Transport for NSW

Leichhardt Bus Depot Conversion

Minor works review of environmental factors

January 2025

NSW GOVERNMENT

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Acknowledgement of Country

Transport for NSW acknowledges the traditional custodians of the land on which the Leichhardt Bus Depot Conversion 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.

Table of contents

Tables

Figures

1. Introduction

The purpose of the minor works review of environmental factors (REF) is to describe the proposal, to document the likely impacts of the proposal on the environment, to detail mitigation measures to be implemented and to determine whether or not the proposal can proceed. For the purposes of this work Transport for NSW (Transport) is the proponent and determining authority under Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

The description of the proposed works and assessment of associated environmental impacts has been undertaken in the context of section 171 of the Environmental Planning and Assessment Regulation 2021, Guidelines for Division 5.1 Assessments (DPE, 2022), the *Biodiversity Conservation Act 2016* (BC Act), the *Fisheries Management Act 1994* (FM Act) and the *Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)* (EPBC Act).

In doing so the minor works 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 to be sought from the Minister for Planning and Public Spaces 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 FM Act, 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 potential for the proposal to significantly impact a matter of national environmental significance, including nationally listed threatened biodiversity matters, or the environment of Commonwealth land. Where a significant impact is considered likely on nationally listed biodiversity matters, either the proposal must be reconsidered or a project REF must be prepared.

2. The proposal

2.1 Description

2.1.1 Proposal location

Table 2-1: Proposal location details

Location details	
Title	Leichhardt Bus Depot Conversion
Local government area	Inner West Council
Transport for NSW region	Greater Sydney

2.1.2 Proposal description

Transport is proposing to convert the existing bus depot at 230-240 Balmain Road, Leichhardt to zero emissions technology (Figure 2-1). Leichhardt Bus Depot Conversion (the Proposal) would support the complete transition from existing diesel and compressed natural gas buses to a new fleet of battery electric buses. This depot conversion is being delivered as part of the Zero Emission Buses (ZEB) Program, a NSW Government initiative to transition the State's 8,000 plus diesel and gas buses, to zero emissions technology by 2047.

Leichhardt Bus Depot undertook previous electrification work in 2022 to support the introduction of 40 battery electric buses. Subsequently, 15 additional battery eletric buses were purchased to operate at the Leichhardt depot. Previous work included grid upgrades, installation of 42 plug in electric vehicle chargers (including 5 dual port chargers, totalling 47 charge points), a battery electric storage system (BESS) and the installation of rooftop solar photovoltaic (PV).

There are over 200 buses (excluding mini buses) operating from Leichhardt Bus Depot. The proposal would support the complete transition and allow for future growth of up to 238 battery electric buses.

Key features of the proposal include:

- transition of existing diesel and compressed natural gas buses to electric buses
- installation of around 77 new plug-in chargers and associated infrastructure
- installation of two raised plant decks within the depot to house the electrical infrastructure (total height around 9.5m) (refer to Appendix C)
- upgraded power supply infrastructure
- reconfiguration of current bus bays and light vehicle parking areas, with the inclusion of electric car chargers for staff use
- decommissioning of existing fuelling infrastructure including the refuelling bay, diesel storage tank and compressed natural gas facilities
- testing and commisioning activities.

Due to the operational contraints of the depot, any stockpiling of materials or equipment would be temporary in nature and would be kept within the depot boundary. Construction personnel would park within the depot car park or on adjacent local streets.

During construction, work would be stagd to facilitate all current bus services.

In order to accomodate for the new techology, the depot would also require provision of high voltage (HV) supply connection to meet the energy demands. The HV supply connection works are subject to separate environmental assessment and approval through Ausgrid.

Bus operations will be maintained during construction with no expected disruption to existing bus services. Construction work will be completed during the day and planned outside of peak operation times such as mornings and afternoons, to maintain bus operations.

The majority of the work required for the proposal would be undertaken during standard construction hours, which are as follows:

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

However, some activities are anticipated to be carried out outside these hours, such as:

- concrete pours for plinth
- installation of oversized/heavy items e.g. raised cable contaminent culvert
- works that require electical isolations or cutovers
- potential oversized deliveries that required ROLs

The type of plant and equipment used during construction are likely to include:

- concrete saw
- light vehicles
- vacuum trucks
- powered handtools
- excavator (up to 20 tonnes)
- jackhammer and rockhammer attachment
- vibratory roller
- wacker packer
- piling rig (bored)
- elevated work platforms
- welding equipment
- concrete saw
- concrete truck
- concrete vibrator
- truck and dog
- mobile crane
- lighting towers
- generators
- scaffolding.

The anticipated number of personnel on site is likely to comprise of up to 20 people.

Subject to receiving planning approval, construction is expected to start from early-2025 and take about 12 months to complete. The new fleet of battery electric buses would be rolled out for service progressively, including testing and commissioning from 2025 to 2028.

Figure 2-1 Location of the proposal (Leichhardt Bus Depot) – Indicative only subject to detailed design

2.1.3 Proposal objectives

The key objectives of this proposal are to:

- convert the remaining of the existing bus depot at Leichhardt to support the complete transition of diesel and compressed natural gas buses to zero emissions technology as part of the ZEB Program
  - deliver a new fleet of battery electric buses for use by the current and any future bus operators in collaboration with Transport
  - ensure bus operations are maintained during construction with minimal disruption to bus services.

Once complete, the Leichhardt Bus Depot would operate a fleet consisting entirely of battery electric buses which deliver a range of benefits to the local community including:

- reduced bus depot operational impacts on neighbours
- quieter and cleaner local streets
- an improved transport experience for passengers.

2.1.4 Ancillary facilities

Table 2-2: Ancillary facilities

Ancillary facilities		
Will the proposal require the use or installation of a compound site? The proposal would require the installation of a compound site. The compound would be located within the existing bus depot and may involve the use of the existing buildings in the site. The proposed site compound (Figure 2-1) would displace up to 7 light vehicles that will be absorbed elsewhere within the depot.	Yes ☒	No ☐
Will the proposal require the use or installation of a stockpile site? Minor stockpiles would be required throughout construction. Due to the operational limits of the depot, storage of materials including wastes would be kept to a minimum. Any waste or material stored on site, would have appropriate measures implemented to reduce potential impact. The contractor, in consultation with the operator would select appropriate stockpile locations away from drainage areas or sensitive areas.	Yes ☒	No ☐
Are any other ancillary facilities required (e.g. temporary plants, parking areas, access tracks)? Construction personnel would park in the bus depot car parking area or on local streets (examples include Alfred Street and Henry Street). No new access tracks or entry points into the depot would be required, all works would be completed on hardstand areas.	Yes ☒	No ☐

2.1.5 Proposed date of commencement

Subject to receiving planning approval, construction is expected to start from early-2025.

2.1.6 Estimated length of construction period

Construction is expected to take around 12 months to complete. The new fleet of battery electric buses would be rolled out for service progressively from 2025 to 2028.

2.2 Need and options

2.2.1 Options considered

The Leichhardt Bus Depot is one of 11 depots to be converted to zero emissions technology as part of Stage 1 of the ZEB program.

The options considered for the proposal included:

- do nothing
- partial conversion of the depot to allow for both battery electric buses and diesel buses to operate from the depot
- full conversion of the depot to transition the entire fleet of diesel and natural gas buses to battery electric buses (preferred option).

The preferred option to convert the entire depot to battery electric buses best supports the objectives of the overall ZEB program and the NSW Government's commitment to achieve net zero emissions by 2050.

2.2.2 Justification for the proposal

The proposal supports the NSW Government's commitment to achieving net zero emission by 2050 and Transport's Net Zero operational and fleet emissions target by 2035, whilst supporting Transport's investigations into reducing energy costs and increased electricity reliability at the depot. While the proposal would involve impacts to the surrounding environment including heritage, construction noise, sediment or water quality impacts, visual impacts and operational impacts to visual amenity, the potential impacts have been identified as potentially minor. On balance, the benefits derived from proceeding with the proposal are considered to outweigh the potential impacts.

2.3 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.

2.3.1 State Environmental Planning Policy (Transport and Infrastructure) 2021

The *Environmental Planning and Assessment Act 1979* (EP&A Act) establishes the framework for environmental planning and assessment in NSW.

This proposal is subject to the environmental impact assessment and planning approval requirements of Division 5.1 of the EP&A Act. Division 5.1 specifies the environmental impact assessment requirements for activities undertaken by public authorities, such as Transport, which do not require development consent under Part 4 of the EP&A Act. In accordance with Section 5.5 of the EP&A Act, Transport, as the proponent and determining authority, must examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the proposal.

Clause 171 of the Environment Planning and Assessment Regulation 2021 (EP&A Regulation) prescribes the minimum environmental factors which must be considered when determining if an activity assessed under Division 5.1 of the EP&A Act has or is likely to have a significant effect on the environment.

Section 3 of the Minor Works REF provides an environmental impact assessment of the proposal in accordance with the requirements of section 171 of the EP&A Regulation, and Appendix A of this Minor Works REF specifically responds to the factors for consideration under section 171 of the EP&A Regulation.

2.3.2 State Environmental Planning Policy (Transport and Infrastructure) 2021

The 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 the SEPP (Transport and Infrastructure) permits development on bus depots to be carried out by or on behalf of a public authority without consent.

As the proposal is within an existing bus depot which is within a prescribed land use zone and is to be carried out by or 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 (Precincts – Eastern Harbour City) 2021
- State Environmental Planning Policy (Precincts – Central River City) 2021
- State Environmental Planning Policy (Precincts – Western Parkland City) 2021
- State Environmental Planning Policy (Precincts – Regional) 2021

- State Environmental Planning Policy (Planning Systems) 2021.

2.3.3 Inner West Local Enviornmental Plan 2022

The Inner West Local Environment Plan 2022 (Inner West LEP) is the prevailing planning instrument for the Inner West Council LGA.

Under Part 2 of the Inner West LEP, the proposal is located within land that is zoned SP2 - Infrastructure, Transport Depot. The land zoning is shown in Figure 2-3.

Table 2-3: Land use zone objectives

Land zone	Objective
SP2 Infrastructure	• 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.

The proposal is generally consistent with the objectives of SP2 zone. However, as the proposal is associated with a bus depot, Section 2.109 of the SEPP (Transport and Infrastructure) prevails over the LEP, and consent requirements of the LEP do not apply.

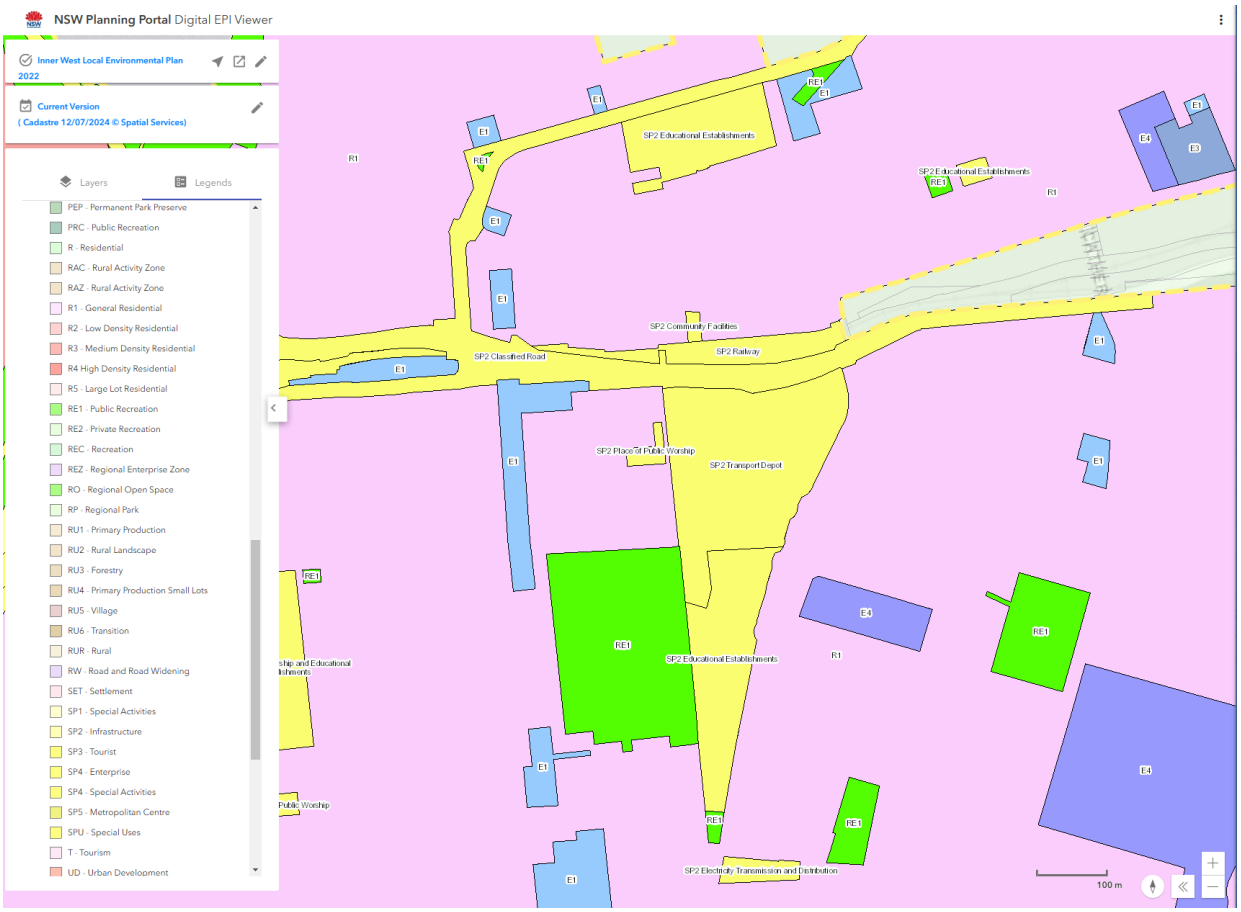


Figure 2-3: Land Use Zoning withing and surrounding proposal site

2.3.4 Other relevant legislation and environmental planning instruments

Contaminated Land Management Act 1997

The *Contaminated Land Management Act 1997* (CLM Act) establishes a process for investigating, managing and remediating contaminated land and outlines the circumstances in which landowners are required to notify the Environment Protection Authority (EPA), such as certain levels of soil contamination, potential to contaminate neighbouring land, presence of friable asbestos and potential surface and groundwater contamination.

The Preliminary Site Investigation (PSI) undertaken for the proposal identified the site was established as an operational bus depot in 1951 on previously vacant or farming land. The site inspection completed to inform the PSI identified storage and dispensing areas for fuels, oils and chemicals, hydrocarbon staining on the concrete ground surface within the workshop and refuelling area, above ground diesel storage tank and potential asbestos containing material within the site buildings.

Under Section 60(3)(b) of the CLM Act, notification of asbestos contamination is required where friable asbestos is present in or on soil or the land, where the levels of asbestos are equal to or above the health screening level of friable asbestos in soil, and a person has been, or foreseeably would be, exposed to elevated levels of asbestos fibres by breathing them into their lungs.

The remediation of sites contaminated with asbestos can be regulated under the CLM Act. Noting there are no proposed works to the workshop under this proposal, any asbestos found during the proposal, would be managed in accordance with the CLM Act.

Protection of the Environment Operations Act 1997

The EPA is the responsible agency for the administration of the *Protection of the Environment Operations Act 1997* (POEO Act) in relation to air, noise, water, pollution and waste management.

Section 120 of the POEO Act prohibits pollution of waters. In the absence of any environment protection licence, to avoid causing pollution and breaches of Section 120, any water discharged from the proposal must be of the same quality, or better, than the quality of the receiving waters (at the time of discharge). The potential impacts and relevant safeguards to ensure compliance with Section 120 of the POEO Act are discussed further in section 3 of this Minor Works REF.

Section 148 of the Act requires immediate notification of pollution incidents causing or threatening material harm to the environment to each relevant authority. Environmental incident procedures would be included as part of the Construction Environmental Management Plan (CEMP) for the proposal. This plan would outline measures to be implemented in the event of a spill, including initial response and containment, notification of emergency services and relevant authorities.

Heritage Act 1977

In NSW, heritage items and relics, that is archaeological sites assessed to be of local significance, are protected by two main pieces of legislation: the EP&A Act and the NSW *Heritage Act 1977* (Heritage Act).

The Heritage Act serves to conserve the heritage places, items and objects of NSW. Local heritage significance is defined within section 4A of the Heritage Act.

Section 170 of the Heritage Act requires State government agencies establish and maintain a register of heritage items, to be known as a Heritage and Conservation Register. State agencies are required to undertake due diligence with regard to the care, control and management of items listed on their Section 170 Heritage and Conservation Register. Additionally, State agencies must notify the Heritage Council of NSW 14 days in advance if they intend to remove an item from their register, transfer ownership, cease occupation, demolish. Section 170 does not place statutory requirements on individuals or non-State government entities.

2.4 Community engagement and agency consultation

2.4.1 SEPP (Transport and Infrastructure) consultation

Part 2.2 of the 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. This is detailed below:

Table 2-4: Consultation required with Council

Is consultation with Council required under sections 2.10 - 2.12 and 2.14 of the SEPP (Transport and Infrastructure)?		
Are the works likely to have a substantial impact on the stormwater management services which are provided by council?	Yes ☐	No ☒
Are the works likely to generate traffic to an extent that will strain the capacity of the existing road system in a local government area?	Yes ☐	No ☒
Will the works involve connection to a council owned sewerage system? If so, will this connection have a substantial impact on the capacity of the system?	Yes ☐	No ☒
Will the works involve connection to a council owned water supply system? If so, will this require the use of a substantial volume of water?	Yes ☐	No ☒
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 minor or inconsequential disruption to pedestrian or vehicular flow?	Yes ☐	No ☒
Will the works involve more than a minor or inconsequential excavation of a road or adjacent footpath for which council is the roads authority and responsible for maintenance?	Yes ☐	No ☒
Is there 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? The Leichhardt Bus Depot Heritage Impact Assessment (January 2025) (Appendix F) concluded that the Proposal would not directly impact the significant values of the former State Rail Authority (SRA) tramshed or the former SRA office and amenities building.	Yes ☐	No ☒
Is the proposal within the coastal vulnerability area and inconsistent with a certified coastal management program applying to that land?	Yes ☐	No ☒
Are the works located on flood liable land? If so, will the works change flooding patterns to more than a minor extent?	Yes ☐	No ☒

Table 2-5: Consultation with other public authorities

Is consultation with a public authority (other than Council) required under sections 2.13, 2.15 and 2.16 of the SEPP (Transport and Infrastructure)?		
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? Note: Flood liable land means land that is susceptible to flooding by the probable maximum flood event, identified in accordance with the principles set out in the Floodplain Development Manual: the management of flood liable land (nsw.gov.au).	Yes ☐	No ☒
Are the works adjacent to a national park, nature reserve or other area reserved under the *National Parks and Wildlife Act 1974*, or on land acquired under that Act?	Yes ☐	No ☒
Are the works on land in Zone C1 National Parks and Nature Reserves or in a land use zone equivalent to that zone?	Yes ☐	No ☒

Do the works include a fixed or floating structure in or over navigable waters?	Yes ☐	No ☒
Are the works for the purpose of residential development, an educational establishment, a health services facility, a correctional facility or group home in bush fire prone land?	Yes ☐	No ☒
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?	Yes ☐	No ☒
Are the works on buffer land around the defence communications facility near Morundah?	Yes ☐	No ☒
Are the works on land in a mine subsidence district within the meaning of the *Mine Subsidence Compensation Act 1961*?	Yes ☐	No ☒
Are the works on, or reasonably likely to have an impact on, a part of the Willandra Lakes Region Work Heritage Property?	Yes ☐	No ☒
Are the works within a Western City operational area specified in Schedule 2 of the *Western Parkland City Authority Act 2018* with a capital value of $30 million or more?	Yes ☐	No ☒

Table 2-6: Notification of council and occupiers of adjoining land

Do Council and occupiers of adjoining land need to be notified under section 2.111 of the SEPP (Transport and Infrastructure)?		
Does the proposal include a car park intended for the use by commuters using regular bus services?	Yes ☐	No ☒
Does the proposal include a bus depot? The occupiers of adjoining land and Inner West Council would be notified in accordance with section 2.111 of the SEPP (Transport and Infrastructure).	Yes ☒	No ☐
Does the proposal include a permanent road maintenance depot or associated infrastructure, such as garages, sheds, tool houses, storage yards, training facilities and workers amenities?	Yes ☐	No ☒

Consultation with the occupiers of adjoining land and Inner West Council (Council) was undertaken between 28 November and 19 December 2024. Responses were received from Council and Sydney Bus Museum. The key issues raised in their submissions and responses to these submissions are in Table 2-7 as follows:

Table 2-7: Summary of key issues raised and Transports responses

Stakeholder	Summary of key feedback	Transport's response to key feedback
Inner West Council	Concerns regarding additonal batteries, specifically: • potential noise impacts of any additional battery installation (including noise associated with battery cooling fans) • visual impacts of any additional batteries	The proposal would not install any additional battery energy storage systems.
Inner West Council	Raised concerns for pedestrian saftey within the depot and in public areas, because of quieter electric buses.	ZEBs can be much quieter than traditional buses, so people are encouraged to remember to always stay alert when walking around buses and traffic.

		In late 2023, Transport proactively introduced a new road safety standard requiring all ZEBs to be fitted with an Acoustic Vehicle Alerting System (AVAS). Transport is currently investigating options to introduce a standardised, sector specific AVAS sound for its growing fleet of ZEBs in compliance with current road safety standards. A standardised AVAS sound will enhance people's safety by making it easier for people to identify an approaching bus and distinguish it from other road vehicles.
Inner West Council	Raised concerns that any additional power used by the depot may impact on the long term potential for Council and the community to transition to the use of electric vehicles.	Transport is working closely with Ausgrid to secure the required power supply requirements for the depot and to ensure minimal impact to other power users. Power supply upgrades are required to support the remaining fleet transition to battery electric buses.
Inner West Council	Requested that any electrical enabling works required on Council land should be discussed with Council including preparation of a community engagement plan and Traffic Guidance schemes that minimise the impact to parking as well as pedestrian and traffic movements.	The HV supply connection works are subject to separate environmental assessment and design approval through Ausgrid. HV suppy connection works will be delivered in accordance with Ausgrid's Environmental Handbook (NS174C) and Council requirements.
Sydney Bus Museum	Raised that Sydney Bus Museum currently has a long standing agreement with Transport to be provided with vehicle access to the Museum via the existing entrance located on William Street and formerly occupied by State Transit Authority Assest Management Division. Requested a meeting to discuss any impacts of the proposal on these arrangements.	Transport has reached out to Sydney Bus Museum to further understand the existing agreement and access requirements.

2.4.2 Other agency and community engagement

During detailed design, consultation will be undertaken with Fire and Rescue NSW and bus drivers where required. There would be ongoing engagement with Ausgrid as an adjacent work group. No other agencies are intended to be consulted on the proposal.

Community consultation has not been undertaken specifically for this proposal, as the work would be minor in nature. A community notification would be delivered prior to any construction work commencing, and would outline the expected impacts during construction. The community would be kept informed as the project progresses.

3. Environmental assessment

This chapter 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 the factors specified in s171 of the Environmental Planning and Assessment Regulation 2021.

The matters of national environmental significance under the *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth) are also considered in Appendix A. Site-specific safeguards are provided to ameliorate the identified potential impacts.

3.1 Soil

Table 3-1: Soil

Description of existing environmental and potential impacts		
Are there any known occurrences of salinity or acid sulfate soils in the area? The NSW Planning Portal acid sulfate soils (ASS) database reports the proposal area as being Class 5 soils under the Inner West Council LEP 2022. ASS are not typically found in Class 5 areas but these areas are located within 500m of adjacent Class 1,2,3 or 4 land. There is no salinity data available for the site.	Yes ☐	No ☒
Does the proposal involve the disturbance of large areas (e.g., >2ha) for earthworks?	Yes ☐	No ☒
Does the site have constraints for erosion and sedimentation controls such as steep gradients or narrow corridors?	Yes ☐	No ☒
Are there any sensitive receiving environments that are located in or nearby the likely proposal area or that would likely receive stormwater discharge from the proposal? Sensitive receiving environments include (but are not limited to) wetlands, state forests, national parks, nature reserves, rainforests, drinking water catchments).	Yes ☐	No ☒
Is there any evidence within or nearby the likely footprint of potential contamination? A Preliminary Site Investigation (PSI) (EMM, April 2022) evaluated the potential contamination risks associated with the potential development of the site for ZEB infrastructure and ongoing use of the site as an operational bus depot. Based on the PSI, potentially complete contamination source, pathway and receptor linkages at the site would most likely be attributed to: • imported fill which may include asbestos containing material (ACM) or other contamination of potential concern • spills or leaks from the parking, storage and maintenance of operating buses • spill or leaks to soil from the storage or dispensing of oils and fuels • the possible presence of hazardous materials such as lead based paint or ACM in buildings (or underlying soils) • the possible presence of historical contamination associated with former underground storage tanks (USTs). Historical data for the depot identified it was a declared site under the CLM Act and was remediated in 2007 and 2008, including decommissioning and removal of USTs. Post remediation, the EPA reviewed the depot and declared that regulation under the CLM Act was not required. For the purpose of assessing the overall potential impact of the environmental risk on the proposal, an overall risk rating of medium is considered based on the preliminary conceptual site model (CSM).	Yes ☒	No ☐

Is the likely proposal footprint in or nearby highly sloping landform?	Yes ☐	No ☒
Is the proposal likely to result in more than 2.5ha (area) of exposed soil?	Yes ☐	No ☒
The proposal would result in limited exposed areas throughout construction; with minor trenching, underboring, piling and excavating for charger plinths and electrical equipment.		

Safeguards

Safeguards to be implemented are:

No.	Safeguards
SC1	Erosion and sediment control measures will be implemented and maintained to prevent sediment moving off-site and sediment laden water entering any water course, drainage lines, or drain inlets (in accordance with the *Landcom/Department of Housing Managing Urban Stormwater, Soils and Construction Guidelines (the Blue Book)*. The erosion and sediment controls will be included in the Construction Environmental Management Plan (CEMP) and Environmental Control Map (ECM).
SC2	Erosion and sedimentation controls will be checked and maintained on a regular basis (including clearing of sediment from behind barriers) and records kept and provided on request.
SC3	All fuels, chemicals and liquids will be stored in an impervious bunded area a minimum of 50 metres away from: • any areas of concentrated water flow • flooded or poorly drained areas • slopes above 10%.
SC4	Refueling of plant and equipment during construction will be in line with operational refueling practices, including: • refueling will occur in impervious bunded areas located a minimum of 50 metres from drainage lines or waterways • if refuelling occurs within 50m of drainage, appropriate management measures will be implemented to prevent a potential spill from leaving site via drainage.
SC5	An emergency spill kit will be kept on site at all times and maintained throughout the construction work. The spill kit must be appropriately sized for the volume of substances at the work site and personnel inducted in its use.
SC6	If an incident (e.g., spill) occurs during construction, Transport's *Environmental incident procedure* EMF-EM-PR-0001 will be followed and the Transport Project Manager and Senior Environment and Sustainability Manager will be notified immediately. The operator/contractor must report incidents using the nominated Transport incident management system.
SC7	Emergency contacts will be kept in an easily accessible location on vehicles. All workers will be advised of these contact details and procedures.
SC8	The CEMP and work health and safety (WHS) plan must both identify appropriate mitigations and control measures with respect to contamination present at the site, and the implementation of these plans must be periodically audited.
SC9	Any excavated soil and fill material removed from the site will require characterisation and off-site disposal to an appropriately licensed waste facility or landfill in accordance with the POEO Act and Protection of the Environment Operations (Waste) Regulation 2014.
SC10	Prior to commencing work to existing building structures that may interface with the proposal, a hazardous material survey will be completed by a suitably qualified professional.
SC11	Existing fuel, chemical storage and other potentially contaminating infrastructure which will no longer be required as part of the depot will be appropriately decommissioned, remediated and/or disposed.
SC12	Where excavation that may intersect with potential areas of medium risk rated contamination identified in the preliminary CSM, a targeted intrusive site investigation will be completed to provide

	a quantitative assessment of the potential contamination exposure pathways to receptors and to further understand the potential management liability.

