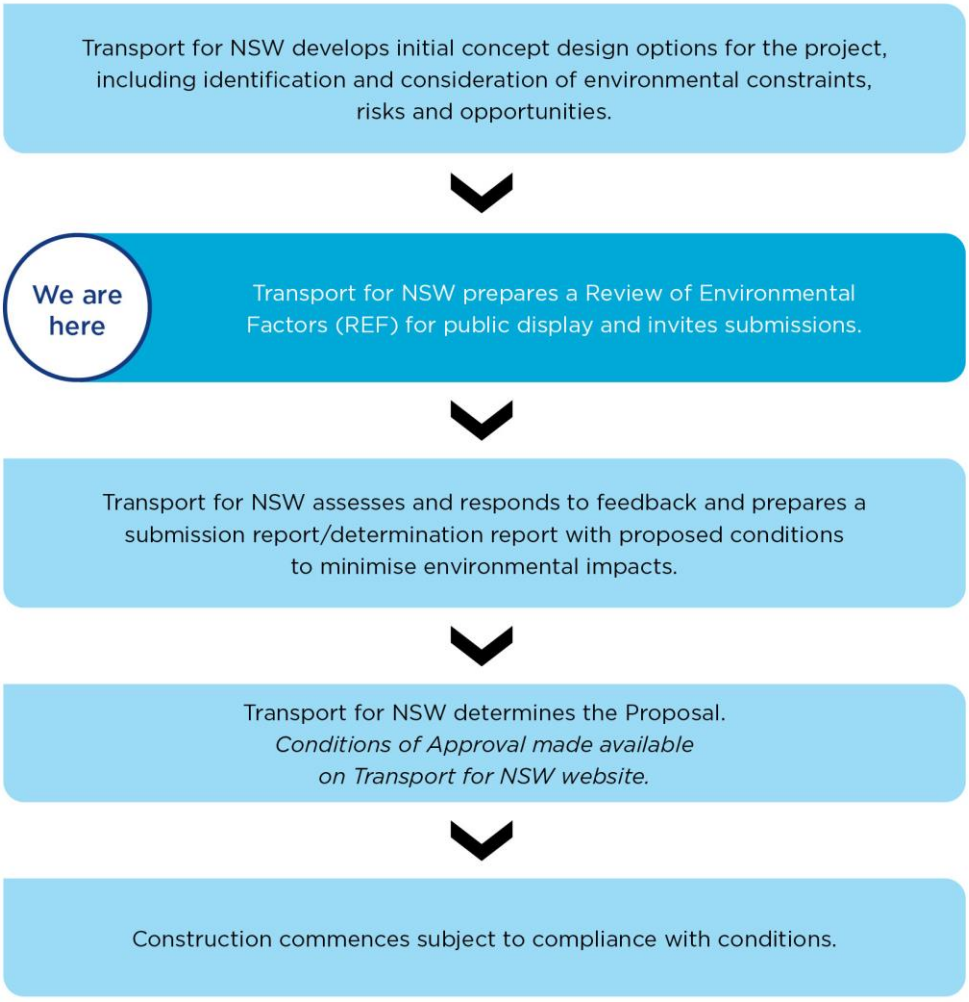

Figure ES-2 Planning approval and consultation process for the Proposal

Environmental impact assessment

This REF identifies the potential environmental benefits and impacts of the Proposal and outlines the mitigation measures to reduce the identified impacts.

The Proposal would provide the following benefits:

- improve accessibility to and around the station by providing a new lift and extension to the existing entrance of the station, a new footbridge, three new lifts and a new southern station entrance, and modifications to the existing family accessible toilet
- improve accessibility and interchange facilities at the station by providing new kiss and ride areas and accessible parking spaces on Bridge Street
- improve customer amenity by installing new canopies on the platforms to provide weather protection, and installing a new family accessible toilet, female ambulant toilet and male ambulant toilet within the Platform 2/3 building
- improve customer safety by platform regrading and installing new tactiles along the platforms, improving station lighting and CCTV, and upgrading footpaths approaching the northern and southern station entrances

- improve customer experience by upgrading customer information and communication systems, adjusting wayfinding signage and landscaping work.

The following key impacts have been identified should the Proposal proceed:

- temporary changes to pedestrian and cyclist movements along Bridge Street and Swanson Street during construction work
- temporary changes to traffic movements and availability of parking as a result of upgrade work on Bridge Street and the delivery of construction plant and materials
- temporary increased platform congestion due to localised platform closures and dedications during platform resurfacing and regrading work
- temporary change to the visual environment during construction phase due to fencing and hoarding, road barriers and signage, formwork and scaffolding, cranes and other construction equipment, site office and amenities, and night lighting
- temporary noise and vibration emission during construction, which are predicted above 75 dBA $L_{Aeq(15minute)}$ at residential receivers directly adjacent Erskineville Station (along Bridge Street and George Street) during the operation of noise intensive equipment
- moderate adverse impact on the heritage significance of Erskineville Station associated with the addition of canopies, the new southern entrance, the footbridge and lifts, and associated infrastructure
- removal of approximately nine trees to facilitate the construction of the proposed new station entrance, footbridge, lifts and other accessibility upgrades at the station. The infrastructure design encroaches greater than 10 per cent of the tree protection zone of a further six trees at the western end of the proposed footbridge and also on Bridge Street. This encroachment may lead to a need to remove the trees if the detailed design and/or preferred construction methodologies cannot be sufficiently altered.

Further information regarding these impacts is provided in Chapter 6 of the REF.

Conclusion

This REF has been prepared having regard to sections 5.5 and 5.7 of the EP&A Act, and clause 228 of the EP&A Regulation, to ensure that Transport for NSW takes into account to the fullest extent possible, all matters affecting or likely to affect the environment as a result of the Proposal.

The detailed design of the Proposal would also be designed in accordance with the Infrastructure Sustainable Council of Australia (ISCA) Infrastructure Sustainable (IS) Rating Tool (v 1.2) taking into account the principles of ecologically sustainable development (ESD).

Should the Proposal proceed, any potential associated adverse impacts would be appropriately managed in accordance with the mitigation measures outlined in this REF, and the Conditions of Approval imposed in the Determination Report. This would ensure the Proposal is delivered to maximise benefit to the community and minimise any adverse impacts on the environment.

In considering the overall potential impacts and proposed mitigation measures outlined in this REF, the Proposal is unlikely to significantly affect the environment including critical habitat or threatened species, populations, ecological communities or their habitats.

Figure ES-3 Photomontage of proposed new southern entrance on Bridge Street

1 Introduction

Transport for NSW is responsible for strategy, planning, policy, procurement, regulation, funding allocation and other non-service delivery functions for all modes of transport in NSW including road, rail, ferry, light rail, point to point, cycling and walking. Transport for NSW is the proponent for the Erskineville Station Upgrade (the 'Proposal').

1.1 Overview of the Proposal

The NSW Government is committed to facilitating and encouraging the use of public transport, such as trains, by upgrading stations to make them more accessible, and improving interchanges around stations with other modes of transport such as buses, bicycles and cars. The NSW Government is also committed to building a modern and up-to-date rail system that will play its part in making Sydney a more productive and liveable city.

1.1.1 The need for the Proposal

The Erskineville Station Upgrade, the subject of this Review of Environmental Factors (REF), forms part of the Transport Access and More Trains More Services programs.

The Transport Access Program is an initiative to provide a better experience for public transport customers by delivering accessible, modern, secure and integrated transport infrastructure. The More Trains, More Services program will transform the rail network and provide customers with more reliable, high capacity turn up and go services.

The Proposal would improve accessibility of the station in line with the requirements of the Commonwealth *Disability Discrimination Act 1992* (DDA) and the *Disability Standards for Accessible Public transport 2020* (DSAPT). The Proposal would also ensure that customers at the station receive a continuing level of amenity, safety and comfort whilst improving timetable reliability.

The needs and objectives of the Proposal are further discussed in Chapter 2 of this REF.

1.1.2 Key features of the Proposal

The key features of the Proposal are summarised as follows:

- a new southern station entrance off Bridge Street including a new footbridge with three new lifts and stairs connecting to all platforms
- extension of the existing northern footbridge with a new lift and lift landing to the western side of Platform 1 (whilst retaining the existing overhead booking office, footbridge and stairs)
- one new kiss and ride area and one accessible parking space at the northern terminus of Bridge Street providing an accessible path of travel to the existing (northern) station entrance
- a new kiss and ride area with capacity for two cars and a new pedestrian crossing on Bridge Street opposite the new southern station entrance
- new canopies on the platforms to provide weather protection
- a new family accessible toilet, female ambulant toilet and male ambulant toilet within the Platform 2/3 building
- modifications to the family accessible toilet on Platform 1 for improved accessibility

- upgrade work along the footpaths approaching the northern and southern station entrances
- kerb modifications and line marking at the southern station entrance to provide access to the new kiss and ride areas
- improvements to customer information and communication systems including wayfinding modifications, public address (PA) system modifications and new hearing induction loops
- localised platform regrading and the installation of new tactiles along the platforms
- improvements to station lighting and CCTV to improve safety and security
- landscaping work, tree removal and adjustments to wayfinding
- electrical upgrades for the new infrastructure and service relocations.

Subject to planning approval, construction is expected to commence in 2021 and take around 24 months to complete.

A detailed description of the Proposal is provided in Chapter 3 of this Review of Environmental Factors (REF).

1.2 Location of the Proposal

The Proposal would involve upgrade work to Erskineville Station, which is located in the suburb of Erskineville in the City of Sydney Local Government Areas (LGA) about 3 kilometres southwest of the Sydney Central Business District (CBD). The location of the station and its regional context is shown in Figure 1.1. The key features located around the station is described in Section 1.3.2 and shown in Figure 1.7.

Erskineville Station consists of one island platform (Platform 2/3) and two side platforms (Platform 1 and 4) and is serviced by the T3 Bankstown line. It is bound by Swanson Street to the north and Bridge Street to the east. The Proposal includes upgrades to Erskineville Station on land owned by the NSW Transport Asset Holding Entity, and managed by Sydney Trains within the station precinct, with some work also proposed within Bridge Street which is managed by City of Sydney Council.

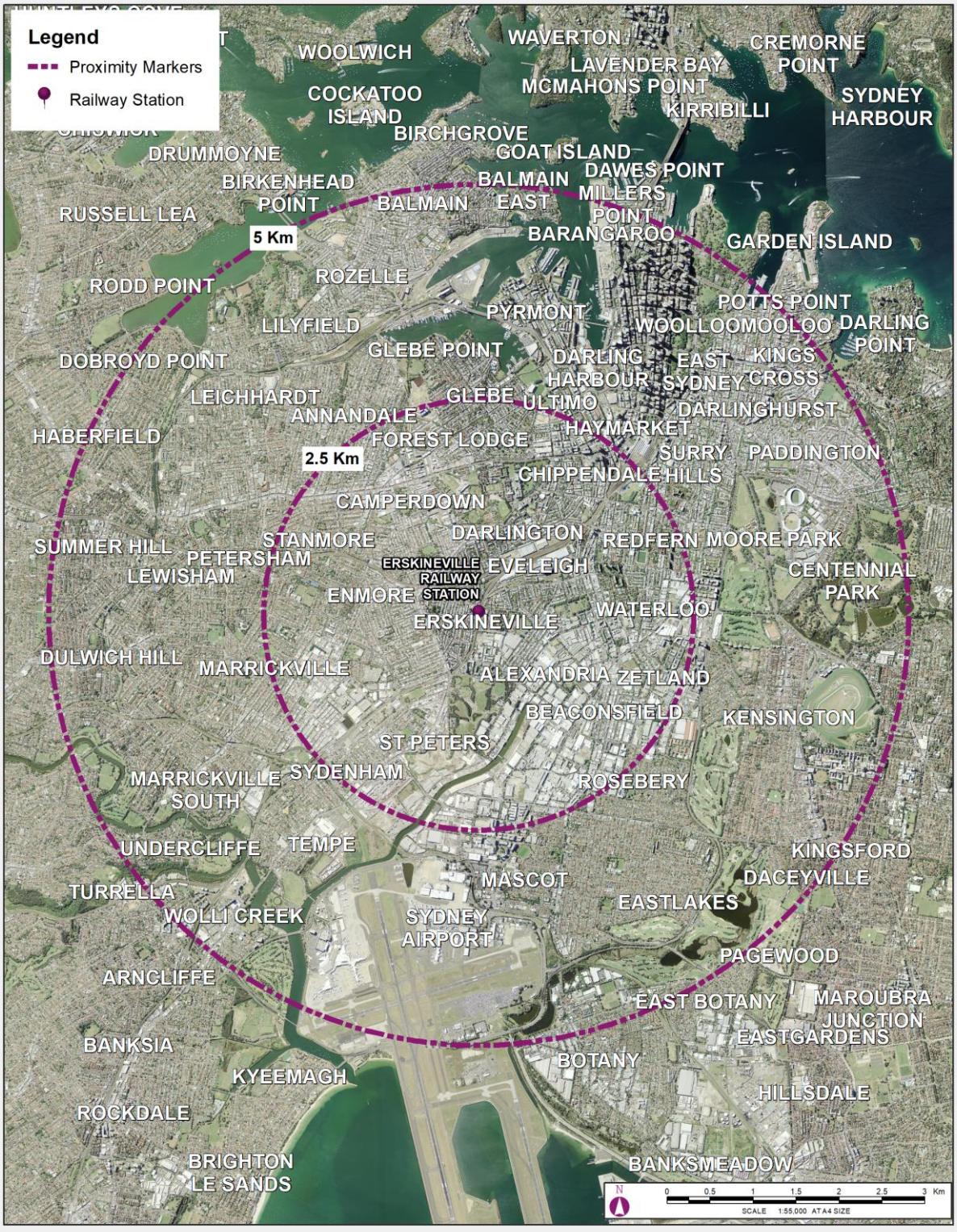

Figure 1.1 Regional context of the Proposal

1.3 Existing infrastructure and land uses

1.3.1 Erskineville Station

Erskineville Station is currently accessed via a single entrance on Swanson Street through the overhead booking office, which connects to a pedestrian footbridge that provides stair access to the station platforms. The overhead booking office also contains a small retail kiosk.

There is one island platform and two side platforms at the station, accessed via a pedestrian footbridge and stairs at the northern end of the platforms. Platform 1 provides services to Central Station and the City Circle and Platform 2 provides services to Lidcombe and Liverpool via Bankstown. There are no regular services at Platform 3 and Platform 4, however occasionally these platforms are utilised when the Bankstown Line is closed for trackwork.

There are two bus stops located within 100 metres of the station on Swanson Street, approximately 90 metres west and 70 metres east. A temporary dedicated cycle path is located east of the station along Bridge Street, and bicycle parking is provided at the station. There are no taxi ranks, kiss and ride areas, accessible parking spaces or commuter parking provided at the station. Car-share parking facilities are located east of the station on Bridge Street and general parking is available in the local streets, though surrounding streets such as Bridge Street and George Street have a two hour parking limit.

Swanson Street has a road bridge and footpath which crosses over the rail corridor north of the station and provides pedestrian access to the station and across Swanson Street.

Key features of Erskineville Station are shown in Figure 1.2 to Figure 1.6.

Figure 1.2 View of the overhead booking office and station entrance on Swanson Street

Figure 1.3 Overhead booking office and footbridge, looking south towards the platforms

Figure 1.4 View of the platforms from the existing footbridge

Figure 1.5 View of the overhead booking office, footbridge and stairs from Platform 1

Figure 1.6 View of the Platform 2/3 building

1.3.2 Land uses

Under the *Sydney Local Environmental Plan 2012* (Sydney LEP) the rail infrastructure is zoned SP2 Infrastructure. The proposed work to the interchange facilities and pedestrian access from Bridge Street are within land zoned R1 General Residential. There is land zoned public recreation approximately 30, 80, 120 and 130 metres west of the station on Swanson Street, and immediately east of the station on Bridge Street. The surrounding area around Erskineville Station is a combination of R1 General Residential, SP2 Infrastructure, B1 Neighbourhood Centre and RE1 Public Recreation.

There are four schools and education centres located within 500 metres of the station including:

- Erskineville Public School, located immediately east of the station
- St Mary's Catholic Primary School, located approximately 160 metres east of the station
- Gowrie NSW Erskineville Early Education and Care, located approximately 320 metres southeast of the station
- SDN Erskineville Children's Education and Care Centre, located approximately 270 metres east of the station.

Harry Noble Reserve, Bowling Greens, Erskineville Park and Erskineville Oval are located approximately 350 metres east of the station. Sydney Animal Hospitals Newtown and the Erskineville Post Office are located approximately 120 metres to the west and northwest respectively, with Erskineville Town Hall located approximately 170 metres west of the station. The Eveleigh Maintenance Centre is located approximately 400 metres northeast of the station.

There are three places of worship located within 500 metres of the station including:

- Turkish Mosque, located approximately 150 metres northwest of the station
- St Mary's Catholic Church Erskineville, located approximately 150 metres east of the station
- Erskineville Village Anglican Church, located approximately 200 metres west of the station.

The site locality and key points of interest surrounding the Proposal area is shown in Figure 1.7.

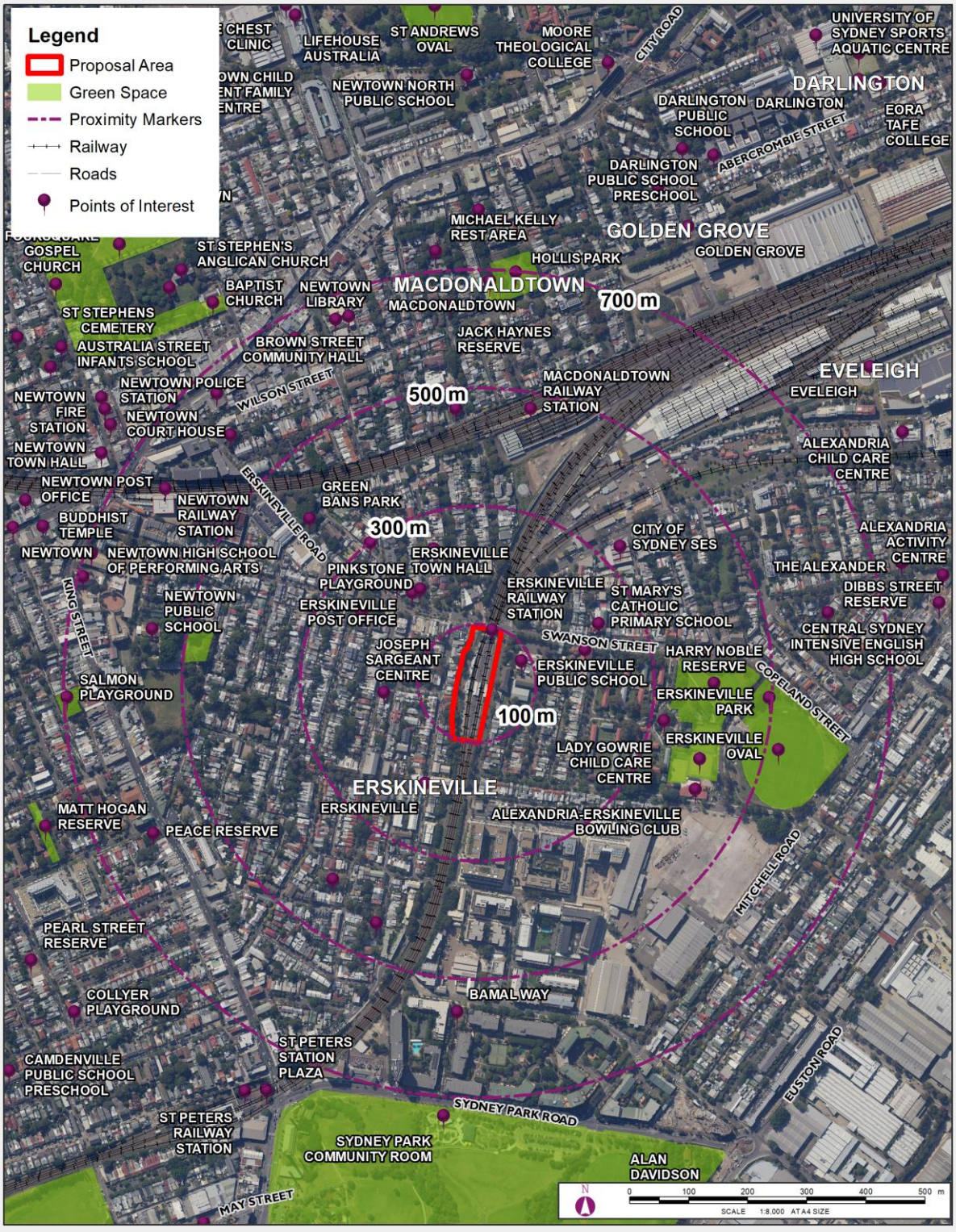

Figure 1.7 Site locality map

1.4 Purpose of this Review of Environmental Factors

This REF has been prepared by RPS on behalf of Transport for NSW to assess the potential impacts of the Erskineville Station Upgrade. For the purposes of this work, Transport for NSW is the proponent and the determining authority under Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

The purpose of this REF is to describe the Proposal, to assess the likely impacts of the Proposal having regard to the provisions of Section 5.5 of the EP&A Act, and to identify mitigation measures to reduce the likely impacts of the Proposal. This REF has been prepared in accordance with clause 228 of the *Environment Planning and Assessment Regulation 2000* (EP&A Regulation).

This assessment has also considered the relevant provisions of other relevant environmental legislation, including the *Biodiversity Conservation Act 2016* (BC Act), *Fisheries Management Act 1994* (FM Act) and the *Roads Act 1993* (Roads Act).

Having regard to the provisions of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), this REF considers the potential for the Proposal to have a significant impact on matters of National Environmental Significance (NES) or Commonwealth land, and the need to make a referral to the Commonwealth Department of the Environment and Energy for any necessary approvals under the EPBC Act. Refer to Chapter 4 for more information on statutory considerations.

2 Need for the Proposal

Chapter 2 discusses the need and objectives of the Proposal, having regard to the objectives of the Transport Access Program and the specific objectives of the Proposal. This chapter also provides a summary of the options that have been considered during development of the Proposal and why the preferred option has been chosen.

2.1 Strategic justification

Improving transport customer experience is the focus of the NSW Government's transport initiatives. Transport interchanges and train stations are the important gateways to the transport system and as such play a critical role in shaping the customer's experience and perception of public transport.

The Erskineville Station Upgrade, the subject of this REF, forms part of the Transport Access Program. This program is designed to drive a stronger customer experience outcome to deliver seamless travel to and between modes, encourage greater public transport use and better integrate station interchanges with the role and function of town centres within the metropolitan area and developing urban centres in regional areas of NSW.

Erskineville Station Upgrade also forms part of the More Trains, More Services Program, which is a program of staged investments that will progressively transform the rail network into a modern and reliable mass transit system using world class digital technology. The program is already delivering better customer outcomes through timetable enhancements and integration of Sydney Metro Northwest with the heavy rail network. The current stage of the More Trains, More Services Program will focus on delivering greater capacity, reliability and connectivity for customers on the T4 Eastern Suburbs & Illawarra Line, South Coast Line and T8 Airport and South Line.

As part of the broader network re-configuration strategy, customers will board and alight trains at Erskineville from different platforms and these alternative platforms do not currently have sufficient canopy cover for customer amenity. The Proposal involves canopy upgrades to platforms at these stations to ensure that customers receive a continuing level of amenity, safety and comfort and spread evenly along the platform.

Table 2.1 provides an overview of NSW Government policies and strategies relevant to the Proposal.

Table 2.1 Key NSW Government policies and strategies applicable to the Proposal

Policy / Strategy	Overview	How the Proposal aligns
Future Transport Strategy 2056 (TfNSW, 2018a)	*Future Transport 2056* is an update of NSW's *Long Term Transport Master Plan*. It is a suite of strategies and plans for transport to provide an integrated vision for the state. *Future Transport 2056* identifies 12 customer outcomes to guide transport investment in Greater Sydney. These outcomes include transport providing convenient access, supporting attractive places and providing 30-minute access for customers to their nearest centre by public transport and the provision of accessible transport services.	The Transport Access Program is identified in the Strategy as an example of the NSW Government working to improve accessibility of the rail network. As identified in the Strategy, the delivery and modernisation of infrastructure would allow greater access for people with disabilities and those with limited mobility. The Proposal would assist in meeting the following State-wide outcomes detailed in *Future Transport 2056*: • encouraging active travel (walking and cycling) and using public transport

Policy / Strategy	Overview	How the Proposal aligns
		• a fully accessible network that enables barrier-free travel for all. The Strategy also identifies the More Trains, More Services Program as a priority initiative to provide modern and reliable turn-up-and-go services to customers. The Proposal forms part of the More Trains, More Services Program and would deliver on the customer focus, safety and performance outcomes of the Strategy.
Disability Inclusion Action Plan (2018-2022) (TfNSW, 2017a)	The *Disability Inclusion Action Plan 2018-2022* was developed by Transport for NSW in consultation with the Accessible Transport Advisory Committee, which consists of representatives from peak disability and ageing organisations within NSW. The Disability Plan identifies the challenges, the achievements to date, the considerable undertaking that is required to finish the job and provides a solid and practical foundation for future progress over the next five years.	The Transport Access Program has been identified in this Plan as a key action to ensure transport networks in Sydney are accessible for all potential users. The Proposal has been developed with consideration of the objectives outlined in this Plan and seeks to improve and provide equitable access to public transport facilities. The Proposal would also enable Erskineville to be a more liveable community for people with a disability by improving accessibility at Erskineville Station and interchange at the station to other transport modes include bus, taxi and private vehicles.
A Metropolis of Three Cities - Greater Sydney Region Plan (Greater Sydney Commission, 2018a)	The *Greater Sydney Region Plan* is the NSW Government's 40-year land use plan for Sydney. It establishes a vision for a metropolis of three cities – the Eastern Harbour City, Central River City and Western Parkland City. One of the ten directions of the framework is a well-connected city, by developing a more accessible and walkable city, through optimising existing infrastructure where possible.	The Proposal would enable equitable access to services and employment as well as social and cultural opportunities through investment in transport. The proposed upgraded infrastructure and station entrances would promote public transport movements, walking, cycling and social opportunity, which contribute to the character and identity of the area.
Eastern City District Plan (Greater Sydney Commission, 2018b)	The *Eastern City District Plan* has been prepared to align with the visions and objectives of the *Greater Sydney Region Plan*. This Plan covers the City of Sydney LGA and is a 20-year plan to manage growth in the context of economic, social and environmental matters to achieve the 40-year vision for Greater Sydney. The vision includes aligning growth with infrastructure, including transport, social and green infrastructure, and delivering sustainable, smart and adaptable solutions.	Planning Priority E1 is about planning for a city supported by infrastructure through transport programs and investing in transport interchanges. Planning Priority E10 is about delivering integrated land use and transport planning. The Proposal would upgrade Erskineville Station to be accessible by wheelchair and also improve access for people with limited mobility. As such, the Proposal aligns with the vision of the Plan to focus on accessibility and inclusion when

Policy / Strategy	Overview	How the Proposal aligns
		designing and building public transport.
Building Momentum – State Infrastructure Strategy 2018-2038 (Infrastructure NSW, 2018)	The *State Infrastructure Strategy 2018-2038* makes recommendations for each of NSW's key infrastructure sectors including transport. Public transport is viewed as critical to productivity, expanding employment opportunities by connecting people to jobs, and reducing congestion.	The Proposal would upgrade public transport services to provide access for a wider range of customers. It would also involve the upgrade of existing infrastructure which aligns with an objective of the strategy to optimise the use of the State's existing assets.
Sustainable Sydney 2030 (e City of Sydney Council, 2017)	*Sustainable Sydney 2030* is the Community Strategic Plan for the City of Sydney and outlines the strategies and action plans for a green, global and connected city. The plan includes a strategic direction for integrated transport for a connected city with an objective to provide transport services and infrastructure that is accessible.	The Proposal would assist the goals of *Sustainable Sydney 2030* by upgrading the public transport services to be accessible to a wider range of the community. The Proposal also aligns with the strategies of creating a connected city through the upgrade and improvement of the public transport network in Erskineville.
City Plan 2036 (City of Sydney Council, 2020)	*City Plan 2036* is the Local Strategic Planning Statement that links the NSW Government's strategic plans, the *Sustainable Sydney 2030* community strategic plan and the planning controls for the City of Sydney. The planning statement identifies planning priorities for infrastructure and liveability, supporting the strategic direction for a green, global and connected city.	The Proposal would support the planning priorities of the *City Plan 2036* improving infrastructure and liveability by upgrading the public transport services at Erskineville Station to be accessible and more connected to the surrounding community.

2.2 Objectives of the Transport Access Program

The Transport Access Program is a NSW Government initiative to provide a better experience for public transport customers by delivering accessible, modern, secure and integrated transport infrastructure where it is needed most. The program aims to provide:

- stations that are accessible to those with disabilities, the ageing and parents/carers with prams and customers with luggage
- modern buildings and facilities for all modes that meet the needs of a growing population
- modern interchanges that support an integrated network and allow seamless transfers between all modes for all customers
- safety improvements including extra lighting, lift alarm, fences and security measures for car parks and interchanges, including stations, bus stops and wharves
- signage improvements so customers can more easily use public transport and transfer between modes at interchanges
- other improvements and maintenance such as painting, new fencing and roof replacements.

2.3 Objectives of the More Trains More Services Program

Over the next ten years the More Trains, More Services Program will simplify and modernise the rail network, creating high capacity and turn-up-and-go services for many customers. Customers will experience more frequent train services, with less wait times, less crowding and more seats on a simpler, more reliable network.

The More Trains, More Services Program is about building a modern and up-to-date rail system that will play its part in making Sydney a more productive and liveable city. The NSW Government's *Future Transport Strategy 2056* (Transport for NSW, 2018a) identifies More Trains, More Services as a priority initiative and is a commitment to the State's transport and infrastructure needs.

More Trains, More Services is key to enabling Greater Sydney Commission's vision for the Greater Sydney Region Plan, A Metropolis of Three Cities (Greater Sydney Commission, 2018a), where most residents live within 30 minutes of their jobs, education and health facilities, services and great places.

More Trains, More Services is a program of staged investments that will progressively transform the rail network into a modern and reliable system using world class technology.

The program is already delivering better customer outcomes through timetable enhancements and the integration of the Sydney Metro Northwest with the existing heavy rail network. The current stage of More Trains, More Services will focus on delivering greater capacity, reliability and connectivity for customers on the T4 Eastern Suburbs & Illawarra Line, South Coast Line and T8 Airport & South Line.

These services will be enabled by upgrading and modernising signalling and control systems and using digital technology that, when combined with other infrastructure upgrades, will deliver major increases in the capacity and reliability of the network.

2.4 Objectives of the Proposal

The specific objectives of the Erskineville Station Upgrade are to:

- provide a station that is accessible to those with a disability, the ageing and parents/carers with prams and customers with luggage
- improve customer experience (weather protection, better interchange facilities and visual appearance)
- minimise pedestrian conflict and crowding points
- improve integration with surrounding precinct
- improve customer safety
- improve wayfinding in and around the station
- respond to the heritage values of the site
- improve customer amenity
- minimise impacts to existing vegetation
- address the principles of ecologically sustainable development.

2.5 Design development

Options for improving access to Erskineville Station were developed following workshops with a stakeholder working group that included representatives from Transport for NSW and the design team. Two design options were initially developed from those workshops, which involved providing lifts at the existing overhead booking office. Due to the constructability, deliverability, and heritage considerations, a third and fourth option was introduced which included a new footbridge, lift and stairs at the southernmost end of the station platforms, and additional walkways to link the existing and new station infrastructure. The four options considered are further discussed below.

2.6 Alternative options considered

Improvements common to all four options included upgrades to all existing stairs with new compliant handrails, tactiles and nosing, regrading of Platform 2/3 around the existing station building, and amendments to fixture heights within the existing family accessible toilet.

The key differences between the four options were as follows:

- Option 1:
  - three lifts proposed on the existing footbridge, all located on the southern side of the existing overhead booking office and footbridge
  - lifts on Platform 1 and Platform 4 would be through-lifts and would have a lift landing extended from the existing footbridge. New retaining walls would be required adjacent to Platform 1 and Platform 4 to enable the installation of the lifts
  - an elevated walkway on either side of the existing stairs on Platform 2/3 would be provided to connect to the landing of the new narrow lift.
- Option 2:
  - three lifts proposed on the existing footbridge, all located on the southern side of the existing overhead booking office and footbridge
  - lifts on Platform 1 and Platform 4 would be through-lifts and would have a lift landing extended from the existing footbridge. New retaining walls would be required adjacent to Platform 1 and Platform 4 to enable the installation of the lifts
  - a new lift and stairs proposed on Platform 2/3. The lift would be located close to the existing overhead booking office and footbridge. The existing stairs would be removed, and new stairs would be constructed.
- Option 3:
  - a new southern footbridge complete with three lifts and stairs at the southern end of all platforms
  - a new entrance to the southern station footbridge from Bridge Street
  - a new lift from the existing northern entrance of the station to Platform 1
  - retention of the existing footbridge, stairs and station entry at Swanson Street
  - an additional access to the new southern footbridge from George Street through Kirsova 2 Playground.

