

Pedestrian Bridge – across Dobroyd Parade at Waratah Street intersection

Review of Environmental Factors

November 2023



Acknowledgement of Country

Transport for NSW acknowledges the traditional custodians of the land on which the pedestrian bridge is proposed.

We pay our respects to Elders past and present and celebrate the diversity of Aboriginal people and their ongoing cultures and connections to the lands and waters of NSW.

Many of the transport routes we use today – from rail lines, to roads, to water crossings – follow the traditional Songlines, trade routes and ceremonial paths in Country that our nation's First Peoples followed for tens of thousands of years.

Transport for NSW is committed to honouring Aboriginal peoples' cultural and spiritual connections to the land, waters and seas and their rich contribution to society.



Approval and authorisation

Title	
Accepted on behalf of Transport for NSW by:	
Signed	
Date:	

Document review tracking

Draft No.	Date	Comments
1	10/08/2023	First draft for Transport review
2	14/09/2023	Second draft for Transport review
3	23/10/2023	Issue to Transport
4	23/11/2023	Updated for public display

Executive summary

The proposal

Transport for NSW (Transport) proposes to construct a pedestrian bridge across Dobroyd Parade, at the Waratah Street intersection, Haberfield, NSW 2045 (the proposal). The southern end of the proposal is located on the corner of Waratah Street and Dobroyd Parade, and the northern end is located on the land adjacent to Iron Cove Creek.

Key features of the proposal include:

- new pedestrian bridge including a covered walkway for weather protection, built over Dobroyd Parade at the Waratah Street intersection
- new lifts and stairs on either side of the pedestrian bridge, a ramp to the lower lift landing on the northern side
- removal of existing at-grade (street-level) road crossing on Dobroyd Parade and extension of the existing fence in the median
- widening the footpaths on approach to the Waratah Street crossing and a new kerb ramp to provide a smoother transition between the footpath and the road for bike users
- installing a concrete barrier along Dobroyd Parade in front of the pedestrian bridge
- relocation of utilities, new landscaping, signage and linemarking
- bicycle wheeling ramps on stairs.

Subject to planning approval, construction is expected to commence in late 2024 and take around 6 months to complete.

Need for the proposal

Dobroyd Parade is a state road with a speed limit of 60 kilometres per hour and is a primary link between east and west Sydney in the Inner West. Dobroyd Parade at the intersection of Waratah Street has been identified by Transport as needing improvements to support safe access for pedestrians.

The existing pedestrian crossing of Dobroyd Parade at Waratah Street is an at-grade two stage crossing over seven lanes of traffic. Since the opening of WestConnex M4 East, there have been several recorded incidences of vehicles colliding with the median pedestrian fence, where pedestrians are situated at the crossing. There have been no reported pedestrian injuries resulting from these crashes. During peak periods, eastbound traffic on Dobroyd Parade queues back from the Timbrell Drive and Mortley Avenue intersection with some motorists queuing on the crossing itself and blocking access for pedestrians. This in addition to heavy vehicle traffic using the route, has raised concerns for pedestrian safety, including children who use the crossing to access local schools.

The proposal would replace the at-grade crossing on Dobroyd Parade with a pedestrian bridge, allowing safe crossing for pedestrians. The proposal also reduces traffic congestion, which improves the safety of the intersection with less likelihood of accidents such as rear end crashes.

The proposal is aligned with the Future Transport Strategy (Transport 2022a) by integrating sustainable transport infrastructure into our network; as well as the Sydney's Walking Future (Transport 2013) and Sydney's Cycling Future (Transport 2013) in providing safe and connected bike and pedestrian networks; and the Metropolis of Three Cities (Greater Sydney Commission 2018a) in creating infrastructure to support the growth and development of Sydney.

Proposal objectives

The objectives of the proposal are to:

- improve safety for pedestrians, people with mobility issues, prams and bikes
- ease congestion and improve flow of traffic along Dobroyd Parade
- minimise environmental and community impacts during construction and operation
- optimise the urban design and landscape outcome to compliment the surrounding natural, built and community environment.

Options considered

Transport identified five strategic options for improving safety and traffic efficiency. The options considered were:

- Option 1 – base case or “do-nothing”
- Option 2 – construct a pedestrian bridge from Waratah Street to Timbrell Park
- Option 3 – construct a pedestrian bridge from Waratah Street to the southern side of Iron Cove Link with ramps and stairs
- Option 4 – construct a pedestrian bridge from Waratah Street to the southern side of Iron Cove Link with stairs and lifts
- Option 5 – construct a single stage at-grade crossing.

Although the ‘do nothing’ option and Option 5 would represent the lowest capital cost, they do not fulfill the objectives of the proposal to improve safety for pedestrians, people with mobility issues, prams and bikes. Pedestrians would continue to use the signalised pedestrian crossing where there is a history of vehicles colliding with the pedestrian fence on the centre median and vehicles queuing across the intersection in the morning peak.

Options 2 and 3 would result in ramps about 100 metres long and greater impacts to Timbrell Park or Reg Coady Reserve respectively.

Option 4 was selected as the preferred option as it provides an effective and safe solution for the community to access local schools, residential and recreational facilities on either side of Dobroyd Parade whilst minimising visual, environmental and community impact.

It is acknowledged that Option 4 does not provide ramps which would avoid bike users having to dismount their bikes to cross the bridge. The lifts proposed in the preferred option would be large enough to cater for a minimum of two bikes at a time and long enough for a cargo bike. Bicycle wheeling ramps would also be provided on the stairs to avoid needing to carry bikes up and down the stairs.

Statutory and planning framework

The proposal is for road infrastructure facilities and is to be carried out on behalf of Transport and can therefore be assessed under Division 5.1 of the *Environmental Planning and Assessment Act 1979* (NSW) (EP&A Act). Development consent from council is not required.

The proposed work corresponds to a road infrastructure facility construction activity under the *State Environmental Planning Policy (Transport and Infrastructure) 2021*.

The proposal is not located on land reserved by the *National Parks and Wildlife Act 1974*.

Community and stakeholder consultation

Transport carried out community and stakeholder consultation on a concept design of the proposal between April and May 2020 as part of consultation on four local network improvements across Haberfield, Ashfield, Leichhardt, and surrounding suburbs (HAL proposals). The HAL proposals included improvements to City West Link, Norton Street and James Street intersections, Dobroyd Parade and Waratah Street intersection, Mortley Avenue and Timbrell Drive intersection, Parramatta Road and Dalhousie Street intersection, and the Liverpool Road and Parramatta Road intersection.

Sydney Water, key stakeholders and the community were consulted about the proposal via a letterbox drop, an online interactive feedback portal, briefings and workshops, live webinars, door knocking, media releases, stakeholder emails, a dedicated email inbox and an 1800 number.

Further consultation on the proposal was carried out with City of Canada Bay Council and Inner West Council in July 2022, and again in May 2023 as part of the WestConnex M4 East 12-month post-opening Road Network Performance Review Plan development. The key feedback from councils focused on pedestrian safety at the intersection including support for infrastructure that improved pedestrian safety. Transport has since prioritised the design and construction of the pedestrian bridge over Dobroyd Parade at Waratah Street.

At this stage, Transport does not plan to proceed with the remaining Haberfield, Ashfield and Leichhardt improvements as originally proposed in 2020. Transport is consulting with local councils about appropriate measures to address traffic issues in these areas and will consult with the community on any future plans for intersection upgrades in the area.

Environmental impacts

The main environmental and social impacts of the proposal are outlined below.

Traffic, Transport, and Access

An assessment of the existing traffic, transport and access networks and environment was conducted through a desktop analysis of the relevant databases and literature.

During construction of the proposal, minor temporary increases to traffic volumes are expected on Dobroyd Parade and surrounding local roads. This is due to the additional construction vehicles accessing the construction site and temporary partial and full road closures. These closures would occur out of standard construction hours. Light vehicle traffic detours would redirect traffic into the surrounding local roads and heavy vehicle traffic would be encouraged to use different freight routes such as Parramatta Road and Victoria Road.

Residential areas surrounding the proposal would experience disturbances from the presence of construction vehicles and equipment associated with the site compounds proposed as part of the construction activities.

Pedestrian access during the construction of the proposal would be temporarily impacted and pedestrians redirected around existing footpaths within proposal area and proposed site compounds including Reg Coady Reserve.

The proposed pedestrian bridge construction is not anticipated to have an impact on public transport in the area as there are no direct routes within the proposal area.

During operation, traffic flow through the Dobroyd Parade and Waratah Street intersection is expected to improve and the bridge would not restrict any existing property accesses. Completion of the pedestrian bridge would improve pedestrian safety and maintain the connectivity of pedestrian networks in the area.

A traffic management plan including temporary traffic diversions would be implemented to reduce and mitigate any potential impacts to traffic, transport and access networks around the proposal.

Noise and Vibration

A quantitative noise and vibration assessment was conducted using the Transport construction and maintenance noise estimator tool to predict any potential impacts in accordance with the Interim Construction Noise Guideline (ICNG) (DECC 2009) and the Construction Noise and Vibration Guideline (Transport 2023e).

The impacts of construction activities, including the noise from all three temporary site compounds, on the nearest residents was assessed. Four different construction scenarios were used in the assessment. This assessment concluded:

- construction noise levels are predicted to exceed management levels for all scenarios during standard, non-standard and night work hours for the nearest residential receivers
- construction noise levels are predicted to exceed sleep disturbance levels during proposed night construction activities
- potential construction vibration impacts are predicted for the heritage listing Dobroyd Canal Stormwater Channel as it is located within 10 metres of the north side of the proposal and in the vicinity of vibration intensive construction equipment
- there are no predicted noise and vibration impacts during the operational phase of the proposal.

Safeguards would be implemented to mitigate and reduce any potential impacts to residents such as notification to local residents, selection of quieter equipment, noise barriers, scheduling works to minimise disturbance, and vibration monitoring and attenuation.

Landscape character and visual impact

An Urban Design Report and Landscape Character and Visual Impact Assessment was undertaken for the proposal to assess the potential impact to the landscape character and visual amenity of the locality from the proposal. The proposal design responds to the objectives and principles detailed in Beyond the Pavement: Urban design policy procedures and design principles (Transport 2020a), including fitting in with the built fabric and landform, incorporating heritage and cultural contexts, connecting modes and communities, and responding to natural pattern.

Four viewpoints were used to assess the visual impact of the proposal. The visual impact assessment concluded:

- a high overall visual impact is expected to occur to Viewpoint A (Dobroyd Parade cul-de-sac looking west)
- a moderate overall visual impact is expected to occur to Viewpoint B and Viewpoint C (Dobroyd Parade looking east and Dobroyd Parade looking west)
- a high-moderate overall visual impact is expected to occur to Viewpoint D (Timbrell Park).

Additional safeguards would be implemented during construction to further reduce any potential impacts to the landscape character or visual amenity of the area. This includes minimising vegetation removal and ensuring the orientation of lights do not intrude on residents.

Safeguards during the operational stage would be implemented including designing and positioning lighting to not intrude on residents, and the installation of privacy screens on the bridge to minimise overlooking into nearby residents.

Non-Aboriginal heritage

A Statement of Heritage Impact assessment was prepared to assess the potential impacts to listed heritage items and potential archaeological remains due to the proposal.

Listed heritage items include the Haberfield Conservation Area (HCA), listed on the Inner West LEP, which has local significance and the Dobroyd Canal Stormwater Channel No. 53, listed on the Sydney Water s170

heritage register and has State significance. The HCA is located within and to the south of the proposal area and the Dobroyd Canal Stormwater Channel is located to the north of the proposal area.

The Statement of Heritage Impact concluded that the proposal would have a neutral direct physical impact, a negligible potential direct impact and an overall negligible indirect visual impact to both heritage listed items. It also concluded that impacts to or finding of relics or remains of archaeological significance is not expected.

The design of the proposal has been developed to reduce potential impacts to non-Aboriginal heritage and safeguards would be implemented to reduce any potential impacts.

Aboriginal cultural heritage

Stage 1 of the Procedure for Aboriginal Cultural Heritage Consultation and Investigation (PACHCI) was completed for the proposal. This assessment identified the proposal is unlikely to have an impact on Aboriginal cultural heritage and if any potential objects or items are uncovered from construction activities the *Unexpected Heritage Finds Procedure* is to be followed.

Justification and conclusion

The need for the proposal has been driven by existing community concerns for motorist, pedestrian safety and the incident history of vehicles colliding with the median pedestrian fence on Dobroyd Parade. Additionally, the increase in heavy vehicle on Dobroyd Parade, and persistent queuing at the intersection poses further safety concerns for people using the crossing.

The assessment of the environment and social impacts determined that the proposal is not likely to cause significant impacts and, therefore, assessment under Division 5.2 of the EP&A Act is not required.

Several potential environmental impacts from the proposal have been avoided or reduced during the concept design development and options assessment. However, the proposal would still result in some short-term impacts on traffic, and noise and vibration during construction as well as some longer-term minor urban design and visual impacts. Environmental safeguards and management measures as detailed in this report and would minimise these expected impacts.

Overall, the proposal is justified on the basis that it best meets the proposal objectives and results in long-term benefits which include improvements to the safety of pedestrians, eases congestion, minimises community and environmental impacts, and optimises the urban design and landscape. This would outweigh the potential adverse impacts, which would mainly occur during construction. Moreover, the proposal would not result in any significant negative long-term impacts on the local community or environment.

Display of the review of environmental factors

This Review of Environmental Factors (REF) has been published online and is available for community and stakeholder feedback. You can access the REF documents in the following ways:

Internet

Information about the project and copies of all REF documents can be found on the Transport website www.transport.nsw.gov.au/pedestrian-bridge-haberfield

You can also learn about the project by visiting yoursay.transport.nsw.gov.au/pedestrian-bridge-haberfield

How can I make a submission?

To make a submission about this proposal, please:

- visit the website www.transport.nsw.gov.au/pedestrian-bridge-haberfield and fill out the feedback form
- email us at ni@transport.nsw.gov.au
- visit the Inner West Portal at <https://caportal.com.au/tfnsw/inner-west>
- call the Transport for NSW project hotline on 1800 660 490
- mail Transport at PO BOX K659 Haymarket NSW 1240.

Submissions must be received by Monday 11 December 2023. Submissions will be managed in accordance with the [Transport for NSW Privacy Statement](#). A copy can be made available upon request.

What happens next?

Transport will collate and consider the submissions received during public display of the REF.

After this consideration, Transport will determine whether or not the proposal should proceed as proposed and will inform the community and stakeholders of this decision.

If the proposal is determined to proceed, Transport will continue to consult with the community and stakeholders prior to and during construction.

Table of contents

1.	Introduction	1
1.1	Proposal identification	1
1.2	Purpose of the report	4
2.	Need and options considered.....	5
2.1	Strategic need for the proposal.....	5
2.2	Limitations of existing infrastructure	7
2.3	Proposal objectives and development criteria.....	11
2.4	Alternatives and options considered.....	13
2.5	Preferred option	16
3.	Description of the proposal	17
3.1	The proposal	17
3.2	Design.....	18
3.3	Construction activities	20
3.4	Ancillary facilities	27
3.5	Public utility adjustment	28
3.6	Property acquisition	28
4.	Statutory and planning framework.....	30
4.1	Environmental Planning and Assessment Act 1979.....	30
4.2	Other relevant NSW legislation.....	34
4.3	Commonwealth legislation	34
4.4	Other relevant Commonwealth legislation.....	35
4.5	Confirmation of statutory position	35
5.	Consultation	36
5.1	Consultation strategy	36
5.2	Community involvement.....	36
5.3	Aboriginal community involvement.....	38
5.4	SEPP (Transport and Infrastructure) consultation.....	39
5.5	Government agency and stakeholder involvement.....	40
5.6	Ongoing or future consultation.....	41
6.	Environmental assessment.....	42
6.1	Traffic, transport, and access	42
6.2	Noise and vibration	47
6.3	Landscape character and visual impacts.....	69
6.4	Non-Aboriginal heritage	80
6.5	Hydrology and flooding.....	87
6.6	Biodiversity.....	92
6.7	Geology, soils and contamination	99

6.8	Socio-economic	103
6.9	Other impacts	108
6.10	Cumulative impacts.....	112
7.	Environmental management.....	117
7.1	Environmental management plans (or system).....	117
7.2	Summary of safeguards and management measures	118
7.3	Licensing and approvals	131
8.	Conclusion.....	132
8.1	Justification.....	132
8.2	Objects of the EP&A Act	132
8.3	Conclusion.....	134
9.	Certification.....	136
10.	EP&A Regulation publication requirement	137
11.	References.....	138
	Terms and acronyms used in this REF	140
	Appendix A - Consideration of section 171 factors and matters of national environmental significance and Commonwealth land.....	142
	Appendix B - Statutory consultation checklists.....	147
	Appendix C – Transport for NSW Construction and Maintenance Noise Estimator tool results.....	152
	Appendix D – Urban Design Report and Landscape Character and Visual Impact Assessment	153
	Appendix E – Non-Aboriginal Statement of Heritage Impact Assessment ..	154
	Appendix F – Stage 1 of the Procedure for Aboriginal Cultural Heritage Consultation and Investigation (PACHCI)	155
	Appendix G – Flood Impact Assessment.....	156
	Appendix H – Desktop Search Results including Biodiversity and Aboriginal Heritage Information Management Systems	157

Tables

Table 2-1 Analysis of options	15
Table 3-1 Engineering and development constraints	19
Table 3-2 Proposal staging.....	21
Table 4-1 Inner West LEP zoning	32
Table 5-1 2020 community consultation activities.....	37
Table 5-2 Summary of issues raised by the community	38
Table 5-3 Issues raised through SEPP (Transport and Infrastructure) 2021 consultation.	39
Table 6-1 Traffic, transport and access safeguards and management measures.....	46
Table 6-2 Estimated background noise levels	49
Table 6-3 Construction scenarios.....	49
Table 6-4 Recommended construction NMLs at residential receivers.....	49
Table 6-5 Recommended construction NMLs at non-residential receivers	50
Table 6-6 Site specific noise management levels	51
Table 6-7 Scenario 1 – Site establishment / preparation works	51
Table 6-8 Scenario 2 – Bridge works	52
Table 6-9 Scenario 3 – Road works	52
Table 6-10 Scenario 4 – Bridge lifting works.....	52
Table 6-11 Site compound 1 – compound operation	53
Table 6-12 Site compound 2 – compound operation	53
Table 6-13 Site compound 3 – compound operation	54
Table 6-14 Noise mitigation measures	64
Table 6-15 Approximate vibration levels for various equipment.....	66
Table 6-16 Noise and vibration safeguards and management measures.....	66
Table 6-17 Landscape character and visual impact assessment matrix.....	70
Table 6-18 Landscape character zone descriptions.....	70
Table 6-19 Viewpoint descriptions	74
Table 6-20 Landscape character assessment.....	76
Table 6-21 Visual impact assessment	77
Table 6-22 Landscape character and visual safeguards and management measures	79
Table 6-23 Terminology for assessing the magnitude of heritage impact.....	81
Table 6-24 Terminology for impact types	81
Table 6-25 Heritage listings in the vicinity of the proposal	83
Table 6-26 Summary of heritage impacts.....	85
Table 6-27 Historical archaeological potential and significance.....	86
Table 6-28 Non-Aboriginal heritage safeguards and management measures	86
Table 6-29 Flood hazard class	87

Table 6-30 Hydrology safeguards and management measures.....	91
Table 6-31 Biodiversity safeguards and management measures	97
Table 6-32 Contaminated sites notified to the EPA.....	100
Table 6-33 Soils safeguards and management measures	101
Table 6-34 Demographic characteristics in 2016	103
Table 6-35 Socio economic safeguards and management measures	107
Table 6-36 Other potential impacts	108
Table 6-37 Other impacts safeguards and management measures	110
Table 6-38 Present and future projects in vicinity of proposal area	113
Table 6-39 Potential cumulative impacts	115
Table 6-40 Cumulative safeguards and management measures	116
Table 7-1 Summary of safeguards and management measures.....	118
Table 7-2: Summary of licensing and approvals required	131
Table 8-1 Objects of the Environmental Planning and Assessment Act 1979.....	132
Table 10-1 EP&A Regulation publication requirement	137

Figures

Figure 1-1 Proposal location.....	2
Figure 1-2 The proposal.....	3
Figure 2-1 Existing Dobroyd Parade and Waratah Street signalised intersection	8
Figure 2-2 Existing Dobroyd Parade and Waratah Street signalised pedestrian crossing	8
Figure 2-3 Waratah Street signalised pedestrian crossing.....	8
Figure 2-4 View south along Waratah Street – existing concrete footpaths on the eastern side of the road.....	9
Figure 2-5 View north along Waratah Street – existing concrete footpaths on the western side of the road.....	9
Figure 2-6 Dobroyd Parade southern side east of proposal site – no pedestrian access	10
Figure 2-7 Shared pedestrian and bike path adjacent to Dobroyd Parade looking east from Martin Street	10
Figure 2-8 View south towards Dobroyd Parade and Waratah Street intersection.....	10
Figure 2-9 Access to Iron Cove Creek pedestrian bridge from Dobroyd Parade.....	10
Figure 2-10 View east from the Dobroyd Parade cul-de-sac	11
Figure 2-11 Option 2.....	14
Figure 2-12 Option 3.....	14
Figure 2-13 Option 4.....	15
Figure 3-1 Bridge concept design (subject to detailed design)	20
Figure 3-2 Proposal footprint and site compound locations	23

Figure 3-3 Light vehicle detour route	27
Figure 3-4 Existing utilities in the proposal area.....	29
Figure 4-1 Land zones in the vicinity of the proposal.....	32
Figure 6-1 Existing pedestrian crossings and public transport routes.....	44
Figure 6-2 Sensitive receivers – Scenario 1 (Day)	55
Figure 6-3 Sensitive receivers – Scenario 2 (Day)	56
Figure 6-4 Sensitive receivers – Scenario 3 (Evening).....	57
Figure 6-5 Sensitive receivers – Scenario 3 (Night).....	58
Figure 6-6 Sensitive receivers – Scenario 4 (Evening).....	59
Figure 6-7 Sensitive receivers – Scenario 4 (Night).....	60
Figure 6-8 Sensitive receivers – Compound areas – Day	61
Figure 6-9 Sensitive receivers – Compound areas – Evening	62
Figure 6-10 Sensitive receivers – Compound areas – Night.....	63
Figure 6-11 Landscape character zones	72
Figure 6-12 Viewpoints.....	73
Figure 6-13 Heritage listings in the vicinity of the proposal	84
Figure 6-14 Existing flood conditions – 1% AEP flood depth	89
Figure 6-15 Flood hazard – 1% AEP.....	90
Figure 6-16 Native plantings and landscaped area within the proposal area.....	93
Figure 6-17 Site compound 2 – 87 Dobroyd Parade / 21 Martin Street Haberfield.....	93
Figure 6-18 Maintained lawn within Reg Coady Reserve – adjacent to site compound 1 ...	94
Figure 6-19 Site compound 3 (287 Ramsay Road, Haberfield) - exotic groundcover	94
Figure 6-20 Pedestrian and cycle network.....	105

1. Introduction

This chapter introduces the proposal and provides context for the environmental assessment. In introducing the proposal, the objectives and project development history are detailed and the purpose of the report provided.

1.1 Proposal identification

Transport for NSW (Transport) proposes to construct a pedestrian bridge over Dobroyd Parade and upgrade the road infrastructure at the intersection of Dobroyd Parade and Waratah Street (the proposal). The proposal is located within Haberfield, in the Inner West Local Government Area (LGA) adjacent to Iron Cove Creek which is the border to the City of Canada Bay LGA. The proposal area is a key section of Dobroyd Parade which connects to the WestConnex M4 East tunnel and Greater Sydney.

Once constructed the proposal would replace the existing at-grade pedestrian crossing and provide a safer crossing for pedestrians over Dobroyd Parade. The proposal is surrounded by low and medium density residential areas, recreational areas, and an educational facility, the Dobroyd Point Primary School 250 metres southeast. The nearest local centre is Five Dock, 450 metres to the northwest.

The proposal would include road infrastructure upgrades to the intersection and a pedestrian bridge spanning 7 lanes of traffic, approximately 37 metres in length with a width of 3.5 metres and a clearance of 6.1 metres above the road surface. The bridge would include stairwells and lifts on either side for accessibility and an access ramp to the northern lift landing.

Key features of the proposal would include:

- new pedestrian bridge including a covered walkway for weather protection, built over Dobroyd Parade at the Waratah Street intersection
- two new lifts and stairs on either side of the pedestrian bridge, a ramp to the lower lift landing on the northern side
- removal of existing at-grade (street-level) road crossing on Dobroyd Parade and extension of the existing fence in the median
- widening the footpaths on approach to the Waratah Street crossing and a new kerb ramp to provide a smoother transition between the footpath and the road for bike users
- installing a concrete barrier along Dobroyd Parade in front of the pedestrian bridge
- relocation of utilities, new landscaping, signage and linemarking
- bicycle wheeling ramps on stairs.

The location of the proposal including proposed compounds are shown in Figure 1-1 and an overview of the proposal is provided in Figure 1-2. Chapter 3 describes the proposal in more detail.



Figure 1-1 Proposal location



Figure 1-2 The proposal

1.2 Purpose of the report

This Review of Environmental Factors (REF) has been prepared by Stantec Australia Pty Ltd (Stantec) on behalf of Transport. For the purposes of this work, Transport is the proponent and determining authority under Division 5.1 of the *Environmental Planning and Assessment Act 1979 (NSW)* (EP&A Act).

The purpose of the REF is to describe the proposal, to document the likely impacts of the proposal on the environment, and to detail mitigation and management measures to be implemented.

The description of the proposed work and assessment of associated environmental impacts has been undertaken in the context of section 171 of the Environmental Planning and Assessment Regulation 2021, the factors in *Guidelines for Division 5.1 assessments*, (DPE 2022), *Roads and Related Facilities EIS Guideline* (DUAP 1996), the *Biodiversity Conservation Act, 2016* (BC Act), the *Fisheries Management Act 1994*, and the Australian Government's *Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)* (EPBC Act).

In doing so, the REF helps to fulfil the requirements of:

- section 5.5 of the EP&A Act including that Transport examine and take into account, to the fullest extent possible, all matters affecting or likely to affect the environment by reason of the activity.

The findings of the REF would be considered when assessing:

- whether the proposal is likely to have a significant impact on the environment and therefore the necessity for an environmental impact statement to be prepared and approval sought from the Minister for Planning under Division 5.2 of the EP&A Act
- the significance of any impact on threatened species as defined by the BC Act and/or the *Fisheries Management Act 1994*, in section 1.7 of the EP&A Act and therefore the requirement for a Species Impact Statement or a Biodiversity Development Assessment Report
- the significance of any impact on nationally listed biodiversity matters under the EPBC Act, including whether there is a real possibility that the activity may threaten long-term survival of these matters, and if offsets are required and able to be secured.

The potential for the proposal to significantly impact any other matters of national environmental significance or Commonwealth land and the need, subject to the EPBC Act strategic assessment approval, to make a referral to the Australian Department of Climate Change, Energy, the Environment and Water for a decision by the Commonwealth Minister for the Environment on whether assessment and approval is required under the EPBC Act.

2. Need and options considered

This chapter describes the need for the proposal in terms of its strategic setting and operational need. It identifies the various options considered and the selection of the preferred option for the proposal.

2.1 Strategic need for the proposal

The WestConnex M4 East 12-month post-opening Road Network Performance Review Plan (Transport 2023a) recognises network improvements to mitigate impacts of WestConnex M4 East on the existing road network. The Dobroyd Parade and Waratah Street intersection was identified as a location requiring mitigation due to the safety concerns that have arisen after the opening of the tunnels.

As identified in the WestConnex M4 East 12-month post-opening Road Network Performance Review Plan, there have been several records of vehicles colliding with the median fence, where pedestrians are regularly situated at the crossing. There have been no reported pedestrian injuries resulting from these crashes. During peak periods, eastbound traffic on Dobroyd Parade queues back from the Timbrell Drive and Mortley Avenue intersection with some motorists queuing on the crossing itself and blocking access for pedestrians. This in addition to heavy vehicle traffic using the route, has raised concerns for pedestrian safety, including school children who often use the crossing.

The proposal would replace the at-grade crossing on Dobroyd Parade with a pedestrian bridge, allowing safe crossing for pedestrians. The proposal also reduces traffic congestion, which improves the safety of the intersection with less likelihood of accidents such as rear end crashes.

The proposal was also developed to respond to the objectives of various government policies as described in the sections below.

2.1.1 State Infrastructure Strategy 2022-2042

The strategy identifies the NSW Government's infrastructure vision for the state over the next 20 years, across all sectors. It is supported by the Future Transport Strategy (Transport 2022a).

The proposal is consistent with the Strategy as it would integrate infrastructure and service planning, delivering improvements to Dobroyd Parade which would contribute to meeting future traffic growth transport requirements across Greater Sydney.

The proposal objectives of improving efficiency, safety, and flow of traffic along Dobroyd Parade, and improving the safety and amenity of Waratah Street and Dobroyd Parade for local residents would align with the State Infrastructure Strategy.

2.1.2 Future Transport Strategy

The Future Transport Strategy (Transport 2022a) is part of a suite of strategies, policies and plans that integrate and guide long-term land use, transport planning, and the design, delivery, and management of transport. The strategy provides the direction for Transport based on three outcomes:

- connecting our customers' whole lives
- successful places for communities
- enabling economic activity.

The proposal for the pedestrian bridge across Dobroyd Parade would meet these outcomes of the strategy, connecting *our customers' whole lives* and *successful places for communities* through the construction of an easily accessible bridge for pedestrian to safely cross Dobroyd Parade. This would enhance the liveability, amenity, and the local community connection to Iron Cove Creek, Timbrell Park, and the Five Dock commercial centre.

2.1.3 Beyond the Pavement

Beyond the Pavement (Transport 2020a) aligns with the Future Transport Strategy (Transport 2022a) by providing a guideline on creating 'successful places' with 'liveability, amenity and economic success of communities and places enhanced by transport'. The document sets out four physical urban design objectives which should be achieved by all road infrastructure work:

- projects should fit sensitively into the built, natural, and cultural environment in both urban and rural locations
- projects should contribute to the accessibility and connectivity of communities and a general permeability of movement through areas by all modes of movement
- the design and management of projects should contribute to the overall design quality of the public domain for the community, including transport users
- projects should help revitalise areas and contribute to the local and broader economy.

The proposal would directly respond to all four urban design objectives through providing a connection that responds to sensitivity of the visual and cultural environment. The proposal responds to the overarching urban design principles for Transport projects, as discussed further in section 2.3.3.

2.1.4 Sydney's Walking Future

The Sydney's Walking Future (Transport 2013a) has a goal of getting more people in Sydney walking via actions that make walking more convenient, better connected and a safer mode of transport. The actions set out in this strategy will make walking the transport choice for quick trips under two kilometres and will help people access public transport. Increasing the number of people walking and improving the experience of people who already walk will help to reduce the burden of congestion on roads, connect Sydney's communities, provide health benefits to individuals and free up capacity on key public transport corridors.

While the proposal site is not located within two kilometres of a nominated centre or public transport interchange, it is consistent with this Plan as it is an investment in safe walking infrastructure.

2.1.5 Sydney's Cycling Future

Sydney's Cycling Future (Transport 2013b) provides a framework for how cycling in Sydney is planned, prioritised and provided for in Sydney. The overarching goal of the Plan is to make cycling a safe, convenient and enjoyable transport option for short trips through the provision of a safe and connected bicycle network benefits the wider transport network by improving access to towns and centres, reducing congestion and increasing capacity on the public transport system.

The proposal would maintain connectivity for bike users by providing a safe crossing of Dobroyd Parade, access into Timbrell Park via the existing bridge over Iron Cove Creek, the existing on-road bicycle route along Waratah Street and Henley Marine Drive.

2.1.6 A Metropolis of Three Cities

The Greater Sydney Region Plan, A Metropolis of Three Cities (Greater Sydney Commission 2018a) has a vision of three cities, Western Parkland City, Central River City, and the Eastern Harbour City where most residents live within 30 minutes of their jobs, education and health facilities, services, and great places. The plan aims to align infrastructure and growth to restructure economic activity and access across the three cities. For Eastern Harbour City, in which the proposal is located this would include 'building on its recognised economic strength and addressing livability and sustainability'.

The transport related initiatives of the plan are aligned with Future Transport Strategy (Transport 2022a), being Sydney's Walking Future Strategy (Transport 2013a) and the Sydney's Cycling Future Strategy (Transport 2013b).

2.1.7 Eastern City District Plan

The Our Greater Sydney 2056 – Eastern City District Plan (Greater Sydney Commission 2018b) includes a vision that the Eastern City District will become ‘more innovative and globally competitive, carving out a greater portion of knowledge intensive jobs from the Asia Pacific Region’. It also identifies that achieving this vision will *improve the District’s lifestyle and environmental assets*.

Of relevance to the proposal is the identification that this vision will be achieved in part, by:

- sustaining communities through vibrant public places, walking and cycling
- aligning growth with infrastructure, including transport, infrastructure, and delivering sustainable, smart and adaptable solutions.

Planning priorities detailed in the plan that are applicable to the proposal include:

- Planning Priority E1 – Planning for a city supported by infrastructure
- Planning Priority E6 – Creating and renewing great places and local centres and respecting the district’s heritage
- Planning Priority E10 – Delivering integrated land use and transport planning and a 30-minute city.

2.1.8 Inner West Local Strategic Planning Statement

The Inner West Local Strategic Planning Statement (Inner West Council 2020) sets out the vision for the area over the next decade and the actions and intentions of the community. The statement talks to creating a sustainable and resilient community with green infrastructure that can support the growing population.

The proposal would align with this Strategy through the objectives of creating a more connected and safer environment by improving traffic flow, pedestrian connectivity, and safety. These objectives respond to the strategies themes of unique and networked liveability and sustainable and collaborative infrastructure.

2.2 Limitations of existing infrastructure

Dobroyd Parade is a state road and approved B-Double State Road with a posted speed limit of 60 kilometres per hour and is a principal east-west link between the Central Business District (CBD) and Western Sydney areas in Sydney’s Inner West.

The Dobroyd Parade eastbound approach to Waratah Street has two eastbound through lanes that continue down from Wattle Street intersection with Ramsay Street. Parallel to these through lanes, and separated by a thin median, there are another two eastbound through lanes that extend out of the WestConnex M4 East tunnel portal exit, which then widens to introduce a right turn bay to serve Waratah Street.

East of the Dobroyd Parade and Waratah Street intersection, one through lane from Dobroyd Parade continues and one through lane from Wattle Street and one through lane from the WestConnex M4 East tunnel exit merge to form one lane, and one through lane from WestConnex M4 East tunnel exit continue eastbound.

The Dobroyd Parade westbound approach to Waratah Street, has three lanes which enables both through movements (in all lanes), beyond the intersection and the left lane permits a left turn into Waratah Street. West of the Waratah Street intersection, the three Dobroyd Parade westbound lanes continue to serve A44 Wattle Street and diverge with a lane gain for the WestConnex M4 East tunnel entry.

Waratah Street is a local road with two lanes exiting onto Dobroyd Parade and one lane entering from Dobroyd Parade.

2.2.1 Pedestrian access routes

Pedestrians crossing Dobroyd Parade at the intersection with Waratah Street, currently use a two-stage signalised pedestrian crossing (Figure 2-1 and Figure 2-2), meaning they cross to the centre median in the first stage of the crossing and wait to complete the second stage of the crossing. Crossing Waratah Street at the same intersection also occurs via the existing signalised pedestrian crossing (Figure 2-3). There are existing concrete footpaths along both sides of Waratah Street (Figure 2-4 and Figure 2-5).



Figure 2-1 Existing Dobroyd Parade and Waratah Street signalised intersection



Figure 2-2 Existing Dobroyd Parade and Waratah Street signalised pedestrian crossing



Figure 2-3 Waratah Street signalised pedestrian crossing



Figure 2-4 View south along Waratah Street – existing concrete footpaths on the eastern side of the road

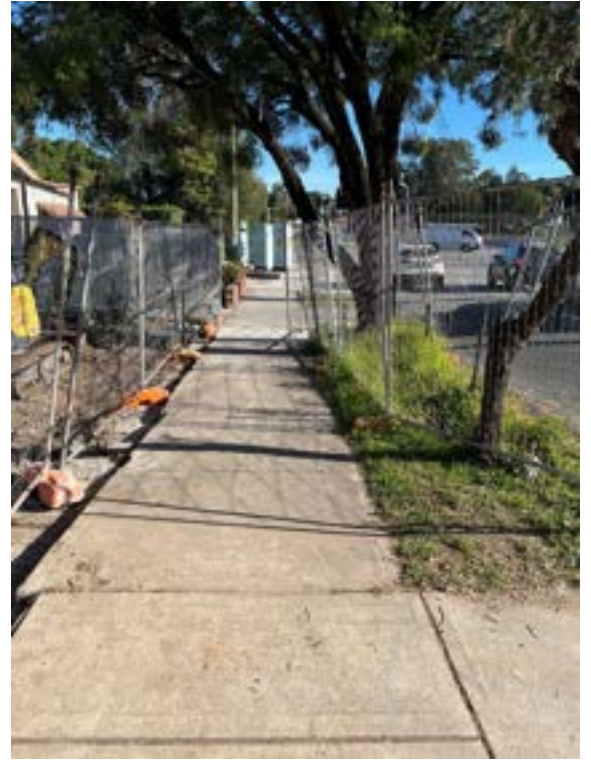


Figure 2-5 View north along Waratah Street – existing concrete footpaths on the western side of the road

Nearby signalised intersections, providing access across Dobroyd Parade for pedestrians are located at the Timbrell Drive/City West Link/Mortley Avenue intersection approximately 500 metres to the east, and at the Ramsay Street and Wattle Street intersection approximately 300 metres to the west of the proposal. Pedestrian access locations are shown in Figure 6-1.

To the west of the intersection of Dobroyd Parade and Waratah Street there is no pedestrian access available on the southern side of the road (Figure 2-6) with pedestrian and bike user access on this side of the road provided in the cul-de-sac Dobroyd Parade. A pedestrian footpath is provided on the northern side of Dobroyd Parade west of the Waratah Street intersection.

Pedestrian and movement along Dobroyd Parade to the west of the Waratah Street intersection is via the existing concrete footpaths and a shared path near Martin Street, also available to bike users (Figure 2-7).



Figure 2-6 Dobroyd Parade southern side east of proposal site – no pedestrian access



Figure 2-7 Shared pedestrian and bike path adjacent to Dobroyd Parade looking east from Martin Street

North of Dobroyd Parade at Waratah Street there is an existing low-level pedestrian bridge crossing over Iron Cove Creek to connect Timbrell Park (Figure 2-8 and Figure 2-9). This bridge is owned jointly by City of Canada Bay Council and Inner West Council and is used by pedestrians to access the areas north of Iron Cove Creek.



Figure 2-8 View south towards Dobroyd Parade and Waratah Street intersection



Figure 2-9 Access to Iron Cove Creek pedestrian bridge from Dobroyd Parade

Dobroyd Parade is a local road which is now closed off to Waratah Street after it was converted to a cul-de-sac as part of the WestConnex M4 East project (Figure 2-10). The posted speed limit is 50 kilometres per hour and it contains driveway access to private properties and provision for parking. There is an existing noise wall between Dobroyd Parade and the Dobroyd Parade cul-de-sac, which extends from Waratah Street to Crane Avenue.



Figure 2-10 View east from the Dobroyd Parade cul-de-sac

2.2.2 Parking

There is provision for parking along Waratah Street. The posted speed limit is 50 kilometres per hour with a 40 kilometres per hour restriction during school zones. Dobroyd Parade contains access to properties and Dobroyd Point Primary Public school.

Around the Dobroyd Parade and Waratah Street intersection, there is no provision for parking on either side of Dobroyd Parade.

2.3 Proposal objectives and development criteria

2.3.1 Proposal objectives

The objectives of the proposal are:

- improve safety for pedestrians, people with limited mobility, prams and bicycles
- ease congestion and improve flow of traffic along Dobroyd Parade
- minimise environmental and community impacts
- optimise the urban design and landscape outcome to compliment the surrounding natural, built and community environment.

2.3.2 Development criteria

The development criteria for the proposal includes:

- the bridge is to follow the *Appendix C: Pedestrian Bridge Design Standard For Built Up Areas* (Transport 2023g) from the Bridge Aesthetics publication, requiring the main span of the bridge to be a steel tied arch structure with access provided at each end by stairs and a lift
- the required vertical clearance is to be 1.5 metres greater than the minimum clearance “above other roads” (4.6 metres) resulting in a required clearance of 6.1 metres above the road surface
- the clear width between handrails is to be 2.3 metres on the bridge span and 1.8 metres on the stair flights and landings
- to avoid flooding of the northern end lift pit the lower lift landing is to have 0.5 metres freeboard above the 1% Annual Exceedance Probability (AEP) flood level. This requires a ramp at the northern end to provide access to the lift for the mobility impaired
- the supports for the bridge span are designed for collision loads from road traffic in accordance with Clause 11.2 of AS5100.2:2017
- a “glazed façade” on one face of the lift shaft (preferably facing east or west) is required.

2.3.3 Urban design objectives

The design of the proposal is guided by the overarching best practice urban design principles and the *Beyond the Pavement: urban design policy, procedures and design principles* (Transport 2020a).

Bridge design guidelines are set out in the *Bridge Aesthetics: Design guideline to improve the appearance of bridges in NSW* (Transport 2023g) and along with the following principles have used as the urban design basis for the proposal:

- *Structures should be simple, refined and elegant with minimal piers and abutments to maximise usability, permeability and visual transparency*
- *The design, form, materials and arrangement of all elements should be simple, elegant, refined and carefully integrated with adjoining elements*
- *Pedestrian bridges should be generous in scale, well lit, provide clear sightlines and feel safe, with their design welcoming, having architectural merit and being appropriate to the context and setting.*

The concept design for the proposal has responded to a number of the objectives and principles set out in *Beyond the Pavement: urban design policy procedures and design principles* (Transport 2020a). The design objectives include:

- fitting with the built fabric
- connecting modes and communities
- incorporating heritage and cultural contexts
- designing roads as an experience in movement
- creating intuitive road environments
- minimising adverse visual impacts
- ensuring the spaces under the bridge is not dark, degraded, and unsafe.

2.4 Alternatives and options considered

During the development of the proposal, five options were considered:

- Option 1 – base case or “do-nothing”
- Option 2 – construct a pedestrian bridge from Waratah Street to Timbrell Park
- Option 3 – construct a pedestrian bridge from Waratah Street to the southern side of Iron Cove Link with ramps and stairs
- Option 4– construct a pedestrian bridge from Waratah Street to the southern side of Iron Cove Link with stairs and lifts
- Option 5 – construct a single stage at-grade crossing.

These options were assessed against the proposal and urban design objectives detailed in section 2.3.3.

2.4.1 Identified options

Option 1 – do nothing

The ‘Do Nothing’ option would retain the current arrangement of pedestrian crossings at the Dobroyd Parade and Waratah Street intersection. Pedestrians, people with limited mobility, prams and bicycles would continue to use the two-stage at-grade crossing where there is a history of crashes and vehicles queuing through the intersection.

Option 2 – construct a pedestrian bridge from Waratah Street to Timbrell Park with ramp, stairs and lift access

Option 2 includes a pedestrian bridge crossing Dobroyd Parade from Waratah Street to Timbrell Park. The option removes the existing at-grade pedestrian crossing at Dobroyd Parade. It consists of lift and stairs on the Waratah Street side and a ramp on the Timbrell Park side (Figure 2-11). The ramp to the bridge would be about 100 metres long and extend into Timbrell Park and Livvi’s Place Playground. Modifications would need to be made to Timbrell Park and Livvi’s Place Playground to accommodate the footprint of the ramp. In the unlikely chance that the lifts are not operating, pedestrians would still be able to cross Dobroyd Parade using the existing crossing at the intersection of Ramsay Street and Wattle Street, about 320 metres away.

Option 3 – construct a pedestrian bridge from Waratah Street to the southern side of Iron Cove Link with ramps and stairs

Option 3 includes a pedestrian bridge crossing only over Dobroyd Parade with stairs and ramps at both ends (Figure 2-12). The option retains the existing low-level bridge crossing over Iron Cove Creek to access to and from Timbrell Park. The existing at-grade pedestrian crossing at Dobroyd Parade would be removed. The ramps to the bridge would be about 100 metres long and extend into Reg Coady Reserve on the northern side and the verge area between Dobroyd Parade and the existing cul-de-sac also called Dobroyd Parade on the southern side. The cul-de-sac and adjacent noise wall along Dobroyd Parade would need to be modified to accommodate the extent of the ramp.

Option 4– construct a pedestrian bridge from Waratah Street to the southern side of Iron Cove Link with stairs and lifts

Option 4 includes a pedestrian bridge crossing only over Dobroyd Parade with stairs and lifts at both ends (Figure 2-13). The option retains the existing low-level bridge crossing over Iron Cove Creek to access to and from Timbrell Park. The existing at-grade pedestrian crossing at Dobroyd Parade would be removed. In the unlikely chance that the lifts are not operating, pedestrians would still be able to cross Dobroyd Parade using the existing signalised crossings at the intersection of Ramsay Street and Wattle Street, about 320 metres away. A ramp is provided on the northern side of the bridge to access the lower lift landing which is raised above ground to protect it from being flooded.

Option 5- construct a single stage at-grade crossing

Option 5 includes replacing the existing two-stage at-grade crossing with a single stage at-grade crossing. Modifications to existing median island would be required to cater for the new crossing. The crossing would be at-grade where there is a history of crashes and vehicles queuing through the intersection.



Figure 2-11 Option 2



Figure 2-12 Option 3



Figure 2-13 Option 4

2.4.2 Analysis of options

Option 1 and 5 would not create any environmental, community or visual impact. However, it would not meet the proposal objectives to improve safety for pedestrians, people with mobility issues, prams or bikes, or ease congestion and improve traffic flow. Pedestrians would continue to use the signalised pedestrian crossing where there is a history of vehicles colliding with the pedestrian fence on the centre median and vehicles queuing across the intersection in the morning peak. This option was therefore not considered any further.

Options 2, 3 and 4, requiring the construction of a pedestrian bridge, meet the proposal objectives to improve safety for pedestrians, people with mobility issues, prams and bikes, or ease congestion and improve traffic flow as compared to Option 1.

Table 2-1 provides a summary of the analysis of Options 2, 3 and 4 in respect to minimising environmental and community impacts as well as optimising urban design and landscape outcomes.

Table 2-1 Analysis of options

Proposal Objectives	Option 2	Option 3	Option 4
Minimise environmental and community impacts	<p>The spiral ramp on the northern side of the bridge would impact about 200m² of Timbrell Park (specifically Livvi's Place) and require the removal of several trees, reducing the amenity of the area.</p> <p>The stairs and lifts on the southern side of the bridge has a smaller footprint compared to ramps but would still</p>	<p>The ramp on the northern side of the bridge would impact about 200m² of Reg Coady Reserve.</p> <p>The ramps and stairs on the southern side of the bridge would require removal of many trees.</p> <p>The Dobroyd Parade cul-de-sac and adjacent noise wall would need to be adjusted to suit the new bridge layout, although</p>	<p>The stairs on the northern side of the bridge would impact about 5m² of Reg Coady Reserve.</p> <p>The stairs and lift on the southern side of the bridge would require the removal of a few trees.</p> <p>If the lifts are not operating, people with mobility issues, prams and bikes would need to use the existing crossing</p>

Proposal Objectives	Option 2	Option 3	Option 4
	<p>require removal of a few trees. If the lifts are not operating, people with mobility issues, prams and bikes would need to use the existing crossing approximately 320 metres away.</p> <p>The large pedestrian bridge and ramp structure would be less sustainable to build and maintain due to the amount of materials required and additional ongoing maintenance requirements.</p>	<p>access to existing properties would be maintained.</p> <p>The large ramps on either side of the bridge would be less sustainable to build and maintain due to the amount of materials required and additional ongoing maintenance requirements.</p>	<p>approximately 320 metres away.</p>
Optimise the urban design and landscape outcome	<p>The larger longer bridge structure with a ramp over 100 metres long would have greater visual impact from both Five Dock and Haberfield.</p>	<p>The ramps on either side of the bridge over 100 metres long would have greater visual impact from Haberfield.</p>	<p>The stairs and lift arrangement are consistent with Transport’s <i>Bridge Aesthetics – Design Guideline</i> to improve the appearance of bridges in NSW. There is less visual impact compared to the other options.</p>

2.5 Preferred option

Option 4, which included a pedestrian bridge over Dobroyd Parade with stairs and lifts on either side was selected as the preferred option. This proposal would meet the objectives of providing a safe crossing of Dobroyd Parade, while also improving traffic flow through Dobroyd Parade and Waratah Street Intersection. The lifts provided would provide better access for mobility aid users and prams over ramps whilst still catering for bike users.

Options 2 and 3 would result in ramps about 100 metres long and greater impacts to Timbrell Park or Reg Coady Reserve respectively.

Option 4 fulfills the design objectives of reducing visual and amenity impact to the local environment. It also provides the best outcome in minimising impact to community spaces by having a smaller footprint and avoiding changes to existing local roads.

It is acknowledged that Option 4 does not provide ramps which would avoid bike users having to dismount their bikes to cross the bridge. The lifts proposed in the preferred option would be large enough to cater for a minimum of two bikes at a time and long enough for a cargo bike. Bicycle wheeling ramps would also be provided on the stairs to avoid needing to carry bikes up and down the stairs.

3. Description of the proposal

This chapter describes the proposal and provides descriptions of existing conditions, the design parameters including major design features, the construction method and associated infrastructure and activities.

The key purpose of this proposal is to construct a pedestrian bridge over Dobroyd Parade at the Waratah Street intersection and upgrade the surrounding road infrastructure to alleviate traffic congestion on the City West Link network and provide a safe environment for pedestrians and road users.

3.1 The proposal

Transport proposes to construct a pedestrian bridge over Dobroyd Parade at Waratah Street and upgrade the surrounding road infrastructure. The proposal is shown in Figure 1-1 and Figure 1-2.

Key features of the proposal include the following.

- new pedestrian bridge including a roof for weather protection, built over Dobroyd Parade at the Waratah Street intersection
- new lifts and stairs on either side of the pedestrian bridge, a ramp to the lower lift landing on the northern side
- removal of existing at-grade (street-level) road crossing on Dobroyd Parade and extension of the existing fence in the median
- widening the footpaths on approach to the Waratah Street crossing and a new kerb ramp to provide a smoother transition between the footpath and the road for bike users
- installing a concrete barrier along Dobroyd Parade in front of the pedestrian bridge
- relocation of utilities, new landscaping, signage and linemarking
- bicycle wheeling ramps on stairs.

The location of the proposal is shown in Figure 1-1 and an overview of the proposal is shown in Figure 1-2. Chapter 3 describes the proposal in more detail.

Construction of the proposal may be staged, so work impacts on the operation of the Dobroyd Parade and surrounding residences are minimised.

For the purpose of the REF, the proposal footprint, proposal area and site compounds have been defined as follows and shown in Figure 1-1 and Figure 1-2:

- proposal footprint – the area directly impacted by the proposed work, including the removal of structures and installation of new structures
- proposal area – the area around the proposal footprint required for construction, including the site compound and material handling area
- site compounds – the temporary facilities required for construction, including for example an office and amenities compound, construction compound, materials handling and load out area. These site compounds would likely be in the vicinity of the Waratah Street and Dobroyd Parade intersection. These areas are shown on Figure 1-1 and described in section 3.4, however, exact locations would be determined prior to construction.

3.2 Design

3.2.1 Design criteria

The proposal has been designed to all applicable NSW and Australian engineering and safety standards, including the following:

- Beyond the Pavement (Transport 2020a)
- QA Specification PS261 – Bridge and Structure Concept Design
- Australian Standards
 - AS 5100-2017 Bridge Design
 - AS1657-2013 Fixed platforms, walkways, stairways, and ladders – design, construction and installation
 - AS1428.1-2009 Design for access and mobility – general requirements
 - AS3661.2-1994 Slip resistance of pedestrian surfaces
 - AS2156.2-2001 Walking tracks – infrastructure design
 - AS1158-2010 Lighting for roads and public spaces
 - AS3000-2007 Electrical installations
 - AS61000 Electromagnetic compatibility
 - AS3008 Electrical installations – selection of cables
 - AS3439 Low-voltage and control gear assemblies
 - AS2293 Emergency escape lighting and exit signs for buildings
- Austroads Guide to Bridge Technology and associated Roads and Maritime supplements
- Roads and Maritime Bridge Aesthetics Guidelines
- Roads and Maritime Pedestrian Bridge Standard for Built-up Areas
- Roads and Maritime Bridge Specifications, including but not limited to:
 - B381 – Design, supply, and installation of pedestrian bridge lifts
- Roads and Maritime Bridge Technical Directions, including but not limited to:
 - BPC 2003/08 Bridge Screens
 - BPC2005/09 Provision for Disabled Access for Pedestrian Bridges
 - BPC2007/07 Vertical Clearance on Bridges
 - BTD2008/07 Design of Bridge Supports for Collision Load from Road Traffic
 - BTD2008/02 Access for Inspection, Monitoring and Repair or Replacement of Bridge Components
 - BTD2012/01 Provision of safety screens on bridges
 - 2017/02 Implementation of AS5100:2017 – Bridge Design
- National Construction Code 2016
- ACMA C-tick and A-tick regulations.

Design elements of the proposal are subject to potential change and refinement. These criteria would be taken into consideration for any future alterations to the proposal.

3.2.2 Engineering constraints

Table 3-1 lists the main engineering constraints to the development and describes how they have been addressed in the concept design.

Table 3-1 Engineering and development constraints

Constraint	Concept design provision
Construction	<ul style="list-style-type: none"> To minimise disruption to traffic, prefabrication of the main structure and installation in a single night is required. Weight reduction considerations have been undertaken to support this aspect of the construction and reduce the time needed for installation.
Traffic	<ul style="list-style-type: none"> Requirements for collision loading have been met for the supporting columns and stair structures. Temporary road closure would be required for various stages of the construction. Total road closure is expected to be in place for only one night with partial road closure expected for a minimum of two nights each across two stages (refer section 6.1).
Flooding	<ul style="list-style-type: none"> The proposal site is subject to mainstream flooding of Iron Cove Creek with a 1% AEP flood level of approx. 0.6 metres above the existing ground level at the northern end of the bridge. As such the northern lift is required to have a freeboard 0.5 metres above the 1% AEP and stairs and an accessibility ramp to the lift base have been included in the design to accommodate this. The southern end lift does not fall below the flood level.
Maintenance	<ul style="list-style-type: none"> Steel bridges are required to have a clearance of 1.5 metres higher than the minimum clearance for steelwork maintenance purposes. As such the clearance has been raised from 4.6 metres to 6.1 metres. The removal of bearings and deck joints has been considered where possible to reduce maintenance burden.
Utilities	<ul style="list-style-type: none"> Bridge and stair support structures have been positioned to avoid underground drainage and service structures. However, relocation may still be necessary for unavoidable utilities.

3.2.3 Major design features

Pedestrian bridge

A new pedestrian bridge would be constructed across Dobroyd Parade at Waratah Street. The bridge would span 37 metres across 7 lanes of traffic with a deck width of 2.3 metres between handrails and a total bridge width of 3.5 metres. The bridge clearance is 6.1 metres above the road.

The bridge would feature lift and stair structures at either end. The lift would be of suitable size to accommodate multiple people, various accessibility needs, or a minimum of two bikes and long enough for a cargo bike (2.3 metres long) at one time.

The southern support column of the bridge and lift structure would be situated on the corner of Waratah Street and the Dobroyd Parade cul-de-sac and the northern support column and lift structure would be situated on the southern bank of Iron Cove Creek.

The proposed bridge would be a tied arch structure with a roof, supported by cantilever support beams off the lift shafts on either end. The northern side of the bridge would feature a three flight staircase above the existing footpath and a Disability Discrimination Act (DDA) compliant accessibility ramp from the lower lift landing to comply with flood constraints (refer section 3.2.2). The southern side of the bridge features a

lift structure positioned to avoid clashes with utility pits and cables in the vicinity and a stair structure placed similarly with the entrance in a desirable location for pedestrians on the footpath.

The bridge would provide sufficient space for pedestrian and bike traffic while incorporating safety and accessibility.

Road upgrades

The road work at the Waratah Street and Dobroyd Parade intersection would include the removal of the at-grade pedestrian crossing, widening of the existing footpaths, new signage and linemarking. Landscaping of the areas around the lift landings and stairs would include the planting of native trees, shrubs, and groundcover to visually anchor the bridge to the locality, provide shade for pedestrians, and minimise the extent of hard paving.

The proposal would include a concrete barrier on the northern side of the intersection. This would act as a protective measure against collisions to the lift shaft and ramp on the northern side and to encourage use of the pedestrian bridge.

These design features are shown in Figure 3-1.



Figure 3-1 Bridge concept design (subject to detailed design)

3.3 Construction activities

The appointed contractor would confirm the final construction activities in discussion with Transport. As such, this section only indicates a likely method and work plan as it may vary due to the identification of additional constraints before work starts, detailed design refinements, community and stakeholder consultation feedback, and contractor and equipment requirements/limitations.

3.3.1 Work methodology

The proposal would be built under Transport specifications as managed by the contractor under a Construction Environmental Management Plan (CEMP). The specification included in the CEMP would cover factors such as environmental performance and management, materials storage and management, and water quality.

The proposal would most likely comprise a sequence of work activities similar to those summarised in Table 3-2.

Table 3-2 Proposal staging

Stage	Activity	Associated work
1	Site establishment	<ul style="list-style-type: none"> Establishment of a temporary site compound (erect site offices, amenities, and plant/material storage areas etc.). Temporary fencing around site compounds and other locations. Traffic control measures (for pedestrians and vehicles) would be established in accordance with a Traffic Management Plan (TMP). Environmental controls would be established in accordance with the CEMP.
2	Clearing for earthworks and foundation treatment	<ul style="list-style-type: none"> The area in the vicinity of the proposed bridge, lift, stairs and ramp would need to be cleared of any vegetation and existing pavement. Piles and foundation treatments for the bridge, stairs, and lift pits on either side of the bridge would be undertaken behind traffic barriers during day shift hours.
3	Relocation and adjustment of utility assets	<ul style="list-style-type: none"> Relocation of TCS cabinets / controllers on Waratah Street and adjustment of utility assets (particularly levels for various pits) would be required prior to any path or bridge work. This includes adjustment of the existing plinth and TCS cabinet on the west side of Waratah Street. The path and associated utility works can take place behind temporary traffic barriers.
4	Construction of bridge deck	<ul style="list-style-type: none"> Following the foundation work, construction of the bridge would involve the following major stages: <ul style="list-style-type: none"> groundwork for bridge lift pit and construction of the bridge column support to be carried out behind traffic barriers during day shift hours lift single span precast bridge deck into place from the road corridor. This would require full road closure and must be undertaken as night work installation of bridge furniture including balustrades, canopy, and screens.
5	Bridgeworks and construction of lifts and stairs	<ul style="list-style-type: none"> Following bridge lifting work, construction of the lift pit and shaft, stairs, ramp, and footpaths on either side of the bridge can take place behind temporary traffic barriers. Continued traffic control may be required during this work to allow for materials to be transported to and from site.
6	Waratah Street work	<ul style="list-style-type: none"> Following completion of the southern bridge work, work can be undertaken to widen the footpath on west side of Waratah Street. Installation of bicycle pavement marking on Waratah Street would require closure of the affected lanes. It is anticipated

Stage	Activity	Associated work
		to be completed across a minimum of two-night shifts, one for each side of the road.
7	Concrete barrier installation	<ul style="list-style-type: none"> Installation of the permanent concrete barrier and crash cushion along Dobroyd Parade eastbound can be completed following completion of the bridge work and associated stairs, ramp, and footpath on the northern side of the bridge.
8	Removal of the existing at-grade crossing	<ul style="list-style-type: none"> Following completion of other work, removal of the existing at-grade crossing at Dobroyd Parade would be required. It is likely be completed in two stages at night. <ul style="list-style-type: none"> closure of Dobroyd Parade eastbound lanes – infill existing kerb ramps across Dobroyd Parade eastbound and provide new kerb to match existing. Mill and re-sheet road pavement to remove existing crossing line marking along eastbound lanes. Remove the existing pedestrian fence across median and reinstate to block any potential crossing. closure of Dobroyd Parade westbound lanes - infill existing kerb ramps across Dobroyd Parade westbound and provide new kerb to match existing. Mill and re-sheet road pavement to remove existing crossing line marking along westbound lanes.
9	Site clean up	<ul style="list-style-type: none"> The site would be cleaned up and restored to its previous state. Temporary structures would be removed.

The footprint associated with the proposal and construction work is shown in Figure 3-2.



Figure 3-2 Proposal footprint and site compound locations

3.3.2 Construction workforce

Workforce numbers on site during construction would generally vary between 10-15 people on site at any one-time people for the duration of the proposal with the maximum number of workers onsite at any one time being about 20.

3.3.3 Construction hours and duration

Start date and length of construction

Subject to planning approvals, the proposal would be built over a duration of six months commencing in late 2024.

Working hours

The work would take place within and outside of standard working hours. Standard working hours are:

- Monday to Friday: 7am to 6pm
- Saturday: 8am to 1pm.

Work would be completed during the standard work hours except for the following three stages which would be undertaken at night.

- bridge lifting work
- removal of the at-grade crossing
- pavement marking work.

The night work would occur as road closure would be necessary to complete each stage. Partial road closure would be necessary during the removal of the at-grade crossing stage and the pavement marking stage.

3.3.4 Plant and equipment

The following are plant and equipment that would likely be used to build the proposal; however, this would be confirmed by the contractor:

- mill and re-sheet existing pedestrian crossings
 - 1.5 metre profiler
 - asphalt paver
 - 6t roller or smaller
- removal/addition of kerb ramps
 - 5t excavator with hammer attachment
 - 5t excavator with bucket attachment
- removal of existing footpath
 - 5t excavator with hammer attachment
 - 5t excavator with bucket attachment
- concrete work
 - concrete agitator (delivery)
- sign installation
 - vacuum excavator truck (non-destructive digging)

- bridge piling
 - piling rig
 - concrete agitator (delivery)
 - vibrating needles
 - concrete boom pump
- lift structure and ramp construction
 - elevated work platform
 - crane
 - concrete boom pump
 - concrete agitator (delivery)
- bridge structure
 - crane
 - elevated work platforms.