3.2 Waterways and water quality

Table 3-2: Waterways and water quality

Description of existing environmental and potential impacts		
Is the proposal located within, adjacent to or near a waterway? The nearest waterway to the proposal, Whites Creek, is located approximately 750 east of the proposal.	Yes ☐	No ☒
Is the location known to flood or be prone to water logging? A review of the Leichhardt LEP, NSW Flood Data Portal and design reports was undertaken. No flood maps were available under the Leichhardt LEP however the NSW Flood Data Portal identified a Flood Study from 2014 (Cardno, 2014) and a Floodplain Risk Management Study from 2017 (Cardno, 2017) relevant to the depot. The results from the modelling of the 100-year average recurrence interval (ARI) event show there is no flooding risk at the depot. Results of the probable maximum flood (PMF) show that there is possible inundation of the north-eastern corner of the depot from flooding along Balmain Road which was modelled in the lower depth range of 0.01-0.3 metres. As the site sits at a higher elevation it is unlikely that it would be adversely impacted by a large flood event. Overall, the flood risk within the Proposal is low.	Yes ☐	No ☒
Is the proposal located within a regulated catchments covered by chapter 6 of State Environmental Planning Policy (Biodiversity and Conservation) 2021 (SEPP (Biodiversity and Conservation))? Refer to Appendix B.	Yes ☒	No ☐
Would the proposal be undertaken on a bridge or ferry?	Yes ☐	No ☒
Is the proposal likely to require the extraction of water from a local water course (not mains)?	Yes ☐	No ☒

Safeguards

Safeguards to be implemented are:

No.	Safeguards
W1	No sediment laden water will be released into drainage lines and/or waterways.
W2	Water quality control measures will be used to prevent any materials (e.g., concrete, grout, sediment etc.) entering drain inlets or waterways. Any concrete washout required on site will be done in accordance with Transport's *Concrete washout guideline EMF-EM-GD-0145.*

3.3 Noise and vibration

Table 3-3: Noise and vibration

Description of existing environmental and potential impacts		
Are there any residential properties or other noise sensitive areas near the location of the proposal that may be affected by the work (i.e., church, school, hospital)? The proposal is surrounded by a mix of residential and industrial premises, with the closest residential receiver being directly adjacent to the proposal. Additionally, a place of worship (St Gerasimos Greek Orthodox Church) is located adjacent to the proposal, separated by the Sydney Bus Museum. Please refer to Noise and Vibration Impact Assessment (NVIA) Appendix D for location and description of the noise catchment area.	Yes ☒	No ☐
Is the proposal going to be undertaken only during standard working hours? Standard working hours • Monday-Friday: 7:00am to 6.00pm • Saturday: 8.00am to 1.00pm • Sunday and Public Holidays: no work Work would generally be carried out during standard construction hours. Any work outside these hours may be undertaken, subject to assessment and if approved by Transport and the community and adjacent stakeholders are notified prior to the work commencing. Transport's *Out-of-hours work application form* EMF-EM-TT-0146 would be prepared by the construction contractor and submitted to Transport's Environment Manager for review and approval prior to the work commencing. Some activities are expected to be undertaken outside standard hours, such as: • lifting of large infrastructure e.g. the plant decks • activities that have the potential to disrupt local traffic including oversized deliveries and any work that may require Road Occupancy Licences (ROLs).	Yes ☐	No ☒
Is any explosive blasting required for the proposal?	Yes ☐	No ☒
Would construction noise or vibration from the proposal affect sensitive receivers? A construction noise and vibration assessment (refer to Appendix D) has been prepared to assess the noise and vibration impacts associated with the construction of the proposal. One Noise Catchment Area (NCA01) has been identified in the assessment to reflect land uses and types of receivers in the area. All noise sensitive receivers within close proximity to the depot feature a noise environment that is typical of an urban setting, with road traffic noise being the dominant source to the nearest receivers. The predicted construction noise impacts provided in the NVIA identify that exceedance of the noise management levels are likely for three residential receivers and one place of worship during standard construction hours. No residential noise sensitive receivers have been identified to be highly noise affected by the construction of the proposal. The out of hours (evening / night-time works) are expected to exceed the noise management levels for majority of the residential receivers within NCA01. An assessment of the potential for vibration generated as part of the required construction activities has been undertaken based on the project safe working distances. Exceedances of the safe working distances are expected to occur due to the heritage building (Sydney Bus Museum). No vibration exceedances are expected to occur for any other receiver types (utilising a small hydraulic hammer as the most vibration intensive construction activities). No vibration intensive works are recommended to take place within the safe working distances provided in Table 5-16 from the NVIA.	Yes ☒	No ☐
Would operation of the proposal alter the noise environment for sensitive receivers?	Yes ☐	No ☒

An operational noise and vibration assessment was prepared to assess the impacts from the operation of the proposal and was prepared in accordance with the EPA's NSW Noise Policy for Industry, refer to Appendix D. The noise model assessed the dominant noise sources generated from the operation of the depot, including bus vehicle movements and electrical infrastructure. The predicted noise levels identified compliance with the applicable noise criteria at all sensitive receiver locations during the daytime period. Exceedances of up to 4 dB and 8 dB is expected to result during the evening and nighttime periods for nearby residential receivers respectively. Given that the predicted exceedances at the nearby residential receivers are resulting from the bus movements which are existing and are only set to decrease the noise impact with the conversion to electric from diesel buses, it is expected that the overall resulting impacts from the site will be of a lower magnitude than the current, existing operations. Noise mitigation treatments (additional to the natural shielding effects from the site buildings, and existing noise walls), would not be deemed feasible or reasonable primarily due to majority of the predicted exceedances occurring from bus movements along the private entry / exit roads located to the north and south of the depot.		
Would the proposal result in vibration being experienced by any surrounding properties or infrastructure during operation?	Yes ☐	No ☒

Safeguards

Safeguards to be implemented are:

No.	Safeguards
NV1	Work will generally be carried out during standard working hours (i.e. 7am to 6pm Monday to Friday; 8am to 1pm Saturdays). Any work outside these hours may be undertaken if approved by Transport and the community is notified prior to the work commencing. Transport's *out-of-hours work application form* EMF-EM-TT-0146 would need to be prepared by the construction Contractor and submitted to Transport's Environment Manager for review and approval prior to the work commencing.
N2	Noise impacts will be minimised in accordance with Transport's C*onstruction noise and vibration guideline - public transport infrastructure* EMF-NV-GD-0060.
NV3	Measures will be implemented to minimise or prevent vibration impacts, including: • complying with the minimum working distances from vibration intensive plant • using non-vibration-producing equipment; and • completing vibration monitoring where required.
NV4	Noise and vibration management measures will be included in the CEMP and implemented during construction. The CEMP will generally follow the approach in the Interim Construction Noise Guideline (ICNG) (DECC, 2009) and Transport's C*onstruction noise and vibration guideline - public transport infrastructure* EMF-NV-GD-0060, including: • selecting quieter plant and equipment based on the optimal power and size to most efficiently perform the required tasks, where feasible and reasonable • operating plant and equipment in the quietest and most efficient manner • avoiding simultaneous operation of noisy plant, where feasible • plant used intermittently to be throttled down or shut down • maximising the offset distance between noisy plant and adjacent sensitive receivers • noise-emitting plant to be directed away from sensitive receivers • site-based vehicles and plant used on-site should be fitted with non-tonal reversing alarms to reduce tonal noise impacts.
NV5	All sensitive receivers (e.g. places of worship, residents and schools) likely to be affected will be notified at least seven calendar days prior to commencement of any works where a notification is triggered in accordance with Transport's C*onstruction noise and vibration guideline-public transport infrastructure* EMF-NV-GD-0060. The notification will provide details of: • the proposal • the construction period and construction hours • expected construction impacts and mitigation measures

	• type of equipment and materials used • contact information including 24-hour Construction Response Line • complaint reporting • how to obtain further information.
NV6	For vibration-intensive activities within the recommended safe work distances (table 5-16 from the NVIA), the following measures will be included in the CEMP and implemented on-site: • Conduct vibration assessments during the initial stages of vibration-intensive activities to establish site-specific minimum working distances. This is especially important for the heritage listed former SRA tram shed, including interior (Sydney Bus Museum) located along the western boundary of the site. • Plan work schedules to incorporate breaks, allowing for reduced impact on nearby locations • Ensure appropriate selection and maintenance of equipment to minimise vibration levels. Saw cuts should be considered as a minimum to reduce vibration propagation and hydrofraise should be considered where applicable to reduce vibration generation. • Perform surveys to assess and monitor potential structural impacts resulting from vibration-intensive activities.
NV7	Any penetrations through the noise wall will be done in a way to maintain noise attenuation efficiency, including the sealing of any gaps.
NV8	Prior to the decommissioning/ removal of structures attached to the heritage items and use of hydraulic hammering (if relevant) / piling rig, the concrete panel is required to be saw cut through, to create a discontinuous condition from the structure that is being decommissioned and the heritage building.

3.4 Air quality

Table 3-4: Air quality

Description of existing environmental and potential impacts		
Is the proposal likely to result in large areas (>2ha) of exposed soils?	Yes ☐	No ☒
Are there any dust-sensitive receivers located within the vicinity of the proposal during the construction period? The following dust-sensitive receivers are located within the vicinity of the proposal: – residents along Balmain Rd and Derbyshire Rd – Pioneers Memorial Park – Sydney Bus Museum – Sydney Secondary College Leichahrdt Campus	Yes ☒	No ☐
Is there likely to be an emission to air during construction? Potential impacts associated with the proposal include emissions to air from construction plant and equipment and airborne dust generated during construction activities. Plant and equipment used to construct the proposal would emit exhaust fumes, releasing emissions which contribute to the local air quality. In the context of existing air pollution from other local and regional sources (including the City West Link) and the limited number of plant and equipment required to deliver the proposal, the impacts would be localised and temporary in nature for the duration of the construction period. The impact is therefore considered to be minor and short-term. Airborne dust generated from construction activities may cause impacts when located close to sensitive receivers. Dust could be generated from a variety of construction activities associated with the proposal including minor excavations and temporary stockpiling of materials. As a result, short-term impacts resulting from airborne dust could be experienced during dust-generating construction activities at nearby sensitive receivers.	Yes ☒	No ☐

During the operation of the proposal, the number of diesel and compressed natural gas buses would be reduced as they are replaced with the battery electric buses, therefore reducing exhaust emissions over time.		

Safeguards

Safeguards to be implemented are:

No.	Safeguards
A1	Measures (including watering or covering exposed areas) will be used to minimise or prevent air pollution and dust.
A2	Work (including the spraying of paint and other materials) will not be carried out during strong winds or in weather conditions where high levels of dust or air borne particulates are likely.
A3	Vehicles transporting waste or other materials that may produce odours or dust will be covered during transportation.

3.5 Aboriginal cultural heritage

Table 3-5: Aboriginal cultural heritage

Description of existing environmental and potential impacts		
Would the proposal involve disturbance in any area that has not been subject to previous ground disturbances?	Yes ☐	No ☒
Has an online Aboriginal Heritage Information Management System (AHIMS) search been completed? In May 2024, a search of the Aboriginal Heritage Information Management System was conducted and there were no listed Aboriginal objects or places identified within 200m of the proposed site. Please refer to Appendix E.	Yes ☒	No ☐
Is there potential for the proposal to impact on any items of Aboriginal cultural heritage?	Yes ☐	No ☒
Would the proposal involve the removal of mature native trees?	Yes ☐	No ☒
Is the proposal consistent with the requirements of Transport's *Procedure for Aboriginal cultural heritage consultation and investigation* (PACHCI)? A Stage 1 PACHCI checklist was completed in June 2024. The proposal was assessed as unlikely to have an impact on Aboriginal cultural heritage. Please refer to Appendix E.	Yes ☒	No ☐

Safeguards

Safeguards to be implemented are:

No.	Safeguards
B1	If Aboriginal heritage items are uncovered during construction, all construction activities in the vicinity of the find must cease and the Transport Senior Manager Environment and Sustainability contacted immediately. Refer to steps in the Transport *Unexpected heritage items* procedure (EMF-HE-PR-0076) which must be followed.

3.6 Non-Aboriginal heritage

Table 3-6: Non-Aboriginal heritage

Description of existing environmental and potential impacts		
Have online heritage database searches been completed? • Transport (including legacy Roads and Maritime) section 170 register • NSW Heritage database • Commonwealth Heritage List, established under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) • Maritime heritage database • Australian Heritage Places Inventory • Local Environmental Plan(s) heritage items. A desktop review of non-Aboriginal heritage databases was undertaken to understand the extent of existing recorded sites and places within the vicinity of the proposal. These included: • Commonwealth Heritage Database (DCCEW, 2022) which includes items on the: – World Heritage List – National Heritage List – Commonwealth Heritage List established under the EPBC Act • NSW State Heritage Inventory (DPE, 2022d), which lists: – Items on the State Heritage Register, established under the *Heritage Act 1977* – Local heritage items under the Inner West Council LEP 2022 – Items on the Transport Section 170 registers The results conclude dthat there were eight non-Aboriginal heritage items within 150m of the proposal.	Yes ☒	No ☐
Are there any items of non-Aboriginal heritage or heritage conservation areas listed on relevant heritage databases/registers that are located within the vicinity of the proposal? There were eight non-Aboriginal heritage items listed within 150m of the proposal, including: • Former SRA office and amenities building, including interiors, within the bus depot (LEP #I1106) • Former SRA Tram shed, including interiors, adjacent to the bus depot (LEP #I1104) • Mature Fig Tree, approximately 80m to the west of the bus depot (LEP #I1105) • Former SRA cable store and traffic office, including interiors, approximately 15m south of the bus depot (LEP #I1107) • Pioneers Memorial Park, approimately 50m south west of the bus depot (LEP #I1145) • House, 'Rutherford', including interiors, approximatley 40m east of the bus depot (LEP #I1185) • Former factory, including interiors, approximately 120m south east of the bus depot (LEP #I1137) • Street trees-row of Brush Box and 1 Ficus hillii, approximately 115m west of the bus depot (LEP #I1119) Refer to figure 3-6. The Leichardt Bus Depot Heritage Impact Assessment (January 2025) (refer Appendix F) concluded that the Proposal will not directly impact the significant values of the former SRA tramshed or the former SRA office and amenities building. The recommendations from the Heritage Impact Assessment have been included as environmental safeguards below	Yes ☒	No ☐
Is the proposal likely to impact trees that form part of a heritage listing or have other heritage value?	Yes ☐	No ☒
Is the proposal likely to occur in or near features that indicate potential archaeological remains? Refer to Appendix F.	Yes ☐	No ☐

The historical record indicates the presence of Annesley House, a substantial structure with outbuildings which was built in 1868 within the bus depot site. An archaeological assessment was prepared for the site in 2006 by Archaeologist Adam Ford which was followed by a monitoring program in the same year. The monitoring results concluded there was no remaining archaeological potential for relics to remain at the site. It is possible that the former tramlines from the SRA tramshed and SRA office and amenities building may remain in part under the ground, although it is understood from historical accounts that these were removed during the transformation of the site to a bus depot. Based on historic images of the site it may be expected that tramlines may be found leading into the bays of the former SRA Tramshed.		

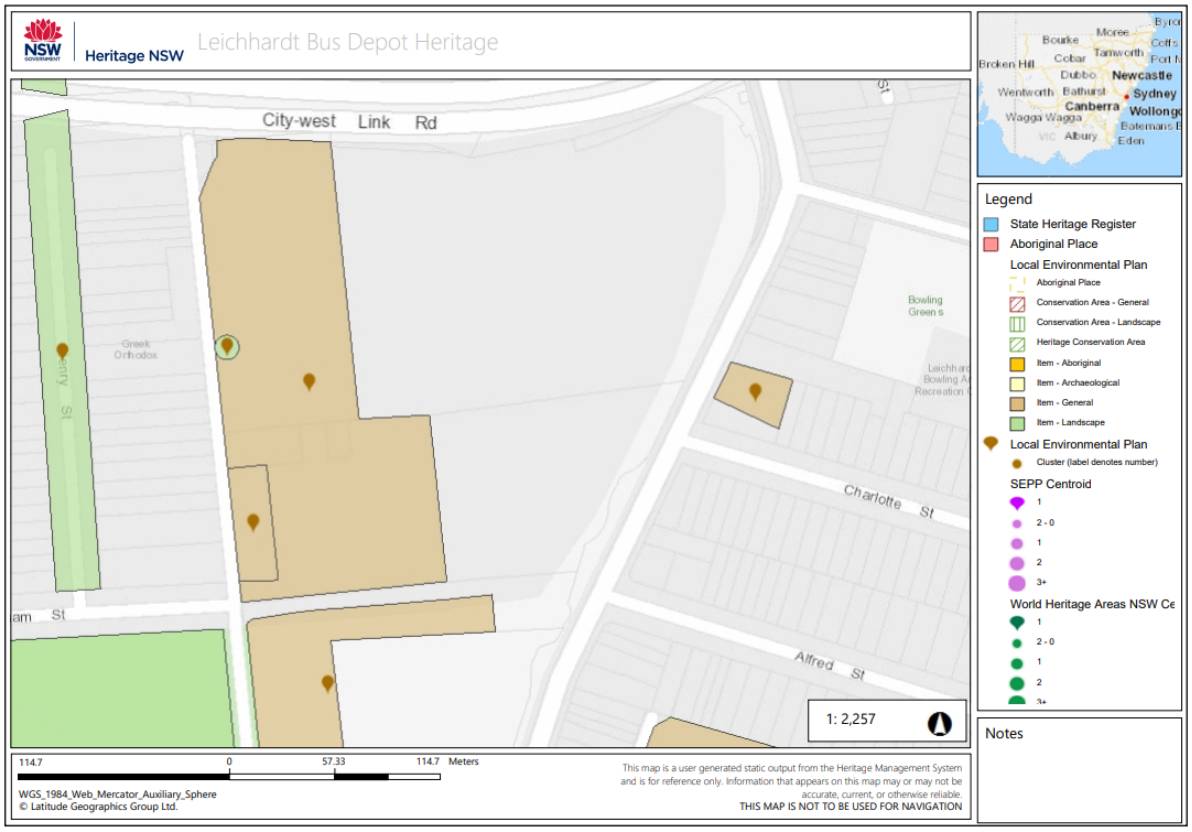


Figure 3-6: Location of heritage items within 150m of Leichhardt Bus Depot

Safeguards

Safeguards to be implemented are:

No.	Safeguards
H1	If unexpected heritage items are uncovered during construction, all work must cease in the vicinity of the material/find and the steps in Transport's *Unexpected heritage items procedure* EMF-HE-PR-0076 must be followed.
H2	Detailed design to consider: • new fencing within the site should match the existing black perimeter (and internal) fencing at 29 Derbyshire Rd (the former SRA office and amenities building) • the new fencing should align with the south facing podium façade of the former SRA tramshed, and ensure a minimum 15m separation from the former SRA office and amenities building is achieved.

H3	Detailed design for the proposed cable containment culvert/plant deck and the cable containment deck elements to consider: • the form of the culvert should remain as open as possible and not be infilled • where the height of the culvert can be reduced in detailed design, and also maintaining safety requirements, this is desirable to reduce potential visual impacts to view catchments of adjacent heritage items • the cable containment decking above the culvert should be as uncluttered as possible • the colour of the steel culvert and cable containment deck elements should be recessive in colour such as a light grey. Signage in colours that stand out should be avoided.
H4	Vibration monitoring, including selection of machinery within the recommended limits, identified in the supporting Noise and Vibration Impact Assessment should be identified and inform the development and delivery of the demolition plan.

3.7 Biodiversity

Table 3-7: Biodiversity

Description of existing environmental and potential impacts

Have relevant database searches been carried out? Yes ☒ No ☐

The following searches were conducted:

- Bionet threatened species records within the locality (10km radius)
- Commonwealth EPBC Act Protected Matters Search Tool (PMST) (10km radius)

Given that the proposed work is limited to an existing bus depot, a highly disturbed area, no further searches were undertaken.

Did the database searches identify any endangered ecological communities, threatened flora and/or threatened or protected fauna, or migratory species in or within the vicinity of the proposed works? Both Commonwealth and State listed matters must be considered. Yes ☒ No ☐

The following threatened species was identified within a 500m radius of the proposal.

Refer to biodiversity searches in Appendix G for the Bionet threatened species records within the locality (10km radius).

Scientific and common name	Status *	Type of listing (BC Act or EPBC Act)	Distance from works	Potential impacts
Grey-headed flying fox *(Pteropus poliocephalus)*	Vulnerable	EPBC	14 sightings with the closest being approximately 120m away	No expected impacts. The proposal would not remove vegetation or structures with habitat potential

Does the proposal involve pruning, trimming or removal of any tree/s? Yes ☐ No ☒

Is the proposal likely to impact nationally listed threatened species, ecological communities or migratory species? Yes ☐ No ☒

Would the proposal require the removal of any other vegetation? Approximately 12m^2 of vegetation (planted shrubs and grasses) within the depot garden beds would be removed as part of the adjacent Ausgrid work and the proposal. See Appendix H.	Yes ☒	No ☐
Would the proposal require the removal of any tree hollows?	Yes ☐	No ☒
Are there any known areas of outstanding biodiversity value or areas mapped as 'littoral rainforest' or 'coastal wetland' under chapter 2 of SEPP (Resilience and Hazards) in or within the vicinity of the proposed work?	Yes ☐	No ☒
Would the proposal provide any additional barriers to the movement of wildlife?	Yes ☐	No ☒
Would the proposal disturb any natural waterways or aquatic habitat?	Yes ☐	No ☒
Would the proposal impact (directly or indirectly) any potential microbat roosting or breeding habitat such as on bridges and culverts?	Yes ☐	No ☒

Safeguards

Safeguards to be implemented are:

No.	Safeguards
F1	Should any additional vegetation trimming and/or removal be required, it will be subject to further environmental assessment.

3.8 Traffic and transport

Table 3-8: Traffic and transport

Description of existing environmental and potential impacts		
Is the proposal likely to result in detours or disruptions to traffic flow (vehicular, cycle and pedestrian) or access during construction? The proposal is limited to works within the bus depot. No changes to external traffic flow including vehicular, cycling or pedestrian would occur as a result of the proposal. There would be a small increase in the number of heavy and light vehicles associated with the work but any impact to the surrounding road network would be negligible. Construction vehicles, including deliveries, would enter and exit the depot via Balmain Road. Up to 20 light vehicles associated with construction personnel would park on local streets during construction. Where feasible, construction personnel would park within the bus depot.	Yes ☐	No ☒
Is the proposal likely to result in detours or disruptions to traffic flow (vehicular, cycle and pedestrian) or access during operation?	Yes ☐	No ☒
Is the proposal likely to affect any other transport nodes or transport infrastructure (e.g., bus stops, bus routes) in the surrounding area? Or result in detours or disruptions to traffic flow (vehicular, cycle and pedestrian) or access during operation? There would be no interruptions or changes to bus services operating from Leichhardt Bus Depot during construction or operations.	Yes ☐	No ☒

Safeguards

Safeguards to be implemented are:

No.	Safeguards
TA1	Where possible, traffic movements and property access will be maintained during the work.
TA2	Road occupancy licence (ROL) or equivalent will be obtained prior to any temporary road closures or contraflow activities where required.

3.9 Socio-economic

Table 3-9: Socio-economic

Description of existing environmental and potential impacts		
Is the proposal likely to impact on local business?	Yes ☐	No ☒
Is the proposal likely to require any property acquisition?	Yes ☐	No ☒
Is the proposal likely to alter any access for properties (either temporarily or permanently)? No, the proposal is not likely to alter access for properties permanently. During construction, there may be temporary changes to access for 27 Derbyshire Road this property is owned by Transport and should temporary access changes be required, it will be managed with the relevant stakeholders. Transport is seeking additional information from Sydney Bus Museum regarding existing access requirements. Where reasonable and feasible, the proposal would maintain existing access arrangements.	Yes ☐	No ☒
Is the proposal likely to alter any on-street parking arrangements (either temporarily or permanently)?	Yes ☐	No ☒
Is the proposal likely to change pedestrian movements or pedestrian access (either temporarily or permanently)?	Yes ☐	No ☒
Is the proposal likely to impact on any items or places of social value to the community (either temporarily or permanently)?	Yes ☐	No ☒
Is the proposal likely to reduce or change visibility of any businesses, farms, tourist attractions or the like (either temporarily or permanently)?	Yes ☐	No ☒
Is the proposal likely to impact trees planted by a community group, Landcare group or by council or a tree that is a memorial or part of a memorial group e.g., has a plaque?	Yes ☐	No ☒
Is the proposal likely to impact trees that form part of a streetscape, an avenue or roadside planting?	Yes ☐	No ☒

Safeguards

Safeguards to be implemented are:

No.	Safeguards
SE1	During construction and operations, existing access arrangements will be maintained with Sydney Bus Museum, where reasonable and feasible.

3.10 Landscape character and visual amenity

Table 3-10: Landscape character and visual amenity

Description of existing environmental and potential impacts		
Is the proposed work over or near an important physical or cultural element or landscape? (For example, heritage items and areas, distinctive or historic built form, National Parks, conservation areas, scenic highways etc.) The proposed work will occur within the curtilage of two locally listed heritage items, and there are six other locally listed heritage items within 150m of the proposal	Yes ☒	No ☐
Would the proposal obstruct or intrude upon the character or views of a valued landscape or urban area? (For example, locally significant topography, a rural landscape or a park, a river, lake or the ocean or a historic or distinctive townscape or landmark)	Yes ☐	No ☒
Would the proposal require the removal of mature trees or stands of vegetation, either native or introduced?	Yes ☐	No ☒
Would the proposal result in large areas of shotcrete visible from the road or adjacent properties?	Yes ☐	No ☒
Would the proposal involve new noise walls or visible changes to existing noise walls? There is an existing noise wall on the north and eastern sides of the bus depot. Minor penetrations through the noise wall would be required for cabling.	Yes ☐	No ☒
Would the proposal involve the removal or reuse of large areas of road corridor, landscape, either verges or medians?	Yes ☐	No ☒
Would the proposal involve substantial changes to the appearance of a bridge (including piers, girders, abutments and parapets) that are visible from the road or residential areas?	Yes ☐	No ☒
If involving lighting, would the proposal create unwanted light spillage on residential properties at night (in construction or operation)?	Yes ☐	No ☒
Would any new structures or features to be constructed, result in over shadowing to adjoining properties or areas?	Yes ☐	No ☒

Visual impact

Within the bus depot there are existing buildings and a noise wall that screens many residents, businesses and public areas from viewing the bus charging/parking areas. Some sections of the bus charging/parking area can be viewed from Pioneers Memorial Park, Derbyshire Road (south of William St) and Balmain Road (south of Alfred Street).

The general height of the pedestal chargers would be shorter than the height of the buses and consistent with existing chargers installed within the depot in 2022.

The proposal would involve the intallation of two raised plant decks, which may be visible from Derbyshire Road and Pioneers Memorial Park. The total height of the plant decks, including the electrical infrastructure, would be approximately 9.5 metres. The approximate heights of existing noise walls and buildings within the depot range in height from around four to seven metres in height.

The site is located within a predominantly residental area, with a vacant adjacent property to the south, owned by Properties NSW on behalf of the NSW Police Force.

The adjacent Ausgrid HV power supply works would require the removal of approximately 12m^2 of planted vegetation on the outer side of the noise wall, along Balmain Road (see Appendix H). Removal is required to faciliate the installation of swtichboards, ring main unites and trechning from inside the bus depot. This vegetation currently helps mitigate the visual impact of the existing concrete noise wall. Where reasonable and feasible, any vegetation that is removed within depot garden beds, will be replaced with similar species with similar screening properties.

The Heritage Impact Assessment (see Appendix F) concluded that the proosed changes would result in minor impacts to the visual catchment and interpretation of the adjoining former SRA tramshed yard and

visual catchment of adjacent heritage items. The project has incorporated an approach to reduce impacts to the yard which consider reducing excavation, reusing existing penetrations into the former SRA office and amenities building for new connections into the adjoining switchboard and aligning the new raised cable containment culvert with the existing yard configuration. The Heritgae Impact Assessment recommended further measures which have been included in section 3.6 and the associated environmental safeguards (safeguards H2 and H3).

Overall, the impacts on existing views are considered to be low-moderae.

Landscape character impact

The proposed works would constitute relatively minor modifications to an existing bus depot, set within a largely residential context and adjacent to recreational infrastructure including heritage listed Pioneers Memorial Park and a sports field wthin Sydney Secondary College. While these constitute sensitive land uses, the overall footprint of the depot, and the scale and nature of its operation would not change as a result of the proposed works. Further, the electrification of the depot as the outcome of the proposed works would effect positive change for surrounding areas, due to the reduction in noise and removal of bus emissions. The proposed works are therefore considered to have a beneficial impact on the landscape character of the area.

Safeguards

Safeguards to be implemented are:

No.	Safeguards
LV1	Where reasonable and feasible, any vegetation that is removed within depot garden beds, will be replaced with similar species with similar screening properties.

3.11 Waste

Table 3-11: Waste

Description of existing environmental and potential impacts		
Is the proposal likely to generate >200 tonnes of waste material (contaminated and /or non-contaminated material)?	Yes ☐	No ☒
Is the proposal likely to require a licence from EPA?	Yes ☐	No ☒
Is the proposal likely to require the removal of asbestos? As identified in the PSI, the underlying soils below the concrete slab may include asbestos.	Yes ☒	No ☐
The proposal would likely generate the following waste streams: • construction and demolition waste (such as concrete or asphalt) • excavation spoil (including potential ACM) • general waste from construction staff • hazardous waste (see soil and contamination section above),including from decommissioning of the refueling infrastructure.		

Safeguards

Safeguards to be implemented are:

No.	Safeguards
M1	Resource management hierarchy principles will be followed: • avoid unnecessary resource consumption as a priority • avoidance is followed by resource recovery (including reuse of materials, reprocessing, recycling and energy recovery) • disposal is undertaken as a last resort. (in accordance with the *Waste Avoidance and Resource Recovery Act 2001*).

M2	Waste material, is not to be left on site once the work has been completed.
M3	Working areas are to be maintained, kept free of rubbish and cleaned up at the end of each working day.
M4	An appropriate Unexpected Finds Protocol, considering asbestos containing materials and other potential contaminants, will be included in the CEMP. Procedures for handling asbestos containing materials, including licensed contractor involvement as required, record keeping, site personnel awareness and waste disposal, will be undertaken in accordance with SafeWork NSW requirements.
M5	All waste will be separated and classified in accordance with the NSW EPA *Waste Classification Guidelines 2014* and disposed of to a suitably licensed facility.

3.12 Climate change and greenhouse gas emissions

Table 3-12: Climate change and greenhouse gas emissions

Description of existing environmental and potential impacts		
Is the proposal located in an area likely to be permanently or tidally inundated in the future or subject to increased duration and intensity of flooding? The proposal is not located in an area likely to be permanently or tidally inundated in future and is not on flood liable land.	Yes ☐	No ☒
Have opportunities for reduced energy consumption during construction and operation been considered. Transport's Baseline Sustainability Requirements would be implemented and opportunities to reduce energy consumption during construction will be considered as part of detailed design. Opportunities to reduce energy consumption have been considered in relation to operating electric buses rather than diesel buses. During operation, renewable energy will be purchased.	Yes ☒	No ☐
Greenhouse gas emissions sources during construction are likely to be from: • Embedded emissions in materials • Transporting materials to site; and • Operation of plant and equipment. Renewable energy will be purchased during operations to reduce reliance on fossil fuels. A climate change risk assessment has been prepared for the proposal and would be further refined during detailed design, and relevant adaptation measures adopted to mitigate high and very high climate risks.		

Safeguards

Safeguards to be implemented are:

No.	Safeguards
CC1	Location and installation of electrical equipment will be designed to consider climate change and increases in rainfall intensity.
CC2	A Sustainability Management Plan will be prepared and incorporate the relevant Transport Baseline Sustainability Requirements. The plan will be submitted to the Transport Sustainability Representative for review and acceptance.