- Option 3b:
    - as Option 3, however with an additional walkway proposed along the western side of rail corridor between the southern footbridge and the existing footbridge.

Initially, the four options did not include provision for accessible car parking, though the provision of a kiss and ride area was considered on each side of the new footbridge along George Street and Bridge Street as part of Option 3 and 3b. As the design was further developed, the access from George Street through Kirsova 2 Playground as part of Option 3 and 3b was removed. An additional entrance through the playground would compromise available space for play and recreation within this area of Erskineville and may result in safety issues. The existing pathway via the underpass at lower George Street and the proximity to the proposed new entrance concourse on Bridge Street was considered a reasonable station link without impacting on valuable open space in a high density area. Additionally, the provision of one new accessible parking and three new kiss and ride areas along Bridge Street were also added to the design for assessment.

A 'do-nothing' option was also considered where existing access to the platform and station amenities would remain the same and there would be no changes to the way the station and interchanges currently operates. The NSW Government has identified the need for improving the accessibility of transport interchanges, train stations and commuter car parks across NSW as a priority under the Transport Access Program. The 'do nothing' option was not considered a feasible alternative as it is inconsistent with NSW Government objectives and would not help encourage the use of public transport and would not meet the needs of the Erskineville community.

2.6.1 Assessment of identified options

The design options were assessed in a multi-criteria analysis (MCA) that included consideration of the following criteria:

- accessibility – compliance with DSAPT
- infrastructure – accommodates supporting infrastructure and removes redundant / end of life assets
- facility operations and maintenance – maximises opportunity for safe and efficient operation and maintenance
- deliverability – innovation in construction, continuity of service, minimised impact on local community and deliverable in program timeframe
- customer experience – ease of accessing the station and customer facilities, personal safety and security, convenience and comfort
- transport interchange – connectivity to the transport interchange
- urban design and precinct planning – integrates into surroundings and does not preclude future development at the station
- environment, sustainability, and heritage – compliance with environmental legislation, protection and enhancement of heritage items and significant trees, and support opportunities for sustainability initiatives.

This methodology consisted of:

- a quantitative assessment that compared the whole-of-life costs for each option (i.e. both capital expenditure and operational expenditure) which were assessed as similar for all options

- a qualitative assessment which assessed and weighted each option against the criteria listed above

Further, an analysis of each option against the urban design principles in *Around the Tracks: Urban Design for Heavy and Light Rail* (TfNSW, 2016) was undertaken as part of the Urban Design Report for the Proposal in 2019 (DesignInc, 2019).

2.7 Justification for the preferred option

Options 1 and 2 were initially identified as the preferred option during earlier stages of design conception and stakeholder consultation. However, following design optioneering, constructability workshops and further consultation regarding the future planning of the Erskineville precinct, substantive risks were identified with Options 1 and 2, summarised as:

- existing services – critical Sydney Trains and external services would require relocation to accommodate construction of extensions at the overhead booking office level and the three new lifts
- customer interface – Platform 2/3 would require the installation of a temporary footbridge for customer access to allow construction of the new lift and stairs
- signalling impacts – sighting issues as a result from the new infrastructure on Platform 2/3
- heritage impacts – impacts to section 170 and locally listed heritage items, including retaining walls and murals on Platform 4
- rail shutdowns – greater requirement for an increase in all-track rail shutdowns for construction and maintenance
- program schedule – additional required work, such as service relocation and all-track rail, delaying completion of the Proposal.

As a result of these identified risks, design Options 1 and 2 were not further progressed.

Options 3 and 3b were confirmed as the preferred options to progress, providing equitable access to service the Erskineville precinct and improving station performance by:

- enabling the efficient arrival and departure of trains on the platforms
- reducing queuing and congestion around existing stairs at the northern end if the station
- increasing walkability to the station by improving connectivity between the station and local community
- providing infrastructure to enable a greater percentage of the community to access the station.

Additionally, Options 3 and 3b best meet longstanding community requests for a southern entrance to Erskineville Station.

During the constructability workshops it was identified that Options 3 and 3b would also reduce or remove the identified risks identified with Options 1 and 2, as follows:

- existing services – reduced interface with existing services by relocating construction to the southern end of the platform where it is easier to avoid clashes with new infrastructure
- customer interface – no requirement for temporary footbridge as station access can be maintained from the existing station entrance to platforms throughout construction

- signalling – no impacts to signalling infrastructure from the proposed lift and stairs and no requirement for platform extension at the southern end of Platform 2/3
- heritage impacts – reduced interface with heritage-listed items by relocating work to the southern end of the station. No impact to existing brick retaining wall and mural on Platform 4
- rail shutdowns – fewer rail shutdowns required for construction and maintenance
- program schedule – minimal/minor risk by avoiding critical path signalling design requirement, service relocations and dependency for all track rail shutdowns.

As the design continue to developed, Option 3b was discarded as a passenger lift, rather than a pathway and stairs, was considered to be more efficient for customers needing to interchange, particularly where there is a height difference of more than two metres from entry to platform. Furthermore, an additional pathway west of Platform 1 would have a greater impact on existing vegetation. Option 3 was then confirmed to be the preferred option as it best achieved the objectives of the Proposal with less impact to the existing environment and local community.

3 Proposal description

Chapter 3 describes the Proposal and summarises key design parameters, construction method, and associated infrastructure and activities. The description of the Proposal is based on the concept design and is subject to detailed design.

3.1 The Proposal

As described in Section 1.1.20, the Proposal involves an upgrade of Erskineville Station as part of the Transport Access Program which would improve accessibility and amenities for customers. The description of the Proposal below is based on a scoping design and is subject to detailed design.

The Proposal would include the following key elements:

- a new southern station entrance off Bridge Street including a new footbridge with three new lifts and stairs connecting to all platforms
- extension of the existing northern footbridge with a new lift and lift landing to the western side of Platform 1 (whilst retaining the existing overhead booking office, footbridge and stairs)
- one new kiss and ride area and one accessible parking space at the northern terminus of Bridge Street providing an accessible path of travel to the northern station entrance
- a new kiss and ride area with capacity for two cars and a new pedestrian crossing on Bridge Street opposite the new southern station entrance
- new canopies on the platforms to provide weather protection
- a new family accessible toilet, female ambulant toilet and male ambulant toilet within the Platform 2/3 building
- modifications to the family accessible toilet on Platform 1 for improved accessibility
- upgrade work along the footpaths approaching the northern and southern station entrances
- kerb modifications and line marking at the southern station entrance to provide access to the new kiss and ride areas
- improvements to customer information and communication systems including wayfinding modifications, PA system modifications and new hearing induction loops
- localised platform regrading and the installation of new tactiles along the platforms
- improvements to station lighting and CCTV to improve safety and security
- landscaping work, tree removal and adjustments to wayfinding
- electrical upgrades for the new infrastructure and service relocations.

Figure 3.1 shows the general layout of key elements for the Proposal.

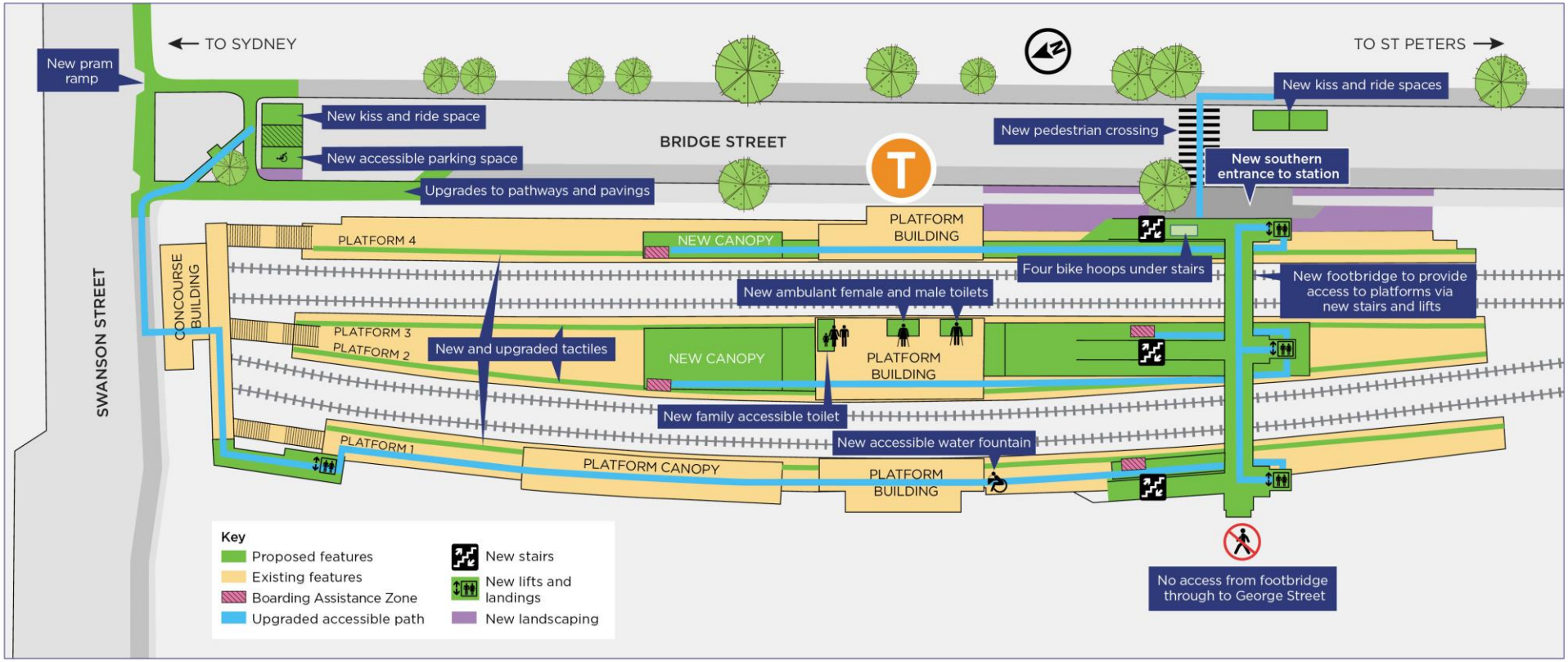

Figure 3.1 Key features of the Proposal

3.2 Scope of work

3.2.1 Station upgrade

Details of the proposed work to take place at the station are provided below:

- construction and installation of a new accessible southern station entrance off Bridge Street which would include:
  - a new footbridge with anti-throw screens connecting Bridge Street to all platforms
  - installation of a lift from the new station entrance at Bridge Street (Platform 4) to the new footbridge
  - installation of a narrow through lift from the new footbridge to Platform 2/3
  - installation of a lift from the new footbridge to the western edge of Platform 1 requiring local widening of existing Platform 1 to accommodate new lift landing and stairs
  - lift landings with canopies for weather protection at the waiting areas on the platforms
  - stairs from the new footbridge to each platform with anti-throw and protection screens as required.
- extension of the existing northern footbridge with a new lift and lift landing to the western side of Platform 1, requiring a new lift landing, canopy and concrete retaining wall at platform level
- retention of the existing northern footbridge (Swanson Street entrance), overhead booking office and stairs with minor modifications which would include minor regrading, upgrades to the handrails, tactiles and stair nosings
- new canopies along the platforms and at the boarding assistance zones for weather protection
- improvements to customer information and communication systems, including public address (PA) system modifications, new hearing induction loops within the station platforms, and new Opal card readers at the southern entrance
- upgrade work, including localised regrading along the platform, replacement of tactile ground surface indicators (TGSIs) and the installation of new directional TGSIs.

3.2.2 Station building modifications

Modifications to the station buildings would include:

- a new family accessible toilet, female ambulant toilet and male ambulant toilet within the Platform 2/3 building
- modifications to the existing family accessible toilet on Platform 1 including changes to the door and internal fixtures for improved accessibility
- installation of a new glass canopy extending from the existing Platform 2/3 building to the new canopies.

3.2.3 Interchange facilities

Modifications to the interchange facilities would include:

- one new kiss and ride area and one accessible parking space at the northern terminus of Bridge Street providing an accessible path of travel to the northern Station entrance, which requires modifications to the Bridge Street reserve kerb
- a new kiss and ride areas with capacity for two vehicles and a new pedestrian crossing on Bridge Street at the new southern station entrance. Work may include kerb / footpath adjustments, new signage and line marking modifications
- the provision of four bicycle hoops for bicycle parking located within the new southern station entrance
- localised regrading of footpaths from the accessible parking spaces and the kiss and ride areas to the station entrances.

3.2.4 Ancillary work

The following ancillary work required as part of the upgrade work would include:

- regrading and resurfacing of localised areas on the platforms to provide accessible paths of travel between the lifts, boarding assistance zones, family accessible toilets, ambulant toilets and other facilities on the platforms
- resurfacing of other areas of the platform where impacted by construction activities
- new stormwater drainage connections from new canopies to the existing stormwater system
- services and utilities protection, adjustments and/or relocations to accommodate the new work including lighting and communications systems (e.g. CCTV), stormwater drainage, overhead wiring etc.
- upgrades to the station power supply to cater for the new lifts including:
  - adjustment to existing power supply connection points
  - new cable routes
  - new main switchboard and distribution boards
  - earthing and bonding of electrical equipment and new or modified structures.
- adjustments to the station furniture including rubbish bins
- new / upgraded wayfinding signage and other station signage
- modifications to existing platform fencing on Platform 1 and corridor fencing on Platform 4
- landscaping work and tree removal at the southern station entrance and the Bridge Street reserve, and adjustments to wayfinding signage.

3.2.5 Materials and finishes

Materials and finishes for the Proposal have been selected based on the criteria of durability, low maintenance and cost effectiveness, to accord with heritage requirements, to minimise visual impacts, and to be aesthetically pleasing.

Availability and constructability are also important criteria to ensure that materials are readily available and the structure can be built with ease and efficiently. Materials are also selected for their application based on their suitability for meeting design requirements. Materials selection should also consider sustainability aspects, including consideration of supply chain and sourcing materials locally where possible, prioritising the use of reused and recycled materials where practicable, and investigating use of materials that have environmental labels.

Each of the upgraded or new facilities would be constructed from a range of different materials, with a different palette for each of the architectural elements. Subject to detailed design, the Proposal would include the following:

- lower lift shafts – concrete
- upper lift shafts – steel frame with glass infill panels
- lift canopies – metal roof
- platform building canopy connection – steel frame with glazed canopy
- footbridge – steel truss footbridge with concrete slab flooring and mesh anti-throw screens
- footbridge foundations, piers and headstocks – concrete
- new stairs – concrete stair on steel frame with mesh anti-throw screens
- stair foundations, piers and headstocks – concrete
- canopies – steel frame with metal sheet roofing
- handrails – stainless steel.

The design was presented to Transport for NSW's Design Review Panel for comment in November 2020 before being accepted by Transport for NSW. An Urban Design Plan and Landscaping Plan (UDLP) including a Public Domain Plan (PDP) was also prepared by the Contractor, prior to finalisation of detailed design for endorsement by Transport for NSW.

3.3 Design development

3.3.1 Engineering constraints

There are a number of constraints which have influenced the design development of the Proposal.

Existing structures: the placement and integrity of existing structures including those with heritage significance needed to be considered during the development of the design – these structures included the existing footbridge, overhead booking office, stairs and the platform buildings.

Sydney Trains' requirements: modifications for existing structures and new structures within the rail corridor must be designed and constructed with consideration of train impact loads, structural clearances to the track, and safe working provisions.

Heritage: Erskineville Station is currently listed on the RailCorp (Sydney Trains) Section 170 Heritage and Conservation Register (4801158), the heritage schedule of the *Sydney Local Environmental Plan 2012* (I625). Under the NSW State Agency Heritage Guide additional consideration, assessment and consultation is triggered. The station borders a number of Heritage Conservation Areas also identified and protected under the *Sydney Local Environmental Plan 2012* and relevant Development Control Plans.

Of specific note is the intact overhead booking office built in 1910 which is the best example of a Federation Queen Anne style overhead booking office and is representative of urban station design of the early twentieth century. Additionally, features of the 1911 footbridge including the footbridge and stair structure, and railings and newel posts to Platform 4 remain intact. The footbridge is a good example of a standard reinforced steel joist footbridge design. The platform buildings built between 1910-1913 remain in a physically good condition with the externals of the buildings intact.

Numerous terrace houses (including their front fences) on Bridge Street are listed on the heritage schedule of the *Sydney Local Environmental Plan 2012,* and local heritage conservation areas line the station on each side. Consideration of the design of new elements would consider its heritage context including the surrounding heritage buildings and conservation areas.

Vegetation: Erskineville Station is located within an urban environment with streetscapes adjacent to the Station characterised by a diversity of native and exotic plant species. Landscaping is also evident in the rail corridor, which is heavily planted with species not locally native to the wider natural environment. More information on how biodiversity has been considered as part of the design development is included in Section 6.7.

Utilities: a Dial Before You Dig (DBYD) search has identified a number of utilities in the vicinity of the proposed work including:

- Ausgrid underground HV cable along Bridge Street
- Jemena gas mains
- NBN Co cable
- Sydney Water sewer and water mains
- HV feeders along Platform 4 and the Swanson Street bridge.

Construction access: construction access would require traffic control in the adjacent streets and use of a large mobile crane would be required to lift construction materials and equipment to the Station from these roadways.

Public access: maintaining pedestrian access to the station during normal hours of operation.

Future patronage: the proposal has been designed to accommodate the forecast Sydney Trains patronage growth (an increase of 15 per cent to 2036) and changing travel patterns.

More Trains, More Services: the Proposal has been designed to complement operational changes to the Station that would occur under the Transport for NSW More Trains, More services program. The More Trains, More Services program will roll out technology to improve the rail network and provide customers with more reliable, high capacity turn up and go services. Infrastructure improvements are being made across the network as part of this program such as modifications to track, signalling, stabling facilities and station platforms. The Proposal includes additional canopy cover on all platforms to meet the objectives of the More Trains, More Services program.

3.3.2 Design standards

The Proposal would be designed having regard to the following:

- *Disability Standards for Accessible Public Transport 2002* (issued under the Commonwealth *Disability Discrimination Act 1992*)
- National Construction Code
- relevant Australian Standards

- Asset Standards Authority standards
- Sydney Trains standards
- Infrastructure Sustainability Council of Australia (ISCA) Infrastructure Sustainability Rating Scheme (V1.2)
- Transport for NSW Urban Design Guidelines
- *Guidelines for the Development of Public Transport Interchange Facilities* (Ministry of Transport, 2008)
- Crime Prevention Through Environmental Design (CPTED) principles
- other Transport for NSW policies and guidelines
- relevant council standards.

3.3.3 Sustainability in design

Transport for NSW is committed to minimising the impact on the natural environment and supports ISCA and the Infrastructure Sustainability (IS) rating tool. The IS rating tool was developed and is administered by ISCA. It is an independently verified and nationally recognised rating system for evaluating sustainability across design, construction and operation of infrastructure.

The Erskineville Station Upgrade is one of a number of projects within the Transport Access Program that is using version 1.2 of the IS rating tool and targeting an 'Excellent' rating. The rating scheme provides an independent and consistent methodology for the application and evaluation of sustainability outcomes in infrastructure projects.

The development of the concept design for the Proposal has been undertaken in accordance with the project targets identified in the program wide TAP 3 Sustainability Strategy.

The Sustainability Strategy sets targets across the following key issues:

- climate change adaptation and resilience
- renewable energy
- waste
- materials
- supply chain management
- community connection
- social procurement and workforce.

Key design elements and strategies developed during concept design will be used to further develop the design and construction.

3.4 Construction activities

3.4.1 Work methodology

Subject to approval, construction is expected to commence in 2021 and take around 24 months to complete. The construction methodology would be further developed during the detailed design of the Proposal by the nominated Contractor in consultation with Transport for NSW.

The proposed construction activities for the Proposal are identified in Table 3.1. This staging is indicative and is based on the current concept design and may change once the detailed design methodology is finalised. The staging is also dependent on the Contractor's preferred methodology, program and sequencing of work.

Table 3.1 Indicative construction staging for key activities

Stage	Activities
Site establishment and enabling work	• establish site compound (erect fencing, site offices, amenities and plant/material storage areas etc.) • remove required vegetation to allow for construction access, site compound and laydown area • relocate or upgrade services / utilities where required • install safety barriers and hoarding around the nominated work zones on the platform.
New southern footbridge	• install piles within each platform • excavate and install concrete bases • install footbridge and stair columns and headstocks • install footbridge concourse over tracks and Bridge Street • install insitu concrete deck for the footbridge to reduce lifting loads • install concrete stairs and anti-throw screens, and under stair infill to platform level • install fire rated cables and cable route from new distribution board to footbridge lifts • install new handrails, lighting, CCTV, PA and wayfinding.
Lifts	• demolish existing asphalt for new southern lifts and existing footbridge balustrade and handrails for northern lift to Platform 1 • install piles within each platform • excavate and install concrete lift pit base and walls including retaining wall for northern lift to Platform 1 • install lift shafts and upper lift landing • install protection screens and external finishes • install lift shaft services, lift cars and fit out lift cars • install lighting / CCTV / PA services to lift landings.
Station entrance and interchange work	• remove existing pavement at entrances to be regraded • regrade pavements in localised areas • construct kiss and ride area and accessible parking • install new signage for kiss and ride area • install new signage and road markings for accessible parking spaces • install new wayfinding signage • install new lighting as required.

Stage	Activities
Platform work	• remove/relocate existing lighting, CCTV and wayfinding to accommodate new platform canopies • install new canopy footings, structures, lighting, CCTV and wayfinding • re-grade / resurface platform in localised areas • platform finishing work (line markings, tactile indicators etc.) • install new Opal card readers • install cable routes to Opal card readers.
Building work	• install new main switchboard • install new cabling and containment to support LV and station system modifications • building work and services / fit out for new family accessible toilet and ambulant toilets on Platform 2/3 • minor modifications to existing family accessible toilet on Platform 1.
Site demobilisation	• cutover / commission digital PA / hearing induction loops / TGSI • test and commission CCTV cameras / station systems installation • test and commission new lifts • finishing work including fencing • site demobilisation.

3.4.2 Plant and equipment

The plant and equipment likely to be used during construction includes:

- jack hammer
- bobcat
- concrete pump and truck
- water cart
- grinders and bar benders
- road rail excavator
- torque wrenches and impact wrenches
- hand tools
- skip trucks
- hammer drills
- piling rig
- elevated work platform
- excavator
- hi-rail plant including elevated work platform, flatbed and hiab
- lighting tower
- suction truck
- forklift
- cranes
- demolition saw
- coring machine
- vibrating roller / compaction plate.

3.4.3 Working hours

The majority of work required for the Proposal would be undertaken during standard (NSW) Environment Protection Authority (EPA) construction hours, which are as follows:

- 7.00 am to 6.00 pm Monday to Friday
- 8.00 am to 1.00 pm Saturdays
- no work on Sundays or public holidays.

Certain work may need to occur outside standard hours and would include night work and work during routine rail shutdowns. These shutdown periods are scheduled closures that would occur regardless of the Proposal, when part of the rail network is temporarily closed and trains are not operating.

Out of hours works are required in some cases to minimise disruptions to customers, pedestrians, motorists and nearby sensitive receivers; and to ensure the safety of railway workers and operational assets. It is estimated that up to 19 rail shutdowns (coinciding with Sydney Trains planned maintenance weekends) would be required to facilitate the following:

- electrical and communication work
- construction work required for the lift installations
- construction work for the accessible footpaths, paths, stairs, car park changes
- station building work
- installation and finishing work.

Out of hours work may also be scheduled outside rail shutdown periods. Approval from Transport for NSW would be required for any out of hours work and the affected community would be notified as outlined in Transport for NSW's *Construction Noise and Vibration Strategy* (TfNSW, 2019a) (refer to Section 6.3 for further details).

3.4.4 Earthworks

Excavations and earthworks would generally be required for the following:

- piles for the new stair, canopy, lift and footbridge foundations
- construction of crane platform within the rail corridor adjacent to Platform 1
- construction of lift shafts
- construction of kiss and ride and accessible parking areas
- localised platform regrading / resurfacing work
- footpath upgrades
- other minor civil work including footings and foundations for structures, drainage / stormwater work, and trenching activities for service adjustments and relocations and drainage upgrade work.

Approximately 250 cubic metres of fill would be excavated during the construction phase and spread within the rail corridor. Any fill material that is odorous and suspected of being potentially contaminated would be sampled and treated and/or disposed in accordance with relevant legislative and sustainability requirements.

Specific locations for spoil placement would be agreed with Transport for NSW and the construction contractor during the delivery phase.

3.4.5 Source and quantity of materials

The source and quantity of materials would be determined during the detailed design phase of the Proposal and would consider the requirements of the ISCA Infrastructure Sustainability Rating Scheme (v1.2). Materials would be sourced from local suppliers where practicable. Reuse of existing materials and sourcing recycled materials would be undertaken where practicable. Investigation of materials that have environmental labels (such as an Environmental Product Declaration) should also be considered as part of design and procurement processes.

3.4.6 Traffic access and vehicle movements

Traffic and transport impacts associated with the Proposal are assessed in Section 6.1 of this REF. The potential traffic and access impacts expected during the construction of the Proposal include:

- impacts to pedestrians, rail customers and cyclists such as:
  - impact to pedestrian and cyclist movements on Bridge Street due to the movement of construction material and traffic diversions
  - temporary alterations to pedestrian access
  - increased construction vehicle movements
- temporary impacts to street parking on Bridge Street and Swanson Street to accommodate passage of large trucks, machinery and cranes during construction
- localised alterations to existing street parking to accommodate the accessible parking space and kiss and ride area
- potential alterations to traffic flow with changes to roadways, implemented through a Traffic Control Plan (TCP).

A detailed construction methodology and associated management plans such as a Construction Environmental Management Plan (CEMP) and Traffic Management Plan would be developed during the next design phase of the Proposal to manage potential traffic and access impacts.

3.4.7 Ancillary facilities

A temporary construction compound would be required to accommodate a site office, amenities, laydown and storage area for materials and waste. An area for a construction compound has been proposed in the rail corridor near Platform 1 (refer to Figure 3.2). The area nominated for the compound is on land owned by Transport Asset Holding Entity (TAHE). Impacts associated with utilising this area have been considered in the environmental impact assessment including requirements for rehabilitation.

A cleared area within the rail corridor approximately 500 metres south of the station would be utilised for construction laydown, with gated access off Concord Street (refer to Figure 3.2).

3.4.8 Public utility adjustments

The Proposal has been designed to avoid relocation of services where feasible, however further investigation may be required. It is likely some services such as water, sewer, communications and gas may require relocation, such relocation is unlikely to occur outside of the footprint of the work assessed in this REF. In the event that work would be required outside of this footprint, further assessment would be undertaken. The appropriate utility providers would be consulted during the detailed design phase.

3.5 Property acquisition

Transport for NSW does not propose to acquire any property as part of the Proposal.

3.6 Operation and maintenance

The future operation and maintenance of the new station is subject to further discussions with Sydney Trains, Transport for NSW and City of Sydney Council. Structures constructed under this Proposal would be maintained by Sydney Trains. However, it is expected that adjacent footpaths and landscape areas would continue to be maintained by City of Sydney Council.

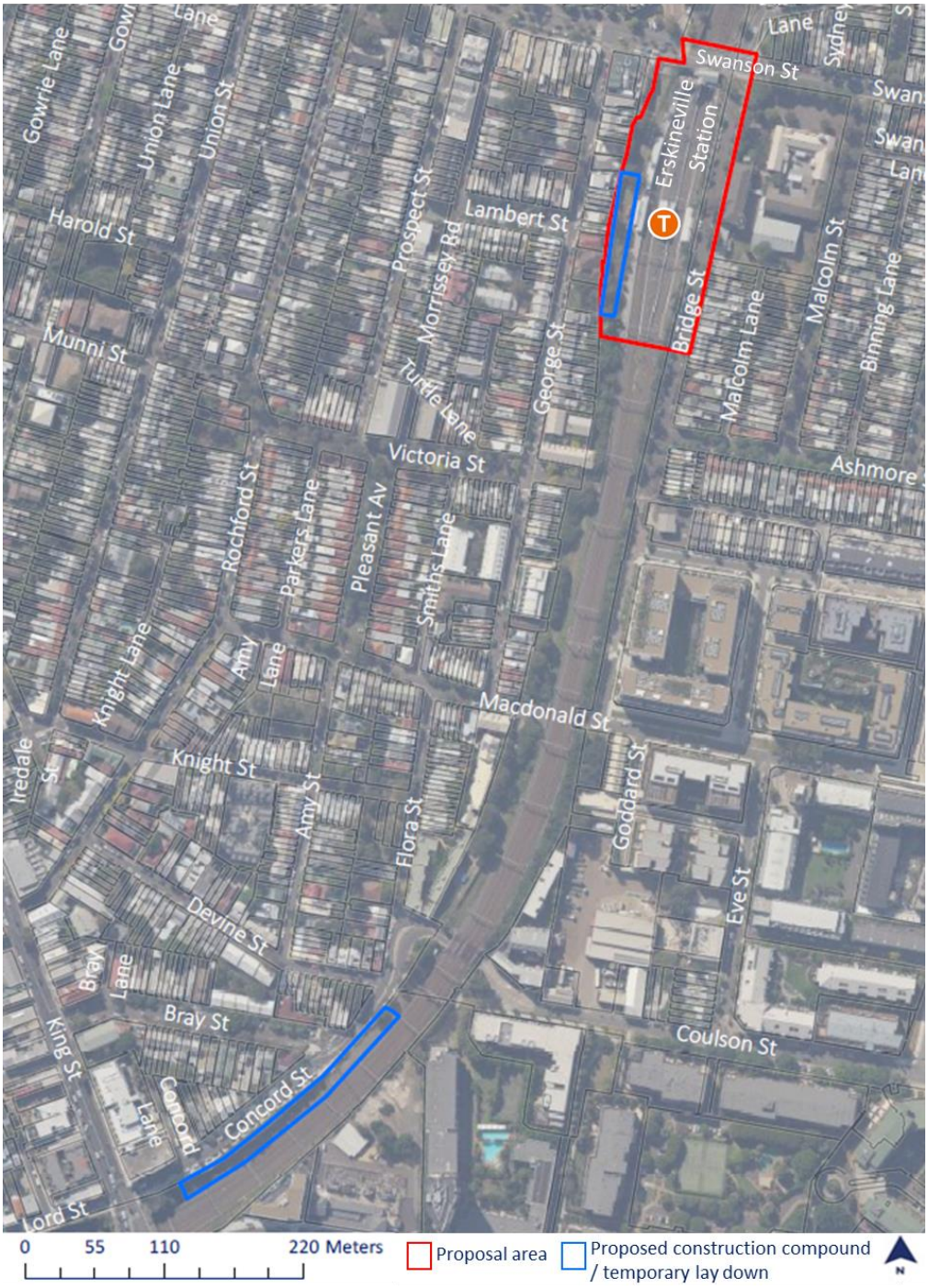

Figure 3.2 Location of proposed temporary compound and laydown areas

4 Statutory considerations

Chapter 4 provides a summary of the statutory considerations relating to the Proposal including a consideration of NSW Government polices/strategies, NSW legislation (particularly the EP&A Act), environmental planning instruments, and Commonwealth legislation.

4.1 Commonwealth legislation

4.1.1 Environment Protection and Biodiversity Conservation Act 1999

The (Commonwealth) EPBC Act provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places - defined in the EPBC Act as 'matters of National Environmental Significance (NES)'. The EPBC Act requires the assessment of whether the Proposal is likely to significantly impact on matters of NES or Commonwealth land. These matters are considered in full in Appendix A.

As the Proposal would not or is not likely to have a significant impact on any matters of NES or on Commonwealth land, a referral to the Commonwealth Minister for the Environment is not required.

4.1.2 Other Commonwealth legislation

Other Commonwealth legislation applicable to the Proposal is discussed in Table 4.1.

Table 4.1 Other Commonwealth legislation applicable to the Proposal

Applicable legislation	Considerations
Aboriginal and Torres Strait Islander Heritage Protection Act 1984	There is an obligation on a person who discovers anything which he or she has reasonable grounds to suspect are Aboriginal remains to report that discovery to the Minister, giving particulars of the remains and their location. The Proposal does not include any previously identified Aboriginal sites and/or places (refer Section 6.5); however, considerations for unexpected finds further detailed in mitigation measures and applies to this Act.
Disability Discrimination Act 1992 (DDA)	This Act aims to eliminate as far as possible, discrimination against persons on the ground of disability in areas including access to premises and the provision of facilities, services and land. The Proposal would be designed having regard to the requirements of this Act. The key objective of the Proposal is to improve the accessibility of Erskineville Station which is consistent with the objectives of this Act.

4.2 NSW legislation and regulations

4.2.1 Transport Administration Act 1988

The *Transport Administration Act 1988* establishes Transport for NSW as a public authority who is to exercise its functions in a manner that promotes certain common objectives, including to promote the delivery of transport services in an environmentally sustainable manner.

This REF has been prepared having regard to, among other things, the specific objectives of Transport for NSW under the *Transport Administration Act 1988*, including:

2A Objects of Act

…

a) to provide an efficient and accountable framework for the governance of the delivery of transport services,

b) to promote the integration of the transport system,

c) to enable effective planning and delivery of transport infrastructure and services,

d) to facilitate the mobilisation and prioritisation of key resources across the transport sector,

e) to co-ordinate the activities of those engaged in the delivery of transport services,

f) to maintain independent regulatory arrangements for securing the safety of transport services.