3.3.5 Earthworks

Earthworks would be limited to the nature of the proposal; however, this could be subject to change depending on future detailed design of the proposal. Earthwork for the proposal would include the following:

- clearing vegetation and existing pavement
- piling and foundation treatment for the bridge, stairs, and lift pits on both side of the bridge
- earthworks may be employed for the ancillary facilities depending on the specifications of the contractor (refer section 3.4).

3.3.6 Source and quantity of materials

Various standard construction materials would be required to build the proposal. They would either be transported to site as prefabricated units ready for installation or delivered in small quantities for use as needed. The main materials needed to build the proposal would comprise of the following:

- pre-cast concrete
- concrete for elements required in-situ pouring
- prefabricated steel arch and other bridge elements
- prefabricated stainless steel handrails and mesh panels
- prefabricated steel mesh panels
- prefabricated glass and steel lift elements
- concrete and asphalt for the new kerbs, pavements, and road elements
- prefabricated signage, light fittings, and street furniture
- additional materials such as relatively small quantities of paint, oils, fuels, and other materials.

Materials would be sourced from local suppliers wherever feasible and cost effective. Sustainable materials and finishes would be considered during sourcing while ensuring the final proposal considers maintenance, durability, and lifespan.

3.3.7 Traffic management and access

Road and pedestrian traffic management would be required while certain elements of the proposal are being built and installed. This may include the following:

- heavy vehicles accessing the site during site establishment and construction
- providing alternative pedestrian routes to access the Dobroyd Parade and Waratah Street intersection during site establishment and construction
- introduction of construction traffic along Dobroyd Parade
- total road closure of Dobroyd Parade during bridge lifting work
- partial road closure of Dobroyd Parade during at-grade crossing removal
- partial road closure of Waratah Street during pavement marking work
- restricted access to site compounds
- lane closures as required.

Vehicular property access would be maintained during construction. Lane closures would be subject to Road Occupancy Licenses. Construction would occur behind barriers during standard hours for the proposal with the exception for the stated phases occurring outside of standard hours.

Construction traffic and access would be managed in accordance with a TMP prepared by the contractor as part of the CEMP for the proposal. The TMP would include establishing and maintaining appropriate traffic control, parking procedures and management, construction vehicle movement requirements and management, notification to local residents, community and business, and pedestrian management.

Traffic detours that would be required during the lifting phase for the bridge are shown in Figure 3-3. Heavy vehicle routes would continue along WestConnex tunnels or use alternative approved heavy vehicle routes including Paramatta Road, Victoria Road and Great North Road.



Figure 3-3 Light vehicle detour route

3.4 Ancillary facilities

Three proposed located for temporary site compounds are as shown in Figure 3-2. These are:

- Site compound 1 - lot adjacent to Reg Cody Reserve
- Site compound 2 - 287 Ramsay Road, Haberfield
- Site compound 3 - 87 Dobroyd Parade/21 Martin Street, Haberfield.

These compounds would be used for the following:

- existing hardstand area - material or vehicle storage or activity
- temporary buildings such as a site office, amenities, and storage
- parking areas
- stockpiling, laydown, and storage areas
- refuelling area for plant and equipment
- material storage.

These areas would only use the grass areas of the lots with no tree clearance required. The areas would be fenced with the perimeter fencing provided on all sites and tree protection would be used to ensure trees adjacent to the site compound are not harmed. Site compounds would be returned to a condition equivalent, or better than, their current condition.

Specific requirements for ancillary facilities such as hoarding heights and clearing/levelling requirements would be updated by the contractor during the detailed design or construction phase of the proposal.

3.5 Public utility adjustment

A review of relevant data as part of the preliminary site investigations was conducted for utility assets in the proposal footprint. The asset owners within the footprint include the following:

- two communication utilities – Transport
- three communication utilities – Telstra
- two electrical utilities – Transport
- four electrical utilities – Ausgrid
- three gas utilities – 110PE, 110NY, or 75NY – Jemena
- four sewer utilities – 225VC or Cl – Sydney Water
- nine stormwater utilities – 300mm, 375mm, 450mm, 252mm, 600mm, or 900mm pipe – Inner West Council
- four water utilities – 900mm SCL or 100mm CICL – Sydney Water.

Provision has been taken to avoid these utilities, however, interaction with some may be unavoidable and relocation has been considered in the proposal (refer section 1.1.1).

Utility asset locations are displayed in Figure 3-4 around the proposal. Utility locations are not displayed for site compounds as no disturbance or relocation would be required.

3.6 Property acquisition

No property would be acquired under the proposal. The additional land needed to support construction would either be leased or used under agreement with Inner West Council.

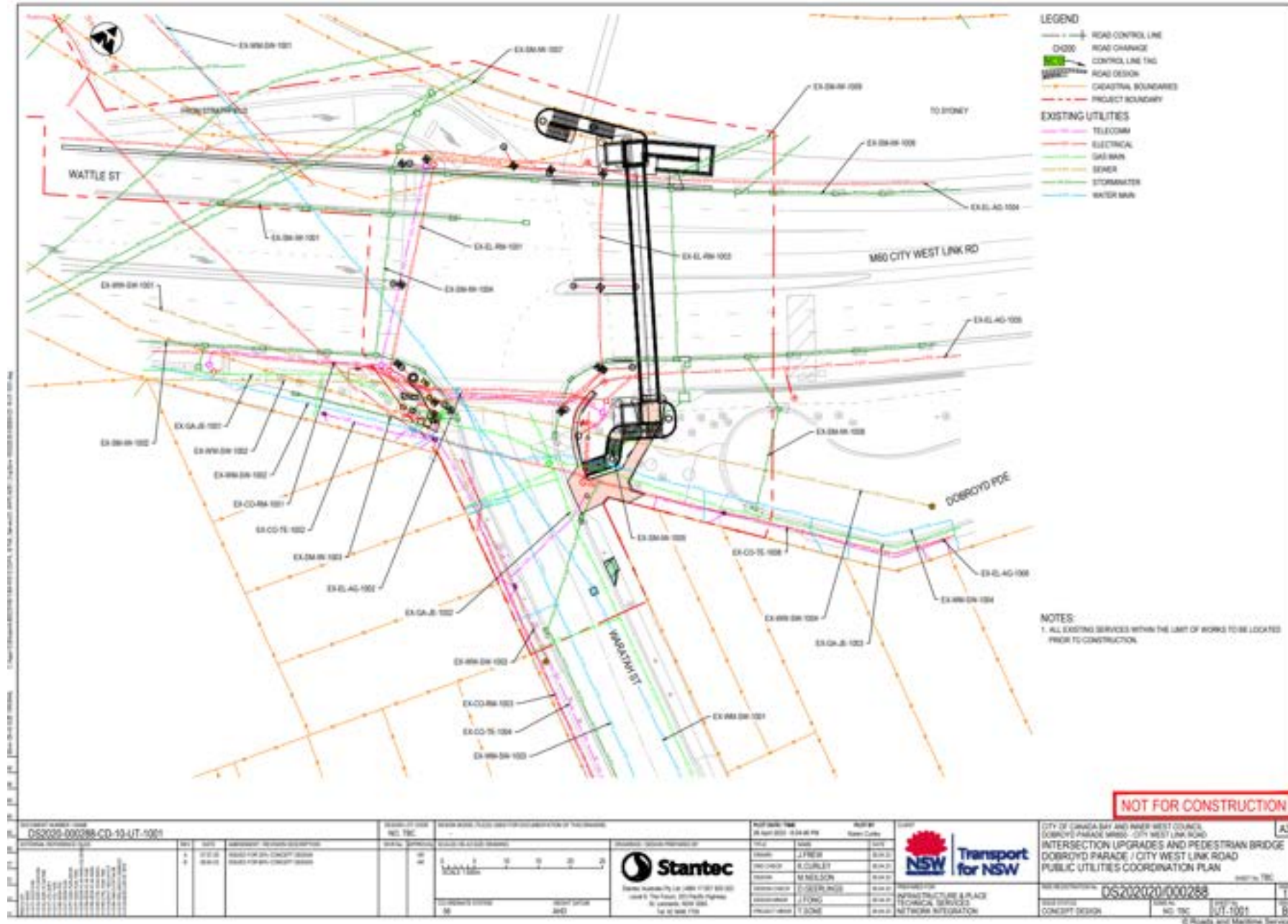


Figure 3-4 Existing utilities in the proposal area

4. Statutory and planning framework

This chapter provides the statutory and planning framework for the proposal and considers the provisions of relevant state environmental planning policies, local environmental plans, and other legislation.

4.1 Environmental Planning and Assessment Act 1979

4.1.1 State Environmental Planning Policies

State Environmental Planning Policy (Transport and Infrastructure) 2021

State Environmental Planning Policy (Transport and Infrastructure) 2021 (SEPP (Transport and Infrastructure)) aims to facilitate the effective delivery of infrastructure across the State.

Section 2.109 of SEPP (Transport and Infrastructure) permits development on any land for the purpose of a road or road infrastructure facilities to be carried out by or on behalf of a public authority without consent.

As the proposal is for road infrastructure facilities and is to be carried out on behalf of Transport it can be assessed under Division 5.1 of the EP&A Act. Development consent from council is not required.

The proposal is not located on land reserved under the *National Parks and Wildlife Act 1974* and does not require development consent or approval under:

- State Environmental Planning Policy (Resilience and Hazards) 2021
- State Environmental Planning Policy (Planning Systems) 2021
- State Environmental Planning Policy (Precincts – Central River City) 2021
- State Environmental Planning Policy (Precincts – Eastern Harbour City) 2021
- State Environmental Planning Policy (Precincts – Regional) 2021
- State Environmental Planning Policy (Precincts – Western Parkland City) 2021.

Section 2.10 to 2.15 of SEPP (Transport and Infrastructure) contains provisions for public authorities to consult with local councils and other public authorities prior to the commencement of certain types of development. Consultation, including consultation as required by SEPP (Transport and Infrastructure) (where applicable), is discussed in Chapter 5 of this REF.

State Environmental Planning Policy (Biodiversity and Conservation) 2021

Chapter 8 (Sydney Drinking Water Catchment) of SEPP (Biodiversity and Conservation) 2021 relates to the use of land within the Sydney drinking water catchment. Section 8.11 of the SEPP requires consideration of whether an activity to which Division 5.1 of the EP&A Act applies will have a neutral or beneficial effect on water quality before carrying out the activity.

As the proposal is not located within the Sydney drinking water catchment, Chapter 8 (Sydney drinking water catchment) of the SEPP (biodiversity and Conservation) 2021 does not apply and a neutral or beneficial effect assessment is not a necessary consideration.

4.1.2 Local Environmental Plans

Inner West Local Environmental Plan 2022

The Inner West Local Environmental Plan (Inner West LEP) is the statutory planning document which applies to all land within the Inner West Local LGA. The following sections provide a summary of the relevant aspects of the Inner West LEP which are applicable to the proposal.

Zoning

The proposal is largely located on SP2 Infrastructure zoned land, with parts also extending in land zoned as RE1 Public recreation land and R2 low density residential (Figure 4-1). The objectives of the SP2 Infrastructure zone are to provide for infrastructure and related uses; to prevent development that is not compatible with or that may detract from the provision of infrastructure; to protect and provide for land used for community purposes; and to provide for public, community and social infrastructure.

The proposal is consistent with the objectives of this zone and the LEP states that it is permissible with consent. However, the proposal is permissible under section 2.109 of the SEPP (Transport and Infrastructure) and can be carried out by on behalf of a public authority without consent.

Site compound 1 is proposed on SP2 Infrastructure land zone and site compounds 2 and 3 are proposed on R3 medium density residential land zones (Figure 4-1). Land zones around the site compounds include RE1 public recreation, R3 medium density residential, R2 low density residential, and SP2 drainage infrastructure. Site compound 3 is located to the south-east of E1 Local centre land zone, being the Five Dock commercial area.

To the north of the proposal is a large area zoned RE1 public recreation which includes Reg Coady Reserve, land along Iron Cove Creek and Timbrell Park. The surrounding residential areas are zoned either R2 low density residential or R3 medium density residential as shown on Figure 4-1 Land zones in the vicinity of the proposal.

Site compound 1 is proposed on SP2 Infrastructure land zone and site compounds 2 and 3 are proposed on R3 medium density residential land zones. Land zones around the site compounds include RE1 public recreation, R3 medium density residential, R2 low density residential, and SP2 drainage infrastructure. Site compound 3 is located within proximity to the E1 Local centre land zone to the northwest.

Land use zones in the vicinity of the proposal, including site compounds, are shown in Figure 4-1, with the objectives of the zoning within the proposal works area provided in Table 4-1.

Heritage Conservation

The proposal is situated within the HCA. Section 6.20 of the Inner West LEP aims to manage development on land in the HCA. The objective of this section is to maintain a single story appearance of dwellings in this area and applies to all land identified as C54 on the Inner West LEP Heritage mapping.

Potential impacts of the proposal on heritage are discussed in Chapter 6.

Development Control Plan

The Development Control Plan (DCP) outlines the detailed design and planning guidelines to support planning controls in the Inner West LEP. Section 6.15 outlines the DCP for certain development within areas identified as Area 1 on the Inner West Key Sites mapping. The proposal is not located within Area 1.



Figure 4-1 Land zones in the vicinity of the proposal

Table 4-1 Inner West LEP zoning

Zone	Objectives of the zone	Proposal component
R2	<ul style="list-style-type: none"> To provide for the housing needs of the community within a low-density residential environment. To enable other land uses that provide facilities or services to meet the day to day needs of residents. To provide residential development that maintains the character of built and natural features in the surrounding area. 	To the south of Dobroyd Parade and the northwest of the proposal area.
R3	<ul style="list-style-type: none"> To provide for the housing needs of the community within a medium density residential environment. To provide a variety of housing types within a medium density residential environment. To enable other land uses that provide facilities or services to meet the day to day needs of residents. To encourage residential development that results in appropriate amenity for a medium density residential area. 	To the southwest and west of the proposal area.
RE1	<ul style="list-style-type: none"> To enable land to be used for public open space or recreational purposes. To provide a range of recreational settings and activities and compatible land uses. To protect and enhance the natural environment for recreational purposes. To conserve, maintain and enhance biodiversity and the natural environment, including terrestrial, aquatic, and riparian habitats and natural landforms. 	Immediately to the north, east, and west of the proposal area.

Zone	Objectives of the zone	Proposal component
SP2	<ul style="list-style-type: none"> • To provide for infrastructure and related uses. • To prevent development that is not compatible with or that may detract from the provision of infrastructure. • To protect and provide for land used for community purposes. • To provide for public, community and social infrastructure. 	<p>Located within the proposal area and along the alignment of Dobroyd Parade and Iron Cove Creek.</p>
E1	<ul style="list-style-type: none"> • To provide a range of retail, business and community uses that serve the needs of people who live in, work in or visit the area. • To encourage investment in local commercial development that generates employment opportunities and economic growth. • To enable residential development that contributes to a vibrant and active local centre and is consistent with the Council’s strategic planning for residential development in the area. • To encourage business, retail, community, and other non-residential land uses on the ground floor of buildings. • To provide employment opportunities and services in locations accessible by active transport. • To provide retail facilities and business services for the local community commensurate with the centre’s role in the local centre’s hierarchy. • To ensure Inner West local centres are the primary location for commercial and retail activities. • To ensure that new development provides diverse and active street frontages to attract pedestrian traffic and to contribute to vibrant, diverse, and functional streets and public spaces. • To enhance the unique sense of place offered by Inner West local centres by ensuring buildings display architectural and urban design quality and contributes to the desired character and cultural heritage of the locality. 	<p>Five Dock local centre to the northwest of the proposal area.</p>

4.2 Other relevant NSW legislation

4.2.1 Roads Act 1993

Roads Act 1993 provides for the construction and maintenance of public roads. *Roads Act 1993* requires consent to dig up, erect a structure or carry out work in, on or over a road. City West Link (also known as Dobroyd Parade) is a classified State Road under the Schedule of Classified Roads (Transport 2023b). Waratah Street is classified as a local road under the NSW Road Network Classifications (Transport 2023c).

The works would be undertaken by Transport in accordance with the provisions of the *Roads Act 1993*.

4.2.2 Crown Lands Management Act 2016

Crown Lands Management Act 2016 provided for the ownership, use and management of the Crown land of New South Wales, to provide clarity concerning the law applicable to Crown land, to require environmental, social, cultural heritage and economic considerations to be taken into account in decision-making about Crown land, to provide for the consistent, efficient, fair and transparent management of Crown land for the benefit of the people of NSW, and to provide for the management of Crown land having regard to the principles of Crown land management.

Under the *Crown Land Management Act 2016* consideration for environmental, social, cultural heritage and economic factors are to be considered in decision making about Crown Land. The proposal area and associated work include part of Reg Coady Reserve which is Crown land (Lots 20-21 DP 1219692). Inner West Council is the Crown Land Manager for this area.

4.2.3 Heritage Act 1977

Heritage Act 1977 provides for the protection of conservation of buildings, works, maritime heritage (wrecks), archaeological relics and places of heritage value through their listing on various state and local registers. *Heritage Act 1977* makes it an offence to harm any non-Aboriginal heritage values without permission.

The proposal is located next to Dobroyd Stormwater Channel No.53 (Iron Cove Creek) which is listed on the Sydney Water Heritage & Conservation Register (No. 4571056) as being of local significance and is also partly located within the HCA in the Inner West LEP.

The proposal is unlikely to impact on non-Aboriginal heritage. Further details on non-Aboriginal heritage are provided in Chapter 6 and Appendix E.

4.3 Commonwealth legislation

4.3.1 Environment Protection and Biodiversity Conservation Act 1999

Under the EPBC Act, a referral is required to the Australian Government for proposed actions that have the potential to significantly impact on matters of national environmental significance or the environment of Commonwealth land.

A referral is not required for proposed road activities that may affect nationally listed threatened species, endangered ecological communities, and migratory species. This is because requirements for considering impacts to these biodiversity matters are the subject of a strategic assessment approval granted under the EPBC Act by the Australian Government in September 2015.

The proposal does not impact on Commonwealth land. Potential impacts on matters of national environmental significance are addressed in Chapter 6 and Appendix A.

Findings - matters of national environmental significance

The assessment of the proposal's impact, on matters of national environmental significance and the environment of Commonwealth land, found that there is unlikely to be a significant impact on relevant matters of national environmental significance or on Commonwealth land. Accordingly, the proposal has not been referred to the Australian Government Department of Climate Change, Energy, the Environment and Water under the EPBC Act.

Findings - nationally-listed biodiversity matters (where the strategic assessment applies)

The assessment of the proposal's impact on nationally listed threatened species, endangered ecological communities and migratory species found that there is unlikely to be a significant impact on relevant matters of national environmental significance. Chapter 6 of the REF describes the safeguards and management measures to be applied.

4.4 Other relevant Commonwealth legislation

4.4.1 Native Title Act 1993

The *Native Title Act 1993* recognises and protects native title. The Act covers actions affecting native title and the processes for determining whether native title exists and compensation for actions affecting native title. It establishes the Native Title Registrar, the National Native Title Tribunal, the Register of Native Title Claims and the Register of Indigenous Land Use Agreements, and the National Native Title Register. Under the Act, a future act includes proposed public infrastructure on land or waters that affects native title rights or interest.

A search of the [Native Title Tribunal Native Title Vision](#) website was undertaken, with no Native Title holders/claimants identified.

Transport would provide a notice of the proposal to NTSCORP under section 24KA of the Act and would invite comment on the proposal.

4.4.2 Aboriginal and Torres Strait Islander Heritage Protection Act 1984

The purpose of the *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* is the preservation and protection from injury or desecration of areas and objects in Australia and in Australian waters, being areas and objects that are of particular significance to Aboriginals in accordance with Aboriginal tradition.

Safeguards proposed for the construction stage of the project include the implementation of the Transport Unexpected Heritage Items Procedure (Transport 2022d) in the event that an unknown or potential Aboriginal object/s, including skeletal remains, is found during construction.

4.5 Confirmation of statutory position

The proposal is categorised as development for the purpose of road infrastructure facilities and is being carried out by or on behalf of a public authority. Under section 2.109 of SEPP (Transport and Infrastructure) the proposal is permissible without consent. The proposal is not State significant infrastructure or State significant development. The proposal can be assessed under Division 5.1 of the EP&A Act.

Transport for NSW is the determining authority for the proposal. This REF fulfils Transport's obligation under section 5.5 of the EP&A Act including to examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the activity.

5. Consultation

This chapter discusses the consultation undertaken to date for the proposal and the consultation proposed for the future.

5.1 Consultation strategy

Transport has prepared a Community and Stakeholder Engagement Plan (CSEP) to guide communications and consultation activities for the proposal. The consultation approach for the proposal aims to:

- provide regular and targeted information to the community and stakeholders on the need and benefits of the proposal and the progress of the proposal and construction activities
- provide opportunities for the public to have meaningful input during development of the proposal
- ensure community and stakeholder feedback and issues are considered in the decision making process
- build stakeholder and community confidence by demonstrating Transport's understanding of the community values and the potential impacts of the proposal, and the measures carried out to manage and minimise potential issues
- manage stakeholder feedback and complaints in a timely, respectful way.

The CSEP outlines the relevant stakeholder groups that have been identified for the proposal, as they may have interested or be affected by the proposal. These groups include, but are not limited to:

- state and local government agencies and elected government representatives
- key organisations
- emergency services
- utility providers
- Aboriginal groups including local Aboriginal land councils
- special interest groups such as bicycle user groups and heritage groups
- local residents, businesses, schools, pedestrians, bike users and road users.

These stakeholder groups would be consulted with on relevant aspects of the proposal using a variety of engagement activities and consultation methods including digital and traditional engagement tools to ensure a broad reach, accommodate the different demographics of the community, and to provide multiple channels and opportunities for the community to provide feedback to Transport.

5.2 Community involvement

5.2.1 2020 Consultation – Haberfield, Leichhardt, and Ashfield proposals

Community and stakeholders were first consulted on a pedestrian bridge proposal at the intersection of Dobroyd Parade and Waratah Street, Haberfield between April and May 2020. The proposal was presented as part of consultation on a series of local network improvements across the Haberfield, Ashfield and Leichhardt area and surrounding suburbs (HAL proposals).

At this stage, Transport has decided to proceed with the development of the pedestrian bridge over Dobroyd Parade and does not plan to proceed with the other network improvements as originally proposed in 2020. Transport is consulting with local councils about appropriate measures to address traffic issues in these areas. Transport will consult with the community on any future plans for intersection upgrades in the area.

Table 5-1 summarises the community engagement activities carried out to date for the proposal. It is noted that the consultation approach for the proposal to date has largely excluded face-to-face consultation activities due to the COVID-19 restrictions and social distancing requirements.

Table 5-1 2020 community consultation activities

Consultation activity	Summary	Dates
Briefing	Briefing with WestConnex Community Reference Group to present the HAL proposals.	22 April 2020
Project enquiries phone, email, and mail address	Centralised project information telephone line (1800 951 212) for feedback, enquiries and to make submissions on the proposals. A project email address (ni@rms.nsw.gov.au) to accept submissions and respond to community feedback. Postal address to which stakeholders could send written feedback to the project team: Transport for NSW Network Integration Communications Locked Bay 928, North Sydney NSW 2060	23 April 2020 to 24 May 2020
Briefing	Briefing with Jo Haylen MP for Summer Hill on the HAL proposals.	23 April 2020
Interactive feedback portal	Interactive feedback portal with animations and videos and FAQs. Feedback from the community on the series of HAL improvements were made by dropping a pin on the map or completing an online form.	23 April 2020 to 24 May 2020
Facebook advertisement	Transport for NSW Facebook account advertised the interactive portal and invited community to provide feedback. Sponsored posts were also utilised from the NSW Roads account targeting Facebook users within a 5 kilometre radius of the proposal.	23 April 2020 to 24 May 2020
Media Release	Media Release issued to Inner West Courier and The Sydney Morning Herald.	23 April 2020
Community briefings	Phone calls, briefings and face to face meetings with businesses, residents and community groups throughout HAL consultation period.	23 April 2020 to 24 May 2020
Email	Emails sent to 800+ registered stakeholders with community letter attached and link to the interactive portal for further information.	23 April 2020
Letterbox drop	25,000 letters were distributed to residents and businesses within Haberfield, Ashfield, Leichhardt, Five Dock, Dobroyd Point, Lilyfield, and Rodd Point. The letters informed them about the proposal and included an Italian translation for residents who speak Italian.	23 April 2020 to 24 May 2020
Live webinar	Webinar sessions were held in replacement of drop-in community information sessions due to the COVID-19 restrictions. The webinar sessions allowed the community to engage with the project team through a live format which included a live Q&A chat function to ask questions about the proposals. There were 55 community members who attended the webinar and approximately 150 questions	2 May 2020

Consultation activity	Summary	Dates
	were asked. A recording of the webinars was listed on the HAL website for reviewing (no longer listed).	
Live webinar	Webinar sessions were held in replacement of drop-in community information sessions due to the COVID-19 restrictions. The webinar sessions allowed the community to engage with the project team through a live format which included a live Q&A chat function to ask questions about the proposals. There were 75 community members who attended the webinar, and 200 questions were asked. A recording of the webinars was listed on the HAL website for reviewing (no longer listed).	6 May 2020
Briefing	Briefing various bicycle user group. This was complete via phone conference to discuss and answer questions about the proposals.	6 May, 11 May 2020
Meeting	Inner West Business Chamber to discuss proposals, answer questions and receive suggestions to the designs.	11 May 2020
Briefing	Dobroyd Point Public School phone conference to present the proposals and answer questions.	17 May 2020

Table 5-2 summarises the key issues raised during the above consultation activities.

Table 5-2 Summary of issues raised by the community

Consultation Summary	Response / where addressed in REF
<ul style="list-style-type: none"> Access concerns for bike users, the elderly, mobility aid users and people with prams Safety concerns around the existing at-grade crossing Overshadowing of nearby residences and privacy concerns because of the new bridge Concerns of impacts to Timbrell Park and Livvi’s Place Playground because of the new bridge 	<ul style="list-style-type: none"> section 3.2 section 2.1 section 6.3 section 6.6

5.3 Aboriginal community involvement

The potential Aboriginal heritage impacts of the proposal have been considered in accordance with the requirements of Transport’s *Procedure for Cultural Heritage Consultation and Investigation* (RMS 2011).

A PACHCI stage 1 has been prepared for the proposal by Transport (refer Appendix F) and a search for known Aboriginal heritage items in the vicinity of the study area (plus a 150-metre buffer) was undertaken on 2 August 2023 using the Aboriginal Heritage Information Management system (AHIMS) database. The AHIMS search did not identify any known Aboriginal heritage items within or close to the proposal.

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. Similarly, the high level of disturbance in the road corridor and surrounding land zones would suggest that the archaeological potential of the area is low. Therefore, it was not considered necessary to undertake targeted Aboriginal consultation.

5.4 SEPP (Transport and Infrastructure) consultation

The Inner West Council have been consulted about the proposal as per the requirements of sections 2.10, 2.11 and 2.12 of SEPP (Transport and Infrastructure) 2021 that “development on behalf of a public authority for the purpose of a road or road infrastructure facilities may be carried out without consent” providing that certain key parties are consulted and/or notified about the work.

The State Emergency Services have been consulted about the proposal as per the requirements under section 2.13 of the SEPP (Transport and Infrastructure).

Appendix B contains a SEPP (Transport and Infrastructure) consultation checklist that documents how consultation requirements have been considered.

Matters raised from this consultation are outlined in Table 5-3.

Table 5-3 Issues raised through SEPP (Transport and Infrastructure) 2021 consultation

Group	Issue raised	Response
Inner West Council	Accessibility <ul style="list-style-type: none"> Desirable for an accessible ramp to be provided on both sides of the bridge, extending into Dobroyd Parade. Proximity of the stairs on the north-western side too close to moving traffic. Space is limited in this location, but it is important that pedestrians are kept well away from moving traffic in the interests of pedestrian safety and comfort. A kerb ramp should be included on north-western side of the bridge near the bridge landing to allow on-road bike users exiting Waratah Street to access the existing walk/cycle bridge across the canal. The existing pedestrian fence on the centre median should be extended to prevent pedestrians attempting to cross Dobroyd Parade. 	<ul style="list-style-type: none"> Access ramps on both sides of the bridge were considered, however lift and stairs were determined to be a better community, environment, and visual outcome. Pedestrians departing the stairs would be protected by proposed pedestrian fences creating a separation between pedestrians and traffic. On-road bike user access from Waratah Street to the northern side of Dobroyd Parade will be restricted due to the proposed concrete safety barrier. Bike users would need to access via the new pedestrian bridge instead. Signage and line marking would be provided to direct bike users from the road to the bridge. The existing median pedestrian fence is proposed to be extended.
	Lift queuing and congestion <ul style="list-style-type: none"> The lifts should be large enough to hold four to five people and at least two bikes to minimise congestion and queuing for the lifts. Stairs should include wheeling ramps so that people with lightweight bikes (or e-bikes with walk-function) can use the stairs instead of lifts. 	<ul style="list-style-type: none"> The lift would be able to hold multiple people and be large enough to accommodate a minimum of two bikes at a time and long enough for a cargo bike. Stairs with bicycle wheeling ramps would be proposed as part of the design.
	Visual and heritage impacts <ul style="list-style-type: none"> The REF should include further information (photomontages, elevations etc.) to allow for consideration of visual impacts, which may have heritage impact implications. 	<ul style="list-style-type: none"> Photomontages and the assessment of the visual impact of the proposal is provided in section 6.3.

Group	Issue raised	Response
	<p>Flooding</p> <ul style="list-style-type: none"> Contact should be made with Sydney Water staff to assess flooding impacts on the bridge and ensure the bridge does not negatively affect any plans for naturalisation of Dobroyd Canal 	<ul style="list-style-type: none"> Sydney Water have been consulted on the proposal and flooding impact assessments undertaken showing that there is negligible impact.
	<p>Changes to G-loop</p> <ul style="list-style-type: none"> Council should be consulted regarding the configuration of footpaths as part of the decommissioning of G-Loop. 	<ul style="list-style-type: none"> The decommissioning of G-loop does not form part of this proposal and is not assessed in this REF.
<p>State Emergency Services</p>	<p>Flooding</p> <ul style="list-style-type: none"> Consider the impact of flooding on the infrastructure up to and including the Probable Maximum Flood (PMF). Pursue, if relevant, site design and stormwater management that minimises any risk to the community. Ensure workers and people using the site during and after the upgrades are aware of the flood risk, for example by using signage. During site works, check the Bureau of Meteorology website prior to start of the workday for any Flood Warnings, and consider closing the worksite prior to the start of the working day if there is a risk of riverine flooding. 	<ul style="list-style-type: none"> Flooding impact has been considered up to the 1% AEP flood event. Transport would consider the PMF event as part of the future design development. The flooding assessment undertaken to date indicates negligible flooding impact to the community due to the proposal. Management of the risk associated with floods would be considered as part of the CEMP. Pre-site work checks for flood warnings would be considered as part of the CEMP.
	<p>Disruption to local roads</p> <ul style="list-style-type: none"> NSW SES requests that notification be provided where there are likely to be significant delays in the operation of the roads affected by the upgrades. 	<ul style="list-style-type: none"> NSW SES would be notified of any significant delays in operation of the roads affected by the proposal.

5.5 Government agency and stakeholder involvement

Inner West Council, City of Canada Bay Council and Sydney Water have been consulted about the proposal.

Early in proposal development Transport held several briefings and workshops with Inner West Council and City of Canada Bay Council to identify focus areas for network improvements based on feedback received during the WestConnex M4 East construction. One of the outcomes of the briefing was that network changes were required at Waratah Street.

Following this, consultation on the proposal was carried out in July 2022 and May 2023 as part of the WestConnex M4 East 12-month post-opening Road Network Performance Review Plan. The pedestrian bridge over Dobroyd Parade was included as a proposed mitigation to improve safety and network performance on Dobroyd Parade at the Waratah Street intersection.

Both councils were again briefed on the proposal in September 2022 and feedback was generally supportive of the proposal.

Inner West Council were briefed in August 2023 following the receipt of SEPP (Transport and Infrastructure) 2021 Consultation letters. The matters raised are addressed in Table 5-3.

Sydney Water has been consulted at various stages of the design.

5.6 Ongoing or future consultation

Should the proposal receive planning approval, Transport would continue to seek feedback from the community and key stakeholders, including during detailed design and construction.

The REF is on public display and is available to download on Transport's project website.

Following the public display period, Transport will collate and consider the submissions received then determine whether the proposal should proceed as described in the REF, or whether any changes are required. A submissions report will then be published, which will respond to the comments received. Transport will notify those who made submissions and distribute a community update. The update will summarise the submissions report and the actions that Transport took to address these comments.

6. Environmental assessment

This section of the REF provides a detailed description of the potential environmental impacts associated with the construction and operation of the proposal. All aspects of the environment, potentially impacted upon by the proposal, are considered. This includes consideration of:

- potential impacts on matters of national environmental significance under the EPBC Act
- the factors specified in the Guideline for Division 5.1 assessments (DPE 2022) and as required under section 171 of the Environmental Planning and Assessment Regulation 2021 and the *Roads and Related Facilities EIS Guideline* (DUAP 1996). The factors specified in section 171 of the Environmental Planning and Assessment Regulation 2021 are also considered in Appendix A.
- site-specific safeguards and management measures are provided to mitigate the identified potential impacts.

6.1 Traffic, transport, and access

This section describes the traffic, transport and access impacts that may occur when constructing and operating the proposal. The assessment of the construction traffic impacts associated with the potential route closure and detour route has been informed by a desktop review of relevant databases and information prepared for the project.

Databases searches included:

- Schedule of Classified State Roads and Unclassified Regional Roads (Transport 2023b)
- NSW Road Network Classifications (Transport 2023c)
- Road Users by LGA area of crash (Transport 2023f).

6.1.1 Existing environment

Road network

Dobroyd Parade is part of the City West Link, which connects the Sydney CBD and the Inner West to Greater Western Sydney via the WestConnex and the M4. The City West Link is classified as a State Roads (Transport 2023b) and is an important route for light and heavy traffic heading in and out of central Sydney. Dobroyd Parade at the Waratah Street intersection has a speed limit of 60 kilometres per hour before entering the WestConnex M4 East tunnel where it eventually increases to 80 kilometres per hour.

Waratah Street is one of many local roads connecting Dobroyd Parade to the suburb of Haberfield. Like the surrounding roads it has a speed limit of 50 kilometres per hour except for a school zone in place between Chelmsford Avenue and Rawson Street. Street parking on Waratah Street and surrounding local roads is unrestricted.

Crash data from Road Users by LGA Area of Crash (Transport 2023f) show 11 accidents that resulted in minor to serious injury at the intersection of the Dobroyd Parade and Waratah Street after 2017. No deaths have been reported from accidents at this intersection.

Traffic volume

The most recent survey of traffic volumes on Dobroyd Parade were during 2019 (Transport 2023d) estimated to be above 60,000 vehicles per day.

Current traffic volumes are impeded by the existing pedestrian crossing over Dobroyd Parade at the Waratah Street intersection and signals currently completely halt traffic to allow pedestrians to cross.

Pedestrian access

Pedestrian access along Dobroyd Parade and Waratah Street is via concrete footpaths. Concrete footpaths are provided on the northern side of Dobroyd Parade next to Iron Cove Creek and a shared path is located on the southern side of Dobroyd Parade to the west of the intersection with Waratah Street. No concrete footpaths are provided on Dobroyd Parade east of Waratah Street.

No bike exclusive paths are located in this area, bike users use shared footpaths or the road for access routes.

Existing pedestrian and cycling crossings in the vicinity of the proposal area include:

- at-grade crossing across Dobroyd Parade at Waratah Street
- Waratah Street at-grade pedestrian crossing and at the intersection signals
- at-grade crossing across Dobroyd Parade at the intersection with Timbrell Drive and Mortley Avenue
- at-grade crossing across Wattle Street at the intersection with Ramsay Street.

Existing pedestrian and cycling access locations are shown in Figure 6-1.

Public transport

Public bus services operate in the vicinity of the proposal area, however, no bus routes travel through the intersection of Dobroyd Parade at Waratah Street and Dobroyd Parade. Nearby bus routes, including 406, 438N, and 438X travel along routes on Timbrell Drive, Ramsay Road, and Parramatta Road.

The nearest light rail station is Hawthorn Station, 1.2 kilometres to the southeast. This station provides access to the Dulwich Hill L1 Line which connects the CBD to the Inner West.

The nearest train station is Ashfield Station, 1.8 kilometres to the southwest. This station provides access to the T1, T2, T3, and T9 lines and connects the CBD to greater western Sydney.

6.1.2 Potential impacts

Construction

Vehicle traffic

The proposal is expected to have minor temporary impacts to vehicle traffic volumes on the Dobroyd Parade and surrounding local roads during construction. Minor increases in light and heavy vehicles accessing the proposal area are expected due to construction staff access and parking, and the delivery of materials and resources. Parking in the proposal footprint would be reduced in areas around the site compounds and along Waratah Street due to the presence of construction vehicles and staff parking. Given the high existing traffic volumes on Dobroyd Parade and traffic movements in the surrounding network, including Waratah Street, Ramsay Street and Timbrell Drive, the increase in construction traffic is unlikely to impact on the operation of the road network.

Construction of the proposal would require construction equipment to operate on or next to the road corridor, along with deliveries of construction material, and would require some lane closures. These closures may result in increased traffic congestion. Where possible work would be carried out outside peak hours to minimise traffic impacts.

Residential areas in the immediate vicinity of the site compounds are expected to experience increased traffic volumes during construction due to the movement of construction vehicles and construction materials.



Figure 6-1 Existing pedestrian crossings and public transport routes

Road closures are required for three parts of the proposal. These would all involve partial or total road closure out of standard daytime construction hours to reduce impacts to traffic and transport on Dobroyd Parade. Subject to Road Occupancy Licenses, this work would likely be carried out between 9pm and 5am. The following road closures are required:

- bridge lifting phase: total road closure of Dobroyd Parade, estimated time is 1 night.
- removal of at-grade crossing: partial road closure of Dobroyd Parade, estimated time is at least 5 nights.
- pavement marking works phase: partial road closure of Dobroyd Parade, estimated time is at least 2 nights.

Temporary detours with an approximate increase of 550 metres would be established during the road closures (refer section 3.3.7) with traffic controllers and temporary signage provided. Light vehicle detours would direct traffic through the surrounding road network. Heavy vehicle detours would direct traffic to remain on the WestConnex tunnels or onto heavy vehicle approved main roads such as Parramatta Road and Victoria Road. Potential impacts to traffic and transport from road closures would be increased congestion on surrounding roads however given these would be in place out of standard night hours this would be minimal.

Construction work would be carried out so that access is maintained for emergency vehicles to minimise delays for emergency services and maintain public safety unless alternate arrangements are made in advance in consultation with the Transport Management Centre and Emergency Services.

Pedestrian traffic

Construction activities on both sides of Dobroyd Parade would temporarily impact pedestrian movements along footpaths. Detours would be established with proper signage to direct pedestrians to alternative routes. Temporary hoarding over the existing footpath along the northern side of Dobroyd Parade will be used to retain pedestrian movements where possible.

Site compound 1 is located within Reg Coady Reserve, a passive recreation area currently available to the public. Pedestrian access and use of the section of the reserve would be closed during the construction stage changing pedestrian movement in this location. Alternative routes would be established. Site compound 2 located on Martin Street and Dobroyd Parade and site compound 3 is on land owned by NSW Government.

Public transport

As no public transport routes operate within the proposal area there would be no direct impacts. However, indirect impacts from traffic congestion in the area may occur. The project team would work with the Traffic Management Centre to ensure transport operates without delay as much as possible.

Operation

Traffic and vehicle access

Operation of the proposal would have no adverse impacts on vehicle traffic at the intersection of Dobroyd Parade and Waratah Street. The proposal would improve traffic flow along Dobroyd Parade and reduce traffic congestion in alignment with the proposal objectives due to the removal of the at-grade crossing. Parking in the proposal area may be impacted by the placement of bike ramps in Waratah Street, however, no parking removal in Waratah Street or no-stopping signs have been included as part of the current design.

Operation of the proposal would have no impact on property access.

Pedestrian traffic

The proposal would maintain a pedestrian and bike crossing of Dobroyd Parade. The route to cross Dobroyd Parade via the new pedestrian bridge with stairs and lifts would be longer than the existing crossing by about 25 metres. However, wait times for the crossing would be reduced or removed as there are no signals, and the risk of injury from vehicles due to standing in the median crossing would be

removed. A pedestrian fence provided at the southern median on Dobroyd Parade would increase pedestrian and cycling safety by restricting unsafe crossing behaviour and encourage the use of the bridge.

Public transport

The operation of the proposal would have no direct impact on public transport due to no bus routes travelling along Dobroyd Parade in this location. There may however be indirect benefits from improved traffic flow along Dobroyd Parade.

6.1.3 Safeguards and management measures

Table 6-1 describes the proposed safeguards and management measures that would be implemented to manage the potential traffic and transport impacts from the proposal.

Table 6-1 Traffic, transport and access safeguards and management measures

ID	Impact	Environmental safeguards	Responsibility	Timing
T1	Traffic and transport	<p>A Traffic Management Plan (TMP) will be prepared and implemented as part of the CEMP. The TMP will be prepared in accordance with the Transport <i>Traffic Control at Work Sites Manual</i> (Transport 2022b) and <i>QA Specification G10 Traffic Management</i> (Transport 2020b). The TMP will include:</p> <ul style="list-style-type: none"> • confirmation of haulage routes and any Transport Management Centre requirements • measures to maintain access to local roads and properties and minimise the potential for ‘rat-runs’ to form on local roads during road closures • site-specific traffic control measures (including signage) to manage and regulate traffic movement • measures to maintain pedestrian and bike user access • requirements and methods to consult and inform the local community of impacts on the local road network • access to construction sites including entry and exit locations and measures to prevent construction vehicles queuing on public roads • a response plan for any construction traffic incident • consideration of other developments that may be under construction to minimise traffic conflict and congestion that may occur due to the cumulative increase in construction vehicle traffic • monitoring, review, and amendment mechanisms. 	Contractor	Detailed design/Pre-construction

ID	Impact	Environmental safeguards	Responsibility	Timing
T2	Pedestrian and bike user access	Management of pedestrian and bike users movements during construction would be detailed in the CEMP. Specific items to minimise pedestrian and bike user's disruptions may include: <ul style="list-style-type: none"> • signage outlining pedestrian diversion routes • advanced notification of any construction work that affects pedestrians and bike users. 	Contractor	Construction
T3	Changed traffic conditions	The community will be notified in advance of any road closures and the likely disruptions to access in accordance with the Community and Stakeholder Engagement Plan. Adequate advisory and warning signage will be provided to inform motorists of the road conditions ahead including any road closure and/or detour route.	Contractor	Construction
T4	Emergency vehicle and key stakeholder access	Access would be maintained for emergency response vehicles, and utility providers at all times, where possible. During the bridge lift, alternative arrangements will be developed in consultation with the relevant stakeholders in advance.	Contractor	Construction
T5	Road closures and detours	Temporary traffic diversions and road closures would be implemented in consultation with and in accordance with the Transport Management Centre requirements.	Contractor	Construction

6.2 Noise and vibration

6.2.1 Methodology

The construction noise and vibration assessment was carried out with reference to the:

- Interim Construction Noise Guideline (DECC 2009)
- Construction Noise and Vibration Guideline (Transport 2023e)
- Transport Construction and Maintenance Noise Estimator tool.

Operational road traffic noise has been assessed according to the Road Noise Policy (EPA 2011). The application of the Road Noise Policy guidelines as set out in the Noise Criteria Guideline (RMS 2015) has been used.

Noise and vibration impacts have the potential to impact the community in the vicinity of the proposal. The Transport Construction and Maintenance Noise Estimator tool was used to assess construction noise impacts from the proposed activities associated with the proposal.

Key tasks completed during the assessment include the following:

- identification of appropriate background noise levels
- identification of the noise management levels (NMLs)
- identification of development scenarios
- identification of the type of sensitive receivers
- identification of the noise and vibration impacts
- identification of buffer distances for the highly affected areas and Noise Management Levels (NMLs) for each construction scenario
- identification of feasible and reasonable additional mitigation measures.

The Construction and Maintenance Noise Estimator tool was used to identify an appropriate background noise level and background NML for the proposed works. Sensitive receivers were identified using the Inner West land zone mapping (refer Figure 4-1).

Based on the represented noise environment from the Construction and Maintenance Noise Estimator tool a noise area category was selected. This produced both the background noise levels (L_{90}) and the NML. Noise area category R3 was selected for the proposal area. The background noise levels and NML are shown in Table 6-2.

Within the noise estimator tool, the Estimator (Individual Plant) tab was used for the assessment of both day work and night work scenarios as it considers a selected number of plants operating together in different scenarios. The development stages of the proposal, as detailed in the proposal description (refer Chapter 3), have been grouped into four work scenarios bringing together similar activities and equipment/plant used. These scenarios are included in Table 6-3.

Within the estimator tool, the Estimator (Scenario) tab was used for the assessment of each individual site compound. Each compound site is assessed using the “compound activity” scenario with the closest residential receiver as the calculation distance. The site compounds are identified in Table 6-11 to Table 6-13.

The results of the estimator tool were subsequently used to identify buffer distances for affected receivers for each scenario. This is displayed in Figure 6-2 to Figure 6-10.

6.2.2 Existing environment

Background noise levels at the proposal location are mostly influenced by traffic on Dobroyd Parade and in the surrounding residential properties. Sensitive receivers were identified in the vicinity of the proposal area and the individual site compounds. These are:

- Proposal area - The closest residential receivers are between 20 and 30 metres away on the southeast and southwest corners of the Dobroyd Parade and Waratah Street intersection
- Site compound 1 – This location is surrounded by recreational parks, low and medium density residential areas. The closest residence is approximately 55 metres away on the southern side of Dobroyd Parade
- Site compound 2 – This site is surrounded by low and medium residential areas and immediately adjoins the closest residence which is less than 10 metres from the boundary
- Site compound 3 – This site is surrounded by recreational parks, low and medium density residential areas, and has a local centre across Iron Bark Creek. The closest residence is less than 10 metres away and is located on the north side of Ramsay Street.

Current background noise levels estimated, using the Construction and Maintenance Noise Estimator tool, are provided in Table 6-2.

Table 6-2 Estimated background noise levels

Time of day	Rating background level (RBL) or L90 background level (dB(A))
Day	50
Evening	45
Night	40

6.2.3 Construction scenarios

Construction scenarios used in the noise assessment (Table 6-3) were based on the equipment and plant list in section 3.3.4. Each scenario is a combination of similar activities with similar equipment that would occur across the staging of the proposal. Compound scenarios have been based on the compound operation scenario described in the Transport Construction and Maintenance Noise Estimator tool.

Table 6-3 Construction scenarios

Scenario	Construction activities	Time period
1	Site establishment/preparation work (including earthworks, clearing and utility relocation)	Day
2	Bridge Works (construction and foundation works)	Day
3	Road Works (pavement works, kerb works, signage and line marking)	Night
4	Bridge Works (bridge span lifting and connecting)	Night
Compound 1	Compound operation	Day and night
Compound 2	Compound operation	Day and night
Compound 3	Compound operation	Day and night

6.2.4 Criteria

Construction noise criteria

The recommended construction NMLs at residential receivers as outlined by the ICNG (DECC 2009) is displayed in Table 6-4.

Table 6-4 Recommended construction NMLs at residential receivers

Time of Day	Noise Management Level L _{Aeq} (15min))
Recommended standard hours: Monday to Friday 7am to 6pm Saturday 8am to 1pm	Noise affected RBL + 10 dB
No work on Sundays or public holidays	Highly noise affected 75 dB(A)
Outside recommended standard hours	Noise affected RBL + 5 dB

The recommended construction NMLs at non-residential receivers as outlined by the ICNG (DECC 2009) is shown in Table 6-5.

Table 6-5 Recommended construction NMLs at non-residential receivers

Land use	Management level <i>L</i> _{Aeq (15min)}
Classrooms at schools and other educational institutions	Internal noise level 45 dB(A)
Hospital wards and operating theatres	Internal noise level 45 dB(A)
Places of worship	Internal noise level 45 dB(A)
Active recreation areas (characterised by sporting activities and activities which generate their own noise or focus for participants, making them less sensitive to external noise intrusion)	External noise level 65 dB(A)
Passive recreation areas (characterised by contemplative activities that generate little noise and where benefits are compromised by external noise intrusion, for example, reading, meditation)	External noise level 60 dB(A)
Community centres	Depends on the intended use of the centre

Vibration monitoring would be conducting according to the following criteria:

- British Standard BS 7385: Part 2: Evaluation and Measurement for Vibrations in Buildings – Part 2 Guide to Damage Levels from Ground-Borne Vibration
- German Standard DIN 4150, Part 3: Structural Vibration in Buildings: Effects on Structures.

Sleep disturbance

Given the need for night works to occur, noise criteria for sleep disturbance levels from the Transport Construction and Maintenance Noise Estimator tool were set at 65 dB(A).

Construction vibration criteria

Impacts from vibration can be considered in both, terms of impact to building occupants (human comfort) and the impacts to the building structure (cosmetic damage). Of these two considerations, the impact to building occupants are the most stringent.

The minimum safe working distances for cosmetic damage must be complied with at all times, unless otherwise approved by Transport. Minimum safe working distances outline the minimum distance individual plant/equipment must be from building to ensure there is no cosmetic damage to buildings. Of particular importance is heritage items in the vicinity of the proposal area.

The minimum safe working distances refers to Table 2 of the Construction Noise and Vibration Guideline (Transport 2023e). A relevant version has been included as Table 6-15.

Operational noise criteria

Noise calculations and modelling have not been undertaken for the operational phase of the proposal. This is due to the expectation that traffic volumes and environmental impacts from traffic would remain unchanged, however, traffic congestion is expected to decrease.

6.2.5 Potential impacts

Construction noise

Noise management levels (NML) for construction during standard hours are set at 10dB(A) above the rating background level (RBL) and 5dB(A) above the RBL for outside of standard hours as per the ICNG (DECC 2009). Therefore, the NMLs based on the existing background noise levels are adjusted to the values in Table 6-6.

Work hours and time of day corresponding to the noise assessment time is also outlined in Table 6-6.

Table 6-6 Site specific noise management levels

Work hours	Time of day	Noise management level (NML) (dB(A))
Day (standard hours)	Day (standard hours Mon to Fri 7am to 6pm; Sat 8am to 1pm)	50 + 10 = 60
Day Out of Hours Work (OOHW)	Day (Sat 1pm-6pm)	50 + 5 = 55
OOHW period 1	Evening (6pm-10pm)	45 + 5 = 50
OOHW period 2	Night (10pm-7am)	40 + 5 = 45

Proposal area

The Construction and Maintenance Noise Estimator tool was used to assess the noise impacts during construction activities around the proposal area.

The estimator tool uses the 'worst case' scenario for the closest residential property during each stage of the proposal and recommends mitigation safeguards to reduce the potential impact. These are shown on Figure 6-2 to Figure 6-7.

The results of the noise assessment for each construction scenario are summarised in Table 6-7 to Table 6-10 and for each site compound in Table 6-11 to Table 6-13.

Table 6-7 Scenario 1 – Site establishment / preparation works

Receiver type	Residential			
Representative distance from activity	20 metres			
Total SPL LAeq (15 minute) (dB(A))	89			
Scenario	Noise Management Level (dB(A))	Level above background (dB(A))	Level above NML (dB(A))	Additional mitigation measures
Standard hours	60	39	29	N, V, PC, RO
Day (OOHW)	55	39	34	V, IB, N, R1, DR, PC, SN

Table 6-8 Scenario 2 – Bridge works

Receiver type	Residential			
Representative distance from activity	20 metres			
Total SPL LAeq (15 minute) (dB(A))	85			
Scenario	Noise Management Level (dB(A))	Level above background (dB(A))	Level above NML (dB(A))	Additional mitigation measures
Standard hours	60	35	25	N, V, PC, RO
Day (OOHW)	55	35	30	V, IB, N, R1, DR, PC, SN

Table 6-9 Scenario 3 – Road works

Receiver type	Residential			
Representative distance from activity	20 metres			
Total SPL LAeq (15 minute) (dB(A))	91			
Scenario	Noise Management Level (dB(A))	Level above background (dB(A))	Level above NML (dB(A))	Additional mitigation measures
OOHW Period 1	50	46	41	V, IB, N, R1, DR, PC, SN
OOHW Period 2	45	51	46	AA, V, IB, N, PC, SN, R2, DR

Table 6-10 Scenario 4 – Bridge lifting works

Receiver type	Residential			
Representative distance from activity	30 metres			
Total SPL LAeq (15 minute) (dB(A))	74			
Scenario	Noise Management Level (dB(A))	Level above background (dB(A))	Level above NML (dB(A))	Additional mitigation measures
OOHW Period 1	50	29	24	V, N, R1, DR
OOHW Period 2	45	34	29	AA, V, IB, N, PC, SN, R2, DR

Site compounds

Site compound 1

The assessment for site compound 1 is based on the closest residential receiver to the compound site located adjacent to Reg Coady reserve on the south side of Iron Cove Creek (Figure 6-8 to Figure 6-10). The assessment results are included in Table 6-11.

Table 6-11 Site compound 1 – compound operation

Receiver type	Residential			
Representative distance from activity	55 metres			
Total SPL LAeq (15 minute) (dB(A))	66			
Scenario	Noise Management Level (dB(A))	Level above background (dB(A))	Level above NML (dB(A))	Additional mitigation measures
Standard hours	60	16	6	-
Day (OOHW)	55	16	11	N, R1, DR
OOHW Period 1	50	21	16	V, N, R1, DR
OOHW Period 2	45	26	21	V, IB, N, PC, SN, R2, DR

Site compound 2

The assessment for site compound 2 is based on the closest residential receiver to the compound site located at 87 Dobroyd Parade / 21 Martin Street, Haberfield on the south side of the Dobroyd Parade (Figure 6-8 to Figure 6-10). The result of the assessment is included in Table 6-12.

Table 6-12 Site compound 2 – compound operation

Receiver type	Residential			
Representative distance from activity	10 metres			
Total SPL LAeq (15 minute) (dB(A))	80			
Scenario	Noise Management Level (dB(A))	Level above background (dB(A))	Level above NML (dB(A))	Additional mitigation measures
Standard hours	60	30	20	N, V, PC, RO
Day (OOHW)	55	30	25	V, IB, N, R1, DR, PC, SN
OOHW Period 1	50	35	30	V, IB, N, R1, DR, PC, SN
OOHW Period 2	45	40	35	AA, V, IB, N, PC, SN, R2, DR

Site compound 3

The assessment for site compound 3 is based on the closest residential receiver to the compound site located at 287 Ramsay Road, Haberfield, Haberfield to the northwest of the proposal area (Figure 6-8 to Figure 6-10). The assessment results are included in Table 6-13.

Table 6-13 Site compound 3 – compound operation

Receiver type	Residential			
Representative distance from activity	10 metres			
Total SPL LAeq (15 minute) (dB(A))	80			
Scenario	Noise Management Level (dB(A))	Level above background (dB(A))	Level above NML (dB(A))	Additional mitigation measures
Standard hours	60	30	20	N, V, PC, RO
Day (OOHW)	55	30	25	V, IB, N, R1, DR, PC, SN
OOHW Period 1	50	35	30	V, IB, N, R1, DR, PC, SN
OOHW Period 2	45	40	35	AA, V, IB, N, PC, SN, R2, DR

Noise level distances

The Total SPL LAeq from the results of each scenario were used to identify the distances in which receivers in the vicinity of the proposal would be affected by noticeable, clearly audible, moderately intrusive, and highly affected levels. These distances for each of the scenarios detailed above are shown on Figure 6-2 to Figure 6-10.



Figure 6-2 Sensitive receivers – Scenario 1 (Day)
 EMF-PA-PR-0070-TT04



Figure 6-3 Sensitive receivers – Scenario 2 (Day)

EMF-PA-PR-0070-TT04

OFFICIAL



Figure 6-4 Sensitive receivers – Scenario 3 (Evening)

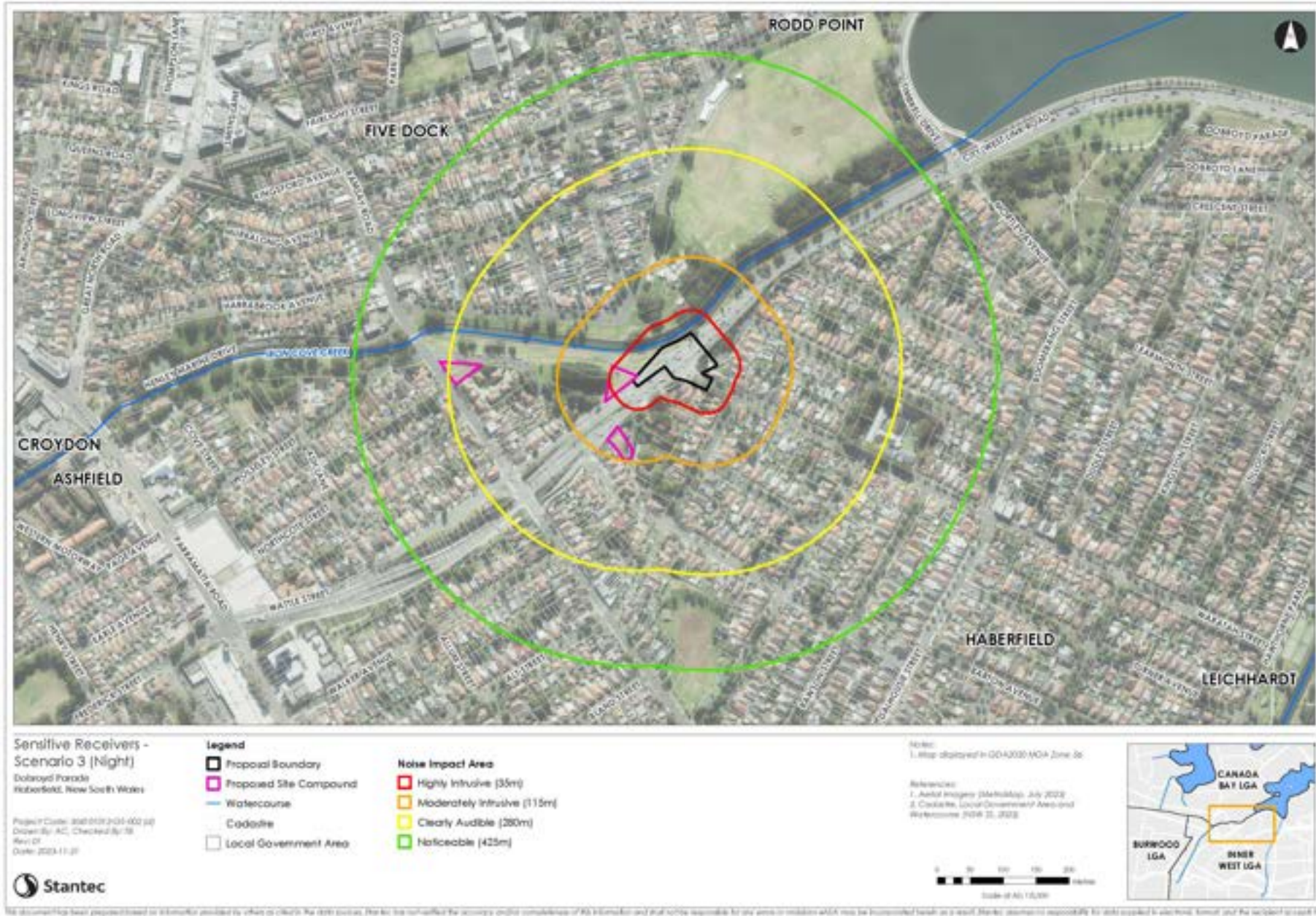


Figure 6-5 Sensitive receivers – Scenario 3 (Night)



Figure 6-6 Sensitive receivers – Scenario 4 (Evening)

EMF-PA-PR-0070-TT04

OFFICIAL



Figure 6-7 Sensitive receivers – Scenario 4 (Night)



Figure 6-8 Sensitive receivers – Compound areas – Day

EMF-PA-PR-0070-TT04

OFFICIAL



Figure 6-9 Sensitive receivers – Compound areas – Evening



Figure 6-10 Sensitive receivers – Compound areas – Night

EMF-PA-PR-0070-TT04

OFFICIAL

Summary of assessment and mitigation measures

The assessment shows that for all construction scenarios and for all site compounds, noise levels would exceed the NMLs. These exceedances in most cases range into the highly intrusive level due to the proximity of sensitive receivers and the timing of works and would require a higher level of mitigation.

In some cases, sensitive receivers may be affected by multiple noise sources at the same time, noise generated from the proposal works (one of the four scenarios and activities at one or more of the site compounds). This means that some sensitive receivers could experience higher levels of disturbance as compared to the assessment results. The additional noise mitigation measures prescribed by the Construction and Maintenance Noise Estimator tool are detailed in Table 6-16.

The assessment of OOHW shows that night works would have a higher impact on surrounding sensitive receivers across scenarios 3 and 4 and site compound operation. Construction scenarios 3 and 4 have a higher level of impact as compared to the site compounds with site compound 1 having the lowest level of impact and Scenario 3 (road works) having the highest level of impact.

It is noted that at site compound 1 during standard hours the exceedance is only 6 dB(A) and therefore has no additional mitigation measures suggested. Additionally, for all scenarios 3 and 4 and site compounds NMLs exceed the sleep disturbance level of 65 dB(A) for both OOHW periods 1 and 2.

The exceedances would be managed using the additional mitigation measures detailed in Table 6-7 to Table 6-13, generated from the Construction and Maintenance Noise Estimator tool, and the Transport Construction Noise and Vibration Guideline (2022).

Figure 6-2 to Figure 6-10 identify the sensitive receivers within the buffer zones that would be rated as equivalent to the “worst case scenario” receivers used in the estimator.