3.13 Cumulative impact

Table 3-13: Cumulative impact

Description of existing environmental and potential impacts		
Are there other projects and developments in the study area which could add to potential impacts in both construction and operation? A search of the NSW Planning Portal in December 2024 did not identify any major developments in close proximity to the proposal area. The proposal requires upgrades to the HV electrical supply to meet the energy demands. The HV upgrades are subject to separate environmental assessment and approval through Ausgrid. The HV upgrades are planned to occur at the same time as the proposal. Where feasible, coordination with the HV upgrade work will occur to make every effort to minimise cumulative impacts during construction	Yes ☒	No ☐

Safeguards

Safeguards to be implemented are:

No.	Safeguards
CM1	Where feasible, community notifications will be combined for the proposal and the HV upgrade work.

4. Summary of safeguards and environmental management measures

4.1 Safeguards and environmental management measures

This section provides a summary of the site-specific environmental safeguards and management measures identified in described in chapter 3 of this minor works REF. These safeguards will be implemented to reduce potential environmental impacts throughout construction and operation. For clarity, all safeguards are the responsibility of the operator/contractor.

Table 4-1: Summary of site-specific safeguards for proposed work

Factor	Reference no.	Safeguards
General	G1	If the scope of the works changes at any time, review the changes against the Transport *Environmental assessment procedure –routine and minor works* EMF-PA-PR-0081 and complete any further environmental assessments prior to carrying out works associated with the changed scope.
	G2	A construction environmental management plan (CEMP) will be prepared and submitted to Transport's Senior Manager Environment and Sustainability for endorsement prior to the commencement of works.
	G3	An Environment Control Map (ECM) will be prepared in accordance with Transport's *Environmental control map guideline* EMF-EM-GD-

		0148 and submitted to Transport Senior Manager Environment and Sustainability for endorsement prior to commencement of works.
	G4	Parking of vehicles and storage of plant/equipment will only occur on existing paved areas.
	G5	As part of detailed design, management measures will be designed to ensure any potential contaminants identified during operations (e.g. waste water from fire suppression systems) will be captured and disposed of in accordance with applicable legislation and standards.
Soil	SC1	Erosion and sediment control measures will be implemented and maintained to prevent sediment moving off-site and sediment laden water entering any water course, drainage lines, or drain inlets (in accordance with the *Landcom/Department of Housing Managing Urban Stormwater, Soils and Construction Guidelines (the Blue Book))*. The erosion and sediment controls will be included in the Construction Environmental Management Plan (CEMP) and Environmental Control Map (ECM).
	SC2	Erosion and sedimentation controls will be checked and maintained on a regular basis (including clearing of sediment from behind barriers) and records kept and provided on request.
	SC3	All fuels, chemicals and liquids will be stored in an impervious bunded area a minimum of 50 metres away from: • any areas of concentrated water flow • flooded or poorly drained areas • slopes above 10%.
	SC4	Refueling of plant and equipment during construction will be in line with operational refueling practices, including: • refueling will occur in impervious bunded areas located a minimum of 50 metres from drainage lines or waterways if refuelling occurs within 50m of drainage, appropriate management measures will be implemented to prevent a potential spill from leaving site via drainage.
	SC5	An emergency spill kit will be kept on site at all times and maintained throughout the construction work. The spill kit must be appropriately sized for the volume of substances at the work site and personnel inducted in its use.
	SC6	If an incident (e.g., spill) occurs during construction, Transport's *Environmental incident procedure* EMF-EM-PR-0001 will be followed and the Transport Project Manager and Senior Environment and Sustainability Manager will be notified immediately. The operator/contractor must report incidents using the nominated Transport incident management system
	SC7	Emergency contacts will be kept in an easily accessible location on vehicles. All workers will be advised of these contact details and procedures.
	SC8	The CEMP and work health and safety (WHS) plan must both identify appropriate mitigations and control measures with respect to contamination present at the site, and the implementation of these plans must be periodically audited.

	SC9	Any excavated soil and fill material removed from the site will require characterisation and off-site disposal to an appropriately licensed waste facility or landfill in accordance with the POEO Act and Protection of the Environment Operations (Waste) Regulation 2014.
	SC10	Prior to commencing work to existing building structures that may interface with the proposal, a hazardous material survey will be completed by a suitably qualified professional.
	SC11	Existing fuel, chemical storage and other potentially contaminating infrastructure which will no longer be required as part of the depot will be appropriately decommissioned, remediated and/or disposed.
	SC12	Where excavation that may intersect with potential areas of medium risk rated contamination identified in the preliminary CSM, a targeted intrusive site investigation will be completed to provide a quantitative assessment of the potential contamination exposure pathways to receptors and to further understand the potential management liability.
Waterways and water quality	W1	No sediment laden water will be released into drainage lines and/or waterways.
	W2	Water quality control measures will be used to prevent any materials (e.g., concrete, grout, sediment etc.) entering drain inlets or waterways. Any concrete washout required on site will be done in accordance with Transport's *Concrete washout guideline* EMF-EM-GD-0145.
Noise and vibration	NV1	Work will generally be carried out during standard working hours (i.e. 7am to 6pm Monday to Friday; 8am to 1pm Saturdays). Any work outside these hours may be undertaken if approved by Transport and the community is notified prior to the work commencing. Transport's *out-of-hours work application form* EMF-EM-TT-0146 would need to be prepared by the construction Contractor and submitted to Transport's Environment Manager for review and approval prior to the work commencing.
	N2	Noise impacts will be minimised in accordance with Transport's *Construction noise and vibration guideline - public transport infrastructure* EMF-NV-GD-0060.
	NV3	Measures will be implemented to minimise or prevent vibration impacts, including: • complying with the minimum working distances from vibration intensive plant • using non-vibration-producing equipment; and • completing vibration monitoring where required.
	NV4	Noise and vibration management measures will be included in the CEMP and implemented during construction. The CEMP will generally follow the approach in the *Interim Construction Noise Guideline* (ICNG) (DECC, 2009) and *Transport's Construction noise and vibration guideline - public transport infrastructure* EMF-NV-GD-0060, including: • selecting quieter plant and equipment based on the optimal power and size to most efficiently perform the required tasks, where feasible and reasonable • operating plant and equipment in the quietest and most efficient manner • avoiding simultaneous operation of noisy plant, where feasible • plant used intermittently to be throttled down or shut down • maximising the offset distance between noisy plant and adjacent sensitive receivers

		• noise-emitting plant to be directed away from sensitive receivers • site-based vehicles and plant used on-site should be fitted with non-tonal reversing alarms to reduce tonal noise impacts.
	NV5	All sensitive receivers (e.g. places of worship, residents and schools) likely to be affected will be notified at least seven calendar days prior to commencement of any works where a notification is triggered in accordance with Transport's Construction noise and vibration guideline-public transport infrastructure EMF-NV-GD-0060. The notification will provide details of: • the proposal • the construction period and construction hours • expected construction impacts and mitigation measures • type of equipment and materials used • contact information including 24-hour Construction Response Line • complaint reporting • how to obtain further information.
	NV6	For vibration-intensive activities within the recommended safe work distances (table 5-16 from the NVIA), the following measures will be included in the CEMP and implemented on-site: • Conduct vibration assessments during the initial stages of vibration-intensive activities to establish site-specific minimum working distances. This is especially important for the heritage listed former SRA tram shed, including interior (Sydney Bus Museum) located along the western boundary of the site. • Plan work schedules to incorporate breaks, allowing for reduced impact on nearby locations • Ensure appropriate selection and maintenance of equipment to minimise vibration levels. Saw cuts should be considered as a minimum to reduce vibration propagation and hydrofraise should be considered where applicable to reduce vibration generation. • Perform surveys to assess and monitor potential structural impacts resulting from vibration-intensive activities.
	NV7	Any penetrations through the noise wall will be done in a way to maintain noise attenuation efficiency, including the sealing of any gaps. Prior to the decommissioning/ removal of structures attached to the heritage items and use of hydraulic hammering (if relevant) / piling rig, the concrete panel is required to be saw cut through, to create a discontinuous condition from the structure that is being decommissioned and the heritage building.
	NV8	Prior to the decommissioning/ removal of structures attached to the heritage items and use of hydraulic hammering (if relevant) / piling rig, the concrete panel is required to be saw cut through, to create a discontinuous condition from the structure that is being decommissioned and the heritage building.
Air quality	A1	Measures (including watering or covering exposed areas) will be used to minimise or prevent air pollution and dust.
	A2	Work (including the spraying of paint and other materials) will not be carried out during strong winds or in weather conditions where high levels of dust or air borne particulates are likely.
	A3	Vehicles transporting waste or other materials that may produce odours or dust will be covered during transportation.

Non-Aboriginal heritage	H1	If unexpected heritage items are uncovered during construction, all work must cease in the vicinity of the material/find and the steps in Transport's *Unexpected heritage items procedure* EMF-HE-PR-0076 must be followed.
	H2	Detailed design to consider: • new fencing within the site should match the existing black perimeter (and internal) fencing at 29 Derbyshire Rd (the former SRA office and amenities building) • the new fencing should align with the south facing podium façade of the former SRA tramshed, and ensure a minimum 15m separation from the former SRA office and amenities building is achieved.
	H3	Detailed design for the proposed cable containment culvert/plant deck and the cable containment deck elements to consider: • the form of the culvert should remain as open as possible and not be infilled • where the height of the culvert can be reduced in detailed design, and also maintaining safety requirements, this is desirable to reduce potential visual impacts to view catchments of adjacent heritage items • the cable containment decking above the culvert should be as uncluttered as possible • the colour of the steel culvert and cable containment deck elements should be recessive in colour such as a light grey. Signage in colours that stand out should be avoided.
	H4	Vibration monitoring, including selection of machinery within the recommended limits, identified in the supporting Noise and Vibration Impact Assessment should be identified and inform the development and delivery of the demolition plan
Aboriginal cultural heritage	B1	If Aboriginal heritage items are uncovered during construction, all construction activities in the vicinity of the find must cease and the Transport Senior Manager Environment and Sustainability contacted immediately. Refer to steps in the Transport *Unexpected heritage items* procedure (EMF-HE-PR-0076) which must be followed.
Biodiversity	F1	Should any additional vegetation trimming and/or removal be required, it will be subject to further environmental assessment.
Traffic and transport	TA1	Where possible, traffic movements and property access will be maintained during the work.
	TA2	Road occupancy licence (ROL) or equivalent will be obtained prior to any temporary road closures or contraflow activities where required.
Socio-economic	SE1	During construction and operations, existing access arrangements will be maintained with Sydney Bus Museum, where reasonable and feasible.
Landscape character and visual amenity	LVA1	Where reasonable and feasible, any vegetation that is removed within depot garden beds, will be replaced with similar species with similar screening properties.
Waste	M1	Resource management hierarchy principles will be followed: • avoid unnecessary resource consumption as a priority • avoidance is followed by resource recovery (including reuse of materials, reprocessing, recycling and energy recovery) • disposal is undertaken as a last resort.

		(in accordance with the *Waste Avoidance and Resource Recovery Act 2001).*
	M2	Waste material is not to be left on site once the work has been completed.
	M3	Working areas are to be maintained, kept free of rubbish and cleaned up at the end of each working day.
	M4	An appropriate Unexpected Finds Protocol, considering asbestos containing materials and other potential contaminants, will be included in the CEMP. Procedures for handling asbestos containing materials, including licensed contractor involvement as required, record keeping, site personnel awareness and waste disposal, will be undertaken in accordance with SafeWork NSW requirements.
	M5	All waste will be separated and classified in accordance with the NSW EPA *Waste Classification Guidelines 2014* and disposed of to a suitably licensed facility.
Climate change and greenhouse gas emissions	CC1	Location and installation of electrical equipment will be designed to consider climate change and increases in rainfall intensity.
	CC2	A Sustainability Management Plan will be prepared and incorporate the relevant Transport Baseline Sustainability Requirements. The plan will be submitted to the Transport Sustainability Representative for review and acceptance.
Cumulative impacts	CM1	Where feasible, community notifications will be combined for the proposal and the HV upgrade work.

4.2 Licensing and approvals

Table 4-2: Summary of licensing and approvals required

Instrument	Requirement	Timing
Roads Act 1993 (Section 138)	Road occupancy licence to carry out works that would impact on the operational efficiency of the road network.	Prior to any works on public roads.

5. Certification, review and determination

5.1 Certification

This minor works REF 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.

Prepared by:

Signature [redacted]

Name: [redacted]

Position: Transport Senior Environment and Sustainability Officer

Date: 10/01/2025

Minor works REF reviewed by:

Signature [redacted]

Name: [redacted]

Position: Transport Senior Manager Environment and Sustainability

Date: 13/01/2025

5.2 Environment and sustainability staff review

The minor works REF has been reviewed and considered against the requirements of sections 5.5 and 5.7 of the EP&A Act.

In considering the proposal this assessment has examined and taken into account to the fullest extent possible, all matters affecting or likely to affect the environment by reason of that activity as addressed in the minor works REF and associated information. This assessment is considered to be in accordance with the factors required to be considered under section 171 of the Environmental Planning and Assessment Regulation 2021.

The proposal described in this minor works REF will have some environmental impacts which can be ameliorated satisfactorily. Having regard to the safeguards and management measures proposed, this assessment has considered that these impacts are unlikely to be significant and therefore an approval for the proposal does not need to be sought under Division 5.2 of the EP&A Act.

The assessment has considered the potential impacts of the activity on areas of outstanding value and on threatened species, ecological communities or their habitats for both terrestrial and aquatic species as defined by the *Biodiversity Conservation Act 2016* and the *Fisheries Management Act 1994*.

The proposal described in the minor works REF will not affect areas of outstanding value. The activity described in the minor works REF will not significantly affect threatened species ecological communities or their habitats. Therefore, a species impact statement is not required.

The assessment has also addressed the potential impacts of the activity on matters of national environmental significance and any impacts on the environment of Commonwealth land and concluded that there will be no significant impacts. Therefore, there is no need for a referral to be made to the Australian Government 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 *Environment Protection and Biodiversity Conservation Act 1999*.

The minor works REF is considered to meet all relevant requirements.

5.3 Environment and Sustainability staff recommendation

It is recommended that the proposal to undertake the Zero Emission Bus Leichhardt Bus Depot conversion as described in this minor works REF proceed subject to the implementation of all safeguards identified in the minor works REF and compliance with all other relevant statutory approvals, licences, permits and authorisations.

The minor works REF has examined and taken into account to the fullest extent possible all matters likely to affect the environment by reason of the activity in accordance with the EP&A Act, EP&A Regulation and the Guidelines approved under clause 170 of the EP&A Regulation. The minor works REF has established that the activity is not likely to significantly affect the environment or threatened species, ecological communities or their habitats.

The minor works REF has concluded that there will be no significant impacts on matters of national environmental significance or any impacts on the environment of Commonwealth land.

If the proposal has not commenced within two years of the determination date the SMES must be consulted to identify any new or updated assessment or approval requirements.

Recommended by:		**Noted by:**	
Signature	[redacted]	Signature	[redacted]
Name:	[redacted]	Name:	[redacted]
Position:	Senior Manager Environment and Sustainability	Position:	Project Manager
Date:	13/01/2025	Date:	10/01/2025

5.4 Decision statement

In accordance with the above recommendation, I certify that I have reviewed and endorsed the contents of this minor works REF, and to the best of my knowledge, it is in accordance with the EP&A Act, the EP&A Regulation and the Guidelines approved under Section 170 of the EP&A Regulation, and the information is neither false nor misleading.

I determine that Transport for NSW may proceed with the activity.

Signature	[redacted]
Name:	[redacted]
Position:	Director Cross City Engagement Enablement
Date:	14.1.25

5.5 EP&A Regulation publication requirement

Table 5-1: EP&A Regulation publication requirement

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

Appendix A: Consideration of State and Commonwealth environmental factors

Environmental Planning and Assessment Regulation 2021 section 171(2) factors

The following factors, listed in section 171(2) of the Environmental Planning and Assessment Regulation 2021, have been considered to assess the likely impacts of the proposal on the natural and built environment. This consideration is required to comply with sections 5.5 and 5.7 of the EP&A Act.

Table A1: Consideration of section 171 of the EP&A Regulation factors

Factor	Description of impact	Duration and extent
a) Environmental impact on the community.	• There would be some temporary impacts to the community during construction, particularly in relation to noise and visual amenity. The proposed safeguards in this document would be implemented to manage and minimise potential adverse impacts to the community. • There would be some positive minor impacts to the community during operation in relation to operation of an electric fleet rather than internal combustion engines.	Negative, short-term, minor Positive, long-term
b) The transformation of the locality.	• During construction there would be some minor visual impacts associated with the presence of construction equipment and activities. • Operational visual impacts are expected with the installation of the two raised plant decks. The impacts will be minor given the restricted views into the bus parking/charging areas.	Negative, short-term and long-term minor
c) Any environmental impact on the ecosystems of the locality.	• Construction of the proposal has the potential to result in temporary environmental impacts on the ecosystem of the locality such as noise, air quality and contamination however, this would be managed in accordance with the implementation of the safeguards. The proposal is not expected to result in any long-term environmental impacts on the ecosystem of the locality.	Negative, short-term, minor
d) Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality.	• The proposal is located within an existing bus depot. The proposal has the potential to result in short-term negative impacts due to construction related activities. The impacts would be minimised with the implementation of the safeguards as detailed in the Minor Works REF. • The proposal would not result in any substantial reduction of the aesthetic, recreational, scientific or other environmental quality or value of the locality	Negative, short-term, minor and long-term minor
e) Any effect on any locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social	• The proposal would not affect a known Aboriginal heritage item, place or object. • Minor impacts to the visual catchment and interpretation of the adjoining heritage listed former SRA tramshed yard and visual catchment of adjacent heritage items.	Negative, long-term, minor

Factor	Description of impact	Duration and extent
significance or other special value for present or future generations.		
f) Any impact on the habitat of protected fauna (within the meaning of the *Biodiversity and Conservation Act 2016*).	• The proposal is located within an existing bus depot, a highly disturbed area and is unlikely to have any impact on the habitat of protected fauna.	Nil
g) Any endangering of a species of animal, plant or other form of life, whether living on land, in water or in the air.	• The proposal requires some vegetation removal within the bus depot. The proposal is located within an existing bus depot, a highly disturbed area. The proposal is is unlikely to endanger any species of animal, plant or other form of life, whether living on land, in water or in the air.	Negative, long-term, minor
h) Any long-term effects on the environment	• The proposal is unlikely to have any long-term effects on the environment given the nature and extent of the works, and safeguards to be implemented.	Nil
i) Any degradation of the quality of the environment.	• The proposal is unlikely to result in degradation of the quality of the environment. During construction there would be minor and temporary impacts to the environment, primarily from noise and during operations a reduction in visual amenity. These potential impacts would be managed in accordance with the safeguards within the Minor Works REF. With the replacement of the diesel and CNG buses with electric buses, there would be postive benefits for the local community in terms of improved transport experience for passengers and more sustainable operations.	Negative, short-term, minor Positive long-term
j) Any risk to the safety of the environment.	• The proposal is unlikely to cause any pollution or safety risks to the environment provided the safeguards are implemented.	Nil
k) Any reduction in the range of beneficial uses of the environment.	• The proposal is unlikely to result in the reduction in the range of beneficial uses of the environment.	Nil
l) Any pollution of the environment.	• Minor, short-term risks to water quality would be present in the event of spill or release of material from the work site during construction. Safeguards have been proposed to address the risk of water pollution. • The reduction and replacement of diesel buses at the depot would reduce potential risks associated with spills.	Negative, short-term, minor Positive long-term
m) Any environmental problems associated with the disposal of waste	• Given the historical use of the bus depot, there is potential for contaminants to be present within the soils. Hazardous waste (including asbestos) may be generated by the proposal. All spoil to be removed from site would be	Negative, short-term and long-term, minor

Factor	Description of impact	Duration and extent
	tested to confirm the presence of any contamination. Any contaminated spoil would be disposed of at an appropriately licensed facility, and in accordance with SafeWork NSW requirements. • During operation of the proposal, water used in the event of fire supression will be captured and disposed of appropriately.	
n) Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply.	• The proposal is not likely to put an increased demand on resources that are, or are likely to become, in short supply. Renewable energy will be purchased during operations to support the electric fleet.	Nil
o) The cumulative environmental effect with other existing or likely future activities.	• Cumulative impacts have been assessed earlier in this assessment. To minimise any cumulative construction impacts with other work occurring at the same time in the surrounding area, environmental safeguards would be coordinated with these projects where feasible.	Negative, short-term, minor
p) Any impact on coastal processes and coastal hazards, including those under projected climate change conditions.	• The proposal would not affect or be affected by any coastal processes or coastal hazards.	Nil
q) Applicable local strategic planning statements, regional strategic plans or district strategic plans made under the Act, Division 3.1	• The applicable local strategic plan is the Inner West Local Strategic Planning Statement which provides the land-use planning framework for the Inner West. The proposal supports planning priority 8, "Provide improved and accessible sustainable transport infrastructure", which includes an objective to embrace emerging transport technology that reduces carbon footprint and improves travel information and services.	Positive, long-term
r) Other relevant environmental factors	• In considering the potential impacts of this proposal all relevant environmental factors have been considered, refer to Chapter 3 of this assessment.	Nil

Matters of National Environmental Significance

Table A2: Matters of national environmental significance

Environmental factor	Impact
a) Any impact on a World Heritage property?	Nil
b) Any impact on a National Heritage place?	Nil
c) Any impact on a wetland of international importance (often called 'Ramsar' wetlands)?	Nil

d)	Any impact on nationally threatened species, ecological communities or migratory species?	Nil
e)	Any impact on a Commonwealth marine area?	Nil
f)	Does the proposal involve a nuclear action (including uranium mining)?	Nil
Additionally, any impact (direct or indirect) on the environment of Commonwealth land?		Nil

Appendix B: Environmental Planning and Assessment Regulation 2021 section 171(A) factors – activities in catchments

SEPP (Biodiversity and Conservation) – Chapter 6 (Water Catchments)

Chapter 6 of SEPP (Biodiversity and Conservation) relates to the use of land within regulated catchments. In these catchments, Transport is required to consider the environmental impact of activities to which Division 5.1 of the EP&A Act applies before carrying out the activity.

The four regulated catchments are:

a) Sydney Drinking Water Catchment

b) Sydney Harbour Catchment

c) Georges River Catchment

d) Hawkesbury-Nepean Catchment.

In undertaking an activity in a regulated catchment Transport must satisfy sections 6.6(2), 6.7(2), 6.8(2) and 6.9(2) and consider environmental impacts listed in sections 6.6(1), 6.7(1), 6.8(1) and 6.9(1) of State Environmental Planning Policy (Biodiversity and Conservation) 2021. This includes specific consideration of water quality and quantity, aquatic ecology, flooding, and recreation and public access.

The proposal is located in Sydney Harbour Catchment, the below tables consider the impacts of the proposal on each of the identified factors.

Water quality and quantity

Table C1: Water quality and quantity considerations SEPP (Biodiversity and Conservation)

Section	Factor	Impact/comment
The project must be satisfied of the below before undertaking the activity:		
6.6(2)(a)	The effect on the quality of water entering a natural waterbody will be as close as possible to neutral or beneficial.	During construction no changes to the existing water quality is anticipated, noting the minor excavation proposed. The removal of refuelling infrastructure would reduce existing water quality risks. In the event of a battery fire, water used in suppression activities would be captured.
6.6(2)(b)	The impact on water flow in a natural waterbody will be minimised.	Nil
The project must consider the below before undertaking the activity:		
6.6(1)(a)	Consider whether the development will have a neutral or beneficial effect on the quality of water entering a waterway.	The proposal would have a neutral effect of water quality entering a waterway. The removal of refuelling infrastructure would reduce existing water quality risks.
6.6(1)(b)	Consider whether the development will have an adverse impact on water flow in a natural waterbody.	Nil
6.6(1)(c)	Consider whether the development will increase the amount of stormwater run-off from a site.	Nil. There would be no increase to hardstand areas.

6.6(1)(d)	Consider whether the development will incorporate on-site stormwater retention, infiltration or reuse.	Nil. No changes to existing stormwater system or bus wash bay.
6.6(1)(e)	Consider the impact of the development on the level and quality of the water table.	Nil
6.6(1)(f)	Consider the cumulative environmental impact of the development on the regulated catchment.	Nil. Waterways and water quality environmental safeguards will be implemented.
6.6(1)(g)	Consider whether the development makes adequate provision to protect the quality and quantity of ground water.	Nil. During construction, the required excavation depths are unlikely to interact with groundwater.

Aquatic ecology

Table C2: Aquatic ecology considerations SEPP (Biodiversity and Conservation)

Section	Factor	Impact/comment
The project must be satisfied of the below before undertaking the activity:		
6.7(2)(a)	The direct, indirect or cumulative adverse impact on terrestrial, aquatic or migratory animals or vegetation will be kept to the minimum necessary for the carrying out of the development.	There would be minor vegetation impacts to a planted garden bed. No further impacts to terrestrial, aquatic or migratory animals or vegetation.
6.7(2)(b)	The development will not have a direct, indirect or cumulative adverse impact on aquatic reserves	Nil
6.7(2)(c)	If a controlled activity approval under the *Water Management Act 2000* or a permit under the *Fisheries Management Act 1994* is required in relation to the clearing of riparian vegetation — the approval or permit has been obtained.	Nil. No approval or permit required.
6.7(2)(d)	The erosion of land abutting a natural waterbody or the sedimentation of a natural waterbody will be minimised.	Nil
6.7(2)(e)	The adverse impact on wetlands that are not in the coastal wetlands and littoral rainforests area will be minimised.	Nil
The project must consider the below before undertaking the activity:		
6.7(1)(a)	Consider whether the development will have a direct, indirect or cumulative adverse impact on terrestrial, aquatic or migratory animals or vegetation.	Nil
6.7(1)(b)	Consider whether the development involves the clearing of riparian vegetation and, if so, whether the development will require — (i) a controlled activity approval under the *Water Management Act 2000*, or (ii) a permit under the *Fisheries Management Act 1994.*	Nil
6.7(1)(c)	Consider whether the development will minimise or avoid — (i) the erosion of land abutting a natural waterbody; or (ii) the sedimentation of a natural waterbody.	Nil

Section	Factor	Impact/comment
6.7(1)(d)	Consider whether the development will have an adverse impact on wetlands that are not in the coastal wetlands and littoral rainforests area.	Nil
6.7(1)(e)	Consider whether the development includes adequate safeguards and rehabilitation measures to protect aquatic ecology.	Nil
6.7(1)(f)	Consider if the development site adjoins a natural waterbody — whether additional measures are required to ensure a neutral or beneficial effect on the water quality of the waterbody. Example — Additional measures may include the incorporation of a vegetated buffer between the waterbody and the site.	Nil

Flooding

Table C3: Flooding considerations SEPP (Biodiversity and Conservation)

Section	Factor	Impact/comment
The project must be satisfied of the below before undertaking the activity:		
6.8(2)(a)	On flood liable land in a regulated catchment, the development will not — If there is a flood, result in a release of pollutants that may have an adverse impact on the water quality of a natural waterbody; or	Nil, proposal is not situated on flood liable land.
6.8(2)(b)	On flood liable land in a regulated catchment, the development will not have an adverse impact on the natural recession of floodwaters into wetlands and other riverine ecosystems.	Nil. The proposal is not situated on flood liable land.
The project must consider the below:		
6.8(1)	Consider the likely impact of the development on periodic flooding that benefits wetlands and other riverine ecosystems.	Nil

Recreation and public space

Table C4: Flooding considerations SEPP (Biodiversity and Conservation)

Section	Factor	Impact/comment
The project must be satisfied of the below before undertaking the activity:		
6.9(2)(a)	The development will maintain or improve public access to and from natural waterbodies for recreational purposes, including fishing, swimming and boating, without adverse impact on natural waterbodies, watercourses, wetlands or riparian vegetation.	Nil
6.9(2)(b)	New or existing points of public access between natural waterbodies and the site of the development will be stable and safe.	Nil
6.9(2)(c)	If land forming part of the foreshore of a natural waterbody will be made available for public access as a result of the development but is not in	Nil

	public ownership — public access to and use of the land will be safeguarded.	
The project must consider the below before undertaking the activity:		
6.9(1)(a)	Consider the likely impact of the development on recreational land uses in the regulated catchment.	Nil
6.9(1)(b)	Consider whether the development will maintain or improve public access to and around foreshores without adverse impact on natural waterbodies, watercourses, wetlands or riparian vegetation.	Nil

Appendix C: Concept Designs (indicative only)

NOTES

TOTAL DEPOT CAPACITY: 238 EVs
- * 28 no. 18m buses
- * 210no. 12.5m buses

EXISTING INFRASTRUCTURE
- * 46 no. 12.5m buses
- * 37 no. AC chargers
- * 5 no. DC chargers

NEW INFRASTRUCTURE
- * 110 no. 12.5m buses
- * 28 no. 18m buses
- * 19 no. 12.5m buses - Uncharged/ Garaged
- * 6 no. 12.5m buses - Portable Charger
- * 71 no. DC chargers

FUTURE GROWTH INFRASTRUCTURE
- * 29 no. 12.5m buses
- * 16 no. light EVs for fleet
- * 16 no. DC chargers
- * 8 no. AC chargers

LEGEND

CLEARANCE DETAILS (mm)

Revision	Description	Date
REV A	Initial version	N/A
REV B	255 No. EVs (26 x artic + 229 12.5m)	24/03/2023
REV C	274 No. EVs (26 x artic + 248 x 12.5m)	18/4/2023
REV D	274 No. EVs (26 x artic + 248 x 12.5m) with vehicle movements check	22/05/2023
REV E	275 No. EVs (26 x artic + 249 x 12.5m)	29/06/2023
REV F	Updated HV Equipment location options	08/01/2024
REV G	250 No. EVs (28 x artic + 222 x 12.5m)	15/03/2024
REV H	250 No. EVs (28 x artic + 222 x 12.5m) 16No. Light vehicles.	27/03/2024
REV I	Empty lane 12	05/04/2024
REV J	Update layout with new future buses	26/04/2024
REV K	Remove 3 12.5m buses	01/05/2024
REV L	Add buses in Old Leichhardt Depot to Blue	02/05/2024
REV M	Space saving charging solution	22/05/2024
REV N	ZEROVA stand-alone charging solution and future light EVs are shifted to Future Growth	27/05/2024