2B Common objectives and service delivery priorities of public transport agencies

…

(a) ***Environmental sustainability***

To promote the delivery of transport services in an environmentally sustainable manner.

(b) ***Social benefits***

To contribute to the delivery of social benefits for customers, including greater inclusiveness, accessibility and quality of life.

4.2.2 Environmental Planning and Assessment Act 1979

The EP&A Act establishes the system of environmental planning and assessment in NSW. This Proposal is subject to the environmental impact assessment and planning approval requirements of Division 5.1 of the EP&A Act. Division 5.1 of the EP&A Act specifies the environmental impact assessment requirements for activities undertaken by public authorities, such as Transport for NSW, which do not require development consent under Part 4 of the Act.

In accordance with section 5.5 of the EP&A Act, Transport for NSW, as the proponent and determining authority, must examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the Proposal.

Clause 228 of the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation) defines the factors which must be considered when determining if an activity assessed under Division 5.1 of the EP&A Act has or is likely to have a significant impact on the environment. Chapter 6 of the REF provides an environmental impact assessment of the Proposal in accordance with clause 228 and Appendix B specifically responds to the factors for consideration under clause 228.

4.2.3 Other NSW legislation and regulations

Table 4.2 provides a list of other relevant legislation applicable to the Proposal.

Table 4.2 Other legislation applicable to the Proposal

Applicable legislation	Considerations
Biodiversity Conservation Act 2016 (BC Act) (NSW)	The site does not contain suitable habitat for any listed threatened species or community and is unlikely to have a significant impact on any threatened species or community (refer Section 6.7).
Biosecurity Act 2015 (NSW)	Clause 22 requires any person who deals with a biosecurity matter has a duty to ensure that in so far as is reasonably practicable, the potential biosecurity risk is prevented, eliminated or minimised. Appropriate management methods would be implemented during construction if declared noxious weeds in the City of Sydney LGA are identified (refer Section 6.7).
Contaminated Land Management Act 1997 (CLM Act) (NSW)	Section 60 of the CLM Act imposes a duty on landowners to notify the Office of Environment and Heritage (OEH), and potentially investigate and remediate land if contamination is above EPA guideline levels. The site has not been declared under the CLM Act as being significantly contaminated (refer Section 6.8).
Crown Lands Act 1987 (NSW)	The Proposal does not involve work on any Crown land.
Disability Discrimination Act 1992 (DDA Act) (Cwlth)	The Proposal would be designed having regard to the requirements of this Act.
Heritage Act 1977 (Heritage Act) (NSW)	• Sections 57 and 60 (approval) where items listed on the State Heritage Register are to be impacted • Sections 139 and 140 (permit) where relics are likely to be exposed • Section 170 where items listed on a government agency Heritage and Conservation Register are to be impacted. Erskineville Station is listed on the RailCorp (Sydney Trains) 170 Heritage and Conservation Register. A discussion of potential impacts to local heritage is discussed in Section 6.5.
National Parks and Wildlife Act 1974 (NPW Act) (NSW)	Sections 86, 87 and 90 of the NPW Act require consent from OEH for the destruction or damage of Indigenous objects. The Proposal is unlikely to disturb any Indigenous objects (refer Section 6.4). However, if unexpected archaeological items or items of Indigenous heritage significance are discovered during the construction of the Proposal, all work would cease, and appropriate advice sought.
Protection of the Environment Operations Act 1997 (PoEO Act) (NSW)	The Proposal does not involve a 'scheduled activity' under Schedule 1 of the PoEO Act. Accordingly, an Environment Protection Licence (EPL) is not required for the Proposal. However, in accordance with Part 5.7 of the PoEO Act, Transport for NSW would notify the EPA of any pollution incidents that occur onsite. This would be managed in the CEMP to be prepared and implemented by the Contractor.

Applicable legislation	Considerations
Roads Act 1993 (Roads Act) (NSW)	Section 138 of the Roads Act requires consent from the relevant road authority for the carrying out of work in, on or over a public road. However, clause 5(1) in Schedule 2 of the Roads Act states that public authorities do not require consent for work on unclassified roads. The Proposal would involve work on Swanson Street and Bridge Street, which are local roads under the control of City of Sydney Council. Road Occupancy Licence/s would be obtained from the relevant roads authority for road work and any temporary road closures where required (see Section 6.1 for more information).
Sydney Water Act 1994 (NSW)	The Proposal would not involve discharge of wastewater to the sewer.
Waste Avoidance and Resource Recovery Act 2001 (WARR Act) (NSW)	Transport for NSW would carry out the Proposal having regard to the requirements of the WARR Act. A site-specific Waste Management Plan would be prepared.
Water Management Act 2000 (NSW)	The Proposal would not involve any water use (from a natural source e.g. aquifer, river – only from the network), water management work, drainage or flood work, controlled activities or aquifer interference.

4.2.4 State Environmental Planning Policies

State Environmental Planning Policy (Infrastructure) 2007

The Infrastructure SEPP is the key environmental planning instrument which determines the permissibility of a proposal and under which part of the EP&A Act an activity or development may be assessed.

Division 15, Clause 79 of the Infrastructure SEPP allows for certain types of development to be carried out by or on behalf of a public authority without consent on any land (i.e. assessable under Division 5.1 of the EP&A Act). Specifically, Clause 79(1) of the Infrastructure SEPP states that:

> *'Development for the purpose of a railway or rail infrastructure facilities may be carried out by or on behalf of a public authority without consent on any land.'*

Clause 78 defines 'rail infrastructure facilities' as including elements such as:

> *(a) 'railway tracks, associated track structures, cuttings, drainage systems, fences, tunnels, ventilation shafts, emergency accessways, bridges, embankments, level crossings and roads, pedestrian and cycleway facilities.'*
>
> *(d) 'railway stations, station platforms and areas in a station complex that commuters use to get access to the platforms'*
>
> *(e) public amenities for commuters*
>
> *(f) associated public transport facilities for railway stations…'*

Consequently, development consent is not required for the Proposal, which is classified as a rail infrastructure facility, however the environmental impacts of the Proposal have been assessed under the provisions of Division 5.1 of the EP&A Act.

Part 2 of the Infrastructure SEPP contains provisions for public authorities to consult with local councils and other agencies prior to the commencement of certain types of development.

Section 0 of this REF discusses the consultation undertaken under the requirements of the Infrastructure SEPP.

The Infrastructure SEPP prevails over all other environmental planning instruments except where there is an inconsistency with *State Environmental Planning Policy (State Significant Precincts) 2005* or certain provisions of *State Environmental Planning Policy (Coastal Management) 2018*. The Proposal does not require consideration under these SEPPs and therefore do not require further consideration as part of this REF.

State Environmental Planning Policy 55 – Remediation of Land

State Environmental Planning Policy No.55 — Remediation of Land (SEPP 55) provides a State-wide approach to the remediation of contaminated land for the purpose of minimising the risk of harm to the health of humans and the environment. While consent for the Proposal is not required, the provisions of SEPP 55 have still been considered in the preparation of this REF.

Section 6.8 of this REF contains an assessment of the potential contamination impacts of the Proposal. It is not expected that any large-scale remediation (Category 1) work would be required as part of the Proposal. The proposed land use would not differ to the existing use and is, therefore, unlikely to be affected by any potential contaminants that exist within the rail corridor.

Impacts of contaminated lands and potential remediation are in Section 6.8.

4.2.5 Sydney Local Environmental Plan 2012

The Proposal is located within the City of Sydney LGA. The Infrastructure SEPP prevails over all other environmental planning instruments (such as LEPs) except where there is an inconsistency with *State Environmental Planning Policy (State Significant Precincts) 2005* or certain provisions of *State Environmental Planning Policy (Coastal Management) 2018.* During the preparation of this REF, the provisions of *Sydney Local Environmental Plan 2012* were considered (refer Table 4.3). Notwithstanding, the provisions of the Sydney LEP have been considered as detailed below in Table 4.3.

Table 4.3 Relevant provisions of the Sydney LEP

Provision description	Relevance to the Proposal
Clause 2.3 Zone Objectives and Land Use Table	Under the Sydney LEP: • the rail corridor is zoned as SP2 Infrastructure • surrounding areas are zoned as SP2 Infrastructure, B1 Neighbourhood Centre, R1 General Residential, RE1 Public Recreation and B4 Mixed Use • Swanson Street is zoned SP2 Infrastructure • George Street and Bridge Street are zoned R1 General Residential • west of the station along Swanson Street is zoned as B1 Neighbourhood Centre and RE1 Public Recreation • Erskineville Public School, to the east of the station, is zoned SP2 Infrastructure • north of the station is zoned G Special Purposes Zone – Infrastructure. The Proposal is consistent with the objectives of these zones.
Clause 5.10 Heritage conservation	Clause 5.10 of the Sydney LEP aims to conserve the heritage significance of heritage items, archaeological sites, Aboriginal objects and Aboriginal places within the LGA. There are a number of heritage items listed on the Sydney LEP within 100 metres of the Proposal including: • Malcolm Estate Heritage Conservation Area • Terrace House (Swanson Street) • Erskineville Public School • Terrace Group (Bridge Street) • Terrace Groups (Malcolm Street) • Terrace Houses (Malcolm Street) • Burren Estate Heritage Conservation Area • Rose of Australia Hotel • Erskineville Town Hall • Toogood and White's Estate Heritage Conservation Area • Erskineville Town Hall • House (George Street) • Pleasant Avenue Heritage Conservation Area • Terrace Group (Victoria Street). A discussion of potential impacts to local heritage is discussed in Section 6.5.

Provision description	Relevance to the Proposal
Clause 7.14 Acid sulfate soils	Clause 7.14 of the Sydney LEP aims to ensure that development does not disturb, expose or drain acid sulfate soils and result in environmental damage. Erskineville Station is located primarily within Class 5 acid sulfate soils. Class 3 acid sulfate soils are located within the southern portion of the station boundary, around 35 metres south of the platform edge. No work is proposed within this area. By virtue of clause 5(3) and 79 of the Infrastructure SEPP, the Proposal is permissible without development consent. Consideration of the potential impacts and mitigation measures for acid sulfate soils for the Proposal is outlined in Section 6.8.

The land use planning zones for the Proposal are shown in Figure 4.1.

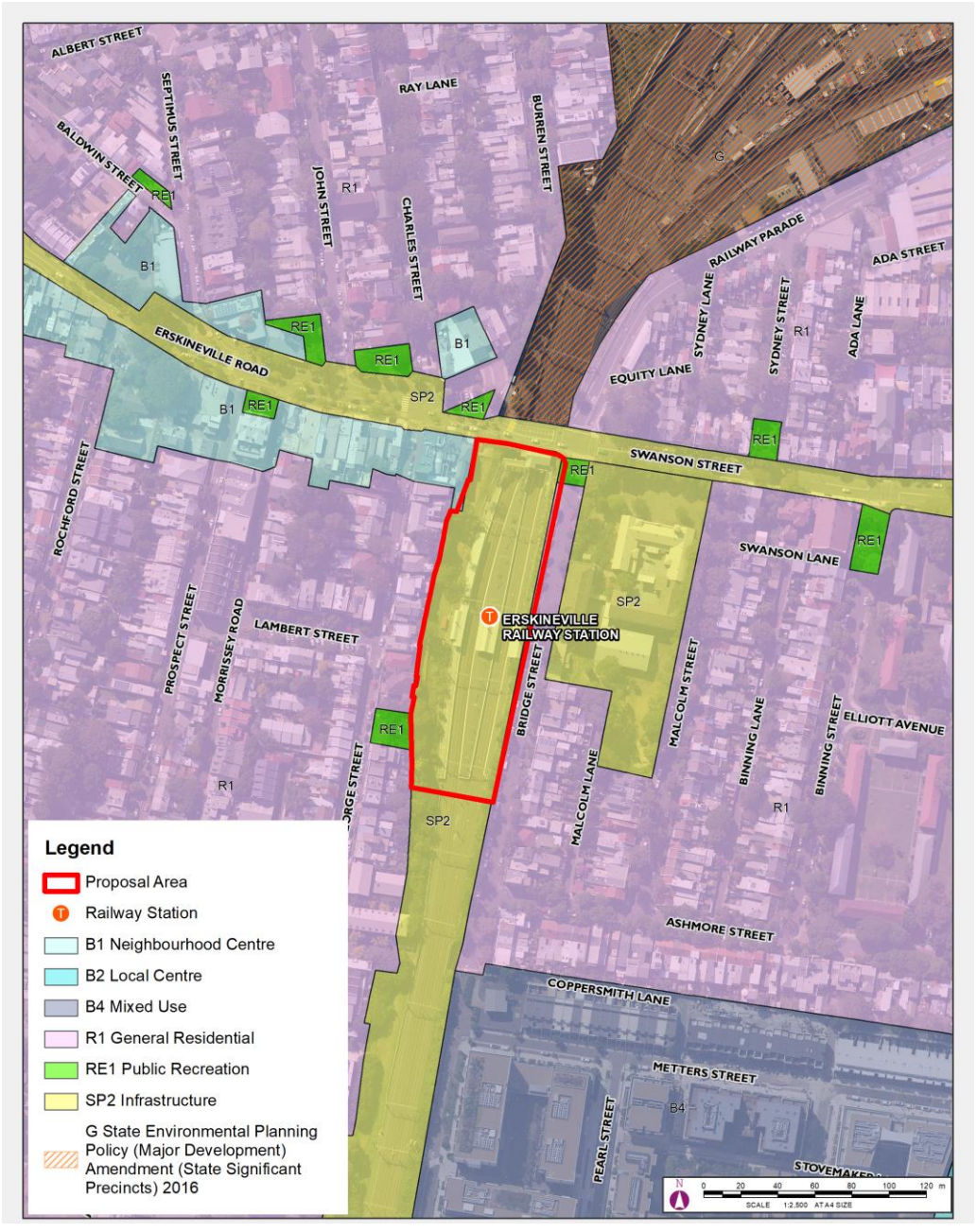

Figure 4.1 Sydney LEP zoning map

4.3 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 (ESD). The principles of ESD are generally defined under the provisions of clause 7(4) of Schedule 2 to the EP&A Regulation as:

- the precautionary principle – If there are threats of serious or irreversible damage, a lack of full scientific uncertainty should not be used as a reason for postponing measures to prevent environmental degradation
- intergenerational equity – the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations
- conservation of biological diversity and ecological integrity – the diversity of genes, species, populations and their communities, as well as the ecosystems and habitats they belong to, should be maintained or improved to ensure their survival
- improved valuation, pricing and incentive mechanisms – environmental factors should be included in the valuation of assets and services.

The principles of ESD have been adopted by Transport for NSW throughout the development and assessment of the Erskineville Station Upgrade. Section 3.3.3 summarises how ESD would be incorporated in the design development of the Proposal. Section 6.13 includes an assessment of the Proposal on climate change and sustainability, and Section 7.2 lists mitigation measures to ensure ESD principles are incorporated during the construction phase of the Proposal.

5 Community and stakeholder consultation

Chapter 5 discusses the consultation undertaken to date for the Proposal and the consultation proposed for the future. This chapter discusses the consultation strategy adopted for the Proposal and the results of consultation with the community, relevant government agencies and stakeholders.

5.1 Stakeholder consultation during concept design

Key internal stakeholders for Erskineville Station, comprising of Sydney Trains and various departments within Transport for NSW, were engaged during development of the scoping design plan to provide insights into the scope of work for the Proposal, and to also participate in the development and assessment of the station improvement options.

In regard to agency and specific external stakeholders, consultation has been undertaken with the City of Sydney Council for Erskineville Station Upgrade.

Furthermore, the development of the preferred option has considered longstanding community requests for a southern entrance to Erskineville. Consultation requirements under the Infrastructure SEPP Part 2, Division 1 of the Infrastructure SEPP contains provisions for public authorities to consult with local councils and other public authorities prior to the commencement of certain types of development. Clauses 13, 14, 15 and 16 of the Infrastructure SEPP require that public authorities undertake consultation with councils and other agencies, when proposing to carry out development without consent.

Table 5.1 provides details of consultation requirements under the Infrastructure SEPP for the Proposal.

Table 5.1 Infrastructure SEPP consultation requirements

Clause	Clause particulars	Relevance to the Proposal
Clause 13 | Consultation with Councils – development with impacts on council related infrastructure and services	Consultation is required where the Proposal would result in: • substantial impact on stormwater management services • generating traffic that would place a local road system under strain • involve connection to or impact on a council owned sewerage system • involve connection to and substantial use of council owned water supply • significantly disrupt pedestrian or vehicle movement • involve significant excavation to a road surface or footpath for which Council has responsibility.	The Proposal includes work that would: • require connections or impacts the stormwater system • disrupt pedestrian and vehicle movements • impact on road pavements under Council's care and control • impact on Council-operated footpaths. Consultation with City of Sydney Council has been undertaken and would continue throughout the detailed design and construction phases.
Clause 14 | Consultation with Councils – development with impacts on local heritage	Where railway station work would: • substantially impact on local heritage item (if not also a State heritage item) • substantially impact on a heritage conservation area.	The Proposal would be undertaken within the curtilage of a local heritage item, being the Erskineville Railway Station (I625). A Non-Aboriginal heritage assessment was undertaken, which determined that the Proposal is likely to have a minor to moderate adverse impact on Erskineville Railway Station. As such, consultation with Council under Clause 14 is required. Refer to Section 6.5.
Clause 15 | Consultation with Councils – development with impacts on flood liable land	Where railway station work would: • impact on land that is susceptible to flooding – reference would be made to *Floodplain Development Manual: the management of flood liable land.*	The Proposal is not located on land that is susceptible to flooding. Accordingly, consultation with City of Sydney Council under Clause 15 is not required. Refer to Section 6.9.
Clause 15A Consultation with Councils – development with impacts on certain land within the coastal zone	Where railway station work would: • impact on land within a coastal vulnerability area and is inconsistent with certified coastal management program that applies to that land	The Proposal is not within a coastal vulnerability area. Accordingly, consultation with the City of Sydney Council under Clause 15A is not required.

Clause	Clause particulars	Relevance to the Proposal
Clause 15AA Consultation with State Emergency Service – development with impacts on flood liable land	Where railway station work would: • impact on flood liable land -written notice must be given (together with a scope of work) to the State Emergency Services and taken into consideration any response to the notice received from the State Emergency Service within 21 days after the notice is given.	The Proposal area has not been identified in the Sydney LEP as having potential for flooding. Accordingly, consultation with State Emergency Service under Clause 15AA is not required.
Clause 16 | Consultation with public authorities other than Councils	For *specified development*, which includes development that is undertaken adjacent to land reserved under the *National Parks and Wildlife Act 1974*, consultation with the DPIE Energy, Environment and Science Group is required. Consultation with other agencies is require when specified by the Infrastructure SEPP.	The Proposal is not located adjacent to land reserved under the *National Parks and Wildlife Act 1974*. Accordingly, consultation with the DPIE Energy, Environment and Science Group under Clause 16 is not required.

5.2 Consultation objectives

The consultation objectives for the Proposal were developed to encourage stakeholder and community involvement and foster interaction between stakeholders, the community and the project team. The consultation strategy that was developed, having regard to the requirements of the planning process ensures that stakeholders, customers and the community are informed of the Proposal and have the opportunity to provide input.

The objectives of the consultation strategy are to:

- provide accurate and timely information about the Proposal and REF process to relevant stakeholders
- raise awareness of the various components of the Proposal and the specialist environmental investigations
- ensure that the directly impacted community are aware of the REF and consulted where appropriate
- provide opportunities for stakeholders and the community to express their view about the Proposal
- understand and access valuable local knowledge from the community and stakeholders
- record the details and input from community engagement activities
- build positive relations with identified community stakeholders
- ensure a comprehensive and transparent approach.

5.3 Public display

The REF display strategy adopts a range of consultation mechanisms, including:

- installation of information signage at the station with QR codes taking customers to the project webpage

- public display of the REF on the project webpage transport.nsw.gov.au/erskineville
- distribution of a project update to the local community outlining the Proposal and inviting feedback on the REF
- advertisement of the REF public display in local newspapers and on social media with a link to the Transport for NSW website that includes a summary of the Proposal and information on how to provide feedback
- consultation with City of Sydney Council, Sydney Trains, NSW Trains and other non-community stakeholders.

Community consultation activities for the Proposal would be undertaken during the public display of this REF. The display period of the REF would be advertised in the week that the public display commences. The REF would be displayed for a period of approximately two weeks.

Enquiries about the Proposal can be made through the Project Infoline (1800 684 490) or by email[1].

Feedback can be sent to:

- projects@transport.nsw.gov.au
- Transport Access Program – Erskineville Station Upgrade
  Associate Director Environmental Impact Assessment
  Transport for NSW
  PO Box K659
  Haymarket NSW 1240

Or submitted:

- via transport.nsw.gov.au/erskineville

Following consideration of feedback received during the public display period, Transport for NSW would determine whether to proceed with the Proposal and what conditions would be imposed on the project should it be determined to proceed.

5.4 Aboriginal community involvement

An Aboriginal Heritage Information Management System (AHIMS) search was undertaken for the area covered by the Proposal (the area around Erskineville Station) plus a 200 metre radius, on 1 December 2020. The search confirmed there to be no known Aboriginal heritage items within or close to Erskineville Station.

The extensive landscape modification that has occurred across the Proposal area suggests that intact evidence of Aboriginal land use is unlikely to occur within the boundaries of the Proposal area. Similarly, the high level of disturbance would suggest that the archaeological potential of the area is low. Accordingly, consultation with Aboriginal parties under the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW, 2010) is not required.

[1] projects@transport.nsw.gov.au

5.5 Ongoing consultation

At the conclusion of the public display period for this REF, Transport for NSW would acknowledge receipt of feedback from each respondent. The issues raised by the respondents would be considered by Transport for NSW before determining whether to proceed with the Proposal (refer Figure ES-2).

Should Transport for NSW determine to proceed with the Proposal, the Determination Report would be made available on the Transport for NSW website and would summarise the key impacts identified in this REF, demonstrate how Transport for NSW considered issues raised during the public display period, and include a summary of mitigation measures proposed to minimise the impacts of the Proposal.

Should Transport for NSW determine to proceed with the Proposal, the project team would keep the community, councils and other key stakeholders informed of the process, identify any further issues as they arise, and develop additional mitigation measures to minimise the impacts of the Proposal. The interaction with the community would be undertaken in accordance with a Community Liaison Plan to be developed prior to the commencement of construction.

6 Environmental impact assessment

Chapter 6 of the REF provides a detailed description of the likely environmental impacts associated with the construction and operation of the Proposal. For each likely impact, the existing environment is characterised and then an assessment is undertaken as to how the Proposal would impact on the existing environment.

This environmental impact assessment has been undertaken in accordance with clause 228 of the EP&A Regulation. A checklist of clause 228 factors and how they have been specifically addressed in this REF is included at Appendix B.

6.1 Traffic and transport

A Traffic, Transport and Access Impact Assessment was prepared for the Proposal (SLR, 2021a). The assessment involved a site inspection undertaken on the 21 October 2020. The findings of the assessment are summarised in this section.

6.1.1 Existing environment

Erskineville Station consists of one island platform and two side platforms and is serviced by the T3 Bankstown line. It is bound by Swanson Street to the north and Bridge Street to the south. The Proposal includes upgrades to Erskineville Station on land owned by the NSW Transport Asset Holding Entity, and managed by Sydney Trains within the station precinct, with some work also proposed within Bridge Street which is managed by the City of Sydney Council.

Access to the platforms is provided via stairs from the station entrance on Swanson Street (north). Given the lack of ramps or lifts, Erskineville Station does not currently accommodate persons with a disability, mobility impaired or elderly persons, or parents and carers with prams and is not DSAPT compliant.

There are pedestrian footpaths on either side of Swanson Street, Erskineville Road and Bridge Street. The verge adjacent to the Swanson Street station entrance accommodates a 3.3 metre wide footpath, a cycleway to allow direct access to Railway Parade from Bridge Street, one marked zebra crossing to the west and two signalised pedestrian crossings to the east of the station.

There is a pocket park (Bridge Street Rest Area) 20 metres to the east of the Swanson Street Station Entrance with two benches providing some recreational space to the members of the community.

Road network and Traffic

Erskineville Station is located around 5.5 kilometres south of the Sydney CBD. It is bound by Swanson Street (State Road 193) and Erskineville Road (State Road 193) to the north and Bridge Street (local road) to the east. The only pedestrian access to the station is from Swanson Street.

Bridge Street is a no-through-road with a cul-de-sac in the northern end. A temporary separated on-road cycleway has recently been installed along the western kerb as part of Transport for NSW's CovidSafe Travel Plan to tackle the recent challenges in public transport which have arisen due to the Covid-19 pandemic.

The road network is summarised in Table 6.1.

Table 6.1 Road network surrounding the Proposal area

Road	Classification	Posted speed limit	School zone	Configuration
Swanson Street & Erskineville Road (State Road 193)	Arterial Road:	50km/h and 40km/h (school zone)	Yes	2 marked lanes, partially divided carriageway, partially no stopping restrictions and partially 1/2P parking. No formal kiss and ride areas, 1 nearby taxi zone space, 1 nearby car-share parking space. Station frontage: 2 marked lanes, undivided carriageway, no stopping restrictions in place
Bridge Street	Local Road:	40km/h	No	2 unmarked lanes, undivided carriageway, 2P parking in the eastern side of the carriageway, a pop-up cycleway and no parking restrictions in the western side of the carriageway.

Parking

There is no commuter car parking facility available to the users of Erskineville Station. A number of streets in the vicinity of Erskineville Station provide unrestricted parking, however on-street parking in the morning peak is limited.

Taxis and kiss and ride

A site inspection and desktop analysis revealed that there are two informal kiss and ride areas in the vicinity of Erskineville Station. However, there are no formal kiss and ride areas dedicated to pick-up and drop-off activities.

The informal kiss and ride areas are located in Bridge Street, Swanson Street and Erskineville Road, as follows:

- two pick-up and drop-off spaces on Swanson Street for school children. These spaces are located across the road from Erskineville Public School, adjacent to 42 Swanson Street. The parking restriction that apply at this location is “No Parking 8:00am-9:30am and 2:30pm-4:00pm”, meaning that these two spaces can operate as kiss and ride facilities for up to 3 hours a day, Monday to Friday.
- four 5-minute parking spaces intended for school children drop-off in the northern end of Bridge Street, adjacent to the gates of Erskineville Public School. P5-minute restrictions are for a limited time and across weekdays only, from 8:00am to 9:30am and from 2:30pm to 4:00pm. These four spaces operate as kiss and ride facilities for up to 3 hours a day, Monday to Friday.

A taxi zone space is located on Erskineville Road about 215 metres to the west of Erskineville Station.

Bus services

There are four bus stops proximate to Erskineville Station, as follows:

- two bus stops on Erskineville Road, to the west of Erskineville Station (stop ID: 204313 in the eastbound direction and stop ID: 204320 in the westbound direction)

- two bus stops on Swanson Street, to the east of Erskineville Station (stop ID: 204314 in the eastbound direction and stop ID: 204319 in the westbound direction).

Table 6.2 summarises the public bus routes that utilise these bus stops.

Table 6.2 Bus services at Erskineville Station

ID	Service	Route	Frequency (Peak)	Frequency (Off-Peak)
204313 204320 204314 204319	355	Marrickville Metro to Bondi Junction via Moore Park & Erskineville	20 minutes	30 minutes

Bike network and facilities

At present, there are no means of transporting a bicycle to the station platform without having to carry it down (and up) a flight of stairs. There are two unsheltered bicycle racks with capacity of approximately 12 bicycles on Swanson Street.

City of Sydney LGA has cycling facilities with continuous cycle ways from Erskineville Station to the Sydney CBD. Based on the information obtained through City of Sydney Council's website, the majority of the cycle ways in the area also have wayfinding signage. A temporary cycle path is located east of the station along Bridge Street,

6.1.2 Potential impacts

a) Construction phase

Key construction activities required would primarily consist of construction of a new southern footbridge with three lift shafts and a new lift and extension of the existing footbridge at the existing station entrance, as well as the internal renovation of the station building and regrading of the areas adjacent to the proposed new Bridge Street station entrance.

Limited earthwork and excavation would be required for the following.

- piles for the new footbridge foundations
- construction of crane platform within the rail corridor adjacent to Platform 1
- construction of lift shafts
- construction of the kiss and ride areas and accessible parking space
- localised platform regrading / resurfacing work
- footpath upgrades
- other minor civil work including footings and foundations for structures, drainage / stormwater work, and trenching activities for service adjustments and relocations and drainage upgrade work.

As part of the construction work, ancillary facilities would also be required to accommodate the needs of construction workers. Two adjacent compounds would be required to undertake the work, one being a site office and parking area and another for the materials to be laid down.

Customer and public access impacts

The following impacts to pedestrians, cyclists and station customers are anticipated to result from construction activities:

- reduction in size of footpath (or closures) adjacent to Swanson Street and Bridge Street may require users to dismount and potentially deviate around construction work associated with the footbridge
- temporary closure of the cycle way in Bridge Street may be required due to parked construction vehicles and increased safety risk for pedestrians and cyclists
- increased safety risk due to the interaction of cyclists, pedestrians and construction vehicles at the proposed site compound access and / or parked construction vehicles on Swanson Street and Bridge Street
- uneven surfaces and detours required during footpath closures and platform resurfacing work
- increased platform congestion due to localised platform closures and dedications during the resurfacing and regrading of the platform surfaces
- potential confusion and loss of amenity for customers due to the temporary relocation of station accesses and facilities
- detours required for potential footpath closures on Bridge Street due to work associated with the footbridge and nearby informal kiss and ride areas.

Road network and traffic

Traffic generated by construction activities includes construction worker light vehicles (including utility vans), as well as heavy vehicles for periodic delivery and removal of materials, and construction plant and equipment. It is expected that articulated vehicles (AV 19m in length) would be needed on a minimal basis, only while the footbridge, canopy and lift shafts are being delivered. Vehicle types and sizes would vary depending on the required use, but typically include medium and large rigid vehicles and articulated vehicles for import of bulk materials or spoil removal as well as for the transportation of plant and equipment.

The amount of fill material or spoil / demolition spoil would be minor due to the limited extent of excavation required for the Proposal. Specific oversize vehicles (i.e. 200-tonnes crane) may be required for prefabricated / precast elements such as footbridge, canopy, lift shaft structure components, and steel beams. In such cases, specific permits would be required, and advance route planning would need to be undertaken in order to ensure that a suitable route with sufficient geometric capacity to accommodate these vehicles is chosen.

Existing traffic demand data on Swanson Street and Erskineville Road was not considered, however the traffic generated as part of the construction work is not expected to exceed 25 light vehicles and 15 heavy vehicles per day during the peak construction periods. This construction demand is unlikely to cause significant impact to traffic flow or operational performance except when footbridge, canopy and lift shafts are being delivered as these activities may require the closure of traffic for a short period of time.

Parking

Access to construction compounds is not expected to have an impact on parking in Swanson Street, Erskineville Road and Concord Street based on the swept path assessments undertaken.

Access to Bridge Street may however, benefit from the temporary restriction of parking in a small number of spaces in the vicinity of the Bridge Street and Ashmore Street intersection to improve ease of materials delivery to the footbridge. It should be noted that the swept path assessments strictly only require the removal of a number of signposts and bollards, but the short-term restriction of parking near this intersection would assist.

Parking arrangements for construction vehicles and construction workers would be well planned to mitigate the influx of parking demand in the area. Transport for NSW expect many of the construction workers to park away from the station and construction compounds and are encouraged to catch public transport or carpool where practicable.

Interchange facilities

Construction of the Proposal would not have an impact on any kiss and ride areas or taxi activities as there are no formal kiss and ride or taxi facilities in the vicinity of the station. However, the four P5 parking spaces at the northern end of Bridge Street may not be accessible on a temporary basis during work undertaken from Bridge Street.

Public transport

Train services would be affected during rail shutdowns although these are not specific to this project and would occur regardless and accordingly are not impacts arising from the Proposal. Buses would replace trains during rail shutdown periods. Accordingly, any construction activities occurring during rail shutdown periods would consider additional buses and users.

Beyond rail shutdown periods, the Proposal's impact on public transport services is expected to be minor, as summarised below.

- reduced travel speeds as a result of traffic management could increase travel times for bus services on Erskineville Road and Swanson Street
- bus services may also be delayed due to the interaction with construction vehicles entering and exiting construction compound – one off Swanson Street.

Property access

Property access would be maintained and unaffected by construction work where possible, however temporary obstruction of accesses may be required during activities such as the loading and unloading of oversize materials and plant. Should this be necessary all affected properties would be notified well in advance of disruptions.

b) Operational phase

The Proposal would result in an overall positive impact by contributing towards making public transport more accessible to the community.

Customer and public access impacts

The Proposal would enhance pedestrian accessibility given the inclusion of facilities such as a new southern station entrance on Bridge Street, new lifts to each platform and improvements to the canopy. Beyond station accessibility, these enhancements would also and improve user amenity.