Table 6-14 Noise mitigation measures

Mitigation measure	Abbreviation	Description
Notification	N	Advanced warning of works and potential disruptions can assist in reducing the impact on the community. The notification may consist of a letterbox drop (or equivalent) detailing work activity, time periods over which these will occur, impacts and mitigation measures. Notification should be a minimum of five working days prior to the start of works.
Specific notifications	SN	Specific notifications are letterbox dropped (or equivalent) to identified stakeholders no later than seven calendar days ahead of construction activities that are likely to exceed the noise objectives. The specific notification provides additional information when relevant and informative to more highly-affected receivers than covered in general letterbox drops.
Phone calls	PC	Phone calls detailing relevant information made to identified/affected stakeholders within seven calendar days of proposed work. Phone calls provide affected stakeholders with personalised contact and tailored advice, with the opportunity to provide comments on the proposed work and specific needs. Where the resident cannot be telephoned then an alternative form of engagement should be used.
Individual briefings	IB	Individual briefings are used to inform stakeholders about the impacts of high noise activities and mitigation measures that will be implemented. Project representatives would visit identified stakeholders at least 48 hours ahead of potentially disturbing construction activities. Individual briefings provide affected stakeholders with personalised contact and tailored advice, with

Mitigation measure	Abbreviation	Description
		opportunity to comment on the project. Where the resident cannot be met with individually then an alternative form of engagement should be used.
Respite offer	RO	Respite offers should be considered where there are high-noise and vibration-generating activities near receivers. As a guide, work should be carried out in continuous blocks that do not exceed three hours each with a minimum respite period of one hour between each block. The actual duration of each block of work and respite should be flexible to accommodate the usage of, and amenity at, nearby receivers
Respite period 1	R1	Out-of-hours construction noise in out-of-hours period 1 shall be limited to no more than three consecutive evenings per week except where there is a Duration Respite. Work during these periods should be separated by not less than one week and no more than six evenings per month
Respite period 2	R2	Night-time construction noise in out-of-hours period 2 shall be limited to two consecutive nights except for where there is a Duration Respite. For night work, these periods of work should be separated by not less than one week and six nights per month. Where possible, high noise-generating works shall be completed before 11 pm.
Duration respite	DR	Respite offers and respite periods 1 and 2 may be counterproductive in reducing the impact on the community for longer-duration projects. In this instance, and where it can be strongly justified, it may be beneficial to increase the work duration, number of evenings or nights worked through Duration Respite so that the project can be completed more quickly. Community consultation should be included with this measure to accommodate nearby receiver's views.
Alternative accommodation	AA	Alternative accommodation options may be offered to residents living in close proximity to construction works that are likely to experience highly intrusive noise levels.
Verification	V	The spot check verification of noise levels for specific residences with 14 days of construction commencing to verify the actual noise levels are consistent with the predicted noise levels.

Vibration

Construction

The proposed work has the potential to cause vibration impacts to nearby residential receivers and a heritage item. This is due to vibration intensive plant/equipment used for construction activities and the distance between the proposal area, heritage items, and the nearest residential receivers. Minimum safe working distances from the Construction Noise and Vibration Guideline (2023e) have been used for the vibration assessment.

Table 6-15 details the plant / equipment necessary for construction activities with the potential to cause vibration intensive impacts to receivers in the vicinity of the proposal.

Table 6-15 Approximate vibration levels for various equipment

Plant item	Rating / description	Minimum working distance		
		Cosmetic damage (BS 7385)	Human response (OH&E vibration guideline)	Cosmetic damage (DIN 4150) Heritage and other sensitive structures
Vibratory roller	<200kN (typically 4-6 tonnes)	12 metres	40 metres	33 metres
Small Hydraulic Hammer	(300 kg- 5 to 12t excavator)	2 metres	7 metres	5 metres
Pile boring	≤ 800 mm	2 metres (nominal)	4 metres	40 metres
Jackhammer	Hand held	1 metres (nominal)	2 metres	-

Table 6-15 identifies the minimum safe distances for buildings and humans to avoid impacts from the operation of vibration intensive equipment. There are no public structures or residential structures are within these distances, therefore, cosmetic and human impacts are unlikely. However, caution should be used when conducting construction activities.

Dobroyd Stormwater Channel listed under the S170 Sydney Water heritage register is located within 10 metres of the north side of the proposal and could experience impacts to heritage fabric due to the use of vibration intensive plant and equipment. Refer to Section 6.4 for additional information on heritage impacts.

Operation noise and vibration

Potential impacts due to noise and vibration during the operational phase of the proposal are not a consideration due to the nature of the proposal.

6.2.6 Safeguards and management measures

Noise and vibration safeguards necessary to mitigate any potential impacts as a result of the proposed construction works are outlined in Table 6-16.

Table 6-16 Noise and vibration safeguards and management measures

ID	Impact	Environmental safeguards	Responsibility	Timing
NV1	Noise and vibration	<p>A Noise and Vibration Management Plan (NVMP) will be prepared and implemented as part of the CEMP. The NVMP will generally follow the approach in <i>the Interim Construction Noise Guideline</i> (DECC 2009) and identify:</p> <ul style="list-style-type: none"> all potential significant noise and vibration generating activities associated with the activity mitigation measures for implementation. These are to consider the urban design principles in <i>Beyond the Pavement: urban design</i> 	Contractor	Detailed design / Pre-construction

ID	Impact	Environmental safeguards	Responsibility	Timing
		<p><i>policy, process and principles</i> (Transport 2020a).</p> <ul style="list-style-type: none"> • a monitoring program to assess performance against relevant noise and vibration criteria • arrangements for consultation with affected neighbours and sensitive receivers, including notification and complaint handling procedures • contingency measures to be implemented in the event of non-compliance with noise and vibration criteria. 		
NV2	Noise and vibration	<p>All sensitive receivers (local residents) likely to be affected will be notified at least five working days prior to commencement of any works associated with the activity that may have an adverse noise or vibration impact. The notification will provide details of:</p> <ul style="list-style-type: none"> • the project • the construction period and construction hours • contact information for project management staff • complaint and incident reporting • how to obtain further information. 	Contractor	Detailed design / Pre-construction
NV3	Construction hours and scheduling	<p>Where feasible and reasonable, construction will be carried out during the standard daytime working hours and work generating high noise levels will be scheduled during less sensitive time periods.</p>	Contractor	Pre-construction / Construction
NV4	Plant noise levels	<p>Only the necessary size and power of equipment will be used.</p>	Contractor	Pre-construction
NV5	Equipment selection	<p>Use quieter and less noise emitting construction methods where feasible and reasonable.</p>	Contractor	Pre-construction
NV6	Noise and Vibration	<p>All project personnel attending site are to receive an environmental induction. The induction must at least include:</p> <ul style="list-style-type: none"> • all project specific and relevant standard noise and vibration mitigation measures • relevant licence and approval conditions • permissible hours of work • any limitations on high noise generating activities • location of nearest sensitive receivers 	Contractor	Construction

ID	Impact	Environmental safeguards	Responsibility	Timing
NV7	Noise and Vibration	<ul style="list-style-type: none"> construction employee parking areas designated loading/unloading areas and procedures site opening/closing times (including deliveries) environmental incident procedures. 		
		Implementation of additional project specific mitigation measures is required. These measures include additional measures from the Transport Construction Noise and Vibration Guideline.	Contractor	Construction
NV8	Non-tonal and ambient sensitive reversing alarms	<p>Non-tonal reversing beepers (or an equivalent mechanism) will be fitted and used on all construction vehicles and mobile plant regularly used on site and for out of hours work.</p> <p>The use of ambient sensitive alarms that adjust output relative to the ambient noise level will be considered.</p>	Contractor	Construction
NV9	Noise and Vibration	Vibration monitoring to be carried out during piling and where complaints about vibration received.	Contractor	Construction
NV10	Noise and Vibration	Where human comfort vibration guidelines are exceeded, the management measures are to be reviewed and are to consider alternate equipment and construction methodologies.	Contractor	Construction
NV11	Noise and Vibration	Where vibration criteria specific to structural damage are exceeded during monitoring, work would cease immediately and less vibration intensive construction methods would be used.	Contractor	Construction
NV12	Noise and vibration	<p>To minimise the risk of vibration impacts Dobroyd Stormwater Channel No.53 (Iron Cove Creek) the following mitigation measures should be implemented:</p> <ul style="list-style-type: none"> determine safe working limits based on proposed plant, and where possible, the smallest plant able to carry out required work should be used to minimise potential impacts. Where works are proposed within the safe working limits for the heritage structures, specialist advice must be sought from an appropriately qualified structural engineer who is familiar with heritage structures to assess if vibrations associated with the proposed works will potentially 	Contractor	Pre-construction/ construction

ID	Impact	Environmental safeguards	Responsibility	Timing
		<p>result in impacts to heritage structures.</p> <ul style="list-style-type: none"> • a vibration monitoring plan is to be prepared as part of the Construction Noise and Vibration Management Plan where works are proposed within safe working limits and implemented to confirm vibration levels prior to construction commencement. Where exceedances are recorded, works should be modified in consultation with the identified specialist to reduce vibration levels. • if vibration monitors are attached to the heritage items, they must not be attached with permanent fixings. They should be removable without causing damage. Bees wax may be a suitable attachment method. • attended vibration measurements should be undertaken at the commencement of vibration generating activities to confirm that vibration levels are within the acceptable range to prevent cosmetic building damage • assessment and monitoring of vibration impacts to heritage items within the safe working limits should adhere to: <ul style="list-style-type: none"> – British Standard BS 7385: Part 2: Evaluation and Measurement for Vibrations in Buildings – Part 2 Guide to Damage Levels from Ground-Borne Vibration – German Standard DIN 4150, Part 3: Structural Vibration in Buildings: Effects on Structures. 		

6.3 Landscape character and visual impacts

This section summarises the proposal’s landscape character and visual impacts. Appendix D contains a supporting technical assessment prepared by DesignInc (2023e).

6.3.1 Methodology

A landscape character and visual impact assessment was prepared based on the Transport *Environmental Impact Assessment Practice Code EIA-N04 – Guideline for landscape character and visual impact assessment* (Transport 2020c).

The assessment methodology for the assessment was undertaken using the following steps:

- assessment of the existing context and character
- assessment of the visibility of the proposal

- identification of key viewpoints
- assessment of visual impacts
- identification of mitigation strategies to minimise visual impacts.

A visual impact assessment was also conducted to determine the potential visual changes and impact of the proposal and its surroundings. The assessment was taken from four viewpoints and combines the viewers sensitivity to the proposed works and structures with the magnitude of the proposed work/activity within the existing views as detailed in Table 6-17.

Table 6-17 Landscape character and visual impact assessment matrix

		Magnitude			
		High	Moderate	Low	Negligible
Sensitivity	High	High	High-moderate	Moderate	Negligible
	Moderate	High-moderate	Moderate	Moderate-low	Negligible
	Low	Moderate	Moderate-low	Low	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

6.3.2 Existing environment

The overall character of the area around the proposal is predominantly residential, made up of low and medium density residential areas, with recreational parks, an educational facility, and infrastructure. Vegetation in the vicinity of the proposal is predominantly planted with some native vegetation existing along the banks of Iron Cove Creek and on residential properties.

Landscape character zones

To assess the landscape character of the area and how the proposal would fit into the surrounding landscape, the area around the proposal were divided into six Landscape Character Zones (LCZs) described in Table 6-18 and shown on Figure 6-11.

Table 6-18 Landscape character zone descriptions

LCZ	Description
LCZ1 Dobroyd Parade – road corridor	<ul style="list-style-type: none"> • a flat section of road corridor east of Waratah Street at a low elevation adjoining Iron Cove Creek to north and noise wall to south • gently rising section of road corridor west of Waratah Street that extends to Parramatta Road which runs along a major ridgeline • visually prominent concrete retaining walls with crash barriers on top at entrances to the WestConnex tunnel portals • other road infrastructure includes signs, light standards, and pedestrian safety barriers • long distance views to the east from Dobroyd Parade and adjoining paths extend to the skyline of North Sydney commercial centre • recent landscape works include shrubs and ground covers with a limited number of trees
LCZ2 Iron Cove Creek Canal	<ul style="list-style-type: none"> • formed by sloping concrete walls with safety railing along both edges which combined with a consistent width creates a strong linear form in the landscape

LCZ	Description
	<ul style="list-style-type: none"> • water surface forms a distinctive element in the open space landscape areas of Reg Coady Reserve and Timbrell Park with views along the water surface forming a key element of the landscape character • the water level and width of water surface varies with tidal movement
LCZ3 (3a and 3b) Parkland – Timbrell Park and Reg Coady Reserve	<ul style="list-style-type: none"> • large areas of flat open grass provide long distance views that extend to residential areas to the north and Iron Cove Creek to the south • mature trees adjoin the canal to form a green wall along the south edge
LCZ4 Livvi’s Place Playground	<ul style="list-style-type: none"> • play elements for children of all abilities together with shade cloth structures form visually prominent elements of the landscape character • the playground is visually semi-enclosed by trees that also provide extensive shade • pedestrian fence runs along boundary of the playground
LCZ5 Five Dock residential area	<ul style="list-style-type: none"> • the building form is predominantly single storey
LCZ6 Haberfield residential heritage zone	<ul style="list-style-type: none"> • residential blocks making up the major area of Haberfield to the south of Dobroyd Parade • this area is under the HCA limiting dwelling heights to single story



Figure 6-11 Landscape character zones

Viewpoints

The visual impact assessment was undertaken using four key viewpoints selected from relatively close range, within the immediate vicinity of the proposal, due to the built-up nature of the surrounding area. All the viewpoints are location within the foreground relative to the proposal. The location and direction of the viewpoints are shown in Figure 6-12 and described in Table 6-19.

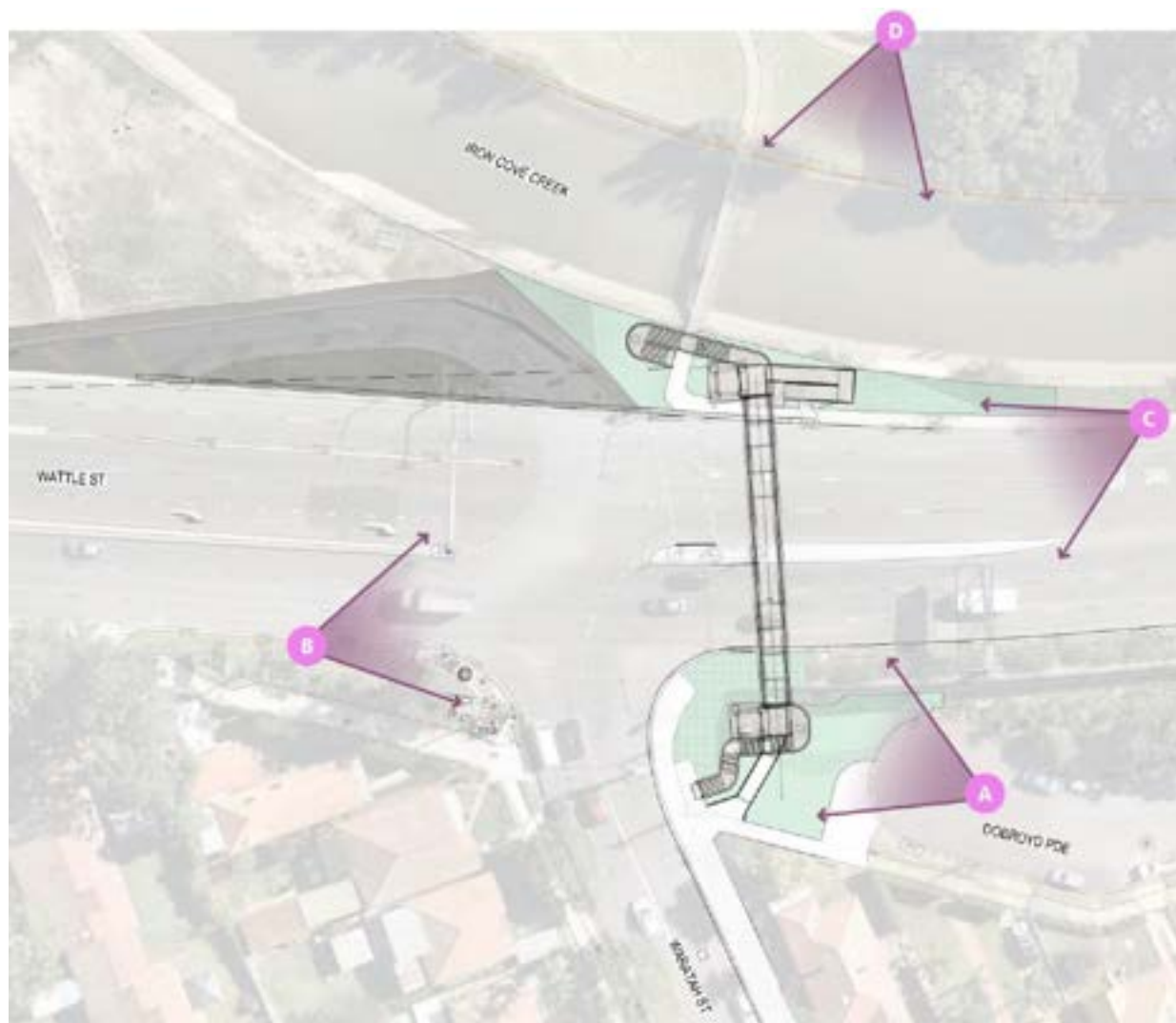


Figure 6-12 Viewpoints

Table 6-19 Viewpoint descriptions

Viewpoint	Description
Viewpoint A Dobroyd Parade cul-de-sac looking west	Viewpoint A is located at the end of the Dobroyd Parade cul-de-sac looking west towards the proposal. The Dobroyd Parade is to the right behind the motorway noise barrier and the HCA is to the left.
	
Viewpoint	Description
Viewpoint B Dobroyd Parade looking east	Viewpoint B is located on the south corner of Dobroyd Parade and Waratah Street intersection looking east towards the proposal. The HCA is to the right of the viewpoint and the Dobroyd Parade road corridor sits to the left.
	

Viewpoint	Description
Viewpoint C Dobroyd Parade looking west	Viewpoint C is located north side of Dobroyd Parade looking west towards the proposal. Iron Cove Creek is to the right of this viewpoint and Dobroyd Parade road corridor to the left with the sound wall also visible to the left.



Viewpoint	Description
Viewpoint D Timbrell Park, looking south	Viewpoint D is located to the north of the proposal in Timbrell Park looking south towards Dobroyd Parade. The Five Dock residential area sits to the right of this viewpoint and Timbrell Park sits to the left.



6.3.3 Potential impacts

Construction

During construction, landscape character and visual impacts are expected due to the following:

- construction activities necessary for the proposal
- presence of construction plant / equipment
- presence of exposed soils due to earthworks.

These impacts will be short term and partly shielded from view with to the use of construction fencing.

Operation

Landscape character

A summary of the potential impacts to the exiting landscape character are outlined in Table 6-20.

Table 6-20 Landscape character assessment

Sensitivity	Magnitude	Description of impact
LCZ1 Dobroyd Parade road corridor		
Low	High	Moderate This LCZ has a low sensitivity to landscape change and as the proposal is a large-scale change is built form the magnitude would be high. Therefore, although the proposal would increase the built form elements in the road corridor, the overall impact would be moderate.
LCZ2 Iron Cove Creek Canal		
Moderate	Moderate	Moderate This LCZ has a moderate sensitivity to landscape change as a built-up natural waterway and as the proposal would be constructed adjacent to this LCZ but still visible, the magnitude would be moderate. Therefore, the overall impact would be moderate.
LCZ3 Parkland – Timbrell Park and Reg Coady Reserve		
High	Moderate	High-moderate This LCZ has a high sensitivity to landscape change as parklands and natural environment, however, as Reg Coady reserve is adjacent and as only parts of the Timbrell Park are in direct line of sight and vegetation lining the parks forms a partial ‘green wall’ the magnitude of impact is moderate. Therefore, the overall impact on this LCZ is high-moderate.
LCZ4 Livvi’s Place playground		
High	Low	Moderate This LCZ has a high sensitivity to landscape change as a natural environment and public recreational playground typically used by children and a low magnitude of impact due to the obscured line of site behind tree canopy lining. Therefore, the overall impact to this LCZ is moderate.
LCZ5 Five Dock residential area		
High	Low	Moderate This LCZ has a high sensitivity to landscape change as a residential area in an urban environment and a low magnitude of impact due to the obscured line of sight from some areas, even with the removal of trees and the change in prominent built form elements. Therefore, the overall impact is moderate.

Sensitivity	Magnitude	Description of impact
LCZ6 Haberfield Residential Heritage area		
High	Low	<p>Moderate</p> <p>This LCZ has a high sensitivity to landscape change as a residential area in an urban environment, however, it has a low magnitude as even with the removal of trees and overshadowing from the built elements the proposal would be largely obscured by the surrounding planted and existing trees, sound wall, and directly adjacent properties. Therefore, this LCZ has an overall impact of moderate.</p>

Viewpoints

A summary of the potential visual impacts of the proposal from the above viewpoints is outlined in Table 6-21.

The impact ratings range between moderate and high, but predominantly moderate, this is due to the type of viewer at the locations of the viewpoints and the surrounding infrastructure and landmarks such as the sound barrier of Dobroyd Parade, road lighting, traffic lights and signage. The high rating is due to the residential type of viewer at Viewpoint A and the removal of vegetation included to accommodate the construction of the proposal.

Table 6-21 Visual impact assessment

Viewpoint A				
Location	Sensitivity	Magnitude	Overall rating	Comments
Dobroyd Parade cul-de-sac looking west	High	High	High	<p>This section of Dobroyd Parade is a residential street terminating in a cul-de-sac abutting the Dobroyd Parade sound barrier to the left.</p> <p>The proposed bridge would sit within the public greenspace and be a dominant visual feature for residents and visitors in the street. Planting and the grey colour choice have been included to reduce the presence of the proposed structure.</p> <p>The overall rating is high as even though tree and shrub planting would partially screen the proposed structure, the bridge would be a dominant structure and highly visible to residents.</p>



Existing view



Proposed view

Viewpoint B				
Location	Sensitivity	Magnitude	Overall rating	Comments
Dobroyd Parade looking east	Low	High	Moderate	<p>The Dobroyd Parade road corridor is defined by its utility and highly modified road environment. The broad roadway, overhead signage, noise walls and limited greenery are therefore not inversely impacted by the new bridge.</p> <p>Therefore, even though the proposed structure is a large-scale change to the built form or this viewpoint, the environment is not very susceptible to the change and the impact is moderate.</p>



Existing view



Proposed view



Viewpoint C				
Location	Sensitivity	Magnitude	Overall rating	Comments
Dobroyd Parade looking west	Low	High	Moderate	<p>The Dobroyd Parade road corridor is defined by its utility and highly modified road environment. The broad roadway, overhead signage, noise walls, WestConnex tunnel portal in the background and limited greenery are therefore not inversely impacted by the new bridge.</p> <p>Therefore, even though the proposed structure is a large-scale change to the built form of this viewpoint, the environment is not very susceptible to the change and the impact is moderate.</p>



Existing view



Proposed view

Viewpoint D				
Location	Sensitivity	Magnitude	Overall rating	Comments
Timbrell Park	High	Moderate	High-moderate	<p>Timbrell Park is a local public greenspace comprising open grassed areas and with a boundary of mature trees at the perimeter. The view of the bridge from the park is distant and partially obscured by existing trees.</p> <p>The overall impact is high-moderate as even though this view is highly sensitive the view is partially obstructed by the tree canopy barrier along the Iron Cove Creek canal.</p>
				
Existing view		Proposed view		

6.3.4 Safeguards and management measures

Landscape character and visual impact safeguards necessary to mitigate any potential impacts as a result of the proposed construction works are outlined in Table 6-22.

Table 6-22 Landscape character and visual safeguards and management measures

ID	Impact	Environmental safeguards	Responsibility	Timing
LV1	Visual Impact	Where reasonable and feasible trees will be retained in design.	Transport	Detailed Design
LV2	Landscape character and visual impact	Limit vegetation removal to the minimum amount required for the construction of the proposal.	Contractor	Construction
LV3	Visual Impact	Construction facilities will be contained within the construction works zone boundary and occupy the minimum area practicable for their intended use.	Contractor	Construction
LV4	Visual Impact	Provide suitable barriers to screen views from adjacent areas during construction	Contractor	Construction
LV5	Visual impact	The work site should be cleaned and tidied at the end of each day to reduce visual impact.	Contractor	Construction

ID	Impact	Environmental safeguards	Responsibility	Timing
LV6	Visual Impact	Following the completion of construction works, plant/equipment will be removed, and disturbed areas will be revegetated, turfed or otherwise restored as appropriate.	Contractor	Construction
LV7	Lighting	The design of new street lighting will consider potential light spill impacts on adjacent properties.	Transport	Detailed design
LV8	Artwork	Incorporating artwork to be included in the bridge design, that would be sympathetic to the area, will be investigated.	Transport	Detailed Design / Pre-construction
LV9	Lighting	Temporary site lighting will be installed and operated in accordance with AS4282:1997 Control of the Obtrusive Effect of Outdoor Lighting, and an approved Traffic Management Plan. Construction lighting would be orientated to reduce any potential light spillage to surrounding areas.	Contractor	Construction

6.4 Non-Aboriginal heritage

6.4.1 Methodology

Statement of heritage impact

A Statement of Heritage Impact was completed for the proposal to determine the significance of heritage in the vicinity of the proposal area and the potential impact of the proposal on heritage listings. It is attached as Appendix E.

Heritage items were identified through a database search of the following registers and databases:

- World Heritage List
- Commonwealth Heritage List
- National Heritage List
- State Heritage register
- Section 170 Heritage conservation registers
- Inner West LEP 2022
- NSW State Heritage Inventory database
- Register of the National Estate
- National Trust of Australia (NSW) Register.

An inspection of the proposal area was undertaken by a heritage specialist on 29 June 2023 to inspect heritage items and key views to assist in the determining any potential impacts from the proposal.

Assessment of heritage impact

The assessment for potential impacts to heritage items in the vicinity of the study area is based on a magnitude of impact approach based on guidelines produced by the International Council on Monuments and Sites (ICOMOS) and the Heritage Council of NSW.

Potential impacts during the construction phase of the proposal are determined based on the magnitude of impact approach outlined in Table 6-23 and the type of impact outlined in Table 6-24.

Table 6-23 Terminology for assessing the magnitude of heritage impact

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

Table 6-24 Terminology for impact types

Impact	Definition
Direct	Impacts resulting from works located within the curtilage boundaries of the heritage item.
Potential direct	Impacts resulting from increased noise, vibrations and construction works located outside the curtilage boundaries of the heritage item.
Indirect	Impact to views, vistas and setting of the heritage item resulting from proposed works outside the curtilage boundaries of the heritage item.
Archaeological	Impacts to potential archaeological remains located within the curtilage boundaries of the heritage item.

The assessment of heritage significance is completed using a system centered on the Burra Charter (ICOMOS 2013). If an item meets one of the seven criteria outlined in the charter it is considered to have heritage significance.

Archaeological assessment and significance

The archaeological assessment is based on information obtained from historical sources, previous archaeological works in and around the area, and the current condition of the site. Archaeological remains were documented based on the following period phases:

- Phase 1(1803-1825): Early land grants
- Phase 2 (1825-1883): Ramsay's Bush
- Phase 3 (1883-1960): Subdivision and establishment of roads
- Phase 4 (1883-1960): Modernisation.

The significance assessment of historical archaeological sites and items requires a specialised framework in order to consider the range of values associated with each site/item. To facilitate assessment of archaeological significance, the NSW Heritage Branch (now Heritage NSW) arranged the seven heritage criteria into four groups.

- archaeological research potential
- association with individuals, events, or groups of historical importance
- aesthetic or technical significance
- ability to demonstrate the past through archaeological remains.

6.4.2 Existing environment

Early settlement

In 1803 Nicholas Bayley, a former soldier of the NSW Corp, received a 480-acre grant between Iron Cove Creek and Long Cove Creek. This comprised all land north of Parramatta Road and the property was sold within 2 years. In 1805 the property was purchased by Simeon Lord, a prominent Sydney businessman. Lord then renamed the property Dobroyd and it remained uncultivated until 1826 with the development of the local estate. Dobroyd house, the first local school, was built in 1826 near Parramatta Road.

Subdivision of local land

The Dobroyd estate was subdivided in 1883. By the end of the century, two main subdivisions had occurred in the area with many smaller ones. Several of the smaller lots were sold over the early 1900s with only a small number of residents. In 1901 additional lots were sold to Richard Stanton who developed the local area into the regular grid pattern layout of today's suburb with nature strips and public parks. Infrastructure such as sandstone kerbing, gutters, sewerage, gas, and electricity were part of Stanton's vision and plan for the suburb, as were beautification elements such as trees and grassy nature strips.

The remaining large lots in the area were sold to the bank in 1904 for subdivision by the Haymarket Permanent Land Building and Investment Company. The subdivision resulted in an extension of Wattle Street to meet Alt Street. This area was heavily sold and developed between 1915 and 1920, with the western side of Wattle Street re-subdivided in 1922.

A sewerage system had been established throughout the inner-city suburbs by the late 1890s, however the outer suburbs were rapidly growing and had inefficient sewerage infrastructure, relying on polluted creeks. The Department of Public Works subsequently commissioned the rapid construction of stormwater channels. This led to the conversion of Iron Cove Creek into a canal in 1892.

Mid-twentieth to early twenty-first century development

From the 1930s an extensive land reclamation and beautification works program commenced throughout Haberfield and Five Dock, concentrated around Iron Cove and Iron Cove Creek. During this period Iron Cove Creek was partially reclaimed to even out the foreshore edges. The reclamations remain particularly significant today as they comprised part of the great depression unemployment relief works.

By the 1940s, Haberfield was a well-established suburb with several public reserves and services. Few changes to the area occurred between the 1940s and the 1970s. A new amenities building for Timbrell Park was constructed on the northern side of the park in the mid-1970s and potential athletics or cycling track was created adjacent to Iron Cove Creek. In the 1990s the numerous cricket pitches and amenities building were still present.

In the 1970s the precursor of the current road was constructed, with portions of Dobroyd Parade realigned. The portion of Dobroyd Parade between Waratah Street and Martin Street was demolished along the Iron Cove Creek foreshore and was realigned to connect with Wattle Street, with the new alignment directly adjacent to existing houses. Road improvements were met with parkland improvements to Robson Park, Timbrell Park and Reg Coady Reserve, all of which retained existing boundaries through the road widening schemes and saw several improvements. Extensive planting occurred at Timbrell Park along the foreshore of Iron Cove Creek.

Throughout the 2010s Dobroyd Parade has changed extensively in association with several road upgrades. Consistent upgrades to Dobroyd Parade have occurred and in recent years the entrance to the WestConnex M4 East tunnel was constructed at Haberfield at the boundary of Wattle Street and Dobroyd Parade, roughly in alignment with Ramsay Street. The northern portion of Reg Coady Reserve was used as part of the project construction footprint, and the project resulted in the demolition of several Federation era houses fronting Wattle Street between Ramsay Street and Parramatta Road. The project was heavily opposed by the local community.

Listed heritage items

The results of the database search (28 June 2023) identified the following heritage listing outlined in Table 6-25 and shown on Figure 6-13 in relation to the proposal footprint and a 100-metre buffer around it.

Table 6-25 Heritage listings in the vicinity of the proposal

Item	Address	Significance	Listing	Distance from proposal location
Haberfield Conservation Area (HCA)	Haberfield	Local	Inner West LEP 2022 #C54 RNE #3352 NTAR	Within
Dobroyd Canal Stormwater Channel No 53	Various Inner West suburbs	State	Sydney Water s170 #4571056 RNE# 101990 NTAR	<10 metres

The HCA is identified to have historical significance as the first successful comprehensively planned and marketed Garden suburb in Australia. It has significance to the history of town planning in NSW.

The Dobroyd stormwater channel is identified to have representative significance as one of the first stormwater channels built in the 1890's to alleviate the city's severe public health problems.

Archaeology

The previous archaeological investigations undertaken within HAMU 10 for the WestConnex project identified no archaeological remains around Waratah Street, and there are no known substantial developments in the HCA in the locations of the proposal works.



Figure 6-13 Heritage listings in the vicinity of the proposal

6.4.3 Potential impacts

Construction

Heritage

The assessment of potential impacts to the two heritage listings within the vicinity of the proposal is summarised in Table 6-26.

Table 6-26 Summary of heritage impacts

Listing	Direct (physical) heritage impact	Potential direct heritage impact	Indirect (visual) heritage impact
HCA (Inner Wet LEP 2022 #C54)	<p>While the proposal is located within the HCA the activities would be conducted within the road corridor along the edge of the zone.</p> <p>The proposed works do not require demolition of any buildings and therefore would not directly impact the HCA.</p> <p>Neutral Impact.</p>	<p>Vibration intensive equipment required for the proposal such as the vibratory roller and pile boring machine pose potential impacts.</p> <p>Vibration intensive works on the west side of the proposal area are outside the safe working distances, however, works on the east side are within 20 metres of residences inside the HCA.</p> <p>The nature of vibration intensive equipment is expected to be minor and therefore, potential impacts would be minimal.</p> <p>Negligible impact.</p>	<p>Significance of the conservation area is derived from the aesthetic appeal of the area. Works would be visible to traffic and pedestrians and would cause visual impacts localised to the HCA in the vicinity of the proposal area.</p> <p>Landscaping and tree planting would reduce the visual impact. However, the greater conservation area would not see any visual impacts.</p> <p>Minor adverse impact (local)</p> <p>Negligible impact (overall)</p>
Dobroyd Stormwater Channel No 53 (s170 Sydney Water #4571056)	<p>The curtilage of the item is defined by the channel bed, walls, and coping. Although the footprint of the proposal extends into the curtilage, the proposed works would not modify the heritage fabric of the canal. The nearest item of the proposal (stair and ramp footings) would be 2 metres away.</p> <p>Neutral impact.</p>	<p>Due to the proximity of the nearest proposed item (stair and ramp footings) the proposed works would be within the minimum safe working distances for vibration intensive equipment and could result in cosmetic damage to heritage fabric. However, due to the minor nature of the vibration activities and the concrete based material of the canal potential impacts are unlikely.</p> <p>Negligible impacts</p>	<p>Significance of the canal is derived from aesthetic value. The proposed works would be visible from the canal bridge and either side of the channel (between gaps in cover). However, visual impact would only occur in the vicinity of the proposal and within the established buffer zone (100m refer Figure 6-13). Cultural views outside this zone could not be affected by the proposal.</p> <p>Minor adverse impact (local)</p> <p>Negligible impact (overall)</p>

Archaeology

It is not expected that substantial and significant archaeological remains would be present within the proposal area. Potential archaeological remains within the conservation area would likely be limited to evidence of former road surfaces or kerbing, or non-significant fills, deposits, and isolated artefacts.

A summary of archaeological potential and significance of the resources associated with each phase of the proposal area's land use is outlined in Table 6-27.

Table 6-27 Historical archaeological potential and significance

Phase	Anticipated remains	Potential for survival	Significance
Phase 1 (1803- 1825)	Evidence of land clearing activities or informal land use, such as tree bowls, isolated artefacts, or postholes	Nil	Nil
Phase 2 (1825- 1883)	Evidence of land clearing activities, informal land use or evidence of gardening, such as tree bowls, isolated artefacts, postholes, archaeobotanical remains	Nil to low	Nil
Phase 3 (1883- 1960s)	Evidence of former road surfaces, kerbing, drainage	Low	Local ('works')
	Artefact bearing land reclamation fills	High	Nil
Phase 4 (1960s-present)	Nil	Nil	Nil

Operation

Operation of the proposal is not considered for potential impacts outside of indirect visual impact due to the nature of the proposal. Indirect impacts would match the indirect impacts of the construction phases of the proposal. Indirect impacts on heritage items would be minor adverse in the vicinity of the proposal due to line of site and would be negligible outside of the localised area.

6.4.4 Safeguards and management measures

Non-Aboriginal heritage safeguards necessary to mitigate any potential impacts as a result of the proposed construction works are outlined in Table 6-28.

Table 6-28 Non-Aboriginal heritage safeguards and management measures

ID	Impact	Environmental safeguards	Responsibility	Timing
NH1	Non-Aboriginal heritage	A Non-Aboriginal Heritage Management Plan (NAHMP) will be prepared and implemented as part of the CEMP. It will provide specific drafting guidance on measures and controls to be implemented to avoid and mitigate impacts to non-Aboriginal heritage.	Contractor	Detailed design / Pre-construction
NH2	Non-Aboriginal heritage	The <i>Standard Management Procedure - Unexpected Heritage Items</i> (Transport, 2015) will be followed in the event any unexpected heritage items, archaeological remains or potential relics of non-Aboriginal origin are encountered.	Contractor	Detailed design / Pre-construction

ID	Impact	Environmental safeguards	Responsibility	Timing
		Work will only re-commence once the requirements of that Procedure have been satisfied.		
NH3	Non-Aboriginal heritage	Train all personnel working on site to ensure they are aware of the requirements of the NAHMP and relevant statutory responsibilities. Provide site-specific training to personnel when working in the vicinity of identified non-Aboriginal heritage items.	Contractor	Pre-construction / construction

6.5 Hydrology and flooding

6.5.1 Methodology

A flood impact assessment technical memo was completed as part of the 80% concept design (Stantec 2023) as a section of the proposal area is located on the overland flow path during a major flood event.

Hydraulic modelling was completed as part of the flood impact assessment and was built in the TUFLOW model package (provided by Transport 9 September 2022), an industry standard modelling program. Project and site-specific data were incorporated into the model including:

- topographic survey overlay
- road gutters and kerbs were modified to fit the site survey and aerial imagery
- inclusion of the noise wall that blocks overland flows
- inflow locations were rearranged.

6.5.2 Existing environment

Existing conditions in the proposal area are identified in the flood impact assessment undertaken for the proposal and attached as Appendix G. The 1% AEP modelling for the existing site shows that areas of inundation occur during major flooding events (Figure 6-14). During these events Iron Cove Creek floods to levels between 0.2 metres and 1.0 metres above ground level on the northern side of Dobroyd Parade in the proposal area and to less than 0.2 metres on the southern side of the Dobroyd Parade in the proposal area. The difference across the area is likely due to the differences in road level along Dobroyd Parade for drainage purposes and the natural slope of the land.

Figure 6-15 shows the existing flood hazard conditions in the proposal area with the majority of the area identified as H1 and some smaller areas reaching H2, H3, H4, and very few areas reaching H5 outside of the canal. These hazard classes are described in Table 6-29.

Table 6-29 Flood hazard class

Hazard class	Description
H1	Generally safe for vehicles, people, and buildings
H2	Unsafe for small vehicles
H3	Unsafe for vehicles, children, and the elderly
H4	Unsafe for vehicles and people

Hazard class	Description
H5	Unsafe for vehicles and people, All buildings vulnerable to structural damage, and some less robust buildings subjects to failure
H6	Unsafe for vehicles and people, and all building types considered vulnerable to failure

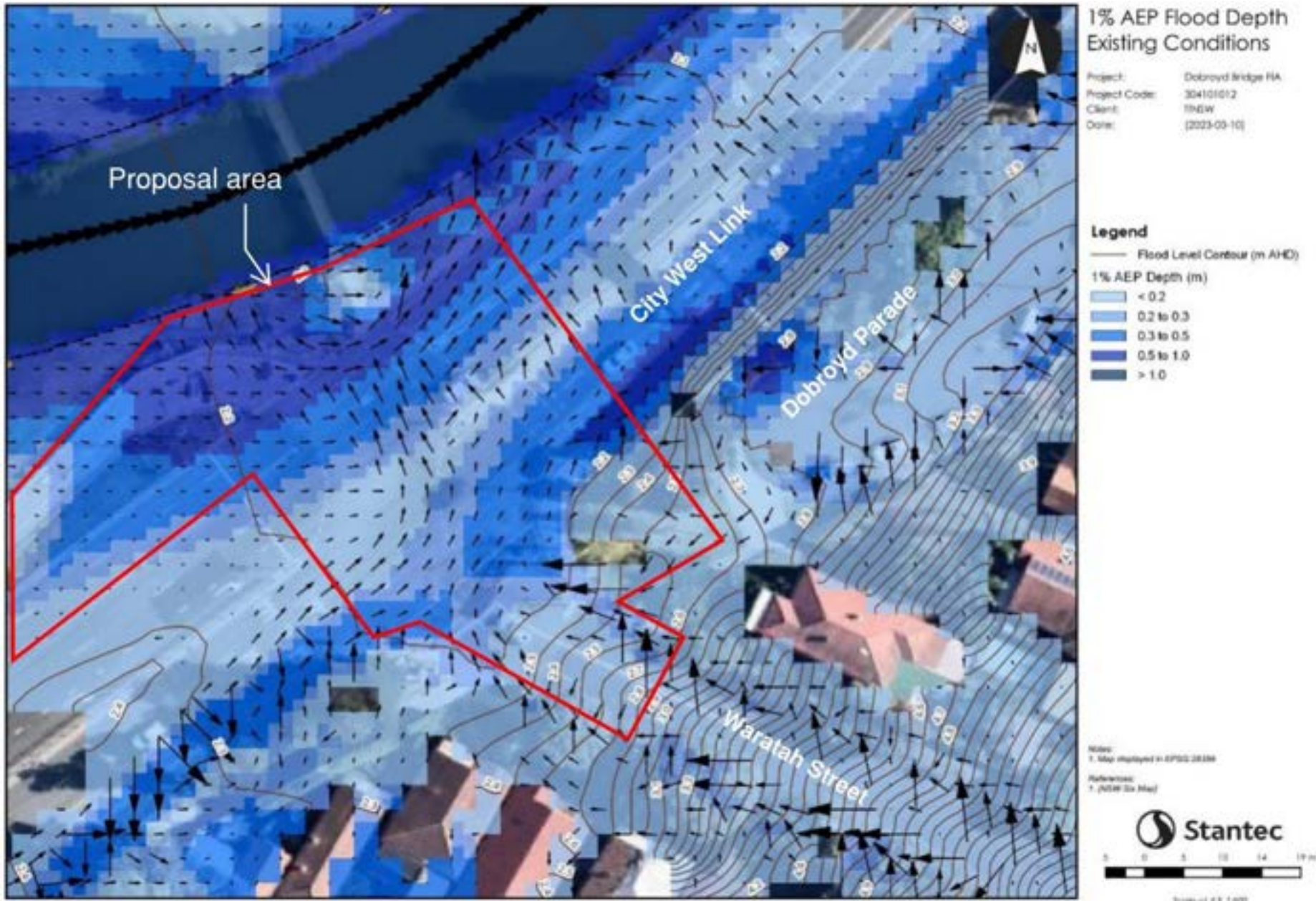


Figure 6-14 Existing flood conditions – 1% AEP flood depth

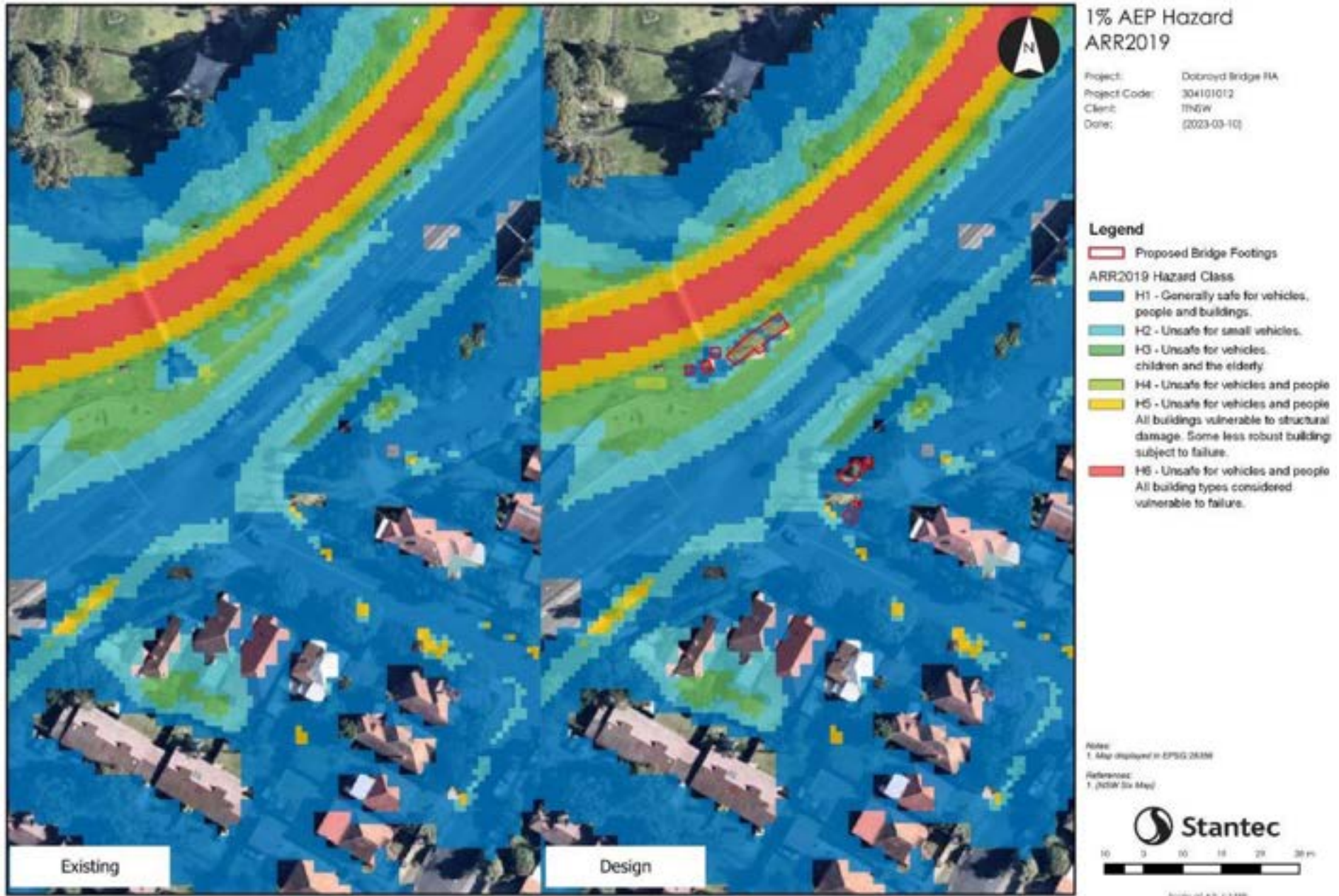


Figure 6-15 Flood hazard – 1% AEP

6.5.3 Potential impacts

Construction

During construction, the 1% AEP flood event poses a potential flood risk in the proposal area. Flooding has the potential to increase risk of erosion and sedimentation particularly in areas where vegetation clearing, or excavation have been undertaken and / or stockpiles are located. Implementation of a Flood Management Plan, as part of the CEMP, would manage the impacts from any flood events that may occur during the construction stage of the proposal.

Operation

The flood hazard assessment for the 1% AEP flood event shows minor changes between the existing flood hazard areas and the proposed operational flood hazard areas (Figure 6-15). The results of the flood depth difference suggest a minor localised increase in flood levels in the vicinity of the bridge. The increase in flood levels from the proposal are an average of 0.02 metres with a maximum increase by approximately 0.1 metres above the ground surface with a maximum velocity of 1 m/s at the southern bridge base. These are modelled to occur in the road reserve away from properties. In response to this modelling the design incorporated a ramp to the lift on the northern side of the bridge. Therefore, these impacts are negligible.

The construction and operation of the proposal would create a minor increase of impervious surface in the proposal area. However, this increase is unlikely to contribute to an increase in runoff potential.

6.5.4 Safeguards and management measures

Hydrology and flooding safeguards necessary to mitigate any potential impacts as a result of the proposed construction works are outlined in Table 6-30.

Table 6-30 Hydrology safeguards and management measures

ID	Impact	Environmental safeguards	Responsibility	Timing
HF1	Flooding provisions	A lifted lift landing on the northern side of the pedestrian bridge has been included in the design along with an access ramp to accommodate potential flooding impacts. This measure would be maintained and carried through to detailed design.	Transport	Detailed design
HF2	Flooding	A flood management plan will be included in the CEMP and include safeguards and measures to reduce the impact of flooding during construction of the proposal and to manage potential impacts such as erosion and sedimentation.	Contractor	Pre-construction
HF3	Flooding	Inclusion of stop work protocols and site management requirements in the CEMP and site health and safety documentation in the event of a major flood event occurring. This will include protocols for protection of material, equipment, and exposed excavation.	Contractor	Construction

6.6 Biodiversity

This section describes the existing biodiversity of the proposal area and assesses the potential impacts associated with the proposal.

6.6.1 Methodology

A review of existing information and State and Commonwealth data sources was completed on 20 June 2023 to gain an understanding of biodiversity values within the proposal area and broader locality. Reviewed sources included:

- NSW State Vegetation Type Map (SVTM C1.1.M1.1)
- NSW Department of Planning and Environment (DPE) BioNet Atlas
- Department of Climate Change, Energy, the Environment and Water (DCCEEW) Protected Matters Search Tool (PMST)
- Sensitive ecological sites databases (DCCEEW register of critical habitat, Areas of Outstanding Biodiversity Value register).

The searches were undertaken on a five-kilometre radius of the proposal site. Searches are attached as Appendix H.

A site walkover of the proposal area was completed on 20 June 2023. A Random Meander and Rapid Biodiversity Assessment was conducted to ground-truth vegetation mapping and identify potential habitat within the proposal area.

6.6.2 Existing environment

Protected areas

The proposal area does not fall within any National Parks, Conservation Reserves, Nature Reserves or Regional Parks. The nearest protected area to the proposal area is Rodd Island, which forms part of Sydney Harbour National Park, located approximately 1.7 kilometres northeast of the proposal area.

Terrestrial vegetation and habitat

Existing vegetation mapping (SVTM C1.1.M1.1) does not identify any native vegetation communities (Plant Community Types; PCTs) within the proposal area. The surrounding area is highly urbanised with little remnant vegetation and is dominated by residential dwellings and recreational spaces characterised by hardstand, landscaped areas, street plantings and open parks. The nearest mapped PCT to the proposal area is a patch of Sydney Turpentine Ironbark Forest (PCT 3262) occurring approximately 700m north of the proposal area in Five Dock Park.

At the time of the site walkover, vegetation within the proposal area was noted to be limited to landscaped gardens, maintained lawns and planted street trees and was not considered to be commensurate with any PCT. Vegetation within the proposal footprint included a landscaped garden, adjacent to the existing noise wall, with planted natives such as spiny-headed mat-rush (*Lomandra longifolia*), Needlebush (*Hakea sericea*), Tick Bush (*Kunzea ambigua*), broad-leaved paperbark (*Melaleuca quinquenervia*), Coast Banksia (*Banksia integrifolia*), Red Spider Flower (*Grevillea speciosa*) and Crimson Bottlebrush (*Callistemon citrinus*), street trees such as water gum (*Tristaniopsis laurina*) and Weeping Bottlebrush (*Callistemon viminalis*), and areas of mown lawn and broadleaf weeds. Vegetation within the site compounds is limited to cultivated and exotic grasses, such as Kikuyu grass (*Cenchrus clandestinus*), Panic Veldtgrass (*Ehrharta erecta*) and Summer Grass (*Digitaria* spp.), and broadleaf weeds, such as White Clover (*Trifolium repens*), Plantain (*Plantago lanceolata*), Vetch (*Vicia* spp.) and Common Sowthistle (*Sonchus oleraceus*). The proposed site compound within Reg Coady Reserve occurs adjacent to a stand of established Fig trees (*Ficus* spp.). One planted juvenile fig is located within the site compound.

Planted native vegetation is located in the landscaped portion of the proposal area shown in Figure 6-16. Figure 6-17 and Figure 6-19 show the exotic vegetation located in site compounds 2 and 3 respectively

while Figure 6-18 shows the maintained lawn characteristic of Reg Coady Reserve adjacent to the proposal site compound 1.



Figure 6-16 Native plantings and landscaped area within the proposal area



Figure 6-17 Site compound 2 – 87 Dobroyd Parade / 21 Martin Street Haberfield



Figure 6-18 Maintained lawn within Reg Coady Reserve – adjacent to site compound 1



Figure 6-19 Site compound 3 (287 Ramsay Road, Haberfield) - exotic groundcover

Aquatic habitat

Iron Cove creek, located to the north of the proposal area, is a first order urban stream and tributary of the Parramatta River. The eastern extent of Iron Cove Creek and the Parramatta River are mapped as Key Fish Habitat under the *Fisheries Management Act 1994* and represent aquatic habitats important to the maintenance of fish populations and survival of threatened aquatic species.

Fauna

Fauna habitat within the proposal area is limited to foraging habitat for nectivorous and insectivorous species. No hollow-bearing trees, nests, burrows, or other fauna habitat features were detected within the proposal area. Fauna species detected during the site visit were limited to common urban bird species:

- Little Corella (*Cacatua sanguinea*)
- Rainbow Lorikeet (*Trichoglossus haematodus*)
- Noisy Miner (*Manorina melanocephala*)
- Welcome Swallow (*Hirundo neoxena*)
- Australian Magpie (*Gymnorhina tibicen*)
- Willie Wagtail (*Rhipidura leucophrys*)
- Australasian Darter (*Anhinga novaehollandiae*)
- Masked Lapwing (*Vanellus miles*).

The habitat within the proposal area is not limited to the locality and therefore no species is considered to be dependent on these resources for their long-term survival. Vegetation within the proposal area may be used on a transitional basis and contribute to connectivity corridors to larger tracts of vegetation within the locality.

Threatened and migratory species, populations, and ecological communities

Threatened and migratory species

The Protected Matter Search Tool (PMST) identified the following Matters of National Environmental Significance (MNES), relating to threatened and migratory species within the locality:

- 92 EPBC Listed Threatened Species have potential to occur within the locality, of which 29 are known to occur within the locality.
- 64 EPBC Listed Migratory Species have potential to occur within the locality, of which 34 are known to occur within the locality.

The DPE BioNet Atlas database search indicated that 61 threatened and/or migratory species had been recorded within five kilometres of the proposal area, including one amphibian, 35 bird, 12 mammal, one reptile, one insect and 11 flora species. No threatened species records from the BioNet Atlas are located within the proposal area.

Overall, the reviews of the DPE BioNet Atlas database and the DCCEEW PMST identified 163 threatened and/or migratory species, listed under the (BC Act or EPBC Act, with the potential to occur in the locality. This includes a large number of shorebirds, pelagic birds and other marine species with no suitable habitat present within the proposal area. Threatened flora species are unlikely to occur within the proposal area due to the modified nature of the vegetation within the proposal area.

No terrestrial threatened species have been recorded within the proposal area. One species, the Grey-headed Flying-fox (*Pteropus poliocephalus*), listed as vulnerable under the BC Act and EPBC Act, has frequently been recorded in close proximity to the proposal area. Suitable, albeit suboptimal, foraging habitat for the species is present within the proposal area. Due to the mobile nature of this species and the presence of higher quality habitat that occurs within the range of the species, habitat within the proposal area is not considered a key resource for this species.

Due to the nature of the proposal area, limited impacts to vegetation and habitat features, and mitigation measures to be implemented, it is considered unlikely that the proposal would have a significant impact on any native species.

Threatened ecological communities

The PMST identified 10 EPBC listed threatened ecological communities with potential to occur within the locality. No remnant vegetation or PCTs occur within the proposal area and therefore no PCTs occur within the proposal area.

6.6.3 Potential impacts

Construction

Terrestrial vegetation and habitat

The proposal footprint is limited to areas of existing hardstand and native landscape plantings. The proposal would require the removal of planted native trees and shrubs within landscaped areas of approximately 150 square metres. No habitat features were detected within the proposal area during the site walkover. The vegetation to be removed does not form part of any remnant PCT, however may provide marginal foraging and roosting habitat and movement corridors for mobile, disturbance tolerant native fauna.

The removal of this vegetation is unlikely to have a significant impact on native fauna as there is an abundance of similar habitat across the locality, including habitat to be retained and replanted within the proposal area. The placement of the site compound would be within an existing area of clearance and would not require any tree removal.

Aquatic habitat

Ground disturbance could expose soils and components of reclaimed land which can then be easily mobilised. Contaminants in the soil can also be subsequently released into the surrounding environment.

Erosion and sedimentation have the potential to impact Iron Cove Creek, located to the immediate north of the proposal footprint. Impacts to Iron Cove Creek could occur if erosion and sedimentation controls are not implemented, particularly during inclement weather (e.g. rainfall, high winds). This could result in turbid conditions, the smothering of macrophytes, sessile marine vegetation, habitat and fauna, and/or sediment and biota contamination in the waters of the Iron Cove Creek, and the Parramatta River.

Threatened, migratory and protected species

Potential foraging habitat for urban, disturbance tolerant species is present within the proposal area, however the proposal would only result in the removal of a small amount of this habitat and replacement planting would be undertaken. No habitat within the proposal area is considered to be limited in the locality and therefore no species is considered to be dependent on these resources for their long-term survival. Vegetation within the proposal area may be used on a transitional basis and contribute to connectivity corridors to larger tracts of vegetation in the locality.

One threatened species, the Grey-headed Flying-fox (*Pteropus poliocephalus*), listed as vulnerable under the BC Act and EPBC Act, has frequently been recorded close to the proposal area and suitable foraging habitat, albeit suboptimal, for the species is present within the proposal area. Due to the mobile nature of this species and the presence of higher quality habitat that occurs within the range of the species, habitat within the proposal area is not considered a key resource for this species.

Overall, the proposal area is highly modified, and the proposal is not likely to have a significant impact on threatened species, ecological communities or migratory species listed under the BC and/or EPBC Act and therefore it is considered that no assessments of significance are required. A Species Impact Statement or Biodiversity Development Assessment Report is not required for the works.

Invasion and spread of weeds, pathogens, and diseases

Disturbance of vegetation can result in the introduction or spread of exotic flora (i.e. weeds). This can occur by the spread of opportunistic exotic vegetation from adjacent private properties or new species can be introduced via equipment, plant and footwear. Any foreign equipment or materials brought onto the construction site also have potential to introduce diseases such as Phytophthora (*Phytophthora cinnamomi*) and Myrtle Rust (*Puccinia psidii*). The vegetation and habitat in the proposal area and the surrounding areas would be susceptible to weeds and diseases if not managed during construction.

Operation

Following the completion of works, tree planting and landscaping would be undertaken. The landscaping of the proposal after completion of the structure would include the planting of native tall trees, native shade trees, shrubs, grasses, and turf areas around the lift bases on both the northern and southern sides. Species suggested for planting include Sydney Red Gum, Blueberry Ash, Black Tea Tree, and Prickly Paperbark.

Site compounds would be landscaped and returned to a condition equivalent or of higher quality than before construction. No changes to operational impacts to terrestrial fauna and flora are expected.

Conclusion on significance of impacts

The proposal is not likely to significantly impact threatened species or ecological communities or their habitats, within the meaning of the *Biodiversity Conservation Act, 2016* or *Fisheries Management Act 1994* and therefore a *Species Impact Statement* or Biodiversity Development Assessment Report is not required.

The proposal is not likely to significantly impact threatened species, ecological communities, or migratory species, within the meaning of the EPBC Act.

Where a significant impact is likely to threatened species, ecological communities, or migratory species within the meaning of the EPBC Act.

6.6.4 Safeguards and management measures

Biodiversity safeguards necessary to mitigate any potential impacts from the proposal construction works are outlined in Table 6-31.

Table 6-31 Biodiversity safeguards and management measures

ID	Impact	Environmental safeguards	Responsibility	Timing
B1	Biodiversity	<p>Biodiversity Management Plan is to be prepared and included within the CEMP. The plan would include:</p> <ul style="list-style-type: none"> a site walk over with an ecologist as part of the pre-clearing surveys a map showing vegetation clearing boundaries and sensitive area/no go area or trees to be protected incorporation of management measures identified as a result of pre-clearing survey reports, completed by an ecologist a detailed cleaning process in accordance with Biodiversity Guidelines (2011) identify controls/mitigation measures to prevent impacts on sensitive location or no go zones or tree protection zones a stop work procedure in the event of identification of unidentified species, habitat or populations. 	Contractor	Pre-construction
B2	Biodiversity Impacts	pre-clearing survey will be conducted in accordance with Biodiversity Guidelines, Guide 1 (Roads and Maritime, 2016) and will:	Contractor	Pre-construction

ID	Impact	Environmental safeguards	Responsibility	Timing
		<ul style="list-style-type: none"> confirm (with the assistance of a surveyor) clearing boundaries, exclusion zones, protected habitat features and revegetation areas prior to starting work identify, in toolbox talks, where biodiversity controls are located on the site. 		
B3	Encountering fauna	A suitably qualified ecologist or experienced wildlife handler would be engaged to survey and handle any fauna.	Contractor	Construction
B4	Weed management	<p>Weed management will occur in accordance with Biodiversity Guidelines, Guide 6 (Roads and Maritime 2016) and include:</p> <ul style="list-style-type: none"> the Identification of weeds on site (confirmed during pre-clearing survey) weed management priorities and objectives Exclusion zones, protected habitat features and revegetation areas prior to starting work within or directly next to the site the location of weed infested areas weed control methods measures to prevent the spread of weeds, including machinery hygiene procedures and disposal requirements a monitoring program to measure the success of weed management communication with local Council noxious weed representative. 	Contractor	Construction
B5	Spreading of diseases affecting plants	Management measures will be implemented to control and/or prevent the introduction and/or spread of disease-causing agents such as bacteria and fungi in accordance with the Biodiversity Guidelines, Guide 7 (Roads and Maritime 2016).	Contractor	Construction
B6	Unexpected threatened species finds	If unexpected flora or fauna are discovered on site stop work immediately and implement the Roads and Maritime Unexpected Threatened Species Find Procedure in the Biodiversity Guidelines, Guide 1 (Roads and Maritime 2016).	Contractor	Construction
B7	Spread of weeds	Reuse of topsoil free from weeds or pathogens would be used as part of habitation/landscaping works, where reasonable and feasible.	Contractor	Construction
B8	Loss of trees	The loss of trees due to the proposal will be offset in accordance with the Tree and	Contractor	Construction

ID	Impact	Environmental safeguards	Responsibility	Timing
B9		Hollow Replacement Guideline (Transport 2022c)		
	Minimise risks to native flora and fauna during construction	Protect trees nominated for retention in line with Australian Standard AS 4970-2009 Protection of Trees on Development Sites (Standards Australia 2010). Exclusion zones will be established in area of construction and ancillary sites and identified in CEMP. Vehicle parking, machinery, construction compounds and material stockpiles will be located in cleared or disturbed areas.	Contractor	Construction
B10	Protect native flora and fauna, minimise edge effects and avoid inadvertent impacts	Site-specific training will be given to personnel when working in the vicinity of areas of identified biodiversity value that are to be protected.	Contractor	Construction

6.7 Geology, soils and contamination

6.7.1 Methodology

A desktop search of relevant databases and literature was undertaken including the following:

- Inner West LEP acid sulphate soil mapping – NSW Government, 2023c
- Acid Sulphate Soil risk mapping (SEED) – NSW Government, 2023e
- Geology information (Sydney 1:100,000 geological map) – Digs, 2023
- Contaminated land (Environmental Protection Authority) – EPA, 2023b
- Soil information (eSPADE mapping) – eSPADE, 2023
- Geotechnical interpretive report (20% concept design) – Stantec, 2020.