Client

TRANSIT SYSTEMS

Project Name
Leichhardt 100% Expansion

Address
230/240 Balmain Rd,
Leichhardt NSW 2040

Drawing Title
General Arrangement - REV N

ZENOBĒ
Zenobē Energy Limited
Level 26, 1 Bligh Street,
Sydney NSW 2000

notices@zenobe.com
zenobe.com

Drawn	Checked	Approved
CT	MB	MB
Scale 1:375	Size A1	Date 27/05/2024

Drawing Name
TRANSPORT NSW – LEICHHARDT 100 EXPANSION- GENERAL ARRANGEMENT REV N

NOTES

TOTAL DEPOT CAPACITY: 238 EVs
* 28 no. 18m buses
* 210no. 12.5m buses

EXISTING INFRASTRUCTURE
* 46 no. 12.5m buses
* 37 no. AC chargers
* 5 no. DC chargers

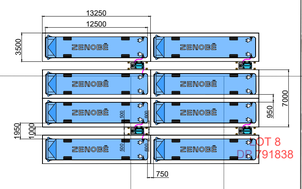
NEW INFRASTRUCTURE
* 110 no. 12.5m buses
* 28 no. 18m buses
* 19 no. 12.5m buses - Uncharged/ Garaged
* 6 no. 12.5m buses - Portable Charger
* 71 no. DC chargers

FUTURE GROWTH INFRASTRUCTURE
* 29 no. 12.5m buses
* 16 no. light EVs for fleet
* 16 no. DC chargers
* 8 no. AC chargers

LEGEND

- 12.5m EV - Fed from existing MSB
- 12.5m EV - Fed by MSB 1
- 12.5m EV - Fed by MSB 2
- 12.5m EV - Fed by MSB 3
- 12.5m EV - Fed by MSB 4
- 12.5m EV - Fed by MSB 6
- 12.5m EV - Uncharged vehicles
- 12.5m EV - Workshop vehicles
- Light EVs for fleet. - Fed by MSB 6
- 150kW EV CHARGERS
- 150kW EV CHARGERS - FUTURE GROWTH
- 22kW AC EV CHARGERS -FUTURE GROWTH
- HV DNSP RMU
- HV PRIVATE RMU
- LV PANELBOARD
- LV FEEDER PILLAR
- EV CHARGER LEAD
- DIRECT CURRENT CABLE
- HIGH VOLTAGE AC CABLE
- LOW VOLTAGE AC CABLE
- ARMCO SAFETY BARRIER
- BOLLARD
- WHEEL STOP
- WALKWAY
- ARMCO BARRIER

CLEARANCE DETAILS (mm)



Provision

Revision	Description	Date
REV B	Updated EVC label, Plandeck location, AC charger label	10/10/2024
REV A	Initial version	30/05/2024

Client: TRANSIT SYSTEMS

Project Name: Leichhardt 100% Expansion

Address: 230/240 Balmain Rd, Leichhardt NSW 2040

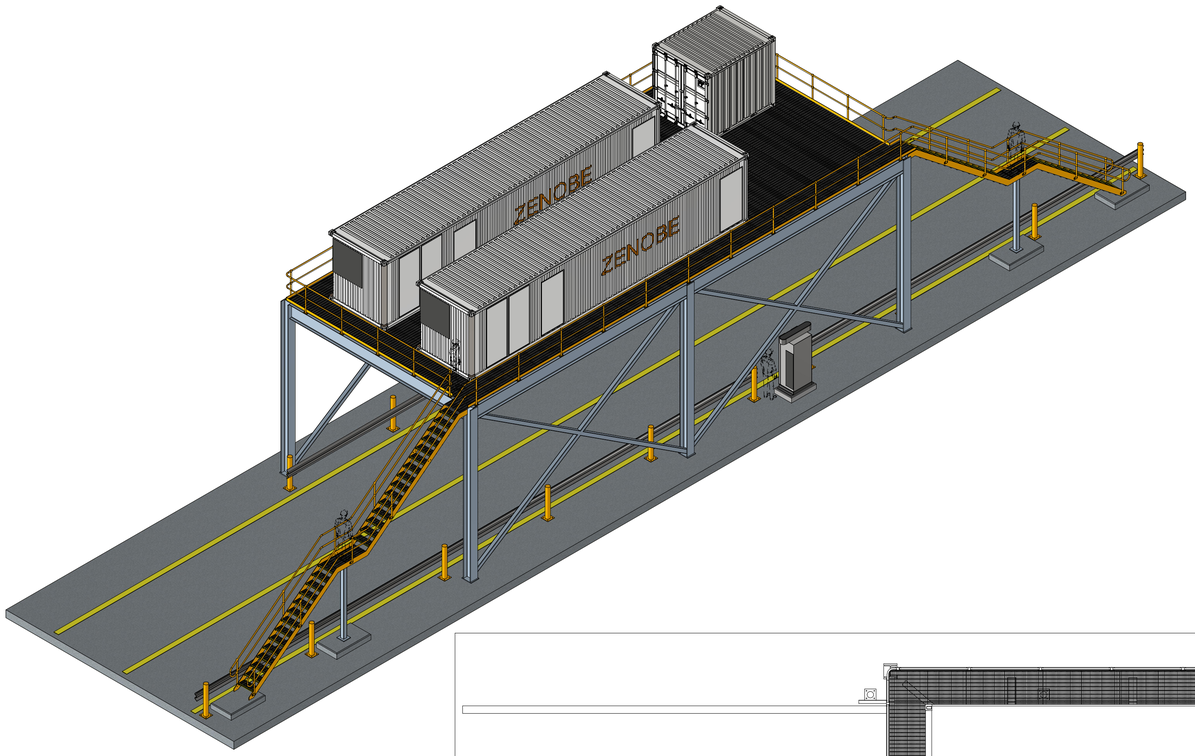
Drawing Title: Power Distribution Plan

Zenobē Energy Limited
Level 26, 1 Bligh Street,
Sydney NSW 2000

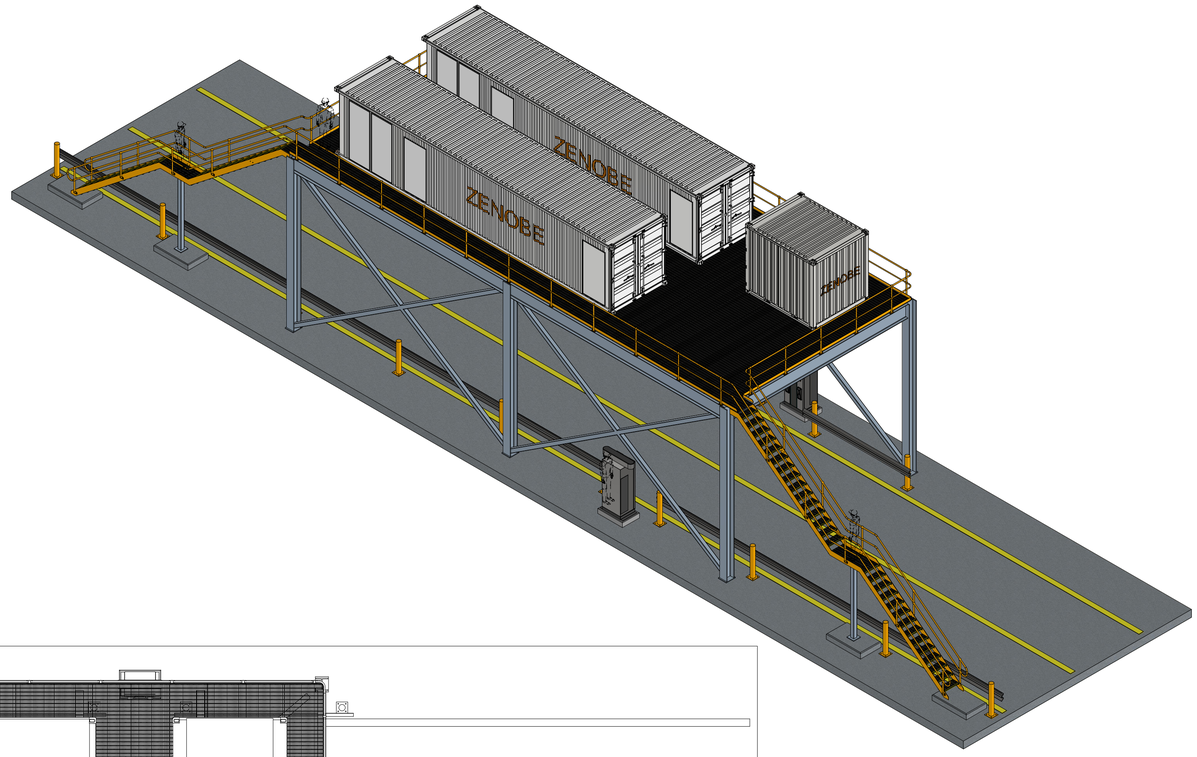
notices@zenobe.com
zenobe.com

Drawn	Checked	Approved
CT	MB	MB
Scale	**Size**	**Date**
1:375	A1	10/10/2024

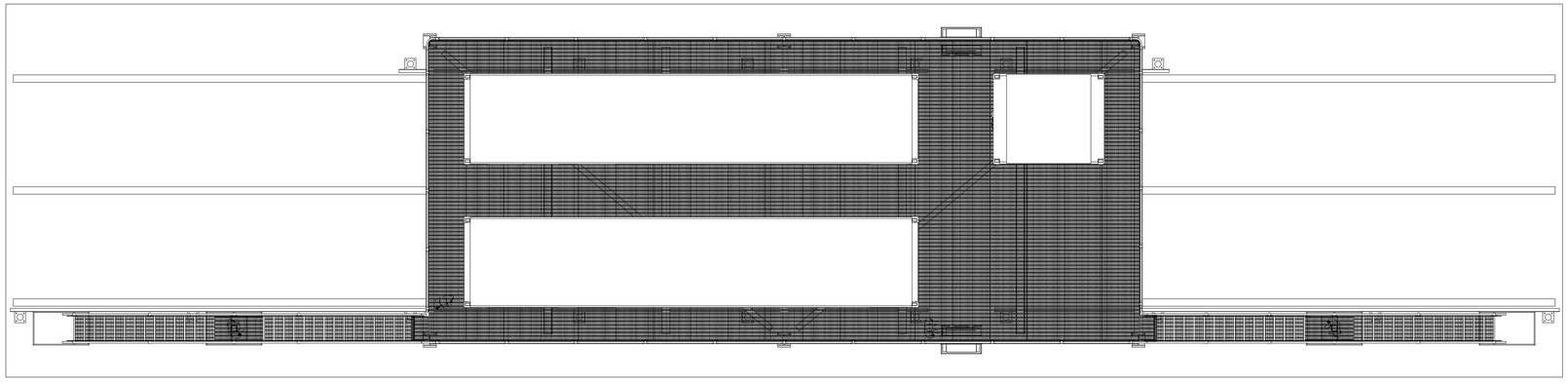
Drawing Name: TRANSPORT NSW - LEICHHARDT EXPANSION - POWER DISTRIBUTION PLAN - REV B



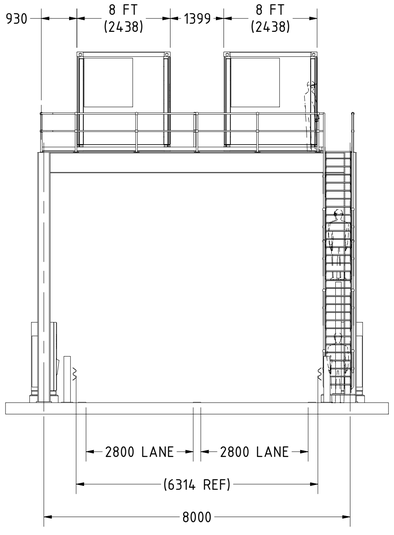
ISOMETRIC VIEW



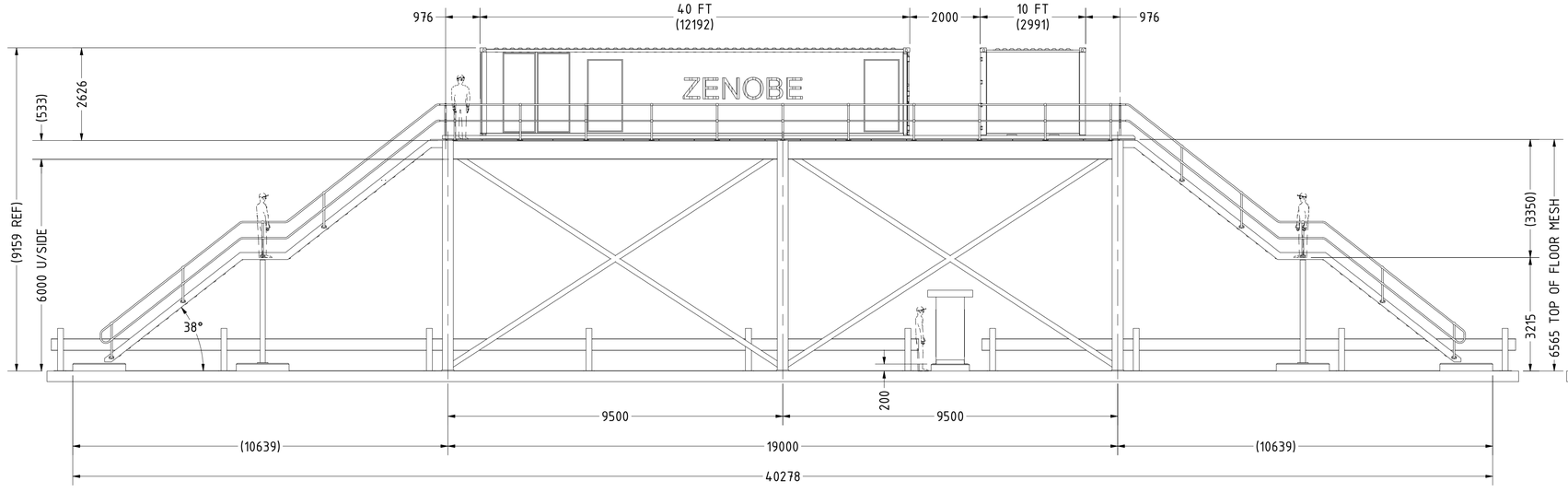
ISOMETRIC VIEW



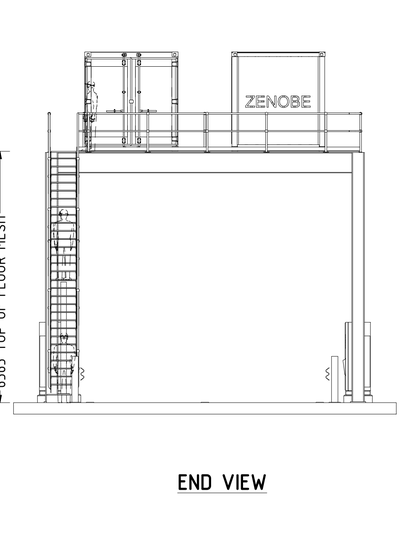
PLAN VIEW



END VIEW



SIDE VIEW



END VIEW

ZONE	REV	DESCRIPTION	DATE	AUTHOR
	B	RE-ISSUED FOR CONCEPT REVIEW	17/07/2024	GP
	A	ISSUED FOR CONCEPT REVIEW	05/07/2024	GP

REVISION HISTORY

TOLERANCE UNLESS NOTED OTHERWISE	
MACHINING – Decimal	± 0.1 mm
MACHINING – Whole	± 0.2 mm
MACHINING – Surface in Contact	1.6 µm
MACHINING – Surface in General	3.2 µm
FABRICATION – Up to 100	± 0.5 mm
FABRICATION – 100 to 500	± 1.0 mm
FABRICATION – Over 500	± 1.5 mm
ALL ANGLES	± 0.5°

DO NOT SCALE - IF IN DOUBT ASK

Scale: N.T.S

Projection Method: AS1100.101

CARTERS
3 Toronto Street, Kelso, NSW 2795
ABN 12 143 824 677
Phone: (02) 6331 6811

Drafted	GP	Date	5/07/2024
Checked		Date	
Approved		Date	
Doc Status	FOR CONCEPT REVIEW		

Title: ZENOBE LEICHHARDT
Project: BUS DEPOT PLATFORM - CONCEPT
Description: ARRANGEMENT

Size	Dwg Number	Sheet	of	Revision
A1	0325-A-000	1	1	B

Appendix D: Noise and Vibration Impact Assessment

Transport for NSW

ZEB Leichhardt Depot Noise and Vibration Impact Assessment

January 2025

NSW GOVERNMENT

transport.nsw.gov.au

Acknowledgement of Country

Transport for NSW acknowledges the traditional custodians of the land on which we work and live.

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.

Prepared by Pulse White Noise Acoustics.

Report controls

Approval and authorisation

Title of report	Leichhardt ZEB Depot Construction Noise and Vibration Impact Assessment		
Report document number			
Signed:	[redacted]	Date	8/1/2025
Name of approver	Michael Allan		
Title of approver	Technical Director		

Document status

Document status	Date	Prepared by	Reviewed by
Revision 0 - Draft	04/12/2024	Nikolaj Drydale-Cech	Michael Allan
Revision 1	08/1/2025	Nikolaj Drydale-Cech	Michael Allan

Table of contents

1. Introduction

Transport for NSW is proposing to convert the existing bus depot at 230 / 240 Balmain Road, Leichhardt to zero emissions technology. The Leichhardt Bus Depot Conversion will support the transition of the existing diesel fleet to an entirely new fleet of battery electric buses. The Leichhardt depot is able to operate up to a total of 281 buses. This conversion will support up to approximately 238 buses. This is one of the first depot conversions being delivered as part of the Zero Emission Buses (ZEB) Program, a NSW Government initiative to transition the State's 8,000 plus diesel and gas buses, to zero emissions technology by 2047.

The Proposal is located on Lot 2 DP1244017 within the Inner West Council. The Proposal is approximately three hectares and is located on land zoned as SP2 Transport Depot (Infrastructure). The site locality and the Study Area are shown in Figure 1 below.

1.1 Existing Leichhardt bus depot layout and aspects

The existing Leichhardt depot has a nominal operating capacity of 281 buses, however current operations include a fleet of 203 buses. The current depot layout and aspects are shown in Figure 1 below.

The depot has the following aspects:

- office and amenity building
- above ground diesel fuel tanks and other refuelling infrastructure
- bus wash
- workshop
- car parking includes:
  - access via the depot only,
- bus parking includes:
  - grid arrangement in the centre of the depot

Figure 1 Study area.

1.2 Proposed Leichhardt bus depot description

Transport for NSW is proposing to convert the existing bus depot at 230 / 240 Balmain Road, Leichhardt to zero emissions technology. The Leichhardt Bus Depot Conversion will support the transition of the existing diesel fleet to an entirely new fleet of battery electric buses. The Leichhardt depot is able to operate up to a total of 281 buses. This conversion will support up to approximately 238 buses. This is one of the first depot conversions being delivered as part of the Zero Emission Buses (ZEB) Program, a NSW Government initiative to transition the State's 8,000 plus diesel and gas buses, to zero emissions technology by 2047.

Key features of the proposal include:

- a centralised bus charging system including:
  - new charging infrastructure (including pedestal chargers)
  - upgraded power supply infrastructure
- reconfiguration of current bus bays and removal of some existing sheds
- decommissioning of existing fuelling infrastructure.

Due to the operational constraints of the depot, any stockpiling of materials or equipment would be temporary in nature and would be kept within the depot boundary. Construction personnel would park within the depot car park or on adjacent local streets.

In order to accommodate for the new technology, the depot would also require provision of high voltage (HV) supply connection to meet the energy demands. The HV supply connection works are subject to separate environmental assessment and approval through Ausgrid.

Bus operations will be maintained during construction with no expected disruption to existing bus services. Construction work will be completed during the daytime and planned outside of peak operation times such as mornings and afternoons, to maintain bus operations.

1.3 Scope of this report

This report provides a Noise and Vibration Impact Assessment (NVIA) for the proposal. This NVIA is required to address noise and vibration impacts that have the potential to be generated by the proposal.

This report:

- Identifies the existing noise sensitive receivers
- Presents details about existing noise environment
- Identifies the applicable NSW noise and vibration policies and applicable construction and operational design criteria
- Assesses the construction and operational noise and vibration impacts in accordance with the applicable NSW policies
- Provides construction and operational noise and vibration mitigation and management measures to comply with the applicable design criteria.

2. Location

The Leichhardt depot site is located at address 230 / 240 Balmain Road, Leichhardt NSW 2040.

The proposal is located on Lot 2, deposited plan (DP) 1244017 within the Inner West Council Local Government Area (LGA). The total area of the site is approximately 3 ha. The existing and proposed layout of the Leichhardt depot are depicted in Figure 2 and Figure 3 respectively below.

Figure 2 Leichhardt depot existing site layout.

Figure 3 Leichhardt depot - proposed layout.

The depot is located in a general residential development area, with the City-West Link Road located along the northern boundary. Residential developments are located to the east, west and north (across the City-West Link Road) of the site.

Additionally, the Sydney Secondary College is located to the south of the site. Other noise sensitive receivers include the St. Gerasimos Greek Orthodox Church to the west of the depot. Presented in Figure 4 below is an illustration of the site location in relation to the nearest receiver types and zoning class.

Figure 4 Sensitive receiver zoning.

The noise environment for the sensitive receivers located to the west and east of the project site is controlled by the City-West Link Road.

The noise environment throughout the assessment is considered to be Urban Residential due to the resulting local traffic volumes on the immediate road networks.

2.1.1 Noise catchment areas (NCA)

To assist the assessment process of the noise impact from the operation of the project site and construction noise, noise catchment areas are identified to reflect land uses and types of receivers within each area. A description of the NCAs relevant to the works being undertaken is provided in Table 2-1. The description includes the primary characteristics of each area. The maps for the noise catchment areas are provided in Figure 5 below.

Figure 5 Noise catchment areas and receiver point locations.

Table 2-1: NCAs applicable to operational activities and construction works.

NCA	Area Description
NCA01	One Noise Catchment area (NCA01) has been selected for this site. All noise sensitive receivers within close proximity to the project site feature a noise environment that is typical of an urban setting. With road traffic noise being the dominant source to all of the nearest receivers.

As illustrated in Table 2-1 above, the receivers that are likely to be most exposed to the noise emissions from the proposed development are detailed within Table 2-2 below.

Table 2-2 Receiver IDs and receiver types.

NCA	Receiver ID	Noise Sensitive Locations	Elevation of Receiver	**Type**
NCA01	R01	267-269 Balmain Road, Lilyfield	1.5 m, 4.5 m, 7.5 m	Residential
NCA01	R02	259 Balmain Road, Lilyfield	1.5 m	Residential
NCA01	R03	251 Balmain Road, Lilyfield	1.5 m	Residential
NCA01	R04	88-92 Piper St, Lilyfield	1.5 m	Commercial
NCA01	R05	243 Balmain Road, Lilyfield	1.5 m	Residential
NCA01	R06	2A Charlotte Street, Lilyfield	1.5 m	Residential
NCA01	R07	1 Charlotte Street, Lilyfield	1.5 m	Residential
NCA01	R08	241 Balmain Road, Lilyfield	1.5 m	Residential
NCA01	R09	239 Balmain Road, Lilyfield	1.5 m	Residential
NCA01	R10	237 Balmain Road, Lilyfield	1.5 m	Residential
NCA01	R11	29 Derbyshire Road, Leichardt	1.5 m, 4.5 m	Educational
NCA01	R12	1 Henry Street, Leichardt	1.5 m	Residential
NCA01	R13	11 Henry Street, Leichardt	1.5 m	Residential
NCA01	R14	21 Henry Street, Leichardt	1.5 m, 4.5 m	Place of Worship
NCA01	R15	144 Lilyfield Road, Lilyfield	1.5 m	Residential

3. Existing ambient noise environment

3.1 Noise monitoring and analysis

In the absence of any background noise logging, the rating background noise level (RBL) has been adopted from the Australian Standard 1055:1997 "Acoustics - Description and measurement of environmental noise" which provides estimated average background sound pressure levels ($L_{A90,T}$). Considering the land zoning of the nearby noise sensitive receivers, a Noise Area Category of R4 – Area with dense transportation or with some commerce or industry has been adopted.

This approach was selected to maintain consistency with previous noise impact assessments for the Leichhardt Depot.

The Rating Background Noise Level (RBL) is the background noise level used for assessment purposes at the nearest potentially affected receiver. It is the 90th percentile of the daily background noise levels during each assessment period, being day, evening and night. The $L_{Aeq,period}$ is the Ambient noise level (logarithmically averaged) over the defined period.

The standard measurement periods used in NSW for assessment of noise impacts are:

- Daytime – 7:00 am to 6:00 pm
- Evening – 6:00 pm to 10:00 pm
- Night-time – 10:00 pm to 7:00 am

Presented in Table 3-1 is a summary of the estimated RBL noise levels for each time period. These estimated noise levels are used throughout the assessment to establish appropriate site-specific noise criteria.

Table 3-1: Estimated RBL noise levels, dB(A).

Noise Area Category	Description of neighbourhood	Rating background level (RBL)		
		Daytime	Evening	Night-time
R4	Areas with dense transportation or with some commerce or industry	55	50	45

4. Operational noise assessment

4.1 Noise criteria

4.1.1 Operational facility noise criteria

Noise Policy for Industry

Responsibility for the control of noise emissions in New South Wales is vested in Local Government and the NSW Environment Protection Authority (EPA).

The EPA's NSW Noise Policy for Industry (NPfI) provides guidance on appropriate noise levels for external noise emissions from fixed facilities on surrounding sensitive receivers. The NPfI criteria for industrial noise sources have two components:

- Controlling the intrusive noise impacts for residents and other sensitive receivers in the short term; and
- Maintaining noise level amenity of defined land uses for residents and sensitive receivers in other land uses.

The intrusiveness noise level protects against significant changes in noise, while the amenity noise level seeks to protect against cumulative noise impacts from industry. Together, these levels are used to assess the potential impact of noise and assess reasonable and feasible noise mitigation measures. Project noise trigger levels are developed through this process. They are not used directly as regulatory limits.

The NPfI requires a project to take consideration of other industrial noise sources in setting amenity noise objectives. In cases of a new development where there are no existing industrial sources, the NPfI accepts a default of the amenity noise level minus 5 dB to take account of future industrial sources.

For this project, the default amenity noise level minus 5 dB adjustment will be used to account for cumulative noise sources.

Intrusive noise impacts – residential receivers

The intrusiveness noise level protects against significant changes in noise levels and is applicable to residential receivers only. The criterion is defined by the formula:

$$L_{Aeq,15min} = rating\ background\ noise\ level + 5\ dB$$

The RBL is the average background noise level over a measurement period of at least one week. Using the RBL results in the intrusiveness criterion being met for 90% of the time. Adjustments are to be applied to the level of noise produced by the source that is received at the assessment point where the noise source contains annoying characteristics such as tonality or impulsiveness.

Presented below in Table 4-1 is a summary of the measured RBL and corresponding intrusiveness level for each time period.

Table 4-1: Intrusive noise criteria, $LAeq_{15\text{-}min}$ dB(A).

ID	Estimated rating background level			Intrusive noise level, $L_{Aeq,15min}$		
	Daytime	Evening	Night-time	Daytime	Evening	Night-time
NCA01	55	50	45	60	55	50

Protecting noise amenity

The amenity noise level seeks to protect against cumulative noise impacts from industry.

The NPfI uses project noise trigger levels measured over a 15-minute time period, assessed as an $L_{Aeq,15min}$. To account for converting $L_{Aeq,period}$ to $L_{Aeq,15min}$, the NPfI accepts a default conversion factor of $L_{Aeq,15min} = L_{Aeq,period}$ + 3 dB.

To ensure industrial noise levels do not gradually increase with new developments, a minus 5 dB correction is applied to the amenity noise level. The amenity noise levels have been presented in Table 4-2.

Table 4-2: Noise Policy for Industry amenity noise levels, dB(A).

Receiver	Noise amenity area	**Time of day**	Recommended amenity noise level
Residential	Rural	Daytime	50
		Evening	45
		Night-time	40
	Suburban	Daytime	55
		Evening	45
		Night-time	40
	Urban	Daytime	60
		Evening	50
		Night-time	45
Hotels, motels, caretakers' quarters, holiday accommodation, permanent resident caravan parks	5 dB(A) above the recommended amenity noise level for a residence for the relevant noise amenity area and time of day		
School classroom	All	Noisiest 1-hour period	35 internal
Hospital ward Internal external	All	 Noisiest 1-hour period Noisiest 1-hour period	 35 internal 50 external
Place of worship	All	When in use	40
Passive recreation	All	When in use	50
Active recreation	All	When in use	55
Commercial	All	When in use	65
Industrial	All	When in use	70
Industrial interface	Add 5 dB(A) to recommended noise amenity area		

Presented in Table 2.3 of the NPfI is a more detailed description of receiver categories.

The residential receivers are zoned within a R1 – General Residential land zoning category. The NPfI considers R1 to be Urban Residential, which is an area with an acoustical environment that:

- Is dominated by 'urban hum' or industrial source noise where urban hum means the aggregate sound if many unidentifiable, mostly traffic and / or industrial related sound sources.
- Has through-traffic with characteristically heavy and continuous traffic flows during peak periods.
- Is near commercial districts or industrial districts
- Has any combination of the above.

Project amenity noise criteria

The applicable amenity noise criteria for each zone are presented below in Table 4-3. The NPfI uses project noise trigger levels measured over a 15-minute time period, assessed as an $L_{Aeq,15min}$. To account for converting the amenity $L_{Aeq,period}$ to an $L_{Aeq,15min}$, the NPfI accepts a default conversion factor of $L_{Aeq,15min} = L_{Aeq,period} + 3$ dB. To ensure industrial noise levels do not gradually increase with new developments, a minus 5 dB correction is applied to the amenity noise level. Both these corrections have been included in the amenity noise levels below.