The new footbridge and lifts in particular are integral in allowing all areas of the station to be accessed by persons with a disability or mobility impairment, which is currently not possible given the existing entrance on Swanson Street does not have lifts. The Proposal would facilitate improved community outcomes by increasing the independence and mobility of the local community regardless of their level of mobility, therefore reducing reliance on private vehicles as a means of travel.

The proposed footpath upgrades on Bridge Street and Swanson Street between the existing station entrance and the pocket park at the northern end of Bridge Street (Bridge Street Rest Area) would also provide similar benefits through eliminating trip hazards as well as enhancing circulation.

A number of pedestrian capacity assessments have been performed as part of the development of the concept design to determine whether the minimum standard for pedestrian Level of Service (LoS) would be achieved in 2036 in the following sections of Erskineville Station:

- platforms
- staircases
- footbridges.

The minimum standard for pedestrian level of service is identified as LoS C, attributing to 33-49 pedestrians per minute along walkways (platforms and footbridges) and 23-33 pedestrians per minute on staircases. Despite assumed pedestrian forecast 2036 demand including +15 per cent contingency, results of the study indicated that all elements of the station are expected to operate at LoS C or better under the current timetable arrangements. Any congestion issues are expected to be mitigated with the high frequency rail services that will be introduced by 2030 as part of the More Trains More Services (MTMS) program as well as the future Sydney Metro.

The Proposal would provide four new bicycle parking spaces at the proposed new station entrance on Bridge Street in addition to the existing twelve bicycle parking spaces at the Swanson Street station entrance. Based on current station patronage and observed demand for the existing parking, this supply is considered reasonable and can accommodate the existing and any projected increase attributable to the Proposal.

The Proposal is not expected to have any impact on existing property access within the vicinity of the station.

Road network and traffic

The Proposal would increase accessibility to Erskineville Station and improve the customer experience and amenity, potentially leading to a minor increase in utilisation and patronage. This may be due to customers either travelling by train where they did not before, or by changing from another nearby station.

As a result, there may be a minor increase in traffic generation however, it would have a negligible impact on the surrounding road network or the amenity of local residents.

Parking and access

The Proposal includes the provision of one new kiss and ride area and one new accessible parking space at the northern terminus of Bridge Street, and also of two new kiss and ride areas near the proposed new Bridge Street station entrance. Although the station improvements may encourage additional passengers and associated demand for accessible parking spaces, this is expected to be relatively minor given the primary focus of the Proposal is improving accessibility for mobility impaired customers rather than increasing utilisation and passenger capacity.

Interchange facilities

The Proposal comprises the provision of a new kiss and ride area at the northern terminus of Bridge Street and two new kiss and ride areas on Bridge Street at the new southern station entrance. No modifications are proposed to the operations of the existing school drop-off and pick-up facilities on Swanson Street (across the road from Erskineville public school) and Bridge Street (adjacent to the Erskineville public school gates).

The proposed new Bridge Street station entrance would improve safety and amenity for motorists and loading / unloading passengers as it is expected to result in reduced passenger and drop-off and pick-up activity near the busy Swanson Street station entrance.

6.1.3 Mitigation measures

A number of mitigation measures would be implemented to reduce potential traffic impacts of the Proposal:

- the design of the kiss and ride and accessible parking spaces at the northern terminus of Bridge Street would be further refined during detailed design to avoid vehicles swinging into the adjacent cycleway and school driveway
- any proposed rail corridor access points not assessed in this REF would require further traffic assessment to be undertaken
- a Construction Traffic Management Plan (CTMP) would be prepared by the construction contractor in consultation with TfNSW and provided to City of Sydney Council. The CTMP would be the primary tool to manage potential traffic, cyclist and pedestrian impacts associated with each phase of construction. The CTMP, at a minimum, would include:
    - procedures for preparing and implementing TCPs which would provide details for signage and timing of any detours and traffic controls to manage temporary road disruptions and the delivery of large plant and materials
    - necessary Road Occupancy Licences (ROLs) and permits required for the passage of construction vehicles and required consultation with Council and other relevant authorities
    - identification of final construction traffic access routes, ancillary facilities, contractor parking and loading zones
    - nomination of access routes to and from the local road network and contractor parking
    - scheduling of work / deliveries to avoid peak times and limiting of work in the road carriageway as much as practicable to limit traffic and parking impacts and maintain customer access to the station
    - measures to:
        - limit temporary parking losses
        - maintain pedestrian cross corridor access along Swanson Street and customer access to the station through traffic and pedestrian diversions
        - maintain private property access unless otherwise agreed
        - identify changed traffic, cyclist and pedestrian conditions including details of construction signage including signposts and variable message signs, traffic controllers and other community notifications.
    - consultation with the NSW Taxi Council and bus services would be undertaken to discuss impacts and consider alternate arrangements during construction
    - the CTMP would consider the suggested haulage routes and swept path assessments for accessing the construction compound and laydown areas as identified in the Traffic Transport and Access Impact Assessment (SLR, 2021a).

Refer to Table 7.1 for a full list of proposed mitigation measures.

6.2 Urban design, landscape and visual amenity

A Landscape Character and Visual Impact Assessment was undertaken by RPS for the Proposal (RPS, 2021a). The assessment included desktop analysis, site inspection and creation of photo montages. The photo montages provide an indication of what the Proposal

may look like from key representative viewpoints once complete, in particular to demonstrate the bulk and scale, noting that materials and finishes are indicative and would be further investigated during detailed design.

The methodology adopted for the assessment is guided by policy and guidelines outlined in *Beyond the Pavement* (TfNSW, 2020a) and the *Guideline for Landscape character and visual impact Environmental Impact Assessment Practice Note assessment EIA-N04* (TfNSW, 2020b). The sensitivity and magnitude of the landscape and visual impact was assessed to produce a combined impact rating of negligible, low, moderate and high (refer to Figure 6.1).

Sensitivity	Magnitude: High	Magnitude: Moderate	Magnitude: Low	Magnitude: Negligible
High	High Impact	High-Moderate	Moderate	Negligible
Moderate	High- Moderate	Moderate	Moderate-Low	Negligible
Low	Moderate	Moderate-Low	Low	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible

Figure 6.1 Landscape character and visual impact rating matrix adapted from (Transport for NSW 2020)

6.2.1 Existing environment

Nine landscape character zones (LCZs) have been identified for the Proposal, as described in Table 6.3 and Figure 6.2. A LCZ is defined as the collective qualities including the built form, natural elements, and the cultural and social facets that combine to provide a locale with a unique sense of place.

Table 6.3 Local character zones surrounding the Proposal area

LCZ	Description
LCZ 1	LCZ 1 comprises residential uses around the Erskineville Station precinct. This LCZ type is proliferated around the precinct in several zones. The landscape in this zone is heavily urbanised/modified with minimal contrived vegetative elements in parts of this zone. This LCZ has the capacity to accommodate some change without losing its valued attributes. This LCZ includes Heritage Conservation areas listed in the Sydney LEP.
LCZ 2	LCZ 2 is the Erskineville Public School located east of the Proposal. The landscape characteristics in this zone are mostly urbanised/modified with some contrived vegetative elements in parts of this zone. This LCZ has the capacity to accommodate some change without losing its valued attributes.
LCZ 3	LCZ 3 is the Erskineville Housing Scheme and is located east of the Proposal. The Erskineville Housing Scheme is part of the Erskineville Estate Heritage Conservation Area which is listed on the State Heritage Register. The landscape characteristics in this zone are urbanised/modified with some contrived vegetative elements in and around the buildings within this zone. This LCZ has a limited capacity to accommodate some change without losing its valued attributes.
LCZ 4	LCZ 4 is modern town housing associated with the Ashmore Precinct. This LCZ type is specific to Metters Street, south of the Proposal. The landscape characteristics in this zone are modern and urbanised with some contrived vegetative elements in the front yards of the townhouses. This LCZ has a substantial capacity to accommodate change without losing its attributes.

LCZ	Description
LCZ 5	LCZ 5 incorporates the commercial and public buildings on Erskineville Road, west of the Proposal. The landscape in this zone is heavily urbanised/modified with minimal contrived vegetative elements in parts of this zone. In part due to its eclectic nature, this LCZ has some capacity to accommodate some change and continue to retain its valued attributes.
LCZ 6	LCZ 6 is modern apartments located in the Ashmore Precinct. This LCZ type located south of the Proposal between Metters Street and MacDonalds Street. The landscape characteristics in this zone are modern and urbanised with contrived/introduced vegetative elements. This LCZ has a substantial capacity to accommodate change without losing its attributes.
LCZ 7	LCZ 7 includes a series of pocket parks in and around the Proposal. The landscape in this zone is heavily modified with contrived vegetative elements. This landscape character zone has some capacity to accommodate some change and continue to retain its valued attributes as long as the open space and connections are maintained.
LCZ 8	LCZ 8 is the St Mary's Catholic Church Precinct located on Swanson Street. The church is listed on the State Heritage Register and was constructed in 1912. The landscape in this zone is heavily urbanised/modified with contrived vegetative elements. This LCZ has the limited capacity to accommodate change without losing its valued attributes.
LCZ 9	LCZ 9 is Erskineville Station itself and the rail corridor. The station is bound by Swanson Street, Bridge Street, George Street, and Victoria Street. The LCZ continues in both northerly (inbound) and southerly (outbound) direction. The landscape in this zone is heavily industrialised/modified with contrived vegetative elements. This LCZ has the capacity to accommodate change.

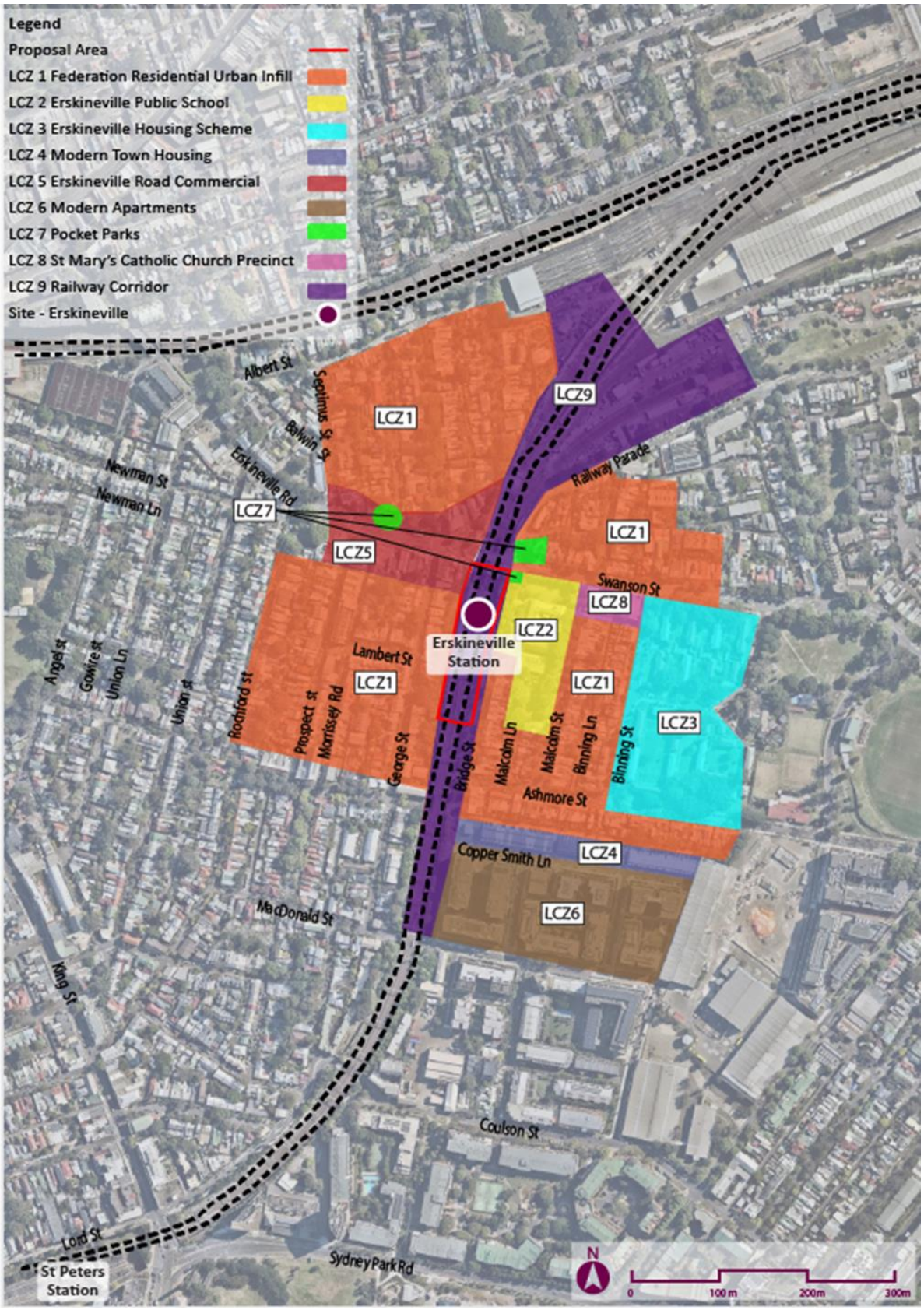

Figure 6.2 Landscape character zones around the Proposal

Visual receivers / viewpoints

Visual receivers are individuals and / or groups of people whose views may be affected by the Proposal. These include users of residential dwellings, commercial properties and open space and generally comprise residents, rail customers, motorists and pedestrians. Twelve locations have been identified to represent key viewpoints to and from the Proposal:

- viewpoint 1: View from Bridge Street at Ashmore Street
- viewpoint 2: View from playground on George Street
- viewpoint 3: View from Victoria Street at George Street
- viewpoint 4: View from 14 Bridge Street
- viewpoint 5: View from 1 Swanson Street
- viewpoint 6: View from Erskineville Public School
- viewpoint 7: View from Swanson Street at Malcolm Street
- viewpoint 8: View from Erskineville Road at Prospect Street
- viewpoint 9: View from George Street – mid block
- viewpoint 10: View from Pocket Park – Corner of Swanson Street and Railway Avenue
- viewpoint 11: View from Overhead Booking office
- viewpoint 12: View from station platform.

As part of the Visual Impact Assessment, an assessment was undertaken to understand the potential impacts on views as a result of the Proposal at these locations. These locations are shown in Figure 6.3.

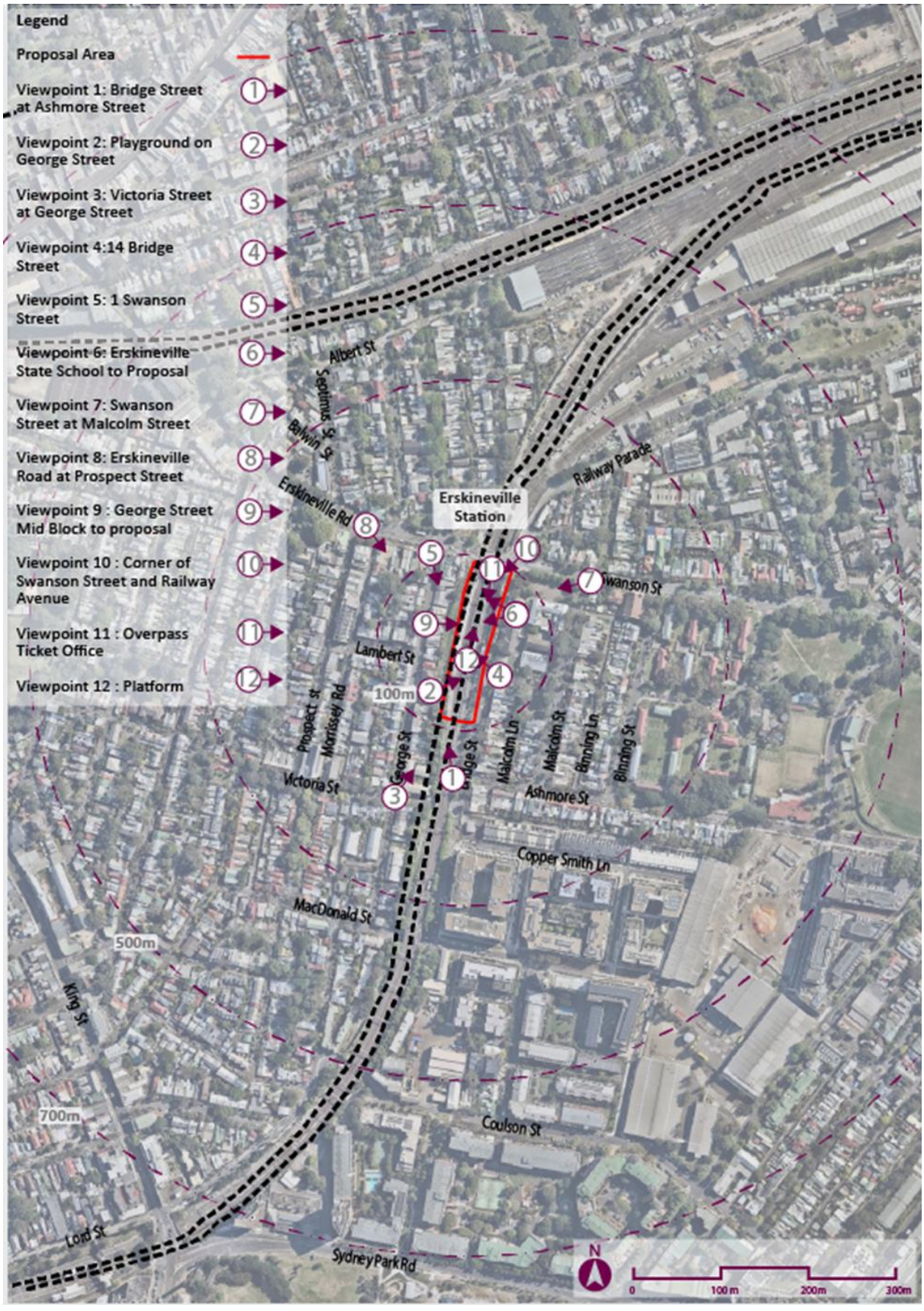

Figure 6.3 Viewpoints surrounding the Proposal area

6.2.2 Potential impacts

a) Construction phase

Construction activities would generally be more visible than the operational stage of the Proposal however, they would be transient in nature. Temporary elements likely to be introduced into the visual environment include:

- fencing and hoarding
- road barriers and signage
- ground disturbance
- formwork and scaffolding
- cranes and other construction equipment
- site office and amenities including the storage of materials and equipment.

Although temporary, construction would be a prominent feature of the scene and contrast with the surrounding scale and character of the station. This would temporarily impact the views from passengers, motorists, and residential dwellings as the most sensitive receptors.

To facilitate the upgrades, up to eleven trees in close proximity may need to be removed. These are detailed in Section 6.7.

Where night work is required for the Proposal, this would involve the use of temporary lighting for operational, safety and security purposes. Lighting installations would be placed to avoid light spill to adjoining road corridors and residential areas.

All viewpoints have low sensitivity to change due to the urbanised / contrived environment and associated scenic values, predominately dominated by rail and road infrastructure. The magnitude of change on the landscape during construction is low, given the scale of new elements such as construction plant, equipment and ancillary facilities that are not a significant visual departure from the existing landscape character and are temporary in nature.

b) Operational phase

Artist's impressions have been prepared from viewpoints 4, 11 and 12 to provide an indication of what the Proposal may look like during operation and are included in Figure 6.4 to Figure 6.9. These viewpoints were chosen to highlight different aspects of the Proposal and demonstrate potential future views from the most impacted viewpoints.

An assessment of the visual sensitivity and magnitude of each viewpoint during the operational phase of the Proposal is provided in Table 6.4, utilising the impact grading system matrix previously discussed (refer to Figure 6.1). In summary, the Proposal would result in Negligible to Low impacts for the selected viewpoints.

Lighting would be designed in accordance with the requirements of standards relevant to *AS 1158 Road Lighting,AS 4282 Controlling the Obtrusive Effects of Outdoor Lighting* and *AS 1428 Design for Access and Mobility,* and as such operational lighting impacts (such as light spill) are expected to be negligible.

Figure 6.4 Viewpoint 4 - Bridge Street - existing view

Figure 6.5 Viewpoint 4 – Photomontage from 14 Bridge Street, subject to detailed design

Figure 6.6 Viewpoint 11 – View from overhead booking office (looking south) - existing view

Figure 6.7 Viewpoint 11 – Photo montage from overhead booking office (looking south), subject to detailed design

Figure 6.8 Viewpoint 12 – View from Platform 1 looking north toward Swanson Street entrance - existing view

Figure 6.9 Viewpoint 12 – Photo montage of the view from Platform 1looking north towards the Swanson Street entrance, subject to detailed design

Table 6.4 Summary of visual impact assessment

Viewpoint (VP)	Summary	Overall impact (sensitivity x magnitude)
Viewpoint 1: View from Bridge Street at Ashmore Street	• this viewpoint has low sensitivity due to the urbanised environment with little scenic value • the proposed station infrastructure, including the new lifts, footbridges and stairs and associated infrastructure would be slightly visible at this viewpoint, however it would not be a significant departure from the existing visual landscape • all other elements of the Proposal would be screened from this view by the vegetation.	Low
Viewpoint 2: View from playground on George Street	• the Proposal cannot be viewed from this location due to the vegetation obscuring views and therefore no visual impact is anticipated.	Negligible
Viewpoint 3: View from Victoria Street at George Street	• the Proposal cannot be viewed from this location due to the existing buildings obscuring views and therefore no visual impact is anticipated.	Negligible
Viewpoint 4: View from 14 Bridge Street	• this viewpoint has low sensitivity due to the urbanised environment with little scenic value • the proposed station infrastructure would be a visual departure to the residents of Bridge Street though would not be a departure from the existing landscape character of the wider area • the visual impacts of the proposed station infrastructure would be mitigated by the use of appropriate materials and building design outcomes.	Moderate - Low
Viewpoint 5: View from 1 Swanson Street	• this viewpoint has low sensitivity due to the urbanised environment with little to no natural elements • the proposed station infrastructure would not be a visual departure from the existing visual conditions and the Proposal is not a departure from existing landscape character in the zone.	Low
Viewpoint 6: View from Erskineville State School	• this viewpoint has low sensitivity due to the urbanised environment with little to no natural elements • the proposed station infrastructure would not be a visual departure from the existing visual conditions and the Proposal is not a departure from existing landscape character in the zone.	Low
Viewpoint 7: View from Swanson Street at Malcolm Street	• the Proposal cannot be viewed from this location due to the vegetation and existing building obscuring views and therefore no visual impact is anticipated.	Negligible
Viewpoint 8: View from Erskineville Road at Prospect Street	• the Proposal cannot be viewed from this location due to the vegetation and existing building obscuring views and therefore no visual impact is anticipated.	Negligible

Viewpoint (VP)	Summary	Overall impact (sensitivity x magnitude)
Viewpoint 9: View from George Street – mid block	• the Proposal cannot be viewed from this location due to the existing residential buildings obscuring views and therefore no visual impact is anticipated.	Negligible
Viewpoint 9a: View from George Street residences	• this viewpoint has moderate sensitivity due to views with scenic value, such as to vegetation and historic station elements, available to some residents • there would be a temporarily higher visual impact at this viewpoint during construction due to the usage of the western side of the railway corridor as a construction compound/laydown area • the proposed station infrastructure would have a moderate visual impact due to the increased scale of railway infrastructure over the existing visual environment. However, the visual impact of the Proposal would be somewhat mitigated through the use of appropriate material and building design outcomes.	Moderate
Viewpoint 10: View from pocket park – corner of Swanson Street and Railway Avenue	• this viewpoint has moderate sensitivity due to views of scenic value available to some receivers, as well as the presence of historic station elements • the Proposal would have a low magnitude impact due to the negligible increase in views of station infrastructure over the existing visual outlook. •	Negligible
Viewpoint 11: View from overhead booking office	• this viewpoint has moderate sensitivity due to views of scenic value available to some receivers, as well as the presence of historic station elements • the proposed station infrastructure would be a minor visual departure from the existing visual conditions, however, the Proposal would not be a departure from existing landscape character in the zone.	Moderate - Low
Viewpoint 12: View from platform	• this viewpoint has moderate sensitivity due to views of scenic value available to some receivers, as well as the presence of historic station elements • the proposed station infrastructure would not be a visual departure from the existing visual conditions and the Proposal is not a departure from existing landscape character in the zone.	Moderate - Low

6.2.3 Mitigation measures

Mitigation measures would be reviewed where appropriate during detailed design development and construction planning to minimise the level of visual impact of the construction and operation phases of the Proposal.

The detailed design of the Proposal is to be undertaken with reference to the recommendations included in the Landscape Character and Visual Impact Assessment (RPS, 2021a). Key project-specific mitigation includes:

- implementation of materials and finishes to complement the existing platform buildings, infrastructure and existing landscape character of the local area, including but not limited to:
  - the use of materials such as steel to complement the existing infrastructure and mitigate the visual impact on adjacent visual receptors
  - extensions of the canopies to complement the existing walkways and platform buildings
  - the use of translucent/lightweight materials, such as glass, to allow the design to complement the building mass and mitigate the visual impact of the design
- retention of mature trees and vegetation along the boundary of the rail corridor (where possible) to maintain screening to new and existing railway infrastructure
- additional vegetation would be planted as screening between residents on George Street and the Proposal to mitigate the ongoing visual impact of the Proposal following demobilisation of the construction compound
- implementation of landscape design proposed in the initial Urban Design Plan and Landscaping Plan (UDLP), which is to be updated in the detailed design phase
- privacy of the Bridge Street residents would be considered when choosing materials and their placement for the new footbridge and stairs.

Measures to mitigate visual impacts during construction would be included in a CEMP for the Proposal and would include measures such as minimising light spill during night work (including identification of sensitive receptors) and screening of compounds.

Refer to Table 7.1 for a full list of proposed mitigation measures.

6.3 Noise and vibration

This section provides a summary of the Noise and Vibration Impact Assessment undertaken by SLR (2021b). The assessment included:

- establishing the existing background noise levels in the vicinity of Erskineville Station
- establishing the construction noise management levels and vibration limits that would apply to the upgrade work
- predicting environmental noise and vibration levels at nearby residential and other sensitive receivers due to the upgrade work
- considering potential noise from the operation of the upgraded Erskineville Station
- identifying mitigation measures to reduce and manage noise and vibration impacts from the upgrade work to comply with established construction noise management levels and vibration limits.

As operational noise levels are expected to remain mostly unchanged and the specific mechanical systems to be installed for the Proposal are not yet finalised, no quantitative modelling of operational noise impacts was undertaken.

6.3.1 Existing environment

Noise sensitive receivers

The area surrounding the station was divided into four noise catchment areas (NCA01 to NCA04) as shown in Figure 6.10.

NCA01, located on both sides of the rail corridor beyond MacDonald Street to the south of Erskineville station is mostly residential buildings beyond MacDonald Street with outdoor

recreation areas and various commercial receivers. Closest receivers are located around 15 m from the proposed Concord Street laydown area and around 250 metres south of the Erskineville Station platform.

NCA02, located on the west side of the rail corridor, south of Swanson Street is mostly residential buildings with a mixed block of commercial receivers along Swanson Street. Closest receivers located around 15 metres west of the Erskineville Station platform.

NCA03, located on the east side of the rail corridor, south of Swanson Street is mostly residential buildings with an educational receiver (Erskineville Public School) located immediately east of the station, between Bridge Street and Malcolm Street. Closest receivers are located around 15 metres east of the Erskineville Station platform.

NCA04, located on both sides of the rail corridor beyond Swanson Street to the north of Erskineville station consists of mixed receiver types north of Erskineville stations beyond Swanson Street. Nearest receivers are residential, commercial, educational (St Mary's Catholic Primary School) and a childcare centre (SDN Erskineville Children's Education and Care Centre). Closest receivers located around 50 metres northeast and northwest of the Erskineville Station platforms.

Background noise levels

Existing noise levels (prior to construction of the Proposal) are measured to understand existing ambient noise levels and their sources, which inform the assessment of potential noise impacts from the Proposal.

Rating Background Noise Levels (RBLs) are determined from measurement of LA90 noise levels (representing the noise level exceeded for 90 per cent of the monitoring period) in the absence of noise from the Proposal.

To determine the RBLs, unattended noise monitoring using noise loggers was undertaken from 18 November 2020 to 30 November 2020 at the locations shown in Figure 6.10. RBLs are reported as L_{A90} as shown in Table 6.5.

Table 6.5 Unattended noise monitoring results

Location	Address	Period[1]	Rating Background Level (L_{A90}) in dB	Ambient noise level (L_{Aeq}) in dB
L.01	68 Bray Street, Erskineville	Day time	44	64
		Evening	42	66
		Night time	38	62
L.02	130A George Street, Erskineville	Day time	43	58
		Evening	43 (45 actual)[2]	58
		Night time	38	55
L.03	1 Bridge Street, Erskineville	Day time	42	56
		Evening	42	55
		Night time	35	52
L.04	134 Erskineville Street, Erskineville	Day time	48	62
		Evening	48	62
		Night time	39	57

Note 1: Day is defined as 7.00am to 6.00pm, Monday to Saturday and 8.00am to 6.00pm Sundays & Public Holidays. Evening is defined as 6.00pm to 10.00pm Monday to Sunday. Night time is defined as 10.00pm to 7.00am Monday to Saturday and 10.00pm to 8.00am Sundays & Public Holidays.

Note 2: The evening RBL has been reduced to match the daytime RBL due to the measured evening RBL being higher than the daytime, as outlined in the NPfI.

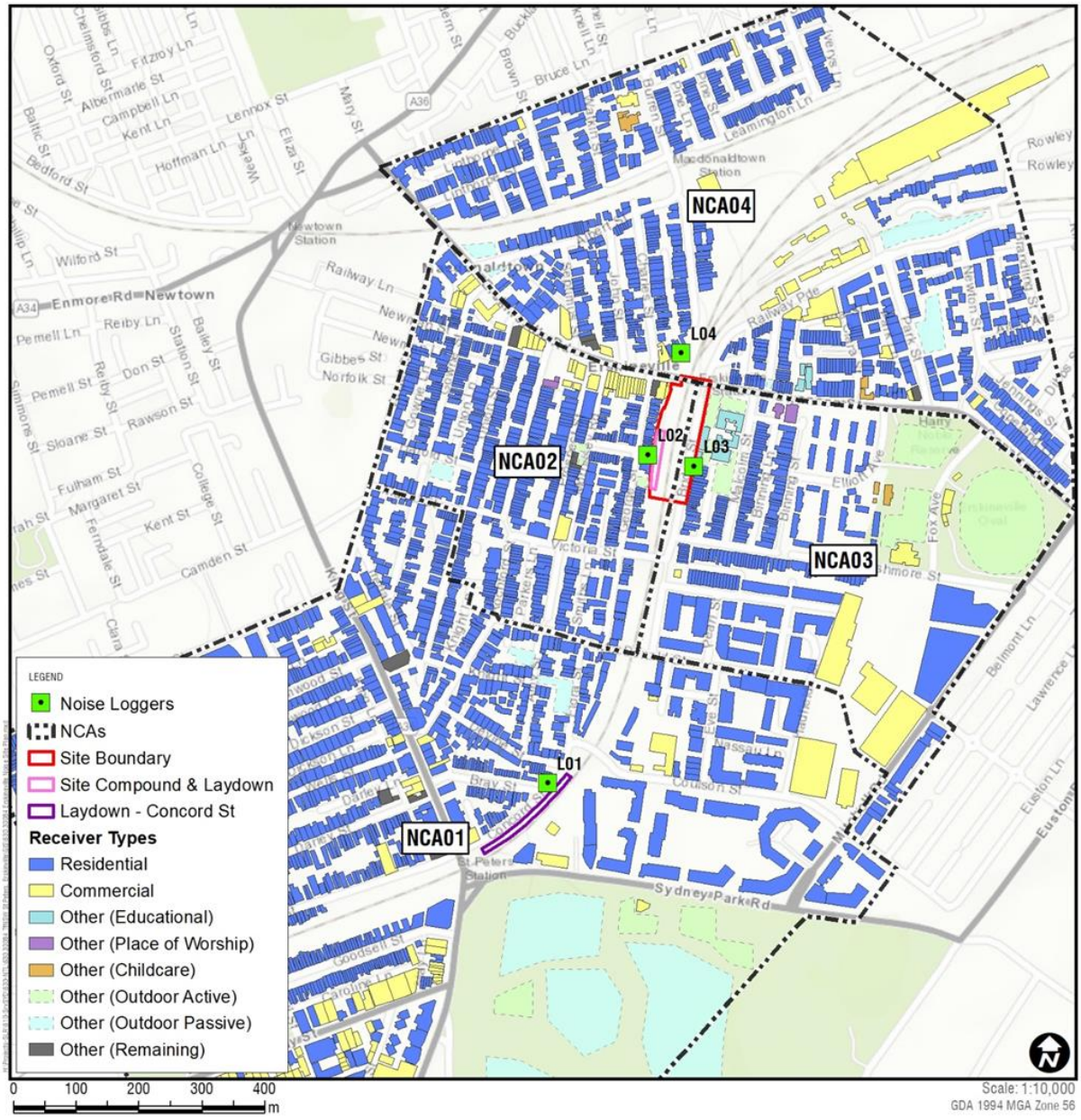

Figure 6.10 Noise catchment areas and noise monitoring locations

Operator attended monitoring was also undertaken on 18 November 2020 at each logger location. Daytime ambient noise levels at all locations were observed to be dominated by train passbys, including flanging noise at most locations, and crossover noise at L04. Local traffic and aircraft also contributed to the noise level at most locations. At L02 and L03 noise from Erskineville Public School contributed to the noise level.