6.7.2 Existing environment

Geology and soil landscapes

The proposal area sits on the east bank of Iron Cove Creek on the Hawkesbury Sandstone formation within the Sydney Basin. The geology of the area is characterised by medium to coarse-grained quartz sandstone, with very minor amounts of shale and laminate lenses (Digs 2023). The lithology of the region includes the following (Stantec 2020):

- alluvium from remnant paleochannels infused into the bedrock
- residual soils derived from shale, with some silty sands and gravels
- Ashfield shale overlaying the Hawkesbury sandstone along the alignment of Dobroyd Parade
- Mittagong formation that separates the Hawkesbury sandstone layer with the Ashfield shale layer as a translational formation
- Hawkesbury sandstone is the primary bedrock formation that would be encountered along the alignment of the Dobroyd Parade characterised by medium to coarse grained quartz sandstone.

The proposal area is situated on disturbed terrain soil landscape (eSPADE 2023) which is characterised by plain, hummocky terrain with mild slopes, previously disturbed by human activity. This is likely from the local development and the construction of Dobroyd Parade.

Acid sulphate soils

The Inner West acid sulphate soil (ASS) mapping (NSW Government 2023c) identifies that the proposal area is situated on class 2 ASS. This soil zone is localised around Iron Cove Creek with Class 5 ASS being located in the residential areas to the north of Timbrell Park and the south of Dobroyd Parade.

Class 2 ASS are soils likely to be found below the natural below surface and class 5 ASS is soils within 500 metres of class 1, 2, 3, or 4 ASS. The ASS risk mapping determines the proposal area and Iron Cove Creek as not assessed for probability of occurrence of ASS (NSW Government 2023c).

Contaminated land

A search of the NSW EPA databases including the EPA Contaminated Land Record (2023a) and the EPA List of NSW Contaminated Sites Notified (2023b) was completed on August 1, 2023. This search identified one site of potential contamination in the vicinity of the proposal area as detailed in Table 6-32.

Table 6-32 Contaminated sites notified to the EPA

Site name	Address	Contamination causing activity	EPA site management class	Distance from the proposal
7-11 Haberfield	25-35 Parramatta Road	Service station	Contamination currently regulated under <i>Contaminated Land Management Act 1997</i>	1600 metres

6.7.3 Potential impacts

Construction

Potential impacts associated with geology, soils and contamination mostly relate to exposure of soils and contaminants due to earthworks, and erosion sedimentation from site runoff. Construction stage activities including site establishment, foundation treatment, excavation, and earthworks involve exposure of soils.

Exposed soils or stockpiles have the potential to erode through either wind or water actions. This may lead to transportation of sediments or contamination issues into adjacent stormwater systems or waterways.

The implementation of safeguards and mitigation measures would reduce the risk of potential impacts through standardised measures and proper handling methods. These measures would ensure the safe and proper handling and treatment of soil and contaminated materials.

Accidental spills during construction also have the potential to impact soil and contamination in the area. Spills would also have the potential to enter adjacent waterways or local stormwater systems and cause pollution impacts. Appropriate safeguards and mitigation measures would reduce the risk of potential impacts from accidental spills.

The desktop review of contaminated land identified the low risk of contaminated land to be encountered during the construction of the proposal. The one identified site is more than 1500 metres away from the proposal and does not pose any risk. If unidentified contaminated lands are encountered during the construction of the proposal certain measures would need to be considered including:

- potential impacts to humans
- the treatment or movement of contaminated material

- safeguards or measures to contain or reduce impact.

Operation

Potential impacts associated with the operational phase of the proposal are expected to be minimal due to the nature of the proposal and the reestablishment of cover on disturbed areas.

6.7.4 Safeguards and management measures

Geology, soils, and contamination safeguards necessary to mitigate any potential impacts from the proposal construction works are outlined in Table 6-33.

Table 6-33 Soils safeguards and management measures

ID	Impact	Environmental safeguards	Responsibility	Timing
GSC1	Erosion and sediment control	A site-specific Erosion and Sediment Control Plan/s will be prepared and implemented in accordance with the Managing Urban Stormwater: Soils and Construction, Volume 1 and 2 (Landcom 2004) as part of the Soil and Water Management Plan	Contractor	Detailed design / Pre-construction
GSC2	Accidental spill	A site-specific emergency spill plan will be developed and include spill-management measures in accordance with the Transport <i>Code of Practice for Water Management</i> (RTA 1999) and relevant EPA guidelines. The plan will address measures to be implemented in the event of a spill, including initial response and containment, notification of emergency services and relevant authorities (including Transport EPA officers).	Contractor	Detailed design / Pre-construction
GSC3	Acid sulphate soils	Acid Sulphate soil management plan would be included as part of the CEMP. This management plan would include the safe management, treatment and transportation of any material deemed to be of acid sulphate soil risk and would include training and induction for all workers.	Contractor	Detailed design / Pre-construction
GSC4	Removal of excavated material	Classify all waste material excavated and removed from the proposal area in accordance with the NSW Waste Classification Guidelines (EPA 2004)	Contractor	Pre-construction
GSC5	Existing condition of ancillary sites	Undertake a pre-construction land assessment prior to land being used for ancillary construction purposes (compounds, storage, parking, etc) to identify the presence of any pre-existing wastes or stored materials. The assessment should be prepared in accordance with the Transport for NSW Management of road construction and	Contractor	Pre-construction

ID	Impact	Environmental safeguards	Responsibility	Timing
GSC6	Soil and water	<p>maintenance wastes (Roads and Maritime Services 2016).</p> <p>A Soil and Water Management Plan (SWMP) will be prepared and implemented as part of the CEMP. The SWMP will identify all reasonably foreseeable risks relating to soil erosion and water pollution and describe how these risks will be addressed during construction.</p> <p>The SWMP would include:</p> <ul style="list-style-type: none"> • stockpile management plan • dewatering plan which includes process for monitoring flocculants and dewatering water from site • a process to routinely monitor the Bureau of Meteorology weather forecast • preparation of a wet weather (rain event) plan which includes a process for monitoring potential wet weather and identification of controls to be implemented in the event of wet weather. • inspection and maintenance schedule for ongoing maintenance of temporary and permanent erosion and sediment controls <p>The SWMP will address:</p> <ul style="list-style-type: none"> • transport for NSW Code of Practice for Water Management • the Blue Book- Managing Urban Stormwater: Soils and Construction, Volume 1 and 2 • transport for NSW Technical Guideline – Temporary Stormwater Drainage for Road Construction. 	Contractor	Pre-construction
GSC7	Contaminated land	<p>If contaminated areas are encountered during construction, appropriate control measures, as detailed in the CEMP, will be implemented to manage the immediate risks of contamination. All other works that may impact on the contaminated area will cease until the nature and extent of the contamination has been confirmed and any necessary site-specific controls or further actions identified in consultation with the Transport for NSW Senior Manager Environment and Sustainability and/or EPA.</p>	Contractor	Construction
GSC8	Soil and water	<p>All stockpiles would be designed, established, operated, and decommissioned in accordance with the</p>	Contractor	Construction

ID	Impact	Environmental safeguards	Responsibility	Timing
GSC9	Soil and water	Transport for NSW Stockpile Management Procedures.		
		Controls would be implemented at construction zones exit points to minimise the tracking of material onto the road.	Contractor	Construction

6.8 Socio-economic

6.8.1 Methodology

The socio-economic assessment has been conducted through a quantitative review of relevant databases and spatial databases. Data has been acquired from the Australian Bureau of Statistics (ABS) (2016) and Google Maps to assess the study area.

6.8.2 Existing environment

Demographic characteristics

The proposal is located in the suburb of Haberfield, around six kilometres west of Sydney central business district (CBD). According to the 2016 Census, the population was 6457 people which is 3.5% of the Inner West population with a median age of 44 yrs. (ABS 2016). The proposal area is made of single-story dwellings as controlled by the HCA (refer Section 1.1.1) and recreational parkland.

Table 6-34 summarises the key demographic characteristics of Haberfield and the Inner West LGA (ABS 2016a and ABS 2016b).

Table 6-34 Demographic characteristics in 2016

Indicator	Haberfield	Percent	Inner West LGA	Percent
Population				
Total population	6457		182,043	
Proportion of people aged 14 years or younger	1202	18.6	27,911	15.3
Proportion of people aged 65 years or older	1266	19.6	22,197	12.2
Travel to work – applies to employed people over the age of 15				
Travel to work by car (as driver – one method)	1,523	50.3	35,225	35.4
Travel to work by car (as passenger – one method)	113	3.7	4,650	4.6
Travel to work by public transport	673	22	38,019	38.2
Worked at home	211	7	4,618	4.6

Source: ABS 2016a and ABS, 2016b

Analysis of Table 6-34 shows that Haberfield has a lower proportion of working population as compared to the Inner West LGA and a higher percentage of people who travel to work in a private vehicle.

Access and connectivity

Dobroyd Parade is the main road through Haberfield, connecting traffic and transport from Sydney CBD to greater western Sydney. Existing access and connectivity for the local community include the following:

- buses: there are approximately five bus routes through Haberfield that connect the suburb to the Light Rail network, train network and surrounding suburbs. None of these routes travel along Dobroyd Parade through the proposal area.
- rail: the train network exists outside the boundaries of Haberfield to the south and the light rail network runs along the eastern boundary of Haberfield to the east of the Hawthorn Canal.
- pedestrians: access along the Dobroyd Parade is via existing shared footpaths on either side with the exception of the south side between Waratah Street and Crane Avenue. Residential areas around the proposal area have similar footpaths and areas of shared access.
- bike users: access is along existing shared footpaths either side of the Dobroyd Parade (with the exception of the south side between Waratah Street and Crane Avenue). There is no designated on- or off-road cycle pathways in the vicinity of the proposal area.
- parking: there is no parking on Dobroyd Parade, however, local roads through the residential areas provide for on-street parking.

The pedestrian and bike user access networks around the proposal area are displayed in Figure 6-20. This shows the break in roadside access along the south side of Dobroyd Parade as well as the other options along the Dobroyd Parade cul-de-sac and the north side of Dobroyd Parade.

Social infrastructure

Community facilities and services exist around the proposal area in Haberfield, Five Dock and Ashfield that cater for the needs of both local and visiting communities. These facilities and services include the following:

- local shopping facilities, including Lamonica IGA Haberfield, McDonalds Haberfield, Coles Five Dock, and Coles Ashfield
- educational facilities, including Dobroyd Point Public School, Haberfield Public School, St Joan of Arc Catholic Primary School, Domremy Catholic College Five Dock, and St Johns Preschool Ashfield
- medical and healthcare facilities, including 4Cyte Pathology Haberfield, Ramsay Street Medical Centre, Five Dock Veterinary Hospital, and Sydney Private Hospital Ashfield
- religious and cultural facilities, including St Joan of Arc Catholic Parish Haberfield, Haberfield Baptist Church, and St Johns Anglican Church Ashfield.

Local business and industry

Local business hubs in the vicinity of the proposal area exist along Parramatta Road to the south and in the Five Dock local centre to the northwest. Individual small businesses exist among the residential areas surrounding the proposal area such as cafes and retail businesses.



Figure 6-20 Pedestrian and cycle network

6.8.3 Potential impacts

Construction

Access and connectivity

The proposal has the potential to temporarily increase traffic congestion and travel delays during total and partial road closures required during some construction stages. The construction of the proposal would not result in any impacts to driveways or residential or commercial properties.

Local amenity

Construction of the proposal would result in potential impacts to the visual amenity of the surrounding area. Residences on Waratah Street and Dobroyd Parade, and people traveling through the area via cars, cycling, or walking would have views of construction activities as detailed in section 6.3. Signage would be provided to inform individuals of the program and nature of work, changes to traffic conditions.

Visual amenity of the area may also be temporarily impacted through the removal and clearing of landscaped vegetation. Though the vegetation is planted, and its removal would pose no impact to biodiversity, its removal has the potential to impact on the visual amenity of the proposal area.

Landscaping and planting works undertaken as part of the proposal works would minimise the impact to visual amenity and loss of vegetation.

Construction of the proposal may result in potential impacts to amenity for residents and visitors to the area. Construction noise and vibration impacts are likely to result from some stages of construction activities. Site controls, community notification and staging would be included to reduce potential impacts of the proposal. This is addressed further in section 6.2.

Site compounds

Three site compounds are included in the proposal. As detailed in section 3.4 one or all these areas would be used during construction of the proposal. All three compound sites are located in the immediate vicinity of residential properties with the Reg Coady Reserve site having a small buffer between Martin Street residences. The establishment and operation of these sites may lead to potential impacts to visual (refer section 6.3) and general amenity as well as noise impacts (refer section 6.2) to residences along Dobroyd Parade, Martin Street and Ramsay Street.

Operation

Access and connectivity

Operation of the proposal would alter pedestrian movement in the area and improve public safety. The completion of the proposal would also maintain pedestrian connectivity in the local area with the direct link between Waratah Street and eastern Haberfield areas to Iron Cove Creek, Timbrell Park and residential and commercial areas to the north. It would also reduce congestion for vehicles at this intersection.

Visual amenity

The operation of the proposal would see permanent change to the visual amenity of the area with the introduction of the pedestrian bridge across Dobroyd Parade. The landscaping and native tree planting would seek to reduce this impact and anchor the proposal to the area. Noise and vibration impacts are not anticipated during the operational phase of the proposal. Long-term socio-economic impacts are not expected once the proposal is operational.

6.8.4 Safeguards and management measures

Socio-economic safeguards necessary to mitigate any potential impacts as a result of the proposed construction works are outlined in Table 6-35.

Table 6-35 Socio economic safeguards and management measures

ID	Impact	Environmental safeguards	Responsibility	Timing
SE1	Community engagement	<p>A Community and Stakeholder Engagement Plan (CSEP) will be prepared and will include:</p> <ul style="list-style-type: none"> procedures and mechanisms that would be implemented in response to the key social impacts identified for the proposal procedures and mechanisms that would be used to engage with affected landowners, business owners, and the wider community to identify potential access, parking, business visibility, and other impacts and develop appropriate management measures procedures to keep the community informed about construction and any associated changes to conditions (e.g., detours or lane closures) such as through advertisements in local media and advisory notices or variable message signs procedure for the management of complaints and enquiries, including a contact name and number for complaints. 	Transport	Pre-construction
SE2	Community notification of work	Notify local residents and potentially affected businesses before the work starts regarding the timing, duration and likely impact of construction activities., including interruptions to utility services.	Contractor	Pre-Construction / Construction
SE3	Proposal communication	<p>A Community Liaison Management Plan will be prepared and implemented as part of the CEMP to help provide timely and accurate information to the community during construction. The Community Liaison Management Plan will include (as a minimum):</p> <ul style="list-style-type: none"> mechanisms to provide details and timing of proposed activities to affected residents, including changed traffic and access conditions. contact name and number for complaints. 	Contractor	Detailed design / Pre-construction

ID	Impact	Environmental safeguards	Responsibility	Timing
SE4	Access	Access to bus stops will be maintained during construction. Where changes to access arrangement are necessary, the contractor will advise those impacted.	Contractor	Pre-construction

6.9 Other impacts

6.9.1 Existing environment and potential impacts

The impact of the proposal on other sensitive receivers including Aboriginal heritage, air quality, and waste management was considered. Impacts to these receptors were considered negligible or low. A high-level assessment of the existing environment and potential impacts of the proposal on each of these is provided in Table 6-36.

Table 6-36 Other potential impacts

Environmental factor	Existing environment	Potential impacts
Aboriginal heritage	<p>Prior to the appropriation of their land by Europeans, Aboriginal people lived in small family or clan groups that were associated with particular territories or places. It seems that territorial boundaries were fairly fluid, although details are not known. The language group spoken across Sydney was known as Darug (Dharruk – alternate spelling).</p> <p>A desktop review for the existing environment for aboriginal heritage involved a basic search of the Office of Environment and Heritage (OEH) AHIMS (conducted on 2 August 2023). This search identified that no Aboriginal sites are recorded in or near the proposal area and no aboriginal sites are declared in or near the proposal area.</p> <p>Details of the AHIMS search is provided in Appendix H.</p> <p>A PACHCI stage 1 has been prepared for the proposal by Transport (refer Appendix F).</p>	<p>Aboriginal sites are not likely to be discovered during the construction of the proposal due to the nature of the area. Previous disturbance is likely to have either removed or destroyed any existing relics in the vicinity during the development of the area and the construction of Dobroyd Parade.</p> <p>The proposal is therefore unlikely to harm or damage any aboriginal heritage items, however, in the event that any relics or items are uncovered, an unexpected finds protocol would be followed to ensure the protection of the heritage item.</p> <p>Operational impacts have not been considered for aboriginal heritage due to the nature of the proposal.</p>
Air quality	<p>A desktop review of the National Pollutant inventory (conducted 4 August 2023) identified no facilities to report on their emission in the vicinity of the proposal or Haberfield Local Government Area. The closest facility is the Malt Shovel Facility in Camperdown approximately 3.5 kilometres away.</p> <p>Review of the Air quality concentration data (NSW Government 2023) indicates</p>	<p>Construction of the proposal has the potential to temporarily change air quality in the locality around the proposal. This could be from dust emissions from equipment exhaust or excavation activities.</p> <p>Given that limited excavation is required for the proposal, potential impacts to air quality are low.</p>

Environmental factor	Existing environment	Potential impacts
	<p>readings of 'good' for the Rozelle Monitoring station which is the closest to the proposal area. The parameters for air quality data reading are ozone, nitrogen dioxide, carbon monoxide, sulfur dioxide, PM2.5, and PM10.</p>	
<p>Waste management</p>	<p>Waste production in the proposal area is characteristic of main roads. Minimal waste is generated outside of general litter and some material from stormwater or drainage systems.</p>	<p>The construction of the proposal would lead to the generation of some waste streams typical of road construction including the following:</p> <ul style="list-style-type: none"> • waste from the clearing of vegetation • general waste from ancillary facilities and workers • road infrastructure waste materials including fencing and concrete • potential contaminated material produced during excavation activities • general waste from the delivery of material and resources including plastics, pallets, and crates. <p>Any waste produced during the construction of the proposal would be disposed of in the proper manner according to mitigation measures.</p>
<p>Hazards and risk</p>	<p>Existing hazards and risks are associated with operation of the road network and include the risk of crashes, including those involving pedestrians / cyclists.</p> <p>The proposal site is not near bushfire prone land, however it is adjacent to flood prone land. This is discussed in section 6.5.</p>	<p>Hazards and risks associated with the construction of the proposal would potentially include:</p> <ul style="list-style-type: none"> • carrying out work within or next to a busy road and areas with high pedestrian activity • carrying out work near existing services and utilities (e.g. power lines and gas mains) • the use and storage of hazardous materials • the use of heavy machinery • unexpected excavation of contaminated land • sparks and/or hot works causing fire, particularly during dry, hot periods • unauthorised access to the construction work site. <p>Construction hazards and risks are manageable through the application of standard mitigation measures, which would be developed by the construction contractor prior to construction.</p>

Environmental factor	Existing environment	Potential impacts
		Hazards or risks associated with the operation of the proposal would be limited new road and driveway crossings. The safety of pathway users is a key design consideration with measures being included to minimise risks (refer section 6.1).

6.9.2 Safeguards and management measures

The safeguards for other impacts necessary to mitigate any potential impacts as a result of the proposed construction works are outlined in Table 6-37.

Table 6-37 Other impacts safeguards and management measures

ID	Impact	Environmental safeguards	Responsibility	Timing
AH1	Aboriginal heritage	<p>The Transport <i>Unexpected Heritage Items Procedure</i> (Transport 2022) will be followed in the event that an unknown or potential Aboriginal object/s, including skeletal remains, is found during construction. This applies where Transport does not have approval to disturb the object/s or where a specific safeguard for managing the disturbance (apart from the Procedure) is not in place.</p> <p>Work will only re-commence once the requirements of that Procedure have been satisfied.</p>	Contractor	Detailed design / Pre-construction
AQ1	Air quality	<p>Consideration would be made in the CEMP for air quality impacts to include the following:</p> <ul style="list-style-type: none"> • potential sources of air pollution (including site compound operation) • air quality management objectives consistent with any relevant published EPA guidelines • mitigation and suppression measures to be implemented • methods to manage work during strong winds or other adverse weather conditions. • the AQMP will include the following requirements: • plant and equipment will be maintained in good condition and in accordance with manufactures specifications • plant and machinery will be turned off when not in use 	Contractor	Detailed design / Pre-construction

ID	Impact	Environmental safeguards	Responsibility	Timing
AQ2	Air quality	<ul style="list-style-type: none"> work activities will be reprogrammed if the management measures are not adequately restricting dust generation. 		
		Work would halt during dust emitting activities if strong winds or weather occur.	Contractor	Construction
W1	Waste management	<p>Prepare and implement a design resource plan. As a minimum, the plan is to include the following information:</p> <ul style="list-style-type: none"> quantities and type of materials that will be produced by the project steps taken during detailed design to minimise the generation of material (such as excavated material) how the design maximises the on-site reuse of any excavated materials how detailed design maximises the opportunities for the use of recycled materials (ensuring that the material are fit for purpose and meet engineering performance standards) details of the quantities and type materials that cannot be reused onsite. 	Contractor	Detailed design / Pre-construction
W2	Waste management	<p>A Waste Management Plan (WMP) will be prepared and implemented as part of the CEMP. The WMP will include but not be limited to:</p> <ul style="list-style-type: none"> measures to avoid and minimise waste associated with the project classification of wastes and management options (re-use, recycle, stockpile, disposal) statutory approvals required for managing both on and off-site waste, or application of any relevant resource recovery exemptions procedures for storage, transport and disposal monitoring, record keeping and reporting. 	Contractor	Detailed design / Pre-construction
W3	Waste	<p>The following resource management hierarchy principles will be followed:</p> <ul style="list-style-type: none"> avoid unnecessary resource consumption as a priority avoidance will be followed by resource recovery (including reuse of materials reprocessing and recycling and energy recovery. 	Contractor	Construction

ID	Impact	Environmental safeguards	Responsibility	Timing
		disposal will be undertaken as a last resort (in accordance with the <i>Waste Avoidance and Resource Recovery Act 2001</i>).		
W4	Waste	Housekeeping at construction sites will be addressed regularly. This will include collection and sorting of recycling, general waste and green waste. Waste will be disposed regularly at a licensed waste facility or recycling facility where available.	Contractor	Construction
HR1	Hazards and risks	A Hazard and Risk Management Plan (HRMP) will be prepared and implemented as part of the CEMP. The HRMP will include, but not be limited to: <ul style="list-style-type: none"> • details of hazards and risks associated with the activity • measures to be implemented during construction to minimise these risks • record keeping arrangements, including information on the materials present on the site, material safety data sheets, and personnel trained and authorised to use such materials • a monitoring program to assess performance in managing the identified risks • contingency measures to be implemented in the event of unexpected hazards or risks arising, including emergency situations. • the HRMP will be prepared in accordance with relevant guidelines and standards, including relevant Safe Work Australia Codes of Practice and EPA publications. 	Contractor	Construction

6.10 Cumulative impacts

6.10.1 Study area

The proposal area is located in Haberfield, Inner West. For the purpose of the cumulative impact assessment, the broader study area includes Haberfield as well as surrounding suburbs, including Ashfield and Five Dock.

6.10.2 Other projects and developments

Other projects that may have a cumulative impact with the proposal have been outlined in Table 6-38. Information on these projects has been acquired from the following databases and websites:

- Inner West Council website
- City of Canada Bay Council website
- NSW Major Projects register (NSW Government 2023d)
- Transport Program of Major Works (NSW Government 2023f).

Table 6-38 Present and future projects in vicinity of proposal area

Project	Construction impacts	Operational impacts
<p>Parramatta Road improvement work, Leichhardt.</p> <p>Transport for NSW have proposed road improvement development intended to enhance traffic flow along Parramatta Road between Rofe Street and Cannon Street, Leichhardt.</p> <p>This is located approximately 2.5 kilometres from the proposal.</p>	<p>Construction impacts include:</p> <ul style="list-style-type: none"> • noise and vibration impacts from road work construction activities • traffic, transport, and access impacts due to partial or total road closures and the presence of construction equipment/activities in the road corridor • heritage impacts from vibration intensive equipment • landscape and visual due to the presence of construction equipment and activities in the road corridor • soil and contamination impacts from excavation, earthworks, and soil exposure. 	<p>Operational impacts include:</p> <ul style="list-style-type: none"> • improved traffic flow
<p>Frederick Street road safety upgrade works.</p> <p>Transport for NSW have proposed to upgrade the road and pedestrian safety on Frederick Street, Ashfield, after a road safety review on response to community feedback.</p> <p>This is located approximately 1.5 kilometres from the proposal.</p>	<p>Construction impacts include:</p> <ul style="list-style-type: none"> • traffic, transport, and access impacts due to partial or total road closures and the presence of construction equipment/activities in the road corridor • landscape and visual due to the presence of construction equipment and activities in the road corridor • noise and vibration impacts from road work construction activities • soil and contamination impacts from excavation, earthworks, and soil exposure. 	<p>Operational impacts include:</p> <ul style="list-style-type: none"> • improved pedestrian safety in the local area. • potential reduction in traffic flow due to the implementation of pedestrian safety measures.
<p>Iron Cove Creek naturalisation works.</p> <p>Sydney Water are investigating options to rehabilitate approximately 400 metres of the concrete lined Iron Cove Creek</p>	<p>Construction impacts include:</p> <ul style="list-style-type: none"> • traffic, transport, and access impacts due to the presence of construction and delivery vehicles and activities alongside the road corridor 	<p>Operational impacts include:</p> <ul style="list-style-type: none"> • enhanced visual amenity • changes to landscape character in the immediate area • improved biodiversity through planting of native vegetation along the waterway

Project	Construction impacts	Operational impacts
<p>between Ramsay Road and Timbrell Park. This would be located next to the proposal.</p>	<ul style="list-style-type: none"> • biodiversity impacts from the removal of vegetation along iron Cove Creek • waste impacts from the removal of concrete, soil, and rocks from the waterway • landscape and visual impacts due to the presence of construction equipment and activities in the recreational park area • noise and vibration impacts due to the operation of construction machinery • heritage impacts due to the activities to occur on the s170 Sydney Water heritage listing – Dobroyd Stormwater Channel. 	
<p>Local development within Inner West Council:</p> <ul style="list-style-type: none"> • Roadworks development – National Street, Leichhardt • Tree approval – Balmain Road, Leichhardt • Tree approval – Frederick Street, Ashfield • Private development – Hay Street, Leichhardt • Private development – Liverpool Road, Ashfield • Roadworks development – Myrtle Street, Leichhardt 	<p>Potential construction impacts include:</p> <ul style="list-style-type: none"> • increased traffic impact from construction vehicles leading to congestion • soil and contamination impacts from excavation and earthworks exposing soils • waste impacts from construction waste, general waste from workers and equipment waste • construction noise and vibration impacts from the operation of construction equipment • heritage impacts from vibration intensive equipment. 	<p>Operational impacts include:</p> <ul style="list-style-type: none"> • improved road traffic and flow from road works • enhancement of local streets.
<p>Local development within the City of Canada Bay:</p> <ul style="list-style-type: none"> • Mechanic development – Ramsay Road, Five Dock • Demolition and construction development – Duke Avenue, Rodd Point • Private development – Minnesota Avenue, Five Dock • Private development – Duke Avenue, Rodd Point • Demolition and construction development 	<p>Construction impacts include:</p> <ul style="list-style-type: none"> • increased traffic impact from construction vehicles leading to congestion • soil and contamination impacts from excavation and earthworks exposing soils • waste impacts from construction waste, general waste from workers and equipment waste • construction noise and vibration impacts from usage of construction equipment • heritage impacts from vibration intensive equipment. 	<p>Operational impacts include:</p> <ul style="list-style-type: none"> • increased vehicles on local roads due to traffic generation from new development.

Project	Construction impacts	Operational impacts
- Rickard Street, Rodd Point		

6.10.3 Potential cumulative impacts

The potential cumulative impacts associated with projects listed above that are occurring at the same time or in a similar timeframe as the proposal are outlined in Table 6-39. Timeframes for the construction of the above projects is currently unknown so the number of projects that will be occurring at the same time of the construction of the proposal are uncertain. This assessment of potential impacts has assumed that there will be some projects being constructed simultaneously with the proposal.

Table 6-39 Potential cumulative impacts

Environmental factor	Construction impacts	Operational impacts
Noise and vibration	Noise and vibration impacts from the combined construction work in the local area have the potential to increase the impact to receptors. Implementation of project specific safeguards and mitigation measures will minimise potential construction impacts.	The projects listed in Table 6-38 are unlikely to result in operational noise and vibration impacts that will impact on receptors. The road improvement works on Parramatta Road will improve traffic flow and pedestrian safety, while the projects in the immediate vicinity of the proposal, particularly the naturalisation of Iron Cove Creek are unlikely to result in operation noise and vibration impacts. Implementation of operational safeguards and mitigation measures for each of the project would ensure any potential impacts are minimised.
Traffic and transport	There is the potential for impacts to vehicle movement and traffic flows from the construction of multiple projects in the vicinity of the proposal. This may result in congestion as a result of lane closures, the movement of construction vehicles and construction equipment in the road corridor.	Operational impacts would be minimal
Visual	Visual impacts from the construction of multiple projects would impact on the landscape and visual amenity during the construction stage. Should multiple projects occur simultaneously there will be increased presence of construction vehicles, temporary fencing and screening in various places across the local area may reduce overall visual amenity of the area.	There will be a change to the landscape and visual character of the area from the projects, with the potential for these to be perceived as both positive and negative. The implementation of design outcomes and mitigation measures will assist in minimising potential negative impacts.

6.10.4 Safeguards and management measures

The safeguards for cumulative impacts necessary to mitigate any potential impacts as a result of the proposed construction works are outlined in Table 6-40.

Table 6-40 Cumulative safeguards and management measures

ID	Impact	Environmental safeguards	Responsibility	Timing
C1	Cumulative construction impacts	The contractor's CEMP would be revised as required to consider potential cumulative impacts from surrounding development activities as they become known.	Contractor	Pre-construction/ Construction
C2	Cumulative construction impacts	<p>Current and upcoming projects with the potential to interact with the proposal will be monitored. Where potential cumulative impacts are identified, the scheduling of works will be coordinated with interacting projects to minimise potential impacts. This will include:</p> <ul style="list-style-type: none"> • scheduling works to allow suitable respite periods for construction noise • scheduling of works to minimise consecutive construction noise impacts, where feasible • coordinating lane closures and pedestrian/cyclist diversions to minimise the overall number of occasions where disruption occurs. 	Transport Project manager	Pre-construction / Construction

7. Environmental management

This chapter describes how the proposal will be managed to reduce potential environmental impacts during detailed design, construction, and operation. A framework for managing potential impacts is provided. A summary of site-specific environmental safeguards is provided and the licence and/or approval requirements required prior to construction are listed.

7.1 Environmental management plans (or system)

Safeguards and management measures have been identified in the REF in order to minimise adverse environmental impacts, including social impacts, which could potentially arise as a result of the proposal. Should the proposal proceed, these safeguards and management measures would be incorporated into the detailed design and applied during the construction and operation of the proposal.

A CEMP will be prepared to describe the safeguards and management measures identified. The CEMP will provide a framework for establishing how these measures will be implemented and who would be responsible for their implementation.

The CEMP will be prepared prior to construction of the proposal and must be reviewed and certified by the Transport for NSW Environment and Sustainability Officer, prior to the commencement of any on-site works. The CEMP will be a working document, subject to ongoing change and updated as necessary to respond to specific requirements. The CEMP would be developed in accordance with the specifications set out in the *QA Specification G36 - Environmental Protection (Management System)*, *QA Specification G38 - Soil and Water Management (Soil and Water Plan)*, *QA Specification G40 - Clearing and Grubbing*, *QA Specification G10 - Traffic Management*.

7.2 Summary of safeguards and management measures

Environmental safeguards and management measures outlined in this REF will be incorporated into the detailed design phase of the proposal and during construction and operation of the proposal, should it proceed. These safeguards and management measures will minimise any potential adverse impacts arising from the proposed works on the surrounding environment. The safeguards and management measures are summarised in Table 7 1.

Table 7-1 Summary of safeguards and management measures

ID	Impact	Environmental safeguards	Responsibility	Timing
GEN1	General - minimise environmental impacts during construction	<p>A CEMP will be prepared and submitted for review and endorsement of the Transport for NSW Senior Manager Environment and Sustainability prior to commencement of the activity. As a minimum, the CEMP will address the following:</p> <ul style="list-style-type: none"> any requirements associated with statutory approvals details of how the project will implement the identified safeguards outlined in the REF issue-specific environmental management plans roles and responsibilities communication requirements induction and training requirements procedures for monitoring and evaluating environmental performance, and for corrective action reporting requirements and record-keeping procedures for emergency and incident management procedures for audit and review. <p>The endorsed CEMP will be implemented during the undertaking of the activity.</p>	Contractor / Transport for NSW project manager	Pre-construction / detailed design
T1	Traffic and transport	<p>A Traffic Management Plan (TMP) will be prepared and implemented as part of the CEMP. The TMP will be prepared in accordance with the <i>Transport Traffic Control at Work Sites Manual</i> (Transport 2022b) and <i>QA Specification G10 Traffic Management</i> (Transport, 2020b). The TMP will include:</p> <ul style="list-style-type: none"> confirmation of haulage routes and any Transport Management Centre requirements measures to maintain access to local roads and properties and minimise the potential for 'rat-runs' to form on local roads during road closures site-specific traffic control measures (including signage) to manage and regulate traffic movement 	Contractor	Detailed design/Pre-construction

ID	Impact	Environmental safeguards	Responsibility	Timing
		<ul style="list-style-type: none"> measures to maintain pedestrian and bike user access requirements and methods to consult and inform the local community of impacts on the local road network access to construction sites including entry and exit locations and measures to prevent construction vehicles queuing on public roads a response plan for any construction traffic incident consideration of other developments that may be under construction to minimise traffic conflict and congestion that may occur due to the cumulative increase in construction vehicle traffic monitoring, review, and amendment mechanisms. 		
T2	Pedestrian and bike user access	<p>Management of pedestrian and bike users movements during construction would be detailed in the CEMP. Specific item to minimise pedestrian and bike users disruptions may include:</p> <ul style="list-style-type: none"> signage outlining pedestrian diversion routes advanced notification of any construction work that affects pedestrians and bike users. 	Contractor	Construction
T3	Changed traffic conditions	The community will be notified in advance of any road closures and the likely disruptions to access in accordance with the Community and Stakeholder Engagement Plan. Adequate advisory and warning signage will be provided to inform motorists of the road conditions ahead including any road closure and/or detour route.	Contractor	Construction
T4	Emergency vehicle and key stakeholder access	Access would be maintained for emergency response vehicles, and utility providers at all times, where possible. During the bridge lift, alternative arrangements will be developed in consultation with the relevant stakeholders in advance.	Contractor	Construction
T5	Road closures and detours	Temporary traffic diversions and road closures would be implemented in consultation with and in accordance with the Transport Management Centre requirements.	Contractor	Construction
NV1	Noise and vibration	<p>A Noise and Vibration Management Plan (NVMP) will be prepared and implemented as part of the CEMP. The NVMP will generally follow the approach in <i>the Interim Construction Noise Guideline</i> (DECC 2009) and identify:</p> <ul style="list-style-type: none"> all potential significant noise and vibration generating activities associated with the activity 	Contractor	Detailed design / Pre-construction

ID	Impact	Environmental safeguards	Responsibility	Timing
		<ul style="list-style-type: none"> mitigation measures for implementation. These are to consider the urban design principles in <i>Beyond the Pavement: urban design policy, process and principles</i> (Transport 2020a). a monitoring program to assess performance against relevant noise and vibration criteria arrangements for consultation with affected neighbours and sensitive receivers, including notification and complaint handling procedures contingency measures to be implemented in the event of non-compliance with noise and vibration criteria. 		
NV2	Noise and vibration	<p>All sensitive receivers (local residents) likely to be affected will be notified at least seven days prior to commencement of any works associated with the activity that may have an adverse noise or vibration impact. The notification will provide details of:</p> <ul style="list-style-type: none"> the project the construction period and construction hours contact information for project management staff complaint and incident reporting how to obtain further information. 	Contractor	Detailed design / Pre-construction
NV3	Construction hours and scheduling	Where feasible and reasonable, construction will be carried out during the standard daytime working hours and work generating high noise levels will be scheduled during less sensitive time periods.	Contractor	Pre-construction
NV4	Construction respite period during normal hours and out of hours	<p>The duration and respite of high noise generating activities will be carried out in accordance with the Construction Noise and Vibration Guideline, and in consultation with the community.</p> <ul style="list-style-type: none"> As a guide, high noise generating activities near receivers will be carried out in blocks that do not exceed three hours each, with a minimum respite period of one hour between each block. The duration of each block of work and respite will be flexible to accommodate the usage and amenity at nearby receivers. 	Contractor	Pre-construction
NV5	Plant noise levels	The noise levels of plant and equipment will have operating Sound Power or Sound Pressure Levels compliant with the criteria in Appendix F of the Construction Noise and Vibration Guideline.	Contractor	Pre-construction

ID	Impact	Environmental safeguards	Responsibility	Timing
		A noise monitoring audit program will be implemented to ensure equipment remains within the more stringent of the manufacturer's specifications or Appendix F of the Construction Noise and Vibration Guideline. Only the necessary size and power of equipment will be used.		
NV6	Equipment selection	Use quieter and less noise emitting construction methods where feasible and reasonable.	Contractor	Pre-construction
NV7	Noise and Vibration	All project personnel attending site are to receive an environmental induction. The induction must at least include: <ul style="list-style-type: none"> • all project specific and relevant standard noise and vibration mitigation measures • relevant licence and approval conditions • permissible hours of work • any limitations on high noise generating activities • location of nearest sensitive receivers • construction employee parking areas • designated loading/unloading areas and procedures • site opening/closing times (including deliveries) • environmental incident procedures. 	Contractor	Construction
NV8	Noise and Vibration	Implementation of additional project specific mitigation measures is required. These measures include additional measures acquired from the Transport Construction Noise and Vibration Guideline	Contractor	Construction
NV9	Non-tonal and ambient sensitive reversing alarms	Non-tonal reversing beepers (or an equivalent mechanism) will be fitted and used on all construction vehicles and mobile plant regularly used on site and for out of hours work. The use of ambient sensitive alarms that adjust output relative to the ambient noise level will be considered.	Contractor	Construction
NV10	Noise and Vibration	Noisier activities, such as the use of jackhammers and concrete saws, would only be used prior to midnight.	Contractor	Construction
NV11	Noise and Vibration	Vibration monitoring to be carried out during piling and where complaints about vibration received	Contractor	Construction

ID	Impact	Environmental safeguards	Responsibility	Timing
NV12	Noise and Vibration	Where human comfort vibration guidelines are exceeded, the management measures are to be reviewed and are to consider alternate equipment and construction methodologies.	Contractor	Construction
NV13	Noise and Vibration	Where vibration criteria specific to structural damage are exceeded during monitoring, work would cease immediately and less vibration intensive construction methods would be used	Contractor	Construction
NV14	Noise and vibration	<p>To minimise the risk of vibration impacts Dobroyd Stormwater Channel No.53 (Iron Cove Creek) the following mitigation measures should be implemented:</p> <ul style="list-style-type: none"> • determine safe working limits based on proposed plant, and where possible, the smallest plant able to carry out required work should be used to minimise potential impacts. Where works are proposed within the safe working limits for the heritage structures, specialist advice must be sought from an appropriately qualified structural engineer who is familiar with heritage structures to assess if vibrations associated with the proposed works will potentially result in impacts to heritage structures. • a vibration monitoring plan is to be prepared as part of the Construction Noise and Vibration Management Plan where works are proposed within safe working limits and implemented to confirm vibration levels prior to construction commencement. Where exceedances are recorded, works should be modified in consultation with the identified specialist to reduce vibration levels. • if vibration monitors are attached to the heritage items, they must not be attached with permanent fixings. They should be removable without causing damage. Bees wax may be a suitable attachment method. • attended vibration measurements should be undertaken at the commencement of vibration generating activities to confirm that vibration levels are within the acceptable range to prevent cosmetic building damage. • assessment and monitoring of vibration impacts to heritage items within the safe working limits should adhere to: <ul style="list-style-type: none"> – British Standard BS 7385: Part 2: Evaluation and Measurement for Vibrations in Buildings – Part 2 Guide to Damage Levels from Ground-Borne Vibration – German Standard DIN 4150, Part 3: Structural Vibration in Buildings: Effects on Structures. 	Contractor	Pre-construction/ construction

Transport
for NSW

ID	Impact	Environmental safeguards	Responsibility	Timing
LV1	Visual Impacts	Where reasonable and feasible trees will be retained in design.	Transport	Detailed Design
LV2	Landscape character and visual impact	Limit vegetation removal to the minimum amount required for the construction of the proposal.	Contractor	Construction
LV3	Visual Impacts	Construction facilities will be contained within the construction works zone boundary and occupy the minimum area practicable for their intended use.	Contractor	Construction
LV4	Visual Impacts	Provide suitable barriers to screen views from adjacent areas during construction	Contractor	Construction
LV5	Visual impact	The work site should be cleaned and tidied at the end of each day to reduce visual impact.	Contractor	Construction
LV6	Visual Impacts	Following the completion of construction works, plant/equipment will be removed, and disturbed areas will be revegetated, turfed or otherwise restored as appropriate.	Contractor	Construction
LV7	Lighting	The design of new street lighting will consider potential light spill impacts on adjacent properties.	Transport	Detailed design
LV8	Artwork	Incorporating artwork to be included in the bridge design, that would be sympathetic to the area, will be investigated.	Contractor	Detailed Design / Pre-construction
LV9	Lighting	Temporary site lighting will be installed and operated in accordance with AS4282:1997 Control of the Obtrusive Effect of Outdoor Lighting, and an approved Traffic Management Plan. Construction lighting would be orientated to reduce any potential light spillage to surrounding areas.	Contractor	Construction
NH1	Non-Aboriginal heritage	A Non-Aboriginal Heritage Management Plan (NAHMP) will be prepared and implemented as part of the CEMP. It will provide specific drafting guidance on measures and controls to be implemented to avoid and mitigate impacts to non-Aboriginal heritage.	Contractor	Detailed design / Pre-construction
NH2	Non-Aboriginal heritage	The <i>Standard Management Procedure - Unexpected Heritage Items</i> (Transport, 2015) will be followed in the event that an unknown or potential Aboriginal object/s, including skeletal remains, is found during construction. This applies where Transport does not have approval to disturb the object/s or where a specific safeguard for managing the disturbance (apart from the Procedure) is not in place. Work will only re-commence once the requirements of that Procedure have been satisfied.	Contractor	Detailed design / Pre-construction

ID	Impact	Environmental safeguards	Responsibility	Timing
NH3	Non-Aboriginal heritage	All relevant construction staff, contractors and subcontractors must be made aware of their statutory obligations for heritage under the Heritage Act 1977 and best practice as outlined in The Burra Charter (Australia ICOMOS 2013) to ensure no archaeological remains or heritage fabric are impacted during the proposed works without appropriate mitigation measures in place. This will be implemented through a heritage induction carried out prior to works commencing and throughout the works program.	Contractor	Pre-construction / construction
HF1	Flooding provisions	A lifted lift landing on the northern side of the pedestrian bridge has been included in the design along with an access ramp to accommodate potential flooding impacts. This measure would be maintained and carried through to detailed design.	Contractor	Detailed design
HF2	Flooding	A flood management plan will be included in the CEMP and include safeguards and measures to reduce the impact of flooding during construction of the proposal and to manage potential impacts such as erosion and sedimentation.	Contractor	Detailed design / pre-construction
HF3	Flooding	Inclusion of stop work protocols and site management requirements in the CEMP and site health and safety documentation in the event of a major flood event occurring. This will include protocols for protection of material, equipment, and exposed excavation.	Contractor	Construction
B1	Biodiversity	Biodiversity Management Plan is to be prepared and included within the CEMP. The plan would include: <ul style="list-style-type: none"> • a site walk over with an ecologist as part of the pre-clearing surveys • a map showing vegetation clearing boundaries and sensitive area/no go area or trees to be protected • incorporation of management measures identified as a result of pre-clearing survey reports, completed by an ecologist • a detailed cleaning process in accordance with Biodiversity Guidelines (2011) • identify controls/mitigation measures to prevent impacts on sensitive location or no go zones or tree protection zones a stop work procedure in the event of identification of unidentified species, habitat or populations.	Contractor	Pre-construction
B2	Biodiversity Impacts	Pre-clearing survey will be conducted in accordance with Biodiversity Guidelines, Guide 1 (Roads and Maritime, 2016) and will:	Contractor	Pre- construction

Transport
for NSW

ID	Impact	Environmental safeguards	Responsibility	Timing
		<ul style="list-style-type: none"> Confirm (with the assistance of a surveyor) clearing boundaries, exclusion zones, protected habitat features and revegetation areas prior to starting work Identify, in toolbox talks, where biodiversity controls are located on the site. 		
B3	Encountering fauna	A suitably qualified ecologist or experienced wildlife handler would be engaged to survey and handle any fauna.	Contractor	Construction
B4	Weed management	<p>Weed management will occur in accordance with Biodiversity Guidelines, Guide 6 (Roads and Maritime, 2016) and include:</p> <ul style="list-style-type: none"> the Identification of weeds on site (confirmed during pre-clearing survey) weed management priorities and objectives Exclusion zones, protected habitat features and revegetation areas prior to starting work within or directly next to the site the location of weed infested areas weed control methods measures to prevent the spread of weeds, including machinery hygiene procedures and disposal requirements a monitoring program to measure the success of weed management communication with local Council noxious weed representative. 	Contractor	Construction
B5	Spreading of diseases affecting plants	<ul style="list-style-type: none"> Management measures will be implemented to control and/or prevent the introduction and/or spread of disease-causing agents such as bacteria and fungi in accordance with the Biodiversity Guidelines, Guide 7 (Roads and Maritime, 2016). 	Contractor	Construction
B6	Unexpected threatened species finds	If unexpected flora or fauna are discovered on site stop work immediately and implement the Roads and Maritime Unexpected Threatened Species Find Procedure in the Biodiversity Guidelines, Guide 1 (Roads and Maritime 2016).	Contractor	Construction
B7	Spread of weeds	Reuse of topsoil free from weeds or pathogens would be used as part of habitation/landscaping works, where reasonable and feasible.	Contractor	Construction
B8	Loss of trees	<ul style="list-style-type: none"> The loss of trees due to the proposal will be offset in accordance with the Tree and Hollow Replacement Guideline (Transport 2022) 	Contractor	Construction
B9	Minimise risks to native flora and fauna during construction	Protect trees nominated for retention in line with Australian Standard AS 4970-2009 Protection of Trees on Development Sites (Standards Australia, 2010). Exclusion zones will be established in area of construction and ancillary sites and	Contractor	Construction

Transport
for NSW

ID	Impact	Environmental safeguards	Responsibility	Timing
		identified in CEMP. Vehicle parking, machinery, construction compounds and material stockpiles will be located in cleared or disturbed areas.		
B10	Protect native flora and fauna, minimise edge effects and avoid inadvertent impacts	Site-specific training will be given to personnel when working in the vicinity of areas of identified biodiversity value that are to be protected.	Contractor	Construction
GSC1	Erosion and sediment control	A site specific Erosion and Sediment Control Plan/s will be prepared and implemented in accordance with the Managing Urban Stormwater: Soils and Construction, Volume 1 and 2 (Landcom 2004) as part of the Soil and Water Management Plan	Contractor	Detailed design / Pre-construction
GSC2	Accidental spill	A site-specific emergency spill plan will be developed and include spill-management measures in accordance with the Transport <i>Code of Practice for Water Management</i> (RTA, 1999) and relevant EPA guidelines. The plan will address measures to be implemented in the event of a spill, including initial response and containment, notification of emergency services and relevant authorities (including Transport EPA officers).	Contractor	Detailed design / Pre-construction
GSC3	Acid sulphate soils	Acid Sulphate soil management plan would be included as part of the CEMP. This management plan would include the safe management, treatment and transportation of any material deemed to be of acid sulphate soil risk and would include training and induction for all workers.	Contractor	Detailed design / Pre-construction
GSC4	Removal of excavated material	Classify all waste material excavated and removed from the proposal area in accordance with the NSW Waste Classification Guidelines (EPA, 2004)	Contractor	Pre-construction
GSC5	Existing condition of ancillary sites	Undertake a pre-construction land assessment prior to land being used for ancillary construction purposes (compounds, storage, parking, etc) to identify the presence of any pre-existing wastes or stored materials. The assessment should be prepared in accordance with the Transport for NSW Management of road construction and maintenance wastes (Roads and Maritime Services, 2016).	Contractor	Pre-construction
GSC6	Soil and water	A Soil and Water Management Plan (SWMP) will be prepared and implemented as part of the CEMP. The SWMP will identify all reasonably foreseeable risks relating to soil erosion and water pollution and describe how these risks will be addressed during construction. The SWMP would include: <ul style="list-style-type: none"> • stockpile management plan 	Contractor	Pre-construction

ID	Impact	Environmental safeguards	Responsibility	Timing
		<ul style="list-style-type: none"> dewatering plan which includes process for monitoring flocculants and dewatering water from site a process to routinely monitor the Bureau of Meteorology weather forecast preparation of a wet weather (rain event) plan which includes a process for monitoring potential wet weather and identification of controls to be implemented in the event of wet weather. inspection and maintenance schedule for ongoing maintenance of temporary and permanent erosion and sediment controls. <p>The SWMP will address:</p> <ul style="list-style-type: none"> transport for NSW Code of Practice for Water Management the Blue Book- Managing Urban Stormwater: Soils and Construction, Volume 1 and 2 <p>transport for NSW Technical Guideline – Temporary Stormwater Drainage for Road Construction.</p>		
GSC7	Contaminated land	If contaminated areas are encountered during construction, appropriate control measures, as detailed in the CEMP, will be implemented to manage the immediate risks of contamination. All other works that may impact on the contaminated area will cease until the nature and extent of the contamination has been confirmed and any necessary site-specific controls or further actions identified in consultation with the Transport for NSW Senior Manager Environment and Sustainability and/or EPA.	Contractor	Construction
GSC8	Soil and water	All stockpiles would be designed, established, operated and decommissioned in accordance with the Transport for NSW Stockpile Management Procedures.	Contractor	Construction
GSC9	Soil and water	Controls would be implemented at construction zones exit points to minimise the tracking of material onto the road.	Contractor	Construction
SE1	Community engagement	<p>A Community and Stakeholder Engagement Plan (CSEP) will be prepared and will include:</p> <ul style="list-style-type: none"> procedures and mechanisms that would be implemented in response to the key social impacts identified for the proposal procedures and mechanisms that would be used to engage with affected landowners, business owners, and the wider community to identify potential access, parking, business visibility, and other impacts and develop appropriate management measures 	Transport	Pre-construction

ID	Impact	Environmental safeguards	Responsibility	Timing
		<ul style="list-style-type: none"> procedures to keep the community informed about construction and any associated changes to conditions (e.g., detours or lane closures) such as through advertisements in local media and advisory notices or variable message signs procedure for the management of complaints and enquiries, including a contact name and number for complaints. 		
SE2	Community notification of work	Notify local residents and potentially affected businesses before the work starts regarding the timing, duration and likely impact of construction activities, including interruptions to utility services.	Contractor	Pre- Construction/ Construction
SE3	Proposal communication	<p>A Community Liaison Management Plan will be prepared and implemented as part of the CEMP to help provide timely and accurate information to the community during construction. The Community Liaison Management Plan will include (as a minimum):</p> <ul style="list-style-type: none"> mechanisms to provide details and timing of proposed activities to affected residents, including changed traffic and access conditions. <p>contact name and number for complaints.</p>	Contractor	Detailed design / Pre-construction
SE4	Access	Access to bus stops will be maintained during construction. Where changes to access arrangement are necessary, the contractor will advise those impacted.	Contractor	Pre-construction
AH1	Aboriginal heritage	<p>The Transport <i>Unexpected Heritage Items Procedure</i> (Transport 2022) will be followed in the event that an unknown or potential Aboriginal object/s, including skeletal remains, is found during construction. This applies where Transport does not have approval to disturb the object/s or where a specific safeguard for managing the disturbance (apart from the Procedure) is not in place.</p> <ul style="list-style-type: none"> Work will only re-commence once the requirements of that Procedure have been satisfied. 	Contractor	Detailed design / Pre-construction
AQ1	Air quality	<p>Consideration would be made in the CEMP for air quality impacts to include the following:</p> <ul style="list-style-type: none"> potential sources of air pollution (including site compound operation) air quality management objectives consistent with any relevant published EPA guidelines mitigation and suppression measures to be implemented methods to manage work during strong winds or other adverse weather conditions. 	Contractor	Detailed design / Pre-construction

ID	Impact	Environmental safeguards	Responsibility	Timing
		<ul style="list-style-type: none"> the AQMP will include the following requirements: plant and equipment will be maintained in good condition and in accordance with manufactures specifications plant and machinery will be turned off when not in use <p>work activities will be reprogrammed if the management measures are not adequately restricting dust generation.</p>		
AQ2	Air quality	<ul style="list-style-type: none"> Work would halt during dust emitting activities if strong winds or weather occur. 	Contractor	Construction
W1	Waste management	<p>Prepare and implement a design resource plan. As a minimum, the plan is to include the following information:</p> <ul style="list-style-type: none"> quantities and type of materials that will be produced by the project steps taken during detailed design to minimise the generation of material (such as excavated material) how the design maximises the on-site reuse of any excavated materials how detailed design maximises the opportunities for the use of recycled materials (ensuring that the material are fit for purpose and meet engineering performance standards) <p>details of the quantities and type materials that cannot be reused onsite.</p>	Contractor	Detailed design / Pre-construction
W2	Waste management	<p>A Waste Management Plan (WMP) will be prepared and implemented as part of the CEMP. The WMP will include but not be limited to:</p> <ul style="list-style-type: none"> measures to avoid and minimise waste associated with the project classification of wastes and management options (re-use, recycle, stockpile, disposal) statutory approvals required for managing both on and off-site waste, or application of any relevant resource recovery exemptions procedures for storage, transport and disposal monitoring, record keeping and reporting. 	Contractor	Detailed design / Pre-construction
W3	Waste	<p>The following resource management hierarchy principles will be followed:</p> <ul style="list-style-type: none"> avoid unnecessary resource consumption as a priority avoidance will be followed by resource recovery (including reuse of materials reprocessing and recycling and energy recovery 	Contractor	Detailed design / Pre-construction

ID	Impact	Environmental safeguards	Responsibility	Timing
		disposal will be undertaken as a last resort (in accordance with the <i>Waste Avoidance and Resource Recovery Act 2001</i>).		
W4	Waste	Housekeeping at construction sites will be addressed regularly. This will include collection and sorting of recycling, general waste and green waste. waste will be disposed regularly at a licensed waste facility or recycling facility where available.	Contractor	Construction
HR1	Hazards and risks	A Hazard and Risk Management Plan (HRMP) will be prepared and implemented as part of the CEMP. The HRMP will include, but not be limited to: <ul style="list-style-type: none"> • details of hazards and risks associated with the activity • measures to be implemented during construction to minimise these risks • record keeping arrangements, including information on the materials present on the site, material safety data sheets, and personnel trained and authorised to use such materials • a monitoring program to assess performance in managing the identified risks • contingency measures to be implemented in the event of unexpected hazards or risks arising, including emergency situations. • the HRMP will be prepared in accordance with relevant guidelines and standards, including relevant Safe Work Australia Codes of Practice and EPA publications. 	Contractor	Construction
C1	Cumulative construction impacts	<ul style="list-style-type: none"> • The contractor's CEMP would be revised as required to consider potential cumulative impacts from surrounding development activities as they become known. 	Contractor	Pre-construction/ Construction
C2	Cumulative construction impacts	Current and upcoming projects with the potential to interact with the proposal will be monitored. Where potential cumulative impacts are identified, the scheduling of works will be coordinated with interacting projects to minimise potential impacts. This will include: <ul style="list-style-type: none"> • scheduling works to allow suitable respite periods for construction noise • scheduling of works to minimise consecutive construction noise impacts, where feasible. • coordinating lane closures and pedestrian/cyclist diversions to minimise the overall number of occasions where disruption occurs. 	Transport Project manager	Pre-construction / Construction

7.3 Licensing and approvals

Table 7-2: Summary of licensing and approvals required

Instrument	Requirement	Timing
<i>Crown Land Management Act 2016</i> (Division 3.4, 5.5 and 5.6)	Lease or licence to occupy areas of Crown land.	Prior to start of the activity.
Road Occupancy Licence (ROL)	Applications for ROLs would be submitted to Transport for NSW regional traffic management officer	At least 14 days before start of the activity

8. Conclusion

This chapter provides the justification for the proposal taking into account its biophysical, social and economic impacts, the suitability of the site and whether or not the proposal is in the public interest. The proposal is also considered in the context of the objectives of the EP&A Act, including the principles of ecologically sustainable development as defined in Section 193 of the Environmental Planning and Assessment Regulation 2021.

8.1 Justification

8.1.1 Social factors

The proposal would benefit the community by enhancing the safety of pedestrians crossing the Dobroyd Parade and improving traffic flow. It would maintain the connectivity of Haberfield to Five Dock across Iron Cove Creek by improving the safety and providing a DDA compliant bridge for pedestrians, people with mobility issues, prams and bikes.

8.1.2 Biophysical factors

The proposal would have a minor impact on biodiversity due to the nature of the planted landscape to be cleared. Landscaped and planted vegetation that is to be removed for the construction of the bridge and intersection works is proposed to be replaced by landscaping. Landscaping around the base of the completed pedestrian bridge would anchor the bridge to the local landscape and planted vegetation. This landscaping would provide habitat for local species currently present in the locality.

8.1.3 Economic factors

The proposal would provide economic benefits through the improvement in the efficiency of traffic flow along Dobroyd Parade. This would benefit commuters, local traffic, and freight movement between Central Sydney and greater Western Sydney.

8.1.4 Public interest

The proposal is in the public interest as it creates a safe and optimal pathway across the Dobroyd Parade and increases connectivity between Haberfield and Five Dock through Timbrell Park. Consultation with the local community and relevant stakeholders has influenced the design of the proposal, aligning with the public interest where possible.

8.2 Objects of the EP&A Act

Table 8-1 Objects of the Environmental Planning and Assessment Act 1979

Instrument	Requirement
1.3(a) To promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources.	The proposal aligns with this object by enhancing the safety of pedestrian routes in Haberfield and through the management of the natural and built environment through the implementation of safeguards during construction.
1.3(b) To facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment.	The principals of ecologically sustainable development were considered in the design and delivery of the proposal.

Instrument	Requirement
1.3(c) To promote the orderly and economic use and development of land.	The proposal would maintain the connection between existing residential, community facilities and infrastructure providing for a safe and accessible crossing of Dobroyd Parade. While the proposal does not directly relate to this objective it has the potential to improve access to nearby commercial land uses, having a positive influence on economic development.
1.3(d) To promote the delivery and maintenance of affordable housing.	Not applicable to the project.
1.3(e) To protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats.	Environmental impacts have been considered in the design of the proposal, including flooding, biodiversity, and non-aboriginal heritage. Vegetation required to be removed by the proposal will be replaced with landscaping that will minimise impacts to fauna present within the locality.
1.3(f) To promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage).	The proposal has been designed to have minimal impact on surrounding heritage items such as the HCA and the Dobroyd Stormwater Channel.
1.3(g) To promote good design and amenity of the built environment.	The landscape character and visual amenity of the local area and built environment have been considered in the design of the proposal.
1.3(h) To promote the proper construction and maintenance of buildings, including the protection of the health and safety of their occupants.	Not relevant to the proposal.
1.3(i) To promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State.	Not relevant to the proposal.
1.3(j) To provide increased opportunity for community participation in environmental planning and assessment.	Community and stakeholder consultation and engagement has been undertaken throughout design development providing the public and other stakeholders to provide input.

8.2.1 Ecologically sustainable development

Ecologically sustainable development (ESD) is development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends. The principles of ESD have been an integral consideration throughout the development of the project.

ESD requires the effective integration of economic and environmental considerations in decision-making processes. The four main principles supporting the achievement of ESD are discussed below.

The precautionary principle

The precautionary principle deals with reconciling scientific uncertainty about environmental impacts with certainty in decision-making. It provides that where there is a threat of serious or irreversible environmental damage, the absence of full scientific certainty should not be used as a reason to postpone measures to prevent environmental degradation.

The principles of minimising the potential serious or irreversible environmental damage has guided design development, the assessment of environmental impacts for this REF, and the development of mitigation measures. Including:

- alternative design options were considered and assessed to reduce the risk of serious and irreversible impacts on the environment
- the best-available technical information, environmental standards and measures have been used to minimise environmental risks
- conservative 'worst case' scenarios were considered while assessing environmental impact
- specialist studies were incorporated to gain a detailed understanding of the existing environment.

Intergenerational equity

Social equity is concerned with the distribution of economic, social and environmental costs and benefits. Inter-generational equity introduces a temporal element with a focus on minimising the distribution of costs to future generations.

The proposal would provide safer and improved road infrastructure facilities for future generations. In the event that the proposal does not proceed, the principle of intergenerational equity may be compromised as future generations would inherit a local environment with lower pedestrian safety levels and increased traffic and access delays.

Conservation of biological diversity and ecological integrity

An assessment of the ecological values of the proposal area and its immediate surrounds was undertaken to assist in understanding current values, the impact of the proposal and how the proposal can manage any changes that may have a negative impact. The proposal will require the removal of planted or landscape vegetation which will be replaced and enhanced through landscaping proposed as part of the works. The landscape works will reflect the current environment and vegetation and provide habitat for local fauna species present in this locality.