Table 4-3: Noise Policy for Industry Amenity noise levels, $L_{Aeq,15min}$ dB(A).

NPfI Category	Daytime $L_{Aeq,15min}$dB(A)	**Evening** $L_{Aeq,15min}$ dB(A)	Night-time $L_{Aeq,15min}$ dB(A)
Urban Residential	58	48	43
Commercial	63 (when in use)		
Educational / Active Recreation[1]	53 (When in use)		
Place of Worship	38 (when in use) – Internal		

Note 1 No operational classrooms / educational spaces are within close proximity to the proposed development. As such the nearby Sydney Secondary College Leichhardt oval / sports field has been assessed as an active recreation area.

Corrections for annoying noise characteristics

Table C1 of the NPfI provides corrections for tonality, intermittency, irregularity or dominant low-frequency content. These corrections are to be added to the measured or predicted noise levels at the receiver before comparison with the project noise trigger levels. NPfI also provides adjustments for duration that can increase the project noise criterion for unusual or one-off high-noise level events.

Low frequency noise correction

A difference of 15 dB or more between the C- and A-weighted noise measurements, identifies the potential for an unbalanced spectrum and an increased likelihood of low frequency noise annoyance.

The difference between C- and A-weighted noise levels is typically used as a screening tool to determine if further investigation is required. Where further investigation confirms significant low frequency content, a low frequency noise correction is applied to the predicted or measured noise levels.

The NPfI identifies that the corrections should “reflect external assessment locations”, or sensitive receiver locations so the existing noise environment should be considered.

Project specific noise trigger levels

The project specific noise trigger levels (PSNTLs) for residential receivers is the more stringent of the intrusiveness and amenity noise criteria. For other receivers the PSNTLs are the amenity noise criteria.

Presented below in Table 4-4 is a summary of this assessments PSNTLs.

Table 4-4: Project specific noise trigger levels, dB(A).

Receiver type	Time period	RBL	Intrusiveness	Amenity[1]	Overall[2]
Residential – Urban	Daytime	55	60	58	58
	Evening	50	55	48	48
	Night-time	45	50	43	43
Commercial	When in use	Not applicable	Not applicable	63	63
Educational / Active Recreation Area[3]	When in use	Not applicable	Not applicable	53[3]	53
Place of Worship	Internal - When in use	Not applicable	Not applicable	38	38

Note 1 The amenity noise level has been reduced by 5 dB(A) to account for other industrial noise sources and increased by 3 dB(A) to convert from $L_{Aeq,period}$ to $L_{Aeq,15min}$

Note 2 The overall noise level is the more stringent of the intrusiveness and amenity criteria

Note 3 No operational classrooms / educational spaces are within close proximity to the proposed development. As such the nearby Sydney Secondary College Leichhardt oval / sports field has been assessed as an active recreation area.

4.1.2 Road generating development – road traffic noise

Industrial developments have the potential to generate additional road traffic and associated noise impacts from the vehicles accessing the site. The NSW Road Noise Policy provides guidance on appropriate noise criteria which should be considered.

Presented below are the applicable noise criteria for road traffic on arterial, sub-arterial, and local roads.

Table 4-5: Road generating development noise criteria, dB(A).

Road category	Type of project / land use	Assessment criteria, dB(A)	
		Daytime (7:00 am to 10:00 pm)	Night-time (10:00 pm to 7:00 am)
Freeway /arterial / sub-arterial roads	Existing residences affected by additional traffic on existing freeways/arterial/sub-arterial roads generated by land use developments	$L_{Aeq\ (15\ hour)}$ 60 (external)	$L_{Aeq\ (9\ hour)}$ 55 (external)
Local roads	Existing residences affected by additional traffic on existing local roads generated by land use developments	$L_{Aeq\ (1\ hour)}$ 55 (external)	$L_{Aeq\ (1\ hour)}$ 50 (external)

Where the predicted noise levels with the proposal indicate likelihood to exceed the noise criteria presented in Table 4-5, it is considered not reasonable and feasible to provide noise mitigation measures if the proposal does not increase noise by greater than 2.0 dB. A change of 2 dB in road traffic noise is often considered to be indiscernible.

4.1.3 Maximum noise level assessment

During night-time periods, increased night-time noise levels have the potential to create sleep disturbance noise impacts.

The NPfI identifies the amenity noise level, discussed in Section 4.1.1, '*will protect against noise impacts such as speech interference, community annoyance and some sleep disturbance'*. However further guidance is provided in Section 2.5 of the NPfI, which requires consideration of maximum noise level events. This approach provides a screening criterion. The NPfI identifies that where the screening criterion is exceeded, a detailed maximum noise level event assessment should be undertaken.

The sleep disturbance screening noise criteria are:

- $L_{Aeq,15min}$ 40 dB(A) or the prevailing RBL plus 5 dB, whichever is the greater, and/or

- L_{AFmax} 52 dB(A) or the prevailing RBL plus 15 dB, whichever is the greater.

These screening criteria were developed based on a review of research provided by the EPA's NSW Road Noise Policy. The detailed assessment should consider all feasible and reasonable noise mitigation measures with a goal of achieving the above trigger levels.

4.2 Operational noise assessment

4.2.1 Modelling methodology

Site operational noise emissions have been calculated using the CONCAWE algorithm. The CONCAWE algorithm has been selected to ensure that noise enhancing weather conditions including temperature inversions and downwind conditions have been appropriately considered in the noise assessment. The nearest sensitive receivers will be shielded from most impacts by the adjacent industrial buildings, however with temperature inversions the shielding effects may be reduced for receivers further away from the site.

A worst-case assessment has been completed assessing the adverse weather conditions in all directions. The following weather conditions have been included in the assessment, in accordance with the requirements of the NPfI.

Daytime and evening noise enhancing properties:

- 3 m/s wind speeds; and
- Stability category D.

This is equivalent to CONCAWE Meteorological Category 5

Night-time noise enhancing properties:

- 2 m/s wind speeds; and
- Stability category F.

This is equivalent to CONCAWE Meteorological Category 6 (the highest category)

4.2.2 Operational site noise emissions

Noise generating features of the Project include:

- Future space for a total of 238 electric buses on the depot site, including:
- High Voltage Transformer x 4 (2 x per plant deck)
- Existing Battery Storage System (BSS) x 1 (located along the eastern boundary of the site (external))

Approximate location of the electrical infrastructure is illustrated in Figure 6 below.

The greatest noise source would typically be generated from buses entering and leaving the site. The traffic and transport assessment has identified the future peak movements:

- Daytime peak max = 71 buses / 15-minutes
- Evening peak max = 33 buses / 15-minutes
- Nighttime peak max = 26 buses / 15-minutes

Source noise emission levels

Presented below in Table 4-6 is a summary of the source noise levels incorporated in this assessment.

Electric bus idling and passby noise measurements were undertaken at the Leichardt bus depot. The noise measurements noted there was an audible hum associated with the acceleration of the vehicles, and air-conditioning dominated the low speed passby and stationary noise.

The noise measurements of the electric buses did not feature the use of the Acoustic Vehicle Alerting System (AVAS). The AVAS maximum sound power levels provided by UN Regulation No. 138, *Uniform provisions concerning the approval of Quiet Road Transport Vehicles with regard to their reduced audibility* defines a maximum sound pressure level of 75 dB(A) when measured at 2 m for a forward moving vehicle. This noise level is equivalent to a Sound Power Level (SWL) of 89 dB(A). This noise level has been added to the measured bus noise level to account for the overall noise impacts from an electric bus passby.

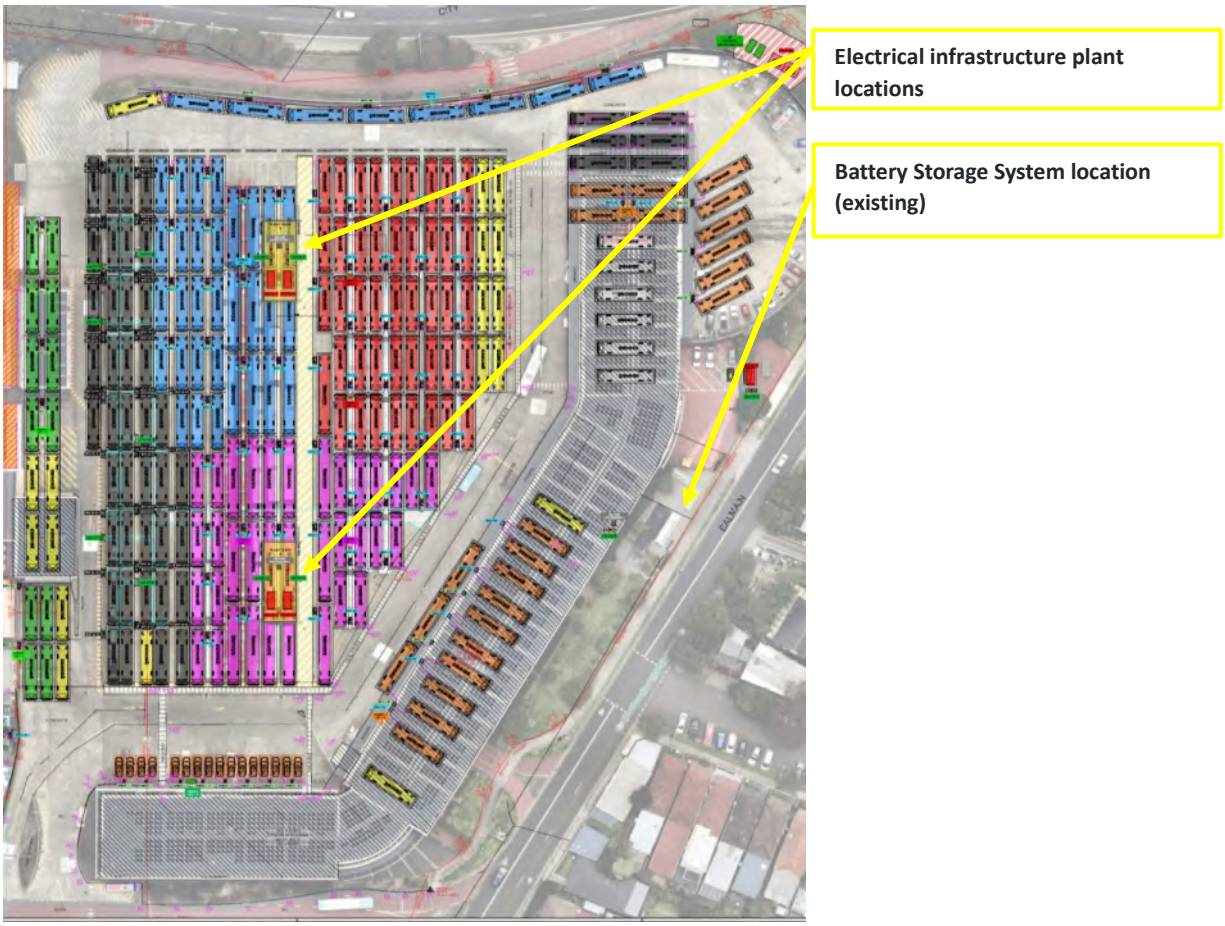
Table 4-6: Noise source sound power levels, dB(A).

Source	**Description** / Source Location	**Sound Power Levels (SWL)**		**Number of Sources and location**
		15-minute noise level, L_{Aeq} dB(A)	Maximum noise level, L_{AFmax}	
HV Transformer	Noise level for conservatively large high voltage transformer.	62[1]	62	4 x sources / 2 x per plant deck – each plant deck located ~6.5 m above ground
Battery Storage System – Daytime operating level	Tesla Power Pack	89	89	1 x BSS located along the eastern boundary of the site (external to the site) – located ~1 m above ground
Battery Storage System – Evening operating level	Tesla Power Pack	79[2]	79	""
Battery Storage System – Nighttime operating level	Tesla Power Pack	76.5[2]	76.5	""
Electric buses idling	Measured idling electric bus, including AC unit noise	90	92	Depot and entry / exit
Electric buses moving	Measured moving electric bus (equating to a SWL of 95 dB(A)), with addition of noise Acoustic Vehicle Alerting System (AVAS) added into the measured moving noise level.	96	104	Depot entry / exit
Bus air brake release	Typical air brake release	-	104 L_{AFmax}	Depot entry / exit (southern)

Note 1 A +5 dB correction has been applied to the transformer to account of the potential tonal nature of the unit, in accordance with Fact Sheet C of the NPfI.

Note 2 It is understood that the BSS does not operate at full capacity outside of the daytime period. The BSS is understood to operate at a condition resulting in a sound power level of 79 and 76.5 dB(A) during the evening and nighttime periods respectively.

Figure 6 Electrical infrastructure plant locations.



The noise model has assessed the total number of vehicle movements leaving and exiting the site (i.e. arrival and departure movements) to complete a full lap of the site within a 15-minute period. This is a conservative assumption made to ensure that the greatest noise impacts are considered. All electrical infrastructure has been assumed to be operating during all assessment periods.

4.2.3 Annoying characteristics of noise

The NPfI requires annoying characteristics of noise to be taken into consideration in the assessment of noise. Annoying characteristics include:

- Tonal noise – noise containing a prominent frequency and characterised by a defined pitch.
- Low frequency noise – where a source has a significant component of noise in the 10 – 160 Hz range
- Intermittent noise – where the noise source at the receiver varies by more than 5 dB(A)

For the characteristics to be relevant, they must be assessed at the receiver location, so the propagation characteristics of noise and existing ambient noise level should be taken into consideration.

Of the noise sources identified in Table 4-6, the only source with the potential for annoying characteristics is the HV transformer. The source level of the transformers has only been provided in an overall broadband level (not one-third octave), so a complete tonality assessment cannot be completed. However, in our experience, transformers have the potential to trigger the requirements for tonality. As such, a +5 dB correction has been applied to all receivers due to the presence of transformers operating continuously throughout all time periods within the proposed development.

The site has been arranged so that the buses will not need to reverse and engage the reversing alarm. While annoying characteristics from reversing beepers and any annoying characteristic penalties are not required to be assessed, they have been considered.

Assessment scenarios

Three separate assessment scenarios have been considered, daytime, evening, and night-time. Vehicle movements have been based on the vehicle movement timetable provided by the Transport for NSW for the existing bus movement at the Leichhardt site.

4.2.4 Predicted noise impacts – no mitigation

Presented in Table 4-7, Table 4-8, and Table 4-9 is a summary of the worst-case daytime, evening, and night-time noise impacts during each period for the combined noise level resulting from the vehicle movements and electrical infrastructure.

Additionally, presented in the same tables, Table 4-7, Table 4-8, and Table 4-9 is a summary of the daytime, evening, and night-time noise impacts during each period for the electrical infrastructure equipment only. This assessment allows for the direct contribution of the electrical infrastructure to be assessed independently of the existing noise sources (i.e. heavy vehicle movements). This is particularly important a project of this nature, given that the electrical infrastructure will introduce a new type of noise to the nearby noise sensitive receivers.

Noise contours for the complete assessment (vehicle movements and electrical infrastructure) are presented in Appendix A: Operational noise contours (Vehicle movements and Electrical Infrastructure).

Noise contours for the electrical infrastructure assessment (excluding vehicle movements) are presented in Appendix B: Operational noise contours (Electrical Infrastructure only).

Table 4-7: Daytime predicted noise levels, $L_{Aeq,15min}$ dB(A) – Vehicle movements and electrical infrastructure.

ID	Address	Criteria	Predicted $L_{Aeq,15min}$ noise level Receiver height – 1.5 m / 4.5 m / 7.5 m		Exceedance
			Electrical infrastructure only	All sources	
R01	267-269 Balmain Road, Lilyfield	58	21 / 31 / 32	43 / 44 / 45	- / - / -
R02	259 Balmain Road, Lilyfield	58	39	41	-
R03	251 Balmain Road, Lilyfield	58	45	46	-
R04	88-92 Piper St, Lilyfield	63	28	41	-
R05	243 Balmain Road, Lilyfield	58	56	56	-
R06	2A Charlotte Street, Lilyfield	58	53	54	-
R07	1 Charlotte Street, Lilyfield	58	47	51	-
R08	241 Balmain Road, Lilyfield	58	44	53	-
R09	239 Balmain Road, Lilyfield	58	42	54	-
R10	237 Balmain Road, Lilyfield	58	40	55	-
R11	29 Derbyshire Road, Leichardt	53	12 / 16	39 / 42	- / -
R12	1 Henry Street, Leichardt	58	18	49	-
R13	11 Henry Street, Leichardt	58	13	43	-
R14	21 Henry Street, Leichardt	38[2]	5 / 10	30 / 35	- / -
R15	144 Lilyfield Road, Lilyfield	58	23	52	-

Note 1 As detailed in Section 4.2.3, a +5 dB correction has been applied to the predicted noise levels of the transformers to account of the tonal nature of some of the electrical infrastructure equipment.

Note 2 A -10 dB correction has been applied to the predicted external level to convert it into an internal criterion. A -10 dB correction is a conservative reduction for an open window.

Table 4-8: Evening predicted noise levels, $L_{Aeq,15min}$ dB(A) – Vehicle movements and electrical infrastructure.

ID	Address	Criteria	Predicted $L_{Aeq,15min}$ noise level Receiver height – 1.5 m / 4.5 m / 7.5 m		Exceedance
			Electrical infrastructure only	Electrical infrastructure and vehicles	
R01	267-269 Balmain Road, Lilyfield	48	12 / 21 / 23	40 / 41 / 42	- / - / -
R02	259 Balmain Road, Lilyfield	48	29	36	-
R03	251 Balmain Road, Lilyfield	48	35	37	-
R04	88-92 Piper St, Lilyfield	63	19	38	-
R05	243 Balmain Road, Lilyfield	48	46	46	-
R06	2A Charlotte Street, Lilyfield	48	43	45	-
R07	1 Charlotte Street, Lilyfield	48	37	47	-
R08	241 Balmain Road, Lilyfield	48	34	49	+1
R09	239 Balmain Road, Lilyfield	48	32	50	+2
R10	237 Balmain Road, Lilyfield	48	30	52	+4
R11	29 Derbyshire Road, Leichardt	53	8 / 15	36 / 39	- / -
R12	1 Henry Street, Leichardt	48	17	45	-
R13	11 Henry Street, Leichardt	48	12	40	-
R14	21 Henry Street, Leichardt	38[2]	4 / 9	26 / 32	- / -
R15	144 Lilyfield Road, Lilyfield	48	22	49	+1

Note 1 As detailed in Section 4.2.3, a +5 dB correction has been applied to the predicted noise levels of the transformers to account of the tonal nature of some of the electrical infrastructure equipment.

Note 2 A -10 dB correction has been applied to the predicted external level to convert it into an internal criterion. A -10 dB correction is a conservative reduction for an open window.

Table 4-9: Night-time predicted noise levels, $L_{Aeq,15min}$ dB(A) – Vehicle movements and electrical infrastructure.

ID	Address	Criteria	Predicted $L_{Aeq,15min}$ noise level Receiver height – 1.5 m / 4.5 m / 7.5 m		Exceedance
			Electrical infrastructure only	Electrical infrastructure and vehicles	
R01	267-269 Balmain Road, Lilyfield	43	11 / 19 / 22	39 / 40 / 41	- / - / -
R02	259 Balmain Road, Lilyfield	43	26	34	-
R03	251 Balmain Road, Lilyfield	43	33	35	-
R04	88-92 Piper St, Lilyfield	63	17	37	-
R05	243 Balmain Road, Lilyfield	43	43	44	+1
R06	2A Charlotte Street, Lilyfield	43	41	43	-
R07	1 Charlotte Street, Lilyfield	43	34	46	+3
R08	241 Balmain Road, Lilyfield	43	32	48	+5
R09	239 Balmain Road, Lilyfield	43	30	49	+6
R10	237 Balmain Road, Lilyfield	43	28	51	+8
R11	29 Derbyshire Road, Leichardt	53	8 / 15	35 / 38	- / -
R12	1 Henry Street, Leichardt	43	17	44	+1
R13	11 Henry Street, Leichardt	43	11	39	-
R14	21 Henry Street, Leichardt	38[2]	4 / 9	15 / 21	- / -
R15	144 Lilyfield Road, Lilyfield	43	22	48	+5

Note 1 As detailed in Section 4.2.3, a +5 dB correction has been applied to the predicted noise levels of the transformers to account of the tonal nature of some of the electrical infrastructure equipment.

Note 2 A -10 dB correction has been applied to the predicted external level to convert it into an internal criterion. A -10 dB correction is a conservative reduction for an open window.

The predicted noise levels for the electrical infrastructure equipment presented in Table 4-7, Table 4-8, and Table 4-9 indicates that compliance with the applicable noise criteria would be achieved during all operational periods. Hence, no additional acoustic treatments are required for the proposed electrical infrastructure equipment.

The predicted noise levels presented in Table 4-7 indicates that compliance with the applicable noise criteria would be achieved during the daytime period. All sources noise levels in Table 4-8 identified that exceedances at receivers 08 – 10, and 15 are predicted for during peak evening operations. Additionally, the levels presented in Table 4-9 show that exceedances are expected at receivers 05, 07 – 10, 12 and 15 during peak night-time operations. These exceedances are expected to range from 1 to 4 dB above the criteria during the evening, and 1 to 8 dB during the nighttime period.

This assessment also illustrates that the predicted noise exceedances (presented in Table 4-8, and Table 4-9 (complete depot operations)) are directly resulting from the bus movements, and not the electrical infrastructure.

Given that all of the predicted exceedances at the nearby residential receivers are resulting from the bus movements, which are existing and are only set to decrease the noise impact with the conversion to electric from diesel buses, it is expected that the overall resulting impacts from the site will be of a lower magnitude than the current, existing operations.

It is noted that additional noise mitigation treatments (additional to the natural shielding effects from the site buildings, and existing noise walls), would not be deemed feasible or reasonable primarily due to majority of the predicted exceedances occurring from bus movements along the private entry / exit roads located to the north and south of the project site.

4.2.5 Maximum noise level assessment – no mitigation

Maximum noise levels have been predicted for the night-time period based on the source noise levels in Section 4.2.2. Presented below in Table 4-10 is a summary of the predicted L_{AFmax} noise levels, and the receiver specific screening criterion. An exceedance of the screening criterion indicates the potential for sleep disturbance to be a potential issue which requires further investigation. Note, the maximum noise level assessment only applies to residential receivers (Receivers 01 – 03, 05 – 10, 12 – 13, and 15).

Table 4-10: Night-time predicted maximum noise levels, L_{AFmax} dB(A).

ID	Address	Screening criterion	L_{AFmax} noise level	Exceedance (screening criterion)
01	267-269 Balmain Road, Lilyfield	60	29 / 33 / 37	- / - / -
02	259 Balmain Road, Lilyfield	60	32	-
03	251 Balmain Road, Lilyfield	60	34	-
05	88-92 Piper St, Lilyfield	60	36	-
06	243 Balmain Road, Lilyfield	60	33	-
07	2A Charlotte Street, Lilyfield	60	26	-
08	1 Charlotte Street, Lilyfield	60	26	-
09	241 Balmain Road, Lilyfield	60	26	-
10	239 Balmain Road, Lilyfield	60	50	-
12	1 Henry Street, Leichardt	60	50	-
13	11 Henry Street, Leichardt	60	45	-
15	144 Lilyfield Road, Lilyfield	60	39	-

The results in Table 4-10 indicate that the sleep disturbance screening criterion will not be exceeded by the proposed operations. These noise impacts (resulting from the air brake release) are an existing feature of the site and would remain in the future arrangement. The noise impacts would not change as a result of this project.

As the screening criteria has not been exceeded, further consideration of sleep disturbance noise impacts is not required.

4.2.6 Operational road traffic

The purpose of this project is to store and charge buses while they are not in use. The nature of the proposal is to add vehicles to the road network which has the potential to increase road traffic noise. The site is in close proximity to major sub-arterial and arterial roads, however there are a number of noise sensitive receivers located within close proximity to the development site. Sub-arterial and arterial roads such as City West Link and Balmain Road have existing high to moderate traffic volumes which may exceed the Road Noise Policy for the nearest residential receivers.

Buses will access the depot via the offramp on the City West Link Road to the north, and off Wiliam Street and Balmain Road to the south, before either travelling along Norton Street or continuing along Balmain Road via a signposted intersection (Wiliam Street) or a signalised intersection (Balmain Road).

William Street is classified as a local road, with a number of residential receivers located along the road. Balmain Road and the City West Link are classified as Sub-Arterial and Arterial State classified roads respectively.

Presented in Figure 7 below is an illustration of the bus and light vehicle access routes. State roads are managed and financed by Transport for NSW and Regional and Local roads are managed and financed by councils.

This proposal would marginally increase the number of buses accessing the site (from approximately 203 to 238, however this is still below the maximum operational capacity of the site of 281 buses). The noise levels from a bus travelling at 50 km/h is dominated by noise generated from the road/tyre interface. The noise of the electric buses travelling this route would not change with the electric buses. While electric buses do not idle at intersections, noise is emitted from the drivetrain, air-conditioning units, and inverters.

Figure 7 Bus access routes.

5. Construction noise and vibration assessment

5.1 Existing noise levels

5.1.1 Sensitive land use

A survey of land use in the area surrounding the Proposal was conducted to identify the types of receivers and verify the presence of sensitive land users (including residential receivers) that might be susceptible to potential noise disturbances from the proposed construction work.

The existing noise environment across the proposal is dominated by local road traffic noise from the surrounding street and the City-West Link Road to the north. The majority of sensitive noise receivers surrounding the site are residential receivers, with some educational, commercial, and place of worship also located near the site.

Additionally, the Sydney Bus Museum, located along the western boundary of the bus depot is a heritage listed building, which will require additional considerations for vibration impacts.

5.2 Relevant noise criteria

5.2.1 EPA Interim Construction Noise Guidelines (ICNG)

The assessment of noise impacts from construction work associated with the Zero Emission Buses Leichhardt Depot proposal have been undertaken in accordance with the assessment and management approach outlined in the Interim Construction Noise Guidelines (ICNG). Table 2 within the ICNG sets out the noise management level at residences and restrictions apply to activities which generate noise at residence above the 'highly noise affected' noise management level.

The rating background level (RBL) is used when determining the management level. The RBL is the overall single-figure background noise level measured in each relevant assessment period (during or outside the recommended standard hours). The term RBL is described in detail in the NSW Industrial Noise Policy (EPA 2000).

As a guide, the difference between the internal noise level and the external noise level is typically 10 dB with windows open for adequate ventilation.

Table 5-1: ICNG Noise Criteria.

Time of Day	Management Level $L_{Aeq(15\ min)}$	How to apply
Recommended standard hours: Monday to Friday 7 am to 6 pm Saturday 8 am to 1 pm No work on Sundays or public holidays	Noise affected RBL + 10 dB	The noise affected level represents the point above which there may be some community reaction to noise. • Where the predicted or measured $L_{Aeq\ (15\ min)}$ is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level. • The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
	Highly noise affected 75 dB(A)	The highly noise affected level represents the point above which there may be strong community reaction to noise. • Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account: 1. times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid-morning or mid-afternoon for works near residences

Time of Day	Management Level $L_{Aeq(15\ min)}$	How to apply
		2. if the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
Outside recommended standard hours	Noise affected RBL + 5 dB	• A strong justification would typically be required for works outside the recommended standard hours. • The proponent should apply all feasible and reasonable work practices to meet the noise affected level. • Where all feasible and reasonable practices have been applied and noise is more than 5 dB(A) above the noise affected level, the proponent should negotiate with the community. For guidance on negotiating agreements see section 7.2.2.
Noise levels apply at the property boundary that is most exposed to construction noise, and at a height of 1.5 m above ground level. If the property boundary is more than 30 m from the residence, the location for measuring or predicting noise levels is at the most noise-affected point within 30 m of the residence. Noise levels may be higher at upper floors of the noise affected residence.		

Airborne noise management levels (ANML) have been established for the sensitive land uses including commercial and industrial receivers. The unattended noise monitoring was undertaken at the nearest residential boundary that will be most exposed to the proposed construction area.

Table 5-2: Airborne Noise Management Levels (NMLs).

Time of Day	Management level L_{Aeq}(15min) dB(A)	Airborne Noise Management Levels (ANML) L_{Aeq}(15min) dB(A)
Recommended standard hours: Monday to Friday 7 am to 6 pm Saturday 8 am to 1 pm No work on Sundays or public holidays	Noise affected RBL + 10 dB	55 + 10 = 65 dB(A) **Daytime**
	Highly noise affected 75 dB(A)	75 dB(A)
	Noise affected RBL + 5 dB	50 + 5 = 55 dB(A) **Evening OoHW**
		45 + 5 = 50 dB(A) **Night-time OoHW**
Noise levels apply at the property boundary that is most exposed to construction noise, and at a height of 1.5 metres above ground level. If the property boundary is more than 30 metres from the residence, the location for measuring or predicting noise levels is at the most noise-affected point within 30 metres of the residence. Noise levels may be higher at upper floors of the noise affected residence. *Airborne Noise Management Levels have been determined using the estimated background noise levels provided by AS 1055-1997 for a noise area category R4 (areas with dense transportation or with some commerce or industry)*		

Specific NMLs have been established for the proposed work based on the methodology outlined in Table 5-2. Non-mandatory management levels for nearby property which are sensitive to noise impacts are presented in Table 5-3. The values are set to ensure that characteristic activities in each of these land uses would not be impacted by noise. The noise management levels are only applicable when the property is in use, such as classrooms or offices during working hours. When assessing noise levels, measurements are taken at the centre of occupied rooms for internal noise and at the most affected point within 50 metres of the area boundary for external noise.

Table 5-3: Noise Management Levels for other sensitive receivers.

Land Use	Management Level, L_{Aeq} (15min) Applies when in use
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)
Office, retail outlets	External noise level 70 dB(A)
Industrial premises	External noise level 75 dB(A)
Active recreation areas (such as parks and sports grounds or playgrounds)	External noise level 65 dB(A)
Passive recreation areas (such as outdoor grounds used for teaching, outdoor cafes or restaurants)	External noise level 60 dB(A)

Other noise-sensitive businesses require separate specific noise goals. It is suggested in the ICNG that the internal construction noise levels at these premises are to be referenced to the 'maximum' internal levels presented in AS 2107. Recommended 'maximum' internal noise levels from AS 2107 are reproduced in Table 5-3 for other sensitive receiver types.