The daytime background noise was typically distant traffic at all locations.

Construction noise criteria

The EPA's *Interim Construction Noise Guideline* (ICNG) (Department of Environment and Climate Change, 2009) is the principal guideline for the assessment and management of construction noise in NSW. The ICNG recommends standard hours of construction as:

- Monday to Friday: 7am to 6pm
- Saturday: 8am to 1pm
- Sundays and public holidays: no work.

Noise management levels (NMLs) have been determined for receivers as per the procedures in the ICNG. The ICNG prescribes set noise management levels for non-residential receivers such as commercial, schools and places of worship. Noise management levels for residential receivers are calculated based on the rating background level (RBL) + 10 dB(A) (for day time periods) or the RBL + 5 dB(A) (for evening and night time periods).

In addition, a 'highly noise affected' level of 75 dB(A) for residential receivers represents the point above which the ICNG indicates there may be strong community reaction to noise. Where work exceeds the noise management levels, all reasonable and feasible measures (such as equipment selection and location, construction scheduling and respite periods) should be implemented to reduce noise levels as far as practicable.

The construction NMLs calculated for residential receivers are listed in Table 6.6. The NML for sensitive receivers nearby such as educational institutes and places of worship, is prescribed by the ICNG, and is an internal noise management level. The corresponding external noise level (which the assessments are based on) has therefore been determined on the assumption that a 10 dB(A) noise reduction from outside to inside is applicable. This is considered to be a typical assumption for a 'windows open' scenario.

Sleep disturbance noise goals have also been established for residential receivers. The sleep disturbance criteria for the four NCAs are a screening level RBL + 15 dB(A). Where construction work is planned to extend over more than two consecutive nights, the ICNG recommends that an assessment of sleep disturbance impacts should be completed.

For traffic noise, the criterion applied on public roads generated during the construction phase of a project is an increase in existing road traffic noise of no more than 2 dB(A).

Table 6.6 NMLs for construction

NCA	Receiver type	Standard construction (RBL+10dB)	Out of Hours (RBL+5dB)[1]			Sleep disturbance (RBL+15dB)
		Day time	Day time	Evening	Night	
NCA01	Residential	54	49	47	43	53
NCA02	Residential	53	48	48	43	53
NCA03	Residential	52	47	47	40	50
NCA04	Residential	58	53	53	44	54
All	Commercial	70	70	n/a	n/a	n/a
All	Childcare centre	50	50	n/a	n/a	n/a
All	Place of worship	55	55	55	n/a	n/a
All	Educational	55	55	n/a	n/a	n/a
All	Medical centre	65	65	n/a	n/a	n/a

NCA	Receiver type	Standard construction (RBL+10dB)	Out of Hours (RBL+5dB)[1]			Sleep disturbance (RBL+15dB)
		Day time	Day time	Evening	Night	
All	Hotel	55	55	55	55	n/a
All	Public building	55	55	n/a	n/a	n/a
All	Outdoor passive recreation	60	60	60	n/a	n/a
All	Outdoor Active recreation	65	65	65	n/a	n/a

Note 1: Out of Hours construction hours – Evening hours are 6pm to 10pm. Night time hours are 10pm to 7am Sunday to Saturday and 10pm Saturday to 8am Sunday

Ground-borne noise assessment criteria

Construction work can cause ground-borne noise impacts in nearby buildings when vibration generating equipment is in use. Vibration can be transmitted through the ground and into the structure of nearby buildings, which can then create audible noise impacts inside the building. The ICNG and *Construction Noise and Vibration Strategy* (CNVS) (TfNSW, 2019a) provide evening and night-time ground-borne noise NMLs for residences to protect the amenity and sleep of affected residents. The ground-borne noise NMLs are:

- Evening $L_{Aeq(15minute)}$ 40 dBA
- Night-time $L_{Aeq(15minute)}$ 35 dBA.

For commercial receivers, the CNVS does not provide guidance in relation to acceptable ground-borne noise levels. An internal NML of 60 dBA has been used for these receivers, which is consistent with other similar infrastructure projects.

The NMLs only apply where internal ground-borne noise levels are higher than noise transmitted through the air. This situation can occur where buildings near to construction work have high performing facades which attenuate the airborne component, or where sensitive internal areas do not have facades which face the construction work. Should buildings susceptible to ground-borne noise be identified in the project area this should be assessed during preparation of the Construction Noise and Vibration Management Plan (CNVMP).

Construction vibration criteria

The effects of vibration in buildings can be divided into three main categories:

- those in which the occupants or users of the building are inconvenienced or possibly disturbed
- those where the building contents may be affected
- those in which the integrity of the building or the structure itself may be prejudiced.

Human comfort

The EPA's *Assessing Vibration: a technical guideline* (Department of Environment and Conservation, 2006) provides guideline values for continuous, transient and intermittent events that are based on a Vibration Dose Value (VDV) rather than a continuous vibration level. The

VDV is dependent upon the level and duration of the short-term vibration event, as well as the number of events occurring during the day time or night time period.

The maximum criteria level is 0.4 $m/s^{1.75}$ for residences during the day time and 0.26 $m/s^{1.75}$ during the night time. For offices, educational facilities and places of worship (when in use) the maximum criteria is 0.8 $m/s^{1.75}$. For critical working areas (such as precision laboratories) the maximum criteria is 0.2 $m/s^{1.75}$.

Effects on building contents

People can perceive floor vibration at levels well below those likely to cause damage to building contents or affect the operation of typical equipment. For most receivers, the controlling vibration criterion would be the human comfort criterion, and it is therefore not normally required to set separate criteria in relation to the effect of construction vibration on most building contents.

Where appropriate, objectives for the satisfactory operation of critical instruments or manufacturing processes should be sourced from manufacturer's data and / or other published objectives.

Structural damage vibration

Structural damage vibration limits are based on British Standard *BS 7385 Part 2-1993 Evaluation and measurement for vibration in buildings Part 2*. These standards provide frequency-dependent vibration limits related to cosmetic damage, noting that cosmetic damage is very minor in nature, is readily repairable and does not affect the structural integrity of the building.

The recommended vibration limits from BS 7385 for transient vibration for minimal risk of cosmetic damage to residential and industrial buildings is shown in Table 6.7.

Table 6.7 Transient vibration guide values for minimal risk of cosmetic damage (BS 7385)

Type of building	Peak particle velocity: 4 – 15 Hz	Peak particle velocity: 15 Hz and above
Reinforced or framed structures industrial and heavy commercial buildings	50 mm/s at 4 Hz and above	
Un-reinforced or framed structures Residential or light commercial type buildings	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above

Safe working distances

Safe working distances for items of vibration intensive equipment are provided in Table 6.8.

Table 6.8 Safe working distances from vibrating plant

Plant item	Rating/description	Safe working distance (Cosmetic damage)	Safe working distance (Human response)
Vibratory roller	< 50 kN (Typically 1-2t)	5 m	15 m to 20 m
	< 100 kN (Typically 2-4t)	6 m	20 m
	< 200 kN (Typically 4-6t)	12 m	40 m
	< 300 kN (Typically 7-13t)	15 m	100 m
	> 300 kN (Typically 13-18t)	20 m	100 m

Plant item	Rating/description	Safe working distance (Cosmetic damage)	Safe working distance (Human response)
	> 300 kN (Typically > 18t)	25 m	100 m
Small hydraulic hammer	300 kg - 5 to 12t excavator	2 m	7 m
Medium hydraulic hammer	900 kg - 12 to 18t excavator	7 m	23 m
Large hydraulic hammer	1600 kg - 18 to 34t excavator	22 m	73 m
Jackhammer	Hand held	1 m (nominal)	Avoid contact with structure
Bored piling	< 800 mm	2 m	n/a

Operational noise criteria

The *Noise Policy for Industry* (EPA, 2017) (NPI) has two broad objectives:

- control intrusive noise levels in the short-term
- maintain noise amenity levels for specific land uses over the medium to long-term.

The NPI sets out procedures for establishing the project intrusiveness $L_{Aeq(15minute)}$ and project amenity $L_{Aeq(period)}$ noise levels, where the lower (i.e. more stringent) is then adopted as the Project Trigger Noise Level (PTNL). Applicable PTNLs for all noise sensitive receiver areas surrounding the Proposal have been calculated and are shown in Table 6.9.

Table 6.9 Project Trigger Noise Levels - residential

NCA	Time of day	Intrusive[1] (dBA)	Amenity[2] (dBA)	Overall PTNL[3] (dBA)
NCA01	Day	49	53	49
	Evening	47	43	43
	Night	43	38	38
NCA02	Day	48	53	48
	Evening	48	43	43
	Night	43	38	38
NCA03	Day	47	53	47
	Evening	47	43	43
	Night	40	38	38
NCA04	Day	53	53	53
	Evening	53	43	43
	Night	44	38	38

Note 1: Project intrusive noise level is RBL + 5dB

Note 2: The recommended amenity noise levels have been reduced by 5 dB to give the project amenity noise levels due to other sources of industrial noise being present in the area

Note 3: Resulting PTNL is the lower of the project intrusive and project amenity noise levels

6.3.2 Potential impacts

c) Construction phase

Noise

To assess the potential impacts from the proposed work, the construction phases described in Section 3.4.1 were used to develop indicative construction scenarios comprising typical plant and equipment. The scenarios developed were:

- site establishment – including establishment of compound / work areas and vegetation removal
- main work – including demolition activities, excavation, lift installation, station building modifications and platform work
- site demobilisation.

A 3D computer noise model was then used to predict the $L_{Aeq(15minute)}$ and $L_{A1(1minute)}$ noise levels for each of the NCAs resulting from the above scenarios. Predictions include the source noise levels of the anticipated equipment, the location of the nearest sensitive receivers, the number of plant items likely to be operating at any given time, the distance between the equipment and the receivers, and any shielding or reflections that the topography or buildings may provide.

Worst-case noise level predictions have been made based on worst case impacts for each work scenario when the work is located at the nearest position within the work area to each receiver. The predictions are provided in the Noise and Vibration Impact Assessment (SLR, 2021b). The impacts are summarised in Table 6.10.

In practice, the noise levels would vary because plant would move around the worksites and would not all be operating concurrently. This means that noise levels are likely to be lower than the worst-case noise levels presented for notable periods of time during the work.

Residential receivers are considered to be highly noise affected if noise levels from construction exceed 75 dBA $L_{Aeq(15minute)}$.

Due to the close vicinity of the work to receivers directly adjacent to Erskineville Station, worst case construction daytime noise levels are predicted above 75 dBA $L_{Aeq(15minute)}$ during the operation of noise intensive equipment.

The location of receivers with potential to be highly noise affected at noise intensive times during these activities is shown in Figure 6.11.

Table 6.10 Summary of predicted noise impacts

Work scenario	Summary of predictions	Timing and duration of work
Site establishment	• during site establishment, the most potentially affected residential receivers are predicted to exceed the daytime NMLs by more than 30 dB in NCA02 and NCA03. During these noise-intensive activities the receivers with the highest NML exceedances are generally those with direct line of sight to the equipment and situated immediately adjacent to the work • impacts at other sensitive receiver types are typically those receivers immediately adjacent to the work (ie the nearby mixed commercial/other receivers in NCA02 adjacent to the work and Erskineville Public School in NCA03) • while the NML exceedances have been identified as relatively high, these impacts are highly dependent on the specific location of the high noise plant which would be considered to minimise the impacts • NML exceedances of this magnitude would be limited to periods when noise intensive plant is operating directly adjacent to the sensitive receivers. Sensitive receivers which are located further away from the proposed work areas would have lower NML exceedances. For example, the predicted noise levels at the second row of receivers from the work areas typically reduce by 10 dB when compared with the front row. However, due to the noise intensive nature of the equipment, NML exceedances are predicted over the adjacent area during the site establishment work.	Standard day time hours and out of hours work (including rail shutdowns).
Main work	• in general, impacts during are predicted to be minor or below NML at the majority of surrounding residential receivers in NCA01. Due to the close vicinity to the work, receivers in NCA02 and NCA03 adjacent to the station are the most potentially affected residential receivers and are predicted to exceed the daytime NMLs by over 30 dB during noise intensive activity. The highest impacts are predicted during demolition work, platform resurfacing work and excavation work • the highest predicted noise levels at non-residential receivers exceed the NML by over 25 dB at Erskineville Public School during platform resurfacing work. NML exceedances of this magnitude would be limited to the rooms with a line of sight to the proposed equipment for this work. For operational reasons, it may also be required to program some of the work out of hours at a time when these receivers are not occupied and therefore not susceptible to adverse noise impact.	Standard day time hours and out of hours work (including rail shutdowns).

Work scenario	Summary of predictions	Timing and duration of work
Site compounds and laydown areas	• the nearest-affected residential receivers in NCA02 and NCA03 are predicted to exceed the daytime NMLs by up to 28 dB and 6 dB respectively during the proposed site compound and laydown activity at the Platform 1 in-corridor location • construction noise levels in NCA01 due to the Concord Street in-corridor laydown area are predicted to exceed NMLs by up to 19 dB during the daytime and up to 30 dB during out of hours at residential receivers during the work • the highest predicted noise levels at non-residential receivers exceed the NMLs by up to 7 dB at the nearest outdoor active recreation area in NCA02, and up to 5 dB at Erskineville Public School in NCA03.	Standard day time hours and out of hours work (including rail shutdowns).

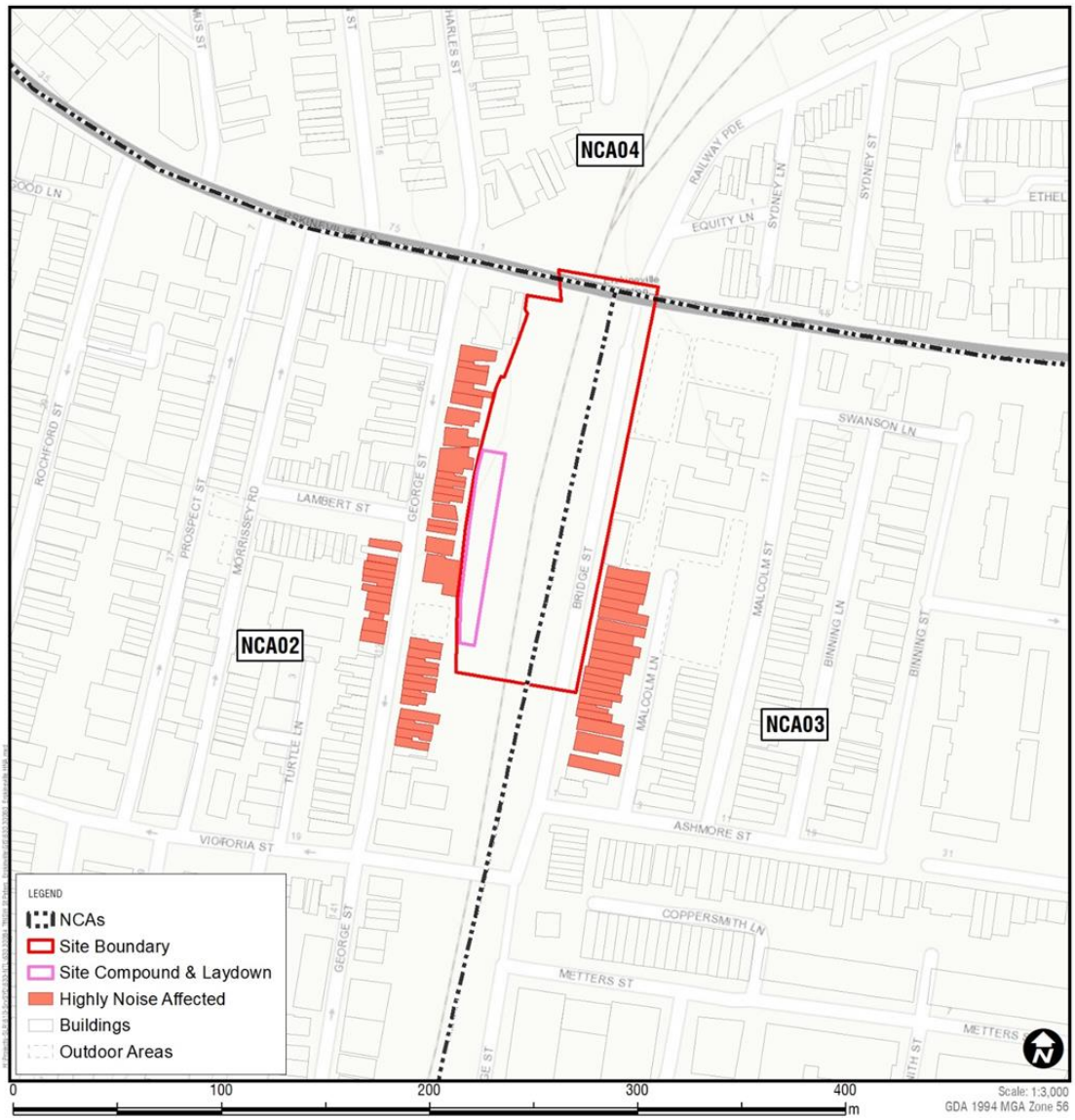

Figure 6.11 Highly affected noise receivers

Cumulative noise impacts

Cumulative noise impacts warrant assessment where more than one work scenario operates at the same time and in the same location such that the same receiver is impacted by noise from more than one work scenario simultaneously. Generally, the proposed work is scheduled in consecutive phases and therefore cumulative noise impacts are not predicted as the assessment is controlled by noise impacts from the individual phases (as assessed).

Where construction work associated with other projects occurs at the same time as the Proposal work, this has the potential to result in marginally higher noise levels at the nearby receivers. Noisy work from each project would however, typically not occur at the same time, and may affect different facades of a building, minimising the cumulative impacts.

Construction traffic noise

Construction vehicles associated with the Proposal on public roads are not expected to exceed 12 heavy vehicle deliveries per day during peak construction periods (scheduled Sydney Trains track work periods) and less during non-track work periods.

The relatively small number of construction vehicles accessing the site is predicted to have an insignificant effect on existing road traffic noise levels and further consideration of noise impacts due to construction traffic is not required.

Vibration

Vibration intensive equipment is proposed during the service relocation work scenarios which include the use of jackhammers and bored piling.

Piling work is associated with several work activities. It is assumed that piling work would be performed using non-vibration intensive bored piling. If the Contractor elects to use an alternative piling method, the vibration levels generated by this plant may be higher and would require further assessment.

Vibratory rolling is proposed during the following scenarios:

- excavation and piling work
- platform resurfacing work.

Jackhammering is proposed during platform canopies work, as well as the two activities above.

Vibratory rolling and jackhammering during the work at its closest is likely to be the around 15 metres from the closest residential receivers. For work on the platform, vibration impacts to the station buildings should be considered.

Human comfort

In relation to human comfort (response), the safe working distances in Table 6.8 relate to continuous vibration and apply to residential receivers. For most construction activities, vibration emissions are intermittent in nature and for this reason, higher vibration levels, occurring over shorter periods are permitted, as discussed in *Assessing Vibration - a technical guideline* (Department of Environment and Conservation, 2006).

Cosmetic damage assessment

Indicative vibration levels at nearby receivers are shown in Table 6.11.

Table 6.11 Indicative vibration levels at receivers

Receiver	Approximate distance to work area	Indicative vibration level (mm/s)[1]
NCA01 (residential)	> 250 metres	< 1
NCA02 (residential)	20 metres	7.5
NCA03 (residential)	20 metres	7.5
NCA04 (residential)	50 metres	1.1

Note 1: Estimated from the safe working distances specified in TfNSW Construction Noise and Vibration Strategy and assumed dense rock.

Heritage building impacts

Heritage structures identified in close proximity of the Proposal area are identified in Section 0.

Heritage buildings are to be considered on a case by case basis. Where a historic building is deemed to be sensitive to damage from vibration (following inspection), it is recommended to reduce the vibration criteria accordingly in line with the *Construction Noise and Vibration Strategy* (TfNSW, 2019a).

The more conservative DIN 4150 (German Institute for Standardisation, DIN4150-3:1999-02 *Structural vibration – Effects of vibration on structures)* superficial cosmetic damage criteria of 2.5 mm/s should be considered for vibration sensitive structures. Where heritage buildings of a typical residential-type construction are not found to be structurally unsound, DIN 4150 superficial cosmetic damage criteria of 5 mm/s may be more suitable as a screening criterion.

For the proposed construction activities, the vibration intensive equipment is limited to the vibratory roller (during excavation and platform resurfacing work).

During this work the DIN4150 criteria could be exceeded at the following heritage items:

- Erskineville Railway Station
- Erskineville Public School
- House at 134 George Street
- Terrace group at 1-10 Bridge Street.

As such, alternative lower vibration techniques to the vibratory roller (eg non-vibratory rolling or use of a smaller capacity roller) would be preferred when in the near vicinity of these items.

Where vibration intensive work is required to be undertaken within the specified safe working distances, or in close proximity to vibration sensitive heritage structures, vibration monitoring would be undertaken to ensure acceptable levels of vibration are satisfied.

d) Operational phase

Due to the minor to negligible increase in operational noise, noise monitoring and assessment was not completed.

At this stage of the design specific lift systems have not been selected, which means it is too early to assess compliance with the applicable noise criteria. However, given this type of noise source generally has relatively low noise emissions, it is anticipated that the lift system designs could be relatively easily mitigated if required during the detailed phase of the Proposal through the selection of appropriate equipment. While noise emissions from PA

systems are generally louder than the other operational noise sources, they can typically be designed to minimise any impacts through the equipment selection, location, directionality and volume.

6.3.3 Mitigation measures

Prior to commencement of work, a CNVMP would be prepared and implemented in accordance with the requirements of the CNVS and the Noise and Vibration Impact Assessment (SLR, 2021b) and in consultation with impacted receivers.

The CNVMP would prescribe reasonable and feasible mitigation measures to minimise construction noise and vibration. The measures would focus on contractor inductions, selection and operation of plant and equipment, work scheduling (including respite periods), prescribing safe working distances for vibration intensive equipment, procedures for noise and vibration monitoring and obtaining approvals for out of standard hours work. The CNVMP would also detail requirements for managing potential vibration impacts to heritage structures through monitoring and safe working distances.

For any highly affected noise receivers (over 75 dB), Transport for NSW would communicate with the impacted residents regarding the duration and noise level of the work, and by describing any respite periods that would be provided.

Operational plant and equipment would be designed with regard to the PTNLs.

Refer to Table 7.1 for a full list of proposed mitigation measures.

6.4 Aboriginal heritage

An Aboriginal Heritage Information Management System (AHIMS) search was undertaken for the Proposal area plus a 200 metre radius, on 18 December 2020. No Aboriginal sites were identified in the search.

Certain landscape features, such as nearby waterways, sand dune systems, ridge tops, ridge lines, headlands, cliff faces and rock caves / shelters, can indicate the likely presence of Indigenous objects. None of these features are present immediately surrounding the station and therefore the Proposal is not considered to be located within a high risk landscape for Indigenous heritage potential. The extensive landscape modification and high level of disturbance that has occurred across the Proposal area suggests that the presence of culturally sensitive buried items is unlikely within the boundaries of the Proposal.

6.4.1 Potential impacts

a) Construction phase

Construction of the Proposal would involve some minor excavation and other ground disturbing activities. Ground disturbing activities have the potential to impact Aboriginal sites if present.

As no known Aboriginal heritage items are located in the vicinity of the Proposal area and no high-risk landscape features are located at or near the Proposal area, the potential for unknown items to be present is considered to be low. As such, the Proposal is unlikely to affect Aboriginal heritage during construction.

b) Operational phase

There would be no risks to Aboriginal heritage from the operation of the Proposal.

6.4.2 Mitigation measures

If previously unidentified Aboriginal objects are uncovered during construction, in accordance with Transport for NSW's *Unexpected Heritage Finds Guideline* (TfNSW, 2019b), work would cease in the vicinity of the find and the Transport for NSW Project Manager and Transport for NSW Environment and Planning Manager would be notified immediately to assist in co-ordinating next steps which are likely to involve consultation with an archaeologist, Heritage NSW, DPIE and the Local Aboriginal Land Council/s. If human remains are found, work would cease, the site would be secured and the NSW Police and the Energy, Environment and Science Group would be notified.

Refer to Table 7.1 for a full list of proposed mitigation measures.

6.5 Non-Aboriginal heritage

A Statement of Heritage Impact (SoHI) has been prepared by RPS (2021b) for the Proposal. This included a desktop assessment and site inspection of the Proposal area on 21 October 2020. The assessment of the SoHI is summarised in this section.

6.5.1 Existing environment

A desktop search of historic registers including the World Heritage List, National Heritage List, Commonwealth Heritage List, NSW State Heritage Register (SHR), RailCorp's Section 170 Heritage and Conservation Resister and the heritage schedule of the Sydney LEP was undertaken for the Proposal area and surrounds.

Heritage listed items in and within the vicinity of the Proposal are listed in Table 6.12 and a historical photograph is shown in Figure 6.13. Erskineville Railway Station Group is listed on RailCorp's Section 170 Heritage and Conservation Register. The extent of the heritage listing for the station is shown in Figure 6.12.

Table 6.12 Heritage items in proximity to the Proposal area

Name / Item	Listing no.	Register	Location in relation to Erskineville Station
Eveleigh Railway Workshop	01140	State Heritage Register	In vicinity, adjacent
Erskineville Railway Station Group	SHI No. 4801158	s.170	Within
Erskineville Railway Station including buildings and their interiors	I625	LEP	Within
Toogood & White's Estate – conservation area	C26	LEP	In vicinity, adjacent
Malcolm Estate – conservation area	C24	LEP	In vicinity, adjacent
House including interior	L612	LEP	In vicinity, adjacent
Erskineville Public School	I626	LEP	In vicinity, adjacent

Name / Item	Listing no.	Register	Location in relation to Erskineville Station
Terrace Group	I604	LEP	In vicinity, adjacent
Burren Estate – conservation area	C21	LEP	In vicinity

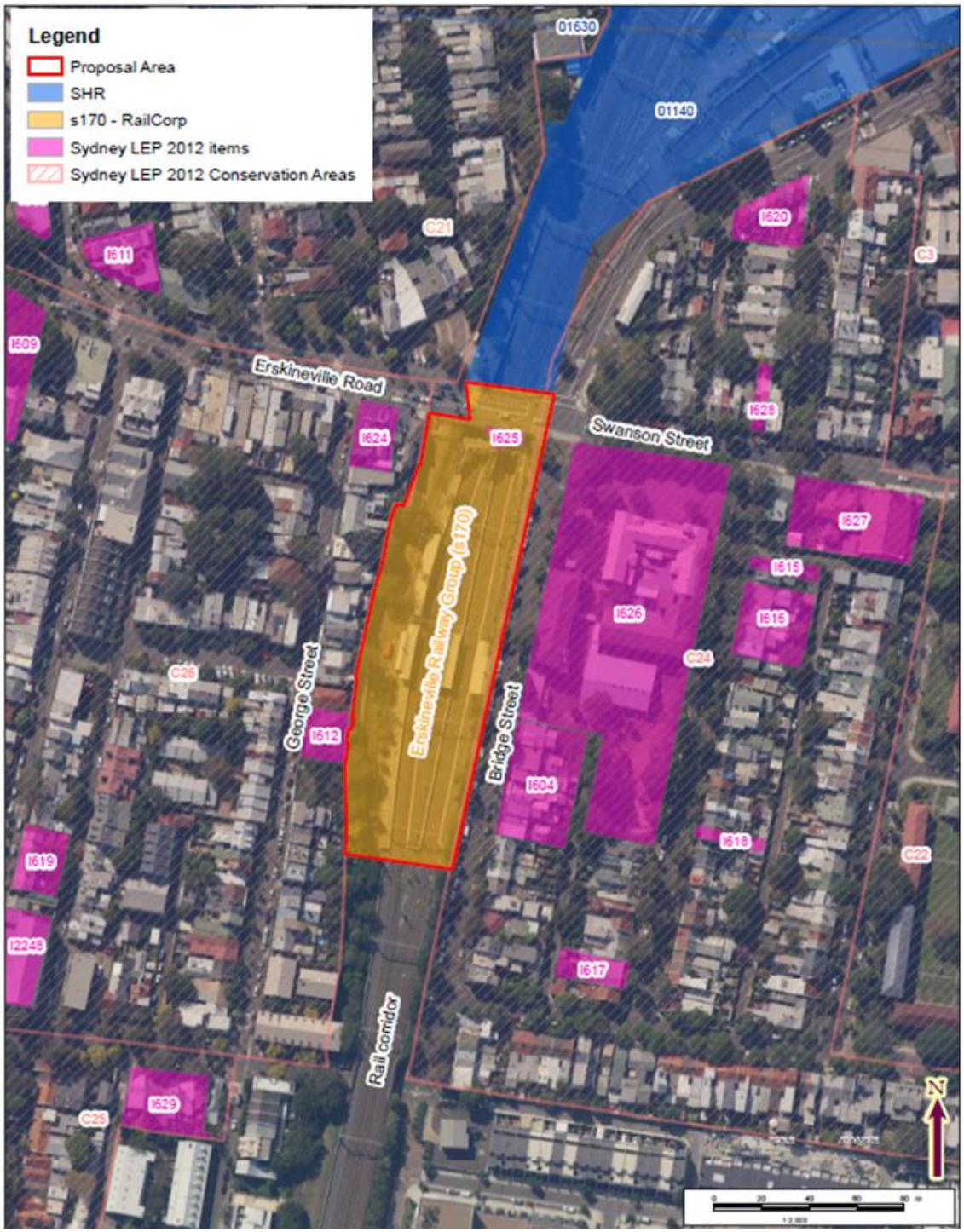

Figure 6.12 Erskineville Railway Station Group and other registered heritage items in proximity to the Proposal

Historical background

The first iteration of Erskineville Station opened on 3 August 1885 (Evening News 3 August 1885, 5) to the north of Erskineville Road/Swanson Street on the double track line built from Illawarra Junction to Hurstville. The station comprised of two side platforms with small, timber waiting rooms that were accessed from Burren Street and Railway Parade. A ticket office was located on the Sydney-bound platform.

In December 1889, Macdonaldtown Municipal Council requested a new station (Sydney Morning Herald, 24 December 1889, 4), and in February 1890, the Railway Commissioners completed plans for the new Erskineville Station (Sydney Morning Herald, 7 February 1890, 3). The tenders for the "erection of a passenger station and bridge at Erskineville on the South Coast Railway" closed on 31 March 1890 (New South Wales Government Gazette, Issue No. 178, 28 March 1890, 2746) and the job was eventually won by Gatty and Flook, a Sydney-based general contracting company (Australian Town and Country Journal, 12 April 1890, 43). The plans included the first overhead booking and parcels office in NSW and construction of the road bridge over the rail line. In addition to the overhead booking office, shelters were erected along both platforms, though it was reported that they restricted passenger movement and created "dangerous" conditions on the platforms (Sydney Morning Herald, 2 September 1890, 6).

The road bridge and booking office were completed quickly, and by June 1890 locals were protesting that the bridge was too narrow (Evening News, 2 July 1890, 2). Over the next years, Macdonaldtown Council made requests to the Railway Commissioners for several upgrades to the station including that the bridge be widened, for improved lighting, better access to the station, and a connection of the station to the local sewerage system (Evening News, 15 June 1892, 5; 5 June 1893, 3; 20 June 1893, 3; 14 July 1893, 2). Eventually the road was widened and the sewerage was connected. By 1912, however, the station had fallen into disrepair.

The decision was made to convert the line between Illawarra Junction and Sydenham from two tracks to four, necessitating that the 1890 Erskineville Station be relocated to the southern side of Swanson Street. The four tracks were officially operational on 15 June 1913 (Traffic Branch Circular No. 146, 10 June 1913).

In 1911, plans were prepared for the third iteration of Erskineville Station, which included three platforms servicing four tracks, overbridge with stepways to the station, an overhead booking office, and side platform buildings. The two side platforms and their buildings were completed by January 1912, which allowed the demolition of the 1890 Erskineville Station. In July 1912, the plan for the building of the island platform was issued, and work was soon completed. The station was completed and operational in 1913.

In 1926, the Illawarra Line between Central Station and Oatley Station (including Erskineville Station) was electrified. Around this time, a relaying hut below the stepway leading to the island platform was constructed. In 1949, the Station Master's office was relocated from the island platform station building to the western side platform building, replacing the general waiting room on Platform 1. The former Station Master's office was converted into a Porters Room.

In the late 1940s, in preparation for proposed but later abandoned, sextuplication of tracks through Erskineville Station, land to the west of Platform 1 was resumed (announced in numerous Government Gazettes of NSW between 1948 and 1949) and the platform walls of the additional two proposed tracks were built, though the additional two tracks were not constructed. In the 1960s, a newsagency made from large concrete blocks was built adjacent to the overhead booking office on the overhead bridge between Swanson Street and the station footbridge.