The proposal would not significantly impact biodiversity or ecological integrity in the proposal area.

Improved valuation, pricing and incentive mechanisms

This REF has examined the environmental factors of the proposal and identified safeguards for areas which have the potential to experience adverse impacts. Requirements imposed in terms of implementation of these mitigation measures would result in an economic cost to Transport for NSW. The implementation of safeguards would increase both the capital and operating costs of the proposal. This signifies that environmental resources have been given appropriate valuation.

8.3 Conclusion

The proposed pedestrian bridge over the Dobroyd Parade at Waratah Street is subject to assessment under Division 5.1 of the EP&A Act. The REF has examined and taken into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the proposed activity.

This has included consideration (where relevant) of conservation agreements and plans of management under the *National Parks and Wildlife Act 1974*, biodiversity stewardship sites under the BC Act, wilderness areas, areas of outstanding value, impacts on threatened species and ecological communities and their habitats, and other protected fauna and native plants. It has also considered potential impacts to matters of national environmental significance listed under the EPBC Act.

A number of potential environmental impacts from the proposal have been avoided or reduced during the concept design development and options assessment. The proposal, as described in the REF, best meets the project objectives but would still result in some impacts on biodiversity, noise and vibration, traffic and access, and heritage. Safeguards and management measures as detailed in this REF would ameliorate or minimise these expected impacts. The proposal would also improve pedestrian safety, improve driving

conditions and reduce congestion. On balance, the proposal is considered justified and the following conclusions are made.

Significance of impact under NSW legislation

The proposal would be unlikely to cause a significant impact on the environment. Therefore, it is not necessary for an environmental impact statement to be prepared nor approval to be sought from the Minister for Planning under Division 5.2 of the EP&A Act. A Biodiversity Development Assessment Report or Species Impact Statement is not required. The proposal is subject to assessment under Division 5.1 of the EP&A Act. Consent from Council is not required.

Significance of impact under Australian legislation

The proposal is not likely to have a significant impact on matters of national environmental significance nor the environment of Commonwealth land within the meaning of the *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth). A referral to the Australian Department of Climate Change, Energy, the Environment and Water is not required.

9. Certification

This review of environmental factors provides a true and fair review of the proposal in relation to its potential effects on the environment. It addresses to the fullest extent possible all matters affecting or likely to affect the environment as a result of the proposal.



Name: Tracey Hooper
Position: Senior Principal Environmental Consultant
Company name: Stantec
Date: 23 November 2023

I certify that I have reviewed and endorsed the contents of this REF and, to the best of my knowledge, the information is neither false nor misleading. I accept it on behalf of Transport for NSW.



Name: Jessica Chen
Position: Project Manager
Transport region/program: Network Integration
Date: 24 November 2023

10. EP&A Regulation publication requirement

Table 10-1 EP&A Regulation publication requirement

Requirement	Yes/No
Does this REF need to be published under section 171(4) of the EP&A Regulation?	Yes

11. References

- ABS (2016a) *Haberfield 2016 Census*. Australian Bureau of Statistics, 2016.
- ABS (2016b) *Inner West (A) 2016 Census*. Australian Bureau of Statistics, 2016.
- Arcadis (2018) *A Traffic Modelling and Assessment for the Existing Traffic Conditions on Dobroyd Parade*. Arcadis, 2018.
- Artefact (2023) *Dobroyd Parade Intersection Project: Non-Aboriginal Statement of Heritage Impact*. Artefact, July 2023.
- DCCEEW (2023a) *Protected Matter Search Tool*. Available online at: [Protected Matters Search Tool: Interactive Map \(awe.gov.au\)](#)
- DCCEEW (2023b) *Register of Critical Habitat*. Available online at: [Register of Critical Habitat \(environment.gov.au\)](#)
- DECC (2009) *Interim Construction Noise Guideline*. Department of Environment & Climate Change NSW, July 2009.
- DesignInc (2023) *Urban Design Report & Visual Impact Assessment*. DesignInc, April 2023.
- Digs (2023) *Sydney Geological Map 1:100,000*. Available online at: [DIGS Geological Survey of NSW Search](#)
- Department of Urban Affairs and Planning (1996) *Roads and Related Facilities EIS Guideline*. DUAP, 1996.
- EPA (2004) *NSW Waste Classification Guidelines*. EPA, 2004.
- EPA (2023a) *EPA Contaminated Land Record*. Available online at: [Search the contaminated land record | NSW EPA](#)
- EPA (2023b) *EPA List of NSW Contaminated Sites Notified to the EPA*. Available online at: [List of notified sites \(nsw.gov.au\)](#)
- eSPADE (2023) *eSPADE v2.2 mapping*. Available online at: [eSPADE v2.2 \(nsw.gov.au\)](#)
- Greater Sydney Commission (2018a) *The Greater Sydney Region Plan, A metropolis of Three Cities*. Available online at: [A Metropolis of Three Cities | Greater Cities Commission](#)
- Greater Sydney Commission (2018b) *Our Greater Sydney 2056 - Eastern City District Plan*. Available online at: [Eastern City District Plan | Greater Cities Commission](#)
- Inner West Council (2020) *Inner West Local Strategic Planning Statement*. Available online at: [Inner West Local Strategic Planning Statement.pdf](#)
- Landcom (2004) *Managing Urban Stormwater: Soils and Construction, Volume 1 and 2*. Landcom, 2022.
- NSW DPE (2023a) *Area of Outstanding Biodiversity Value Register*. Available online at: [Areas of Outstanding Biodiversity Value register | NSW Environment and Heritage](#)
- NSW DPE (2023b) *BioNet Search Tool*. Available online at: [Environment & Heritage | NSW BioNet](#)
- NSW Government (2023a) *Aboriginal Heritage Information Management System*. NSW Government, 2023.
- NSW Government (2023b) *Inner West Local Environmental Plan mapping*. Available online at: [Inner West Local Environmental Plan 2022 | Planning Portal - Department of Planning and Environment \(nsw.gov.au\)](#)
- NSW Government (2023c) *SEED mapping: Acid Sulphate Soil Risk mapping*. Available online at: [Geocortex Viewer for HTML5 \(nsw.gov.au\)](#)
- NSW Government (2023d) *Major Projects Register*. Available online at: [Major Projects | Planning Portal - Department of Planning and Environment \(nsw.gov.au\)](#)

NSW Government (2023e) *SEED mapping: NSW State Vegetation Type Map*. Available online at: [Geocortex Viewer for HTML5 \(nsw.gov.au\)](#)

NSW Government (2023f) *Transport Program of Major Works*. New South Wales Government, 2023.

Stantec (2020) *Geotechnical Interpretive Report*. Stantec, August 2020.

Stantec (2023) *Dobroyd Pedestrian Bridge upgrade Flood Impact Assessment*. Stantec, April 2023.

Transport for New South Wales (2013a) *Sydney's Walking Future*. Available online at: [Sydney's Walking Future - Connecting people and places \(nsw.gov.au\)](#)

Transport for New South Wales (2013b) *Sydney's Cycling Future*. Available online at: [Sydney's Cycling Future - Cycling for everyday transport \(nsw.gov.au\)](#)

Transport for New South Wales (2020a) *Beyond the Pavement strategy*. Available online at: [Beyond the Pavement \(nsw.gov.au\)](#)

Transport for New South Wales (2020b) *QA Specification G10 Traffic Management*. Transport for NSW, 2020.

Transport for New South Wales (2020c) *Environmental Impact Assessment Practice Code EIA-N04 – Guideline for landscape character and visual impact assessment*. Transport for NSW, 2020.

Transport for New South Wales (2022a) *Future Transport Strategy*. Available online at: [Future Transport Strategy \(nsw.gov.au\)](#)

Transport for New South Wales (2022b) *Traffic Control at Work Sites Manual*. Transport for NSW, 2022.

Transport for New South Wales (2022c) *Tree and Hollow Replacement Guideline*. Transport for NSW, 2022.

Transport for New South Wales (2022d) *Transport Unexpected Heritage Items Procedure*. Transport for NSW, 2022.

Transport for New South Wales (2023a) *Preliminary M4 East Road Network Performance Plan*. Transport for NSW, 2023.

Transport for New South Wales (2023b) *Schedule for Classified State Roads and Unclassified Regional Roads*. Transport for NSW, 2023.

Transport for New South Wales (2023c) *NSW Road Network Classifications*. Transport for NSW, 2023.

Transport for New South Wales (2023d) *Traffic Volume Viewer*. Available online at: [Traffic Volume Viewer \(nsw.gov.au\)](#)

Transport for New South Wales (2023e) *Construction Noise and Vibration Guideline*. Transport for NSW, 2023.

Transport for New South Wales (2023f) *Road users by local government area of crash*. Transport for NSW, 2023.

Transport for New South Wales (2023g) *Bridge Aesthetics: Design guideline to improve the appearance of bridges in NSW*. Centre for Urban Design, Transport for NSW, 2023.

Roads and Maritime Services (2011) *Procedure for Cultural Heritage Consultation and Investigation*. RMS, 2011.

Terms and acronyms used in this REF

Term / Acronym	Description
ABS	Australian Bureau of Statistics
AEP	Annual Exceedance Probability
AHIMS	Aboriginal Heritage Information Management System
ASS	Acid sulphate soils
BC Act	<i>Biodiversity Conservation Act 2016 (NSW)</i>
CBD	Central Business District
CEMP	Construction environmental management plan
dB(A)	Decibel (standard for sound units)
DCCEEW	Department of Climate Change, Energy, the Environment, and Water
DCP	Development Control Plan
DDA	<i>Disability Discrimination Act 1992</i>
DECC	Department of Environment, Climate Change and Water
DPE	Department of Planning and Environment
DUAP	Department of Urban Affairs and Planning
EIA	Environmental impact assessment
EP&A Act	<i>Environmental Planning and Assessment Act 1979 (NSW)</i> . Provides the legislative framework for land use planning and development assessment in NSW
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)</i> . Provides for the protection of the environment, especially matters of national environmental significance, and provides a national assessment and approvals process
ESD	Ecologically sustainable development. Development which 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
EPA	Environmental Protection Authority
HCA	Haberfield Conservation Area
ICNG	Interim Construction Noise Guideline
ICOMOS	International Council on Monuments and Sites
LCZ	Landscape Character Zone
LEP	Local Environmental Plan. A type of planning instrument made under Part 3 of the EP&A Act.
LGA	Local Government Area
LoS	Level of Service. A qualitative measure describing operational conditions within a traffic stream and their perception by motorists and/or passengers
MNES	Matters of national environmental significance under the <i>Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)</i>
NAHMP	Non-Aboriginal Heritage Management Plan
NML	Noise Management Level

Term / Acronym	Description
NSW	New South Wales
NVMP	Noise and Vibration Management Plan
OEH	Office of Environment and Heritage within the Department of Planning and Environment.
PACHCI	Procedure for Aboriginal Cultural Heritage Consultation and Investigation
PCT	Plant Community type
PMF	Probable Flood Maximum
PMST	Protected Matter Search Tool
QA Specifications	Specifications developed by Transport for use with road work and bridge work contracts let by Transport.
RBL	Rating Background Level
REF	Review of Environmental Factors
RMS	NSW Roads and Maritime Services, now Transport for NSW
ROL	Road Occupancy Licence
RTA	Roads and Traffic Authority
SEED	Sharing and Enabling Environmental Data – Mapping portal
Sensitive receivers	Human receivers at risk of impacts from high noise and vibration levels as a result of construction activities. Can be residential areas, educational areas, or areas of worship.
SEPP	State Environmental Planning Policy. A type of planning instrument made under Part 3 of the EP&A Act.
SEPP (Biodiversity and Conservation)	State Environmental Planning Policy (Biodiversity and Conservation) 2021
SEPP (Resilience and Hazards)	State Environmental Planning Policy (Resilience and Hazards) 2021
SEPP (Transport and Infrastructure)	State Environmental Planning Policy (Transport and Infrastructure) 2021
SVTM	State Vegetation Type Map
TEC	Threatened Ecological Community
TMP	Traffic Management Plan
Transport	Transport for NSW

Appendix A - Consideration of section 171 factors and matters of national environmental significance and Commonwealth land

Section 171 Factors

In addition to the requirements of the Guideline for Division 5.1 assessments (DPE 2022) and the Roads and Related Facilities EIS Guideline (DUAP 1996) as detailed in the REF, the following factors, listed in section 171 of the Environmental Planning and Assessment Regulation 2021, have also been considered to assess the likely impacts of the proposal on the natural and built environment.

Factor	Impact
<ul style="list-style-type: none"> Any environmental impact on a community? The construction of the proposal would affect the community through visual amenity impacts, disruptions to traffic and access, and potential noise and vibration impacts. These constraints would negatively impact the local community as outlined in Section 6 and would be mitigated through the implementation of safeguards outlined in Section 7. 	Negative, short-term, minor
<ul style="list-style-type: none"> Any transformation of a locality? The proposal would temporarily negatively impact the existing locality through visual amenity changes such as the presence of construction equipment fencing and activities The operation of the proposal would positively impact the locality through an increase in visual amenity in the road corridor. 	Negative, short-term, minor
	Positive, long-term, minor
<ul style="list-style-type: none"> Any environmental impact on the ecosystems of the locality? The proposal may impact biodiversity roosting or feeding areas with the removal of vegetation; however, the vegetation is landscaped and doesn't take away from the greater scope of vegetation in the area. Vegetation would be replanted with landscaping at the end of the proposal. 	Negative, short-term, minor
<ul style="list-style-type: none"> Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality? Construction of the proposal would result in a reduction of aesthetics of the locality due to the presence of construction equipment and activities, however, these impacts would be reduced through the implementation of safeguards (refer Chapter 7). Operation of the proposal would enhance the pedestrian access and safety of the area, resulting in an improvement in recreational value. 	Negative, short-term, minor
	Positive, long-term, minor
<ul style="list-style-type: none"> 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? Construction of the proposal has the potential to result in minor impacts to heritage items due to vibration intensive activities. However, these impacts are unlikely and the implementation of safeguards would mitigate these impacts (refer chapter 7). Unknown cultural artefacts have the potential to be uncovered during the construction of the proposal. 	Negligible, short-term
<ul style="list-style-type: none"> Any impact on the habitat of protected fauna (within the meaning of the <i>National Parks and Wildlife Act 1974</i>)? 	Nil

Factor	Impact
<ul style="list-style-type: none"> The proposal would not impact the habitat of protected fauna. 	
<ul style="list-style-type: none"> 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 would not endanger any species of animal, plant or other form of life, whether living on land, in water or in the air. 	Nil
<ul style="list-style-type: none"> Any long-term effects on the environment? Long-term negative effects on the environment are not anticipated, however, long-term positive effects would result from enhanced safety and reduced traffic congestion. 	Nil
<ul style="list-style-type: none"> Any degradation of the quality of the environment? The proposal has the potential to degrade the environment through the accidental spill of contaminants and fuels and the uncontrolled release of sediment into nearby stormwater systems and waterways. Safeguards would be implemented to reduce the risk of these occurring (refer Chapter 7). 	Nil
<ul style="list-style-type: none"> Any risk to the safety of the environment? The proposal has the potential to temporarily decrease the safety of the environment during the construction phase. Movement and usage of construction equipment and vehicles could result in a reduction in safety. Safeguards would be implemented to reduce the risk of these occurring (refer Chapter 7). 	Negative, short-term, minor
<ul style="list-style-type: none"> Any reduction in the range of beneficial uses of the environment? The proposal would not result in a significant reduction in the beneficial uses of the environment. 	Nil
<ul style="list-style-type: none"> Any pollution of the environment? The construction of the proposal would result in potential pollution of the environment due to noise amenity, accidental spills, and runoff. Safeguards would be implemented to reduce the risk of these occurring (refer Chapter 7). 	Nil
<ul style="list-style-type: none"> Any environmental problems associated with the disposal of waste? No environmental problems associated with waste are expected to occur as a result of the proposal. 	Nil
<ul style="list-style-type: none"> Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply? Construction of the proposal would involve the use of steel and concrete; however, it is unlikely to create any demand or shortage of supply. 	Nil
<ul style="list-style-type: none"> Any cumulative environmental effect with other existing or likely future activities? It is likely that development in the local area would occur during construction of the proposal. Cumulative impacts to traffic and noise pollution have the potential to occur. 	Negative, short-term, minor

Factor	Impact
Safeguards would be implemented to reduce the risk of these occurring (refer Chapter 7).	
<ul style="list-style-type: none"> Any impact on coastal processes and coastal hazards, including those under projected climate change conditions? The proposal is not located in the coastal area and would not result in any impacts to coastal processes or hazards. 	Nil
<ul style="list-style-type: none"> Applicable local strategic planning statements, regional strategic plans or district strategic plans made under the Act, Division 3.1, The proposal aligns with the objectives outlined in the following strategic plans: <ul style="list-style-type: none"> Sydney's Walking Future Sydney's Cycling Future Beyond The Pavement Future Transport Strategy 	Positive, long-term
<ul style="list-style-type: none"> Other relevant environmental factors. 	In considering the potential impacts of this proposal all relevant environmental factors have been considered, refer to Chapter 6 of this assessment.

Matters of National Environmental Significance and Commonwealth land

Under the environmental assessment provisions of the EPBC Act, the following matters of national environmental significance and impacts on Commonwealth land are required to be considered to assist in determining whether the proposal should be referred to the Australian Department of Climate Change, Energy, the Environment and Water.

A referral is not required for proposed actions that may affect nationally-listed threatened species, endangered ecological communities and migratory species. Impacts on these matters are still assessed as part of the REF in accordance with Australian Government significant impact criteria and taking into account relevant guidelines and policies.

Factor	Impact
<ul style="list-style-type: none"> Any impact on a World Heritage property? The proposal would not result in any impact to World Heritage. 	Nil
<ul style="list-style-type: none"> Any impact on a National Heritage place? The proposal would not result in any impact to National Heritage. 	Nil
<ul style="list-style-type: none"> Any impact on a wetland of international importance? The proposal would not result in any impact on a Wetland of International importance. 	Nil
<ul style="list-style-type: none"> Any impact on a listed threatened species or communities? The proposal would not result in any impact to threatened species or communities. 	Nil
<ul style="list-style-type: none"> Any impacts on listed migratory species? 	Nil

Factor	Impact
<p>The proposal would not result in any impact to migratory species.</p>	
<ul style="list-style-type: none"> Any impact on a Commonwealth marine area? The proposal would not result in any impact to a Commonwealth marine area. 	<p>Nil</p>
<ul style="list-style-type: none"> Does the proposal involve a nuclear action (including uranium mining)? The proposal does not involve nuclear action. 	<p>Nil</p>
<ul style="list-style-type: none"> Additionally, any impact (direct or indirect) on the environment of Commonwealth land? The proposal would not result in any impact on the environment of Commonwealth land. 	<p>Nil</p>

Appendix B - Statutory consultation checklists

Transport and Infrastructure SEPP

Certain development types

Development type	Description	Yes / No	If 'yes' consult with	SEPP (Transport and Infrastructure) Section
Car Park	Does the project include a car park intended for the use by commuters using regular bus services?	No		Section 2.110
Bus Depots	Does the project propose a bus depot?	No		Section 2.110
Permanent road maintenance depot and associated infrastructure	Does the project propose a permanent road maintenance depot or associated infrastructure such as garages, sheds, tool houses, storage yards, training facilities and workers' amenities?	No		Section 2.110

Development within the Coastal Zone

Development type	Description	Yes / No	If 'yes' consult with	SEPP (Transport and Infrastructure) Section
Development with impacts on certain land within the coastal zone	Is the proposal within a coastal vulnerability area and is inconsistent with a certified coastal management program applying to that land?	No		Section 2.14

Council related infrastructure or services

Development type	Potential impact	Yes / No	If 'yes' consult with	SEPP (Transport and Infrastructure) Section
Stormwater	Are the works likely to have a <i>substantial</i> impact on the stormwater management services which are provided by council?	No		Section 2.10
Traffic	Are the works likely to generate traffic to an extent that will <i>strain</i> the capacity of the existing road system in a local government area?	No		Section 2.10
Sewerage system	Will the works involve connection to a council owned sewerage system? If so, will this connection have a	No		Section 2.10

Development type	Potential impact	Yes / No	If 'yes' consult with	SEPP (Transport and Infrastructure) Section
	<i>substantial</i> impact on the capacity of any part of the system?			
Water usage	Will the works involve connection to a council owned water supply system? If so, will this require the use of a <i>substantial</i> volume of water?	No		Section 2.10
Temporary structures	Will the works involve the installation of a temporary structure on, or the enclosing of, a public place which is under local council management or control? If so, will this cause more than a <i>minor</i> or <i>inconsequential</i> disruption to pedestrian or vehicular flow?	No		Section 2.10
Road & footpath excavation	Will the works involve more than <i>minor</i> or <i>inconsequential</i> excavation of a road or adjacent footpath for which council is the roads authority and responsible for maintenance?	Yes	Inner West Council	Section 2.10

Local heritage items

Development type	Potential impact	Yes / No	If 'yes' consult with	SEPP (Transport and Infrastructure) Section
Local heritage	Is there is a local heritage item (that is not also a State heritage item) or a heritage conservation area in the study area for the works? If yes, does a heritage assessment indicate that the potential impacts to the heritage significance of the item/area are more than minor or inconsequential?	Yes	Inner West Council	Section 2.11

Flood liable land

Development type	Potential impact	Yes / No	If 'yes' consult with	SEPP (Transport and Infrastructure) Section
Flood liable land	Are the works located on flood liable land? If so, will the works change flood patterns to more than a <i>minor</i> extent?	Yes	Inner West Council	Section 2.12
Flood liable land	Are the works located on flood liable land? (to any extent). If so, do the works comprise more than minor alterations or additions to, or the demolition of, a building, emergency works or routine maintenance?	Yes	State Emergency Services	Section 2.13

Public authorities other than councils

Development type	Potential impact	Yes / No	If 'yes' consult with	SEPP (Transport and Infrastructure) Section
National parks and reserves	Are the works adjacent to a national park or nature reserve, or other area reserved under the <i>National Parks and Wildlife Act 1974</i> , or on land acquired under that Act?	No	Environment and Heritage Group, DPE	Section 2.15
National parks and reserves	Are the works on land in Zone E1 National Parks and Nature Reserves or in a land use zone equivalent to that zone?	No	Environment and Heritage Group, DPE	Section 2.15
Navigable waters	Do the works include a fixed or floating structure in or over navigable waters?	No	Transport for NSW - Maritime	Section 2.15
Bush fire prone land	Are the works for the purpose of residential development, an educational establishment, a health services facility, a correctional centre or group home in bush fire prone land?	No	Rural Fire Service (RFS)	Section 2.15
Artificial light	Would the works increase the amount of artificial light in the night sky and that is on land within the dark sky region as identified on the dark sky region map? (Note: the dark sky region is within 200 kilometres of the Siding Spring Observatory)	No	Director of the Siding Spring Observatory	Section 2.15

Development type	Potential impact	Yes / No	If 'yes' consult with	SEPP (Transport and Infrastructure) Section
Defense communications buffer land	Are the works on buffer land around the defense communications facility near Morundah? (Note: refer to Defence Communications Facility Buffer Map referred to in section 5.15 of Lockhart LEP 2012, Narrandera LEP 2013 and Urana LEP 2011.	No	Secretary of the Commonwealth Department of Defence	Section 2.15
Mine subsidence land	Are the works on land in a mine subsidence district within the meaning of the <i>Mine Subsidence Compensation Act 1961</i> ?	No	Mine Subsidence Board	Section 2.15

SEPP (Precincts – Central River City) 2021 and SEPP (Precincts – Western Parkland City) 2021

Development type	Potential impact	Yes / No	If 'yes' consult with	SEPP section
Clearing native vegetation	Do the works involve clearing native vegetation (as defined in the <i>Local Land Services Act 2013</i>) on land that is not subject land (as defined in cl 17 of schedule 7 of the <i>Threatened Species Conservation Act 1995</i>)?	No	Department of Planning and Environment	Section 3.24

Appendix C – Transport for NSW Construction and Maintenance Noise Estimator tool results

Distanced Based Assessment (Construction Scenario)

Please pick from drop-down list in orange cells

Noise area category		R3
RBL or LA90 Background level (dB(A))	Day	50
	Evening	45
	Night	40
LAeq(15minute) Noise	Day	60
	Day (OOHW)	55
Mangement Level (dB(A))	Evening	50
	Night	45
Scenario	Bulk earthworks	
Is there line of sight to receiver?	No (behind substantial solid barrier)	

Steps for Screening Assessment:

- Schedule noisy works to occur in standard hours where possible or before 11pm and implement Standard Measures.
- Select the representative noise area category. The worksheet titled 'Representative Noise Environ.' provides a number of examples to help select the noise area category.
- Select the scenario. If not found in drop-down list, refer to 'Source List' and select a representative scenario with similar plant combination.
- Is there line of sight to receiver? Select the appropriate scenario from the drop down list.

Identify and implement standard mitigation measures where feasible and reasonable. Include any shielding implemented as part of the standard mitigation measures by changing the selection in the 'Is there line of sight to receiver' drop-down list. Solid barrier can be in the form of road cutting, solid construction hoarding, acoustic curtain, timber lapped and capped fence, shipping container, site office, etc. Please note that vegetation and trees are not considered to be a form of solid barrier and any gaps would compromise the acoustic integrity of the solid barrier.

6. Determine if there are any receivers (both residential and non-residential receivers) within the affected distance for each relevant time period. Consider background noise measurements to check assumption in Step #2 if:

- (a) there are many affected receivers and the impact duration at any one receiver is more than 3 weeks; or
- (b) there are a few affected receivers and the impact duration at any one receiver is more than 6 weeks.

Note that consideration need to be given to the construction staging plan when determining impact duration.

7. Identify if there are any receivers within the additional mitigation measures distances and identify feasible and reasonable measures at each receiver

8. Where night works are involved, identify sleep disturbance affected distance.

9. Document the outcomes of these steps.

(Note that suitable noise management levels for other noise-sensitive businesses not identified in the Construction and Maintenance Noise Estimator should be investigated on a project-by-project basis.

Abbreviation	Measure
N	Notification
SN	Specific notifications
PC	Phone calls
IB	Individual briefings
RO	Respite offer
R1	Respite period 1
R2	Respite period 2
DR	Duration respite
AA	Alternative accommodation
V	Verification

Note that spot check verification of noise levels and individual briefings are not required for projects with less than 3 weeks impact duration

Residential receiver

		Affected distance (m)	LAeq(15minute) noise level above background (LA90)												L Aeq(15minute) 75 dB(A) or greater (Highly affected)	Sleep disutrbance LAmax 65 dB(A)	
			5 to 10 dB(A)			10 to 20 dB(A)			20 to 30 dB(A)			> 30 dB(A)					
			Noticeable			Clearly audible			Moderately intrusive			Highly intrusive					
			Measures	Within distance (m)	Mitigation level (dB(A))	Measures	Within distance (m)	Mitigation level (dB(A))	Measures	Within distance (m)	Mitigation level (dB(A))	Measures	Within distance (m)	Mitigation level (dB(A))	Affected distance (m)		
Undeveloped green fields, rural areas with isolated dwellings	Day	105							N	30	70	N, PC, RO	20	75	N, PC, RO	20	75
	Day (OOHW)	155				N, R1, DR	105	60	N, R1, DR	30	70	N, R1, DR, PC, SN	10	80	N, PC, RO	20	75
	Evening	230				N, R1, DR	155	55	N, R1, DR	55	65	N, R1, DR, PC, SN	20	75	N, PC, RO	20	75
	Night	335	N	335	45	N, R2, DR	230	50	N, PC, SN, R2, DR	105	60	AA, N, PC, SN, R2, DR	30	70	N, PC, RO	20	75
	Highly Affected	20													N, PC, RO	20	75
Developed settlements (urban and suburban)	Day	115							N	35	70	N, PC, RO	20	75	N, PC, RO	20	75
	Day (OOHW)	180				N, R1, DR	115	60	N, R1, DR	35	70	N, R1, DR, PC, SN	10	80	N, PC, RO	20	75
	Evening	280				N, R1, DR	180	55	N, R1, DR	70	65	N, R1, DR, PC, SN	20	75	N, PC, RO	20	75
	Night	425	N	425	45	N, R2, DR	280	50	N, PC, SN, R2, DR	115	60	AA, N, PC, SN, R2, DR	35	70	N, PC, RO	20	75
	Highly Affected	20													N, PC, RO	20	75
Propagation across a valley / over water	Day	140							N	40	70	N, PC, RO	20	75	N, PC, RO	20	75
	Day (OOHW)	230				N, R1, DR	140	60	N, R1, DR	40	70	N, R1, DR, PC, SN	10	80	N, PC, RO	20	75
	Evening	365				N, R1, DR	230	55	N, R1, DR	80	65	N, R1, DR, PC, SN	20	75	N, PC, RO	20	75
	Night	575	N	575	45	N, R2, DR	365	50	N, PC, SN, R2, DR	140	60	AA, N, PC, SN, R2, DR	40	70	N, PC, RO	20	75
	Highly Affected	20													N, PC, RO	20	75

Distanced Based Assessment (Construction Scenario)

Please pick from drop-down list in orange cells

Noise area category		R3
RBL or LA90 Background level (dB(A))	Day	50
	Evening	45
	Night	40
LAeq(15minute) Noise Mangement Level (dB(A))	Day	60
	Day (OOHW)	55
	Evening	50
	Night	45
Scenario	Retaining walls / noise walls	
Is there line of sight to receiver?	No (behind substantial solid barrier)	

Steps for Screening Assessment:

- Schedule noisy works to occur in standard hours where possible or before 11pm and implement Standard Measures.
- Select the representative noise area category. The worksheet titled 'Representative Noise Environ.' provides a number of examples to help select the noise area category.
- Select the scenario. If not found in drop-down list, refer to 'Source List' and select a representative scenario with similar plant combination.
- Is there line of sight to receiver? Select the appropriate scenario from the drop down list.
Identify and implement standard mitigation measures where feasible and reasonable. Include any shielding implemented as part of the standard mitigation measures by changing the selection in the 'Is there line of sight to receiver' drop-down list. Solid barrier can be in the form of road cutting, solid construction hoarding, acoustic curtain, timber lapped and capped fence, shipping container, site office, etc. Please note that vegetation and trees are not considered to be a form of solid barrier and any gaps would compromise the acoustic integrity of the solid barrier.
- Determine if there are any receivers (both residential and non-residential receivers) within the affected distance for each relevant time period. Consider background noise measurements to check assumption in Step #2 if:
 - (a) there are many affected receivers and the impact duration at any one receiver is more than 3 weeks; or
 - (b) there are a few affected receivers and the impact duration at any one receiver is more than 5 weeks.
 Note that consideration need to be given to the construction staging plan when determining impact duration.
- Identify if there are any receivers within the additional mitigation measures distances and identify feasible and reasonable measures at each receiver
- Where night works are involved, identify sleep disturbance affected distance.
- Document the outcomes of these steps.
(Note that suitable noise management levels for other noise-sensitive businesses not identified in the Construction and Maintenance Noise Estimator should be investigated on a project-by-project basis.)

Abbrevlation	Measure
N	Notification
SN	Specific notifications
PC	Phone calls
IB	Individual briefings
RO	Respite offer
R1	Respite period 1
R2	Respite period 2
DR	Duration respite
AA	Alternative accommodation
V	Verification

Note that spot check verification of noise levels and individual briefings are not required for projects with less than 3 weeks impact duration

Residential receiver

		Affected distance (m)	LAeq(15minute) noise level above background (LA90)										LAeq(15minute) 75 dB(A) or greater (Highly affected)			Sleep disutrbrance LAmax 65 dB(A)		
			5 to 10 dB(A)			10 to 20 dB(A)			20 to 30 dB(A)			> 30 dB(A)						
			Noticeable			Clearly audible			Moderately intrusive			Highly intrusive			Measures	Within distance (m)	Mitigation level (dB(A))	Affected distance (m)
Measures	Within distance (m)	Mitigation level (dB(A))	Measures	Within distance (m)	Mitigation level (dB(A))	Measures	Within distance (m)	Mitigation level (dB(A))	Measures	Within distance (m)	Mitigation level (dB(A))							
Undeveloped green fields, rural areas with isolated dwellings	Day	65							N	20	70	N, PC, RO	10	75	N, PC, RO	10	75	125
	Day (OOHW)	115				N, R1, DR	65	60	N, R1, DR	20	70	N, R1, DR, PC, SN	5	80	N, PC, RO	10	75	
	Evening	170				N, R1, DR	115	55	N, R1, DR	30	65	N, R1, DR, PC, SN	10	75	N, PC, RO	10	75	
	Night	250	N	250	45	N, R2, DR	170	50	N, PC, SN, R2, DR	65	60	AA, N, PC, SN, R2, DR	20	70	N, PC, RO	10	75	
	Highly Affected	10													N, PC, RO	10	75	
Developed settlements (urban and suburban)	Day	75							N	25	70	N, PC, RO	15	75	N, PC, RO	15	75	140
	Day (OOHW)	130				N, R1, DR	75	60	N, R1, DR	25	70	N, R1, DR, PC, SN	5	80	N, PC, RO	10	75	
	Evening	200				N, R1, DR	130	55	N, R1, DR	40	65	N, R1, DR, PC, SN	15	75	N, PC, RO	15	75	
	Night	305	N	305	45	N, R2, DR	200	50	N, PC, SN, R2, DR	75	60	AA, N, PC, SN, R2, DR	25	70	N, PC, RO	15	75	
	Highly Affected	15													N, PC, RO	15	75	
Propagation across a valley / over water	Day	90							N	25	70	N, PC, RO	15	75	N, PC, RO	15	75	170
	Day (OOHW)	155				N, R1, DR	90	60	N, R1, DR	25	70	N, R1, DR, PC, SN	5	80	N, PC, RO	15	75	
	Evening	250				N, R1, DR	155	55	N, R1, DR	45	65	N, R1, DR, PC, SN	15	75	N, PC, RO	15	75	
	Night	405	N	405	45	N, R2, DR	250	50	N, PC, SN, R2, DR	90	60	AA, N, PC, SN, R2, DR	25	70	N, PC, RO	15	75	
	Highly Affected	15													N, PC, RO	15	75	

Distanced Based Assessment (Construction Scenario)

Please pick from drop-down list in orange cells

Noise area category		R3
RBL or LA90 Background level (dB(A))	Day	50
	Evening	45
	Night	40
LAeq(15minute) Noise Mangement Level (dB(A))	Day	60
	Day (OOHW)	55
	Evening	50
	Night	45
Scenario	Bulk earthworks	
Is there line of sight to receiver?	No (behind substantial solid barrier)	

Steps for Screening Assessment:

- Schedule noisy works to occur in standard hours where possible or before 11pm and implement Standard Measures.
 - Select the representative noise area category. The worksheet titled 'Representative Noise Environ.' provides a number of examples to help select the noise area category.
 - Select the scenario. If not found in drop-down list, refer to 'Source List' and select a representative scenario with similar plant combination.
4. Is there line of sight to receiver? Select the appropriate scenario from the drop down list.
5. Identify and implement standard mitigation measures where feasible and reasonable. Include any shielding implemented as part of the standard mitigation measures by changing the selection in the 'Is there line of sight to receiver' drop-down list. Solid barrier can be in the form of road cutting, solid construction hoarding, acoustic curtain, timber lapped and capped fence, shipping container, site office, etc. Please note that vegetation and trees are not considered to be a form of solid barrier and any gaps would compromise the acoustic integrity of the solid barrier.
6. Determine if there are any receivers (both residential and non-residential receivers) within the affected distance for each relevant time period. Consider background noise measurements to check assumption in Step #2 if:
- (a) there are many affected receivers and the impact duration at any one receiver is more than 3 weeks; or
 - (b) there are a few affected receivers and the impact duration at any one receiver is more than 6 weeks.
- Note that consideration need to be given to the construction staging plan when determining impact duration.
7. Identify if there are any receivers within the additional mitigation measures distances and identify feasible and reasonable measures at each receiver
8. Where night works are involved, identify sleep disturbance affected distance.
9. Document the outcomes of these steps.
- (Note that suitable noise management levels for other noise-sensitive businesses not identified in the Construction and Maintenance Noise Estimator should be investigated on a project-by-project basis.)

Abbreviation	Measure
N	Notification
SN	Specific notifications
PC	Phone calls
IB	Individual briefings
RO	Respite offer
R1	Respite period 1
R2	Respite period 2
DR	Duration respite
AA	Alternative accommodation
V	Verification

Note that spot check verification of noise levels and individual briefings are not required for projects with less than 3 weeks impact duration

Residential receiver

		Affected distance (m)	LAeq(15minute) noise level above background (LA90)												Sleep disturbance LAmax 65 dB(A)			
			5 to 10 dB(A)			10 to 20 dB(A)			20 to 30 dB(A)			> 30 dB(A)				LAeq(15minute) 75 dB(A) or greater (Highly affected)		
			Noticeable			Clearly audible			Moderately intrusive			Highly intrusive						
			Measures	Within distance (m)	Mitigation level (dB(A))	Measures	Within distance (m)	Mitigation level (dB(A))	Measures	Within distance (m)	Mitigation level (dB(A))	Measures	Within distance (m)	Mitigation level (dB(A))	Measures	Within distance (m)	Mitigation level (dB(A))	Affected distance (m)
Undeveloped green fields, rural areas with isolated dwellings	Day	105							N	30	70	N, PC, RO	20	75	N, PC, RO	20	75	
	Day (OOHW)	155				N, R1, DR	105	60	N, R1, DR	30	70	N, R1, DR, PC, SN	10	80	N, PC, RO	20	75	
	Evening	230				N, R1, DR	155	55	N, R1, DR	55	65	N, R1, DR, PC, SN	20	75	N, PC, RO	20	75	
	Night	335	N	335	45	N, R2, DR	230	50	N, PC, SN, R2, DR	105	60	AA, N, PC, SN, R2, DR	30	70	N, PC, RO	20	75	105
	Highly Affected	20													N, PC, RO	20	75	
Developed settlements (urban and suburban)	Day	115							N	35	70	N, PC, RO	20	75	N, PC, RO	20	75	
	Day (OOHW)	180				N, R1, DR	115	60	N, R1, DR	35	70	N, R1, DR, PC, SN	10	80	N, PC, RO	20	75	
	Evening	280				N, R1, DR	180	55	N, R1, DR	70	65	N, R1, DR, PC, SN	20	75	N, PC, RO	20	75	
	Night	425	N	425	45	N, R2, DR	280	50	N, PC, SN, R2, DR	115	60	AA, N, PC, SN, R2, DR	35	70	N, PC, RO	20	75	115
	Highly Affected	20													N, PC, RO	20	75	
Propagation across a valley / over water	Day	140							N	40	70	N, PC, RO	20	75	N, PC, RO	20	75	
	Day (OOHW)	230				N, R1, DR	140	60	N, R1, DR	40	70	N, R1, DR, PC, SN	10	80	N, PC, RO	20	75	
	Evening	365				N, R1, DR	230	55	N, R1, DR	80	65	N, R1, DR, PC, SN	20	75	N, PC, RO	20	75	
	Night	575	N	575	45	N, R2, DR	365	50	N, PC, SN, R2, DR	140	60	AA, N, PC, SN, R2, DR	40	70	N, PC, RO	20	75	140
	Highly Affected	20													N, PC, RO	20	75	

Distanced Based Assessment (Construction Scenario)

Please pick from drop-down list in orange cells

Noise area category		R3
RBL or LA90 Background level (dB(A))	Day	50
	Evening	45
	Night	40
LAeq(15minute) Noise Mangement Level (dB(A))	Day	60
	Day (OOHW)	55
	Evening	50
	Night	45
Scenario	Compound operation	
Is there line of sight to receiver?	No (behind substantial solid barrier)	

Steps for Screening Assessment:

- Schedule noisy works to occur in standard hours where possible or before 11pm and implement Standard Measures.
- Select the representative noise area category. The worksheet titled 'Representative Noise Environ.' provides a number of examples to help select the noise area category.
- Select the scenario. If not found in drop-down list, refer to 'Source List' and select a representative scenario with similar plant combination.
- Is there line of sight to receiver? Select the appropriate scenario from the drop down list.
Identify and implement standard mitigation measures where feasible and reasonable. Include any shielding implemented as part of the standard mitigation measures by changing the selection in the 'Is there line of sight to receiver' drop-down list. Solid barrier can be in the form of road cutting, solid construction hoarding, acoustic curtain, timber lapped and capped fence, shipping container, site office, etc. Please note that vegetation and trees are not considered to be a form of solid barrier and any gaps would compromise the acoustic integrity of the solid barrier.
- Determine if there are any receivers (both residential and non-residential receivers) within the affected distance for each relevant time period. Consider background noise measurements to check assumption in Step #2 if:
 - there are many affected receivers and the impact duration at any one receiver is more than 3 weeks; or
 - there are a few affected receivers and the impact duration at any one receiver is more than 5 weeks.
 Note that consideration need to be given to the construction staging plan when determining impact duration.
- Identify if there are any receivers within the additional mitigation measures distances and identify feasible and reasonable measures at each receiver
- Where night works are involved, identify sleep disturbance affected distance.
- Document the outcomes of these steps.
(Note that suitable noise management levels for other noise-sensitive businesses not identified in the Construction and Maintenance Noise Estimator should be investigated on a project-by-project basis.)

Abbrevlation	Measure
N	Notification
SN	Specific notifications
PC	Phone calls
IB	Individual briefings
RO	Respite offer
R1	Respite period 1
R2	Respite period 2
DR	Duration respite
AA	Alternative accommodation
V	Verification

Note that spot check verification of noise levels and individual briefings are not required for projects with less than 3 weeks impact duration

Residential receiver

		Affected distance (m)	LAeq(15minute) noise level above background (LA90)										LAeq(15minute) 75 dB(A) or greater (Highly affected)			Sleep disutrbrance LAmax 65 dB(A)		
			5 to 10 dB(A)			10 to 20 dB(A)			20 to 30 dB(A)			> 30 dB(A)						
			Noticeable			Clearly audible			Moderately intrusive			Highly intrusive			Measures	Within distance (m)	Mitigation level (dB(A))	Affected distance (m)
Measures	Within distance (m)	Mitigation level (dB(A))	Measures	Within distance (m)	Mitigation level (dB(A))	Measures	Within distance (m)	Mitigation level (dB(A))	Measures	Within distance (m)	Mitigation level (dB(A))							
Undeveloped green fields, rural areas with isolated dwellings	Day	35							N	10	70	N, PC, RO	5	75	N, PC, RO	5	75	25
	Day (OOHW)	65				N, R1, DR	35	60	N, R1, DR	10	70	N, R1, DR, PC, SN	#N/A	80	N, PC, RO	5	75	
	Evening	115				N, R1, DR	65	55	N, R1, DR	20	65	N, R1, DR, PC, SN	5	75	N, PC, RO	5	75	
	Night	170	N	170	45	N, R2, DR	115	50	N, PC, SN, R2, DR	35	60	AA, N, PC, SN, R2, DR	10	70	N, PC, RO	5	75	
	Highly Affected	5													N, PC, RO	5	75	
Developed settlements (urban and suburban)	Day	40							N	15	70	N, PC, RO	5	75	N, PC, RO	5	75	25
	Day (OOHW)	75				N, R1, DR	40	60	N, R1, DR	15	70	N, R1, DR, PC, SN	#N/A	80	N, PC, RO	5	75	
	Evening	125				N, R1, DR	75	55	N, R1, DR	25	65	N, R1, DR, PC, SN	5	75	N, PC, RO	5	75	
	Night	200	N	200	45	N, R2, DR	125	50	N, PC, SN, R2, DR	40	60	AA, N, PC, SN, R2, DR	15	70	N, PC, RO	5	75	
	Highly Affected	5													N, PC, RO	5	75	
Propagation across a valley / over water	Day	50							N	15	70	N, PC, RO	5	75	N, PC, RO	5	75	30
	Day (OOHW)	90				N, R1, DR	50	60	N, R1, DR	15	70	N, R1, DR, PC, SN	#N/A	80	N, PC, RO	5	75	
	Evening	150				N, R1, DR	90	55	N, R1, DR	25	65	N, R1, DR, PC, SN	5	75	N, PC, RO	5	75	
	Night	250	N	250	45	N, R2, DR	150	50	N, PC, SN, R2, DR	50	60	AA, N, PC, SN, R2, DR	15	70	N, PC, RO	5	75	
	Highly Affected	5													N, PC, RO	5	75	

Distanced Based Assessment (Construction Scenario)

Please pick from drop-down list in orange cells

Noise area category		R3
RBL or LA90 Background level (dB(A))	Day	50
	Evening	45
	Night	40
LAeq(15minute) Noise Mangement Level (dB(A))	Day	60
	Day (OOHW)	55
	Evening	50
	Night	45
Scenario	Compound site establishment	
Is there line of sight to receiver?	No (behind substantial solid barrier)	

Steps for Screening Assessment:

- Schedule noisy works to occur in standard hours where possible or before 11pm and implement Standard Measures.
 - Select the representative noise area category. The worksheet titled 'Representative Noise Environ.' provides a number of examples to help select the noise area category.
 - Select the scenario. If not found in drop-down list, refer to 'Source List' and select a representative scenario with similar plant combination.
 - Is there line of sight to receiver? Select the appropriate scenario from the drop down list.
 - Identify and implement standard mitigation measures where feasible and reasonable. Include any shielding implemented as part of the standard mitigation measures by changing the selection in the 'Is there line of sight to receiver' drop-down list. Solid barrier can be in the form of road cutting, solid construction hoarding, acoustic curtain, timber lapped and capped fence, shipping container, site office, etc. Please note that vegetation and trees are not considered to be a form of solid barrier and any gaps would compromise the acoustic integrity of the solid barrier.
 - Determine if there are any receivers (both residential and non-residential receivers) within the affected distance for each relevant time period. Consider background noise measurements to check assumption in Step #2 if:
 - there are many affected receivers and the impact duration at any one receiver is more than 3 weeks; or
 - there are a few affected receivers and the impact duration at any one receiver is more than 6 weeks.
 Note that consideration need to be given to the construction staging plan when determining impact duration.
 - Identify if there are any receivers within the additional mitigation measures distances and identify feasible and reasonable measures at each receiver
 - Where night works are involved, identify sleep disturbance affected distance.
 - Document the outcomes of these steps.
- (Note that suitable noise management levels for other noise-sensitive businesses not identified in the Construction and Maintenance Noise Estimator should be investigated on a project-by-project basis.)

Abbreviation	Measure
N	Notification
SN	Specific notifications
PC	Phone calls
IB	Individual briefings
RO	Respite offer
R1	Respite period 1
R2	Respite period 2
DR	Duration respite
AA	Alternative accommodation
V	Verification

Note that spot check verification of noise levels and individual briefings are not required for projects with less than 3 weeks impact duration

Residential receiver

		Affected distance (m)	LAeq(15minute) noise level above background (LA90)										LAeq(15minute) 75 dB(A) or greater (Highly affected)			Sleep disturbance LAmax 65 dB(A)		
			5 to 10 dB(A)			10 to 20 dB(A)			20 to 30 dB(A)			> 30 dB(A)						
			Noticeable			Clearly audible			Moderately intrusive			Highly intrusive			Measures	Within distance (m)	Mitigation level (dB(A))	
			Measures	Within distance (m)	Mitigation level (dB(A))	Measures	Within distance (m)	Mitigation level (dB(A))	Measures	Within distance (m)	Mitigation level (dB(A))	Measures	Within distance (m)	Mitigation level (dB(A))				
Undeveloped green fields, rural areas with isolated dwellings	Day	65							N	20	70	N, PC, RO	10	75	N, PC, RO	10	75	35
	Day (OOHW)	115				N, R1, DR	65	60	N, R1, DR	20	70	N, R1, DR, PC, SN	5	80	N, PC, RO	10	75	
	Evening	170				N, R1, DR	115	55	N, R1, DR	30	65	N, R1, DR, PC, SN	10	75	N, PC, RO	10	75	
	Night	250	N	250	45	N, R2, DR	170	50	N, PC, SN, R2, DR	65	60	AA, N, PC, SN, R2, DR	20	70	N, PC, RO	10	75	
	Highly Affected	10													N, PC, RO	10	75	
Developed settlements (urban and suburban)	Day	75							N	25	70	N, PC, RO	15	75	N, PC, RO	15	75	40
	Day (OOHW)	130				N, R1, DR	75	60	N, R1, DR	25	70	N, R1, DR, PC, SN	5	80	N, PC, RO	10	75	
	Evening	200				N, R1, DR	130	55	N, R1, DR	40	65	N, R1, DR, PC, SN	15	75	N, PC, RO	15	75	
	Night	305	N	305	45	N, R2, DR	200	50	N, PC, SN, R2, DR	75	60	AA, N, PC, SN, R2, DR	25	70	N, PC, RO	15	75	
	Highly Affected	15													N, PC, RO	15	75	
Propagation across a valley / over water	Day	90							N	25	70	N, PC, RO	15	75	N, PC, RO	15	75	50
	Day (OOHW)	155				N, R1, DR	90	60	N, R1, DR	25	70	N, R1, DR, PC, SN	5	80	N, PC, RO	15	75	
	Evening	250				N, R1, DR	155	55	N, R1, DR	45	65	N, R1, DR, PC, SN	15	75	N, PC, RO	15	75	
	Night	405	N	405	45	N, R2, DR	250	50	N, PC, SN, R2, DR	90	60	AA, N, PC, SN, R2, DR	25	70	N, PC, RO	15	75	
	Highly Affected	15													N, PC, RO	15	75	

Distanced Based Assessment (Construction Scenario)

Please pick from drop-down list in orange cells

Noise area category		R3
RBL or LA90 Background level (dB(A))	Day	50
	Evening	45
	Night	40
LAeq(15minute) Noise Mangement Level (dB(A))	Day	60
	Day (OOHW)	55
	Evening	50
	Night	45
Scenario	Compound site establishment	
Is there line of sight to receiver?	No (behind substantial solid barrier)	

Steps for Screening Assessment:

- Schedule noisy works to occur in standard hours where possible or before 11pm and implement Standard Measures.
- Select the representative noise area category. The worksheet titled 'Representative Noise Environ.' provides a number of examples to help select the noise area category.
- Select the scenario. If not found in drop-down list, refer to 'Source List' and select a representative scenario with similar plant combination.
- Is there line of sight to receiver? Select the appropriate scenario from the drop down list.

Identify and implement standard mitigation measures where feasible and reasonable. Include any shielding implemented as part of the standard mitigation measures by changing the selection in the 'Is there line of sight to receiver' drop-down list. Solid barrier can be in the form of road cutting, solid construction hoarding, acoustic curtain, timber lapped and capped fence, shipping container, site office, etc. Please note that vegetation and trees are not considered to be a form of solid barrier and any gaps would compromise the acoustic integrity of the solid barrier.

6. Determine if there are any receivers (both residential and non-residential receivers) within the affected distance for each relevant time period. Consider background noise measurements to check assumption in Step #2 if:

- (a) there are many affected receivers and the impact duration at any one receiver is more than 3 weeks; or
- (b) there are a few affected receivers and the impact duration at any one receiver is more than 6 weeks.

Note that consideration need to be given to the construction staging plan when determining impact duration.

7. Identify if there are any receivers within the additional mitigation measures distances and identify feasible and reasonable measures at each receiver

8. Where night works are involved, identify sleep disturbance affected distance.

9. Document the outcomes of these steps.

(Note that suitable noise management levels for other noise-sensitive businesses not identified in the Construction and Maintenance Noise Estimator should be investigated on a project-by-project basis.

Abbreviation	Measure
N	Notification
SN	Specific notifications
PC	Phone calls
IB	Individual briefings
RO	Respite offer
R1	Respite period 1
R2	Respite period 2
DR	Duration respite
AA	Alternative accommodation
V	Verification

Note that spot check verification of noise levels and individual briefings are not required for projects with less than 3 weeks impact duration

Residential receiver

		Affected distance (m)	LAeq(15minute) noise level above background (LA90)										LAeq(15minute) 75 dB(A) or greater (Highly affected)			Sleep disturbance LAmax 65 dB(A)		
			5 to 10 dB(A)			10 to 20 dB(A)			20 to 30 dB(A)			> 30 dB(A)						
			Noticeable			Clearly audible			Moderately intrusive			Highly intrusive			Measures	Within distance (m)	Mitigation level (dB(A))	
			Measures	Within distance (m)	Mitigation level (dB(A))	Measures	Within distance (m)	Mitigation level (dB(A))	Measures	Within distance (m)	Mitigation level (dB(A))	Measures	Within distance (m)	Mitigation level (dB(A))				
Undeveloped green fields, rural areas with isolated dwellings	Day	65							N	20	70	N, PC, RO	10	75	N, PC, RO	10	75	35
	Day (OOHW)	115				N, R1, DR	65	60	N, R1, DR	20	70	N, R1, DR, PC, SN	5	80	N, PC, RO	10	75	
	Evening	170				N, R1, DR	115	55	N, R1, DR	30	65	N, R1, DR, PC, SN	10	75	N, PC, RO	10	75	
	Night	250	N	250	45	N, R2, DR	170	50	N, PC, SN, R2, DR	65	60	AA, N, PC, SN, R2, DR	20	70	N, PC, RO	10	75	
	Highly Affected	10													N, PC, RO	10	75	
Developed settlements (urban and suburban)	Day	75							N	25	70	N, PC, RO	15	75	N, PC, RO	15	75	40
	Day (OOHW)	130				N, R1, DR	75	60	N, R1, DR	25	70	N, R1, DR, PC, SN	5	80	N, PC, RO	10	75	
	Evening	200				N, R1, DR	130	55	N, R1, DR	40	65	N, R1, DR, PC, SN	15	75	N, PC, RO	15	75	
	Night	305	N	305	45	N, R2, DR	200	50	N, PC, SN, R2, DR	75	60	AA, N, PC, SN, R2, DR	25	70	N, PC, RO	15	75	
	Highly Affected	15													N, PC, RO	15	75	
Propagation across a valley / over water	Day	90							N	25	70	N, PC, RO	15	75	N, PC, RO	15	75	50
	Day (OOHW)	155				N, R1, DR	90	60	N, R1, DR	25	70	N, R1, DR, PC, SN	5	80	N, PC, RO	15	75	
	Evening	250				N, R1, DR	155	55	N, R1, DR	45	65	N, R1, DR, PC, SN	15	75	N, PC, RO	15	75	
	Night	405	N	405	45	N, R2, DR	250	50	N, PC, SN, R2, DR	90	60	AA, N, PC, SN, R2, DR	25	70	N, PC, RO	15	75	
	Highly Affected	15													N, PC, RO	15	75	

Distanced Based Assessment (Construction Scenario)

Please pick from drop-down list in orange cells

Noise area category		R3
RBL or LA90 Background level (dB(A))	Day	50
	Evening	45
	Night	40
LAeq(15minute) Noise Mangement Level (dB(A))	Day	60
	Day (OOHW)	55
	Evening	50
	Night	45
Scenario	Compound site establishment	
Is there line of sight to receiver?	No (behind substantial solid barrier)	

Steps for Screening Assessment:

- Schedule noisy works to occur in standard hours where possible or before 11pm and implement Standard Measures.
- Select the representative noise area category. The worksheet titled 'Representative Noise Environ.' provides a number of examples to help select the noise area category.
- Select the scenario. If not found in drop-down list, refer to 'Source List' and select a representative scenario with similar plant combination.
- Is there line of sight to receiver? Select the appropriate scenario from the drop down list.

Identify and implement standard mitigation measures where feasible and reasonable. Include any shielding implemented as part of the standard mitigation measures by changing the selection in the 'Is there line of sight to receiver' drop-down list. Solid barrier can be in the form of road cutting, solid construction hoarding, acoustic curtain, timber lapped and capped fence, shipping container, site office, etc. Please note that vegetation and trees are not considered to be a form of solid barrier and any gaps would compromise the acoustic integrity of the solid barrier.

6. Determine if there are any receivers (both residential and non-residential receivers) within the affected distance for each relevant time period. Consider background noise measurements to check assumption in Step #2 if:

- (a) there are many affected receivers and the impact duration at any one receiver is more than 3 weeks; or
- (b) there are a few affected receivers and the impact duration at any one receiver is more than 6 weeks.

Note that consideration need to be given to the construction staging plan when determining impact duration.

7. Identify if there are any receivers within the additional mitigation measures distances and identify feasible and reasonable measures at each receiver

8. Where night works are involved, identify sleep disturbance affected distance.

9. Document the outcomes of these steps.

(Note that suitable noise management levels for other noise-sensitive businesses not identified in the Construction and Maintenance Noise Estimator should be investigated on a project-by-project basis.)

Abbreviation	Measure
N	Notification
SN	Specific notifications
PC	Phone calls
IB	Individual briefings
RO	Respite offer
R1	Respite period 1
R2	Respite period 2
DR	Duration respite
AA	Alternative accommodation
V	Verification

Note that spot check verification of noise levels and individual briefings are not required for projects with less than 3 weeks impact duration

Residential receiver

		Affected distance (m)	LAeq(15minute) noise level above background (LA90)										LAeq(15minute) 75 dB(A) or greater (Highly affected)			Sleep disutrbance LAmax 65 dB(A)		
			5 to 10 dB(A)			10 to 20 dB(A)			20 to 30 dB(A)			> 30 dB(A)						
			Noticeable			Clearly audible			Moderately intrusive			Highly intrusive			Measures	Within distance (m)	Mitigation level (dB(A))	
			Measures	Within distance (m)	Mitigation level (dB(A))	Measures	Within distance (m)	Mitigation level (dB(A))	Measures	Within distance (m)	Mitigation level (dB(A))	Measures	Within distance (m)	Mitigation level (dB(A))				
Undeveloped green fields, rural areas with isolated dwellings	Day	65							N	20	70	N, PC, RO	10	75	N, PC, RO	10	75	35
	Day (OOHW)	115				N, R1, DR	65	60	N, R1, DR	20	70	N, R1, DR, PC, SN	5	80	N, PC, RO	10	75	
	Evening	170				N, R1, DR	115	55	N, R1, DR	30	65	N, R1, DR, PC, SN	10	75	N, PC, RO	10	75	
	Night	250	N	250	45	N, R2, DR	170	50	N, PC, SN, R2, DR	65	60	AA, N, PC, SN, R2, DR	20	70	N, PC, RO	10	75	
	Highly Affected	10													N, PC, RO	10	75	
Developed settlements (urban and suburban)	Day	75							N	25	70	N, PC, RO	15	75	N, PC, RO	15	75	40
	Day (OOHW)	130				N, R1, DR	75	60	N, R1, DR	25	70	N, R1, DR, PC, SN	5	80	N, PC, RO	10	75	
	Evening	200				N, R1, DR	130	55	N, R1, DR	40	65	N, R1, DR, PC, SN	15	75	N, PC, RO	15	75	
	Night	305	N	305	45	N, R2, DR	200	50	N, PC, SN, R2, DR	75	60	AA, N, PC, SN, R2, DR	25	70	N, PC, RO	15	75	
	Highly Affected	15													N, PC, RO	15	75	
Propagation across a valley / over water	Day	90							N	25	70	N, PC, RO	15	75	N, PC, RO	15	75	50
	Day (OOHW)	155				N, R1, DR	90	60	N, R1, DR	25	70	N, R1, DR, PC, SN	5	80	N, PC, RO	15	75	
	Evening	250				N, R1, DR	155	55	N, R1, DR	45	65	N, R1, DR, PC, SN	15	75	N, PC, RO	15	75	
	Night	405	N	405	45	N, R2, DR	250	50	N, PC, SN, R2, DR	90	60	AA, N, PC, SN, R2, DR	25	70	N, PC, RO	15	75	
	Highly Affected	15													N, PC, RO	15	75	

Appendix D – Urban Design Report and Landscape Character and Visual Impact Assessment

Proposed Pedestrian Bridge over Dobroyd Parade at Haberfield

Urban Design Report & Visual Impact Assessment

Project # P22-199

Revision 80% Concept Design

Date 13.09.23

Document prepared by:

DesignInc Sydney Pty Ltd

ABN 87 003 008 820

Level 12, 126 Phillip Street

Sydney NSW 2000

+61 2 8905 7100

reception@designinc.com.au

5. Landscape and Visual Impact Assessment

5.1. Introduction

This section of the report aims to assess the impact of the proposal on the identified Landscape Character Zones and viewpoints within the study area. The Environmental Impact Assessment Practice Note: Guidelines for Landscape Character and Visual Impact Assessment (“EIA No. 4 Guidelines”, August 2023, Transport for NSW), referred to as the Practice Note hereafter, sets out two main purposes of landscape character and visual impact assessment: “To inform the development of the preferred route and concept design so that the proposal can avoid and minimise impacts up front” “To inform Transport, there agencies and the community about the landscape character and visual impact of the proposal and what avoidance, management and mitigation strategies would be implemented.” The Practice Note describe the landscape character assessment and visual impact assessment as follows: “Landscape character and visual assessment are equally important. Landscape character assessment helps determine the overall impact of a project on an area’s character and sense of place. Visual impact assessment helps define the day-to-day visual effects of a project on people’s views. This dual assessment helps differentiate options and improve design outcomes.”

5.2. Methodology

This report has been prepared by DesignInc – The Urban Designers and Landscape Architects for the project. The report is based on a desktop analysis, a site visit and visual assessment of various locations.

The assessment is based on the 80% concept design drawings.

The assessment generally follows the structure and methodology of the RMS guidelines for Landscape Character and Visual Impact Assessment (EIA-NO4, 2020).

The following steps have been taken in developing this study:

- Assess existing context and character
- Assess visibility of the proposal
- Identify key viewpoints
- Assess visual impacts
- Identify mitigation strategies to minimise visual impacts

5.3. Landscape Character Assessment

Landscape Character Zones are described and assessed. This task involves photographing, understanding, mapping and describing the identified landscape character zone and determining and describing the capacity of this zone to visually absorb the Proposal. The Landscape Character Zone identified for the Study is mapped and described in Section 6.

Two primary factors are used to determine landscape character zone impacts:

- Sensitivity.
- Magnitude.

Sensitivity refers to the qualities of an area, the number and type of receivers and how sensitive the existing character of the setting is to the proposed nature of change. For example a pristine natural environment is likely to be more sensitive to a change of the nature of a four lane motorway than a built up industrial area. The design quality of the proposed development does not make the area less sensitive to change but instead affects the magnitude of the impact as described following.