5.3 Noise modelling methodology

Noise levels resulting from the proposed construction work have been predicted based on the review of the documentation provided by Transport for NSW, with discussion from the construction arrangement. For each noise modelling scenario, the worst-case noise impacts have been assessed using the ISO9613-2 noise propagation algorithm and modelled in SoundPLAN v9.1 software. The algorithm calculates downwind noise propagation and is considered appropriate for construction noise impacts in NSW.

Noise modelling scenarios have incorporated the proposed construction staging that is stated in Table 5-4 below.

Table 5-4: Proposed construction staging.

Stage	Activities
Ground works (trenching and piling) & building / structure works	
1	• Ground disturbances for trenching (cabling and cabling terminations) • Piling works related to plant deck platform installation • Decommissioning of existing infrastructure / equipment
Installation of electrical Infrastructure	
2	• Installation of transformers and other charging equipment / electrical infrastructure • Installation of switch gear and cables (LV & HV)
Miscellaneous out of hours works (nighttime)	
3	• Concrete pours for plinths • Installation of any oversized / heavy items (e.g. plant deck platforms), may include the use of a piling rig (bored) • Delivery of any oversized items that may require ROLs • Any required isolations or cutovers etc.

Each of the noise modelling scenarios is based on the construction staging presented above. The construction noise impact assessment has been prepared in accordance with the *Construction Noise and Vibration Guideline – Public Transport Infrastructure 2023* guideline (CNVG 2023). Airborne noise level has been predicted at noise sensitive receivers and compared with the specified NMLs.

Where noise levels are predicted to exceed the NMLs, reasonable and feasible mitigation and work practices need to be investigated and implemented to minimise noise impacts.

Some plant and equipment emit high noise levels, known as highly noise-intensive plant. Examples include hydraulic rock breakers, concrete saws, and ballast tampers. The use of these highly noise-intensive items of plant can lead to noise levels exceeding the relevant assessment criteria, even if they are used for only short period of time. Following the methodology outlined in the ICNG, all construction plant and equipment are assumed to be operating at full power simultaneously, resulting in worst-case noise level predictions as documented later in this report. However, in practice, these levels are unlikely to be representative of the noise levels experienced by the majority of the community or over the majority of the construction period.

5.3.1 Construction noise sources levels

Presented below in Table 5-5 is a summary of Sound Power Levels (Lw) of construction equipment which has been included in the noise modelling process. Each noise modelling scenario in Table 5-5 is presented with a total Sound Power Level with typical worst-case assumptions.

Table 5-5: Construction noise modelling scenarios and equipment sound power level

Scenario	Equipment	Sound Power Level, SWL dB(A)[1]
Ground works (trenching and piling) & building / structure works	Concrete saw, Light vehicle, Powered hand tools, Excavator (up to 20 tonne), Piling rig (bored), EWP, Welding equipment, Concrete truck, Vibrator – concrete, Truck and dog, Mobile crane, Generators, and Scaffolding	122
Installation of electrical Infrastructure	Light vehicle, Powered hand tools, EWP, Welding equipment, Truck and dog, Mobile crane, Generators, and Scaffolding	118
Miscellaneous out of hours works (nighttime)	Light vehicle, Vacuum truck, Powered hand tools, Piling rig (bored), EWP, Truck and dog, Mobile crane, Daymakers, Generators, concrete truck, Vibrator – Concrete.	120
Note 1 The overall sound power level is based on the equipment SWLs in Appendix C CNVG 2023, and equipment duty cycles based on typical worst-case 15-minute period operation.		

The CNVG 2023 requires all plant and equipment used for construction to have an operating Sound Power or Sound Pressure Levels below or equal to the allowable noise levels in Table 19 of CNVG 2023 Appendix C.

Equipment not listed in Table 19 of the CNVG 2023, shall achieve compliance to the most applicable equipment listed in Australian Standard *AS 2436-2010 Guide to noise and vibration control on construction, demolition and maintenance sites*, British Standard *BS 5228-1 Code of practice for noise and vibration control on construction and open sites* or DEFRA noise database14 (2006). The list of construction plant and associated sound power levels used in noise modelling is provided in Table 5-6 below.

Table 5-6: Construction plant and associated works and sound power levels.

Plant	Ground works (trenching and piling) & building works	Installation of electrical Infrastructure	Miscellaneous out of hours works (nighttime)	**Sound power level – SWL dB(A)**	**Maximum noise level - L_{AFMax}**
Concrete saw	X			118	120
Light vehicle	X	X	X	103	86
Vacuum truck			X	109	95

Plant	Ground works (trenching and piling) & building works	Installation of electrical Infrastructure	Miscellaneous out of hours works (nighttime)	**Sound power level – SWL dB(A)**	**Maximum noise level - L_{AFMax}**
Powered handtools	X	X	X	112	120
Handtools	X	X	X	99	107
Excavator (up to 20 tonne)	X			105	-
Piling rig (bored)	X		X	112	120
EWP	X	X	X	98	101
Welding equipment	X	X		110	-
Concrete truck	X		X	109	117
Vibrator - concrete	X		X	113	116
Truck and dog	X	X	X	108	115
Mobile crane	X	X	X	113	116
Daymakers			X	98	101
Generators	X	X	X	103	106
Scaffolding	X	X	X	-	-
Activity sound power level	**122**	**118**	**120**	**-**	**-**

The nearest residential and non-residential sensitive receives identified are those that are closest to the point at which the noisiest piece of plant or equipment will be operated. The predicted level is then compared against the NMLs and an exceedance is calculated. The receiver where the exceedance has been identified determines the level of Additional Mitigation Measures which is considered. These additional mitigation measures are based on those specified in Section 7.2.2 of the CNVG 2023.

5.4 Construction noise modelling results

An assessment of the proposed construction noise impacts has been calculated using the ISO9613-2 noise propagation algorithm in SoundPLAN 9.1. The assessment has been based on the equipment which would be used during the proposed works identified in Section 5.3. Presented below in Table 5-7 is a summary of the worst-case predicted noise impacts. Noise contours are also presented in Appendix C: Construction noise contours.

The below assessment has considered the worse-case scenario, in which:

- all equipment selected is operating at the maximum allowable noise levels as stated in Table 19 of the CNVG 2023 Appendix B,
- all equipment is operating simultaneously within each construction stage,
- all equipment is located within the same approximate location; and
- all equipment is operating continuously over the assessed 15-minute period.

In practice, the expected noise impact from the construction works may be considerably lower for majority of the construction phases. The worst-case prediction is included however to gauge the potential severity of proposed works and to identify appropriate construction noise management measures.

Table 5-7: Construction works and predicted construction noise levels.

Receiver	Noise management level (NML) – Standard Hours - Out of Hours (OoHW) (Evening / Nighttime)	Ground Works (trenching and piling) & building works dB(A) Receiver height 1.5 m / 4.5 m / 7.5 m	Installation of electrical Infrastructure dB(A) Receiver height 1.5 m / 4.5 m / 7.5 m	Miscellaneous out of hours works (nighttime) dB(A) Receiver height 1.5 m / 4.5 m / 7.5 m
R01 - Residential	65 – (55 / 50)	62 / 63 / 66	59 / 60 / 63	61 / 62 / 65
R02 - Residential	65 – (55 / 50)	55	52	54
R03 - Residential	65 – (55 / 50)	59	56	58
R04 - Commercial	70	56	53	55
R05 - Residential	65 – (55 / 50)	59	56	58
R06 - Residential	65 – (55 / 50)	57	54	56
R07 - Residential	65 – (55 / 50)	57	54	56
R08 - Residential	65 – (55 / 50)	55	52	54
R09 - Residential	65 – (55 / 50)	54	51	53

Receiver	Noise management level (NML) – Standard Hours - Out of Hours (OoHW) (Evening / Nighttime)	Ground Works (trenching and piling) & building works dB(A) Receiver height 1.5 m / 4.5 m / 7.5 m	Installation of electrical Infrastructure dB(A) Receiver height 1.5 m / 4.5 m / 7.5 m	Miscellaneous out of hours works (nighttime) dB(A) Receiver height 1.5 m / 4.5 m / 7.5 m
R10 - Residential	65 – (55 / 50)	55	52	54
R11 – Educational / Active play area (sport oval)[2]	65 – active play area (sports oval)	52 / 55	49 / 52	51 / 54
R12 - Residential	65 – (55 / 50)	66	63	65
R13 - Residential	65 – (55 / 50)	61	58	60
R14 - Place of Worship	45 – Internal	50[1] / 55[1]	47[1] / 52[1]	49[1] / 54[1]
R15 - Residential	65 – (55 / 50)	72	69	71

Note 1 A -10 dB correction has been applied to the predicted external level to convert it into an internal criterion. A -10 dB correction is a conservative reduction for an open window.

Note 2 No operational classrooms / educational spaces are within proximity to the proposed works. As such the nearby Sydney Secondary College Leichhardt oval / sports field has been assessed as an active recreation area. No exceedances are expected to occur for the classrooms located an additional 120 m south.

The predicted standard construction hours noise impacts provided in Table 5-7 identify that exceedances of the noise management levels are likely for three residential receivers (R01, R12, and R15) of 1 dB, 1 dB, and 7 dB respectively. Additionally, one place of worship (R14) is predicted to exceed the internal criteria by 10 dB during standard construction hours.

No residential noise sensitive receivers have been identified to be highly noise affected by the works. The out of hours (evening / night-time works) are expected to exceed the noise management levels for majority of the residential receivers within NCA01, should works be undertaken outside of standard construction hours.

Provided in Section 5.7 is a summary of recommended management and mitigation measures which should be followed to reduce the impacts on the nearby place of worship and other noise sensitive receivers.

Detailed noise contours have been prepared for each construction stages for visual reference shown in Appendix C: Construction noise contours.

A summary of highly noise affected catchment areas is provided in Table 5-8.

Table 5-8: Highly noise affected (residential receivers).

Noise catchment area	Highly noise affected level (NML)	Ground Works (trenching and piling) & building works	Installation of electrical Infrastructure	Miscellaneous out of hours works (nighttime)
NCA01	75	No	No	No

No residential receivers are predicted to be highly noise affected by this project during any of the construction phases.

5.4.1 Out of hours work

Out of hours work is likely to be required for the pouring of concrete for various plinths, lifting and positioning the plant deck structure into place / other heavy lifting works, and activities that may result in a disruption in nearby traffic flows (delivery of oversized items and other activities that may require ROLs etc.) In addition, piling activities may be conducted for the foundation of the plant deck platform.

The noise modelling scenario for the proposed out of hours works has been undertaken. By reviewing the indicative construction activities, the out of hours works would have potential noise impacts on the nearby residential receivers (NCA01). The modelling results for the proposed out of hours works has been assessed, with the results presented in Table 5-9 below.

Table 5-9: Modelling result for out of hours work – (Evening and Night-time) – $LAeq_{15\text{-}min}$.

Receiver	**Out of Hours (OoHW) Noise Management Level (Evening / night-time)**	**Predicted Level ($LAeq_{15\text{-}min}$)**	**Exceedance**	**Highly Noise Affected**
NCA01 (Residential)	55 / 50	Up to 71 dB(A) (R15)	Yes	No

An exceedance of the Out of Hours Noise management level of 16 and 21 dB is predicted for the worst affected residential receivers located within NCA01 during the evening and nighttime periods respectively. Noise management measures are considered in Section 5.7.1.

Additionally, maximum noise levels have been predicted for the night-time period based on the source noise levels in Section 5.3.1. Presented in Table 5-10 below in is a summary of the predicted L_{AFmax} noise levels, and the receiver specific screening criterion. An exceedance of the screening criterion indicates the potential for sleep disturbance to be a potential issue which requires further investigation. Note, the maximum noise level assessment only applies to residential receivers.

Table 5-10 Night-time predicted construction works maximum noise levels, L_{AFmax} dB(A).

ID	**Address**	**Screening criterion**	**L_{AFmax} noise level (worst affected receiver height)**	**Exceedance**
R01	267-269 Balmain Road, Lilyfield	60	61	+1
R02	259 Balmain Road, Lilyfield	60	54	-
R03	251 Balmain Road, Lilyfield	60	56	-
R05	88-92 Piper St, Lilyfield	60	58	-
R06	243 Balmain Road, Lilyfield	60	56	-
R07	2A Charlotte Street, Lilyfield	60	56	-
R08	1 Charlotte Street, Lilyfield	60	54	-
R09	241 Balmain Road, Lilyfield	60	53	-

ID	Address	Screening criterion	L_{AFmax} noise level (worst affected receiver height)	Exceedance
R10	239 Balmain Road, Lilyfield	60	54	-
R12	1 Henry Street, Leichardt	60	65	+5
R13	11 Henry Street, Leichardt	60	60	-
R15	144 Lilyfield Road, Lilyfield	60	71	+11

The applicable sleep disturbance noise level (Section 4.2.5) is the L_{AFmax} 60 dB(A). An exceedance of the sleep disturbance screening criteria of 11 dB is predicted for the worst affected residential receivers (R15) located within NCA01. Noise management measures are considered in Section 5.7.1.

5.5 Construction traffic assessment

For construction traffic to generate an increase in noise level of greater than 2 dB, existing traffic levels along construction traffic routes would need to increase by around 60%. Nosie level increases due to proposal-related constriction traffic on arterial and sub-arterial roads are expected to be less than 2 dB during both the daytime and night-time periods, given the existing high levels of traffic on the surrounding road networks.

Construction traffic noise resulting from local roads (William Street) cannot be directly assessed due to the lack of existing road traffic volumes. However, taking into consideration the existing road traffic along the local roads due to the existing operation of the bus depot (currently diesel and electric buses) of 203 buses, the proposed worst case construction noise scenario of an additional 8 vehicles per day (3 x heavy and 5 x light), resulting in an additional 16 pass-bys will result in a negligible increase to the nearby surrounding local road networks.

5.6 Vibration

5.6.1 Construction vibration criteria

Effects of ground borne vibration on buildings may be segregated into two major categories:

- Human comfort – vibration in which the occupants or users of the building are inconvenienced or possibly disturbed.
- Effects on building structures – where vibration can compromise the integrity of the building or structure itself

Vibration criteria – human comfort

Vibration effects relating specifically to the human comfort aspects of the proposal are taken from the guideline titled "Assessing Vibration – A Technical Guideline" (AVATG). Vibration impacts can be defined based on the nature of the construction works and vibration generated, specifically:

- Continuous vibration – from uninterrupted sources (refer to Table 6).
- Impulsive vibration – up to three instances of sudden impact e.g. dropping heavy items, per monitoring period (refer to Table 7).
- Intermittent vibration – such as from drilling, compacting or activities that would result in continuous vibration if operated continuously (refer to Table 8).

Presented below in Table 5-11: Continuous vibration acceleration criteria (m/s^2) 1 Hz-80 Hz, Table 5-12 and Table 5-13 is a summary of the applicable human comfort vibration criteria, for continuous, impulsive, and intermittent vibration respectively.

Table 5-11: Continuous vibration acceleration criteria (m/s^2) 1 Hz-80 Hz.

Location	Assessment Period	Preferred Values		**Maximum Values**	
		z-axis	**x- and y-axis**	**z-axis**	**x- and y-axis**
Residence	Daytime	0.010	0.0071	0.020	0.014
	Night-time	0.007	0.005	0.014	0.010
Offices, schools, educational institutions and places of worship	Day or night-time	0.020	0.014	0.040	0.028
Workshops	Day or night-time	0.04	0.029	0.080	0.058

Table 5-12: Impulsive vibration acceleration criteria (m/s^2) 1 Hz-80 Hz.

Location	Assessment Period	Preferred Values		**Maximum Values**	
		z-axis	**x- and y-axis**	**z-axis**	**x- and y-axis**
Residence	Daytime	0.30	0.21	0.60	0.42
	Night-time	0.10	0.071	0.20	0.14
Offices, schools, educational institutions and places of worship	Day or night-time	0.64	0.46	1.28	0.92
Workshops	Day or night-time	0.64	0.46	1.28	0.92

Table 5-13: Intermittent vibration impacts criteria ($m/s^{1.75}$) 1 Hz-80 Hz.

Location	Daytime		Night-time	
	Preferred	Maximum	Preferred	Maximum
Residences	0.20	0.40	0.13	0.26
Offices, Schools, educational institutions and places of worship	0.40	0.80	0.40	0.80
workshops	0.80	1.60	0.80	1.60

Vibration criteria – building contents and structures

The vibration effects on the building are provided by British Standard BS 7385: Part 2-1993 “Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration” (BSI 1993)

The criteria are based on peak particle velocity (mm/s) which is to be measured at the base of the building. These are summarised in Table 5-14 and illustrated in Figure 8.

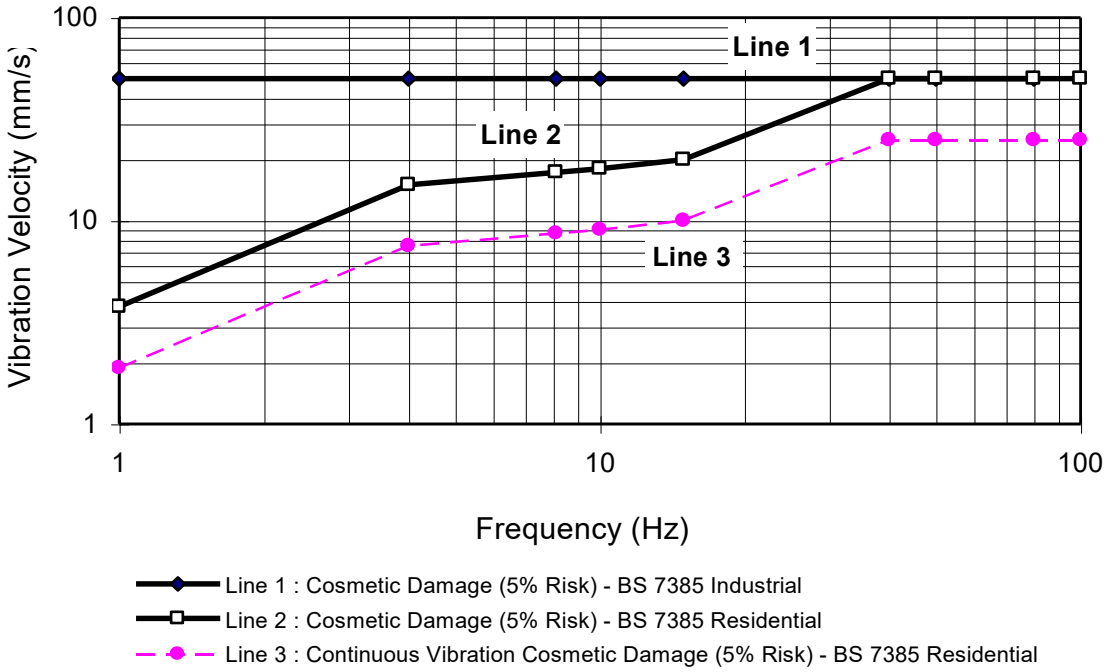
Table 5-14: Transient vibration criteria as per standard BS 7385 Part 2 – 1993.

Line in standard	Type of Building	Peak component particle velocity in frequency range of predominant pulse	
		4 Hz to 15 Hz	**15 Hz and Above**
1	Reinforced or framed structures Industrial and heavy commercial buildings	50 mm/s at 4 Hz and above	
2	Unreinforced or light framed structures Residential or light commercial type buildings	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above

The vibration standard BS 7385 Part 2 – 1993 states that the values in Table 5-14 relate to transient vibration which does not cause resonant responses in buildings.

Where the dynamic loading caused by continuous vibration events is such as that results in dynamic magnification due to resonance (especially at the lower frequencies where lower guide values apply), then the values in Table 5-14 may need to be reduced by up to 50% (refer to Line 3 in Figure 8).

Figure 8 BS 7385 Part 2 – 1993, graph of transient vibration values for cosmetic damage.



In the lower frequency region where strains associated with a given vibration velocity magnitude are higher, the recommended values corresponding to Line 2 are reduced. Below a frequency of 4 Hz where a high displacement is associated with the relatively low peak component particle velocity value, a maximum displacement of 0.6 mm (zero to peak) is recommended. This displacement is equivalent to a vibration velocity of 3.7 mm/s at 1 Hz.

The standard also states that minor damage is possible at vibration magnitudes which are greater than twice those given in Table 5-14, and major damage to a building structure may occur at values greater than four times the tabulated values.

Fatigue considerations are also addressed in the Standard and it is concluded that unless calculation indicates that the magnitude and number of load reversals is significant (in respect of the fatigue life of building materials) then the values in Table 5-14 should not be reduced for fatigue considerations.

Vibration criteria – structural dagame

At present, no Australian Standards exist for the assessment of building damage caused by vibration.

DIN 4150 provides recommended maximum levels of vibration that reduce the likelihood of building damage caused by vibration and are presented in Table 5-15. DIN 4150 states that buildings exposed to higher levels of vibration than recommended limits would not necessarily result in damage.

Table 5-15 DIN4150 Structural damage safe limits for building vibration velocity, mm/s.

Type of structure	At foundation at a frequency of			Highest floor[1]
	Less than 10 Hz	**10 Hz – 50 Hz**	**50 Hz – 100 Hz**	**All frequencies**
Buildings used for commercial purposes, industrial buildings and buildings of similar design	20	20 to 40	40 to 50	40
Dwellings and buildings of similar design and/or use	5	5 to 15	15 to 20	15
Structures that because of their particular sensitivity to vibration, do not correspond to those listed in Lines 1 or 2 and have intrinsic value (e.g. buildings that are under a preservation order)	3	3 to 8	8 to 10	8

Note 1 Vibration at the horizontal plane of the highest floor.

The screening criterion of 3 mm/s is appropriate for the heritage listed Former SRA Tram shed, that is located to the west of the proposed works.

Project vibration criteria

Based on the details included in the sections above the project specific vibration criteria to protect the surrounding residential receivers from structural or architectural damage includes the following:

- Proposed construction vibration management level at all surrounding building structures (excluding the SRA tram shed located at 25 Derbyshire Road LEICHHARDT NSW 2040) – **7.5 mm/s**.
- Heritage listed SRA tram shed / bus museum located at 25 Derbyshire Road LEICHHARDT NSW 2040 – **3 mm/s**.

In the event that this vibration criterion is exceeded, further investigation is required, including an assessment of the nature of the vibration and frequency characteristics to determine if the vibration criterion can be relaxed for the specific nature of the works.

5.6.2 Construction vibration assessment

To maintain compliance with the human comfort vibration criteria identified in Section 5.6.1, it is recommended that the indicative safe distances listed in Table 5-16 should be maintained. These indicative safe distances should be validated prior to the start of construction works by undertaking operator-attended measurements of vibration levels generated by construction equipment to be used on site.

If applicable, the criteria for scientific or medical equipment (should any of these exist close to the site) can be more stringent than those required for human comfort. Vibration validating measurements should be conducted at each site to determine the vibration level and potential impact onto this sensitive equipment.

Recommended safe working distances for various typical items of plant are included in the following table.

Table 5-16: Recommended indicative safe working distances for vibration intensive plant.

Plant	Rating / Description	Safe Working Distances (m)	
		Cosmetic Damage	Heritage Structures
Small tonne excavator with rock hammer	5 – 12 tonnes	2.3	3.6

Medium excavator with rock hammer	12 – 18 tonnes	7.0	17.5
Large excavator with rock hammer	18 – 34 tonnes	22.0	55.0
Jackhammer	Handheld	1.6	2.2
Plate compactor	/	2.5	3.5
Concrete saw	Handheld	0.6	0.9
Hammer drill	Handheld	0.9	1.2
Piling Rig	Vibratory	3.0	5.0
Piling Rig	Hammer	15.0	37.5

An assessment of the potential for vibration generated as part of the required construction activities on the project has been undertaken based on the project safe working distances. Exceedances of the safe working distances are expected to occur due to the heritage building (SRA Tram Shed / Sydney Bus Museum). No vibration exceedances are expected to occur for any other receiver types (Utilising a small hydraulic hammer as the most vibration intensive construction activities).

No vibration intensive works are recommended to take place within the safe working distances provided in Table 5-16.

Given the close proximity of the proposed works to the heritage structure, the contractor will need to consider the potential impacts of the proposed construction methodology with respect to their specific equipment and work practices. Recommended vibration management and mitigation measures are included in Section 5.7.1.

5.7 Management and mitigation

5.7.1 Construction management measures

The construction predicted noise levels identified in Section 5.4 indicate that the noise impacts have the potential occur from the proposed works. These impacts are typical for a construction such as this and highlight the importance for appropriate noise management and mitigation measures.

Presented in Table 5-17 is a summary of site-specific management procedures recommended to manage the predicted airborne noise and vibration impacts based on Table 8 of CNVG 2023.

Table 5-17: Summary of mitigation procedures

Procedure	Abbreviation	Description	Further reference
Project Notification	PN	For each Transport project, a notification is produced and distributed to stakeholders via letterbox drop or distributed to the project postal and/or email mailing lists. The same information will be published on the Transport corporate website (Transport Projects) or equivalent. Periodic notifications provide an overview of current and upcoming work across the project and other topics of interest. The objective is to engage, inform and provide project-specific messages. Advanced warning of potential disruptions (e.g., traffic changes or noisy works) can assist in reducing the impact on stakeholders. The approval conditions for projects specify requirements for notification to sensitive receivers where work may impact them. Content and length are determined on a project-by-project basis and must be approved by Transport prior to distribution. Most projects distribute notifications monthly. Each notification is graphically designed within a branded template. In certain circumstances media advertising may also be used to supplement Periodic Notifications, where considered effective. Periodic Notification may be advised by the Transport Community Engagement Team in cases where AMMM are not triggered, for example where community impacts extend beyond noise and vibration (traffic, light spill, parking, etc.). In these circumstances the Transport Community Engagement Team will determine the community engagement strategy on a case-by-case basis.	Refer to Section 5.7.6
Verification Monitoring	V	Verification monitoring of noise and/or vibration during construction may be conducted at the affected receiver(s) or a nominated representative location (typically the nearest receiver where more than one receiver has been identified). Monitoring can be in the form of either unattended logging (i.e., for vibration provided there is an immediate feedback mechanism such as SMS capabilities) or operator attended surveys (i.e., for specific periods of construction noise). Verification must be undertaken by suitably qualified, trained and experienced personnel using appropriate equipment and methodology, with reference to AS1055. Refer to EPA's guideline 'Approved methods for the measurement and analysis of environmental noise in NSW' for additional guidance on personnel, methodology and equipment requirements. The purpose of monitoring is to confirm that:	For noise impact, refer to Section 5.7.5. For vibration impact, refer to Section 5.6.2

Procedure	Abbreviation	Description	Further reference
		• Construction noise and vibration from the project are consistent with the predictions in the noise assessment. • Mitigation and management of construction noise and vibration is appropriate for receivers affected by the work. Where noise monitoring finds the actual noise levels exceed those predicted in the noise assessment then immediate refinement of mitigation measures may be required and the CNVIS amended.	
Specific Notification	SN	Specific notifications are in the form of a personalised letter or phone call to identified stakeholders no later than seven calendar days ahead of construction activities that are likely to exceed the noise objectives. In addition to Specific Notifications and letters communications representatives from the contractor would visit identified stakeholders at least 48 hours ahead of potentially disturbing construction activities and provide an individual briefing. • Letters may be letterbox dropped, hand distributed or emailed. • Phone calls provide affected stakeholders with personalised contact and tailored advice, with the opportunity to provide comments on the proposed work and their specific needs. • Individual briefings are used to inform stakeholders about the impacts of noisy activities and mitigation measures that will be implemented. Individual briefings provide affected stakeholders with personalised contact and tailored advice, with the opportunity to comment on the project. • Specific notifications are used to support periodic notifications, or to advertise unscheduled or high impact work and must be approved by Transport prior to implementation/distribution. Where impacts have already been captured in a Periodic Notification, a Specific Notification may not be required	Refer to Section 5.7.6
Respite Offer	RO	The purpose of a project specific respite offer is to provide residents subjected to lengthy periods of noise or vibration respite from an ongoing impact. The offer could comprise pre-purchased movie tickets, bowling activities, meal vouchers or similar offers designed to provide residents with a short break from impact of construction activity outside of their home. This measure is determined on a case-by-case basis and may not be applicable to all Transport projects	-
Alternative accommodation	AA	Alternative accommodation options may be provided for residents living near construction activities likely to incur unreasonably high impacts. Alternative accommodation will be determined on a case-by-case basis and should provide a like-for-like replacement for permanent residents, including provisions for pets, where reasonable and feasible.	
Alternative Construction Methodology	AC	Where the vibration assessment identifies that the proposed construction method has a high risk of causing structural damage to buildings near the work, the proponent needs to consider alternative construction options to achieve compliance with the VMLs for building damage. For example, replace large rock breaker with smaller rock breakers or rock saws	-

Procedure	Abbreviation	Description	Further reference
Respite period	RP	OoHW during evening and night periods will be restricted so receivers are impacted for no more than three consecutive evenings and no more than two consecutive nights in the same NCA in any one week, except where there is Duration Reduction. A minimum respite period of four evenings/five nights shall be implemented between periods of consecutive evening and/or night work. Strong justification must be provided where it is not reasonable and feasible to implement these period restrictions (e.g. to minimise impacts to rail operations), and approval must be given by Transport through the OoHW Approval Protocol (Section 5). Note: this management measure does not apply to OoHW Period 1 – Days	Refer to Section 5.7 For vibration impact, also refer to section 5.6.2
Duration reduction	DR	Where Respite Periods (see management measure above) are counterproductive to reducing noise and vibration impacts to the community, it may be beneficial to increase the number of consecutive evenings and/or nights through Duration Reduction to minimise the duration of the activity. This measure is determined on a project-by project basis and may not be applicable to all Transport projects. Impacted receivers must be consulted and evidence of community support for the Duration Reduction must be provided as justification for the Duration Reduction. A community engagement strategy must be agreed with and implemented in consultation with Transport Community and Stakeholder Engagement Representatives.	