In 1993, the station footbridge was upgraded, including replacement of stair railings and posts to Platform 1 and 2/3 stairs, new concrete steps. In 2004, Platform 1 was rebuilt using a

precast concrete unit platform wall and a poured concrete deck. In 2011, a 40-metre long metal canopy was installed on the northern end of platform 1, and in 2015 the platform buildings were repainted.

The New Railway Platform at Erskineville.
The train entering the station is on the existing double track. When the work is finished this track will be duplicated.

Figure 6.13 Photo of station construction in 1912 (The Sum, 21 March 1912, p.2)

Erskineville Railway Station Group

Chapter 4 of the SoHI provides a detailed description of the existing physical condition for those elements listed in the Section 170 Heritage and Conservation Register listing, likely to be impacted by the Proposal including:

- Overhead booking office
- Platform 1 building
- Platform 2/3 building
- Platform 4 building
- the platforms
- footbridge and stairs.

The significance of these elements is shown in Figure 6.14. The Statement of Significance from the SHR listing reads as follows:

Erskineville Railway Station is of local heritage significance. The station is of historical significance for its role as a transport hub for the Erskineville area, evolving from the original 1884 Erskineville railway station north of the Swanson St overbridge to the present station site south of the bridge, constructed in 1911. The station is significant as a group of structures dating from the establishment of the station at this location in 1911-12, is highly intact, and significant for its association with the rail quadruplification works to Sydenham in the early 1900s that resulted in the station's relocation to its present site.

Erskineville Railway Station is of aesthetic significance as a cohesive group of standard Federation period railway station structures, the overhead booking office being particularly rare for its level of intactness.

The footbridge was identified as an item of high heritage significance in the 2016 'Railway Footbridges Heritage Conservation Strategy'. The footbridge deck support and substructures are intact, as are the stair railings and newel posts to Platform 4. It is a good representative example of a standard RSJ footbridge design that contributes to Erskineville Station precinct. It is unusual that the footbridge is contemporary with the other station buildings and structures, as often footbridges were constructed sometime after the original station construction period.

The Overhead Booking Office at Erskineville was identified as the best example of a Federation Queen Anne style OHBO in the 2014 'Railway OHBO Heritage Conservation Strategy' and of potential state significance. The overhead booking office has aesthetic significance as part of a cohesive group of standard Federation period railway station structures, representative of urban station design in the early twentieth century. The overhead booking office is particularly rare for its level of intactness.

There are three moveable heritage objects at Erskineville Station: a safe located in the overhead booking office; three hurricane lamps; and rollover timber indicator boards within the concourse of the overhead booking office. The objects are included on the station's Moveable Heritage Register, which is part of the s170 listing.

Figure 6.14 Significance of elements at Erskineville Station

Potential archaeological features

The ca. 1888 Erskineville map shows that the 1885 station is not within the Proposal area. Since the 1890 station was on the same location as the 1885 station, it too is not within the Proposal area. Consequently, the Proposal area contains no potential of any archaeological resources associated with the early iterations of Erskineville Station.

The ca. 1888 Erskineville map also shows that the land to the south of Swanson Street on which the present-day station is built was mostly rail corridor, with no development of note within the modern station curtilage. The 1943 aerial photograph of the area (Figure 6.15) shows that the westernmost part of the Proposal Area where the unused platforms are used to be the backyards of the residences fronting George Street. These were resumed in the late 1940s and had been demolished for platform construction by 1951. Given that the platform and rail corridor are lower in elevation than those properties fronting George Street, as seen by the large retaining wall marking the western boundary of the station curtilage, any archaeological resources associated with the George Street yards would have been obliterated by ground disturbance associated with platform construction in 1950/1951.

In summary, the archaeological potential of the Proposal Area is low. Based on an analysis of the documentary resources and the level of ground disturbance associated with the development of the station, it is unlikely that any archaeological relics would be identified.

Figure 6.15 1951 aerial photograph (NSW Historical Imagery Viewer)

6.5.2 Potential impacts

a) Construction phase

An assessment of heritage impact has been undertaken in accordance with the definitions in Table 6.13.

Table 6.13 Defining level of impact

Level of impact	Description
Total loss of significance	Major adverse impact to the extent that the item would no longer be significant at a State or local level.
Major adverse	The Proposal would have a severe, long-term and irreversible impact on the item. This includes partial or complete demolition of the item or additions in the vicinity of the item that would impact the visual setting of the item.
Moderate adverse	The Proposal would have an adverse impact on the item. This includes removal of an important aspect of the setting or temporary removal of significant elements or fabric. This impact could be reduced through appropriate mitigation measures.
Minor adverse	The Proposal would have a minor adverse impact on the item. This may be the result of the action affecting only a minor element or part of the setting. This impact may be temporary or reversible.
Little to no impact	The Proposal is minor in nature. The impact of the Proposal to the significance of the item is negligible due to the nature of the work or through appropriate mitigation.
Positive impact	The Proposal enhances the ability to demonstrate the significance of the item.

Station upgrade

Construction and installation of a new accessible southern station entrance

The Proposal includes the construction and installation of a new accessible southern station entrance on Bridge Street, to the east of Erskineville Station. This southern entrance will include a new footbridge with anti-throw screens that will connect the Bridge Street entrance to each of the platforms. The new proposed footbridge would not connect to George Street.

Three lifts and three stairways would be built to allow access between the footbridge and each of the platforms, including a minor widening to Platform 1 to accommodate the lift and stairway. Canopies would be constructed at each lift landing for weather protection. The installation of the lift and stairway on the western platform (Platform 1) would require a new landing and walkway to the platform, as well as minor widening of the platform.

The construction and installation of the new accessible southern station entrance and footbridge would eliminate the need to substantially modify the northern station entrance with its highly significant fabric. Had a different option been chosen that included lifts associated with the northern entry group, the northern fabric of the footbridge would be greatly impacted and the character of the view of the northern station entrance from the platform buildings would be substantially altered. In this way, the construction of a southern entrance and footbridge, and their positioning would be distant enough from the northern entrance so as not to impact on the significant historical spatial and visual relationship between the northern entry

group and the platform buildings. As a result, the overhead booking office (exceptional significance) and original footbridge would remain unaffected by the Proposal.

The construction of the new footbridge, and stairways would involve substantial work within each platform, including the installation of piles, excavation and installation of concrete bases, installation of footbridge columns, and installation of the base of the stairs. The footbridge concourse would then be installed over the tracks and Bridge Street followed by the installation of the in situ concrete deck, stairways, and cabling. The installation of lifts would include the construction of lift foundations into each platform and the extension of Platform 1 to the west for the landing.

Lift shafts and upper lift landings would then be installed as well as protection screens and utilities to cars and lift landings. The construction of this body of work would involve the construction of a crane platform within the rail corridor adjacent to Platform 1, and excavations associated with the piles for the new footbridge foundations and lift shafts. The Proposal would include localised regrading and resurfacing of all platforms and the footpath. During regrading of Platform 2/3, the platform gardens would be unaffected. The installation of the new southern entrance, southern footbridge and associated access structures would physically impact the fabric of a portion of the platforms. Given that the significance of the platforms is derived from their use as railway platforms, the impacts of the proposed work is considered minor.

While the southern entrance and footbridge would nearly eliminate impacts on significant fabrics associated with the northern entry group, the bulk of the new element in the southern portion of the station would have a visual impact. The use of steel frames for the proposed footbridge and lifts reflects the typical design of railway footbridges, thereby minimising the potential discordance between the new element and the historic station complex. Likewise, the new footbridge would not exceed the northern entry group in height, thereby minimising its visual impact and keeping the overhead booking office and northern footbridge as the most prominent features of the station. Despite these efforts to minimise the impact of the southern entrance and footbridge, the bulk of the new element would result in a moderate adverse impact on the heritage significance of Erskineville Station.

Installation of lift at northern footbridge and impacts on footbridge

The Proposal includes the installation of a lift to Platform 1 from the northern footbridge. This would include the removal of the modern balustrade and light on the western end of the extant footbridge and the extension of the footbridge. The balustrade and light proposed for removal is modern and considered significant fabric. The construction of the lift would involve the construction of a new lift landing immediately adjacent to the existing Platform 1 and construction of a canopy over the platform landing. The construction of the lift shaft would include earthwork involving the installation of the lift foundations and new landing.

The existing footbridge would be retained (with the exception of the far western balustrade and light, which are not significant). The existing overhead booking office and stairs would be unaffected beyond upgrades to the handrails, tactiles, stair nosings, and minor platform regrading.

While there would be no impact to significant fabric associated with the existing footbridge, the bulk of the new lift would somewhat detract from the station context. However, in order to minimise this impact, the new lift would be off to the side and would not affect views of the Platform 1 building from the footbridge, or views of the footbridge and overhead booking office from any of the platforms. Additionally, the height of the lift would be lower than the overhead booking office, which would remain as the most prominent feature when viewing the northern entrance group from the platforms. The design of the new lift, with its steel frame and glazed structure, would sympathetically integrate into the station, minimising impacts to the visual context of the northern entrance group.

Given that the existing footbridge would be retained, the construction work would not have a significant physical impact on any significant aspects of Erskineville Station. While the bulk of the new lift would detract from the station context, it would be off to the side and not affect views of the Platform 1 building, and thus would only have a minor adverse impact on the significance of the station.

New canopies along platforms

The Proposal includes new canopies along the platforms and at the boarding assistance zones for weather protection. The canopies have been designed in accordance with the *Canopies and Shelters: Design Guide for Heritage Stations* (Sydney Trains, 2016). The proposed canopies are steel framed with metal sheet roofing. The materials and finishes would be designed to complement the existing station buildings and canopies.

The canopy shape on Platform 2/3 would follow the shape of the Platform 2/3 building and associated canopies, thereby attempting to minimise the visual impact of the Proposal. The canopies on Platform 4 and the southern end of Platform 1 would match the shape of the 2004-built canopy on Platform 1. The intention of this replication is to minimise the visual impact of the Proposal and maintain the symmetry to the shape of the station. The new canopies would end approximately 4.4 metres away from the standard platform buildings and would be connected to the platform buildings by 4.4 metre glazed canopy bays which would provide daylight and lighten the effect of the canopy roof.

The additional canopies would have a moderate adverse impact. They would add bulk at platform level. Those canopies to the north of the station buildings would impede the view of the station buildings from the footbridge. Those canopies between the station buildings and the proposed footbridge and lifts would combine with the proposed footbridge would add bulk to the station, thereby detracting from the station's context.

Upgraded utilities and tactiles

The Proposal includes improvements to customer information and communication systems, including PA system modifications, new hearing induction loops within the station platforms, and new Opal card readers at the southern entrance. The proposed work would involve mounting new equipment and wiring on the station buildings and other infrastructure. So long as the proposed work are performed carefully and do not require the removal of significant fabric from items contributing to the heritage significance of the station, including the Platform buildings and Platforms 2/3 and 4, then the Proposal would have a minor adverse impact.

The Proposal also includes upgrade work, including localised regrading along the platform, replacement of TGSIs and the installation of new directional TGSIs. The work would involve only superficial work on the surface of the Platforms, without significantly affecting the platform fabric. As such, the work would have little to no impact.

Landscaping work at southern entrance

The Proposal includes landscaping work at the southern station entrance and the Bridge Street reserve, and adjustments to wayfinding signage. The proposed work would not affect the context or fabric of Erskineville Station, and are assessed as having little to no impact.

Station building modifications

Platform 2/3 building

The Proposal would include a new family accessible toilet, female ambulant toilet and male ambulant toilet within the Platform 2/3 building. The proposed work would improve the inclusivity and accessibility of the train network via Erskineville Station. The modifications include removal of the seating bench in the female waiting room, partitions between the female waiting room and female toilet, partitions between female toilet stalls, a female toilet, the floors

in the female waiting room and female toilets, a door to a male toilet stall, and a male toilet. The level of the floor would be lowered to provide level access from the platform. The existing fireplace would be preserved, but boarded up behind a new wall.

The space would be reorganised into a family accessible toilet in the northern space accessible from the Platform 3 side of the building (the existing door would be retained) and a female ambulant toilet in the southern side of the space accessible from the Platform 2 side of the building (the existing door would be retained). This would require construction of a new partition between the two sides, as well as toilets, internal stall doors, and a new sink in the family accessible toilet.

Additionally, the floor level would be lowered and a new concrete floor slab on ground would be constructed with all new associated plumbing and building services work and penetrations, as required to suit the new toilet layout. The architectural plans indicate that the proposed floor would be tiled to match the existing heritage tile scheme. These modifications would have a substantial, direct impact on the original spaces and the removal of some original fabric. Likewise, the reconfiguration of the female waiting room and female toilets to accommodate the family accessible toilet and new women's room layout necessitate changing the original layout of the Platform 2/3 building. Consequently, the proposed construction of a new family accessible toilet, female ambulant toilet, and male ambulant toilet in Platform 2/3 building would have a moderate adverse impact on the Platform 2/3 building.

The Proposal also includes the installation of a new glass canopy extending from the existing Platform 2/3 building to the proposed platform canopies. This building canopy would be constructed from a steel structure with a glazed canopy. The transparent nature of the glass building canopy would offset the bulk of the proposed platform canopies, thereby keeping the Platform 2/3 building visually separate from the proposed platform canopies when viewed from the platform level. In this way, these glass building canopies would be a mitigating element that would somewhat mitigate the bulk of the proposed platform canopies. So long as the glass building canopy would not affect the fabric of the Platform 2/3 building, it would have little to no impact on the significance of the Platform 2/3 building and would mitigate some of the potential impact of the proposed platform canopies.

Platform 1 building

The Proposal includes modifications to the existing family accessible toilet on Platform 1 including changes to the door and internal fixtures for improved accessibility. The work would involve changing the door to the family accessible toilet to be more accessible. The modifications to the fixtures and door would have a negligible impact on the original fabric, as it would only affect non-original, modified fabric.

The new door should be sympathetic to the other doors on the building in style, namely being a four panelled timber door, and the fabric around the door including the moulding and six-paned fanlights should not be affected by the new door installation. If this is the case, then the proposed work would affect the fabric of the Platform 1 building in a minor, reversible way, and as such, would have a minor adverse impact.

Interchange facilities

Bridge Street reserve work

One new kiss and ride area and one new accessible parking space would be located at the northern terminus on Bridge Street, which would provide an accessible path of travel to the northern station entrance. There would also be localised regrading of footpaths from the accessible parking spaces to the station entrance. The work would require modifications to the Bridge Street reserve, though the arrangement at Bridge Street Reserve is still under review. Given that the work would take place outside the curtilage of Erskineville Station, and the

views of the station would be unaffected, the proposed work would have little to no impact on Erskineville Station.

Proposed southern station entrance on Bridge Street

A new kiss and ride area with capacity for two vehicles on Bridge Street would be provided at the new southern station entrance. Work may include kerb / footpath adjustments, new signage and line marking modifications. Four bicycle hoops for bicycle parking would also be built within the new southern station entrance, and there would be localised regrading of footpaths from the kiss and ride areas to the station entrance. The proposed bicycle hoops, kiss and ride area, and regraded footpaths would have no visual impact on the station nor would they impact on any of the fabric of the station, and thus would have little to no impact on the station.

Ancillary work

Regrading and resurfacing of localised areas on the platforms would be undertaken to provide accessible paths of travel between the lifts, boarding assistance zones, family accessible toilets, ambulant toilets and other facilities on the platforms. Other areas of the platform that would be impacted by construction activities would also be resurfaced. The impact of regrading and resurfacing of the platform would be negligible, with no impact to significant fabric. Where regrading and resurfacing is required near the station building, the new surface would be abutting the station building and not directly impact the fabric. Regrading and resurfacing the platform would have little to no impact on the significance of the platform as a component of the station, the station building, or the broader significance of the station.

A series of minor work, including the construction of new stormwater drainage connections from the proposed canopies to the existing stormwater system, adjustments to the station furniture including rubbish bins, new wayfinding signage and other station signage, and adjustments to rail corridor boundary and fencing would be undertaken as part of the station upgrade. None of the proposed work would have a significant effect on the fabric of the station. So long as the new station furniture, rubbish bins, and signage are sympathetic in design to the existing station, they would have no impact on the context of the station. As such, the proposed work would have little to no impact.

Protection for services and utilities, adjustments and/or relocations to accommodate the proposed work including lighting and communications systems (CCTV), stormwater drainage, overhead wiring, and other utilities would be undertaken during the proposed work. The work may involve moving utilities from and adding to the station buildings and, thus, would affect the fabric of the buildings in minor, superficial way. If the utilities are to be moved from and added to elements of the station that do not contribute to its significance such as overhead electricity lines and light posts, then no significance fabric would be affected and the context would not be affected. The degree of impact cannot currently be assessed without information about the locations of those utilities to be moved. The degree of impact is to be assessed based on detailed design.

Upgrades to the station power supply would be required to cater for the new lifts, including adjustment to existing power supply connection points, new cable routes, new main switchboard and distribution boards, and earthing and bonding of electrical equipment and new or modified structures. The proposed work would involve rewiring and connecting new cable routes to the existing power supply. The work has the potential to impact the fabric of the platforms and the station buildings, however their impact cannot currently be assessed. The degree of impact is to be assessed based on detailed design.

Additionally, temporary work may be required during construction in order to maintain existing pedestrian access to the station. The details of the temporary work would be developed by the appointed Contractor, and would be assessed based during the detailed design phase.

Impact to items in the vicinity of Erskineville Station

The Proposal would not be visible from the Eveleigh Railway Workshops. The new footbridge and southern station entrance would be visible from the Malcom Estate conservation Area and the new lift on the significant northern footbridge would be visible from the interface of the Burren Estate Conservation Area and Toogood and White's Estate Conservation Area. None of the proposed work would impact views of Erskineville Station from any of the other listed heritage items.

The modifications of the Bridge Street Reserve to enable new accessible parking space and the new kiss and ride area would occur within the curtilage of the Malcom Estate conservation area. The proposed work would not affect any of the Victorian or Federation era residences, nor would it affect the Victorian subdivision pattern. However, the Proposal includes the removal of some tree cover and the introduction of new visual elements of the station that would be visible from the street. Consequently, this visual and landscaping aspect of the Proposal would impact the setting and character of the Malcom Estate conservation area.

As such the Proposal would have a minor adverse impact on the significance of the items in the vicinity of Erskineville Station.

Overall impact

Overall, the Proposal demonstrates compliance with the existing controls and objectives regarding heritage conservation and will have an acceptable heritage impact subject to the recommendations of the SOHI.

While the Proposal would impact the heritage significance of the station, the impact of the Proposal can be mitigated to a degree through detailed design. Given the need for improved accessibility, the Proposal is considered necessary and its heritage impact is acceptable. The siting and use of materials are considered appropriate.

b) Operational phase

The operation of the Proposal would not substantially impact non-Aboriginal or archaeological heritage.

6.5.3 Mitigation measures

A number of mitigation measures are proposed to minimise the heritage impact of the Proposal on the Erskineville Railway Station Group, including:

- a suitably qualified heritage architect would be engaged from the detailed design phase through to construction to ensure compliance with the relevant heritage approvals, and to further minimise the impact of the Proposal through the use of appropriate form, proportion and materials.
- the detailed design would be developed in consultation with a heritage architect and would aim to further minimise the impact of the Proposal. While the impact of the Proposal is mitigated to a degree through the considered siting, it should be further minimised through the use of appropriate form, proportion and materials. In particular, the detailed design would take into consideration the following:
    - every effort should be made to reduce the bulk of the proposed southern footbridge, stairways, and new lifts, so as to minimise their detraction from the context of the views and context of the significant elements of the station. The use of transparent or mesh anti-throw screens would reduce the visual bulk of the footbridge and stairways. These new elements should be constructed of materials that are sympathetic to the heritage values of the station – the use of steel frames for the footbridge and lifts responds to the character of the station

and reflects the typical design of railway footbridges. This principle should be used for all proposed elements to the station

- the colour scheme of the proposed southern footbridge, stairways, and lifts should reflect, as closely as possible, that of the northern footbridge and stairways, so as to be more sympathetic to the character of the station
- the bulk of, and the roof form of the northern Platform 1 lift (abutting the northern footbridge) should be designed to be sympathetic and subordinate to the visual character of the footbridge and overhead booking office
- avoid fixing elements to the significant northern footbridge or the heritage platform buildings. New canopies and structures should be independently supported to minimise direct and potential indirect impacts to these elements. Interface of new structures with old, including joints and columns, should attempt to reduce physical impact to heritage fabric as well as be structurally sympathetic and unobtrusive
- avoid any impacts to the overhead booking office structure or the significant northern footbridge to maintain as much historic fabric as possible.
- where appropriate, the detailed design should also respond to existing and significant architectural detail, such as the architectural detailing of the station buildings and the northern footbridge
- ensure canopy and canopy structural members are minimal in the size and are of a sympathetic design and materiality to the significant northern footbridge and platform buildings
- new canopies should follow the rake of early/original awnings where in proximity to the platform building
- canopies should be designed in accordance with the Sydney Trains *Canopies and Shelters Design Guide for Heritage Stations* (2016)
- canopy column placement to be rationalised in front of heritage structures to reduce visual impact. In particular, columns nearby the platform buildings should be placed in front of solid walls, and avoid obscuring architectural features such as windows and doors
- aim to impact the original fabric of the Platform 2/3 building as little as possible during the construction of the new family accessible toilet and refurbished female toilets. Aim to ensure that all changes made to the layout of the platform building are reversible in nature, and impact on the original fabric of the building and furnishings as little as possible. Ensure the interior of the new family accessible toilet and the refurbished female toilets are sympathetic to the historical character of the building. This can be accomplished by tiling the rooms to match the existing heritage tile scheme and retaining the historical ceiling and wall vents intact
- all signage and additions to existing infrastructure of heritage significance (such as platform buildings and on the platforms) should reflect the colour scheme of the nearby elements of heritage significance (e.g., customer information signage, any new station furniture including rubbish bins, fencing, stormwater drainage connections between canopies and stormwater system, etc.) or camouflage into the elements (e.g., CCTV cameras, loudspeakers, wiring, etc.)
- the design of seating and other amenities should be in line with heritage kit of parts at heritage listed sites, where relevant.

- where appropriate, the detailed design would also respond to existing and significant architectural detail and the canopies would be designed in accordance with the Sydney Trains *Canopies and Shelters Design Guide for Heritage Stations* (2016)
- prior to the commencement of work, contractors would be briefed as to the sensitive nature of the Proposal area and informed of any recommended mitigation measures or controls required
- non-Aboriginal heritage awareness training would be provided for all contractors and personnel prior to commencement of construction to outline the identification of potential heritage items and associated procedures to be implemented in the event of the discovery of non-Aboriginal heritage materials, features or deposits (that is, unexpected finds), or the discovery of human remains
- fabric demolished for the lift landings and footbridge pylons such as from the historic platforms, would be retained and reused where appropriate and practicable
- measures, as determined in consultation with a suitably qualified heritage architect, would be put in place to protect significant fabric on the platform during the proposed regrading and resurfacing. The platform surface would be reinstated on completion
- measures, as determined in consultation with a suitably qualified heritage architect, would be put in place to protect significant fabric of the station building during the proposed internal fit outs of the new toilets, door replacements, and the addition of any utilities (electricity, CCTV, loudspeakers, etc.). Where required, care would be taken when fixing required infrastructure to the exterior of the station building or awning
- measures, as determined in consultation with a suitably qualified heritage architect, would be put in place to protect significant fabric of the historic footbridge, platforms, and station buildings from accidental impact during construction including the installation of the historic footbridge extension, installation of the proposed footbridge and lifts, and canopies
- the assessment of archaeological potential has been limited to the Proposal area. Further assessment of the potential archaeological impacts would be required if ground disturbing work is proposed for any areas outside these locations, including at the potential lay down site within the rail corridor
- new services would be installed in accordance with the Sydney Trains Heritage Technical Note: *Installation of New Electrical and Data Services at Heritage Sites* (2017). The exact location of services is not yet confirmed. Installation of services would be planned in consultation with an appropriate specialist such as a heritage architect or archaeologist and aim to minimise impact to significant fabric. Where practicable, services would be installed within the existing conduit to minimise the cumulative impact to significant fabric
- a photographic archival record of Erskineville Station would be prepared prior to, and at the completion of construction, in accordance with NSW Heritage Office (former) publication H*ow to prepare archival records of heritage items* and *Photographic Recording of Heritage Items using Film or Digital Capture*. Copies of the archival record would be provided to Heritage NSW, Sydney Trains Heritage and the local library.
- a heritage interpretation plan would be prepared for Erskineville Railway Station in accordance with NSW Heritage Office (former) publication *Interpreting Heritage*

Places and Items and the Sydney Trains *Heritage Interpretation Guideline*. This would be incorporated into the station entrance off of Swanson Street

- in the event that unexpected archaeological resources are identified in the course of the Proposal, all work in the affected area would cease, the area cordoned off, and Heritage NSW notified, in accordance with Section 146 of the *Heritage Act 1977*
- the addition of components such as seating, lighting and signage must be consistent with the Sydney Trains and NSW TrainLink *Station Component Guide* (2017) and to the existing seating, lighting and signage at the station
- if the proposed work, or Proposal area, is modified to those discussed in the Statement of Heritage Impact (RPS, 2021), additional heritage advice would be required to appropriately manage and mitigate any potential impacts caused by these changes.
- if the Proposal involves the alteration, disposal or demolition of heritage assets of State heritage significance (not listed on the State Heritage Register), the proposed work would be referred to the Heritage Council for comment in accordance with article 4.14 of the *State Agency Heritage Guide - Management of Heritage Assets by NSW Government Agencies*. As the work impact areas are previously identified as potentially being of state significance, Transport for NSW should consider whether referral to the Heritage Council is required.

Refer to Table 7.1 for a full list of proposed mitigation measures.

6.6 Socio-economic impacts

6.6.1 Existing environment

Land uses within the suburb of Erskineville generally comprise of low to high density residential developments, educational facilities, industrial estates, commercial / retail facilities and recreational public space. Other notable features around the station precinct include Erskineville Public School and the Eveleigh railway yard. The closest residential properties to the Proposal are within 20 metres, on George Street and Bridge Street. Erskineville Oval and Harry Noble Reserve are located approximately 150 metres to the east of the station.

A review of the Australian Bureau of Statistics 2016 Census data indicates the suburb of Erskineville has a population of 8,014 people, with a median age of 34 years. Of the employed persons at Erskineville, 46 per cent use public transport as at least one of their methods to travel to work, 33.4 per cent being via train. People aged 65 years or over made up approximately 4.9 per cent of the population. There is potential that the Erskineville Station also services customers within neighbouring suburbs including St Peters, Newtown. Marrickville, and Alexandria.

Sustainable Sydney 2030 and the *City Plan 2036* have identified key challenges for the City of Sydney LGA, including ensuring there is sufficient provision of public transport, walking and cycling infrastructure to support the current and predicted population growth, ensuring public transport is efficient, accessible and encourages increased use. These challenges have been noted as key priority issues as the population within the Sydney LGA continues to grow and the road and existing public transport network is becoming increasingly congested. The strategic plans outline objectives to address key issues and include strategic directions for integrated transport, infrastructure and liveability, and identifies an accessible and connected public transport network as a key planning priority (City of Sydney, 2017 and 2020).

The Proposal would be designed so that people of all ages and abilities can participate in community life by increasing access to public transport, contributing to positive liveability,

productivity and sustainability outcomes. The Proposal would also support a more efficient public transport network, which would encourage the greater use of existing public transport, walking and cycling infrastructure within the Erskineville precinct.

According to the Transport for NSW Transport Performance and Analytics data, the AM peak hour demand at Erskineville Station in 2017 was 822 passengers and is forecast to increase to 1,079 passengers by 2036. The Proposal has been designed to accommodate the forecast Sydney Trains patronage growth and changing travel patterns, including an ageing population. Erskineville Station has a number of existing facilities for customers including ticket machines, Opal card readers, unisex toilets (non-accessible). Other transport facilities are discussed in Section 6.1.

6.6.2 Potential impacts

a) Construction phase

The construction phase of the Proposal has the potential to impact station customers, pedestrians, adjacent residents, school students, commercial facilities and motorists due to:

- pedestrian and traffic changes associated with the partial road closures and footbridge closures
- minor increase in traffic including truck movements delivering site materials, plant and equipment
- temporary parking loss
- temporary closure and / or relocation of toilet facilities at the station
- construction noise, vibration, dust and visual impacts.

b) Operational phase

It is anticipated that the Proposal would result in the following benefits to Erskineville and the wider area including:

- improved and equitable access to Erskineville Station for customers resulting from the installation of lifts and accessible parking
- improved customer amenity and facilities at the station including a family accessible toilet, ambulant toilet, CCTV, improved wayfinding and new lighting
- improved safety and upgrade of the footbridge by improving its condition
- potential increased use of public transport to and from Erskineville.

6.6.3 Mitigation measures

A number of environmental safeguards would be implemented to minimise potential impacts on the community including:

- mitigation measures in respect of potential impacts to amenity (e.g. noise, dust and visual) as assessed in the relevant sections of this report and listed in Section 7.2 of this report
- development of a Community Liaison Management Plan (to be developed by the Construction Contractor prior to construction) which would identify potential stakeholders and the best-practice methods for consultation. The Plan would identify tools to effectively communicate with each stakeholder group during construction and encourage feedback and facilitate opportunities for the community and stakeholders to have input into the project, where possible

- informing the community of construction progress, activities and impacts in accordance with the Community Liaison Management Plan
- providing contact details for a 24-hour construction response line, Project Infoline and email address provided for ongoing stakeholder contact throughout the construction phase.

Refer to Table 7.1 for a full list of proposed mitigation measures.

6.7 Biodiversity

A Flora and Fauna Assessment Report (RPS, 2021c) and Arboricultural Impact Assessment Report (Allied Tree Consultancy, 2021) were prepared for the Proposal. This included a site inspection by a qualified ecologist on 21 October and 5 November 2020, and an arborist on 29 October 2020 and 31 January 2021, along with a review of relevant databases, spatial datasets, and other ecological resources including:

- local vegetation mapping to identify plant community types (PCT) that may occur
- Mitchell Landscapes (NPWS 2003)
- IBRA Region and subregion mapping (IBRA7).
- notional output from the BAM Credit Calculator using identified PCTs
- fauna and flora records contained in the Biodiversity Conservation Division (BCD) BioNet wildlife atlas (BCD 2020a) (accessed December 2020)
- fauna and flora records contained in the Department of the Environment and Energy (DoEE) Protected Matters Search tool (DoEE 2020) (accessed December 2020)
- habitat descriptions as provided by the online Threatened Species Profile Database (TSPD) (BCD 2020b) (accessed August 2020).

6.7.1 Existing environment

Erskineville Station is located within an urban area which has been modified over a long period of time. Due to the long history of rail land use and site management, existing vegetation within the Proposal area consists of native and exotic plant species resulting from the suburbs colonial heritage.

Some native species have been identified within the landscaped environment, though these have been planted and are predominantly not locally native to the wider natural environment. Native species observed within the Proposal area are listed below:

- Crimson Bottlebrush *(Melaleuca citrinus)*
- Weeping Red Bottlebrush *(Callistemon viminalis)*
- Port Jackson Willow *(Acacia saligna)*
- Bangalay *(Eucalyptus botryoides)*
- Port Jackson Fig *(Ficus rubiginosa)*
- Wollongong Woollybutt *(Eucalyptus saligna x botryoides).*

Most of the Proposal area is dominated by exotic species, introduced as part of historical landscaping or through unassisted processes. Some native groundcover was observed within the rail corridor and included species such as Foxtail (*Cenchrus purpurascens*), Wild Oats

(*Avena sativa*), Prairie Grass (*Bromus catharticus*), Fireweed (*Senecio madagascariensis*) and Fennel (*Foeniculum vulgare*).

Figure 6.16 and Figure 6.17 provide a visual appreciation for the condition of the native and exotic groundcover and midstory layers with the rail corridor and the Proposal area.

Figure 6.16 Example of water plant vegetation within the Proposal area

Figure 6.17 Example of exotic vegetation within the Proposal area

A search using the EPBC Act protected matters search tool with a one kilometre radius of the Proposal area was undertaken on the 18 December 2020. The search identified 27 listed Threatened Ecological Communities, 101 threatened fauna species and 52 threatened flora species that may occur in the Proposal area. The Flora and Fauna Assessment (RPS, 2021c) confirmed there are no threatened ecological communities, threatened flora or threatened fauna species observed within the Proposal area.

Analysis of data obtained from the Proposal area as part of the Flora and Fauna Assessment confirms the absence of native vegetation cover forming part of a recognised PCT listed in the NSW BioNet Vegetation Information System (Biodiversity Conservation Division, 2019). Vegetation observed is consistent with regional vegetation mapping (i.e. urban Exotic / Native).

A total of five fauna species were identified during opportunistic surveys of the Proposal area. These include:

- Sulphur Crested Cockatoo *(Cacatua galerita)*.
- Rainbow Lorikeet *(Trichoglossus moluccanus)*
- Noisy Miner *(Manorina melanocephala)*
- Welcome Swallow *(Hirundo neoxena)*
- Common Myna *(Sturnus tristis)*

These species are commonly found in the urban environment and none are listed as either threatened or migratory species. No frog species were heard or spotlighted during the survey.