Magnitude refers to the physical scale of the project, how distant it is and the contrast it presents to the existing condition. For example, a large interchange would have a very different impact on landscape character than a localised road widening in the same area. A more distant bridge would have a lesser magnitude than one nearer to residents. A vegetated embankment facing a parkland would have less contrast than a retaining wall in the same location.

The Landscape Character Impact is determined using the matrix shown in Table 1, based on the combination of sensitivity and magnitude. As the concept design is developed, impacts identified in the assessment would be avoided and minimized where possible, with mitigation strategies reported

Proposed Pedestrian Bridge over Dobroyd Parade at Haberfield

		MAGNITUDE			
		High	Moderate	Low	Negligible
SENSITIVITY	High	High	High - Moderate	Moderate	Negligible
	Moderate	High - Moderate	Moderate	Moderate - Low	Negligible
	Low	Moderate	Moderate - Low	Low	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

Table 1: Landscape Character and Visual Impact rating Matrix, Guideline for Landscape Character and Visual Impact Assessment TfNSW (2023)

It is important to note what the Landscape Character Zone Impact Assessment has to do with the way and extent to which a proposal alters the perceived nature or sense of place of a zone. Change of character would be felt and understood even when one is not physically present in the Study Area

5.4. Visual Impact Assessment

The extent of the area from which the project would be able to be seen is called the visual catchment or visual envelope. It is primarily related to the landform, taking into account any vegetation or built structures that might obscure views. Visibility is also influenced by distance and direction of view. Representative viewpoints are taken from within the visual catchment. A desktop study using GIS and topographic analysis was supplemented with a site visit to confirm the viewpoints and the sensitivity of potential visual receptors.

Visual sensitivity refers to how the view, from selected viewpoints, would be impacted by the project. It is measured by assessing a combination of factors including the composition of the view, its capacity to absorb change, and potentially also by duration (length of exposure) and frequency from key viewpoints. This is relevant to a road alignment in light of the different speeds of travel of motorists (up to 110km/hr) compared to pedestrians and cyclists in adjacent areas.

Magnitude in relation to visual impact is measured as the degree of change the particular view undergoes as a result of the proposed project. It includes physical character, size and scale considerations and also night-time as well as day-time conditions. Relative to the existing condition, magnitude is ranked on a scale from negligible to high.

The visual impact assessment method is similar to that for landscape character, combining the viewpoint sensitivity and the magnitude of the project for an overall rating. Each rating is accompanied by a description of the factors of both sensitivity and magnitude which have influenced that result.

5.5. Mitigation

Through the design process, the impact on each landscape character zone and viewpoint has been considered in design development. The final documented designs in this report are the product of this refinement and the mitigation steps integrated to reduce the magnitude of impact.

Any residual impact that has been identified, but that cannot be addressed in the design development stage, has been noted to be carried forward into the design and construction phases.

6. Landscape Character Zones Assessment

6.1. Introduction

An analysis of the existing landscape character of the study area was carried out to provide a baseline to assess the significance changes resulting from the proposed new pedestrian bridge. The analysis involved identification of various landscape character zones (LCZs) that are described and illustrated in the following section. These are mapped below in Figure 25. The landscape character zones are areas that are relatively consistent in terms of their combination of landform, vegetation and land uses, while containing a degree of variation in visual landscape character. The following text, tables and photos describe each landscape character zone and its sensitivity to change.



Figure 25 Landscape Character Zones (Map Provided by Corkery Consulting)

Proposed Pedestrian Bridge over Dobroyd Parade at Haberfield

6.1.1. Landscape Character Zone 1 – Wattle Street/Dobroyd Parade (City West Link)

This Character zone includes a flat section of road corridor along City West Link, at a low elevation adjoining Iron Cove Creek Canal to the north a noise wall along the road corridor to the south. West of Waratah Street the road corridor level gently to a crest at Parramatta Road.

There are irregular groups of mature casuarina trees and a small number of Eucalypts on the northern side of the corridor. Recent plantings of Melaleuca trees, shrubs and native grasses adjoin the Dobroyd Parade cul-de-sac along with new low planting of low shrubs and native grasses in front of the noise wall along the southern edge, towards the WestConnex Portal recent plantings of low shrubs and native grasses line the concrete retaining walls.

Extensive tree canopy line the edge of this character zone where it abuts Timbrell Reserve.

Other road infrastructure includes signs, traffic signals and pedestrian safety barriers/fences

Long distance views to the east from Wattle Street and adjoining paths extend to the skyline of North Sydney, Sydney CBDs commercial centre.

Sensitivity: **LOW**

- The Existing road corridor and high noise walls within LCZ1 means there is already significant bulk to the road corridor. Provided the noise walls are retained then the sensitivity of the proposal is considered to be low.

Magnitude: **HIGH**

- The scale of the proposal in relation to the existing residential precinct would make the magnitude high due to the increase in scale of the bridge

Landscape Character Impact: **MODERATE**



Figure 26 City West Link looking east



Figure 27 : City West Link looking West



Figure 28 View east along Wattle St. with M4 exit on the right & Reg Coady Reserve on left



Figure 29 View east along Wattle St. with concrete walls of tunnel portal on the right, pedestrian path on the left & North Sydney commercial centre on the skyline

Proposed Pedestrian Bridge over Dobroyd Parade at Haberfield

6.1.2. Landscape Character Zone 2 – Iron Cove Creek Canal

The Iron Cove Creek Canal is a concrete Line canal that is orientated east to west and flows into the Parramatta River at Iron Cove. There is extensive tree canopy cover along the edge of this character zone. Grass banks on either side of the concrete canal adjoin the road corridor. The channel was constructed in the late 19th Century and is approximately 20 metres wide.

Two pedestrian bridges cross the canal, one near Waratah Street and the other opposite Crane Street.

Metal fencing aligns both sides of the canal to prevent access.

There are intermittent views north to the canal from the City West link due to the scattered nature of the vegetation.

The Canal forms a distinctive element in the open space landscape areas of Reg Coady Reserve and Timbrell Park with views along the Canal forming a key element of the landscape character.

The water level and width of Canal varies with tidal movement.

Sensitivity: **MODERATE**

- The Existing Iron Cove Canal is a fairly sensitive one, concrete embankments line the canal
- Where the Canal is in Timbrell park it is more sensitive than where it is adjacent to the road so on balance it is moderate.
- A concrete man made structure

Magnitude: **MODERATE**

- The scale of the proposal in relation to the Iron Cove Creek Canal is moderate as the proposal is adjacent the zone but still a visible structure.

Landscape Character Impact: **MODERATE**



Figure 30 Iron Cove Creek



Figure 31 Iron Cove Creek



Figure 32 View to east along Iron Cove Creek Canal with Dobroyd Parade on the right

Proposed Pedestrian Bridge over Dobroyd Parade at Haberfield

6.1.3. Landscape Character Zone 3a – Timbrell Park Open Space

This Landscape Character Zone is located at the bottom of the south facing slope of Iron Cove Creek Canal and extends along the southern boundary on flat flood prone land. Timbrell Park is bounded by Timbrell Drive to the east, Henley Marine Drive to the west and north, and City West Link to the south.

This character zone has extensive areas of large open grassland primarily used for playing fields. An extensive tree canopy network of native trees extends along portions of the southern boundary with Iron Cove Creek Canal and fronting Timbrell Drive. Individual trees and small group plantings are scattered along the northern edge and western boundaries creating a more open character. Small groups of Fig trees are scattered throughout this landscape character zone. Street tree planting is limited to Henley Marine Drive consisting of Callistemon and Eucalyptus species.

Within the playing field there is a brick/concrete amenities building and a pedestrian path network that links up to the Bay Run. There is substantial lighting within the park as well as individual bench seating, covered picnic shelters with tables and seats.

Sensitivity: **HIGH**

- Timbrell Park is a natural environment

Magnitude: **LOW**

- The scale of the proposal is less visible from LCZ3a due to the existing tree canopy lining the park and the Iron Cove Canal edge.

Landscape Character Impact: **MODERATE**



Figure 33 Timbrell Park



Figure 34 Timbrell Park

Proposed Pedestrian Bridge over Dobroyd Parade at Haberfield

6.1.4. Landscape Character Zone 3b – Reg Coady Reserve

This Landscape Character Zone is prone to flooding. It is low in elevation and adjoins Iron Cove Creek Canal along the north east boundary. There is a small row of prominent large mature fig trees within the reserve and a number of scattered native trees including Melaleuca Species, the rest of the zone is generally open grassland. Melaleuca trees line the grass verge along western side of Martin Street. A Distinctive brick and turret type tile roof building and surrounding concrete pavement associated with Sydney Water Infrastructure can be seen within this landscape character zone.

Sensitivity: HIGH

- Reg Coady Reserve is a natural environment

Magnitude: MODERATE

- Adjacent the proposal but still visible.

Landscape Character Impact: HIGH - MODERATE



Figure 35 Martin Street



Figure 36 Martin Street

Proposed Pedestrian Bridge over Dobroyd Parade at Haberfield

6.1.5. Landscape Character Zone 4 – Livvi’s Place Playground

Landscape Character Zone 4 is defined by Livvi’s Playground. The playground is an all inclusive specialised playground with play elements for children of all abilities. Shade cloth structures in the playground form visually prominent elements of the landscape character.

The playground is visually semi-enclosed by trees that also provide extensive shade and includes a pedestrian fence that runs along the boundary of the playground. The playground is low lying with sections of constructed landscape mounds within the playground.

Colourful play equipment are embedded in the playground and also include a pop-up café and amenities building.

Sensitivity: MODERATE

- A playground is a public park

Magnitude: LOW

The scale of the proposal is less visible from LCZ4 due to the existing tree canopy lining the park and the Iron Cove Canal and will not effect its landscape character.

Landscape Character Impact: MODERATE-LOW



Figure 37 Livvi’s Place



Figure 38 Livvi’s Place

Proposed Pedestrian Bridge over Dobroyd Parade at Haberfield

6.1.6. Landscape Character Zone 5 – Five Dock Residential Area

This Landscape Character Zone is defined by single or double storey detached brick houses of the post federation era on single or double frontage blocks. Street trees are located in the road reserve and are predominately Lophostemon (Brush Box). Other trees might include Callistemons or other native species in grass verges. Pedestrian pathways line the street verge with some streets having views south over Timbrell Park.

Sensitivity: **HIGH**

- More sensitive to change and coherent character and scale.

Magnitude: **LOW**

- The scale of the proposal is less visible from LCZ5 and the proposal is adjacent

Landscape Character Impact: **MODERATE**



Figure 39 Connecticut Street



Figure 40 Northcote Street

Proposed Pedestrian Bridge over Dobroyd Parade at Haberfield

6.1.7. Landscape Character Zone 6 – Haberfield Residential Area

Landscape Character Zone 6 is similar to 5, Residential lots are generally on well vegetated garden blocks and consist of Federation to post Federation single storey detached brick buildings. There are a range of front fences including picket and brick construction. Overhead wires and poles are prominent within the streetscape. Street tree planting is consists of Lophostemon and Callistemon species.

Sensitivity: **HIGH**

- More sensitive to change.

Magnitude: **LOW**

- Located adjacent the proposal and will not affect its landscape character.

Landscape Character Impact: **MODERATE**



Figure 41 Waratah Street



Figure 42 Loudon Avenue

Proposed Pedestrian Bridge over Dobroyd Parade at Haberfield

6.1.8. Summary of Landscape Character Assessment

Character Zone	Sensitivity	Magnitude	Impact
Zone 1	Low	High	Moderate
Zone 2	Moderate	Moderate	Moderate
Zone 3a	High	Low	Moderate
Zone 3b	High	Moderate	High - Moderate
Zone 4	Moderate	Low	Moderate - Low
Zone 5	High	Low	Moderate
Zone 6	High	Low	Moderate

6.2. Key View Situations

Motorists travelling east along Wattle Street and pedestrians walking along the adjoining footpath are presented with open views that extend along the road corridor to the commercial center of North Sydney on the skyline. The proposed pedestrian bridge at Waratah Street would be located at the base of this slope and have a backdrop of trees.



Figure 43 View to east along Wattle Street towards proposed bridge location with North Sydney Commercial Centre on skyline

Proposed Pedestrian Bridge over Dobroyd Parade at Haberfield



Figure 44 View south from public open space on Henley Marine Drive towards pedestrian bridge over Iron Cove Creek Canal and proposed bridge location east of Waratah Street



Figure 45 View from Dobroyd Parade looking west towards Waratah Street and towards proposed location of pedestrian bridge

Proposed Pedestrian Bridge over Dobroyd Parade at Haberfield



Figure 46 View along City West Link towards the WestConnex Portal Tunnel

7. Visual Impact Assessment

The Potential Visual Impact of the proposed pedestrian bridge has been assessed in relation to a number of key viewpoints. The following tasks were undertaken during the assessment:

- A desktop analysis to ascertain the visual catchment of the Proposal within the area from which the new bridge maintenance units; platforms and walkways may be visible, and potential receptors of the visual impact determined through topographic analysis and Google Maps. This provides the basis for the establishment of the Visual Envelope Map (VEM), view corridors, and key viewpoints.
- The sensitivity of each viewpoint takes into account the sensitivity ranking of the landscape character zone in which it is located.
- The magnitude of the proposal is the degree of change the view undergoes as a result of the Proposal. Relative to the existing condition, magnitude is ranked on a four point scale from negligible to high.
- In a process similar to that used for landscape character zone impact assessment, the visual impact is assessed by combining the viewpoint sensitivity and the magnitude of the proposal in the matrix in Table 1: Landscape Character and Visual Impact rating Matrix, Guideline for Landscape Character and Visual impact Assessment TfNSW (2023)

7.1. Visual Absorption Capacity and Viewing Catchment

'Visual Absorption Capacity' refers to the extent to which the existing visual environment can reduce or eliminate the perception of the proposed development.

7.2. Visual Envelope and Viewpoints

A detailed field and desktop assessment of the alignment was carried out to determine the area from where the proposal is visible as defined in the Visual Envelope Map, **Error! Reference source not found.** The proposal's visibility is influenced primarily by landuse, vegetation and topography. Site assessment of the pedestrian bridge proposal reveals this will primarily be visible from the Beecroft Road corridor itself.

Proposed Pedestrian Bridge over Dobroyd Parade at Haberfield

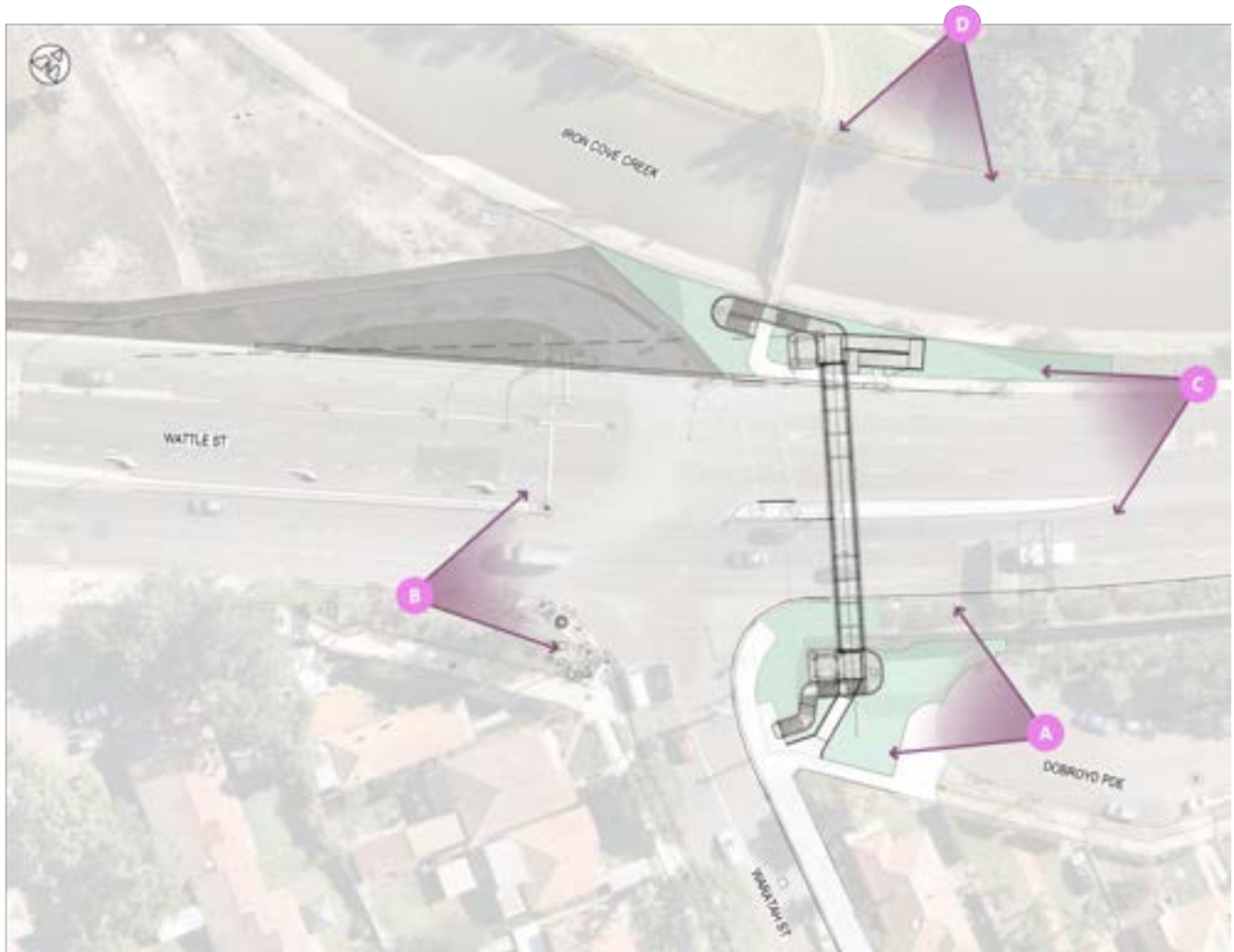


Figure 47 Visual Envelope and Viewpoint Location Plan

Viewpoint Numbers	Location	Receptors
A	Dobroyd Parade Cal-de-sac	Residents, Pedestrians and users of Dobroyd Parade
B	City West Link looking East	Motorists of City West Link
C	City West Link Looking West	Motorist of City West Link
D	Henley Marine Drive	Residents, Pedestrians and users of Henley Marin Drive

Table 2: Viewpoint Location Table

Proposed Pedestrian Bridge over Dobroyd Parade at Haberfield

7.3. Viewpoint assessment

7.3.1. Viewpoint A



Figure 48: Existing View A - view from Dobroyd Parade looking south



Figure 49: Proposed View A - view from Dobroyd Parade looking south

Proposed Pedestrian Bridge over Dobroyd Parade at Haberfield

Viewpoint A	
Location	Dobroyd Parade, looking south
Sensitivity	High
Magnitude	High
Overall rating	High
Comment	<p>Dobroyd Parade is a residential street, with single-storey houses along the eastern side of the roadway. The street terminates in a cul-de-sac where the road used to cut through. There is a broad bitumen turning circle abutting a tall black/dark grey noise wall that visually and acoustically screens the street from City West Link.</p> <p>Plantings and a grassed area offer some screening to the wall and a level of amenity. The new bridge will sit within that space and be a dominant visual element on the street.</p> <p>The overall rating is High – this is because the pedestrian bridge is highly visible to residents. New landscape plantings will help to screen part of the new pedestrian bridge.</p>

Proposed Pedestrian Bridge over Dobroyd Parade at Haberfield

7.3.2. Viewpoint B



Figure 50 Existing View B - view from City West Link, looking north



Figure 51 Proposed View B - view from City West Link, looking north

Proposed Pedestrian Bridge over Dobroyd Parade at Haberfield

Viewpoint B	
Location	City West Link, looking north
Sensitivity	Low
Magnitude	High
Overall rating	Moderate
Comment	<p>The City West Link road corridor is defined by its utility and highly modified including bridge road pavement footprint, existing overhead gantry signage, existing noise walls and limited plantings therefore it has a low sensitivity.</p> <p>The scale of the proposal being a large bridge is very visible and therefore magnitude is high.</p> <p>The motorists are the most impacted by the view of the new bridge, however with the recessive colour chosen (dark grey) the bridge blends neatly into the adjacent noise walls and therefore does not look out of place.</p> <p>The trees that screen the lift shafts also visually diminish the bulk and scale of the lifts.</p> <p>The overall rating is moderate.</p>

Proposed Pedestrian Bridge over Dobroyd Parade at Haberfield

7.3.3. Viewpoint C



Figure 52: Existing View C – view from City West Link, looking south



Figure 53: Proposed View C – view from City West Link, looking south

Proposed Pedestrian Bridge over Dobroyd Parade at Haberfield

Viewpoint C	
Location	City West Link, looking south
Sensitivity	Low
Magnitude	High
Overall rating	Moderate
Comment	<p>The City West Link road corridor is defined by its utility and highly modified including bridge road pavement footprint, existing overhead gantry signage, existing noise walls and limited plantings therefore it has a low sensitivity.</p> <p>The scale of the proposal being a large bridge is very visible and therefore magnitude is high.</p> <p>The motorists are the most impacted by the view of the new bridge, however with the recessive colour chosen (dark grey) the bridge blends neatly into the adjacent noise walls and therefore does not look out of place.</p> <p>The existing vegetation is retained and visually hides the northern lift shaft when heading west.</p> <p>The existing signage gantries helps to balance the bridge as it utilises similar materials and is a similar height therefore the bridge does not look out of place.</p> <p>The overall rating is moderate.</p>

7.3.4. Viewpoint D



Figure 54: Existing View D – Timbrell Park



Figure 55: Proposed View D - Timbrell Park

Proposed Pedestrian Bridge over Dobroyd Parade at Haberfield

Viewpoint D	
Location	Timbrell Park
Sensitivity	High
Magnitude	Moderate
Overall rating	High - Moderate
Comment	<p>Timbrell Park is a natural element comprising open grassed areas and with a boundary of mature trees at the perimeter. The view of the bridge from the park is distant and partially obscured in length by existing trees. The lift and stairs are however quite visible.</p> <p>The magnitude is moderate as only part of the bridge is visible and lower in the viewpoint.</p> <p>The colour choice of the dark grey helps to visually mitigate the impact of the structure as it recedes into the background.</p> <p>The existing vegetation that lines the Iron Cove Creek Canal is retained which minimises the degree of change of the viewpoint</p>

7.4. Summary of Visual Impact

The visual impact is high due to the fact that the pedestrian bridge is a brand-new structure that crosses over an existing road corridor. The colour choice of the bridge couples with the additional vegetation plantings have reduced the vial impact during the concept design process.

The table below summarises the viewpoint analysis, indicating the overall visual Impact.

Viewpoint	Impact
Zone A	High
Zone B	Moderate
Zone C	Moderate
Zone D	High - Moderate

Table 3: Overall Visual Impact for each viewpoint

8. Mitigation Measures

The potential visual impact of the proposed pedestrian bridge on the landscape character of the surrounding urban areas will be mitigated further through the detailed design process. This process will further refine the colour selection of the bridge as well as the colour of the concrete lift shafts to ensure that the structure blends seamlessly with the surrounding character. Further refinement of the planting design should ensure that the lower half of the lift shafts float within the landscape by ensuring different height plantings (without creating CPTED/Surveillance issues).

There is potential for Inner West Council to plant some additional tree plantings along Henley Marine Drive within the Timbrell Reserve to mitigate the view of the new pedestrian bridge by the local residents, by planting trees closer to the residential area the residents will have a more instant affect for screening.

9. Conclusion

The location and configuration of the proposed pedestrian bridge over Dobroyd Parade at the Waratah Street intersection in Haberfield has been determined through a process of evaluation of alternative locations and bridge design options. The evaluation considered a number of options against multiple urban design considerations that included connectivity to the existing pedestrian and cycle network, adjoining land uses, existing road infrastructure, existing trees and other landscape works, potential landscape character and visual impacts.

The preferred location for the proposed pedestrian bridge was determined to be the eastern side of the Waratah Street extending across Dobroyd Parade from the south east corner to the north side adjoining the Iron Cove Creek Canal. A Lift, Stairs and ramps to the lift entry are to be provided at both ends of the bridge.

The proposed pedestrian bridge would consist of a steel arch truss structure and would include lifts and stairs on both side of Wattle Street (City West Link). Other features of the proposal include a safety crash cushion acting as a pedestrian fence to the northern side of Wattle Street, additional panels of pedestrian fencing to the median of Wattle Street which prevents the unsafe crossing of pedestrians, the removal of the at-grade signalised crossing over Wattle Street and the removal of the existing pram ramps at the location of the decommissioned crossing.

The bridge design minimises the depth of the bridge deck and the required number of stairs and length of ramps. The visually light weight form of the steel truss design is simple and easy to 'read', forming a distinctive gateway/marker without being visually dominant. The bridge would be supported by tapered concrete piers at each end. Stairs at both ends of the bridge would be supported by concrete columns to minimise the footprint and visual bulk of the structure. Safety mesh on the bridge would be supported by a steel lattice frame attached to the truss structure and aligned with the diagonals of the truss to visually integrate the elements.

The design of the proposed bridge has adopted the Road and Maritimes Services standard pedestrian bridge design to maintain ensure minimal design standard are met and provide efficiency in construction. The design has been slightly modified to enable it to fit comfortably into the site context and topography and incorporates both lift and stair components to reduce the requirement for long ramps which would increase the footprint.

The bridge will also form part of a placemaking strategy that contributes to and reinforces the strong heritage identity of the Haberfield Residential Heritage Zone and the community within it. Located approximately 280 metres to the east of the WestConnex tunnel portals the new bridge would have a clear visual connection to them. The bridge design will reflect the minimalist character and complement the WestConnex built urban design elements that include the tunnel portals, associated retaining walls and mesh throw screens.

The design development process will refine the bridge support piers, stairs, ramps, safety screens and handrails to coordinate them with the truss bridge design and integrate them into their urban setting to strengthen local identity. Particular consideration will be given to coordination of safety screens on the bridge with balustrades on the ramps as well as handrails on the bridge, ramps and stairs and any treatment to the lift shaft walls. Design development will include careful consideration of materials, landscape design and opportunities for integration of public art.

The new bridge will meet the identified need for a safe grade-separated crossing of Dobroyd Parade for pedestrians and cyclists at a location where there is a strong desire for north-south movement between residential areas, regional public open space parklands, a major playground, school and shops. The proposed planting of tall trees at both ends of the new bridge will visually anchor and integrate it into the urban landscape context of the road corridor and parklands over time.

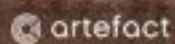
Appendix E – Non-Aboriginal Statement of Heritage Impact Assessment

Dobroyd Parade Intersection Project

Non-Aboriginal Statement of Heritage
Impact

Report to Stantec

November 2023



Artifact Heritage

ABN 73 344 973 525

Suite 56, Jones Bay Wharf

26-32 Pirrama Road

Pymont NSW 2009

Australia

+61 2 9518 8411

office@artefact.net.au

Document history and status

Revision	Date issued	Reviewed by	Approved by	Date approved	Revision type
1	28/07/2023	Sarah-Jane Zammit & Jayden van Beek	Jayden van Beek	27/07/2023	Draft v1
2	24/11/2023	Sarah-Jane Zammit & Jayden van Beek	Jayden van Beek	24/11/2023	Final
3					
4					

Project name:	Dobroyd Parade Intersection Project
Author:	Monika Sakal, Sarah-Jane Zammit, Jayden van Beek
Project manager:	Sarah-Jane Zammit
Project number:	22230
Name of organisation:	Artefact Heritage Services
Document version:	Final

© Artefact Heritage Services

This document is and shall remain the property of Artefact Heritage Services. This document may only be used for the purposes for which it was commissioned and in accordance with the Terms of the Engagement for the commission. Unauthorised use of this document in any form whatsoever is prohibited.

Disclaimer: Artefact Heritage Services has completed this document in accordance with the relevant federal, state and local legislation and current industry best practice. The company accepts no liability for any damages or loss incurred as a result of reliance placed upon the document content or for any purpose other than that for which it was intended.

EXECUTIVE SUMMARY

Transport for NSW proposes to construct a pedestrian bridge over Wattle Street/Dobroyd Parade at Waratah Street, Haberfield and upgrade the surrounding road infrastructure. The project is aimed at alleviating traffic congestion on the City West Link system and providing a safe environment for pedestrians and road users. In addition, a temporary compound would be set up for the duration of the proposed development.

Artefact Heritage has been engaged by Stantec, on behalf of Transport for NSW, to prepare a non-Aboriginal Statement of Heritage Impact regarding potential impacts to listed heritage items and potential archaeological remains as a result of the proposed development. This report is aimed at identifying what listed heritage items are present within the proposal area, identifying potential impacts to the heritage items and potential archaeological remains, and providing recommendations, management strategies and mitigation measures. An options assessment is also provided for the establishment of the temporary compound site during the project.

Overview of findings

- The proposed works are within the heritage curtilage of Haberfield Conservation Area (#C54) which is listed on the Inner West Local Environmental Plan 2022
- The proposed works are located within Dobroyd Stormwater Channel No 53 (#4571056) which is listed on the Sydney Water Section 170 Heritage and Conservation Register
- The proposed works would result in a neutral direct, negligible potential direct, and minor adverse localised indirect (visual) but negligible overall indirect impacts to Haberfield Conservation Area and Dobroyd Stormwater Channel No 53
- Temporary compound option one is the preferred option due to its location outside of the residential areas within the Haberfield Conservation Area
- Given the ephemeral nature of potential archaeological remains from Phase 1 and 2, it is assessed that the archaeological potential of these phases is generally nil to low, and that the archaeological remains would not reach the threshold of local significance
- While remains of former road surfaces and kerbing associated with the subdivision and establishment of the suburb in Phase 3 may reach the threshold of local significance
- The proposed works would result in negligible impacts to potential archaeological remains if present, however, the impacts are expected to be limited to archaeological 'works' and not 'relics'.

Approval pathway

This assessment has concluded that the proposed works would not cause impacts that are more than minor in nature to Haberfield Conservation Area (Inner West LEP 2022 #C54) or Dobroyd Stormwater Channel No 53 (Sydney Water Section 170 #4571056). As a result, the proposal is consistent with the general requirements for exempt development under Part 2.2 Section 20 of the *State Environmental Planning Policy (Transport and Infrastructure) 2021*. Therefore, consultation in regard to heritage impacts is not required with the Inner West Council.

It has been assessed that significant archaeological remains within the impact footprint are likely to be limited to archaeological 'works'; and no impacts to archaeological 'relics' are expected. Therefore, an exception under Section 139 (4) of the NSW *Heritage Act 1977* would not be required for the proposed works.

Recommendations and mitigation measures

- The works should be managed in accordance with Transport for NSW's Unexpected Heritage Finds Guideline¹
- Prior to commencing works all staff and contractors must be provided with a heritage induction to make them aware of the heritage items and heritage implications of the proposed works
- It is unlikely that the vibrations associated with the proposed works would result in direct impacts to the heritage items. However, to further minimise the risk of vibration impacts the following mitigation measures should be implemented:
 - Determine safe working limits based on proposed plant, and where possible, the smallest plant able to carry out required work should be utilised to minimise potential impacts. Where works are proposed within the safe working limits for the heritage structures, specialist advice must be sought from an appropriately qualified structural engineer who is familiar with heritage structures to assess if vibrations associated with the proposed works will potentially result in impacts to heritage structures
 - A vibration monitoring plan is to be prepared as part of the Construction Noise and Vibration Management Plan where works are proposed within safe working limits, and implemented to confirm vibration levels prior to construction commencement. Where exceedances are recorded, works should be modified in consultation with the identified specialist to reduce vibration levels
 - Assessment and monitoring of vibration impacts to heritage items within the safe working limits should adhere to:
 - British Standard BS 7385: *Part 2: Evaluation and Measurement for Vibrations in Buildings – Part 2 Guide to Damage Levels from Ground-Borne Vibration*
 - German Standard DIN 4150, *Part 3: Structural Vibration in Buildings: Effects on Structures*
 - If vibration monitors are attached to the heritage items, they must not be attached with permanent fixings. They should be removable without causing damage. Bees wax may be a suitable attachment method
- A copy of this report should be submitted to Inner West Council and Sydney Water for their records
- If works other than those discussed in this report are proposed, then additional assessment would be required to assess the impacts.

¹ Transport for NSW. 'Unexpected Heritage Finds Guideline'. Sydney: Transport for NSW, 2019.

CONTENTS

1.0	Introduction.....	1
1.1	Project background	1
1.2	Proposal area	1
1.3	Authorship	1
1.4	Limitations	2
2.0	Legislative Context.....	4
2.1	Overview	4
2.2	Identification of heritage listed items	4
2.3	Environment Protection and Biodiversity Conservation Act 1999	4
2.3.1	National Heritage List and World Heritage List	5
2.3.2	Commonwealth Heritage List	5
2.4	Heritage Act 1977.....	5
2.4.1	State Heritage Register	5
2.4.2	Archaeological relics and works	5
2.4.3	Section 170 registers.....	6
2.5	Environmental Planning and Assessment Act 1979 (NSW).....	6
2.5.1	Inner West Local Environmental Plan 2022	7
2.5.2	Development Control Plan and Heritage Conservation Area	7
2.6	State Environmental Planning Policy (Transport and Infrastructure) 2021	7
2.7	Non-statutory considerations.....	8
2.7.1	Register of the National Estate.....	8
2.7.2	National Trust of Australia (NSW) Register	8
2.8	Summary of heritage listings	8
3.0	Historical Background	10
3.1	Aboriginal histories of the locality	10
3.2	Dobroyd Estate.....	10
3.3	Subdivision of the Dobroyd Estate	12
3.4	Richard Stanton.....	13
3.5	Iron Cove and Iron Cove Foreshore Drive	15
3.6	Mid-twentieth to early twenty-first century development	16
4.0	Physical Context.....	20
4.1	Site Inspection.....	20
4.1.1	Context	20
4.1.2	Proposal footprint and compound site option one	23
4.1.3	Compound site option two	24
4.1.4	Compound site option three	25

4.1.5	Views and vistas.....	25
5.0	Significance Assessment.....	30
5.1	Methodology.....	30
5.2	Existing heritage assessments.....	31
5.2.1	Haberfield HCA (Inner West LEP 2022 #C54).....	31
5.2.2	Dobroyd Stormwater Channel No 53 (s170 #4571056).....	32
6.0	Archaeological Assessment.....	34
6.1	Introduction.....	34
6.2	Archaeological potential.....	34
6.2.1	Land use summary.....	34
6.3	Relevant previous reports.....	35
6.4	Assessment of archaeological potential.....	36
6.4.1	Phase 1 (1803-1825): Early land grants.....	36
6.4.2	Phase 2 (1825-1883): Ramsay's Bush.....	37
6.4.3	Phase 3 (1883-1960): Subdivision and establishment of roads.....	37
6.4.4	Phase 4 (1883-1960): Modernisation.....	37
6.5	Archaeological significance.....	37
6.5.1	NSW Heritage criteria for assessing significance related to archaeological sites and relics 38	
6.5.2	Bickford and Sullivan's questions.....	39
6.6	Summary of historical archaeological potential and significance.....	39
7.0	The Proposed Works.....	41
7.1	The proposed works.....	41
7.1.1	The proposal.....	41
7.1.2	Proposal stages.....	42
7.1.3	Project justification.....	44
8.0	Heritage Impact Assessment.....	45
8.1	Overview.....	45
8.1.1	Haberfield HCA (Inner West LEP 2022 #C54).....	46
8.1.2	Dobroyd Stormwater Channel No 53 (s170 Sydney Water #4571056).....	48
8.1.3	Compound site options assessment.....	49
8.1.4	Cumulative impacts.....	50
8.1.5	Impacts to archaeological resources.....	51
8.1.6	Statement of heritage impact.....	51
9.0	Conclusion.....	52
9.1	Conclusion.....	52
9.2	Approval pathway.....	52
9.3	Recommendations and mitigation measures.....	52

10.0 References 54

FIGURES

Figure 1: Location of proposal area (Source: Artefact, 2023)	3
Figure 2: Heritage items in relation to the proposal area (Source: Artefact, 2023)	9
Figure 3: Parish map of Concord, date unknown, showing the land granted to Bayley	11
Figure 4: Estate map of Ashfield Park, dated c.1850	11
Figure 5: Subdivision plan of the Dobroyd Estate, dated 1883, showing its subdivision among the Ramsay Children. The plan shows that Dalhousie Street and Waratah Street had been established by that time	12
Figure 6: Subdivision plan, dated 1885, showing Louisa Ramsay’s land in relation to the proposal area	13
Figure 7: Subdivision Plan of Dobroyd Point Estate, dated 1909	14
Figure 8: Parish map of Concord, dated 1915	15
Figure 9: Left: Original condition of Iron Cove Creek near the Church Street bridge in 1890. Right: Section of Iron Cove Creek near Ramsay Street in 1929 after it had been canalised	16
Figure 10: Aerial imagery of Haberfield and Five Dock around Lane Cove Creek in 1943.....	17
Figure 11: 1986 aerial photograph of the proposal area	18
Figure 12: 2002 aerial photograph of the proposal area prior to the commencement of the WestConnex Project	18
Figure 13: 2018 aerial photograph of the proposal area, showing construction for the WestConnex Project to the southwest.....	19
Figure 14: Southwestern view of Wattle Street intersection. The pedestrian bridge is proposed to replace the current street level pedestrian crossing (Source: Artefact, 2023)	20
Figure 15: Western view of the nature strip between the Wattle Street corridor (to the left of the image) and Iron Cove Creek (Source: Artefact, 2023).....	21
Figure 16: Northwestern view of the Waratah Street looking towards Wattle Street (Source: Artefact, 2023).....	21
Figure 17: Southwestern view of Iron Cove Creek, the wide stormwater channel, from Timbrell Drive (Source: Artefact, 2023).....	22
Figure 18: Eastern view of Timbrell Park bounded by Iron Cove Creek in the background (Source: Artefact, 2023).....	22
Figure 19: Southeastern view of small pedestrian bridge from Timbrell Park crossing over Iron Cove Creek to Wattle Street (Source: Artefact, 2023).....	23
Figure 20: Northeastern view of compound site option 1 (Source: Artefact, 2023).....	24
Figure 21: Southeastern view of compound site option 2 (Source: Artefact, 2023).....	24
Figure 22: Southeastern view of compound site option 3 (Source: Artefact, 2023).....	25
Figure 23: Western view from proposal footprint looking towards the northwest curve in the canal where there is no tree cover on the south side of the canal until it reaches the Reg Coady Reserve (Source: Artefact, 2023).....	26
Figure 24: Northern view from proposal footprint looking towards the cultural landscape with Timbrell Park partially obscured by tree cover (Source: Artefact, 2023).....	27

Figure 25: Eastern view from a break in the tree coverage at Timbrell Park of the canal and the proposal footprint slightly to the left of the centre of the middle ground of the image (Source: Artefact, 2023) 27

Figure 26: Southeastern view from proposal footprint looking towards the Haberfield HCA residential section from the road corridor (Source: Artefact, 2023) 28

Figure 27: Southwestern view from proposal footprint looking towards the WestConnex tunnel and road corridor with dense tree cover forming the barrier to the residential section (Source: Artefact, 2023) 28

Figure 28: South-eastern view from proposal footprint looking down Waratah Street (Source: Google Street View, 2022)..... 29

Figure 29: Bridge concept design (Source: Stantec, 2023) 41

Figure 30: Proposed footprint of the proposal (Source: Stantec, 2023)..... 42

TABLES

Table 1: Results of register searches for the proposal area and adjacent heritage items	8
Table 2. NSW heritage assessment criteria	30
Table 3: Grading of archaeological potential.....	34
Table 4: Land use summary	34
Table 5: Historical archaeological potential and significance	40
Table 6: Staging plan for the proposal (Source: Stantec, 2023)	43
Table 7: Terminology for assessing the magnitude of heritage impact.....	45
Table 8: Terminology for heritage impact types	46
Table 9: Recommended minimum working distance from vibration intensive plant.....	46
Table 10: Statement of heritage impact for the proposal	51

1.0 INTRODUCTION

1.1 Project background

Transport for NSW proposes to construct a pedestrian bridge over Wattle Street/Dobroyd Parade at Waratah Street, Haberfield and upgrade the surrounding road infrastructure. The project is aimed at alleviating traffic congestion on the City West Link system and providing a safe environment for pedestrians and road users. In addition, a temporary compound would be set up for the duration of the proposed development.

Artefact Heritage has been engaged by Stantec, on behalf of Transport for NSW, to prepare a non-Aboriginal Statement of Heritage Impact (SoHI) regarding potential impacts to listed heritage items and potential archaeological remains as a result of the proposed development. This report is aimed at identifying what listed heritage items are present within the proposal area, identifying potential impacts to the heritage items and potential archaeological remains, and providing recommendations, management strategies and mitigation measures. An options assessment is also provided for the establishment of the temporary compound site during the project. The SoHI will support a Review of Environmental factors under Division 5.1 of the *Environmental Planning and Assessment Act 1979 (NSW)* (EP&A Act).

1.2 Proposal area

The proposal is divided into three areas (Figure 1):

- The proposal footprint – the proposed location of the pedestrian bridge located on Wattle Street and Dobroyd Parade near the intersection of Waratah Street to the south of Iron Cove Creek. This area would be directly impacted by the proposed work, including the removal of structures and installation of new structures
- The proposal area – the area around the proposal footprint required for construction, including the compound area and material handling area
- Compound areas – the temporary facilities required for construction, including for example an office and amenities compound, construction compound, materials handling and load out area. There are three location options for the proposed temporary compound area. The first compound area option is directly adjacent to the proposal footprint east of the Reg Coady Reserve. The second compound area option is located at 87 Dobroyd Parade, Haberfield (Lot 1 and Lot 2 of DP 1290732). The third compound area option is located at 289 Ramsay Street, Haberfield (Lot A and Lot B of DP 322430).

The proposal area is located within the Local Government Area (LGA) of the Inner West Council.

1.3 Authorship

This report has been prepared by Monika Sakal (Heritage Consultant) with input and review provided by Sarah-Jane Zammit (Senior Associate) and Jayden van Beek (Technical Specialist), all from Artefact Heritage.

1.4 Limitations

This SoHI report has been prepared to assess potential non-Aboriginal heritage impacts resulting from the proposed works. This report does not provide an assessment of Aboriginal heritage.



Figure 1: Location of proposal area (Source: Artefact, 2023)

2.0 LEGISLATIVE CONTEXT

2.1 Overview

This section discusses the heritage management framework, notably legislative and policy context, applicable to the proposed development and proposal area.

2.2 Identification of heritage listed items

Heritage listed items were identified through a search of relevant state and federal statutory and non-statutory heritage registers and databases:

- World Heritage List (WHL)
- Commonwealth Heritage List (CHL)
- National Heritage List (NHL)
- State Heritage Register (SHR)
- Section 170 Heritage and Conservation Registers
- Inner West Local Environmental Plan (LEP) 2022
- NSW State Heritage Inventory database
- Register of the National Estate (RNE)
- National Trust of Australia (NSW) Register (NTAR).

Items listed on these registers have previously been assessed against the heritage assessment guidelines relevant to their peak governing body. Items that are of Commonwealth, National and World heritage significance have been assessed in accordance with the *Environmental Protection and Biodiversity Conservation Act 1999* (the EPBC Act). Items of state or local significance have been assessed against the NSW Heritage Assessment guidelines, in accordance with the *NSW Heritage Act 1977* (the Heritage Act). Assessments of heritage significance as they appear in relevant heritage inventory sheets and documents, are provided in this assessment.

There are several items of legislation that are relevant to the current proposal area. A summary of the relevant Acts and the potential legislative implications are provided below.

2.3 Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act provides a legislative framework for the protection and management of matters of national environmental significance, that is, flora, fauna, ecological communities and heritage places of national and international importance. Heritage items are protected through their inscription on the World Heritage List, Commonwealth Heritage List, or the National Heritage List. The EPBC Act stipulates that a person who has proposed an action that will, or is likely to, have a significant impact on a World, National or Commonwealth Heritage site must refer the action to the Minister for Sustainability, Environment, Water, Population and Communities (hereafter Minister). The Minister will then determine if the action requires approval under the EPBC Act. If approval is required, an environmental assessment would need to be prepared. The Minister would approve or decline the action based on this assessment. A significant impact is defined as “an impact which is important, notable, or of consequence, having regard to its context or intensity.” The significance of the action is based on the sensitivity, value and quality of the environment that is to be impacted, and the duration, magnitude and geographic extent of the impact. If the action is to be undertaken in accordance with

an accredited management plan, approval is not needed and the matter does not need to be referred to the Minister.

2.3.1 National Heritage List and World Heritage List

The NHL has been established to list places of outstanding heritage significance to Australia, including places overseas. There are nine matters of national environmental significance, these include Australia's world heritage properties (as listed on the WHL), national heritage places, wetlands of international importance (listed under the Ramsar Convention), migratory species, listed threatened and ecological communities, Commonwealth marine areas, the Great Barrier Reef Marine Park, nuclear actions including uranium mining, and water resources in relation to coal seam gas developments and large coal mining developments.

There are **no items** listed on the NHL or WHL within the proposal area.

2.3.2 Commonwealth Heritage List

The CHL has been established to list places of outstanding heritage significance to Australia. Established under the EPBC Act, the CHL comprises natural, Indigenous and historic heritage places on Commonwealth lands and waters or under Australian Government control.

There are **no items** listed on the Commonwealth Heritage List within the proposal area.

2.4 Heritage Act 1977

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

2.4.1 State Heritage Register

The SHR was established under Section 22 of the Heritage Act and is a list of places and objects of particular importance to the people of NSW, including archaeological sites. The SHR is administered by Heritage NSW, and includes a diverse range of over 1,500 items, in both private and public ownership. To be listed, an item must be deemed to be of heritage significance for the whole of NSW. For works to an SHR item, a Section 60 application must be prepared for works that are not exempt under Section 57(2) of the Heritage Act.

There are **no items** listed on the State Heritage Register within the proposal area.

2.4.2 Archaeological relics and works

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

"...any deposit, artefact, object or material evidence that:

- (a) relates to the settlement of the area that comprises New South Wales, not being Aboriginal settlement, and*
- (b) is of State or local heritage significance"*

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

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

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

Items identified as 'works' do not trigger reporting obligations under the Heritage Act, unless they are associated with artefacts and/or assessed to be of State or local significance. Works generally include:

- Former road surfaces or pavement and kerbing
- Railway infrastructure
- Former water supply (wells, cisterns, drains, pipes) and other service infrastructure, where there are no historical artefacts in association with the item.
- Building footings associated with former infrastructure facilities, where there are no historical artefacts in association with the item.

2.4.3 Section 170 registers

Under the Heritage Act all government agencies are required to identify, conserve and manage heritage items in their ownership or control. Section 170 (s170) requires all government agencies to maintain a Heritage and Conservation Register that lists all heritage assets and an assessment of the significance of each asset. They must also ensure that all items inscribed on its list are maintained with due diligence in accordance with State Owned Heritage Management Principles approved by the Government on advice of the NSW Heritage Council. These principles serve to protect and conserve the heritage significance of items and are based on NSW heritage legislation and guidelines.

There is **one item** within the proposal area that is listed on an s170 register:

- Dobroyd Canal Stormwater Channel No 53 (Sydney Water s170# 4571056).

2.5 Environmental Planning and Assessment Act 1979 (NSW)

The EP&A Act establishes the framework for cultural heritage values to be formally assessed in the land use planning and development consent process. The EP&A Act requires that environmental impacts are considered prior to land development; this includes impacts on cultural heritage items and places as well as archaeological sites and deposits.

The EP&A Act also requires that local governments prepare planning instruments (such as LEPs and Development Control Plans [DCPs]) in accordance with the EP&A Act to provide guidance on the level of environmental assessment required. The proposal area falls within the boundaries of the

Inner West LGA. Schedule 5 of each of the *Inner West LEP 2022* includes a list of items/sites of heritage significance within this LGA.

2.5.1 Inner West Local Environmental Plan 2022

Heritage items listed on the Inner West LEP 2022 are managed in accordance with the provisions of Section 5.10 Heritage Conservation of this LEP. Under Clause 5 of this section of the Inner West LEP 2022:

The consent authority may, before granting consent to any development:

(a) on land on which a heritage item is located, or

(b) on land that is within a heritage conservation area, or

I on land that is within the vicinity of land referred to in paragraph (a) or (b),

require a heritage management document to be prepared that assesses the extent to which the carrying out of the proposed development would affect the heritage significance of the heritage item or heritage conservation area concerned.

There is **one item** within the proposal area that is listed on Schedule 5 of the Inner West LEP 2022:

- Haberfield Conservation Area (Haberfield HCA) (Inner West LEP #C54).

2.5.2 Development Control Plan and Heritage Conservation Area

The Inner West Comprehensive DCP 2016 for Ashfield is a supporting document that complements the provisions contained within the Inner West LEP 2022 to provide specific design detail in regard to sympathetic development on, or in the vicinity of, items listed on Schedule 5 of the Inner West LEP 2022.

Chapter E2 of the Inner West DCP 2016 for Ashfield provides additional objectives and development standards for development within the Haberfield HCA. This chapter applies to the Haberfield HCA listed as C54 in Schedule 5 of the Inner West LEP 2022. The chapter considerations include ensuring that the building form, roof form, siting, setbacks and levels is sympathetic and conform to the distinctive character of Haberfield.

2.6 State Environmental Planning Policy (Transport and Infrastructure) 2021

State Environmental Planning Policy (Transport and Infrastructure) 2021 (the Transport and Infrastructure SEPP [TISEPP]) aims to facilitate the effective delivery of transport and infrastructure across NSW. The TISEPP assists local government, the NSW Government and the communities they support, by simplifying the process for providing essential infrastructure in areas such as education, hospitals, roads and railways, emergency services, water supply and electricity delivery.

Generally, where there is conflict between the provisions of the TISEPP and other environmental planning instruments, the TISEPP prevails. While the TISEPP overrides the controls included in the LEPs and DCPs, the proponent is required to consult with the relevant local councils when development “is likely to affect the heritage significance of a local heritage item, or of a heritage conservation area, that is not also a State heritage item, in a way that is more than minor or inconsequential” (TISEPP 2021 Clause 2.11.1).

When this is the case, the proponent must not carry out such development until it has (TISEPP 2021 Clause 2.11.2):

(a) had an assessment of the impact prepared, and

(b) given written notice of the intention to carry out the development, with a copy of the assessment and a scope of works, to the council for the area in which the heritage item or heritage conservation area (or the relevant part of such an area) is located, and

(c) taken into consideration any response to the notice that is received from the council within 21 days after the notice is given.

2.7 Non-statutory considerations

2.7.1 Register of the National Estate

The RNE is no longer a statutory list; however, it remains available as an archive.

There are **two items** within the proposal area that are listed on the RNE:

- Haberfield Conservation Area (RNE #3352)
- Dobroyd Stormwater Channel, Henley Marine Dr (RNE #101990).

2.7.2 National Trust of Australia (NSW) Register

Listing on the NTAR does not impose statutory obligations and is more an indication of the heritage significance held by the community.

There are two items within the proposal area that are listed on the NTAR:

- Haberfield Conservation Area
- Dobroyd Stormwater Channel (SWC No. 53).

2.8 Summary of heritage listings

A search of the relevant registers was undertaken on 28 June 2023. The results are outlined in Table 1 and the curtilages of these items are illustrated in Figure 2.

Table 1: Results of register searches for the proposal area and adjacent heritage items

Item	Address	Significance	Listing
Haberfield Conservation Area	Haberfield	State	Inner West LEP 2022 #C54 RNE #3352 NTAR
Dobroyd Canal Stormwater Channel No 53	Various Inner West suburbs	Local	Sydney Water s170 #4571056 RNE# 101990 NTAR



Figure 2: Heritage items in relation to the proposal area (Source: Artefact, 2023)

3.0 HISTORICAL BACKGROUND

3.1 Aboriginal histories of the locality

Prior to the appropriation of their land by Europeans, Aboriginal people lived in small family or clan groups that were associated with particular territories or places. It seems that territorial boundaries were fairly fluid, although details are not known. The language group spoken across Sydney was known as Darug (Dharruk – alternate spelling). This term was used for the first time in 1900, as before the 1800s language groups or dialects were not discussed in the literature.² The Darug language group is thought to have been spoken in the area south of Port Jackson, north of Botany Bay, and west to Parramatta.³

3.2 Dobroyd Estate

In 1803 Nicholas Bayley, a former soldier of the NSW Corp, received a 480-acre grant between Iron Cove Creek and Long Cove Creek (Figure 3). This comprised all land north of Parramatta Road, which was not officially surveyed and formed for another decade. Bayley named the property Sunning Hill, however there is no evidence he ever lived or built a homestead there. As the property was sold within only two years, it seems unlikely that Bayley undertook any significant improvements to the land.

In 1805 the property was purchased by Simeon Lord, a prominent Sydney businessman. The means of Lord's purchase have been considered dubious by historians.⁴ Lord renamed the property Dobroyd after a castle belonging to his ancestors in Yorkshire.⁵ The property apparently remained unimproved and uncultivated until 1826, with Lord holding residence at an expansive sandstone mansion on Bridge Street.⁶ In 1825 Lord's daughter, Sarah Anne married Dr David Ramsay, who received the Dobroyd Estate as part of the wedding dowry. The following year a timber cottage – named Dobroyd House - was constructed on the property and an extensive garden was planted. Dobroyd House became the location of the first Presbyterian Sunday school in New South Wales. The house was located near Parramatta Road and Dalhousie Street. Dr Ramsay was a talented gardener who won the Horticultural Society Silver Medallion in 1840 and later opened the Dobroyd Nursery adjacent to the Long Cove Creek. Furthermore, Ramsay co-founded the Linnean Society NSW branch and served as a director of the Australian Museum.⁷ The property was also used for grazing of livestock and agricultural cultivation. Several outbuildings were built on the property surrounding Dobroyd House. In 1855 a second house, named Yasmar, was built facing Parramatta Road. The house was built in the Georgian architectural style and additional buildings, such as a stable, and extensive gardens with a variety of rare plants were established around the house.

² Matthews and Everitt, 1900. The Organisation, Language and Initiation Ceremonies of the Aborigines of the South-East Coast of NSW, *Journal and Proceedings of the Royal Society of NSW*, 34: 262-281.

³ Attenbrow, V. 2010 *Sydney's Aboriginal Past: Investigating the archaeological and historical records*. UNSW Press. P:34.

⁴ Jackson-Stepowski, S., 2008. 'Haberfield.' *Dictionary of Sydney*. Accessed online 28 June 2023 at: <https://dictionaryofsydney.org/entry/haberfield>

⁵ The Haberfield Association, n.d. 'The Dobroyd Estate'. *The Haberfield Association*. Accessed online 28 June 2023 at: <https://haberfield.asn.au/dobroyd-estate/>

⁶ Karskens, G., 2009. *The Colony a History of Early Sydney*, p. 170.

⁷ Jackson-Stepowski, S., 2008. 'Haberfield.'



Figure 3: Parish map of Concord, date unknown, showing the land granted to Bayly⁸



Figure 4: Estate map of Ashfield Park, dated c.1850⁹

⁸ Historical Land Records Viewer

⁹ NSW State Library, 'SLNSW_FL8736204'.

3.3 Subdivision of the Dobroyd Estate

Dr Ramsay died in 1860, however Sarah lived until 1889, well into her 80s.¹⁰ The couple had two children, Edward and Ellen, between who the Dobroyd Estate was subdivided in 1883. The subdivision plan from 1883 shows several more Ramsays as owning land – it is likely that these Ramsays are Edward or Ellen’s children, although there appears to be some discrepancy in the historical record regarding whether these were Edward, Ellen or Sarah and David Ramsay’s children.¹¹ This subdivision plan also shows the stark contrast between Haberfield and the densely subdivided Ashfield on the opposite side of Parramatta Road. Contemporaneously, several roads were constructed throughout the estate, including Waratah Street, Dalhousie Street, and Ramsay Street. By the end of the century, two main subdivisions had occurred: one between Dalhousie Street, St David’s Church, and Parramatta Road in 1885; and the second from Wattle Street to Tenandra Street (now Alt Street), and between Parramatta Road and Ramsay Street. Several of these lots were marked as sold within the next few years, however by 1910 and 1915 the Sands Directory was showing only a small number of residents.

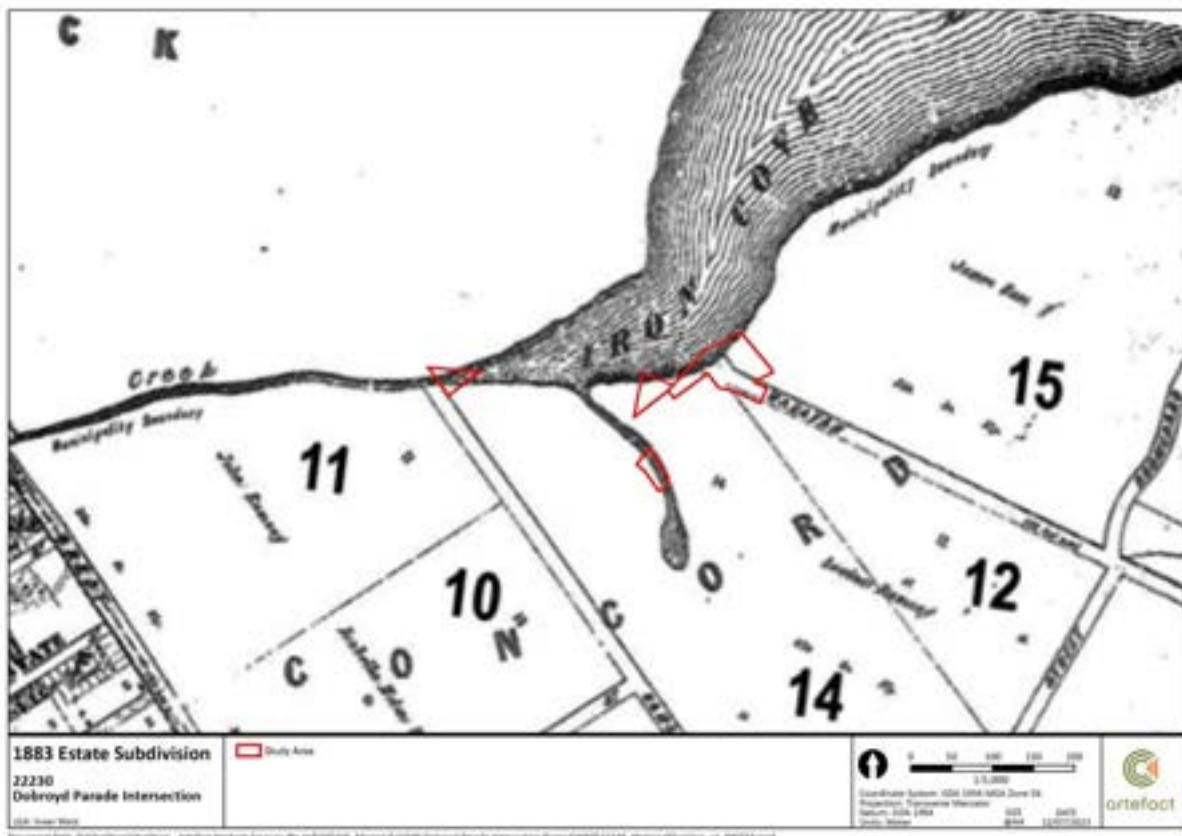


Figure 5: Subdivision plan of the Dobroyd Estate, dated 1883, showing its subdivision among the Ramsay Children. The plan shows that Dalhousie Street and Waratah Street had been established by that time¹²

¹⁰ People Australia, n.d. 'Ramsay, Sarah Ann (1806-1889).' *People Australia*. Accessed online 28 June 2023 at: <http://peopleaustralia.anu.edu.au/biography/ramsay-sarah-ann-23102>

¹¹ Jackson-Stepowski, S., 2008. 'Haberfield.'

¹² State Library of NSW cited in GML Heritage. 'WestConnex M4 East Non-Aboriginal Heritage Impact Assessment. Prepared for WestConnex Delivery Authority'. Surry Hills: GML Heritage, September 2015: 4-61.