The application of these procedures is in relation to the exceedances over the relevant criteria. For airborne noise, the criteria are based on NMLs. The allocation of these procedures is discussed in Section 5.7.2.

For vibration, the criteria either correspond to human comfort, building damage or scientific and medical equipment. The application of these procedures is discussed in Section 5.6.1.

5.7.2 Allocation of noise management procedures

For residences, the management procedures have been allocated based on noise level exceedances at the affected properties, which occur over the designated NMLs (refer to section 5.2.1). The allocation of these procedures is summarised in Table 5-18 below (from Table 9 of CNVG 2023).

Table 5-18: Allocation of noise management procedures.

Construction Hours	Receiver perception	dB(A) above RBL	dB(A) above ANML	Management procedures
Standard Hours Mon – Fri: 7:00 am to 6:00 pm Sat: 8:00 am – 1:00 pm	Noticeable	5 to 10	0	-
	Clearly audible	>10 to 20	≤ 10	-
	Moderately intrusive	> 20 to 30	> 10 to 20	PN, V
	Highly intrusive	> 30	> 20	PN, V
	75 dB(A) of greater	N/A	N/A	PN, V, SN
OoHW Period 1 **Monday-Friday 6pm-10pm** **Saturday 7am-8am** **1pm-10pm** Sunday/PH 8am-6pm	Noticeable	5 to 10	≤ 5	-
	Clearly audible	>10 to 20	> 5 to 15	PN, RP#, DR#
	Moderately intrusive	> 20 to 30	> 15 to 25	PN, V, SN, RO, RP#, DR#
	Highly intrusive	> 30	> 25	PN, V, SN, RO, RP#, DR#
OoHW Period 2 Monday-Saturday 12am – 7am **10pm - 12am** Sunday / PH 12am – 8am 6pm – 12pm	Noticeable	5 to 10	≤ 5	PN
	Clearly audible	>10 to 20	> 5 to 15	PN, V, SN, RO^, RP, DR
	Moderately intrusive	> 20 to 30	> 15 to 25	PN, V, SN, RO^, RP, DR
	Highly intrusive	> 30	> 25	PN, V, SN, RO^, RP, DR, AA

Respite periods and duration reduction are not applicable when works are carried out during OoHW Period 1 Day only (i.e. Saturday 7am-8am & 1pm-6pm, Sundays / Public Holidays 8am-6pm)

^Respite offers during OoHW Period 2 are only applicable for evening periods on Sundays and Public Holidays 6pm-10pm, and may not be required if a respite offer has already been made for the immediately preceding OoHW Period 1

Please note the following regarding the allocation of these procedures:

- The exceedances have been predicted as part of the acoustic assessment, and these are summarised in Section 5.4.
- The allocation of procedures is based on the assumptions used for noise level predictions (refer to Section 5.4).

5.7.3 Allocation of vibration management procedures

Table 5-19 below summarises the vibration management procedures to be adopted based on exceedance scenarios (i.e., whether the exceedance occurs over human comfort criteria, building damage criteria, or criteria for scientific and medical equipment). Please note these management procedures apply for any type of affected receiver.

Table 5-19: Allocation of vibration management procedures.

Construction Hours	Receiver perception	dB(A) above ANML	Management procedures
Standard Hours Mon – Fri: 7:00 am to 6:00 pm Sat: 8:00 am – 1:00 pm	Human disturbance	> HVML	PN, V, RO
	Building damage	> DVML	V, AC
OoHW Period 1 **Monday-Friday 6pm-10pm** **Saturday 7am-8am, 1pm-10pm** Sunday/PH 8am-6pm	Human disturbance	> HVML	PN, V, SN, RO, RP, DR
	Building damage	> DVML	V, AC
OoHW Period 2 **Monday-Saturday 12am – 7am, 10pm - 12am** Sunday / PH 2am – 8am, 6pm – 12pm	Human disturbance	> HVML	PN, V, SN, RO, RP, DR, AA
	Building damage	> DVML	V, AC

Notes – HVML – human disturbance vibration management level, DVML - cosmetic damage to buildings or structures vibration management level

5.7.4 Recommended Standard Mitigation Measures

- Maximising the offset distance between plant items and nearby noise sensitive receivers.
- Preventing noisy plant working simultaneously and adjacent to sensitive receivers.
- Minimising consecutive works in the same site area.
- Orienting equipment away from noise sensitive areas.
- Carrying out loading and unloading away from noise sensitive areas.

To minimise noise impacts during the works, the contractor will take all reasonable and feasible measures to mitigate noise effects.

The contractor will also take reasonable steps to control noise from all plant and equipment. Examples of appropriate noise control include efficient silencers and low noise mufflers.

The contractor should apply all feasible and reasonable work practices to meet the NMLs and inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels, duration of noise generating construction works, and the contact details for the proposal.

Presented below in Table 5-20 is a summary of the noise management measures and approximate noise reductions. Further information is provided in the proceeding section.

Table 5-20: Standard Noise and Vibration Mitigation Measures.

Term	Definition	Noise Reduction
Management Measures		
Implement community consultation measures	Providing the community ongoing updates about potential noise impacts can reduce the impacts and annoyance from the project	Reduced annoyance
Site inductions	All employees, contractors and subcontractors are to receive an environmental induction which would include consideration of noise and vibration impacts.	
Behavioural practices	No swearing or unnecessary shouting or loud stereos/radios on site. No dropping of materials from height, throwing of metal items and slamming of doors.	

Term	Definition	Noise Reduction
Monitoring	See Section 5.7.6	
Work scheduling	Includes scheduling noise intensive works and respite periods	Annoyance reduction
Source controls		
Alternative equipment or process	Use quieter and less vibration emitting construction methods where feasible and reasonable.	5 to 15 dB
Plan worksites and activities to minimise noise and vibration	Plan traffic flow, parking and loading/unloading areas to minimise reversing movements within the site	1 to 3 dB
Minimise the movement of materials	Reduces noise generated through reduced plant operations	1 dB to 3 dB
Broadband reversing alarm	Site based vehicles should be fitted with broadband reversing alarms to reduce tonal noise impacts.	5 dB
Siting of equipment	Simultaneous operation of noisy plant within discernible range of a sensitive receiver is to be avoided. The offset distance between noisy plant and adjacent sensitive receivers is to be maximised. Plant used intermittently to be throttled down or shut down. Noise-emitting plant to be directed away from sensitive receivers	3 to 15 dB
Silencers on mobile plant	Where possible reduce noise from mobile plant through additional fittings	5 dB to 8 dB
Maximise hammer penetration	Reduces the time required and associated noise impacts	Reduced duration
Path controls		
Acoustic enclosure or screening	Stationary noise sources should be enclosed or shielded whilst ensuring that the occupational health and safety of workers is maintained.	5 dB to 10 dB

Acoustic enclosures/screening

Typically, on a construction site there are three different types of plant that will be used: mobile plant (i.e., excavators, skid steers, etc.), semi mobile plant (i.e., hand tools generally) or static plant i.e. (diesel generators).

For plant items which are static it is recommended that, in the event exceedances are being measured due to operation of the plant item, an acoustic enclosure/screen is constructed to reduce impacts. These systems can be constructed from Fibre Cement (FC) sheeting or, if airflow is required, acoustic attenuators or louvres.

For semi mobile plant, relocation of plant should be investigated to either be operated in an enclosed space or at locations away from a receiver.

With mobile plant it is generally not possible to treat these sources. However, investigations into the machine itself may result in a reduction of noise (i.e., mufflers/attenuators etc).

General mitigation measures (Australia Standard 2436-2010)

As well as the above project specific noise mitigation controls, AS 2436-2010 *"Guide to Noise and Vibration Control on Construction, Demolition and Maintenance Sites"* sets out numerous practical recommendations to assist in mitigating construction noise emissions. Examples of strategies that could be implemented on the proposal are listed below, including the typical noise reduction achieved, where applicable.

Adoption of universal work practices

- Regular reinforcement (such as at toolbox talks) of the need to minimise noise and vibration.
- Regular identification of noisy activities and adoption of improvement techniques.
- Avoiding the use of portable radios, public address systems or other methods of site communication that may unnecessarily impact upon nearby sensitive receivers.
- Where possible, avoiding the use of equipment that generates impulsive noise.
- Minimising the need for vehicle reversing for example (particularly at night), by arranging for one-way site traffic routes.
- Use of broadband audible alarms on vehicles and elevating work platforms used on site.
- Minimising the movement of materials and plant and unnecessary metal-on-metal contact.
- Minimising truck movements.

Plant and equipment

The operation of plant and equipment on the site should be undertaken, including the following:

- Choosing quieter plant and equipment based on the optimal power and size to most efficiently perform the required tasks.
- Selecting plant and equipment with low vibration generation characteristics.
- Operating plant and equipment in the quietest and most efficient manner.

Work scheduling

- Providing respite periods which could include restricting very noisy activities to time periods that least affect the nearby noise sensitive locations, restricting the number of nights that after-hours work is conducted near residences or by determining any specific requirements.
- Scheduling work to coincide with non-sensitive periods.
- Planning deliveries and access to the site to occur quietly and efficiently and organising parking only within designated areas located away from the sensitive receivers.
- Optimising the number of deliveries to the site by amalgamating loads where possible and scheduling arrivals within designated hours.

Source noise control strategies

Some ways of controlling noise at the source are:

- Where reasonably practical, noisy plant or processes should be replaced by less noisy alternatives.
- Modify existing equipment: Engines and exhausts are typically the dominant noise sources on mobile plant such as cranes, graders, excavators, trucks, etc. To minimise noise emissions, residential grade mufflers should be fitted on all mobile plant utilised on site.
- Siting of equipment: locating noisy equipment behind structures that act as barriers, or at the greatest distance from the noise-sensitive area; or orienting the equipment so that noise emissions are directed away from any sensitive areas, to achieve the maximum attenuation of noise.
- Regular and effective maintenance.

Miscellaneous comments

Deliveries should be undertaken, where possible, during standard construction hours.

Maximise hammer penetration (and reduce blows) by using sharp hammer tips. Keep stocks of sharp profiles at site and monitor the profiles in use.

It is advised that mobile plant and trucks operating on site for a significant portion of the project are to have reversing alarm noise emissions minimised. This is to be implemented subject to recognising the need to maintain occupational safety standards.

No public address system should be used on site.

5.7.5 Construction vibration mitigation measures

The following vibration mitigation measures should be implemented:

- Investigate the feasibility of rescheduling the hours of operation of major vibration generating plant and equipment.
- Use lower vibration generating items of construction plant and equipment; that is, smaller capacity plant.
- Minimise conducting vibration generating works consecutively in the same area (if applicable).
- Undertake the removal of concrete within the building using saw cutting or pulverising where possible.
- Where possible, hydrofraise should be considered to reduce vibration impacts on heritage structures.

To ensure the vibration impact criteria detailed in this report are complied with the following safe working mitigations and/or working distances should be implemented as detailed in the table below.

Table 5-21: Vibration mitigation requirements.

Construction Activity	Activity	Vibration Mitigation
Decommissioning / removal of structures	Decommissioning / removal of existing infrastructure / equipment	Prior to the use of hydraulic hammering (if relevant) / piling rig, the concrete panel is required to be saw cut through, to create a discontinuous condition from the structure that is being decommissioned and the heritage building.

5.7.6 Noise and vibration monitoring

Construction noise and vibration should be managed by the implementation of a detailed Construction Noise and Vibration Management Plan (CNVMP) to be prepared by the construction contractor prior to commencement of works on site. This will utilise updated information in relation to the proposed construction methodology, location of works sites, activities, durations and equipment type and numbers.

Verification must be undertaken by suitably qualified, trained and experienced personnel using appropriate equipment and methodology, with reference to AS1055. Refer to EPA's guideline 'Approved methods for the measurement and analysis of environmental noise in NSW' for additional guidance on personnel, methodology and equipment requirements.

Noise monitoring is recommended to be undertaken by attended noise measurements at the start of any new phase of works identified in section 5.4. Attended noise monitoring is required to follow the requirement set out within section 7.4 of Construction Noise and Vibration Guideline (Public Transport Infrastructure) 2023 (CNVG-PTI).

Attended noise monitoring needs to be conducted at the nearest sensitive receivers. Compliance with the approved construction noise and vibration objectives is to be audited at the commencement of works and at least every three months, where this is reasonable and feasible. The statistical parameters to be measured should include the following noise descriptors: L_{Amin}, L_{A90}, L_{A10}, L_{A1}, L_{Amax} and L_{Aeq}. Attended noise measurements should be conducted over consecutive 15-minute periods.

In accordance with the CNVG-PTI 2023, the following monitoring procedures are required to be carried out to determine the influence of construction noise:

Timing of Measurements: Measurements should be conducted within 14 days from the start of construction activities or as agreed with the relevant authority (EMR/Transport). This is to confirm that noise and vibration levels at receiver locations align with predictions and approval/licensing conditions.

Location of Measurements: Measurements should be carried out at the potentially most impacted receiver locations.

Noise Measurement Standards: Noise measurements should follow the procedures outlined in AS1055.1-1997 for the description and measurement of environmental noise. Additionally, the NSW EPA's Approved methods for the measurement and analysis of environmental noise on NSW.

Vibration Measurement Standards: Vibration measurements should adhere to procedures documented in the EPA's guideline "Assessing Vibration" (2006) and BS7385 Part 2-1993 for the evaluation and measurement of vibration in buildings.

Frequency of Measurements: For projects lasting more than three months, attended measurements should be repeated every three months, if reasonable and feasible, to ensure consistency with predicted levels. Additional measurements may be required for out-of-hours works as per the CNVIS, out-of-hours assessment, approval, and/or licensing conditions.

Noise Monitoring Implementation: Noise monitoring should be implemented as specified in Additional Management Measures (Section 7.2) or as an ongoing management measure during critical periods, such as during piling and hammering activities when noise emissions are expected to be high.

5.7.7 Community consultation

Active community consultation and the maintenance of positive relations with nearby local residents, and businesses would assist in alleviating concerns and thereby minimising complaint.

This form of notification should provide specific notification of the duration and timing of the required ground works activities so that residents are informed about the works ahead of time. The letter should also provide the community with a hotline number for a community liaison officer available to adequately respond to all project related enquiries.

Ideally the hotline number should provide concerned locals an opportunity to raise any concerns with the project proponent and provide an opportunity to determine the best method to satisfy all requirements.

Additionally, for the nearby place of worship (R14), it is recommended that checks be conducted to determine if any proposed high noise generating activities have been scheduled to occur at the same time as a church service / religious event. Where possible, high noise generating activities should be rescheduled, so that they do not excessively disturb the place of worship during service.

Prior to the works onsite being undertaken, community consultation with the neighbouring affected parties be undertaken. Community engagement and consultation should not be limited to the beginning of the onsite works but throughout, providing the community with constant updates on the progress and upcoming works. In our experience these could include:

- Site noticeboard,
- Email notifications; and
- Letterbox drops.

Complaints management system

Should complaints arise they must be dealt with in a responsible and uniform manner, therefore, a management system to deal with complaints is detailed below:

Local residents and landowners should be informed by direct mail of a direct 24-hour telephone line where any noise complaints related to the required ground works will be recorded. The 24-hour telephone line number will be made available on the construction site signage.

All complaints should be investigated by the Contractor in accordance with the procedures outlined in Australia Standard 2436-2010. Consequently, a complaint response procedure should be implemented. Information to be gathered as part of this process should include:

- location of complainant
- time/s of occurrence of alleged noise or vibration impacts
- nature of impact particularly with respect to vibration
- Perceived source
- Prevailing weather conditions and similar details that could be utilised to assist in the investigation of the complaint.

All resident complaints will be responded to in the required timeframe and action taken recorded.

Post receiving a noise and or vibration complaint, the process outlined in the Contingency Plans below should be undertaken.

Contingency plans

Contingency plans are required to address noise or vibration problems if excessive levels are measured at surrounding sensitive receivers and/or if justified complaints occur. Such plans include:

- Stop the onsite works.
- Identify the source of the main equipment within specific areas of the site which is producing the most required ground works noise and vibration at the sensitive receivers; and
- Review the identified equipment and determine if an alternate piece of equipment can be used or the process can be altered.
- In the event an alternate piece of equipment or process can be used, works can re-commence.
- In the event an alternate piece of equipment or process cannot be determined implement a construction assessment to be performed by a suitably qualified acoustic consultant.
- Respite periods to be scheduled during potentially noise sensitive periods of the surrounding receivers.

The Superintendent shall have access to view the Contractor's noise measurement records on request. The Superintendent may undertake noise monitoring if and when required.

6. Conclusion

Transport for NSW is proposing to convert the existing bus depot at 230 / 240 Balmain Road, Leichhardt to zero emissions technology. The Leichhardt Bus Depot Conversion will support the transition of the existing diesel fleet to an entirely new fleet of battery electric buses. This report provides a Noise and Vibration Impact Assessment (NVIA) for the proposed development. This NVIA is required to address noise and vibration impacts that have the potential to be generated by the proposal.

The depot is located on Lot 2, deposited plan (DP) 1244017 within the Inner West Council Local Government Area (LGA).

The depot is located in a general residential development area, with the City-West Link Road located along the northern boundary. Residential developments are located to the east, west and north (across the City-West Link Road) of the site.

Additionally, the Sydney Secondary College is located to the south of the site. Other noise sensitive receivers include the St. Gerasimos Greek Orthodox Church to the west of the depot.

In the absence of any background noise logging, the rating background noise level (RBL) has been adopted from the Australian Standard 1055:1997 “Acoustics - Description and measurement of environmental noise” which provides estimated average background sound pressure levels ($L_{A90,T}$). Considering the land zoning of the nearby noise sensitive receivers, a Noise Area Category of R4 – Area with dense transportation or with some commerce or industry has been adopted.

This approach was selected to maintain consistency with previous noise impact assessments for the Leichhardt Depot.

Construction noise and vibration assessment

To facilitate the assessment, noise and vibration sensitive receivers and NCAs were identified. Noise and vibration sensitive receivers include residential properties, commercial, educational, and places of worship properties. NMLs have been established for each identified NCA based on the estimated noise monitoring levels for the surrounding receivers.

The construction noise assessment was conducted in accordance with the Interim Construction Noise Guideline (ICNG). The construction scenarios in this assessment have been considered, these are considered to be the noisiest activities likely to occur.

The predicted standard construction hours noise impacts are expected to have a moderate impact to some of the nearby noise sensitive receivers, specifically, residential receivers R01, R12, and R15, where the standard construction noise management levels are predicted to be exceeded by 1 dB, 1 dB, and 7 dB respectively. Additionally, one place of worship (R14) is predicted to exceed the internal criteria by 10 dB during standard construction hours.

During periods of out of hours works 1, the noise management levels for residential receivers are expected to be exceeded for receivers R01, R03, R05, R06, R07, R12, R13, and R15. Additionally, the nearby place of worship (R14), is also expected to be exceeded during this period.

For out of hours works 2, the noise management levels for all residential receivers, and the nearby place of worship are expected to be exceeded.

No residential noise sensitive receivers have been identified to be highly noise affected by the proposed works.

Noise mitigation measures have been recommended to reduce the construction noise impact at surrounding receivers. These measures are outlined in section 5.7 of this report. It is important to note that management and mitigation measures stated in Section 5.7 are to be carried out to minimize the noise and vibration impact of the proposed construction work on identified sensitive receivers.

To mitigate the impact from vibration-intensive activities, we recommend that minimum working distances be established for both human comfort and structural protection. This includes the use of rock breakers, piling rigs, and jackhammers during trenching, excavation, and joint bay work.

For vibration-intensive activities within the recommended distances, the following measures are suggested:

1. Vibration Assessment: Conduct vibration assessments during the initial stages of vibration-intensive activities to establish site-specific minimum working distances. This is especially important for the heritage listed SRA Tram Shed / Sydney Bus Museum located along the western boundary of the site.
2. Work Scheduling and Breaks: Plan work schedules to incorporate breaks, allowing for reduced impact on nearby locations.

3. Equipment Selection and Maintenance: Ensure appropriate selection and maintenance of equipment to minimize vibration levels. Saw cuts should be considered as a minimum to reduce vibration propagation and hydrofraise should be considered where applicable to reduce vibration generation.
4. Building Integrity Surveys: Perform surveys to assess and monitor potential structural impacts resulting from vibration-intensive activities.

Additionally, it should be noted that several noise mitigation measures stated in section 5.7.2 may also assist in mitigating construction-related vibrations.

Operational Noise

In the absence of any background noise logging, the rating background noise level (RBL) has been adopted from the Australian Standard 1055:1997 "Acoustics - Description and measurement of environmental noise" which provides estimated average background sound pressure levels ($L_{A90,T}$). This approach has been used to determine the operational noise limits for the site.

An operational noise model has been developed using SoundPLAN v9.1. The noise model assessed the dominant noise sources generated from the operation of the site. The predicted noise levels identified compliance with the applicable noise criteria at all sensitive receiver locations during the daytime period. Exceedances of up to 4 dB and 8 dB is expected to result during the evening and nighttime periods for nearby residential receivers respectively.

Given that all of the predicted exceedances at the nearby residential receivers are resulting from the bus movements, which are existing and are only set to decrease the noise impact with the conversion to electric from diesel buses, it is expected that the overall resulting impacts from the site will be of a lower magnitude than the current, existing operations.

It is noted that additional noise mitigation treatments (additional to the natural shielding effects from the site buildings, and existing noise walls), would not be deemed feasible or reasonable primarily due to majority of the predicted exceedances occurring from bus movements along the private entry / exit roads located to the north and south of the project site.

Sleep disturbance noise impacts have been assessed against the NPfI screening criterion. The sleep disturbance screening criterion is not predicted to be exceeded by the proposed operations. These noise impacts (resulting from the air brake release) are an existing feature of the site and would remain in the future arrangement. The noise impacts would not change as a result of this project.

This proposal would marginally increase the number of buses accessing the site (from approximately 203 to 238, however this is still below the maximum operational capacity of the site of 281 buses). The noise levels from a bus travelling at 50 km/h is dominated by noise generated from the road/tyre interface. The noise of the electric buses travelling this route would not change with the electric buses. While electric buses do not idle at intersections, noise is emitted from the air-conditioning units and inverters.

7. Definitions

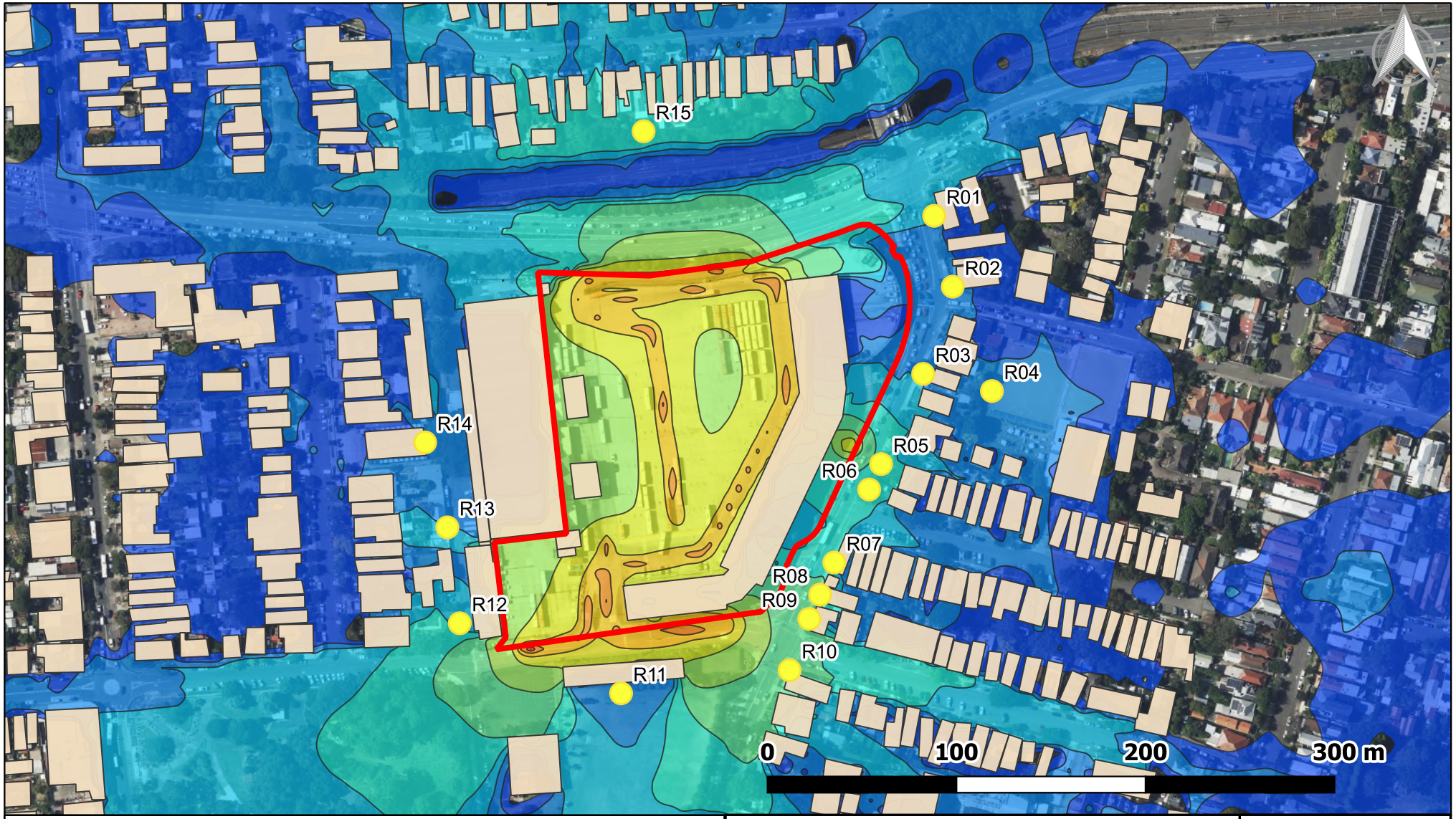
Term	Definition
Ambient Sound	The totally encompassing sound in a given situation at a given time, usually composed of sound from all sources near and far.
Audible Range	The limits of frequency which are audible or heard as sound. The normal ear in young adults detects sound having frequencies in the region 20 Hz to 20 kHz, although it is possible for some people to detect frequencies outside these limits.
Character, acoustic	The total of the qualities making up the individuality of the noise. The pitch or shape of a sound's frequency content (spectrum) dictate a sound's character.
Decibel [dB]	The level of noise is measured objectively using a Sound Level Meter.
dBA	A-weighted decibels
Frequency	Frequency is synonymous to pitch. Sounds have a pitch which is peculiar to the nature of the sound generator. For example, the sound of a tiny bell has a high pitch and the sound of a bass drum has a low pitch. Frequency or pitch can be measured on a scale in units of Hertz or Hz.
Loudness	A rise of 10 dB in sound level corresponds approximately to a doubling of subjective loudness. That is, a sound of 85 dB is twice as loud as a sound of 75 dB which is twice as loud as a sound of 65 dB and so on
Lmax	The maximum sound pressure level measured over a given period.
Lmin	The minimum sound pressure level measured over a given period.
L1	The sound pressure level that is exceeded for 1% of the time for which the given sound is measured.
L10	The sound pressure level that is exceeded for 10% of the time for which the given sound is measured.
L90	The level of noise exceeded for 90% of the time. The bottom 10% of the sample is the L90 noise level expressed in units of dBA.
Leq	The "equivalent noise level" is the summation of noise events and integrated over a selected period of time.
Sound Pressure Level, LP dB	A measurement obtained directly using a microphone and sound level meter. Sound pressure level varies with distance from a source and with changes to the measuring environment. Sound pressure level equals 20 times the logarithm to the base 10 of the ratio of the rms sound pressure to the reference sound pressure of 20 micro Pascals.
Sound Power Level, Lw dB	Sound power level is a measure of the sound energy emitted by a source, does not change with distance, and cannot be directly measured. Sound power level of a machine may vary depending on the actual operating load and is calculated from sound pressure level measurements with appropriate corrections for distance and/or environmental conditions. Sound power levels is equal to 10 times the logarithm to the base 10 of the ratio of the sound power of the source to the reference sound power of 1 picoWatt.
RNCG	*Road Noise Criteria Guideline* (Transport for NSW)
RNMG	*Road Noise Mitigation Guideline* (Transport for NSW)
REF	Review of Environmental Factors
EIS	Environmental Impact Statement

Appendix A: Operational noise contours (Vehicle movements and Electrical Infrastructure)

$L_{Aeq,\ 15\ min\ dB(A)}$			
30 to 35	40 to 45	55 to 60	70 to 75
35 to 40	45 to 50	60 to 65	75 to 80
	50 to 55	65 to 70	

ZEB Leichhardt Noise impact assessment
Operational noise contours - Daytime
(vehicle movements & elec. infrastructure)
LAeq,15 minute noise impacts
Contour Height 1.5 m