A closed depression with standing water and Cumbungi (*Typha orientalis*), with the potential to support frog and wetland bird species such as the locally occurring threatened Green and Gold Bell Frog (*Litoria aurea*) was identified in the Proposal area. Threatened wetlands bird species would be likely to transit through this habitat and opportunistically use this habitat for feeding purposes. No other important habitat features such as hollow-bearing trees, fallen logs or termite mounds were observed.

Noxious weeds identified within the Proposal area include Crofton Weed *(Ageratina adenophora)*, Pampas Grass *(Cortaderia selloana)*, and Fireweed (*Senecio madagascariensis*).

6.7.2 Potential impacts

a) Construction phase

Direct impacts

The Proposal would require the removal of approximately nine trees to facilitate the construction of the proposed footbridge, lifts and other accessibility upgrades at the station. A further six trees may also require removal as they are subject to a major encroachment at the western end of the proposed footbridge and also on Bridge Street (i.e. the infrastructure design is in excess of 10 per cent of the tree protection zone). Opportunities for retention of trees would be explored through detailed design, and trees nominated for retention would require targeted tree management and monitoring during and at the completion of construction. Vegetation offsetting would also be required to mitigate direct impacts from construction activities.

A summary of these trees has been assessed in the Aboricultural Impact Assessment (Allied Tree Consultancy, 2021) for the Proposal, and their approximate location is shown in Figure 6.18. In summary:

- tree numbered 10 south-west of the station would require removal to facilitate the construction of the proposed footbridge and lifts at Platform 1
- trees numbered 22, 23, 24, 25, 27 and 33 south-east of the station would require removal to facilitate the construction of the proposed new footbridge, lifts and station entrance on Bridge Street

- trees numbered 34 and 35 east of the station would require removal to facilitate the construction of the proposed new kiss and ride area at the northern terminus of Bridge Street cul-de-sac
- trees numbered 8, 9 and 11 south-west of the station may require removal due to major encroachment, which is required to facilitate the construction of the proposed footbridge and lifts at Platform 1. There is potential for the retention of these trees based on detailed design and construction methodologies selected by the Contractor.
- trees numbered 28, 29 and 30 east of the station may require removal due to major encroachment, which is required to facilitate the installation of the new kiss and ride area and accessible parking space at the Bridge Street cul-de-sac. There is potential for the retention of these trees based on detailed design and construction methodologies selected by the Contractor.

The removal of these trees is not considered to have an impact on the overall ecological values of the area as it would not result in the loss of a naturally occurring plant community type. Trees identified with potential for removal are described in Table 6.14

Table 6.14 Tree removal for the Proposal (Allied Tree Consultancy, 2021)

Tree number*	Species	Description
8, 10, and 11	*Callistemon viminalis* Weeping Red Bottlebrush	Four to five metre high planted trees located west of Platform 1. These trees are a native species however are not indigenous to the Proposal area. They form part of a linear screen planting composed of predominantly large shrub species that are at a sufficient height to be included as trees for this assessment. Trees numbered 8 and 11 are subject to a major encroachment and may require removal. Tree numbered 10 is in direct conflict with the design of the proposed footbridge at Platform 1 and would require removal.
9	*Melaleuca citrinus* Crimson Bottlebrush	A three metre high planted tree located west of Platform 1. This tree is a native species however is not indigenous to the Proposal area. This tree forms part of a linear screen planting composed of predominantly large shrub species that are at a sufficient height to be included as a tree for the assessment. This tree is subject to a major encroachment require removal.
22	*Eucalyptus punctata* Grey Gum	A 12 metre high tree located east of Platform 4. This tree has been subject to excessive pruning, partly for powerline clearance. Wounds and fungus and epicormic growth has been observed on the tree, indicating poor form with limited viability for retention.

		This tree is in direct conflict with the design of the proposed footbridge and lift and would require removal.
23	*Eucalyptus sp.*	A six metre high tree located east of Platform 4. A young tree, though it is unknown whether the tree is a recent planting or has been subject to extensive cutting. This tree is in direct conflict with the design of the proposed footbridge and lift at Platform 4 and would require removal.
24	*Celtis sp.* Hackberry	A five metre high tree located east of Platform 4, observed to be a self-sown weed. This tree provides poor form and does not provide sufficient significance to retain and design around. This tree is in direct conflict with the design of the proposed footbridge, canopies and stairs on Platform 4 and would require removal.
25	*Lophostemon confertus* Brush Box	A seven metre high tree located east of Platform 4 along Bridge Street. This tree is a native species and forms part of street planting. It is not indigenous to the Proposal area. This tree is in direct conflict with the design of the proposed new station entrance, footbridge and lifts on Bridge Street and would require removal.
27	*Elaeocarpus reticulatus* Blue-berry Ash	A two metre high tree located east of Platform 4 along Bridge Street. This tree is a native species and forms part of street planting. It may align with predicted pre-European plant community types. This tree is in direct conflict with the design of the proposed new station entrance, footbridge and lifts on Bridge Street and would require removal.
28, 29 and 30	*Elaeocarpus reticulatus* Blue-berry Ash	Five to six metre high trees located within an island garden bed at the northern end of Bridge Street. Dieback of the crown structure was observed. These trees have been planted and may align with predicted pre-European plant community types. All trees are subject to a major encroachment and may require removal.
33	*Lophostemon confertus* Brush Box	A seven metre high street-tree planting located on the edge of the kerb along Bridge Street. Some crown lifting has occurred to the western side of the tree to accommodate parking. This tree is in direct conflict with the design of the proposed new kiss and ride areas on Bridge Street adjacent to the new station entrance and would require removal.

34	*Pistacia chinensis* Chinese Pistachio	A three metre high street-tree planting located adjacent to island garden bed at the northern end of Bridge Street. This tree is in direct conflict with the design of the new kiss and ride area and accessible parking space at the Bridge Street cul-de-sac and would require removal
35	*Tristaniopsis laurina* Water Gum	A four metre high street-tree planting located adjacent to the island garden bed at the northern end of Bridge Street. Pruning for powerline clearance has distorted the crown mass. This tree is in direct conflict with the design of the new kiss and ride area and accessible parking space at the Bridge Street cul-de-sac and would require removal.

**Tree numbers are derived from the Arboricultural Impact Assessment and presented in Figure 6.18 of this REF.*

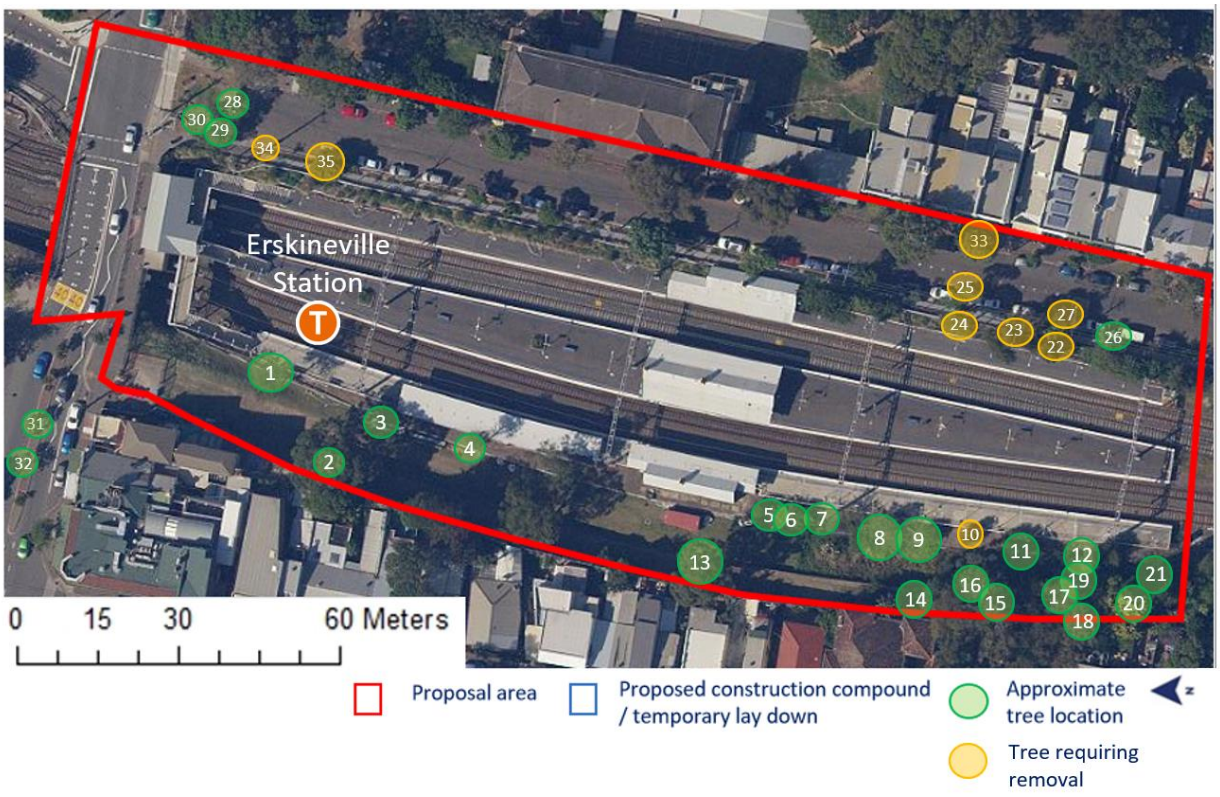

Figure 6.18 Trees requiring removal to be confirmed during detailed design

Indirect impacts

The most likely indirect impact arising from the Proposal is the introduction, establishment and spread of weeds within the Proposal area and to adjoining areas of vegetation. Weed establishment and spread generally results from soil disturbance and excavation as well as use of equipment that may carry weed propagules.

Mitigation measures to be implemented during the construction and operational phases of the Proposal are recommended to manage and control the incidence and effect of noxious and environmental weeds on the receiving environment. There is potential for high threat weeds

observed within and adjacent to the Proposal to benefit from construction work that involves disturbance. Therefore, the management of these species would be a means of minimising any indirect impacts on the adjoining environment.

Additionally, the removal of vegetation, including both trees and grasses has the potential to increase the risk of sediment laden stormwater run-off from the Proposal area into the stormwater network. Mitigation measures outlined in Section 6.8.3 to manage potential soil and water impacts from the proposed work would minimise indirect impacts related to run-off.

Fauna habitat

The area impacted by the Proposal has limited habitat of value to native flora and fauna. No other important fauna habitat features such as hollow-bearing trees, fallen logs or termite mounds were observed.

Vehicle, plant and construction equipment would temporarily increase noise pollution within the Proposal area. This can cause disruption to normal fauna activity and lead to the departure of species from an area during construction.

Key Threatening Processes

Key Threatening Processes are listed under Schedule 4 of the BC Act and EPBC Act. There are no relevant Key Threatening Processes that have the potential to affect biodiversity values within the Proposal area. The proposed vegetation removal is not of a scale to cause significant impacts.

b) Operational phase

No operational impacts to biodiversity are anticipated from the Proposal.

6.7.3 Mitigation measures

A number of additional environmental safeguards would be implemented to minimise potential impacts to biodiversity:

- a project arborist would be appointed following the confirmation of design for the preparation of the Aboricultural Method Statement, which would outline the specific mitigation measures required for the removal and protection of trees and tree protection zones (TPZ) during site establishment, construction activities and demobilisation of work areas for the Proposal. The project arborist would also attend site prior to construction works to confirm which trees are to be removed and retained and respective protection measures applied
- protection of the trees nominated for retention would be undertaken in line with AS 4970-2009 *Protection of Trees on Development Sites*, and the Arboricultural Impact Assessment (Allied Tree Consultancy, 2021)
- work within proximity to existing native trees would consider the TPZ, which is calculated as a circular area with a radius 12 x the diameter at breast height of the tree in line with AS 4970-2009 *Protection of Trees on Development Sites*. Any ground disturbance within this area (i.e. for sub-surface utilities and regrading) would require an arborist to undertake further assessment before proceeding
- a fauna spotter catcher would be present during the felling of the trees, with any native animals recovered from the trees to be released in suitable nearby alternate habitat
- all fuels, chemicals and other hazardous materials would be stored in a roofed, fire-protected and impervious bunded area at least 50 metres from waterways, drainage lines, basins, flood-affected areas or slopes above 10 per cent

- bunding design would comply with relevant Australian Standards, and would generally be in accordance with guidelines provided in the EPA Authorised Officers Manual
- the nine native trees nominated for potential removal would be offset with 36 trees as per the requirements of Transport for NSW Vegetation Offset Guide DMS-SD-087. It is recommended that these are planted within the Proposal area and would be incorporated into the landscape design. This would consist of locally native species such as Blueberry Ash (*Elaeocarpus reticulatus*).
- any additional tree removal required would be assessed and offset in accordance with Transport for NSW policies and procedures.

Refer to Table 7.1 for a full list of proposed mitigation measures.

6.8 Contamination, landform, geology and soils

6.8.1 Existing environment

The Proposal is situated on the Cumberland Lowlands between the Georges and Parramatta Rivers. This lowland is typically underlain by Blacktown landscapes consisting of Ashfield Shale of the Wianamatta Group and featuring laminite and dark grey siltstone and Bringelly Shale which consists of shale, with occasional calcareous claystone, laminite and coal.

Erskineville Station is situated generally at street level with the northern section within a cutting. A review of the Atlas of Australian Soils (CSIRO) indicates that the soil profile in Erskineville consists of red and brown chromosols (red and brown Podzolic soils) and yellow chromosols (yellow Podzolic soils) which have a low-moderate erosion hazard.

A review of the NSW EPA Contaminated Land Register undertaken on the 17 December 2020 indicated that the Proposal area is not listed as a contaminated site, nor has the site been subject to any regulation under the *Contaminated Land Management Act 1997*.

A review of the DPIE's Acid Sulfate Soils (ASS) dataset indicated that the Proposal footprint is located within Class 5. The southern area of the station boundary, approximately 35 metres south of the platform edge, is located within Class 3 ASS, however there is no work proposed in this area. Therefore, there is a low probably of ASS occurrence.

The AS 4482.1-2005 - *Guide to the investigation and sampling of sites with potentially contaminated soil - Non-volatile and semi-volatile compounds* lists the chemicals used by specific industries. The standard lists the following chemicals that are commonly associated with railway yards:

- hydrocarbons
- arsenic
- phenolics
- heavy metals
- nitrates and ammonia.

As Erskineville Station has been in operation since 1884 and undergone upgrades in the 1900s, it is anticipated that possible contamination from fill materials may be present such as heavy metals and asbestos. Given the age of a number of elements at the station, there is also potential for asbestos materials and lead paint to be encountered within the existing building fabric.

6.8.2 Potential impacts

a) Construction phase

Excavation and other earthworks are described in more detail in Section 3.4.4. If such activities are not adequately managed they could result in the following impacts:

- erosion of exposed soil and any stockpiled materials
- dust generation from excavation and vehicle movements over exposed soil
- an increase in sediment loads entering the stormwater system and/or local runoff.

It is expected that erosion risks would be adequately managed through the implementation of standard measures as outlined in the *'Blue Book' - Managing Urban Stormwater: Soils and Construction* (Landcom, 2004).

Excavation also has the potential to expose contaminants, which if not appropriately managed, can present a health risk to construction workers and the community. The exposure of contaminants could also pose an environmental risk if they were to enter nearby waterways through the stormwater infrastructure.

The Proposal has the potential to disturb asbestos containing material and other hazardous substances (such as lead paint) from the proposed work to exiting station buildings.

There is also potential for construction activities to result in the contamination of soil through accidental fuel or chemical spills from construction plant and equipment.

b) Operational phase

There would be no operational risks to geology and soils as a result of the Proposal.

6.8.3 Mitigation measures

As part of the CEMP, a site-specific Erosion and Sediment Control Plan/s would be prepared and implemented in accordance with the '*Blue Book' - Managing Urban Stormwater: Soils and Construction* (Landcom, 2004). The Erosion and Sediment Control Plan would be established prior to the commencement of construction and be updated and managed throughout according to the activities occurring during construction.

An environmental risk assessment would be undertaken prior to construction and would include a section on contamination as per the Transport for NSW Standard Requirements. Measures to mitigate potential impacts from contaminated soil/materials would include an unexpected contamination finds procedure and Waste Management Plan, as part of the CEMP. All waste would be managed in accordance with relevant legislation.

Appropriate mitigation measures would be implemented to manage hazardous substances during demolition work. This would include the identification of hazardous materials from existing registers or identified during construction. Removal of hazardous materials from the structure will be completed by appropriately licensed asbestos/hazardous waste removalists and in accordance with relevant legislation and guidelines.

Refer to Table 7.1 for a full list of proposed mitigation measures.

6.9 Hydrology and water quality

6.9.1 Existing environment

The Proposal area is located approximately one kilometre north-west of the nearest watercourse and riparian land, Sheas Creek which flows into the Alexandra Canal.

General overland flow (including stormwater) is in a south-west direction from the station towards Alexandra Canal.

There are no areas at or immediately surrounding Erskineville Station that are designated as flood planning areas under the Sydney or Marrickville LEPs. The closest designated flood planning area is over one kilometre away.

Local catchments at and around the station are small, and mostly drain away from the station. As such, the Proposal area is unlikely to be impacted by mainstream flooding.

Preliminary geotechnical investigations as part of the proposed lift locations identified that the level of the groundwater is two metres below ground level.

6.9.2 Potential impacts

a) Construction phase

Without appropriate safeguards, pollutants (fuel, chemicals or wastewater from accidental spills, and sediment from excavations and stockpiles) could potentially reach nearby stormwater drains.

Activities which would disturb soil during construction work (such as vegetation removal and excavation) have the potential to impact upon local water quality due to erosion and sedimentation. There is also potential to contaminate local water quality and the stormwater network as a result of incidental spills or inadequate fuel and chemical storage practices.

In an extreme rainfall event, flooding may impact on construction activities. Moderate to heavy wet weather events may cause water flows through the Proposal area which could increase the potential for soil erosion and sedimentation impacts in the cutting and the rail corridor.

During excavation work (notably of the lift shafts), ground water might be present. Dewatering activities may also need to be undertaken and water discharged appropriately should rainwater be captured onsite during excavation work.

Mitigation measures have been identified below to minimise the potential for these impacts.

b) Operational phase

The Proposal would introduce new structures within the station and increase the amount of non-permeable surfaces, however these structures are consistent with the existing landscape of the station and it is anticipated that the Proposal would have little impact upon the hydrology of the surrounding area. This would be confirmed during the detailed design phase. Detailed design would consider stormwater management around new and existing structures to ensure the capacity of the drainage infrastructure can accommodate the additional non-permeable surfaces and potential surface water runoff volumes.

6.9.3 Mitigation measures

As noted in Section 6.8.3, Erosion and Sediment Control Plan/s would be prepared and implemented for the Proposal to manage risks to water quality. Other mitigation measures that would be required for construction include regular vehicle and equipment maintenance along with spill kits and spill response procedures.

Dewatering (if required) would be undertaken in accordance with the Transport for NSW *Water Discharge and Reuse Guideline* (TfNSW, 2019i).

Refer to Table 7.1 for a full list of proposed mitigation measures.

6.10 Air quality

6.10.1 Existing environment

Based on a review of the existing land uses surrounding the Proposal, the existing air quality is characteristic of an urban environment, with some transport emission influences. The Environment, Energy and Science Group of DPIE undertakes air quality monitoring across NSW. Earlwood is the closest monitoring site to the Proposal. A search of the daily regional air quality index for Earlwood on 21 December 2020 showed that the site experienced 'Good' air quality values.

Potentially affected receivers within the vicinity of the site include the following:

- local residents
- users of the adjacent commercial areas
- students, teachers, workers and visitors to Erskineville Public School
- pedestrians, cyclists, and commuters within the Erskineville Station and Erskineville shopping village precinct.

6.10.2 Potential impacts

a) Construction phase

During construction, air quality impacts would be associated with the generation of dust and emissions from the operation of stationary and moving on-site machinery and associated vehicular traffic. Particulate emissions would be associated with a number of stationary and mobile sources as well as minor potential for wind erosion of areas of exposed soil.

Anticipated sources of dust and dust generating activities include:

- loading and transfer of material from trucks
- trenching and excavation activities associated with lift installation, kerb modifications, services relocation etc
- construction activities associated with station building modifications and platform regrading.

The Proposal would have a minimal impact on air quality as it would not involve extensive excavation or other land disturbance with the potential to generate significant quantities of dust. Appropriate measures would be established to manage dust emissions from demolition work, particularly near adjacent residential and commercial receivers on Swanson Street, Bridge Street, and George Street.

The operation of plant, machinery and trucks may also lead to increases in exhaust emissions in the local area, however these impacts would be minor and short-term. The likely airborne dust load generated during a typical construction day would be small and therefore would be unlikely to result in reduced local air quality at the nearest potentially affected receivers, given the relatively small construction footprint, and with the implementation of proposed control measures.

b) Operational phase

The Proposal is not anticipated to significantly increase customer traffic to and from the station. However, over the long-term there is anticipated to be an increase in patronage at Erskineville Station. Increase in patronage at the station is not anticipated to significantly impact air quality in the station area.

Overall impacts of air quality during the operation of the Proposal are considered minimal as the Proposal would not result in a significant change in land use.

6.10.3 Mitigation measures

Table 7.1 provides a list of mitigation measures that are proposed to manage air quality issues during construction. They are aimed around maintaining and operating plant and equipment efficiently and implementing measures for dust suppression including watering exposed soil surfaces, covered loads and appropriate management of tracked dirt or mud on vehicles. Such measures would be included in the CEMP to be prepared for the Proposal.

6.11 Waste

During construction of the Proposal, the following waste materials would be generated:

- demolition waste (brick, concrete, steel, asphalt)
- excavated spoil
- building material wastes (including metals, timbers, plastics, packaging, fencing etc.)
- surplus building materials
- electrical wiring and conduit waste (from electrical connections and utility relocation)
- green waste (including weeds)
- general waste, including food scraps generated by construction workers.

Waste management would be undertaken in accordance with the *Waste Avoidance and Resource Recovery Act 2001* (WARR Act). A Waste Management Plan would be prepared to identify all potential waste streams associated with the work and outline methods of disposal of waste that cannot be reused or recycled at appropriately licensed facilities along with other onsite management practices such as keeping the area tidy and free of rubbish.

The handling, storage, transport and disposal of asbestos and hazardous waste (including any lead waste) would be in accordance with the requirements of relevant EPA and Safe Work NSW guidelines. Waste management targets in consideration of the Infrastructure Sustainability Rating Scheme – Version 1.2 (ISCA, 2018) would be developed for the Proposal and would include reuse and recycling.

The Proposal would not result in changes to operational waste management.

6.12 Sustainability

The design of the Proposal would be based on the principles of sustainability, including aiming for an excellent rating under the ISCA Infrastructure Sustainability Rating Tool Version 1.2 and the Transport for NSW Environmental Management System (EMS). These guidelines require a number of mandatory and discretionary initiatives to be applied. Refer to Section 3.3.3 for more information regarding the application of these guidelines.

Further positive impacts in relation to climate change and sustainability associated with the Proposal include encouraging a reduction in private vehicle use and increasing the accessibility of public transport services.

6.13 Climate change

The dynamic nature of our climate system indicates a need to focus attention on how to adapt to the changes in climate and understand the limitation of adaptation. The effects of climate on the Sydney region can be assessed in terms of weather changes, storm intensity, flooding and increased risk of fire.

A high-level climate change risk assessment was performed using the Transport for NSW *Climate Risk Assessment Guidelines* (TfNSW, 2017b), and relevant climate data and projections from Adapt NSW and the Bureau of Meteorology as part of the design development of the Proposal.

The climate projections for Metropolitan Sydney in 2030 include an increase in mean temperature of 0.9°C which is expected to rise 2.8°C by 2070. Projections also include an increase in the number of hot days with a maximum temperature of over 35°C and increased annual rainfall and rainfall extremes.

The risk assessment is based on the projected changes in the climate and the estimated design life of Proposal components to assess the likely consequences and likelihood of climate risks occurring. The risk assessment identified 31 potential climate change hazards and risk for the Proposal, and no high or extreme risks were identified. It concluded that:

- the Proposal is not situated on land mapped as bushfire prone. Given the predominantly urban environment of the Proposal area it is considered unlikely that increases in bushfires would impact the Proposal increased temperatures have the potential to compromise the structural integrating of surface and above ground materials. The use of heat resilient pavement design and materials, such as pre-cast concrete for the lift shafts, would reduce the likelihood of heat stress on infrastructure
- increased extreme heat days would continue to contribute to an increased urban heat island effect including overheating of benches, rest spots, footpath and streetscapes leading to an increase in the risk of heat stress on station customers. Existing shaded areas on the platforms and streetscapes would be retained and additional canopies would be installed to reduce the likelihood of heat stress on customers extreme rainfall and weather events have the potential to cause direct damage to aboveground structures. The use of precast concrete for the lift shafts would reduce the likelihood of storm-related damage
- extended periods of drought can decrease soil moisture resulting in ground shrinkage and damage to underground infrastructure, compromising serviceability. The design includes piling solution for lift shafts, footbridges and stairs to reduce the risk of impacted foundations
- increased drought periods would result in the death of landscaping, leading to increased maintenance and costs for landscape plant replacements, as well as habitat and amenity impacts. Low water demand plants would be selected for the Proposal and appropriate irrigation systems would be implemented to ensure better quality and consistent vegetation cover for landscaped areas
- the lift design would consider future temperature increases including insulation / glazing, cooling, and protections on electrical equipment
- the provision of a canopy along the platform to the platform buildings would shelter commuters from extreme heat and rainfall events.

6.14 Greenhouse gas emissions

An increase in greenhouse gas emissions, primarily carbon dioxide, would be expected during construction of the Proposal due to exhaust emissions from construction machinery and vehicles transporting materials and personnel to and from site.

The detailed design process would undertake a compliant carbon footprinting exercise in accordance with Transport for NSW's *Carbon Estimate and Reporting Tool Manual* (TfNSW, 2019c) or other approved modelling tools. The carbon footprint would to be used to inform decision making in design and construction. Greenhouse gas emissions would also be assessed in accordance with ISCA IS Rating Tool V1.2.

Due to the small scale of the Proposal and the short term temporary nature of the construction work the greenhouse gas emissions resulting from the construction of the Proposal would be minimal. Furthermore, greenhouse gas emissions generated during construction would be kept to a minimum through the implementation of the standard mitigation measures detailed in Table 7.1.

It is anticipated that, once operational, the Proposal may result in an increase in use of public transport and a relative decrease in use of private motor vehicles by commuters to travel to and from Erskineville. A modal shift in transport usage may reduce the amount of fuel consumed by private motor vehicles with a corresponding relative reduction in associated greenhouse gas emissions in the local area.

6.15 Cumulative impacts

Cumulative impacts occur when two or more projects are carried out concurrently and in close proximity to one another. The impacts may be caused by both construction and operational activities and can result in a greater impact to the surrounding area than would be expected if each project was undertaken in isolation. Multiple projects undertaken at a similar time/similar location may also lead to construction fatigue, particularly around noise, traffic and air quality impacts, if not appropriately managed.

A search of the Department of Planning and Environment's Major Projects Register, and Sydney and Regional Joint Regional Planning Panel Development and Planning Register, and City of Sydney Council Development Application Register on 19 December 2020 did not identify any major projects within 200m of the station.

During construction, the work would be coordinated with any other construction activities in the area. Consultation and liaison would occur with City of Sydney Council, Sydney Trains, and any other developers identified, to minimise cumulative construction impacts such as traffic and noise.

The upgrade of St Peters Station under the Transport Access Program and More Trains, More Services Program is anticipated to occur concurrently with the construction activities for the Proposal. During this time, there may be some disruption to customers on the T3 Bankstown Line, with work occurring at both St Peters and Erskineville stations. The construction of both station upgrades may result in more frequent construction vehicles passing through the Erskineville precinct to access the stations and station compound areas, however traffic associated with the construction work is not anticipated to have a significant impact on the surrounding road network and would be appropriately managed through the CTMP. Operational traffic and transport impacts would have a minimal impact on the performance of the surrounding road network.

Based on this assessment, it is anticipated that the cumulative impacts would be negligible, provided that consultation with relevant stakeholders and mitigation measures in Chapter 7 are implemented.

The potential cumulative impacts associated with the Proposal would be further considered as the design develops and as further information regarding the location and timing of potential developments is released. Environmental management measures would be developed and implemented as appropriate.

7 Environmental management

This chapter of the REF identifies how the environmental impacts of the Proposal would be managed through environmental management plans and mitigation measures. Section 7.2 lists the proposed mitigation measures for the Proposal to minimise the impacts of the Proposal identified in Chapter 6.

7.1 Environmental management plans

A CEMP for the construction phase of the Proposal would be prepared in accordance with the requirements of Transport for NSW's EMS. The CEMP would provide a centralised mechanism through which all potential environmental impacts relevant to the Proposal would be managed, and outline a framework of procedures and controls for managing environmental impacts during construction.

The CEMP would incorporate as a minimum all environmental mitigation measures identified below in Section 7.2, any conditions from licences or approvals required by legislation, and a process for demonstrating compliance with such mitigation measures and conditions.

7.2 Mitigation measures

Mitigation measures for the Proposal are listed below in Table 7.1. These proposed measures would minimise the potential adverse impacts of the Proposal identified in Chapter 6 should the Proposal proceed.

Table 7.1 Proposed mitigation measures

No.	Mitigation measure
	General
1.	A Construction Environmental Management Plan (CEMP) would be prepared by the Contractor in accordance with the relevant requirements of *Environmental Management Plan Guideline – Guideline for Infrastructure Projects,* NSW Department of Planning, Industry and Environment, 2020) for approval by Transport for NSW, prior to the commencement of construction and following any revisions made throughout construction.
2.	A project risk assessment including environmental aspects and impacts would be undertaken by the Contractor prior to the commencement of construction and documented as part of the CEMP.
3.	An Environmental Controls Map (ECM) would be developed by the Contractor in accordance with Transport for NSW's *Guide to Environmental Controls Map* (TfNSW, 2019d) for approval by Transport for NSW, prior to the commencement of construction and following any revisions made throughout construction.
4.	Prior to the commencement of construction, all contractors would be inducted on the key project environmental risks, procedures, mitigation measures and conditions of approval.
5.	Site inspections to monitor environmental compliance and performance would be undertaken during construction at appropriate intervals.
6.	Service relocation would be undertaken in consultation with the relevant authority. Contractors would mark existing services on the ECM to avoid direct impacts during construction.

No.	Mitigation measure
7.	Any modifications to the Proposal, if approved, would be subject to further assessment and approval by Transport for NSW. This assessment would need to demonstrate that any environmental impacts resulting from the modifications have been minimised.
8.	Further investigation into opportunities for provision of a DDA parking space would be undertaken in coordination with the development at 655 King Street St Peters and the Transport for NSW Sydney Gateway Project.
	Traffic and site access
9.	The design of the kiss and ride and accessible parking spaces at the northern terminus of Bridge Street would be further defined during detailed design to avoid vehicles swinging into the adjacent cycleway and school driveway.
10.	Any proposed rail corridor access points not assessed in this REF would require further traffic assessment to be undertaken.
11.	Prior to the commencement of construction, a Construction Traffic Management Plan (CTMP) would be prepared as part of the CEMP and would include at a minimum: • procedures for preparing and implementing TCPs which would provide details for signage and timing of any detours and traffic controls to manage temporary road disruptions and the delivery of large plant and materials • necessary ROL's and permits required for the passage of construction vehicles and required consultation with Council and other relevant authorities • identification of final construction traffic access routes, ancillary facilities, contractor parking and loading zones • nomination of access routes to and from the local road network and contractor parking • scheduling of work / deliveries to avoid peak times and limiting of work in the road carriageway as much as practicable to limit traffic and parking impacts and maintain customer access to the station • measures to: o limit temporary parking losses o maintain pedestrian cross corridor access along Swanson Street and customer access to the station through traffic and pedestrian diversions o maintain private property access unless otherwise agreed o identify changed traffic, cyclist and pedestrian conditions including details of construction signage including signposts and variable message signs, traffic controllers and other community notifications. Consultation with the relevant roads authorities, NSW Taxi Council and bus authorities would be undertaken during preparation of the construction TMP. The performance of all project traffic arrangements must be monitored during construction. The CTMP would also consider the suggested haulage routes and swept path assessments for accessing the construction compound and laydown areas as identified in the Traffic Transport and Access Impact Assessment (SLR, 2021a)
12.	Communication would be provided to the community and local residents to inform them of changes to parking, pedestrian access and/or traffic conditions including vehicle movements and anticipated effects on the local road network relating to site work.
13.	Road Occupancy Licences for temporary road closures would be obtained, where required.
	Urban Design Plan and Landscaping Plan

No.	Mitigation measure

14.	An Urban Design Plan and Landscaping Plan (UDLP) would be updated by the Contractor, and submitted to Transport for NSW for endorsement by the Precincts and Urban Design team, prior to finalisation of the detailed design. The Urban Design Plan and Landscaping Plan would be prepared by a registered Architect and/or Landscape Architect in consultation with Council and relevant stakeholders and would:
	• demonstrate a robust understanding of the site through a comprehensive site analysis to inform the design direction, demonstrate connectivity with street networks, transport modes, active transport options, and pedestrian distances
	• identify opportunities and challenges
	• establish site specific principles to guide and test design options
	• demonstrate how the preferred design option responds to the design principles established in 'Around the Tracks', including consideration of Crime Prevention through Environmental Design Principles
	• be prepared in accordance with the following guidelines:
	  ○ TAP Urban Design Plan, Guidelines, TfNSW, Draft 2018
	  ○ Commuter Car Parks, urban design guidelines, TfNSW, Interim 2017
	  ○ Managing Heritage Issues in Rail Projects Guidelines, TfNSW, Interim 2016
	  ○ Creativity Guidelines for Transport Systems, TfNSW, Interim 2016
	  ○ Water Sensitive Urban Design Guidelines for TfNSW Projects, 2016.
	The Urban Design Plan and Landscaping Plan is to include the Public Domain Plan for the chosen option and will provide analysis of the:
	• landscape design approach including design of pedestrian and bicycle pathways, street furniture, interchange facilities, new planting and opportunities for public art
	• materials schedule including materials and finishes for proposed built work, colour schemes, paving and lighting types for public domain, fencing and landscaping
	• an artist's impression or photomontage to communicate the proposed changes to the precinct.