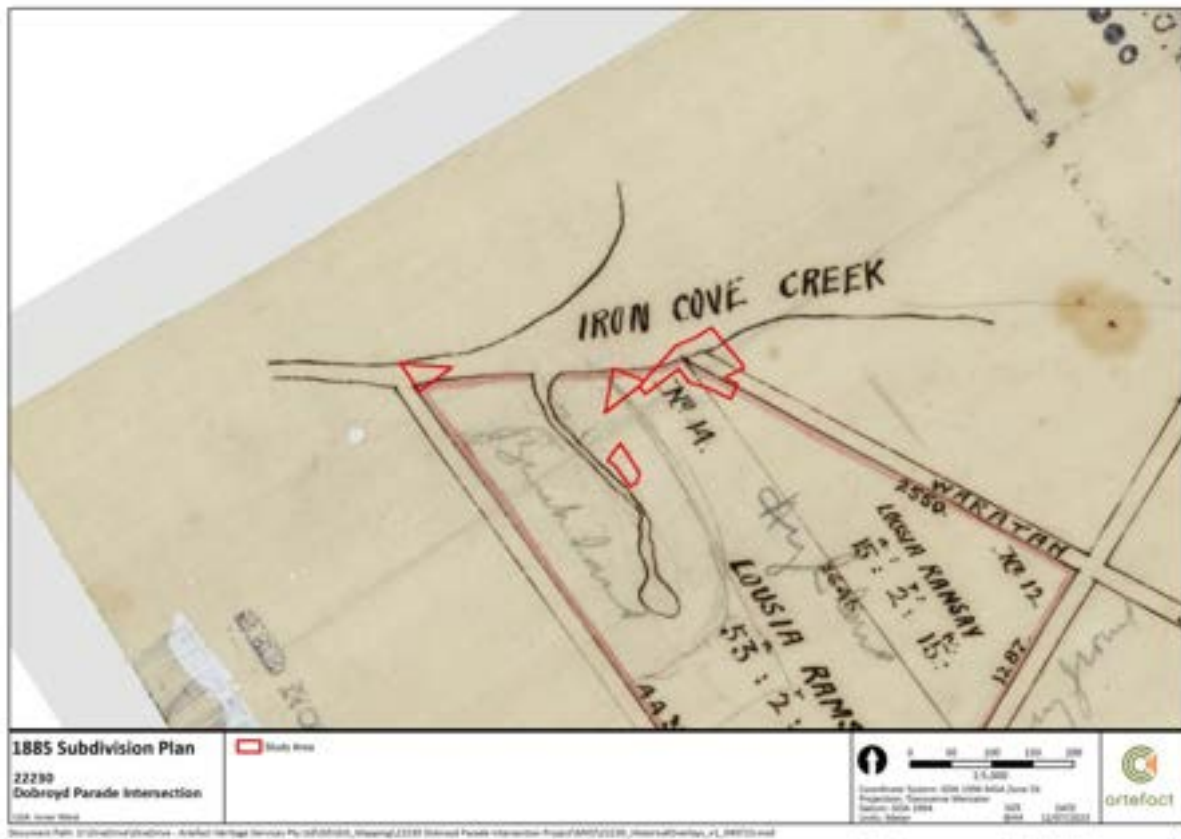


Figure 6: Subdivision plan, dated 1885, showing Louisa Ramsay's land in relation to the proposal area¹³

3.4 Richard Stanton

From 1901 additional lots owned by the Ramsay children (and grandchildren) were sold to Richard Stanton, one of Sydney's prominent real estate agents and town planners. Stanton, heavily influenced by the 'City Beautiful' planning movement in the USA and England, envisioned a regular grid pattern layout, beautified with nature strips and public parks, with regulated residential architectural styles that created a picturesque and cohesive suburb. Stanton planned to create Haberfield as a 'model suburb' with the slogan 'slumless, laneless and publess'. This slogan potentially inadvertently references older Sydney suburbs which experienced poor sanitation and hygiene due to noxious industries, poor sewerage, and narrow lanes. It is clear that Stanton, heavily influenced by international garden cities, intended to avoid this in Haberfield. Infrastructure such as sandstone kerbing, gutters, sewerage, gas, and electricity were part of Stanton's original vision and plan for the suburb, as were beautification elements such as trees and grassy nature strips.¹⁴

Typical house styles included Queen Anne, Arts and Crafts, and Interwar Bungalows in the 1920s and 1930s. Stanton, who co-founded the Town Planning Institute and managed the Stanton Estate, meticulously assessed, and approved all aspects of the subdivision and designed many of the houses with his two key architects, J Spencer Stanfield and Wormal. Stanton also named the suburb Haberfield, after Lord Haberfield, a close connection of his wife's family in Bristol.

The remaining lots between Waratah Street and Ramsay Street, Lots 12 and 14, had been owned by Edward and Margaret Ramsay, however this was sold in 1904 to the Bank of NSW for subdivision by

¹³ NSW State Library, 'SLNSW_FL8737181'.

¹⁴ Jackson-Stepowski, S., 2008. 'Haberfield.'

the Haymarket Permanent Land Building and Investment Company. The subdivision resulted in an extension of Wattle Street to meet Alt Street. This area was heavily sold and developed between 1915 and 1920, with the western side of Wattle Street re-subdivided in 1922. By 1920 much of the suburb was developed, excepting properties of Parramatta Road, which were sparsely developed until c.1930. By this time the street front was heavily occupied with residential properties and commercial businesses, such as a grocer, butcher, and other mixed stores and professional services.



Figure 7: Subdivision Plan of Dobroyd Point Estate, dated 1909¹⁵

¹⁵ 'Dobroyd Point and Haberfield subdivision plans', 1909, NSW State Library, SP/811.1833, https://search.slnsw.gov.au/permalink/f/1ocrdt/SLNSW_ALMA21153577400002626



Figure 8: Parish map of Concord, dated 1915¹⁶

3.5 Iron Cove and Iron Cove Foreshore Drive

A sewerage system had been established throughout the inner-city suburbs by the late 1890s, however the outer suburbs were rapidly growing and had inefficient sewerage infrastructure, relying on polluted creeks¹⁷. The Department of Public Works subsequently commissioned the rapid construction of stormwater channels¹⁸. Conversion of Iron Cove Creek into a canal first began in 1892 (Figure 9), with the construction of a brick-lined channel located south in Ashfield and was used to bring overflow stormwater through Ashfield, Croydon, and Haberfield to Iron Cove¹⁹. The canal remained in this condition until 1926, when further reclamation occurred along Iron Cove Creek in Haberfield, particularly on the western bank²⁰. Additional canalisation works occurred in 1929 and 1934 and were associated with the historical context of the Great Depression and the unemployment relief works around Iron Cove. Extensive volumes of fill were introduced, and brick canal walls were constructed²¹. In the late 1980s and 1990s portions of the brick canal walls were replaced with concrete. In 2010, extra portions of the north canal wall were replaced with concrete²².

¹⁶ NSW Historic Lands Records Viewer, 'Parish Maps'.

¹⁷ NSW DPIE. 'Dobroyd Stormwater Channel No 53'. 22 January 2002. Accessed 16 June 2020: <https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?id=4571056>

¹⁸ NSW DPIE, 'Dobroyd Stormwater Channel No 53'.

¹⁹ AMBS. 'WestConnex M4 East: Historical Archaeological Investigations, Volume 1. Prepared for CPB Samsung John Holland Joint Venture'. Camperdown: AMBS, March 2019: 27.

²⁰ AMBS, 'WestConnex M4 East: Historical Archaeological Investigations', 27.

²¹ AMBS, 'WestConnex M4 East: Historical Archaeological Investigations', 27.

²² AMBS, 'WestConnex M4 East: Historical Archaeological Investigations', 27.



Figure 9: Left: Original condition of Iron Cove Creek near the Church Street bridge in 1890. Right: Section of Iron Cove Creek near Ramsay Street in 1929 after it had been canalised²³

From the 1930s an extensive land reclamation and beautification works program commenced throughout Haberfield and Five Dock, concentrated around Iron Cove and Iron Cove Creek. During this period Iron Cove Creek was partially reclaimed to even out the foreshore edges. The reclamations remain particularly significant today as they comprised part of the Great Depression unemployment relief works, designed to provide extra construction work for those who were otherwise unemployed. The Iron Cove Foreshore Drive was constructed along Timbrell Drive and Henley Marine Drive, connecting Haberfield, Five Dock, and Drummoyne. In 1940 construction began on an extensive sandstone embankment wall along the southern area of Iron Cove which was completed in 1943²⁴. The 1940s aerial imagery shows Iron Cove Creek following the reclamation works and during construction of the Iron Cove Foreshore Drive. By the 1950s the road was completed, and Timbrell Park was established adjacent to the road, operating as a recreational park with several cricket pitches and a small amenity building at the north-east end.

3.6 Mid-twentieth to early twenty-first century development

By the 1940s, Haberfield was a well-established suburb with several public reserves and services. In the late 1920s the Haberfield Rowing Club was established at the tip of Dobroyd Point, located along Dobroyd Parade with what may be an early sea wall present. Aerial images from this time show that the bridge between Haberfield and Lilyfield was not yet constructed. The aerials show that Stanton's vision of wide streets, regular sized blocks and tree-lined streets was retained. Fewer dwellings are also located along Dobroyd Parade facing Iron Cove Creek. Towards the southwest of the proposal area several potential sporting fields are present. In addition to the main bridge at the mouth of Iron Cove Creek (Figure 10), two additional footbridges are evident along Dobroyd Parade crossing Iron Cove Creek. Between the 1940s and 1970s, aerial imagery shows few changes within the proposal area. A new amenities building for Timbrell Park was constructed on the northern side of the park in the mid-1970s and a potential athletics or cycling track was created adjacent to Iron Cove Creek. In the 1990s the numerous cricket pitches and amenities building were still present.

In the 1970s the precursor of the CWL was constructed, with portions of Dobroyd Parade realigned. The portion of Dobroyd Parade between Waratah Street and Martin Street was demolished along the Iron Cove Creek foreshore and was realigned to connect with Wattle Street, with the new alignment directly adjacent to existing houses. This enabled the reclamation of this portion of Iron Cove Creek as parkland for Reg Coady Reserve, with the 1970s and 1980s imagery showing new trees planted and tennis courts established. During the 1990s Dobroyd Parade/Wattle Street was again widened

²³ State Library of NSW cited in AMBS, 'WestConnex M4 East: Historical Archaeological Investigations', 28.

²⁴ NSW DPE, 'Iron Cove Foreshore Drive'. Accessed 16 June 2020: <https://www.hms.heritage.nsw.gov.au/App/Item/View/Item?itemId=2891078>

around the mouth of Iron Cove Creek. Road improvements were met with parkland improvements to Robson Park, Timbrell Park and Reg Coady Reserve, all of which retained existing boundaries through the road widening schemes and saw several improvements. Extensive planting occurred at Timbrell Park along the foreshore of Iron Cove Creek, with the additional construction of garden paths and a children's playground at Nield Park – now notable in Sydney for its inclusivity and accessibility. The two pedestrian bridges across Iron Cove Creek, first constructed by the 1940s, are still extant and in their original locations at this time..

Throughout the 2010s Dobroyd Parade has changed extensively in association with several road upgrades. Consistent upgrades to the CWL have occurred and in recent years the entrance to the WestConnex M4-M5 Link Tunnel was constructed at Haberfield at the boundary of Wattle Street and Dobroyd Parade, roughly in alignment with Ramsay Street. This resulted in major alterations to Wattle Street north of Parramatta Road. The northern portion of Reg Coady Reserve was used as part of the project construction footprint, and the project resulted in the demolition of several Federation era houses fronting Wattle Street between Ramsay Street and Parramatta Road. The project was heavily opposed by the local community.



Figure 10: Aerial imagery of Haberfield and Five Dock around Lane Cove Creek in 1943²⁵

²⁵ NSW Historic Imagery Viewer, 1943.



Figure 11: 1986 aerial photograph of the proposal area²⁶



Figure 12: 2002 aerial photograph of the proposal area prior to the commencement of the WestConnex Project²⁷

²⁶ NSW Historic Imagery Viewer, 1986, '3528_22_057', https://portal.spatial.nsw.gov.au/download/historic/3528/3528_22_057.jp2.jpeg

²⁷ NSW Historic Imagery Viewer, 2002, '4724_10_117', https://portal.spatial.nsw.gov.au/download/historic/4724/4724_10_117.jp2.jpeg



Figure 13: 2018 aerial photograph of the proposal area, showing construction for the WestConnex Project to the southwest

4.0 PHYSICAL CONTEXT

4.1 Site Inspection

A site inspection was conducted on 29 June 2023 by Jayden van Beek (Technical Specialist) of Artefact Heritage. The aim of the site inspection was to inspect the area of proposed impacts, the nearby heritage items, and key views between the proposal area and nearby heritage items. The inspection was undertaken on foot and a photographic record was made.

4.1.1 Context

The proposal area largely consists of the Wattle Street intersection at Waratah Street and the south end of Dobroyd Parade (Figure 14). In this area Wattle Street is oriented north-east by south-west and is typically five to seven lanes wide through, expanding out to eight lanes near Waratah Street as it nears the M4-M5 link tunnel. The area north of Wattle Street consists of a pedestrian walkway, a small nature strip and Iron Cove Creek (Figure 15). The area to the south of Wattle Street is primarily occupied by residential properties which form the garden suburb of Haberfield and Haberfield Conservation Area (Inner West LEP 2022 #C54) (Figure 16).

Haberfield (Inner West LGA) and Five Dock (Canada Bay LGA) are separated by Iron Cove Creek which is bridged by Timbrell Drive and discharges into Iron Cove. The alignment of Iron Cove Creek has been modified over time and now flows through a wide concrete stormwater channel (Figure 17). The north bank of Iron Cove Creek to the west of Timbrell Drive is occupied by the large greenspace of Timbrell Park (Figure 18). The park is primarily occupied with sports fields, with a wide strip of trees along the south-east corner of the park adjacent to Iron Cove Creek and Timbrell Drive. Small pedestrian footbridges over Iron Cove Creek connect the park to Wattle Street (Figure 19), and a playground is located at the south end of the park next to the southern pedestrian bridge.



Figure 14: Southwestern view of Wattle Street intersection. The pedestrian bridge is proposed to replace the current street level pedestrian crossing (Source: Artefact, 2023)



Figure 15: Western view of the nature strip between the Wattle Street corridor (to the left of the image) and Iron Cove Creek (Source: Artefact, 2023)



Figure 16: Northwestern view of the Waratah Street looking towards Wattle Street (Source: Artefact, 2023)



Figure 17: Southwestern view of Iron Cove Creek, the wide stormwater channel, from Timbrell Drive (Source: Artefact, 2023)



Figure 18: Eastern view of Timbrell Park bounded by Iron Cove Creek in the background (Source: Artefact, 2023)



Figure 19: Southeastern view of small pedestrian bridge from Timbrell Park crossing over Iron Cove Creek to Wattle Street (Source: Artefact, 2023)

4.1.2 Proposal footprint and compound site option one

The proposal footprint includes the proposed location of the pedestrian bridge over Wattle Street near the intersection of Waratah Street and the south end of Wattle Street. Additionally, one of the three potential locations for the temporary compound site is located east of the Reg Coady Reserve and west of the proposal footprint. The sites are located on the northern edge of the Haberfield HCA.

The majority of the site is located within the Wattle Street corridor. The northern edge of the site where the bridge landing would be located is bounded by Iron Cove Creek, a small nature strip and an existing pedestrian walkway. The eastern edge of the proposal area extends to Waratah Street where a small greenspace is present at the location of the proposed landing between Waratah Street and Dobroyd Parade. To the north Dobroyd Parade is separated from Wattle Street and the CWL by a noise wall.

The first compound option is located west of the proposed pedestrian bridge and immediately east of the Reg Coady Reserve (Figure 20). The site fronts onto Wattle Street at its southern boundary. The site has previously been cleared of all vegetation and is not currently developed.



Figure 20: Northeastern view of compound site option 1 (Source: Artefact, 2023)

4.1.3 Compound site option two

The second compound site option is located at 87 Dobroyd Parade, Haberfield (Lots 1 and 2 of DP 1290732) (Figure 21). The site is nestled between residential lots and is separated from Dobroyd Parade by a pedestrian walkway at its northern boundary which connects to the end of Martin Street. The site has been previously cleared of all vegetation but is currently undeveloped and covered by thick grass.



Figure 21: Southeastern view of compound site option 2 (Source: Artefact, 2023)

4.1.4 Compound site option three

The third compound site option is located at 289 Ramsay Street, Haberfield (Lots A and B of DP 322430) (Figure 22). The site sits within the triangular corner of Ramsay Street and Martin Street. It is fenced off and features residential properties immediately to the southeast and on the opposite side of Ramsay Street to the southwest, with a nature strip and Iron Cove Creek to the north. The site has been previously cleared of all vegetation and is currently undeveloped with the exception of an Ecotech broadband service hub.



Figure 22: Southeastern view of compound site option 3 (Source: Artefact, 2023)

4.1.5 Views and vistas

In the vicinity of the proposal area, are two heritage listed items. These items include the Dobroyd Stormwater Channel No. 53, which is included in the Timbrell Park cultural landscape,²⁸ and the second is the Haberfield HCA. The proposal footprint is located south of the canal and cultural landscape and within the Haberfield HCA. Due to the location of the proposal area, these two heritage items form key views and vistas to and from the proposed pedestrian bridge.

Looking towards the cultural landscape that includes the canal and Timbrell Park from the proposal footprint the canal is clearly visible in the foreground. The canal is clearly visible towards the northwest as it curves and continues with no tree cover blocking the view of it from the proposal footprint, until it curves behind the Reg Coady Reserve where it is obscured from view (Figure 23). The canal is partially obscured towards the northeast by shrub and tree cover, which become more dense further east and completely obscure the canal from pedestrian view. Similarly, Timbrell Park is visible directly north of the proposal footprint as there is a break in the tree cover due to the existing pedestrian bridge that crosses the canal (Figure 24). The view of Timbrell Park from the proposal

²⁸ NSW DPE, 'Dobroyd Stormwater Channel No 53'. Accessed 28 June 2023: <https://www.hms.heritage.nsw.gov.au/App/Item/View/Item?itemId=4571056>

footprint is blocked towards the northeast by the dense tree cover along the edge of the canal that forms a visual barrier. The tree cover largely blocks the view from Timbrell Park towards the proposal footprint except for the break at the existing pedestrian bridge. The view from the canal towards the proposal footprint is clearly visible, however it is localised, as the canal curves away from the proposal footprint towards the northwest and northeast the view of the proposal footprint eventually becomes obscured by the existing tree cover (Figure 25).

The view of the residential section of the Haberfield HCA is obscured from pedestrian view at the canal looking towards the east as an existing noise wall forms a visual barrier with some tall tree canopy visible behind it. Where the noise wall ends the buildings on that block of land are obscured by existing tree cover. Across Waratah Street some buildings are also partially obscured by mature tree cover (Figure 26), while the buildings closer to the corner of the block are completely visible. Similarly, looking towards the west from the proposal footprint some buildings are partially visible through the tree cover and some are obscured. Further west the WestConnex tunnel entrance and other road corridors that line the edge of the residential section of the Haberfield HCA are visible, tree coverage obscures the residential buildings from view (Figure 27).

Views from the proposal footprint to the Haberfield HCA are afforded down through Waratah Street, which consists of a tree lined street with c1920s residential single storey houses. The mature tree cover obscures most buildings in the street at street level, however, at an elevated position (ie. the proposed pedestrian bridge), views of the street, setting and buildings would be less obscured and would provide a greater understanding of the development and street pattern of the Haberfield HCA (Figure 28).



Figure 23: Western view from proposal footprint looking towards the northwest curve in the canal where there is no tree cover on the south side of the canal until it reaches the Reg Coady Reserve (Source: Artefact, 2023)



Figure 24: Northern view from proposal footprint looking towards the cultural landscape with Timbrell Park partially obscured by tree cover (Source: Artefact, 2023)



Figure 25: Eastern view from a break in the tree coverage at Timbrell Park of the canal and the proposal footprint slightly to the left of the centre of the middle ground of the image (Source: Artefact, 2023)



Figure 26: Southeastern view from proposal footprint looking towards the Haberfield HCA residential section from the road corridor (Source: Artefact, 2023)



Figure 27: Southwestern view from proposal footprint looking towards the WestConnex tunnel and road corridor with dense tree cover forming the barrier to the residential section (Source: Artefact, 2023)



Figure 28: South-eastern view from proposal footprint looking down Waratah Street (Source: Google Street View, 2022)

5.0 SIGNIFICANCE ASSESSMENT

5.1 Methodology

Determining the significance of heritage items or a potential archaeological resource is undertaken by utilising a system of assessment centred on the *Burra Charter* (Australia ICOMOS 2013). The principles of the charter are relevant to the assessment, conservation and management of sites and relics. The assessment of heritage significance is outlined through legislation in the Heritage Act and implemented through the *NSW Heritage Manual*, the *Archaeological Assessment Guidelines*²⁹, the document *Assessing Significance for Historical Archaeological Sites and 'Relics'*³⁰ and *Guidelines for preparing a statement of heritage impact*.³¹

If an item meets one of the seven heritage criteria and retains the integrity of its key attributes, it can be considered to have heritage significance (see Table 2). The significance of an item or potential archaeological site can then be assessed as being of local or State significance. If a potential archaeological resource does not reach the local or state significance threshold, then it is not classified as a relic under the Heritage Act.

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

'*Local heritage significance*', in relation to a place, building, work, relic, moveable object or precinct, means significance to an area in relation to the historical, scientific, cultural, social, archaeological, architectural, natural or aesthetic value of the item.³²

Table 2. NSW heritage assessment criteria

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

²⁹ NSW Heritage Office, 'Archaeological Assessment Guidelines', Sydney: 1996: 25-27.

³⁰ NSW Heritage Branch, 'Assessing Significance for Historical Archaeological Sites and 'Relics'', Sydney: 2009.

³¹ DPE, 'Guidelines for preparing a statement of heritage impact', Sydney: 2023.

³² This section is an extract based on the Heritage Office Assessing Significance for Historical Archaeological Sites and Relics 2009:6.

5.2 Existing heritage assessments

5.2.1 Haberfield HCA (Inner West LEP 2022 #C54)

5.2.1.1 Description

The SHI sheet for Haberfield HCA does not provide a description for the conservation area. However, the conservation area was described in the 2015 WestConnex Environmental Impact Statement (EIS) as:

Haberfield differs from the Victorian inner suburbs which preceded it because it comprises generous suburban allotments which contain one house only. It is characterised by a uniform pattern of development: roads are of a regular width with the original tree planting remaining on many of the verges; because a drainage and sewerage system was in place at the back of the lot before building began there is a lack of night-soil back lanes; lots are of similar width and allowed fresh air to flow between the buildings; and length of lots vary where the street pattern diverges in response to the alignment of earlier roads – Parramatta Road, Ramsay Street and other tracks on the Dobroyd Estate. (Source: Ashfield Council, Interim Development Assessment Policy 2013 – Part C7 Haberfield Heritage Conservation Area)³³

5.2.1.2 Statement of Significance

The SHI sheet for Haberfield HCA (LEP no. C42) does not provide a statement of significance for the conservation area. However, the Comprehensive Inner West DCP 2016 provides the following statement of significance:

Haberfield has historic significance as the first successful comprehensively planned and marketed Garden Suburb in Australia. Designed and developed by real estate entrepreneur and town planning advocate, Richard Stanton, its subdivision layout and tree lined streets, its pattern of separate houses on individual lots (the antithesis of the unhealthy crowded inner suburbs of the period) and its buildings and materials, clearly illustrate his design and estate management principles. Haberfield pre-dates the first Garden Suburbs in Britain by some five years.

It is significant in the history of town planning in NSW. The separation of land uses, exclusion of industry and hotels, designation of land for community facilities and its comprehensive provision of utility services and pre-development estate landscaping profoundly affected housing trends, state subdivision practice and planning legislation in 20th century Australia.

It is significant in the history of Australian domestic architecture for its fine ensemble of Federation houses and their fences, and shops, most with their decorative elements intact.

It is outstanding for its collection of modest Federation houses displaying skilful use of materials and a high standard of workmanship of innovative design and detail

³³ GML Heritage. 'WestConnex M4 East Non-Aboriginal Heritage Impact Assessment'.

particularly reflective of the burgeoning naturalistic spirit of the Federation era in which they were built.

The form, materials, scale and setback of buildings and their landscaped gardens fronting tree lined streets together provide mature streetscapes of aesthetic appeal.

Haberfield is a major research repository of the Federation era, garden design and plant material, architectural detail, modest house planning, public landscaping and utility provision.³⁴

5.2.2 Dobroyd Stormwater Channel No 53 (s170 #4571056)

5.2.2.1 Description

The SHI sheet for the heritage item provides the following description:

The Dobroyd SWC discharges into Iron Cove just to the west of Dobroyd Point in conjunction with the local street drainage systems. It serves the suburbs of Haberfield, Leichhardt, Burwood, Croydon and Ashfield, a total of 800 hectares. The main open channel ends near the intersection of Carshalton and Norton Streets. Along the way, main underground branches take off to the Ashfield, Burwood and Haberfield areas, whilst two smaller underground branches extend west from the main open channel. The SWC has been upgraded by replacing the original brick forms with reinforced concrete in most sections. The remaining heritage fabric survives under the railway tracks between Thomas and Hunt Streets. It had a U-shaped cross section 3.66m x 3.05m. The brickwork was laid in English bond on the sides and stretcher bond on the bottom. It originally extended for a length of 714 metres from Thomas Street to Hunt Street. The length under the railway has been retained in service as a permanent record of the construction skills of the period. The Ashfield Branch is mainly covered or piped underground and joins the main open channel near Heighway Ave. The first length of some 185 metres was also constructed in brick work with an oviform cross section 1.52m x 1.22m.

It is evident across several suburbs where it remains as an open channel. It passes through several different types of areas including parks and playing fields, residential areas and adjacent to roads.³⁵

5.2.2.2 Statement of Significance

The SHI sheet for the heritage item provides the following statement of significance:

The Dobroyd Stormwater Channel is a representative example of one of the first stormwater channels built in the 1890's to alleviate the City's severe public health problems. It still includes a length of brickwork drain illustrating the construction skills of the time. Overall the different sections, built at various times, illustrate the progress and improved construction methods made over a period of 100 years. It is of particular historical significance as it was one of a group of the first nine purpose

³⁴ Inner West Council. 2016. 'Comprehensive Inner West DCP'. Accessed online 28 June 2023: <https://www.innerwest.nsw.gov.au/develop/plans-policies-and-controls/development-controls-lep-and-dcp/development-control-plans-dcp/ashfield-dcp>

³⁵ NSW DPE, 'Dobroyd Stormwater Channel No 53'.

built stormwater drains to be constructed in Sydney in the 1890's. Prior to this period the water courses which served to carry stormwater were entirely in their natural state and were receptacles of sewage from the large population which had settled in the suburbs. In 1890, the then minister for Public Works, the Hon. Bruce Smith MLA., appalled at the extremely unhealthy conditions prevailing at the time, proposed a separate system of stormwater drains be built to help alleviate the problem. By 1897 nine stormwater channels had been built including Dobroyd.

The operational curtilage of the channel includes the channel bed, walls and coping. The visual curtilage will vary along the length of the channel depending on the surrounding landuses. To formulate a specific curtilage statement that includes details of surrounding landuse and encroachment of various developments would require further investigations and is beyond the scope of this study. However, in general the visual curtilage can be described as follows:

- 1) Open sections of the channel commence from Iron Cove to Norton Street in Croydon*
 - 2) Sections of the Chidgeys SWC, Alt Street Branch and the Croydon Branch are also open.*
 - 3) The upper catchment is presently surrounded by urban and industrial development south of Parramatta Road. In this area the channel can only be viewed from various road bridges that cross it.*
 - 4) North of Parramatta Road visual curtilage extends through the boundaries of surrounding parkland and roadways*
 - 5) The downstream section of the channel is part of the cultural landscape of the Timbrell Park and the channel can be viewed from the Main Western Railway Line and bridges on Dobroyd Parade and Ramsey Street.³⁶*
-

³⁶ NSW DPE, 'Dobroyd Stormwater Channel No 53'.

6.0 ARCHAEOLOGICAL ASSESSMENT

6.1 Introduction

This section discusses the potential for the proposal footprint to contain historical archaeological resources. The potential for the survival of archaeological remains is significantly affected by activities which may have caused ground disturbance. This assessment is therefore based on consideration of current ground conditions, and analysis of the historical development of the proposal footprint. The archaeological assessment is limited to the proposal footprint as no ground disturbing works are expected within the wider proposal area.

'Archaeological potential' refers to the likelihood that an area contains physical remains associated with an earlier phase of occupation, activity or development of that area. This is distinct from 'archaeological significance' and 'archaeological research potential'. These designations refer to the cultural value of potential archaeological remains and are the primary basis of the recommended management actions included in this document.

6.2 Archaeological potential

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

Table 3: Grading of archaeological potential

Grading	Rationale
Nil	No evidence of historical development or use, or where previous impacts would have removed all archaeological potential
Low	Research indicates little historical development, or where there have been substantial previous impacts, disturbance and truncation in locations where some archaeological remains such as deep subsurface features may survive
Moderate	Analysis demonstrates known historical development and some previous impacts, but it is likely that archaeological remains survive with some localised truncation and disturbance
High	Evidence of multiple phases of historical development and structures with minimal or localised twentieth century development impacts, and it is likely the archaeological resource would be largely intact

6.2.1 Land use summary

The European occupation of the proposal footprint has been divided into four general phases of historical activity, which are outlined in Table 4 below:

Table 4: Land use summary

Phase	Discussion
Phase 1: Early land grants (1803-1825)	<ul style="list-style-type: none">Proposal footprint formed part of the Nicholay Bayley land grants, granted in 1803

Phase	Discussion
	<ul style="list-style-type: none"> • The land was purchased by Simeon Lord within a few years • No evidence of structures being built in this phase • Some land clearance and construction of timber post fences may have occurred along the Parramatta Road portion of the property; however, it is unlikely that this occurred within the proposal footprint
Phase 2: Ramsay's Bush (1825-1883)	<ul style="list-style-type: none"> • Several activities occurred within the neighbouring Ramsay's land grants • The activities included the construction of two dwellings, the establishment of extensive gardens, and a plant nursery • The proposal footprint is likely to have been located within the gardens focused around Iron Cove Creek
Phase 3: Subdivision and establishment of roads (1883-1960s)	<ul style="list-style-type: none"> • Extensive subdivision occurred, including the proposal footprint, the original Ramsay land grant was subdivided by his children • An extensive number of Federation era houses were constructed during Richard Stanton's subdivision and establishment of the garden style estate in Haberfield • In the late-1800s and early 1900s Dobroyd Parade, Waratah Street and several other streets throughout Haberfield and off the proposal footprint were surveyed and formalised • From the 1910s, land reclamation around Iron Cove and Iron Cove Creek was undertaken • The proposal footprint's land was heavily modified during this phase
Phase 4: Modernisation and road upgrades (1960s-present)	<ul style="list-style-type: none"> • From the 1960s various road upgrade programs and minor changes to recreational grounds near the proposal footprint have occurred • The alignment of Dobroyd Parade was partially altered in the 1970s in association with road widening for what has become the CWL • Throughout the late 20th century and early 21st century Dobroyd Parade has been frequently resealed and upgraded, most notably from the mid-2010s with the construction of WestConnex • All of these works resulted in further modification to the land

6.3 Relevant previous reports

The southern part of the current proposal area up to about Crane Avenue is situated within the WestConnex project area. An assessment of the potential archaeological resources within the area was undertaken by GML Heritage in 2015 as part of the preparation of the EIS for the WestConnex project.³⁷ The WestConnex EIS separated the project route into four separate project areas and the archaeological assessment further divided each area into one of eleven Historical Archaeological Management Units (HAMUs). The current proposal area is situated within Area 4 – Haberfield and Ashfield of the WestConnex project, and within HAMU 10. HAMU 10 included the planned width of Wattle Street and Dobroyd Parade from Parramatta Road to Crane Avenue.

HAMU 10 was assessed as having low potential to contain archaeological evidence associated with:

- *Evidence of Dobroyd estate agricultural uses (circa 1883–1901) such as postholes of timber fence lines. Archaeological evidence of grazing/agriculture activities. While most of the Dobroyd Estate remained undeveloped until 1901, subdivision of the estate commenced with the land bounded by Wattle, Ramsay, Alt streets and Parramatta Road in 1885. If found, such evidence of agricultural activities is likely to be ephemeral in*

³⁷ GML Heritage, 'WestConnex M4 East Non-Aboriginal Heritage Impact Assessment'.

nature and its location not possible to predict based on current documentary evidence

- *Early road alignment of Wattle Street, including remains of kerbs, drains and early road surfaces*
- *Earlier sewerage pumping station buildings on the site of the present structure in Reg Coady Reserve.*³⁸

HAMU 11 was assessed as having moderate potential to contain archaeological evidence associated with:

-
- *The natural environment, such as soil profiles associated with the original course of Iron Cove creek and dam (pre-1890)*
 - *Early twentieth century (1885–1920s/1930s) residential subdivision and development, including structural remains with brick/stone foundations, postholes, yard/work surfaces, underfloor deposits, demolition deposits, landscape modification and artefact scatters/rubbish pits*
 - *Early road alignment of Dobroyd Parade, including remains of kerbs, drains and early road surfaces.*³⁹
-

The archaeological remains were assessed as potentially being of local significance.

The works associated with the WestConnex project within HAMU 10 included substantial excavations, demolition and landscaping. During these works an area alongside Dobroyd Stormwater Channel No 53 (S170 no. 4571056) was investigated by AMBS Ecology & Heritage (AMBS) in 2016 after a tree was uprooted in Reg Coady Reserve by a storm. This exposed underlying reclamation fill of mixed clays and soils that included fragmentary artefacts. Further test excavations confirmed the presence of artefact bearing reclamation fill layers, with the artefacts identified as being consistent with introduced fills. It was assessed that the artefacts were of little to no significance and did not contribute to an understanding of the local Haberfield area.⁴⁰ During the remaining excavations within HAMU 10, no evidence was found of early structures, topsoils, or other features associated with early nineteenth century occupation, and no evidence of former road surfaces were identified.⁴¹

6.4 Assessment of archaeological potential

Based on the review of the information obtained from historical sources, previous archaeological works in the site and the surrounding area, and the current condition of the site, an assessment of the potential archaeological remains within the proposal footprint is provided below.

6.4.1 Phase 1 (1803-1825): Early land grants

Historical documentation does not provide any evidence to suggest that structures associated with Nicholas Bayley or Simeon Lord's ownership of the proposal footprint. Land clearance is unlikely to have occurred around Iron Cove Creek and, if evidence associated with land clearance such as tree boles was present, it has likely been subsequently disturbed and heavily truncated by ground disturbance in later phases. It is unlikely that timber fences or other structures were built in the proposal footprint, and if so, these would have also been truncated heavily by subsequent activities.

³⁸ GML Heritage, 'WestConnex M4 East Non-Aboriginal Heritage Impact Assessment', 5-18.

³⁹ GML Heritage, 'WestConnex M4 East Non-Aboriginal Heritage Impact Assessment', 5-18.

⁴⁰ AMBS, 'WestConnex M4 East: Historical Archaeological Investigations', 29.

⁴¹ AMBS, 'WestConnex M4 East: Historical Archaeological Investigations', 21.

Therefore, there is **nil** archaeological potential for Phase 1 remains within the proposal footprint.

6.4.2 Phase 2 (1825-1883): Ramsay's Bush

There is limited historical documentation to suggest that structures were built within the proposal footprint during this phase. The locations of the first timber dwelling is known to have been close to the intersection of Parramatta Road and Dalhousie Street, and the second building – Yasmar – is still extant on Parramatta Road. Furthermore, the nursery established by Ramsay was located on the other side of Haberfield. Extensive gardens were located throughout the land grant; however it is uncertain if the garden extended to the proposal footprint. Archaeobotanical remains, unless preserved in deposits within structures such as wells or cisterns, often do not preserve well and would not likely be present within the proposal footprint.

Therefore, there is **nil to low** archaeological potential for Phase 2 remains within the proposal footprint.

6.4.3 Phase 3 (1883-1960): Subdivision and establishment of roads

During Phase 3 there were significant changes within the proposal footprint. Following the death of Sarah Ramsay, Ramsay's Bush was subdivided amongst and by the Ramsay children. Within the proposal footprint in c.1880 Waratah Street was established, and Dobroyd Parade established shortly after, both possibly with sandstone kerbs. These have likely been impacted by subsequent road upgrades, as would have earlier road surfaces, however these may be partially present albeit highly truncated. Therefore, there is **low** potential for remains of former road surfaces.

Within the study area from the 1910s, land reclamation along Iron Cove Creek occurred. These land reclamation fill deposits, as evidenced by aerial imagery, appear to be unmodified and would likely be intact. There is also potential for isolated artefacts associated with opportunistic dumping within reclamation fills, as demonstrated by the results of previous investigations for the WestConnex project. It is assessed that there is **high** potential for land reclamation fills and isolated artefacts near Iron Cove Creek. However, as indicated by the previous investigations it is likely that the potential archaeological remains would be minor in nature, and as a result it is assessed that there is generally nil to low potential for more substantial and significant archaeological remains or deposits associated with land reclamation activities to be present.

6.4.4 Phase 4 (1883-1960): Modernisation

During Phase 4 several upgrades to the road network and recreational grounds have occurred and may have reduced the integrity of archaeological deposits and remains from previous phases. Many of the activities associated with this phase are still extant and would not be considered archaeological.

Therefore, there is **nil** archaeological potential associated with this phase.

6.5 Archaeological significance

The significance assessment of historical archaeological sites and items requires a specialised framework in order to consider the range of values associated with each site/item. This because of the challenges associated with the often unknown nature and extent of buried archaeological remains and judgment is usually based on anticipated attributes. To facilitate assessment of archaeological

significance, the NSW Heritage Branch (now Heritage NSW) arranged the seven heritage criteria into four groups (see below). The value of archaeological sources primarily lies in their research potential or the ability to provide additional information about site/item that is not contained in historical records. The assessment of archaeological research potential is augmented by additional three questions posed by Bickford and Sullivan⁴². The following significance assessment of the proposal footprint's potential archaeological remains has been carried out by using these criteria as outlined in the *Assessing Significance for Historical Archaeological Sites and 'Relics'*.

6.5.1 NSW Heritage criteria for assessing significance related to archaeological sites and relics

6.5.1.1 Archaeological research potential (NSW Criterion E)

Archaeological evidence of the former phases of the proposal footprint is unlikely to possess significant research potential. Potential archaeological remains are unlikely to survive with a high degree of integrity and are unlikely to provide any additional information about the past. The low research potential of the potential archaeological resources within the proposal footprint has been demonstrated by the results of previous investigations in the area.

Generally, the potential archaeological remains identified by this assessment **would not reach the local significance threshold under this criterion.**

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

Potential remains associated with Phase 3, namely remains associated with former road surfaces and kerbing from the late nineteenth century may be significant at a local level if located intact and *in situ*, due to their association with the historical development of the suburb of Haberfield, particularly by Richard Stanton. Although the formalisation of Iron Cove Creek into a canal has historical significance, archaeological remains associated with this such as reclamation fills and isolated artefacts are unlikely to reach the threshold of significance at a local level as they are either unlikely to remain *in situ* or would not have a strong association with the canal itself.

It is expected that only more intact and substantial archaeological remains from Phase 3, such as evidence of former road surfaces and kerbing, **might reach the local significance threshold under this criterion.**

6.5.1.3 Aesthetic of technical significance (Criterion C)

Archaeological remains of the former phases of the proposal footprint are unlikely to demonstrate aesthetic characteristics and/or a high degree of creative or technical achievement in the local area.

Archaeological remains are would not reach the local significance threshold under this criterion.

6.5.1.4 Ability to demonstrate the past through archaeological remains (Criteria A, C, F & G)

It is expected that potential archaeological remains from Phase 1 and 2 would be largely ephemeral and therefore would not be able to effectively demonstrate the past. Similarly, archaeological remains of reclamation fills and isolated artefacts from Phase 3 would have little to no ability to demonstrate

⁴² Anne Bickford and Sharon Sullivan, 'Assessing the Research Significance of Historic Sites', in *Site Surveys and Significance in Australian Archaeology*, ed. Sharon Sullivan and Sandra Bowdler (Canberra: Research School of Pacific Studies, ANU, Canberra, 1984), 19–26.

the use and formalisation of the canal. Evidence of former road surfaces and kerbing from Phase 3 however would be able to demonstrate the initial establishment and development of the suburb of Haberfield in the late nineteenth century.

It is expected that only more intact and substantial archaeological remains from Phase 3, such as evidence of former road surfaces and kerbing, **might reach the local significance threshold under this criterion.**

6.5.2 Bickford and Sullivan's questions

- *Can the site contribute knowledge that no other resource can?*

It is not anticipated that the proposal footprint will contain an archaeological resource with the potential to provide data that is particularly significant, unique, highly intact, or that may not be better obtained from other sites.

- *Can the site contribute knowledge that no other site can?*

The site has limited potential to contribute knowledge that no other site can. In-ground evidence of former road surfaces and agricultural activities are common and have limited research potential.

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

The information that may be obtained from the archaeological resource within the proposal footprint is unlikely to contribute knowledge relevant to substantive questions relating to Australian history or other major research questions.

6.6 Summary of historical archaeological potential and significance

The previous archaeological investigations undertaken within HAMU 10 for the WestConnex project identified no archaeological remains around Waratah Street, and there are no known substantial developments in Haberfield HCA in the locations of the proposed works. As a result, it is not expected that substantial and significant archaeological remains would be present within the proposed development. Potential archaeological remains within the conservation area would likely be limited to evidence of former road surfaces or kerbing, or non-significant fills, deposits and isolated artefacts.

Given the ephemeral nature of potential archaeological remains from Phase 1 and 2, it is assessed that the archaeological potential of these phases is generally nil and nil to low, and that the archaeological remains would not reach the threshold of local significance. Although there is high potential for archaeological remains of artefact bearing reclamation fills associated with Iron Cove Creek, the artefact deposits are likely to be isolated and not *in situ*, and therefore these deposits generally would not reach the threshold of local significance. While remains of former road surfaces and kerbing associated with the subdivision and establishment of the suburb in Phase 3 may reach the threshold of local significance, it is assessed that there is generally low potential for substantial and intact remains to be present. It is noted that archaeological remains of this type would be limited to archaeological 'works' and not 'relics' as defined by the 'relics' provisions of the Heritage Act.

A summary of the archaeological potential and significance of the resources associated with each phase of the proposal footprint's land use is summarised in Table 5 below.

Table 5: Historical archaeological potential and significance

Phase	Anticipated remains	Potential for survival	Significance
Phase 1 (1803-1825)	Evidence of land clearing activities or informal land use, such as tree bowls, isolated artefacts, or postholes	Nil	Nil
Phase 2 (1825-1883)	Evidence of land clearing activities, informal land use or evidence of gardening, such as tree bowls, isolated artefacts, postholes, archaeobotanical remains	Nil to low	Nil
Phase 3 (1883-1960s)	Evidence of former road surfaces, kerbing, drainage	Low	Local ('works')
	Artefact bearing land reclamation fills	High	Nil
Phase 4 (1960s-present)	Nil	Nil	Nil

7.0 THE PROPOSED WORKS

7.1 The proposed works

7.1.1 The proposal

Transport for NSW proposes to construct a pedestrian bridge over Wattle Street/Dobroyd Parade at Waratah Street and upgrade the surrounding road infrastructure. The location of the proposal is shown in a render in Figure 29 and an overview of the proposal is shown in Figure 30. Construction of the proposal may be staged, so work impacts on the operation of the CWL and surrounding residences are minimised.

No property would be acquired under the proposal. The additional land needed to support construction would either be leased or used under agreement with Inner West Council.

7.1.1.1 Pedestrian bridge

A new pedestrian bridge would be constructed across Wattle Street/Dobroyd Parade at Waratah Street. The bridge would span 37 metres across 7 lanes of traffic with a deck width of 2.3 metres between handrails. The bridge would feature lift and stair structures at either end for accessibility, running northwest to southeast. The southern support column and lift structure would be situated on the northern corner of Waratah Street and Dobroyd Parade and the northern support column and lift structure would be situated on the eastern banks of Iron Cove Creek alongside Wattle Street.

The proposed bridge would be a tied arch structure with a roof, supported by cantilever support beams off the lift shafts on either end. The northern side of the bridge would feature a three flight staircase above the existing footpath and an accessibility ramp from the lower lift landing to comply with flood constraints. The southern side of the bridge features a lift structure positioned to avoid clashes with TCS and VMS pits and cables in the vicinity and a stair structure placed similarly with the entrance in a desirable location for pedestrians on the footpath.



Figure 29: Bridge concept design (Source: Stantec, 2023)

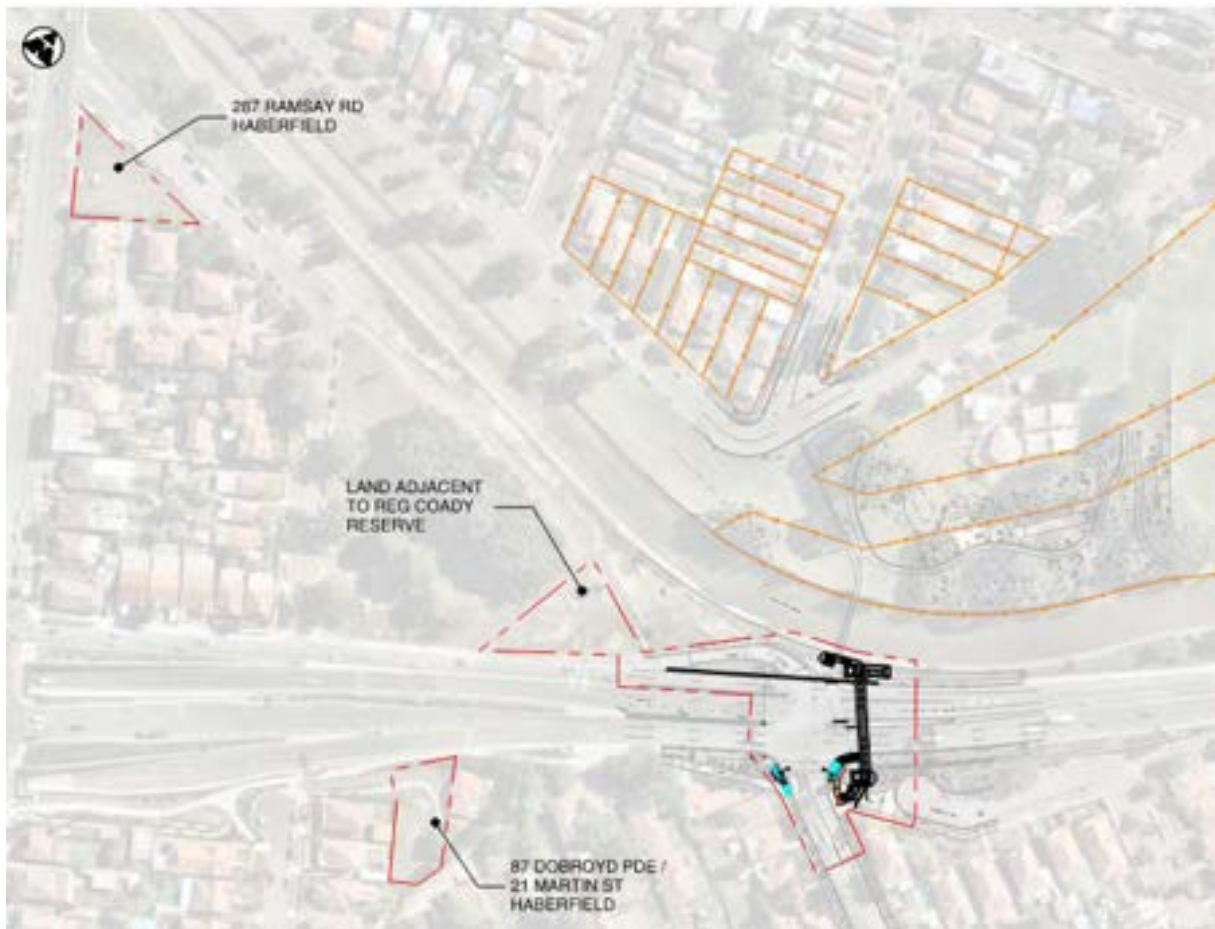


Figure 30: Proposed footprint of the proposal (Source: Stantec, 2023)

7.1.1.2 Road upgrades

The road works at the Wattle Street, Dobroyd Parade and Waratah Street intersection would feature the removal of the on-grade pedestrian crossing, widening of the existing footpaths, provision of street furniture, tree planting, and new signage and linemarking to delineate the shared nature of the path and bridge.

The proposal would feature a concrete barrier on the northern side of the intersection. This would act as a protective measure against collisions to the lift shaft and ramp on the northern side and to encourage use of the pedestrian bridge. The pedestrian crossing at Waratah Street is proposed to be upgraded to a shared crossing. These design features are shown in Figure 29.

7.1.1.3 Ancillary facilities

A temporary site compound would be located in one of three locations. These are: 287 Ramsay Rd Haberfield, 87 Dobroyd Parade/21 Martin St Haberfield, and the lot adjacent to Reg Coady Reserve near the existing G-loop location. The compound would be used as a material storage area. The area would only use the grass area of the lots with no tree clearance required. The area would be fenced off and tree protection would be used to ensure trees adjacent to the compound area are not harmed.

7.1.2 Proposal stages

The proposal would be built under TfNSW specifications as managed by the contractor under a Construction Environmental Management Plan (CEMP). The specification included in the CEMP would cover factors such as environmental performance and management, materials storage and management, and water quality.

The proposal would most likely comprise a sequence of work activities similar to that summarised in Table 6 below.

Table 6: Staging plan for the proposal (Source: Stantec, 2023)

Stage	Activity	Associated Work
1	Site establishment	<ul style="list-style-type: none"> Establishment of a temporary site compound (erect site offices, amenities, and plant/material storage areas etc.). Temporary fencing around site compound areas and other locations. Traffic control measures (for pedestrians and vehicles) would be established in accordance with a traffic management plan (TMP). Environmental controls would be established in accordance with the CEMP
2	Clearing for earthworks and foundation treatment	<ul style="list-style-type: none"> The area in the vicinity of the proposed footbridge, lift and stairs would need to be cleared of any vegetation and existing pavement. Piles and foundation treatments for the footbridge, stairs, and lift pits on either side of the bridge would be undertaken behind traffic barriers during day shift hours (7am – 5pm). Temporary barriers are to be provided along the northbound side of CWL to maintain access to the existing G-loop if required for access during construction.
3	Relocation and adjustment of utility assets	<ul style="list-style-type: none"> Relocation of TCS cabinets / controllers on Waratah St and adjustment of utility assets (particularly levels for various pits) would be required prior to any path or bridge works. This includes adjustment of the existing plinth and TCS cabinet on the southern side of Waratah St. The path and associated utility works can take place behind temporary traffic barriers.
4	Construction of footbridge deck	<ul style="list-style-type: none"> Following the foundation works, construction of the bridge would involve the following major stages: <ul style="list-style-type: none"> Ground works for bridge lift pit and construction of the bridge column support to be carried out behind traffic barriers during day shift hours (7am – 5pm) Lift single span precast bridge deck into place from the road corridor. This would require full road closure and must be undertaken as night works. Installation of bridge furniture including balustrades, canopy, and screens.
5	Bridgeworks and construction of lifts and stairs	<ul style="list-style-type: none"> Following bridge lifting works, construction of the lift pit and shaft, stairs, ramp, and footpaths on either side of the bridge can take place behind temporary traffic barriers. Continued traffic control may be required during these works to allow for materials to be transported to and from site.

Stage	Activity	Associated Work
6	Waratah Street works	<ul style="list-style-type: none"> Following completion of the southern bridge works, installation can be undertaken of widened path on southern side of Waratah St, kerb ramp on northern side, pedestrian fence, and road furniture. Installation of bicycle pavement marking on both sides of Waratah St would require closure of the affected lanes, and thus is suggested to be completed across two-night shifts, one for each side of the road.
7	Concrete barrier installation	<ul style="list-style-type: none"> Installation of the permanent concrete barrier and crash cushion along CWL northbound can be completed following completion of the bridge works and associated stairs, ramp, and footpath on the northern side of the bridge, as well as removal of the G-loop.
8	Removal of the existing on-grade crossing	<ul style="list-style-type: none"> Following completion of other works, removal of the existing on-grade crossing at City West Link would be required. It is suggested that this be completed in two stages each comprising a night shift: <ul style="list-style-type: none"> Closure of CWL northbound lanes – infill existing kerb ramps across CWL northbound and provide new kerb to match existing. Mill and re-sheet road pavement to remove existing crossing line marking along northbound lanes. Remove the existing pedestrian fence across median and reinstate to block any potential crossing. Closure of CWL southbound lanes - infill existing kerb ramps across CWL southbound and provide new kerb to match existing. Mill and re-sheet road pavement to remove existing crossing line marking along southbound lanes.
9	Site clean up	<ul style="list-style-type: none"> The site would be cleaned up and restored to its previous state. Temporary structures would be removed.

7.1.3 Project justification

The new pedestrian bridge is proposed in order to:

- Improve safety outcomes for local residents, pedestrians, cyclists and motorists in the area
- Improve safety and amenity for local residents and Dobroyd Point Public School in Waratah Street
- Reduce traffic noise on Dobroyd Parade by removing a set of traffic lights near the M4 Tunnels entry and exit
- Improve connections for pedestrians and cyclists between Haberfield and Reg Coady Reserve and Timbrell Park.

8.0 HERITAGE IMPACT ASSESSMENT

8.1 Overview

This section assesses the heritage impact of the proposed works on heritage values within the proposal area. The temporary compound options assessment has been separately discussed in section 8.1.3.

Within this approach, the objective of a heritage impact assessment is to evaluate and explain how the proposed works will affect the heritage value of the proposal area and/or place. A heritage impact assessment should also address how the heritage value of the site/place can be conserved or maintained, or preferably enhanced by the proposed works.

In order to consistently identify the impact of the proposed works, the terminology contained in the following table has been references throughout this document. The terminology and definitions are based on those contained in guidelines produced by the International Council on Monuments and Sites (ICOMOS)⁴³ and the Heritage Council of NSW⁴⁴ and are shown in Table 7 and Table 8.

This report also considers the risk of potential vibration impacts on heritage items. The A list of the vibration intensive plants expected to be used for this proposal and their recommended minimum working distances as identified in the Roads and Maritime Construction Noise and Vibration Guideline are outlined in Table 9.⁴⁵

Table 7: Terminology for assessing the magnitude of heritage impact

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

⁴³ Including the document Guidance on Heritage Impact Assessments for Cultural World Heritage Properties, ICOMOS, January 2011.

⁴⁴ NSW Heritage Office, 'Material Threshold Policy', Accessed Online 28 June 2023:

<https://www.environment.nsw.gov.au/resources/heritagebranch/heritage/material-threshold-policy.pdf>

⁴⁵ Roads and Maritime, 'Construction Noise and Vibration Guideline'. Roads and Maritime, 2016.

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

Table 8: Terminology for heritage impact types

Impact	Definition
Direct	Impacts resulting from works located within the curtilage boundaries of the heritage item.
Potential direct	Impacts resulting from increased noise, vibrations and construction works located outside the curtilage boundaries of the heritage item.
Indirect	Impact to views, vistas and setting of the heritage item resulting from proposed works outside the curtilage boundaries of the heritage item.
Archaeological	Impacts to potential archaeological remains located within the curtilage boundaries of the heritage item.

Table 9: Recommended minimum working distance from vibration intensive plant⁴⁶

Plant item	Rating / Description	Minimum working distance	
		Cosmetic damage (BS 7385) Light-framed structures	Cosmetic damage (DIN 4150) Heritage and other sensitive structures
Vibratory Roller	< 200kN (Typically 4-6 tonnes)	12m	33m
Small Hydraulic Hammer	(300kg - 5 to 12t excavator)	2m	5m
Pile Boring	≤ 800mm	2m (nominal)	40m

8.1.1 Haberfield HCA (Inner West LEP 2022 #C54)

8.1.1.1 Direct (physical) heritage impacts

The significance of the Haberfield HCA is primarily derived from the layout and planning of the suburb, characterised by wide streets with tree plantings and set back houses, and the character of the residential developments within the suburb⁴⁷. Whilst the works are located within the Haberfield HCA, they are located at the north-eastern edge within the road corridor. The fabric of the road surface itself and grass surface of the verges are not considered to be significant elements within the conservation area, or contribute to the overall significance. The proposed works do not require the demolition of existing buildings; therefore, the proposed works would not directly impact any of the buildings within the conservation area and would not modify the layout of the streetscape. The potential compound sites would be located in areas which are undeveloped and would be temporary

⁴⁶ Roads and Maritime, 'Construction Noise and Vibration Guideline'. Roads and Maritime, 2016:71.

⁴⁷ Inner West Council, 'Comprehensive Inner West DCP'.

in nature to store project work related materials, tools and plants and fenced off. Thus, there would be no permanent changes to the Haberfield HCA as a result of the proposed works.

Overall, it is assessed that the proposed works would result in **neutral** direct impacts to the Haberfield HCA.

8.1.1.2 Potential direct heritage impacts

Vibration intensive plant that would be required for the proposal are outlined in Table 9 and would include the use of a 6 tonne vibratory roller, a 5 tonne small hydraulic hammer, and a pile boring machine (<800mm). Works on the west side of Wattle Street would be outside of the recommended safe working distance from the nearest houses, however, works on the east side of Wattle Street would be within 20m of the houses within the conservation area. As a result, works would be undertaken within the minimum safe working distance for cosmetic damage and the vibrations associated with the proposed works could result in potential direct impacts caused by vibrations. Due to the relatively minor nature of the vibration intensive activities though, it is expected that any potential direct impacts resulting from vibrations would be minimal. Furthermore, the vibration intensive activities would only be undertaken in proximity to a very small section of the overall heritage item.

Overall, it is assessed that the proposed works would result in **negligible** potential direct impacts to the Haberfield HCA.

8.1.1.3 Indirect (visual) heritage impacts

Part of the significance of the conservation area is derived from the aesthetic appeal of the mature streetscapes. Works undertaken within the streetscape would be visible to traffic and pedestrians and therefore would result in a visual impact to the conservation area. The main elements of the proposal that would be visible and cause visual impacts in this area would be the lift and stair tower and the pedestrian bridge. The proposal would alter the scale and uniformity of Waratah Street and Dobroyd Parade terminating in the cul-de-sac across, which are predominantly of single storey scale. The flat roof of the lift and stair tower would be taller than the average single storey buildings in the vicinity. The proposal's scale and form are out of character for the wider Haberfield HCA, and views to and from Waratah Street towards the edge of the Haberfield HCA into the road corridor would be impacted.

The impacts however would be limited to small and localised areas, would be focussed on the peripheries of the conservation area at Waratah Street, and would not modify the overall layout of the streetscapes or impact any of the built structures, gardens, or tree plantings within the conservation area. While the streetscape of the suburb is significant, due to the later establishment of Wattle Street it is not considered to be a significant element of the HCA. There would be some minor interruption to views within the conservation area along Wattle Street and Iron Cove Creek, but further away from this area the bridge would be obscured by the surrounding residential properties, vegetation, and the alignment of the road. Along Dobroyd Parade views towards the bridge location are already largely obscured by the existing noise wall, with the bridge location only being visible from the cul-de-sac at the southern end of the road. Although the bridge would be out of scale and form with the character of the wider conservation area, a bridge of this design is consistent with similar major roads. As a result, while the bridge would result in minor adverse localised visual impacts along Wattle Street, and visual impact to the broader conservation area would be negligible.

Overall, it is assessed that the proposed works would result in **minor adverse** localised indirect (visual) impacts and **negligible** overall indirect impacts to the Haberfield HCA.

8.1.2 Dobroyd Stormwater Channel No 53 (s170 Sydney Water #4571056)

8.1.2.1 Direct (physical) heritage impacts

The curtilage of the item is defined by Sydney Water as being the stormwater channel bed, walls, and coping.⁴⁸ Although the proposal area does extend into the curtilage of the canal, the proposed pedestrian bridge works would be undertaken adjacent to the canal and would not modify the fabric of the canal itself. The proposed footings for the stair and ramp would be about 2m away from the edge of the canal. As a result, the proposed works would not result in any direct impacts.

Overall, it is assessed that the proposed works would result in **neutral** direct impacts to Dobroyd Stormwater Channel No 53.

8.1.2.2 Potential direct heritage impacts

The footings for the stair and ramp would be about 2m south of the edge of the canal. As a result, works would be undertaken within the minimum safe working distance for cosmetic damage and the vibrations associated with the proposed works could result in potential direct impacts caused by vibrations. Due to the relatively minor nature of the vibration intensive activities though, and given the canal is constructed of concrete and appears to be a stable structure, it is expected that any potential direct impacts resulting from vibrations would be minimal. Furthermore, the vibration intensive activities would only be undertaken in proximity to a very small section of the overall heritage item.

Overall, it is assessed that the proposed works would result in **negligible** potential direct impacts to Dobroyd Stormwater Channel No 53.

8.1.2.3 Indirect (visual) heritage impacts

Part of the significance of the canal is derived from its aesthetic value. In particular, it is noted that the visual curtilage of the item includes:

1) *Open sections of the channel from Iron Cove to Norton Street in Croydon*

5) *The downstream section of the channel is part of the cultural landscape of the Timbrell Park and the channel can be viewed from the Main Western Railway Line and bridges on Dobroyd Parade and Ramsey Street.*⁴⁹

The proposed works would be visible from the existing pedestrian bridge crossing the canal, portions of Timbrell Park and adjacent areas. The proposed stairs, lift tower and pedestrian bridge would be seen from Timbrell Park as there is a break in the existing tree cover that forms a visual barrier between the canal and park. The break in the tree cover is due to the existing small scale pedestrian bridge that crosses the canal between Timbrell Park and the pedestrian sidewalk at Wattle Street. Similarly, looking from Wattle Street towards the north the proposal would alter the view of the canal with Timbrell Park behind it, as it would obstruct the view of the cultural landscape mentioned in the significance statement. This visual impact would only occur in the vicinity of the proposal and within the established 100m buffer zone around the proposal. However, views of the cultural landscape further away than 100m from the proposal would not be visually impacted due to the form of the canal as it bends away from the proposal on either side. The curvature of the canal allows the proposal to be shielded behind tree cover and obscures sight lines to and from it at a distance. As a result, while the proposed works adjacent to the canal would result in a negative impact to the visual curtilage and

⁴⁸ Sydney Water, 1998, 'Dobroyd Canal Stormwater Channel No 53', <https://www.sydneywater.com.au/water-the-environment/what-we-are-doing/heritage-conservation/heritage-search.html>

⁴⁹ DPE, 'Dobroyd Stormwater Channel No 53'.

landscape setting of the heritage item, the impacts would be limited to small areas of the overall canal system and would not visually alter the canal itself. It is noted that the new vantage point from the pedestrian bridge would provide opportunities for better overhead views and interpretation of the canal.

Overall, it is assessed that the proposed works would result in **minor adverse** localised indirect (visual) impacts and **negligible** overall indirect impacts to the Dobroyd Stormwater Channel No 53.

8.1.3 Compound site options assessment

The three options for the temporary compound site have been assessed to narrow down the recommended site locations to minimise temporary indirect impacts to the heritage items.

All three compound site options are located within the Haberfield HCA. However, like the proposed pedestrian bridge all three locations are located on the periphery of the conservation area and would not be visible from the majority of the heritage item. The compound would only be temporary in nature, would be limited to use for material storage, and there would be no permanent changes to the setting of Haberfield HCA from it. As it would be temporary in nature and completely reversible, there would be no direct impacts. The proposed compound area options have varying indirect impacts which are assessed below.

8.1.3.1 Compound site option one

Compound site option one is located adjacent to the proposed location for the pedestrian bridge in the Wattle Street corridor on the edge of the Haberfield HCA. At its nearest point, it is located about 15m away from the Dobroyd Stormwater Channel No 53 heritage item and 30m away from the nearest residential building. As a result, the close proximity to the proposed pedestrian bridge site and the location away from the canal and residential blocks of the Haberfield HCA yield a well-suited site. It would temporarily cause negligible indirect impacts to the item.

8.1.3.2 Compound site option two

Temporary compound site option two is located well away from the Dobroyd Stormwater Channel No 53, however, it is within a residential block in the Haberfield HCA. Although the overall indirect impacts to the two heritage items would be negligible, its closer proximity to the houses within the Haberfield HCA heritage item would cause a localised temporary minor indirect impact to the item.