15.	All permanent lighting would be designed and installed in accordance with the requirements of standards relevant to *AS 1158 Road Lighting* and *AS 4282 Controlling the Obtrusive Effects of Outdoor Lighting.*
16.	The detailed design of the Proposal would comply with Crime Prevention Through Environmental Design principles.
17.	The detailed design of the Proposal would include the implementation of materials and finishes to complement the existing platform buildings, infrastructure and existing landscape character of the local area, including but not limited to; • the use of materials such as steel to complement the existing infrastructure and mitigate the visual impact on adjacent visual receptors • extensions of the canopies to complement the existing walkways and platform buildings • the use of translucent/lightweight materials, such as glass, to allow the design to complement the building mass and mitigate the visual impact of the design.
18.	The privacy of the Bridge Street residents would be considered when choosing materials and their placement for the new footbridge and stairs.
19.	Mature trees and vegetation along the boundary of the rail corridor would be retained where possible to maintain screening to new and existing railway infrastructure.

No.	Mitigation measure
20.	Additional vegetation would be planted as screening between residents on George Street and the Proposal to mitigate the ongoing visual impact of the Proposal following demobilisation of the construction compound.
21.	Worksite compounds would be screened with shade cloth (or similar material, where necessary) to minimise visual impacts from key viewing locations.
22.	Temporary hoardings, barriers, traffic management and signage would be removed when no longer required.
23.	During construction, graffiti would be removed in accordance with Transport for NSW's Standard Requirements.
24.	Light spill from the construction area into adjacent visually sensitive properties would be minimised by directing construction lighting into the construction areas and ensuring the site is not over-lit. This includes the sensitive placement and specification of lighting to minimise any potential increase in light pollution.
25.	The site would be kept tidy and well maintained, including removal of all rubbish at regular intervals. There would be no storage of materials beyond the construction boundaries. Storage would occur off-site considering the location of sensitive receptors, utilise rail corridor storage space where possible.
	Noise and vibration
26.	Prior to commencement of work, a Construction Noise and Vibration Management Plan (CNVMP) would be prepared and implemented in accordance with the requirements of the *Interim Construction Noise Guideline* (Department of Environment and Climate Change, 2009), *Construction Noise and Vibration Strategy* (TfNSW, 2019a) and the Noise and Vibration Impact Assessment for the Proposal (SLR, 2021b). The CNVMP would take into consideration measures for reducing the source noise levels of construction equipment by construction planning and equipment selection where practicable.
27.	The CNVMP would outline measures to reduce the noise impact from construction activities. Reasonable and feasible noise mitigation measures which would be considered, include: • regularly training workers and contractors (such as at the site induction and toolbox talks) on the importance of minimising noise emissions and how to use equipment in ways to minimise noise • avoiding any unnecessary noise when carrying out manual operations and when operating plant • ensuring spoil is placed and not dropped into awaiting trucks • avoiding/limiting simultaneous operation of noisy plant and equipment within discernible range of a sensitive receiver where practicable • switching off any equipment not in use for extended periods e.g. heavy vehicles engines would be switched off whilst being unloaded • avoiding deliveries at night/evenings wherever practicable • no idling of delivery trucks • keeping truck drivers informed of designated vehicle routes, parking locations and acceptable delivery hours for the site • minimising talking loudly; no swearing or unnecessary shouting, or loud stereos/radios onsite; no dropping of materials from height where practicable, no throwing of metal items and slamming of doors.

No.	Mitigation measure
28.	The CNVMP would include measures to reduce the construction noise and vibration impacts from mechanical activities. Reasonable and feasible noise mitigation options which would be considered, include: • maximising the offset distance between noisy plant and adjacent sensitive receivers and determining safe working distances • using the most suitable equipment necessary for the construction work at any one time • directing noise-emitting plant away from sensitive receivers • regularly inspecting and maintaining plant to avoid increased noise levels from rattling hatches, loose fittings etc • implementation of a noise monitoring plan • using non-tonal reversing/movement alarms such as broadband (non-tonal) alarms or ambient noise-sensing alarms for all plant used regularly onsite (greater than one day), and for any out of hours works • use of quieter and less vibration emitting construction methods where feasible and reasonable.
29.	Work would generally be carried out during standard construction hours (i.e. 7.00 am to 6.00 pm Monday to Friday; 8.00 am to 1.00 pm Saturdays). Any work outside these hours may be undertaken if approved by Transport for NSW and the community is notified prior to the work commencing. An Out of Hours Work application form would need to be prepared by the Contractor and submitted to the Transport for NSW Environment and Planning Manager for any work outside normal hours. High noise and vibration generating activities may only be carried out in continuous blocks, not exceeding 3 hours each, with a minimum respite period of one hour between each block.
30.	As per the *Construction Noise and Vibration Strategy* (TfNSW, 2019a), construction activities with special audible characteristics (high noise impact, intensive vibration, impulsive or tonal noise emissions) would be limited to standard hours, starting no earlier than 8am; and to continuous blocks not exceeding three hours each with a minimum respite from those activities and work of not less than one hour between each block, unless otherwise approved by Transport for NSW.
31.	Work would be conducted behind temporary hoardings/screens wherever practicable. The installation of construction hoarding would take into consideration the location of residential receivers to ensure that 'line of sight' is broken, where feasible.
32.	To avoid structural impacts as a result of vibration or direct contact with structures, the proposed work would be undertaken in accordance with the safe work distances outlined in the Noise and Vibration Assessment (SLR, 2021b) and attended vibration monitoring or vibration trials would be undertaken where these distances are required to be challenged.
33.	Vibration (other than from blasting) resulting from construction and received at any structure outside of the project would be managed in accordance with: • for structural damage vibration –British Standard BS 7385 Part 2:1993 Evaluation and measurement for vibration in buildings • for human exposure to vibration the acceptable vibration - values set out in the *Environmental Noise Management Assessing Vibration: A Technical Guideline* (Department of Environment and Conservation, 2006) which includes British Standard BS 6472-2:1992 *Guide to Evaluation of Human Exposure to Vibration in Buildings (1 Hz to 80 Hz).*

No.	Mitigation measure
34.	Property conditions surveys would be completed prior to piling, excavation of bulk fill or any vibratory work including jack hammering and compaction for all buildings/structures/roads with a plan distance of 25 metres from the work and all heritage listed buildings and other sensitive structures within 100 metres of the work (unless otherwise determined following additional assessment they are not likely to be adversely affected).
35.	Affected pre-schools, schools, universities and other identified sensitive receivers would be consulted in relation to noise mitigation measures to identify any noise sensitive periods, e.g. exam periods. As much as reasonably possible noise intensive construction work in the vicinity of affected educational buildings are to be minimised.
36.	Work would be conducted behind temporary hoardings/screens wherever practicable. The installation of construction hoarding would take into consideration the location of residential receivers to ensure that 'line of sight' is broken, where feasible.
	Aboriginal heritage
37.	All construction staff would undergo an induction in the recognition of Aboriginal cultural heritage material. This training would include information such as the importance of Aboriginal cultural heritage material and places to the Aboriginal community, as well as the legal implications of removal, disturbance and damage to any Aboriginal cultural heritage material and sites.
38.	If unforeseen Aboriginal objects are uncovered during construction, the procedures contained in Transport for NSW's *Unexpected Heritage Finds Guideline* (TfNSW, 2019b) would be followed, and work within the vicinity of the find would cease immediately. The Contractor would immediately notify the Transport for NSW Project Manager and Transport for NSW Environment and Planning Manager so they can assist in co-ordinating next steps which are likely to involve consultation with an Aboriginal heritage consultant, Heritage NSW and the Local Aboriginal Land Council. If human remains are found, work would cease, the site secured and the NSW Police and Heritage NSW notified. Where required, further archaeological investigations and an Aboriginal Heritage Impact Permit would be obtained prior to work recommencing at the location.
	Non-Aboriginal heritage

39. The detailed design would be developed in consultation with a heritage architect and would aim to further minimise the impact of the Proposal. While the impact of the Proposal is mitigated to a degree through the considered siting, it should be further minimised through the use of appropriate form, proportion and materials. In particular, the detailed design would take into consideration the following:

- every effort should be made to reduce the bulk of the proposed southern footbridge, stairways, and new lifts, so as to minimise their detraction from the context of the views and context of the significant elements of the station. The use of transparent or mesh anti-throw screens would reduce the visual bulk of the footbridge and stairways. These new elements should be constructed of materials that are sympathetic to the heritage values of the station – the use of steel frames for the footbridge and lifts responds to the character of the station and reflects the typical design of railway footbridges. This principle should be used for all proposed elements to the station
- the colour scheme of the proposed southern footbridge, stairways, and lifts should reflect, as closely as possible, that of the northern footbridge and stairways, so as to be more sympathetic to the character of the station
- the bulk of, and the roof form of the northern Platform 1 lift (abutting the northern footbridge) should be designed to be sympathetic and subordinate to the visual character of the footbridge and overhead booking office
- avoid fixing elements to the significant northern footbridge or the heritage platform buildings. New canopies and structures should be independently supported to minimise direct and potential indirect impacts to these elements. Interface of new structures with old, including joints and columns, should attempt to reduce physical impact to heritage fabric as well as be structurally sympathetic and unobtrusive
- avoid any impacts to the overhead booking office structure or the significant northern footbridge to maintain as much historic fabric as possible.
- where appropriate, the detailed design should also respond to existing and significant architectural detail, such as the architectural detailing of the station buildings and the northern footbridge
- ensure canopy and canopy structural members are minimal in the size and are of a sympathetic design and materiality to the significant northern footbridge and platform buildings
- new canopies should follow the rake of early/original awnings where in proximity to the platform building
- canopies should be designed in accordance with the Sydney Trains *Canopies and Shelters Design Guide for Heritage Stations* (2016)
- canopy column placement to be rationalised in front of heritage structures to reduce visual impact. In particular, columns nearby the platform buildings should be placed in front of solid walls, and avoid obscuring architectural features such as windows and doors
- aim to impact the original fabric of the Platform 2/3 building as little as possible during the construction of the new family accessible toilet and refurbished female toilets. Aim to ensure that all changes made to the layout of the platform building are reversible in nature, and impact on the original fabric of the building and furnishings as little as possible. Ensure the interior of the new family accessible toilet and the refurbished female toilets are sympathetic to the historical character of the building. This can be accomplished by tiling the rooms to match the existing heritage tile scheme and retaining the historical ceiling and wall vents intact
- all signage and additions to existing infrastructure of heritage significance (such as platform buildings and on the platforms) should reflect the colour scheme of the nearby elements of heritage significance (e.g., customer information signage, any new station furniture including rubbish bins, fencing, stormwater drainage connections between canopies and stormwater system, etc.) or camouflage into the elements (e.g., CCTV cameras, loudspeakers, wiring, etc.)
- the design of seating and other amenities should be in line with heritage kit of parts at heritage listed sites, where relevant.

No.	Mitigation measure
40.	A heritage induction would be provided to workers prior to construction, informing them of the location of known heritage items and guidelines to follow if unanticipated heritage items or deposits are located during construction.
41.	A suitably qualified heritage architect would be engaged from the detailed design phase through to construction to ensure compliance with the relevant heritage approvals, and to further minimise the impact of the Proposal through the use of appropriate form, proportion and materials.
42.	Where appropriate, the detailed design would also respond to existing and significant architectural detail and the canopies would be designed in accordance with the Sydney Trains *Canopies and Shelters Design Guide for Heritage Stations* (2016)
43.	Fabric demolished for the lift landings and footbridge pylons such as from the historic platforms, would be retained and reused where appropriate and practicable.
44.	Measures, as determined in consultation with a suitably qualified heritage architect, would be put in place to protect significant fabric on the platform during the proposed regrading and resurfacing. The platform surface would be reinstated on completion.
45.	Measures, as determined in consultation with a suitably qualified heritage architect, would be put in place to protect significant fabric of the station building during the proposed internal fit outs of the new toilets, door replacements, and the addition of any utilities (electricity, CCTV, loudspeakers, etc.). Where required, care would be taken when fixing required infrastructure to the exterior of the station building or awning.
46.	Measures, as determined in consultation with a suitably qualified heritage architect, would be put in place to protect significant fabric of the historic footbridge, platforms, and station buildings from accidental impact during construction including the installation of the historic footbridge extension, installation of the proposed footbridge and lifts, and canopies.
47.	The assessment of archaeological potential has been limited to the Proposal area. Further assessment of the potential archaeological impacts would be required if ground disturbing work is proposed for any areas outside these locations, including at the potential lay down site within the rail corridor.
48.	New services would be installed in accordance with the Sydney Trains *Heritage Technical Note: Installation of New Electrical and Data Services at Heritage Sites* (2017). The exact location of services is not yet confirmed. Installation of services would be planned in consultation with an appropriate specialist such as a heritage architect or archaeologist and aim to minimise impact to significant fabric. Where practicable, services would be installed within the existing conduit to minimise the cumulative impact to significant fabric
49.	A photographic archival record of Erskineville Station would be prepared prior to, and at the completion of construction, in accordance with NSW Heritage Office (former) publication *How to prepare archival records of heritage items* and *Photographic Recording of Heritage Items using Film or Digital Capture*. Copies of the archival record would be provided to Heritage NSW, Sydney Trains Heritage and the local library.
50.	A heritage interpretation plan would be prepared for Erskineville Railway Station in accordance with NSW Heritage Office (former) publication *Interpreting Heritage Places and Items* and the Sydney Trains *Heritage Interpretation Guideline*. This would be incorporated into the station entrance off of Swanson Street.

No.	Mitigation measure
51.	In the event that unexpected archaeological resources are identified in the course of the Proposal, all work in the affected area would cease, the area cordoned off, and Heritage NSW notified, in accordance with Section 146 of the *Heritage Act 1977*.
52.	The addition of components such as seating, lighting and signage must be consistent with the Sydney Trains and NSW TrainLink *Station Component Guide* (2017) and to the existing seating, lighting and signage at the station.
53.	If the proposed work, or Proposal area, is modified to those discussed in the Statement of Heritage Impact (RPS, 2021), additional heritage advice would be required to appropriately manage and mitigate any potential impacts caused by these changes.
54.	If the Proposal involves the alteration, disposal or demolition of heritage assets of State heritage significance (not listed on the State Heritage Register), the proposed work would be referred to the Heritage Council for comment in accordance with article 4.14 of the State Agency Heritage Guide - *Management of Heritage Assets by NSW Government Agencies*. As the work impact areas are previously identified as potentially being of state significance, Transport for NSW should consider whether referral to the Heritage Council is required.
	Socio-economic
55.	Sustainability criteria for the Proposal would be established to encourage the Contractor to purchase goods and services locally, helping to ensure the local community benefits from the construction of the Proposal.
56.	Feedback through the submissions process would be encouraged to facilitate opportunities for the community and stakeholders to have input into the project, where practicable.
57.	A Community Liaison Plan would be prepared prior to construction to identify all potential stakeholders and best practice methods for consultation with these groups during construction. The plan would also encourage feedback and facilitate opportunities for the community and stakeholders to have input into the project, where practicable.
58.	Contact details for a 24-hour construction response line, Project Infoline and email address would be provided for ongoing stakeholder contact throughout the construction phase.
59.	The community would be kept informed of construction progress, activities and impacts in accordance with the Community Liaison Plan to be developed prior to construction.
	Biodiversity
60.	Construction of the Proposal must be undertaken in accordance with Transport for NSW's *Vegetation Management (Protection and Removal) Guideline* (TfNSW, 2019e) and Transport for NSW's *Fauna Management Guideline* (TfNSW, 2019f).
61.	All workers would be provided with an environmental induction prior to commencing work onsite. This induction would include information on the protection measures to be implemented to protect vegetation, penalties for breaches and locations of areas of sensitivity.
62.	Disturbance of vegetation would be limited to the minimum amount necessary to construct the Proposal. Trees nominated to be removed in the Arboricultural Impact Assessment (Allied Tree Consultancy, 2021) and the Flora and Fauna Assessment (RPS, 2021c) would be clearly demarcated onsite prior to construction, to avoid unnecessary vegetation removal.

No.	Mitigation measure
63.	A project arborist would be appointed following the confirmation of design for the preparation of the Arboricultural Method Statement, which would outline the specific mitigation measures required for the removal and protection of trees and tree protection zones (TPZ) during site establishment, construction activities and demobilisation of work areas for the Proposal. The project arborist would also attend site prior to construction works to confirm which trees are to be removed and retained and respective protection measures applied.
64.	Protection of the trees nominated for retention would be undertaken in line with AS 4970-2009 Protection of Trees on Development Sites, and the Arboricultural Impact Assessment (Allied Tree Consultancy, 2021) and would include exclusion fencing of TPZs. Any ground disturbance within this area (i.e. for sub-surface utilities and regrading) would require an arborist to undertake further assessment before proceeding.
65.	In the event of any tree to be retained becoming damaged during construction, the Contractor would immediately notify the Transport for NSW Project Manager and Transport for NSW Environment and Planning Manager to coordinate the response which may include contacting an arborist to inspect and provide advice on remedial action, where possible.
66.	Should the detailed design or onsite work determine the need to remove or trim any additional trees, which have not been identified in the REF, the Contractor would be required to complete Transport for NSW's Tree Removal Application Form and submit it to Transport for NSW for approval.
67.	A fauna spotter catcher would be present during the felling of the trees, with any native animals recovered from the trees to be released in suitable nearby alternate habitat.
68.	All fuels, chemicals and other hazardous materials would be stored in a roofed, fire-protected and impervious bunded area at least 50 metres from waterways, drainage lines, basins, flood-affected areas or slopes above 10 per cent.
69.	Bunding design would comply with relevant NSW EPA and Australian Standards.
70.	The nine native trees nominated for potential removal would be offset with 36 trees as per the requirements of Transport for NSW Vegetation Offset Guide DMS-SD-087. It is recommended that these are planted within the Proposal area and would be incorporated into the landscape design. This would consist of locally native species such as Blueberry Ash (*Elaeocarpus reticulatus*).
71.	For new landscaping work, mulching and watering would be undertaken until plants are established.
72.	Weed control measures, consistent with Transport for NSW's *Weed Management and Disposal Guideline* (TfNSW, 2019g), would be developed and implemented as part of the CEMP to manage the potential dispersal and establishment of weeds during the construction phase of the project. This would include the management and disposal of weeds in accordance with the *Biosecurity Act 2015.*
	Soils and water
73.	Prior to commencement of work, a site-specific Erosion and Sediment Control Plan would be prepared in accordance with the 'Blue Book' *Managing Urban Stormwater: Soils and Construction Guidelines* (Landcom, 2004) and updated throughout construction so it remains relevant to the activities. The Erosion and Sediment Control Plan measures would be implemented prior to commencement of work and maintained throughout construction.

No.	Mitigation measure
74.	Erosion and sediment control measures would be established prior to any clearing, grubbing and site establishment activities and would be maintained and regularly inspected (particularly following rainfall events) to ensure their ongoing functionality. Erosion and sediment control measures would be maintained and left in place until the work is complete and areas are stabilised.
75.	Vehicles and machinery would be properly maintained and routinely inspected to minimise the risk of fuel/oil leaks. Construction plant, vehicles and equipment would also be refuelled offsite, or in a designated refuelling area.
76.	All fuels, chemicals and hazardous liquids would be stored away from drainage lines, within an impervious bunded area in accordance with Australian Standards, EPA Guidelines and Transport for NSW's *Chemical Storage and Spill Response Guidelines* (TfNSW, 2019h).
77.	Adequate water quality and hazardous materials procedures (including spill management procedures, use of spill kits and procedures for refuelling and maintaining construction vehicles/equipment) would be implemented in accordance with relevant EPA guidelines and the Transport for NSW *Chemical Storage and Spill Response Guidelines* (TfNSW, 2019h) during the construction phase. All staff would be made aware of the location of the spill kits and be trained in how to use the kits in the case of a spill.
78.	In the event of a pollution incident, work would cease in the immediate vicinity and the Contractor would immediately notify the Transport for NSW Project Manager and Transport for NSW Environment and Planning Manager. The EPA would be notified by Transport for NSW if required, in accordance with Part 5.7 of the POEO Act.
79.	The existing drainage systems would remain operational throughout the construction phase.
80.	Should groundwater be encountered during excavation work or rainwater captured onsite, water would be managed in accordance with the requirements of the *Waste Classification Guidelines* (EPA, 2014) and Transport for NSW's *Water Discharge and Reuse Guideline* (TfNSW, 2019i).
	Air quality
81.	Air quality management and monitoring for the Proposal would be undertaken in accordance with Transport for NSW's *Air Quality Management Guideline* (TfNSW, 2019j).
82.	Methods for management of emissions would be incorporated into project inductions, training and pre-start/toolbox talks.
83.	Plant and machinery would be regularly checked and maintained in a proper and efficient condition. Plant and machinery would be switched off when not in use, and not left idling.
84.	Vehicle and machinery movements during construction would be restricted to designated areas and sealed/compacted surfaces where practicable.

No.	Mitigation measure
85.	To minimise the generation of dust from construction activities, the following measures would be implemented: • apply water (or alternate measures) to exposed surfaces (e.g. unpaved roads, stockpiles, hardstand areas and other exposed surfaces) • cover stockpiles when not in use • appropriately cover loads on trucks transporting material to and from the construction site and securely fix tailgates of road transport trucks prior to loading and immediately after unloading • prevent mud and dirt being tracked onto sealed road surfaces.
	Waste and contamination
86.	The CEMP (or separate Waste Management Plan, if necessary) must address waste management and would at a minimum: • identify all potential waste streams associated with the work and outline methods of disposal of waste that cannot be reused or recycled at appropriately licensed facilities • detail other onsite management practices such as keeping areas free of rubbish • specify controls and containment procedures for hazardous waste and asbestos waste • outline the reporting regime for collating construction waste data.
87.	An appropriate Unexpected Finds Protocol, considering asbestos containing materials and other potential contaminants, would be included in the CEMP. Procedures for handling asbestos containing materials, including licensed contractor involvement as required, record keeping, site personnel awareness and waste disposal to be undertaken in accordance with WorkCover requirements.
88.	All excavated spoil suitable for reuse would be reused on site and distributed as agreed with Transport for NSW and the construction contractor. The reuse of excavated material would be further reviewed and confirmed during construction.
89.	All spoil to be removed from site would be tested to confirm the presence of any contamination. Any contaminated spoil would be disposed of at an appropriately licensed facility.
90.	All spoil and waste must be classified in accordance with the *Waste Classification Guidelines Part 1: Classifying waste (*EPA, 2014) prior to disposal.
91.	Any concrete washout would be established and maintained in accordance with Transport for NSW's *Concrete Washout Guideline* – draft (TfNSW, 2019k) with details included in the CEMP and location marked on the ECM.
	Sustainability, climate change and greenhouse gases
92.	Detailed design and construction of the Proposal is to be undertaken in accordance with the ISCA Infrastructure Sustainability Rating Scheme (v1.2).
93.	The detailed design process would undertake a compliant carbon footprinting exercise in accordance with Transport for NSW's *Carbon Estimate and Reporting Tool Manual* (Transport for NSW, 2019c) or other approved modelling tools. The carbon footprint would to be used to inform decision making in design and construction.
	Cumulative impacts

No.	Mitigation measure
94.	The potential cumulative impacts associated with the Proposal would be further considered as the design develops and as further information regarding the location and timing of potential developments is released. Environmental management measures would be developed in the CEMP, and implemented as appropriate.

8 Conclusion

This REF has been prepared in accordance with the provisions of Section 5.5 of the EP&A Act, taking into account to the fullest extent possible, all matters affecting or likely to affect the environment as a result of the Proposal.

The Proposal would provide the following benefits:

- improve accessibility to and around the station by providing a new lift and extension to the existing entrance of the station, a new footbridge, three new lifts and a new southern station entrance, and modifications to the existing family accessible toilet
- improve accessibility and interchange facilities at the station by providing new kiss and ride areas and accessible parking spaces on Bridge Street
- improve customer amenity by installing new canopies on the platforms to provide weather protection, and installing a new family accessible toilet, female ambulant toilet and male ambulant toilet within the Platform 2/3 building
- improve customer safety by platform regrading and installing new tactiles along the platforms, improving station lighting and CCTV, and upgrading footpaths approaching the northern and southern station entrances
- improve customer experience by upgrading customer information and communication systems, adjusting wayfinding signage and landscaping work.

The likely key impacts of the Proposal are as follows:

- temporary changes to pedestrian and cyclist movements along Bridge Street and Swanson Street during construction work
- temporary changes to traffic movements and availability of parking as a result of upgrade work on Bridge Street and the delivery of construction plant and materials
- increased platform congestion due to localised platform closures and dedications during platform resurfacing and regrading work
- temporary change to the visual environment during construction phase due to fencing and hoarding, road barriers and signage, formwork and scaffolding, cranes and other construction equipment, site office and amenities, and night lighting
- temporary noise and vibration emission during construction, which are predicted above 75 dBA $L_{Aeq(15minute)}$ at residential receivers directly adjacent Erskineville Station (along Bridge Street and George Street) during the operation of noise intensive equipment
- moderate adverse impact on the heritage significance of Erskineville Station associated with the addition of the southern entrance, footbridge, and associated access structures, and the new canopies would detract from the stations' context
- removal of approximately nine trees to facilitate the construction of the proposed new station entrance, footbridge, lifts and other accessibility upgrades at the station. The infrastructure design encroaches greater than 10 per cent of the tree protection zone of a further six trees at the western end of the proposed footbridge and also on Bridge Street. This encroachment may lead to a need to remove the trees if the detailed design and/or preferred construction methodologies cannot be sufficiently altered.

This REF has considered and assessed these impacts in accordance with clause 228 of the EP&A Regulation and the requirements of the EPBC Act (refer to Chapter 6, Appendix A and Appendix B). Based on the assessment contained in this REF, it is considered that the Proposal is not likely to have a significant impact upon the environment or any threatened species, populations or communities. Accordingly, an EIS is not required, nor is the approval of the Minister for Planning and Public Spaces.

The Proposal would also take into account the principles of ESD and sustainability (refer to Section 3.3.3 and Section 4.3). These would be considered during the detailed design, construction and operational phases of the Proposal. This would ensure the Proposal is delivered to maximum benefit to the community, is cost effective and minimises any adverse impacts on the environment.

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TfNSW, 2020a, *Beyond the Pavement*, Sydney

TfNSW, 2020b, *Guideline for Landscape character and visual impact Environmental Impact Assessment Practice Note Assessment EIA-N04*, Sydney

Appendix A Consideration of matters of National Environmental Significance

The table below demonstrates Transport for NSW's consideration of the matters of NES under the EPBC Act to be considered in order to determine whether the Proposal should be referred to Commonwealth Department of the Environment.

Matters of NES	Impacts
Any impact on a World Heritage property? There are no World Heritage properties in the vicinity of the Proposal.	Nil
Any impact on a National Heritage place? There are no National Heritage places in the vicinity of the Proposal.	Nil
Any impact on a wetland of international importance? There are no wetlands of international importance in the vicinity of the Proposal.	Nil
Any impact on a listed threatened species or communities? No listed threatened species or communities were observed within the Proposal area.	Nil
Any impacts on listed migratory species? A closed depression with standing water and some water flora was identified in the Proposal area and has the potential to support frog and wetland bird species. Threatened wetlands bird species may transit through this habitat and opportunistically use this habitat for feeding purposes. Due to the lack of substantial suitable habitat, it is unlikely that the Proposal would significantly affect any listed migratory species.	Negligible
Does the Proposal involve a nuclear action (including uranium mining)? The Proposal does not involve a nuclear action.	Nil
Any impact on a Commonwealth marine area? There are no Commonwealth marine areas in the vicinity of the Proposal	Nil
Does the Proposal involve development of coal seam gas and/or large coal mine that has the potential to impact on water resources? The Proposal is for a transport facility and does not relate to coal seam gas or mining.	Nil
Additionally, any impact (direct or indirect) on Commonwealth land? The Proposal would not be undertaken on or near any Commonwealth land.	Nil

Appendix B Consideration of clause 228

The table below demonstrates Transport for NSW's consideration of the specific factors of clause 228 of the EP&A Regulation in determining whether the Proposal would have a significant impact on the environment.

Factor	Impacts
(a) Any environmental impact on a community? There would be some temporary impacts to the community during construction, particularly in relation to noise, traffic, access and visual amenity. Mitigation measures outlined in Section 7.2 would be implemented to manage and minimise adverse impacts	Minor adverse
(b) Any transformation of a locality? The Proposal would include the introduction of new visible elements to the station precinct (including a new footbridge, three new lifts, stairs, station entrance and canopies) which would have a visual impact, including to the heritage setting, but which are consistent with a railway facility and would not lead to a major transformation of the locality. In addition, a range of design mitigation has been progressed to minimise impacts.	Minor adverse
(c) Any environmental impact on the ecosystem of the locality? Up to 12 trees are proposed to be removed. The removal of these trees is not considered to have an impact on the overall ecological values of the areas as it would not result in the loss of a naturally occurring Plant Community Type. Offset plantings of 36 trees would be carried out as per the Transport for NSW *Vegetation Offset Guide* (TfNSW, 2019l).	Minor adverse
(d) Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality? The Proposal would include the introduction of new visible elements to the station precinct (including a new footbridge, three new lifts, stairs, station entrance and canopies) which would have a visual impact but not a major impact on the landscape character of the locality	Moderate adverse
(e) Any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations? The Proposal would be a positive contribution to the area as it provides equitable access to the station platform and improves amenity of the station for all customers. The station is listed on RailCorp's Section 170 Heritage and Conservation Register. The Proposal would result in some impacts to some parts of the station that are heritage listed. Impacts to heritage would be minimised through the implementation of the mitigation measures provided in the SoHI and REF. A desktop archaeological assessment has been undertaken which determined that there is a low risk of encountering archaeological items/deposits within the Proposal area. Further assessment of the potential archaeological impacts would be required if ground disturbing work is proposed for any areas not already assessed as part of the SoHI and REF.	Acceptable heritage impact

Factor	Impacts
(f) Any impact on the habitat of protected fauna (within the meaning of the *National Parks and Wildlife Act 1974*)? The Proposal would not have any impact on habit of protected fauna.	Nil
(g) Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air? The Proposal is unlikely to have any impact on endangering any species of animal, plant or other form of like, whether living on land, in water or in the air. No threatened flora or fauna species or ecological communities were observed within the Proposal area.	Minor
(h) Any long-term effects on the environment? The Proposal is unlikely to have any long-term effects on the environment.	Negligible
(i) Any degradation of the quality of the environment? The Proposal is unlikely to have any degradation of the quality of the environment.	Nil
(j) Any risk to the safety of the environment? The Proposal is unlikely to cause any pollution or safety risks to the environment provided the recommended mitigation measures are implemented. Specific management measures would be implemented to manage asbestos and other hazardous materials that may be encountered during construction or demolition work.	Minor adverse
(k) Any reduction in the range of beneficial uses of the environment? The Proposal is unlikely to have any reduction in the range of beneficial uses of the environment.	Nil
(l) Any pollution of the environment? The Proposal is unlikely to cause any pollution of the environment provided the recommended mitigation measures are implemented.	Negligible
(m) Any environmental problems associated with the disposal of waste? The Proposal is unlikely to cause any environmental problems associated with the disposal of waste. All waste would be managed and disposed of with a site-specific Waste Management Plan prepared as part of the Construction Environmental Management Plan. Mitigation measures would be implemented to ensure waste is reduced, reused or recycled where practicable.	Minor
(n) Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply? The Proposal is unlikely to increase demands on resources that are, or are likely to become, in short supply.	Nil
(o) Any cumulative environmental effect with other existing or likely future activities? Cumulative effects of the Proposal are described in Section 6.15, Where feasible, environmental management measures would be co-ordinated to reduce any cumulative construction impacts. The Proposal is unlikely to have any significant adverse long-term impacts.	Negligible

Factor	Impacts
(p) Any impact on coastal processes and coastal hazards, including those under projected climate change conditions? The Proposal would not affect or be affected by any coastal processes or hazards.	Nil