8.1.3.3 Compound site option three

Temporary compound site option three is located about 37m away from the Dobroyd Stormwater Channel No 53 heritage item. However, it is located at the edge of a residential block within the Haberfield HCA. Although the overall indirect impacts to the two heritage items would be negligible, its closer proximity to the houses within the Haberfield HCA heritage item would cause a localised temporary minor indirect impact to the item.

8.1.3.4 Summary

Overall, it is assessed that all three compound site options would cause no direct impacts and would cause temporary negligible indirect impacts to the overall heritage items. Compound site option one is the preferred location though as it collocates the compound with the proposal footprint and would have a reduced localised indirect impact compared to the other two options. The second preference would be compound site option three as its separation from the residential area is greater than that of compound site option two.

8.1.4 Cumulative impacts

Cumulative impacts refer to the combined impact of overlaid or added actions and interactions within a particular place associated with the past, present and the reasonably foreseeable future.

The Wattle Street corridor has developed from a two-lane road to a major intersection after multiple infrastructure developments. As the aerial images in Section 3.6 show the proposal area has undergone extensive change in recent years, notably major changes to the road corridor due to the WestConnex project. The WestConnex M4 East Environmental Impact Statement mentions the impacts to the heritage significance and cumulative impacts:

*The project would impact on the legibility of the original subdivision designed by Richard Stanton, evident in the existing street layout and the pattern of the freestanding and semi-detached houses. The project would effectively fragment the suburb, with the area north of Wattle Street separated from the remainder of the HCA, and interrupt the consistently-spaced street and subdivision pattern of this part of the HCA. The existing traffic volumes along Wattle Street have this effect on the conservation area to some degree, but the project would exacerbate the fragmentation and permanently remove a substantial portion of the built heritage items fronting Wattle Street. The proposed new landscaping around the Wattle Street interchange would not be consistent with the HCA's significant landscape character, which predominantly comprises brush box (*Lophostemon confertus*) street trees, and would also reinforce the motorway's fragmentation of the HCA.*

The proposed future stage of WestConnex (the M4–M5 Link) could potentially have further impacts on the Haberfield HCA. The proposed scope of works would include tunnels underneath the Haberfield HCA [sic] and, while detailed information is not yet available, further surface works and additional demolitions may be required for construction compounds. All ramps, interchanges, ventilation and ancillary facilities for the western end of the M4–M5 Link are being constructed as part of the project. This will avoid the need to undertake further works in the Haberfield HCA in association with key M4–M5 Link infrastructure. Given the major adverse impact of the project on the Haberfield HCA as assessed in this HIA, further impacts associated with the development of construction compounds for the M4–M5 Link may have a severe cumulative impact on its heritage significance. Therefore, if possible, further works within the Haberfield HCA should be avoided.⁵⁰

In comparison the proposal would not cause substantial impacts as it's footprint remains within the road corridor and does not require any further demolition of residential buildings, nor widening of the road. The proposal would cause additional indirect cumulative impacts to some of the key views through the introduction of a new pedestrian footbridge. However, it has been assessed the indirect impacts would be minor in the local area and negligible to the overall heritage item, which is relatively small degree of impact compared to the previous WestConnex project. As a result, the contribution of the proposal to cumulative impacts to setting of the Haberfield HCA is negligible, and consistent with the impacts assessed in the WestConnex EIS.

⁵⁰ GML Heritage, 2015, 'WestConnex M4 East Non-Aboriginal Heritage Impact Assessment' within the WestConnex M4 East Environmental Impact Statement Appendices S-W Volume 2H.

8.1.5 Impacts to archaeological resources

The proposed works would involve excavation activities. If any intact historical archaeology is present within the excavation areas the proposal would result in physical impacts to surviving archaeological resources. However, it has been assessed that the potential for locally significant archaeological remains within the proposal footprint would likely be limited to evidence of former sandstone road surfaces and kerbing (Phase 3), for which it has been assessed that there is low potential. While it has been assessed that there is high potential for artefact bearing reclamation fills and deposits (Phase 3), it has been assessed that evidence of this generally would not reach the threshold of local significance. Therefore, given the relatively low archaeological potential and the fact that the ground disturbing works would largely be undertaken within and adjacent to the road corridor, it is expected that any impacts to potential significant archaeological remains would be negligible, and that this would be limited to archaeological 'works'.

8.1.6 Statement of heritage impact

A statement of heritage impact has been prepared according to NSW Heritage Office guidelines in Table 10 below.

Table 10: Statement of heritage impact for the proposal

Development	Discussion
<p>What aspects of the Proposal respect or enhance the heritage significance of the proposal area?</p>	<ul style="list-style-type: none"> The proposed pedestrian bridge would primarily be located within the road corridor, footpath and verge areas of Wattle Street which is not considered to be an element of significance within the Haberfield Conservation Area. As a result there would be no direct impacts to the heritage item The proposed pedestrian footbridge would primarily only be visible along Wattle Street and would not be visible from the majority of the Haberfield Conservation Area The proposed compound sites would be temporary in nature and would be resolved following the completion of the works. Temporary compound option one has the least amount of impact out the options and is recommended to mitigate the temporary indirect impacts and respect the heritage significance of the heritage items identified There would be no impacts to the overall heritage significance of Haberfield Conservation Area or Dobroyd Stormwater Channel Mitigation measures have been recommended in Section 9.3 to respect the heritage significance of the heritage items identified
<p>What aspects of the Proposal could have a detrimental impact on the heritage significance of the proposal area?</p>	<ul style="list-style-type: none"> The proposed works would cause minor localised visual impacts to the Haberfield Conservation Area and Dobroyd Stormwater Channel, however the visual impacts to the wider heritage items would be negligible The proposed works may cause impacts to archaeological remains, however, the potential for significant archaeological remains is considered to be low, is expected to be limited to archaeological 'works', and the overall impact would be negligible
<p>Justification for impact</p>	<ul style="list-style-type: none"> The proposed works are required to improve road and pedestrian access and safety along Wattle Street. On balance, the benefits derived from proceeding with the proposal are considered to outweigh the impacts.

9.0 CONCLUSION

9.1 Conclusion

This SoHI has found the following:

- The proposed works are within the heritage curtilage of Haberfield HCA (#C54) which is listed on the Inner West LEP 2022
- The proposed works are located within Dobroyd Stormwater Channel No 53 (#4571056) which is listed on the Sydney Water s170 Heritage and Conservation Register
- The proposed works would result in a neutral direct, negligible potential direct, and minor adverse localised indirect (visual) but negligible overall indirect impacts to Haberfield HCA and Dobroyd Stormwater Channel No 53
- Temporary compound option one is the preferred option due to its location outside of the residential areas within the Haberfield HCA
- Given the ephemeral nature of potential archaeological remains from Phase 1 and 2, it is assessed that the archaeological potential of these phases is generally nil to low, and that the archaeological remains would not reach the threshold of local significance
- While remains of former road surfaces and kerbing associated with the subdivision and establishment of the suburb in Phase 3 may reach the threshold of local significance
- The proposed works would result in negligible impacts to potential archaeological remains if present, however, the impacts are expected to be limited to archaeological 'works' and not 'relics'.

9.2 Approval pathway

This assessment has concluded that the proposed works would not cause impacts that are more than minor in nature to Haberfield HCA (Inner West LEP 2022 #C54) or Dobroyd Stormwater Channel No 53 (Sydney Water s170 #4571056). As a result, the proposal is consistent with the general requirements for exempt development under Part 2.2 Section 20 of the TISEPP. Therefore, consultation in regard to heritage impacts is not required with the Inner West Council.

It has been assessed that significant archaeological remains within the impact footprint are likely to be limited to archaeological 'works'; and no impacts to archaeological 'relics' are expected. Therefore, an exception under Section 139 (4) of the Heritage Act would not be required for the proposed works.

9.3 Recommendations and mitigation measures

- The works should be managed in accordance with Transport for NSW's Unexpected Heritage Finds Guideline⁵¹
- Prior to commencing works all staff and contractors must be provided with a heritage induction to make them aware of the heritage items and heritage implications of the proposed works

⁵¹ Transport for NSW. 'Unexpected Heritage Finds Guideline'. Sydney: Transport for NSW, 2019.

- It is unlikely that the vibrations associated with the proposed works would result in direct impacts to the heritage items. However, to further minimise the risk of vibration impacts the following mitigation measures should be implemented:
 - Determine safe working limits based on proposed plant, and where possible, the smallest plant able to carry out required work should be utilised to minimise potential impacts. Where works are proposed within the safe working limits for the heritage structures, specialist advice must be sought from an appropriately qualified structural engineer who is familiar with heritage structures to assess if vibrations associated with the proposed works will potentially result in impacts to heritage structures
 - A vibration monitoring plan is to be prepared as part of the Construction Noise and Vibration Management Plan where works are proposed within safe working limits, and implemented to confirm vibration levels prior to construction commencement. Where exceedances are recorded, works should be modified in consultation with the identified specialist to reduce vibration levels
 - Assessment and monitoring of vibration impacts to heritage items within the safe working limits should adhere to:
 - British Standard BS 7385: *Part 2: Evaluation and Measurement for Vibrations in Buildings – Part 2 Guide to Damage Levels from Ground-Borne Vibration*
 - German Standard DIN 4150, *Part 3: Structural Vibration in Buildings: Effects on Structures*
 - If vibration monitors are attached to the heritage items, they must not be attached with permanent fixings. They should be removable without causing damage. Bees wax may be a suitable attachment method
- A copy of this report should be submitted to Inner West Council and Sydney Water for their records
- If works other than those discussed in this report are proposed, then additional assessment would be required to assess the impacts.

10.0 REFERENCES

- AMBS. *WestConnex M4 East: Historical Archaeological Investigations, Volume 1. Prepared for CPB Samsung John Holland Joint Venture*. Camperdown: AMBS, 2019.
- Attenbrow, V. *Sydney's Aboriginal Past: Investigating the archaeological and historical records*. Randwick: UNSW Press, 2010.
- Bickford, Anne., Sullivan, Sharon., 'Assessing the Research Significance of Historic Sites', in *Site Surveys and Significance in Australian Archaeology*, ed. Sharon Sullivan and Sandra Bowdler (Canberra: Research School of Pacific Studies, ANU, Canberra, 1984).
- GML Heritage. *WestConnex M4 East Non-Aboriginal Heritage Impact Assessment. Prepared for WestConnex Delivery Authority*. Surry Hills: GML Heritage, 2015.
- Haberfield Association, The, n.d. 'The Dobroyd Estate'. Accessed online 28 June 2023 at: <https://haberfield.asn.au/dobroyd-estate/>.
- ICOMOS. *Guidance on Heritage Impact Assessments for Cultural World Heritage Properties*. Paris: ICOMOS, 2010.
- Inner West Council. 2016. 'Comprehensive Inner West DCP'. Accessed online 28 June 2023: <https://www.innerwest.nsw.gov.au/develop/plans-policies-and-controls/development-controls-lep-and-dcp/development-control-plans-dcp/ashfield-dcp>
- Jackson-Stepowski, S., 2008. 'Haberfield.' *Dictionary of Sydney*. Accessed online 28 June 2023 at: <https://dictionaryofsydney.org/entry/haberfield>.
- Karskens, G., 2009. *The Colony a History of Early Sydney*.
- Matthews and Everitt, 1900. The Organisation, Language and Initiation Ceremonies of the Aborigines of the South-East Coast of NSW, *Journal and Proceedings of the Royal Society of NSW*, 34: 262-281.
- NSW DPE. 'Dobroyd Stormwater Channel No 53'. Accessed 28 June 2023: <https://www.hms.heritage.nsw.gov.au/App/Item/ViewItem?itemId=4571056>.
- NSW DPE. 'Iron Cove Foreshore Drive'. Accessed 28 June 2023: <https://www.hms.heritage.nsw.gov.au/App/Item/ViewItem?itemId=2891078>.
- NSW Heritage Office, 'Material Threshold Policy', Accessed Online 28 June 2023: <https://www.environment.nsw.gov.au/resources/heritagebranch/heritage/material-threshold-policy.pdf>.
- NSW Heritage Office. *'Archaeological Assessment Guidelines'*. Sydney: 1996.
- NSW Heritage Branch. *'Assessing Significance for Historical Archaeological Sites and 'Relics''*. Sydney: 2009.
- People Australia, n.d. 'Ramsay, Sarah Ann (1806-1889).' *People Australia*. Accessed online 28 June 2023 at: <http://peopleaustralia.anu.edu.au/biography/ramsay-sarah-ann-23102>.
- Roads and Maritime, 2016. *Construction Noise and Vibration Guideline*.
- Transport for NSW. 'Unexpected Heritage Finds Guideline'. Sydney: Transport for NSW, 2019.



artefact

Artefact Heritage
ABN 73 144 973 526
Suite 56, Jones Bay Wharf
25-32 Pirrama Road
Pyrmont NSW 2009 Australia
+61 2 9518 8411
office@artefact.net.au
www.artefact.net.au

Appendix F – Stage 1 of the Procedure for Aboriginal Cultural Heritage Consultation and Investigation (PACHCI)

29th August 2023

Jessica Chen,
Project Manager

Dear Jessica,

Preliminary assessment results for Pedestrian Bridge – City West Link at Waratah Street Intersection based on Stage 1 of the *Procedure for Aboriginal cultural heritage consultation and investigation* (the procedure).

The project, as described in the Stage 1 assessment checklist was assessed as being unlikely to have an impact on Aboriginal cultural heritage.

The assessment is based on the following due diligence considerations:

- The project is unlikely to harm known Aboriginal objects or places.
- The AHIMS search did not indicate moderate to high concentrations of Aboriginal objects or places in the study area.
- The study area does not contain landscape features that indicate the presence of Aboriginal objects, based on the Office of Environment and Heritage's *Due diligence Code of Practice for the Protection of Aboriginal objects in NSW* and the Roads and Maritime Services' procedure.
- The cultural heritage potential of the study area appears to be reduced due to past disturbance.
- There is an absence of sandstone rock outcrops likely to contain Aboriginal art.

Your project may proceed in accordance with the environmental impact assessment process, as relevant, and all other relevant approvals.

If the scope of your project changes, you must contact The Aboriginal Engagement Section, Greater Sydney Region, and your regional environmental staff to reassess any potential impacts on Aboriginal cultural heritage.

If any potential Aboriginal objects (including skeletal remains) are discovered during the course of the project, all works in the vicinity of the find must cease. Follow the steps outlined in the Roads and Maritime Services' *Unexpected Heritage Finds Procedure*.

For further assistance in this matter do not hesitate to contact me.

Yours sincerely,

Roads and Maritime Services

A handwritten signature in cursive script, appearing to read 'Corrine Quinlan', written in a light grey or blue ink.

Corrine Quinlan
Aboriginal Cultural Heritage Advisor – Greater Sydney Region

Appendix G – Flood Impact Assessment

To:	Travis Sone Guy Charmichael	From:	Eric Lin, Stantec Charles Li, Stantec
File:	Dobroyd Pedestrian Bridge upgrade Flood Impact Assessment	Date:	19 April 2023

INTRODUCTION

As a part of the Dobroyd Parade Intersection Improvements Project, a new shared path bridge over Dobroyd Parade was proposed to provide connectivity to Timbrell Park. Given the bridge is likely located on the overland flow path during a major flood event, a Flood Impact Assessment (FIA) was required to assess the changes of flood levels and hazards as a result of the proposed structure.

HYDRAULIC MODELLING

OVERVIEW

The hydraulic model was built in TUFLOW package and provided by TfNSW (Dated 09 Sept 2022, Rev_C-DCD) to Stantec for the purpose of assessing the impact of the proposed bridge design. It is noted that the TUFLOW model version was 2011-09-AD. It was identified that the provided hydraulic model for the existing scenario had several discrepancies comparing to the current aerial image and site survey. As such, a few modifications were incorporated to the hydraulic model for existing conditions to fit for the purpose of this study:

- > Topographic survey around the project area was overlaid (15 Sep 2022) on previous Model Terrain file (last updated in May 2019)
- > Road gutters and kerbs near the project area were modified based on the survey and aerial image of Wattle St
- > A noise wall was included using a thin z line to block the overland flows
- > Inflow locations using 2d_sa_all were rearranged to ensure the overland flows are placed and routing at upstream of the proposed structures where appropriate

For the design conditions modelling, raised pedestrian crossing structures that potentially impact the overland flows were incorporated based on the 80% design plan, including bridge columns and footings. Refer to **Figure 1**.

Reference: Dobroyd Pedestrian Bridge upgrade Flood Impact Assessment

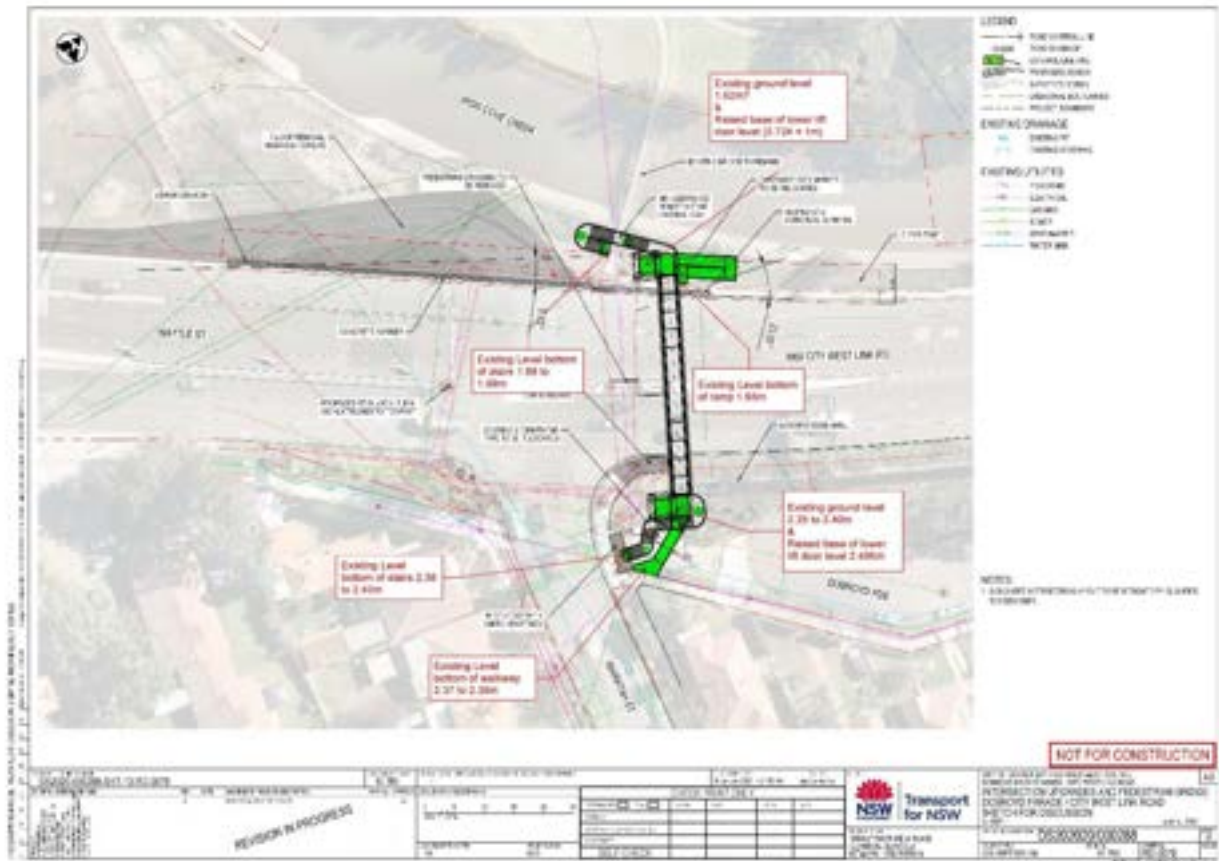


Figure 1 Dobroyd Bridge 80% Design Plan

EXISTING CONDITIONS

Figure 2 shows the modelled 1% AEP Flood Depth for existing conditions. The velocity arrows indicate overland flows draining from north and south along the Wattle Street converge at the intersection of Waratah Street and overtop the Wattle Street flowing towards the Iron Cove Creek. Existing modelling result showed there is minimal flow overtopping the kerb at the end of Dobroyd Parade, resulting in a very shallow depth of 0.02 m. The maximum flood depth to the north of Wattle Street at where the bridge footings are proposed is 0.58 m. The maximum water level is 2.12 m AHD within this area.

March 14, 2023

Recipient Name

Page 3 of 6

Reference: Dobroyd Pedestrian Bridge upgrade Flood Impact Assessment

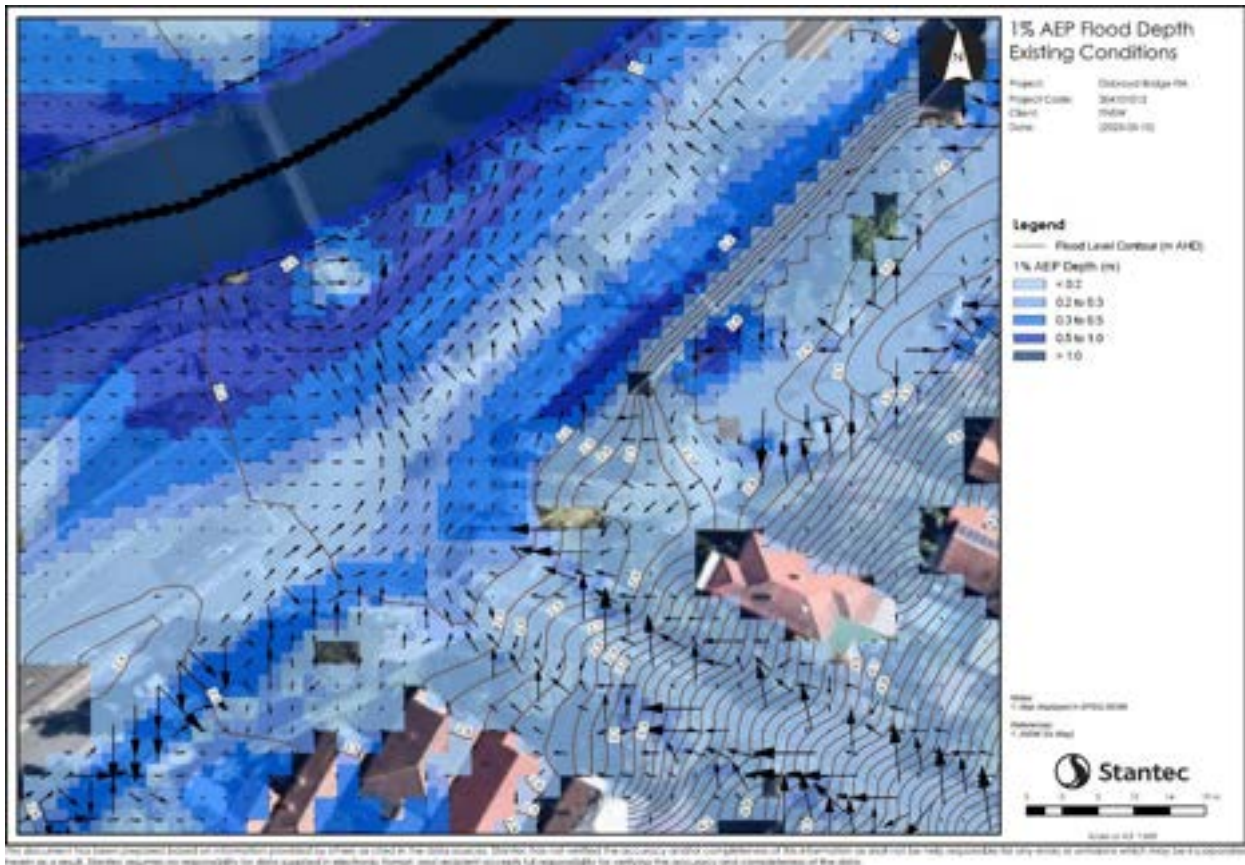


Figure 2 Existing Conditions - 1% AEP Flood Depth

DESIGN CONDITIONS

Figure 3 shows the max depth results with bridge footings and columns incorporated. The depth backing up at the ramp is increased from 0.58 m to 0.6 m.

Reference: Dobroyd Pedestrian Bridge upgrade Flood Impact Assessment

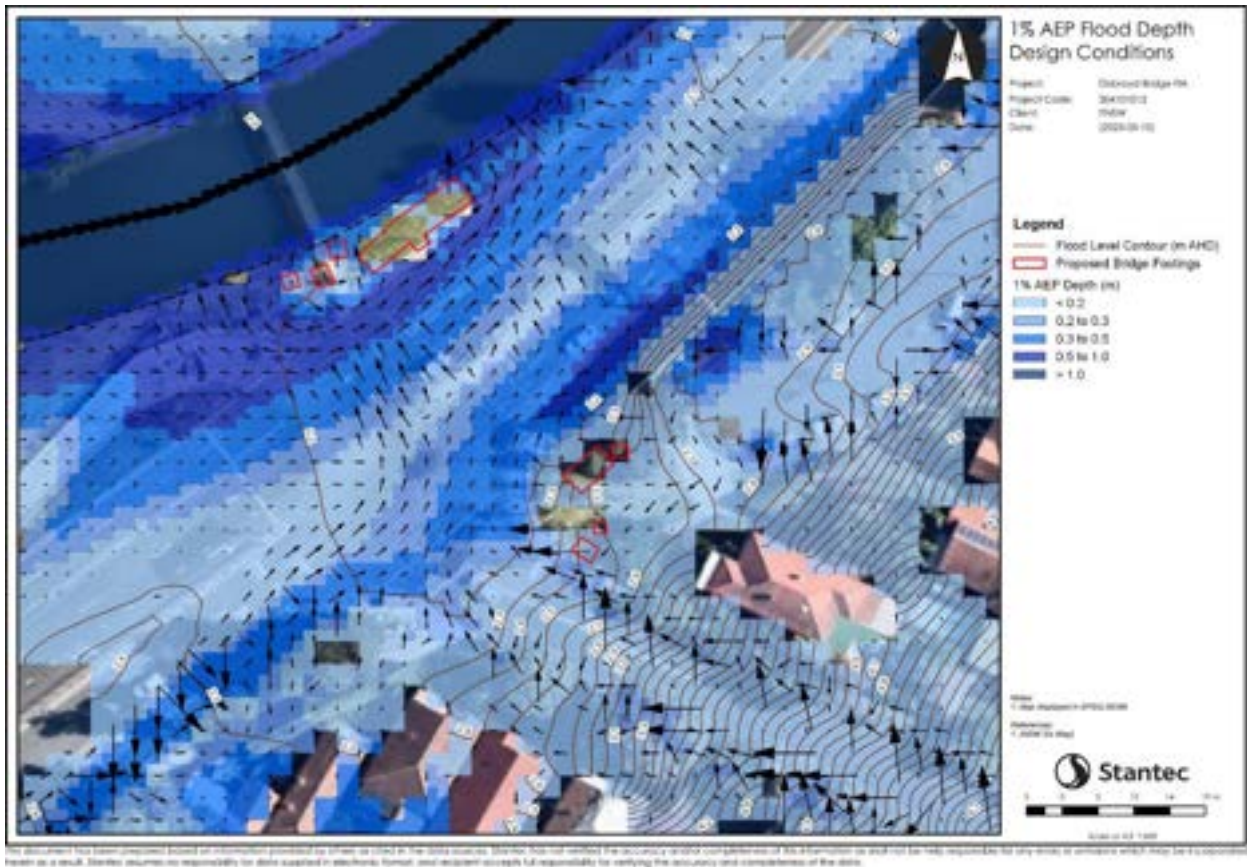


Figure 3 Design Conditions - 1% AEP Flood Depth

CHANGE IN FLOOD LEVELS

The afflux plot (Figure 4) shows the water level difference using the water level for design conditions minus existing conditions. Orange shading shows increase in flood levels while green shading shows decrease. Both orange areas at south and north suggest the increase in flood levels are approximately average in 0.02 m as results of proposed bridge structures.

It is noted that afflux at a small area near the southern abutment is 0.1 m. However, the water depths are within the allowable overland flow tolerance (no greater than 0.2 m). As such, this afflux is considered acceptable, and the remainder of this report will focus on the flood impact at northern bridge footing footprint.

Reference: Dobroyd Pedestrian Bridge upgrade Flood Impact Assessment



Figure 4 1% AEP Flood Level Difference - Design less Existing

FLOOD HAZARD

The flood hazard based on ARR2019 classification is shown for existing (left) and design (right) conditions in Figure 5. Flood hazard generally remains the same, with only minor localised increase near the north part of the bridge.

Reference: Dobroyd Pedestrian Bridge upgrade Flood Impact Assessment

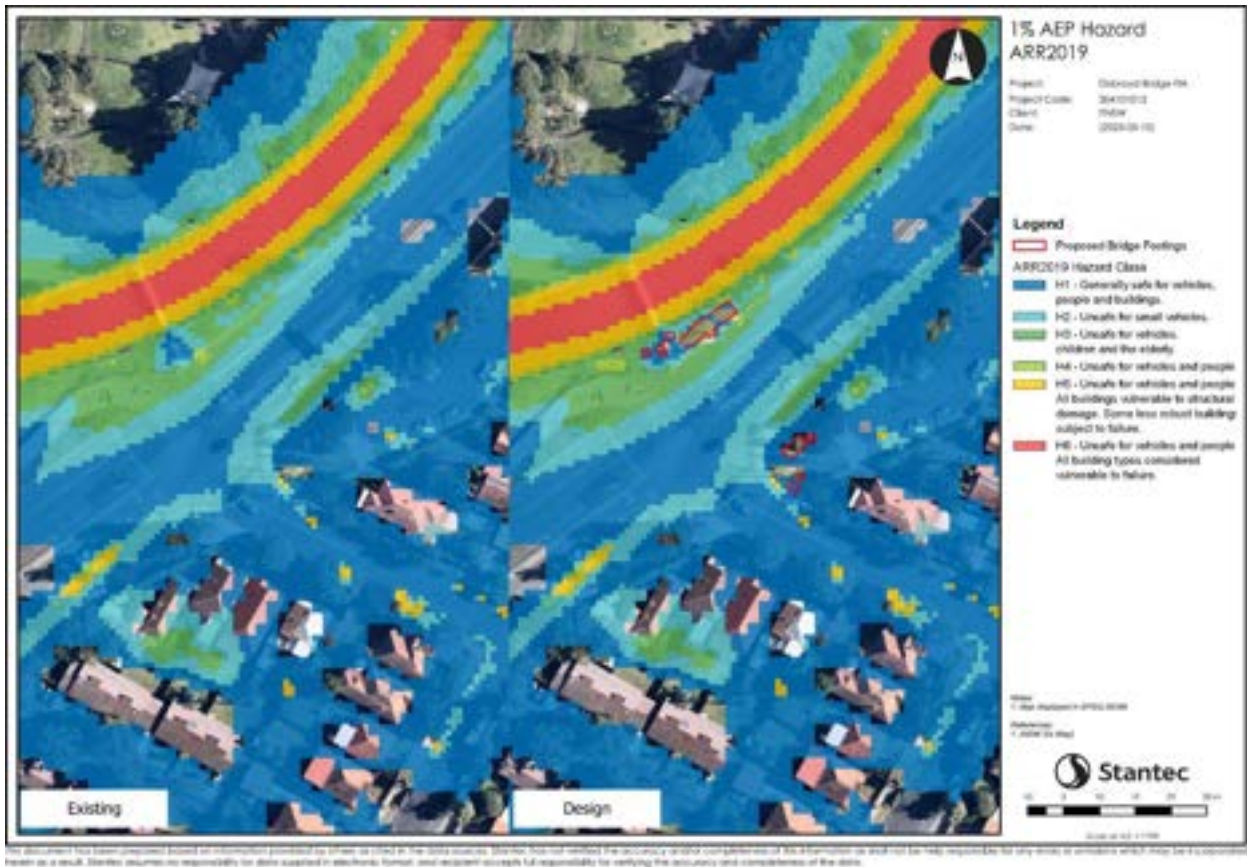


Figure 5 1% AEP Flood Hazard (ARR2019 Classification)

CONCLUSION AND RECOMMENDATION

The Flood Impact Assessment of the 80% proposed pedestrian bridge concept design at Dobroyd Parade was undertaken using the TfNSW provided TUFLOW model. The flood depth difference results suggested a minor localise increase in flood levels (maximum 0.02 m) at the northern pedestrian bridge abutment adjacent to the Iron Cove Creek riverbank.

The localised impacts on the 1% AEP flood levels and velocities occurred away in the road reserve where there are no properties and are considered to be negligible. Therefore, mitigation measures are not recommended at this stage.

Appendix H – Desktop Search Results including Biodiversity and Aboriginal Heritage Information Management Systems

Cardno (NSW) Pty Ltd - St Leonards

Date: 02 August 2023

PO Box 19

St Leonards New South Wales 1590

Attention: Belinda Crichton

Email: belinda.crichton@cardno.com.au

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lat, Long From : -33.8741, 151.1359 - Lat, Long To : -33.8729, 151.1378, conducted by Belinda Crichton on 02 August 2023.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of Heritage NSW AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	Aboriginal sites are recorded in or near the above location.
0	Aboriginal places have been declared in or near the above location. *

If your search shows Aboriginal sites or places what should you do?

- You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.
- If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.
- You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the [NSW Government Gazette \(https://www.legislation.nsw.gov.au/gazette\)](https://www.legislation.nsw.gov.au/gazette) website. Gazettal notices published prior to 2001 can be obtained from Heritage NSW upon request

Important information about your AHIMS search

- The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not to be made available to the public.
- AHIMS records information about Aboriginal sites that have been provided to Heritage NSW and Aboriginal places that have been declared by the Minister;
- Information recorded on AHIMS may vary in its accuracy and may not be up to date. Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,
- Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.
- Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.
- This search can form part of your due diligence and remains valid for 12 months.

Family	Scientific Name	Common Name	BC Act	EPBC Act	Records
Amphibia					
Hylidae	<i>Litoria aurea</i>	Green and Golden Bell Frog	E	V	8
Aves					
Accipitridae	<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle	V	-	9
Apodidae	<i>Apus pacificus</i>	Fork-tailed Swift	P	C,J,K	1
Ardeidae	<i>Botaurus poiciloptilus</i>	Australasian Bittern	E	E	1
Artamidae	<i>Artamus cyanopterus cyanopterus</i>	Dusky Woodswallow	V	-	2
Burhinidae	<i>Burhinus grallarius</i>	Bush Stone-curlew	E	-	3
Charadriidae	<i>Pluvialis fulva</i>	Pacific Golden Plover	-	C,J,K	14
Charadriidae	<i>Pluvialis squatarola</i>	Grey Plover	-	C,J,K	1
Columbidae	<i>Ptilinopus superbus</i>	Superb Fruit-Dove	V	-	3
Haematopodidae	<i>Haematopus longirostris</i>	Pied Oystercatcher	E	-	1
Laridae	<i>Hydroprogne caspia</i>	Caspian Tern	-	J	1
Laridae	<i>Sterna hirundo</i>	Common Tern	-	C,J,K	7
Laridae	<i>Sternula albifrons</i>	Little Tern	E	C,J,K	1
Laridae	<i>Thalasseus bergii</i>	Crested Tern	-	J	13
Meliphagidae	<i>Anthochaera phrygia</i>	Regent Honeyeater	CE	CE	1
Petroicidae	<i>Petroica boodang</i>	Scarlet Robin	V	-	1
Petroicidae	<i>Petroica phoenicea</i>	Flame Robin	V	-	1
Procellariidae	<i>Ardenna grisea</i>	Sooty Shearwater	-	J	1
Procellariidae	<i>Ardenna pacifica</i>	Wedge-tailed Shearwater	-	J	3
Procellariidae	<i>Ardenna tenuirostris</i>	Short-tailed Shearwater	-	C,J,K	3
Psittacidae	<i>Lathamus discolor</i>	Swift Parrot	E	CE	1
Psittacidae	<i>Neophema pulchella</i>	Turquoise Parrot	V	-	1
Scolopacidae	<i>Actitis hypoleucos</i>	Common Sandpiper	-	C,J,K	2
Scolopacidae	<i>Arenaria interpres</i>	Ruddy Turnstone	-	C,J,K	4
Scolopacidae	<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	-	C,J,K	41
Scolopacidae	<i>Calidris canutus</i>	Red Knot	-	E,C,J,K	3
Scolopacidae	<i>Calidris ferruginea</i>	Curlew Sandpiper	E	CE,C,J,K	21

Family	Scientific Name	Common Name	BC Act	EPBC Act	Records
Scolopacidae	<i>Calidris ruficollis</i>	Red-necked Stint	-	C,J,K	8
Scolopacidae	<i>Limosa lapponica</i>	Bar-tailed Godwit	-	C,J,K	27
Scolopacidae	<i>Numenius madagascariensis</i>	Eastern Curlew	-	CE,C,J,K	2
Scolopacidae	<i>Numenius minutus</i>	Little Curlew	-	C,J,K	1
Scolopacidae	<i>Numenius phaeopus</i>	Whimbrel	-	C,J,K	1
Scolopacidae	<i>Tringa brevipes</i>	Grey-tailed Tattler	-	C,J,K	3
Scolopacidae	<i>Tringa nebularia</i>	Common Greenshank	-	C,J,K	1
Strigidae	<i>Ninox strenua</i>	Powerful Owl	V	-	42
Tytonidae	<i>Tyto novaehollandiae</i>	Masked Owl	V	-	1
Flora					
Convolvulaceae	<i>Wilsonia backhousei</i>	Narrow-leaved Wilsonia	V	-	4
Elaeocarpaceae	<i>Tetratheca glandulosa</i>		V	-	1
Elaeocarpaceae	<i>Tetratheca juncea</i>	Black-eyed Susan	V	V	11
Ericaceae	<i>Epacris purpurascens</i> var. <i>purpurascens</i>		V	-	1
Fabaceae (Mimosoideae)	<i>Acacia bynoeana</i>	Bynoe's Wattle	E	V	2
Lamiaceae	<i>Prostanthera marifolia</i>	Seaforth Mintbush	CE	CE	1
Myrtaceae	<i>Eucalyptus nicholii</i>	Narrow-leaved Black Peppermint	V	V	6
Myrtaceae	<i>Melaleuca deanei</i>	Deane's Paperbark	V	V	3
Myrtaceae	<i>Syzygium paniculatum</i>	Magenta Lilly Pilly	E	V	3
Proteaceae	<i>Macadamia integrifolia</i>	Macadamia Nut	-	V	1
Thymelaeaceae	<i>Pimelea curviflora</i> var. <i>curviflora</i>		V	V	1
Insecta					
Petaluridae	<i>Petalura gigantea</i>	Giant Dragonfly	E	-	1
Mammalia					
Dasyuridae	<i>Dasyurus maculatus</i>	Spotted-tailed Quoll	V	E	1
Emballonuridae	<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheath-tail-bat	V	-	6
Miniopteridae	<i>Miniopterus australis</i>	Little Bent-winged Bat	V	-	2
Miniopteridae	<i>Miniopterus orianae oceanensis</i>	Large Bent-winged Bat	V	-	19

Family	Scientific Name	Common Name	BC Act	EPBC Act	Records
Molossidae	<i>Miconomus norfolkensis</i>	Eastern Coastal Free-tailed Bat	V	-	1
Muridae	<i>Pseudomys gracilicaudatus</i>	Eastern Chestnut Mouse	V	-	1
Peramelidae	<i>Perameles nasuta</i>	Long-nosed Bandicoot population in inner western Sydney	EP	-	26
Phascolarctidae	<i>Phascolarctos cinereus</i>	Koala	E	E	5
Pteropodidae	<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	V	V	720
Vespertilionidae	<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	V	V	1
Vespertilionidae	<i>Falsistrellus tasmaniensis</i>	Eastern False Pipistrelle	V	-	5
Vespertilionidae	<i>Myotis macropus</i>	Southern Myotis	V	-	10
Reptilia					
Cheloniidae	<i>Caretta caretta</i>	Loggerhead Turtle	E	E	6
<p>BC Act- NSW Biodiversity Conservation Act (2016), EPBC Act- Commonwealth Environment Protection and Biodiversity Conservation Act (1999)</p> <p>V- Vulnerable, E- Endangered, EP- Endangered Population, CE-Critically Endangered, X- Extinct</p> <p>C- China-Australia Migratory Bird Agreement, J- Japan-Australia Migratory Bird Agreement, K- Republic of Korea-Australia Migratory Bird Agreement</p>					



Australian Government

Department of Climate Change, Energy,
the Environment and Water

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 20-Jun-2023

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	1
National Heritage Places:	1
Wetlands of International Importance (Ramsar)	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	10
Listed Threatened Species:	92
Listed Migratory Species:	64

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <https://www.dcceew.gov.au/parks-heritage/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	76
Commonwealth Heritage Places:	14
Listed Marine Species:	70
Whales and Other Cetaceans:	3
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	3
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	27
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	1
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

World Heritage Properties [\[Resource Information \]](#)

Name	State	Legal Status	Buffer Status
Australian Convict Sites (Cockatoo Island Convict Site)	NSW	Declared property	In buffer area only

National Heritage Places [\[Resource Information \]](#)

Name	State	Legal Status	Buffer Status
Historic Cockatoo Island	NSW	Listed place	In buffer area only

Wetlands of International Importance (Ramsar Wetlands) [\[Resource Information \]](#)

Ramsar Site Name	Proximity	Buffer Status
Towra point nature reserve	Within 10km of Ramsar site	In buffer area only

Listed Threatened Ecological Communities [\[Resource Information \]](#)

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
Castlereagh Scribbly Gum and Agnes Banks Woodlands of the Sydney Basin Bioregion	Endangered	Community may occur within area	In feature area
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community	Endangered	Community likely to occur within area	In feature area
Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland	Endangered	Community may occur within area	In feature area
Coastal Upland Swamps in the Sydney Basin Bioregion	Endangered	Community likely to occur within area	In feature area
Cooks River/Castlereagh Ironbark Forest of the Sydney Basin Bioregion	Critically Endangered	Community may occur within area	In feature area
Eastern Suburbs Banksia Scrub of the Sydney Region	Critically Endangered	Community may occur within area	In buffer area only
River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria	Critically Endangered	Community likely to occur within area	In feature area

Community Name	Threatened Category	Presence Text	Buffer Status
Shale Sandstone Transition Forest of the Sydney Basin Bioregion	Critically Endangered	Community may occur	In buffer area only within area
Turpentine-Ironbark Forest of the Sydney Basin Bioregion	Critically Endangered	Community likely to occur	In buffer area only within area
Western Sydney Dry Rainforest and Moist Woodland on Shale	Critically Endangered	Community may occur	In feature area within area

Listed Threatened Species [[Resource Information](#)]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.

Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur	In feature area within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur	In feature area within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur	In feature area within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur	In feature area within area
Calidris tenuirostris Great Knot [862]	Critically Endangered	Foraging, feeding or related behaviour known to occur	In buffer area only within area
Callocephalon fimbriatum Gang-gang Cockatoo [768]	Endangered	Species or species habitat likely to occur	In feature area within area
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat likely to occur	In feature area within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur	In feature area within area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Dasyornis brachypterus Eastern Bristlebird [533]	Endangered	Species or species habitat may occur within area	In feature area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea antipodensis gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Species or species habitat may occur within area	In feature area
Erythrotriorchis radiatus Red Goshawk [942]	Endangered	Species or species habitat may occur within area	In buffer area only
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat known to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area	In buffer area only
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat known to occur within area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In buffer area only
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Melanodryas cucullata cucullata South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat likely to occur within area	In feature area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Species or species habitat may occur within area	In buffer area only
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Pycnoptilus floccosus Pilotbird [525]	Vulnerable	Species or species habitat may occur within area	In feature area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area	In feature area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat known to occur within area	In feature area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Breeding likely to occur within area	In feature area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area	In feature area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area

FISH

Epinephelus daemeli Black Rockcod, Black Cod, Saddled Rockcod [68449]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Macquaria australasica Macquarie Perch [66632]	Endangered	Species or species habitat may occur within area	In feature area
Serirolella brama Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area	In buffer area only
Thunnus maccoyii Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat likely to occur within area	In buffer area only

FROG

Heleioporus australiacus Giant Burrowing Frog [1973]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Litoria aurea Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat known to occur within area	In feature area
Mixophyes balbus Stuttering Frog, Southern Barred Frog (in Victoria) [1942]	Vulnerable	Species or species habitat may occur within area	In buffer area only

MAMMAL

Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat known to occur within area	In feature area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Isoodon obesulus obesulus Southern Brown Bandicoot (eastern), Southern Brown Bandicoot (south- eastern) [68050]	Endangered	Species or species habitat likely to occur within area	In feature area
Notamacropus parma Parma Wallaby [89289]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Petauroides volans Greater Glider (southern and central) [254]	Endangered	Species or species habitat likely to occur within area	In feature area
Petaurus australis australis Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat known to occur within area	In feature area
Pseudomys novaehollandiae New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area	In feature area
PLANT			
Acacia bynoeana Bynoe's Wattle, Tiny Wattle [8575]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Acacia pubescens Downy Wattle, Hairy Stemmed Wattle [18800]	Vulnerable	Species or species habitat known to occur within area	In feature area
Acacia terminalis subsp. terminalis MS Sunshine Wattle (Sydney region) [88882]	Endangered	Species or species habitat known to occur within area	In feature area
Allocasuarina glareicola [21932]	Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Caladenia tessellata Thick-lipped Spider-orchid, Daddy Long-legs [2119]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Cryptostylis hunteriana Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Darwinia biflora [14619]	Vulnerable	Species or species habitat may occur within area	In feature area
Eucalyptus camfieldii Camfield's Stringybark [15460]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Genoplesium baueri Yellow Gnat-orchid, Bauer's Midge Orchid, Brittle Midge Orchid [7528]	Endangered	Species or species habitat likely to occur within area	In feature area
Haloragodendron lucasii Hal [6480]	Endangered	Species or species habitat may occur within area	In buffer area only
Lasiopetalum joyceae [20311]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Melaleuca biconvexa Biconvex Paperbark [5583]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Melaleuca deanei Deane's Melaleuca [5818]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Persicaria elatior Knotweed, Tall Knotweed [5831]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Persoonia hirsuta Hairy Geebung, Hairy Persoonia [19006]	Endangered	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Pimelea curviflora var. curviflora [4182]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Pimelea spicata Spiked Rice-flower [20834]	Endangered	Species or species habitat may occur within area	In feature area
Pomaderris brunnea Rufous Pomaderris, Brown Pomaderris [16845]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Prostanthera densa Villous Mintbush [12233]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Pterostylis saxicola Sydney Plains Greenhood [64537]	Endangered	Species or species habitat may occur within area	In buffer area only
Rhizanthella slateri Eastern Underground Orchid [11768]	Endangered	Species or species habitat may occur within area	In buffer area only
Rhodamnia rubescens Scrub Turpentine, Brown Malletwood [15763]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Rhodomyrtus psidioides Native Guava [19162]	Critically Endangered	Species or species habitat may occur within area	In feature area
Syzygium paniculatum Magenta Lilly Pilly, Magenta Cherry, Daguba, Scrub Cherry, Creek Lilly Pilly, Brush Cherry [20307]	Vulnerable	Species or species habitat known to occur within area	In feature area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat likely to occur within area	In feature area
REPTILE			
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area	In buffer area only
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Hoplocephalus bungaroides Broad-headed Snake [1182]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area	In buffer area only

SHARK

Carcharias taurus (east coast population) Grey Nurse Shark (east coast population) [68751]	Critically Endangered	Species or species habitat may occur within area	In buffer area only
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Sphyrna lewini Scalloped Hammerhead [85267]	Conservation Dependent	Species or species habitat likely to occur within area	In buffer area only

SNAIL

Pommerhelix duralensis Dural Land Snail [85268]	Endangered	Species or species habitat likely to occur within area	In buffer area only
--	------------	--	---------------------

Listed Migratory Species [[Resource Information](#)]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Ardenna grisea Sooty Shearwater [82651]		Species or species habitat likely to occur within area	In buffer area only
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat known to occur within area	In buffer area only
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Species or species habitat may occur within area	In feature area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area	In buffer area only
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat may occur within area	In buffer area only
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat may occur within area	In buffer area only
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area	In feature area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Migratory Marine Species			
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour may occur within area	In buffer area only
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area	In buffer area only
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area	In buffer area only
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area	In buffer area only
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area	In buffer area only
Mobula alfredi as Manta alfredi Reef Manta Ray, Coastal Manta Ray [90033]		Species or species habitat known to occur within area	In buffer area only
Mobula birostris as Manta birostris Giant Manta Ray [90034]		Species or species habitat may occur within area	In buffer area only
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area	In buffer area only

Migratory Terrestrial Species

Scientific Name	Threatened Category	Presence Text	Buffer Status
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat known to occur within area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area	In feature area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area	In feature area
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat may occur within area	In buffer area only
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Arenaria interpres Ruddy Turnstone [872]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
Calidris acuminata Sharp-tailed Sandpiper [874]		Foraging, feeding or related behaviour known to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area	In feature area
Calidris ruficollis Red-necked Stint [860]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
Calidris tenuirostris Great Knot [862]	Critically Endangered	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Charadrius bicinctus Double-banded Plover [895]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area	In feature area
Gallinago megala Swinhoe's Snipe [864]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Gallinago stenura Pin-tailed Snipe [841]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area
Limosa limosa Black-tailed Godwit [845]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Numenius minutus Little Curlew, Little Whimbrel [848]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Numenius phaeopus Whimbrel [849]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area	In feature area
Philomachus pugnax Ruff (Reeve) [850]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
Pluvialis fulva Pacific Golden Plover [25545]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
Tringa brevipes Grey-tailed Tattler [851]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Tringa stagnatilis			
Marsh Sandpiper, Little Greenshank [833]		Foraging, feeding or related behaviour known to occur within area	In buffer area only

Other Matters Protected by the EPBC Act

Commonwealth Lands [\[Resource Information \]](#)

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State	Buffer Status
------------------------	-------	---------------

Commonwealth Bank of Australia

Commonwealth Land - Commonwealth Bank of Australia [14407]	NSW	In buffer area only
Commonwealth Land - Commonwealth Bank of Australia [14406]	NSW	In buffer area only
Commonwealth Land - Commonwealth Bank of Australia [14408]	NSW	In buffer area only

Communications, Information Technology and the Arts - Australian Postal Corporation

Commonwealth Land - Australian Postal Commission [13121]	NSW	In buffer area only
Commonwealth Land - Australian Postal Commission [15538]	NSW	In buffer area only
Commonwealth Land - Australian Postal Commission [15537]	NSW	In buffer area only
Commonwealth Land - Australian Postal Commission [14384]	NSW	In buffer area only
Commonwealth Land - Australian Postal Commission [14391]	NSW	In buffer area only
Commonwealth Land - Australian Postal Commission [13094]	NSW	In buffer area only
Commonwealth Land - Australian Postal Commission [13091]	NSW	In buffer area only
Commonwealth Land - Australian Postal Corporation [15603]	NSW	In buffer area only
Commonwealth Land - Australia Post [15591]	NSW	In buffer area only

Communications, Information Technology and the Arts - Telstra Corporation Limited

Commonwealth Land - Australian Telecommunications Commission [14383]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [14415]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [14402]	NSW	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - Australian Telecommunications Commission [14416]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [14417]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [14414]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [13095]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [16448]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [13093]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [13092]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [13097]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [14405]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [14409]	NSW	In buffer area only
Commonwealth Land - Telstra Corporation Limited [14385]	NSW	In buffer area only
Commonwealth Land - Telstra Corporation Limited [15504]	NSW	In buffer area only
Commonwealth Land - Telstra Corporation Limited [14410]	NSW	In buffer area only
Defence		
Commonwealth Land - Defence Service Homes Corporation [13054]	NSW	In buffer area only
Defence - 21 CONST REGT - HABERFIELD DEPOT [11099]	NSW	In buffer area only
Defence - 21 CONST REGT - HABERFIELD DEPOT [11104]	NSW	In buffer area only
Defence - 21 CONST REGT - HABERFIELD DEPOT [11098]	NSW	In buffer area only
Defence - 21 CONST REGT - HABERFIELD DEPOT [11105]	NSW	In buffer area only
Defence - 21 CONST REGT - HABERFIELD DEPOT [11106]	NSW	In buffer area only
Defence - 21 CONST REGT - HABERFIELD DEPOT [11107]	NSW	In buffer area only
Defence - 21 CONST REGT - HABERFIELD DEPOT [11108]	NSW	In buffer area only
Defence - 21 CONST REGT - HABERFIELD DEPOT [11101]	NSW	In buffer area only

Commonwealth Land Name	State	Buffer Status
Defence - 21 CONST REGT - HABERFIELD DEPOT [11103]	NSW	In buffer area only
Defence - 21 CONST REGT - HABERFIELD DEPOT [11102]	NSW	In buffer area only
Defence - 21 CONST REGT - HABERFIELD DEPOT [11100]	NSW	In buffer area only
Defence - COCKATOO ISLAND DOCKYARD [10018]	NSW	In buffer area only
Defence - CONCORD OFFICE ACCN [11093]	NSW	In buffer area only
Defence - FOREST LODGE (SYDNEY) TRG DEP [10071]	NSW	In buffer area only
Defence - GLADESVILLE TRAINING DEPOT [10012]	NSW	In buffer area only
Defence - LEICHHARDT STORES DEPOT [11112]	NSW	In buffer area only
Defence - SPECTACLE ISLAND [10038]	NSW	In buffer area only
Defence - SPECTACLE ISLAND [10037]	NSW	In buffer area only
Defence - SPECTACLE ISLAND [10035]	NSW	In buffer area only
Defence - SPECTACLE ISLAND [10036]	NSW	In buffer area only
Defence - SYDNEY UNIVERSITY REGIMENT - DARLINGTON [11094]	NSW	In buffer area only
Defence - Defence Housing Authority		
Commonwealth Land - Defence Housing Authority [16356]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16056]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16132]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16135]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16134]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16045]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16048]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16133]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [15956]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [15711]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16047]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16046]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [15712]	NSW	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - Defence Housing Authority [14403]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14411]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [13096]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [13053]	NSW	In buffer area only
Commonwealth Land - Director of War Service Homes [13090]	NSW	In buffer area only

Transport and Regional Services - Airservices Australia

Commonwealth Land - Airservices Australia [14389]	NSW	In buffer area only
Commonwealth Land - Airservices Australia [13098]	NSW	In buffer area only

Unknown

Commonwealth Land - [13120]	NSW	In buffer area only
Commonwealth Land - [13122]	NSW	In buffer area only
Commonwealth Land - [13123]	NSW	In buffer area only
Commonwealth Land - [14386]	NSW	In buffer area only
Commonwealth Land - [14390]	NSW	In buffer area only
Commonwealth Land - [14387]	NSW	In buffer area only

Commonwealth Heritage Places

[[Resource Information](#)]

Name	State	Status	Buffer Status
Historic			
Barracks Block	NSW	Listed place	In buffer area only
Biloela Group	NSW	Listed place	In buffer area only
Cockatoo Island Industrial Conservation Area	NSW	Listed place	In buffer area only
Fitzroy Dock	NSW	Listed place	In buffer area only
Marrickville Post Office	NSW	Listed place	In buffer area only
Mess Hall (former)	NSW	Listed place	In buffer area only
Military Guard Room	NSW	Listed place	In buffer area only
Power House / Pump House	NSW	Listed place	In buffer area only
Prison Barracks Precinct	NSW	Listed place	In buffer area only
Snapper Island	NSW	Listed place	In buffer area only
Spectacle Island Explosives Complex	NSW	Listed place	In buffer area only

Name	State	Status	Buffer Status
Sutherland Dock	NSW	Listed place	In buffer area only
Underground Grain Silos	NSW	Listed place	In buffer area only
Woolwich Dock	NSW	Listed place	In buffer area only

Listed Marine Species [[Resource Information](#)]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area	In feature area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Ardenna grisea as Puffinus griseus Sooty Shearwater [82651]		Species or species habitat likely to occur within area	In buffer area only
Arenaria interpres Ruddy Turnstone [872]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]		Foraging, feeding or related behaviour known to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area overfly marine area	In feature area
Calidris ruficollis Red-necked Stint [860]		Foraging, feeding or related behaviour known to occur within area overfly marine area	In buffer area only
Calidris tenuirostris Great Knot [862]	Critically Endangered	Foraging, feeding or related behaviour known to occur within area overfly marine area	In buffer area only
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat known to occur within area	In buffer area only
Charadrius bicinctus Double-banded Plover [895]		Foraging, feeding or related behaviour known to occur within area overfly marine area	In buffer area only
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Charadrius ruficapillus Red-capped Plover [881]		Foraging, feeding or related behaviour known to occur within area overfly marine area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea antipodensis gibsoni as Diomedea gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Species or species habitat may occur within area	In feature area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area	In buffer area only
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat may occur within area	In buffer area only
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area overfly marine area	In feature area
Gallinago megala Swinhoe's Snipe [864]		Foraging, feeding or related behaviour likely to occur within area overfly marine area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Gallinago stenura Pin-tailed Snipe [841]		Foraging, feeding or related behaviour likely to occur within area overfly marine area	In buffer area only
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area	In feature area
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Foraging, feeding or related behaviour known to occur within area overfly marine area	In buffer area only
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In buffer area only
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area
Limosa limosa Black-tailed Godwit [845]		Foraging, feeding or related behaviour known to occur within area overfly marine area	In buffer area only
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In buffer area only
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area overfly marine area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat known to occur within area overfly marine area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area	In feature area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In buffer area only
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat likely to occur within area overfly marine area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Numenius minutus Little Curlew, Little Whimbrel [848]		Foraging, feeding or related behaviour likely to occur within area overfly marine area	In buffer area only
Numenius phaeopus Whimbrel [849]		Foraging, feeding or related behaviour known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Pachyptila turtur Fairy Prion [1066]		Species or species habitat known to occur within area	In feature area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area	In feature area
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat may occur within area	In buffer area only
Philomachus pugnax Ruff (Reeve) [850]		Foraging, feeding or related behaviour known to occur within area overfly marine area	In buffer area only
Pluvialis fulva Pacific Golden Plover [25545]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
Pterodroma cervicalis White-necked Petrel [59642]		Species or species habitat may occur within area	In feature area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Foraging, feeding or related behaviour known to occur within area overfly marine area	In buffer area only
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area	In feature area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat may occur within area overfly marine area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche bulleri platei as Thalassarche sp. nov. Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area	In feature area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Tringa brevipes as Heteroscelus brevipes Grey-tailed Tattler [851]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Foraging, feeding or related behaviour known to occur within area overfly marine area	In buffer area only

Reptile

Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area	In buffer area only
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area	In buffer area only
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area	In buffer area only

Whales and Other Cetaceans

[[Resource Information](#)]

Current Scientific Name	Status	Type of Presence	Buffer Status
Mammal			
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area	In buffer area only
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour may occur within area	In buffer area only
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area	In buffer area only

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	Buffer Status
Parramatta River	Regional Park	NSW	In buffer area only
Sydney Harbour	National Park	NSW	In buffer area only
Wolli Creek	Regional Park	NSW	In buffer area only

EPBC Act Referrals				[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
Construction and operation of the Westconnex New M5, Sydney, NSW	2015/7520	Controlled Action	Post-Approval	In buffer area only
Cooks Cove Development Project	2006/2685	Controlled Action	Post-Approval	In buffer area only
Sand Reclamation to Towra Beach	2003/1085	Controlled Action	Post-Approval	In buffer area only
Not controlled action				
Construct and operate an aerial adventure park	2012/6239	Not Controlled Action	Completed	In buffer area only
Decommissioning of Army Depot, Haberfield	2001/217	Not Controlled Action	Completed	In feature area
Decommissioning of NMC and Camperdown Facility	2010/5645	Not Controlled Action	Completed	In buffer area only
Demolition of Ablutions Block, Snapper Island, NSW	2018/8303	Not Controlled Action	Completed	In buffer area only
Environmental Works	2001/396	Not Controlled Action	Completed	In buffer area only
Fuel Reduction Proposal Redfield Road, East Killara	2003/1238	Not Controlled Action	Completed	In buffer area only
Georges River Program 2	2003/999	Not Controlled Action	Completed	In buffer area only
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed	In feature area
Noxious weed removal and controlled burn	2003/1272	Not Controlled Action	Completed	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Rabbit Control Anzac Rifle Range	2005/1940	Not Controlled Action	Completed	In buffer area only
Rehabilitation works of the Coogee Sewer Diversion Submain - Maxwell Avenue, Mar	2004/1683	Not Controlled Action	Completed	In buffer area only
Remediation of Contaminated Buildings	2005/1983	Not Controlled Action	Completed	In buffer area only
Remediation of Contaminated Soil	2005/1985	Not Controlled Action	Completed	In buffer area only
Residential subdivision works, Spurway St, Ermington	2003/1130	Not Controlled Action	Completed	In buffer area only
Shipment of Spent Nuclear Fuel to USA	2007/3672	Not Controlled Action	Completed	In buffer area only
subdivision and development on the Rhodes Peninsula for residential and commerci	2003/1249	Not Controlled Action	Completed	In feature area
Subdivision and sale of Commonwealth land in Pymble to Kuring-gai City Council	2004/1368	Not Controlled Action	Completed	In buffer area only
Sydney Desalination Plant	2005/2331	Not Controlled Action	Completed	In buffer area only
Sydney Metro Network Stage 2	2010/5307	Not Controlled Action	Completed	In feature area
Sydney Primary Loop Gas Pipeline	2006/2622	Not Controlled Action	Completed	In buffer area only
Undertake a controlled burn of the Eastern Suburbs Banksia Scrub at Byrne Cresce	2004/1728	Not Controlled Action	Completed	In buffer area only
Not controlled action (particular manner)				
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Referral decision				
Summer Hill Flour Mills Residential & Commercial development	2011/5859	Referral Decision	Completed	In buffer area only
Bioregional Assessments				
SubRegion	BioRegion	Website	Buffer Status	
Sydney	Sydney Basin	BA website	In feature area	

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence](#)
- [Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact us](#) page.

[© Commonwealth of Australia](#)

Department of Climate Change, Energy, the Environment and Water

GPO Box 3090

Canberra ACT 2601 Australia

+61 2 6274 1111



© Transport for New South Wales

Copyright: The concepts and information contained in this document are the property of Transport for NSW. Use or copying of this document in whole or in part without the written permission of Transport for NSW constitutes an infringement of copyright.