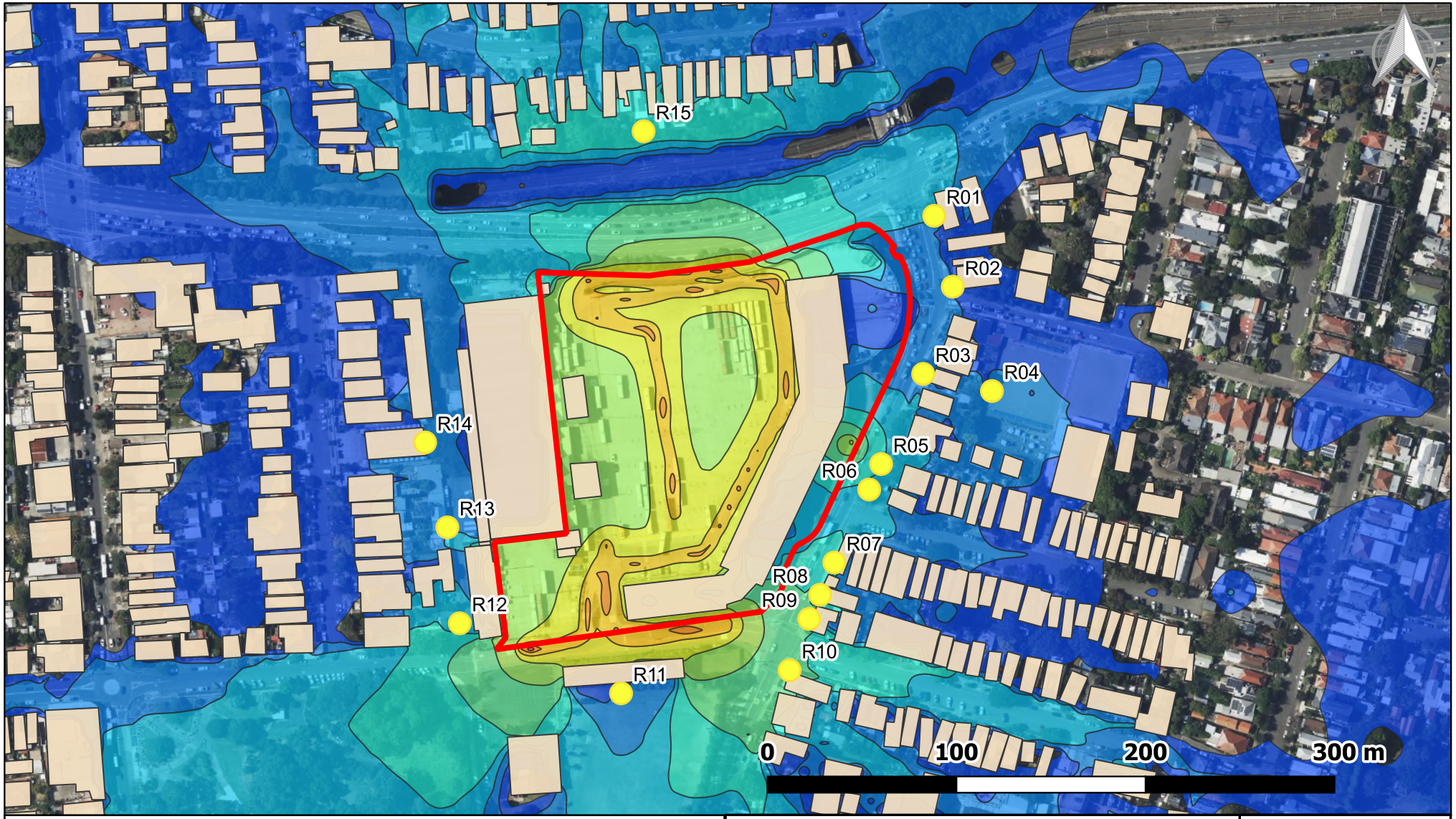
PWNA



$L_{Aeq,\ 15\ min\ dB(A)}$			
30 to 35	40 to 45	55 to 60	70 to 75
35 to 40	45 to 50	60 to 65	75 to 80
	50 to 55	65 to 70	

ZEB Leichhardt Noise impact assessment
Operational noise contours - Evening
(vehicle movements & elec. infrastructure)
LAeq,15 minute noise impacts
Contour Height 1.5 m

PWNA

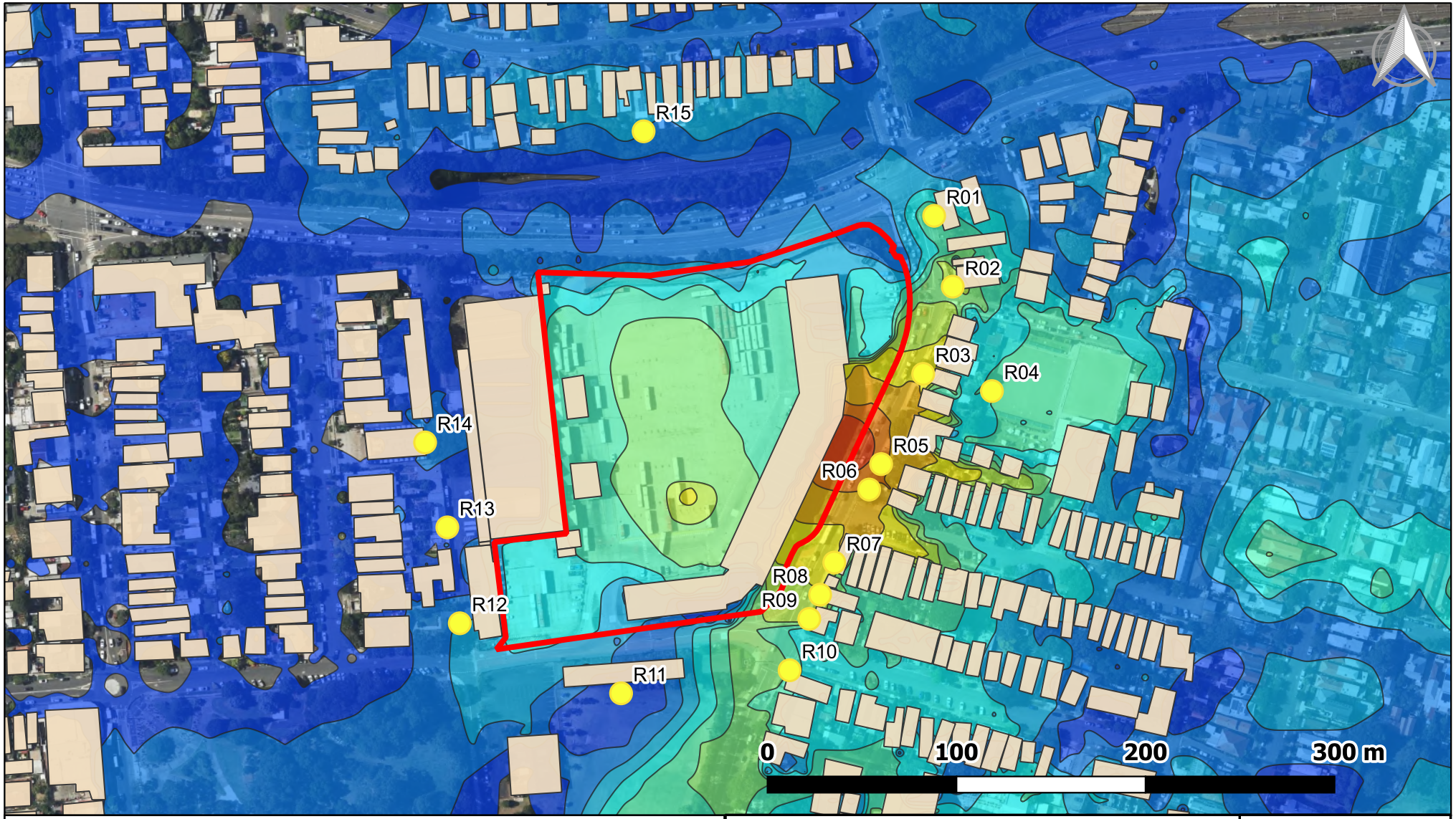


$L_{Aeq,\ 15\ min\ dB(A)}$			
30 to 35	40 to 45	55 to 60	70 to 75
35 to 40	45 to 50	60 to 65	75 to 80
	50 to 55	65 to 70	

ZEB Leichhardt Noise impact assessment
Operational noise contours - Nighttime
(vehicle movements & elec. infrastructure)
LAeq,15 minute noise impacts
Contour Height 1.5 m

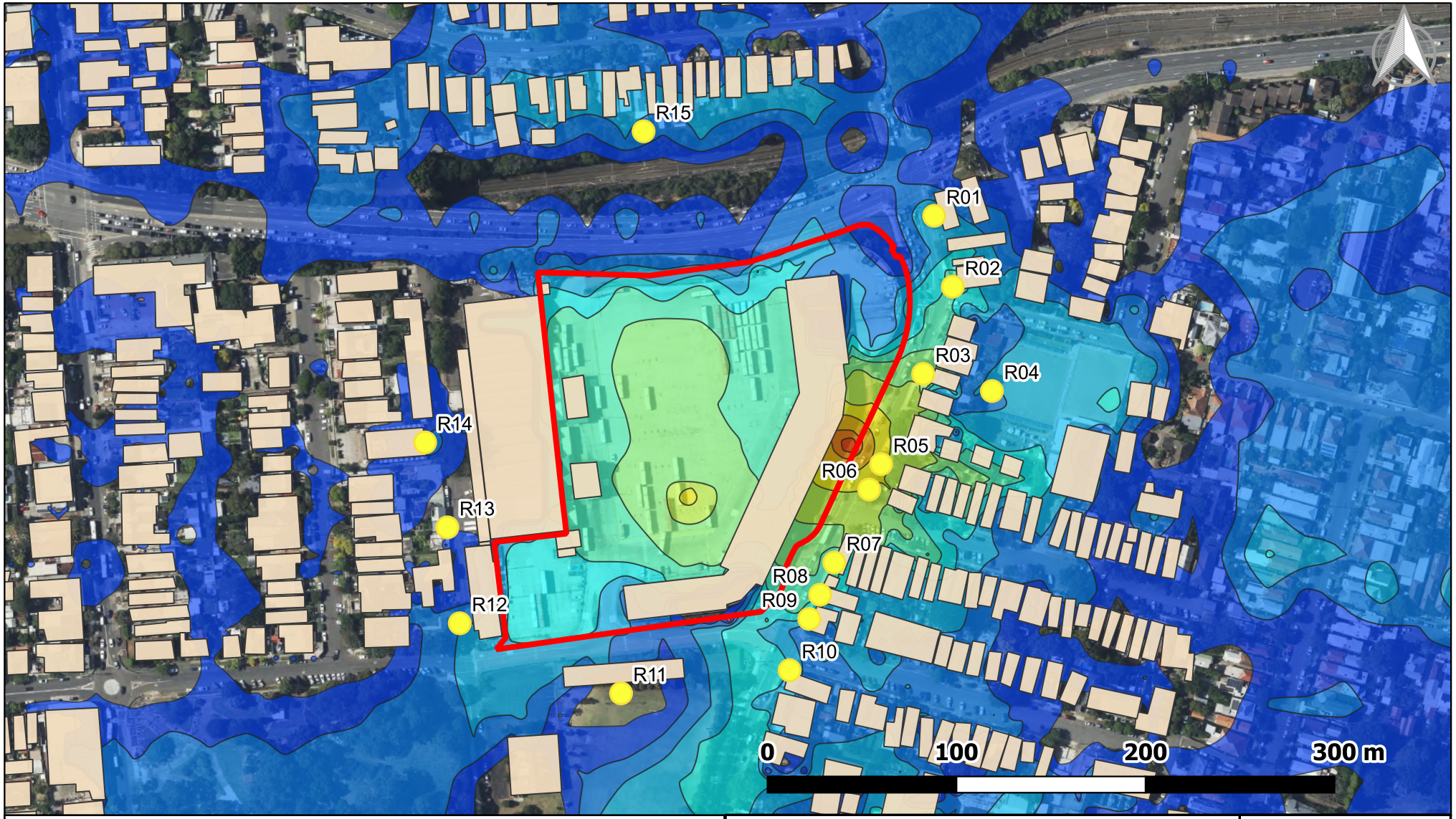
PWNA

Appendix B: Operational noise contours (Electrical Infrastructure only)



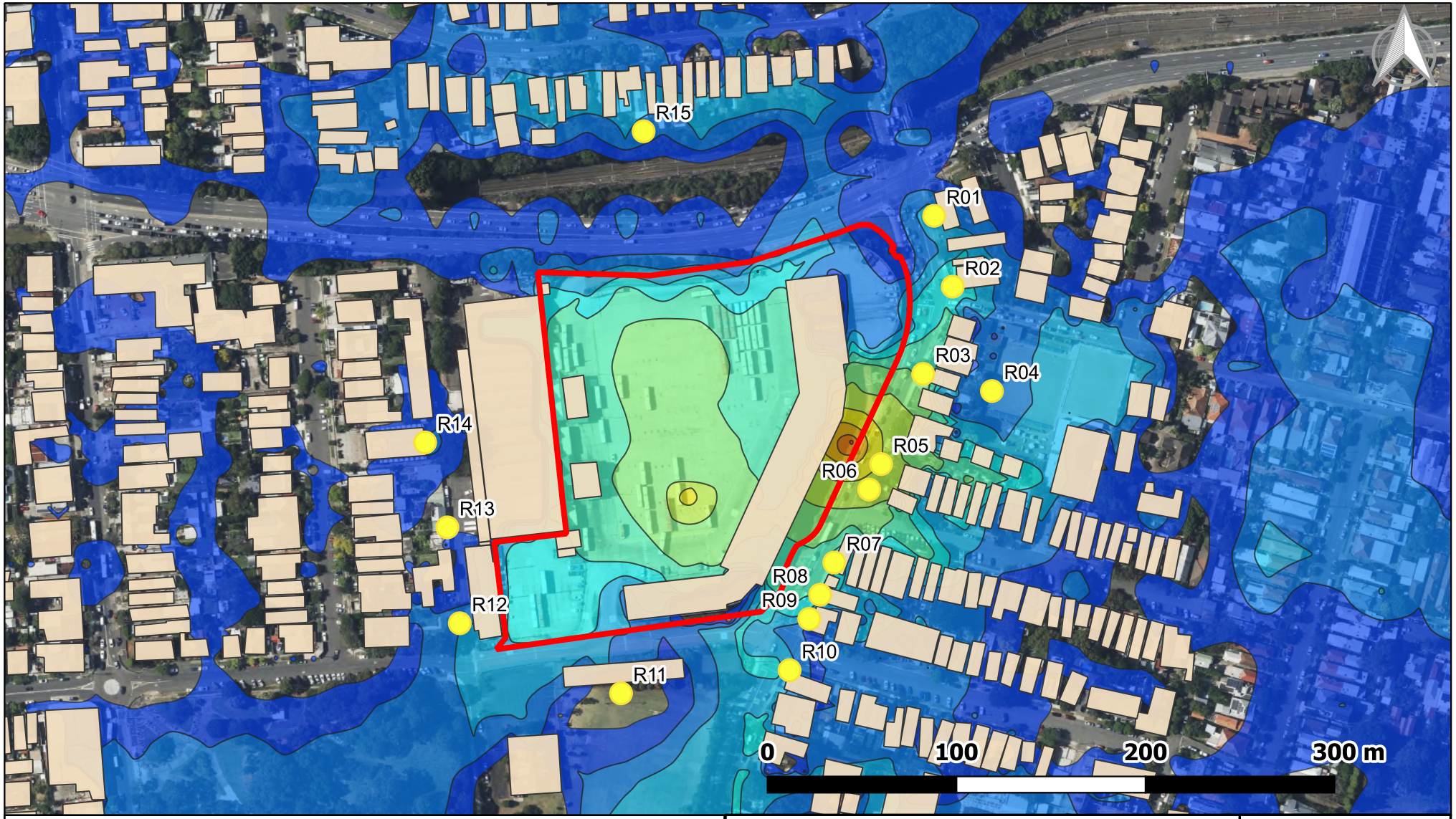
$L_{Aeq,\ 15\ min\ dB(A)}$			
10 to 15	20 to 25	35 to 40	50 to 55
15 to 20	25 to 30	40 to 45	55 to 60
	30 to 35	45 to 50	60 to 65

ZEB Leichhardt Noise impact assessment
Operational noise contours - Daytime
(elec. infrastructure)
LAeq,15 minute noise impacts
Contour Height 1.5 m



$L_{Aeq,\ 15\ min\ dB(A)}$			
10 to 15	20 to 25	35 to 40	50 to 55
15 to 20	25 to 30	40 to 45	55 to 60
	30 to 35	45 to 50	60 to 65

ZEB Leichhardt Noise impact assessment
Operational noise contours - Evening
(elec. infrastructure)
LAeq,15 minute noise impacts
Contour Height 1.5 m

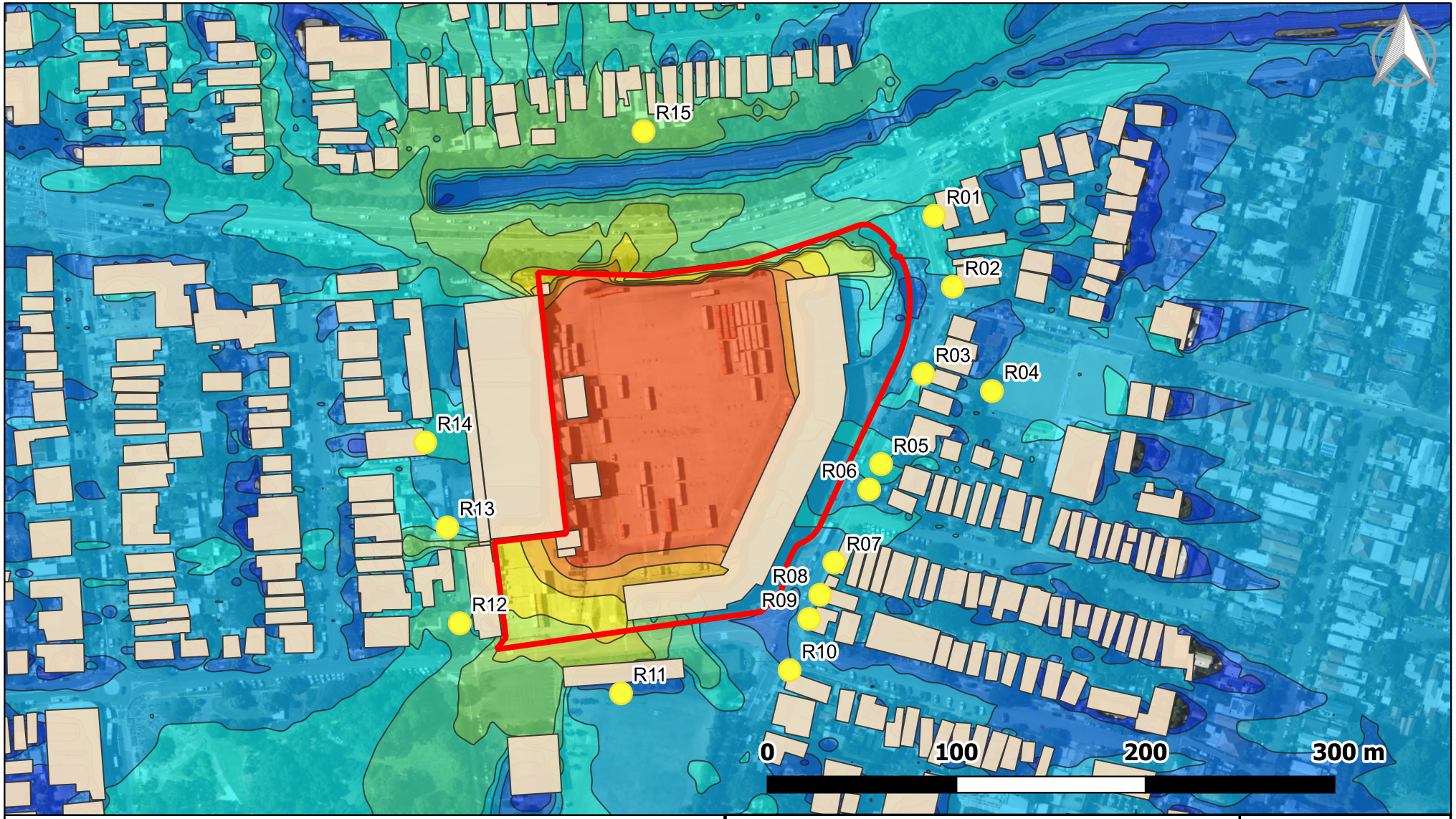


$L_{Aeq,\ 15\ min\ dB(A)}$			
10 to 15	20 to 25	35 to 40	50 to 55
15 to 20	25 to 30	40 to 45	55 to 60
	30 to 35	45 to 50	60 to 65

ZEB Leichhardt Noise impact assessment
Operational noise contours - Nighttime
(elec. infrastructure)
LAeq,15 minute noise impacts
Contour Height 1.5 m

PWNA

Appendix C: Construction noise contours



$L_{Aeq,\ 15\ min\ dB(A)}$			
45 to 50	55 to 60	70 to 75	85 to 90
50 to 55	60 to 65	75 to 80	90 to 95
	65 to 70	80 to 85	95 to 100

ZEB Leichhardt Noise impact assessment
Construction noise contours - Ground Works

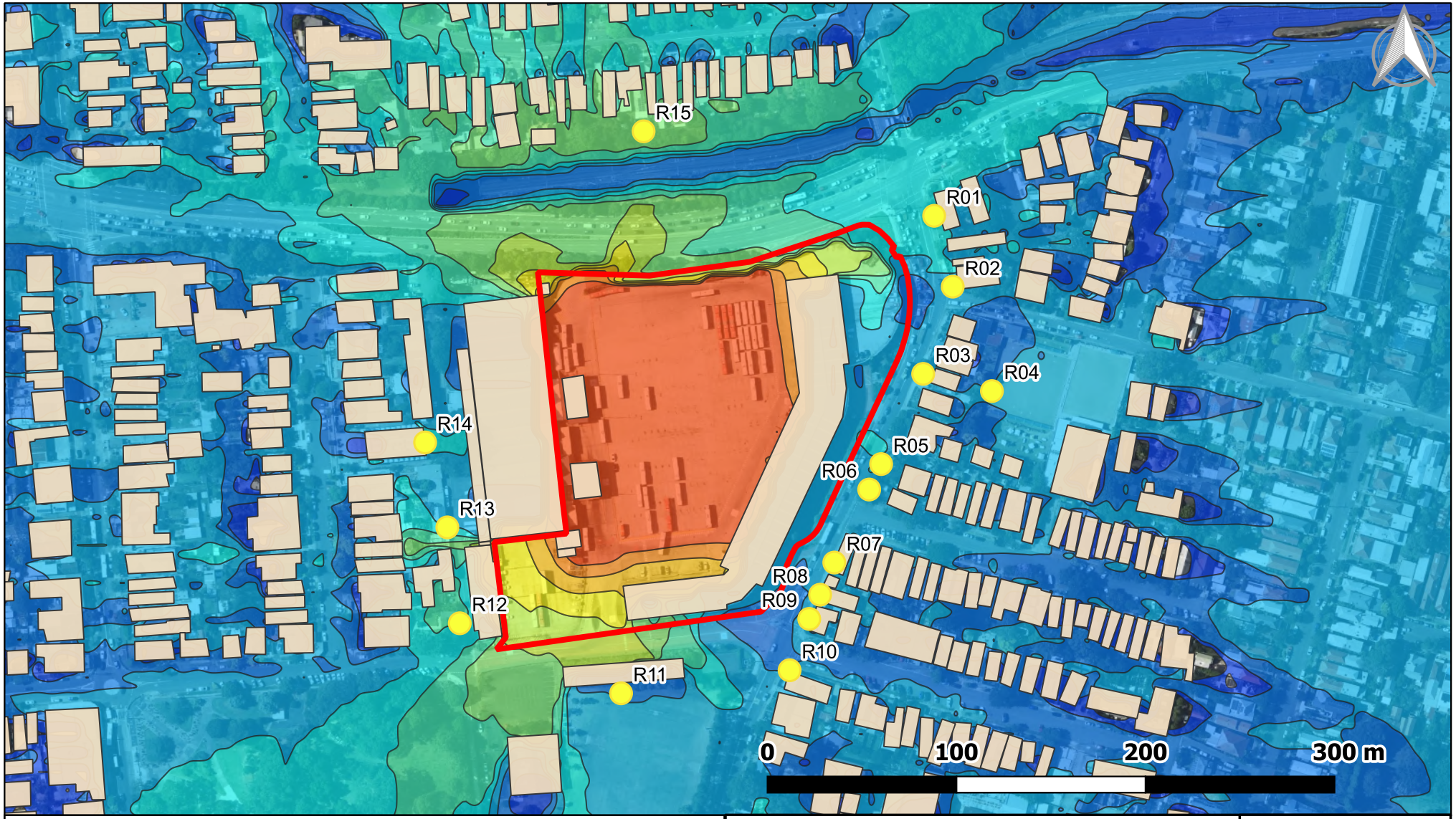
LAeq,15 minute noise impacts
Contour Height 1.5 m

PWNA

$L_{Aeq,\ 15\ min\ dB(A)}$			
45 to 50	55 to 60	70 to 75	85 to 90
50 to 55	60 to 65	75 to 80	90 to 95
	65 to 70	80 to 85	95 to 100

ZEB Leichhardt Noise impact assessment
Construction noise contours - Installation of electrical infrastructure
LAeq,15 minute noise impacts
Contour Height 1.5 m

PWNA



$L_{Aeq,\ 15\ min\ dB(A)}$			
45 to 50	55 to 60	70 to 75	85 to 90
50 to 55	60 to 65	75 to 80	90 to 95
	65 to 70	80 to 85	95 to 100

ZEB Leichhardt Noise impact assessment
Construction noise contours - Out of Hours works
LAeq,15 minute noise impacts
Contour Height 1.5 m

PWNA

NSW GOVERNMENT

Appendix E: Aboriginal heritage searches and PACHCI outcome

Stage 1 Roads and Maritime Services assessment

Procedure for Aboriginal cultural heritage consultation and investigation: Resource 3

Aim

The project manager (or their representative) must provide the information requested in this checklist to the regional Aboriginal cultural heritage adviser. This information will assist them in determining whether the project may affect Aboriginal cultural heritage in accordance with Stage 1 of the procedure.

Please **provide** this completed cover sheet, along with the required information, to your regional Aboriginal cultural heritage adviser.

Contact details for this project

Name of project:
Leichhardt Bus Depot Upgrade – Zero Emissions Bus Program

Project manager
[redacted]

Environmental officer undertaking/managing the environmental impact assessment
[redacted]

Corporate communications officer, if any
[redacted]

Date:
25/06/2024

Action	Status ☑
Item 1 Attach an overview of the project. The overview must include the known scope and extent of the proposed works; compound site requirements; access and movement of plant; re-location and/or provision of utilities; the location of noise walls, sedimentation basins, shared pathways, cycle ways, etc… *See Attachment 1 for an overview of the project.*	☑
Item 2 Attach a map/plan of the study area that clearly outlines the extent and scope of the project. The map/plan should also include topographical information where available. *See Attachment 2 for a map of the study area.*	☑

Item 3 If land acquisition is required, provide details about this. *Land acquisition is not required as Transport for NSW is the landowner.*	☑
Item 4 Attach a brief description of current and past land use, where known. For example, the study area land is currently used as a car park/road reserve/farming/etc. and was formally used for a car park/road reserve/farming/etc… *See Attachment 3 for a brief description of the current and past land use of the site.*	☑
Item 5 Describe the timeframe for the project along with key milestones and deliverables. *The Leichhardt Bus Depot Electrification Stage 2 Environmental Impact Assessment (EIA) Checklist was approved on 15 March 2022. It included the installation of electric chargers and a battery energy storage system at the depot. This proposal would be subject to a Consistency Assessment (CA) in relation to the EIA Checklist. Subject to a decision being made on the CA, design works are anticipated to commence on site in mid 2024, followed by construction commencing in late 2024.*	☐
Item 6 Please attach the results of the Office of Environment and Heritage's Aboriginal Heritage Information Management System **(AHIMS) Basic Search** - http://www.environment.nsw.gov.au/licences/WhatInformationCanYouObtainFromAHIMS.htm If required, please include the results of an **AHIMS Extensive Search**. These results should be plotted on a map/plan covering the study area. *See Attachment 4. An AHIMS search was undertaken on 22 May 2024 which found no registered Aboriginal heritage sites within 200m of the site.*	☑
Item 7 Attach the results of the following heritage searches relevant to the study area: • Native Title Register search – *There are no pending or approved Native Title claims over the proposal area. See Attachment 5a.* • State Heritage Inventory search – *This database search identified 3 locally listed heritage items within the site including* 1. *'Former SRA Tram shed, including interiors' (Item no. I1104)* 2. *'Mature Fig tree' (Item no. I1105)* 3. *'Former SRA office and amenities building, including interiors' (Item no. I1106).* *See Attachment 5b which includes the search result.* • Australian Heritage Database search – *This search found 9 sites within Leichhardt suburb but none of these items are within the site. See Attachment 5c.*	☑
Item 8 Attach a copy of any heritage assessment (Aboriginal or non-Aboriginal) previously prepared for the study area/project? *Not applicable.*	☑
Item 9 Attach a copy of any environmental impact assessment previously prepared for the study area/project? *Not applicable.*	☑

Attachment 1: Project overview

As part of the Zero Emissions Buses (ZEB) Program, Transport for NSW is proposing to convert the existing bus depot at 230-240 Balmain Road, Leichhardt to service ZEB from one that currently only services internal combustion engines (the Proposal). The Proposal is located on the following lots within the Inner West Local Government Area (Inner West LGA):

- Lot 1 DP1244017
- Lot 2 DP1244017
- Lot 3 DP 1244017
- Lot 5 DP 1244017
- Lot 6 DP 1244017
- Lot 7 DP 1244017
- Lot 7 DP 791838

The key infrastructure requirements for converting to ZEB at the existing Leichhardt bus depot would include:

- provision of charging infrastructure
- upgrade or replacement of existing electrical infrastructure
- reconfiguration of depot layout
- decommissioning of diesel and compressed natural gas refuelling facilities.

Attachment 2: Site map

Attachment 3: Previous and current land use

The site is currently used as a bus depot. The western portion of the site comprises a bus museum within the 'Former SRA Tram shed' heritage listed item.

It is not clear from historical imagery when the site first became operational as a bus depot. Figures 1-3 show previous uses of the site for commercial/ industrial uses since as early as 1943. At some point the site was used as a SRA Tram shed, which is evident by the heritage listing on the site. In 1943 the site was highly disturbed and there has been ongoing site layout changes to the present day.

Figure 1: 1943 (Source: Spatial Services)

Figure 2: 1955 (Source: Spatial Services)

Figure 3: 1986 (Source: Spatial Services)

Attachment 4: AHIMS search

AHIMS Web Services (AWS)
Search Result

Your Ref/PO Number : Leichhardt bus depot

Client Service ID : 894179

Transport for NSW - 821 Pacific Highway Chatswood

Date: 22 May 2024

Level 5 Tower A Zenith Centre 821 Pacific Highway
Chatswood New South Wales 2067

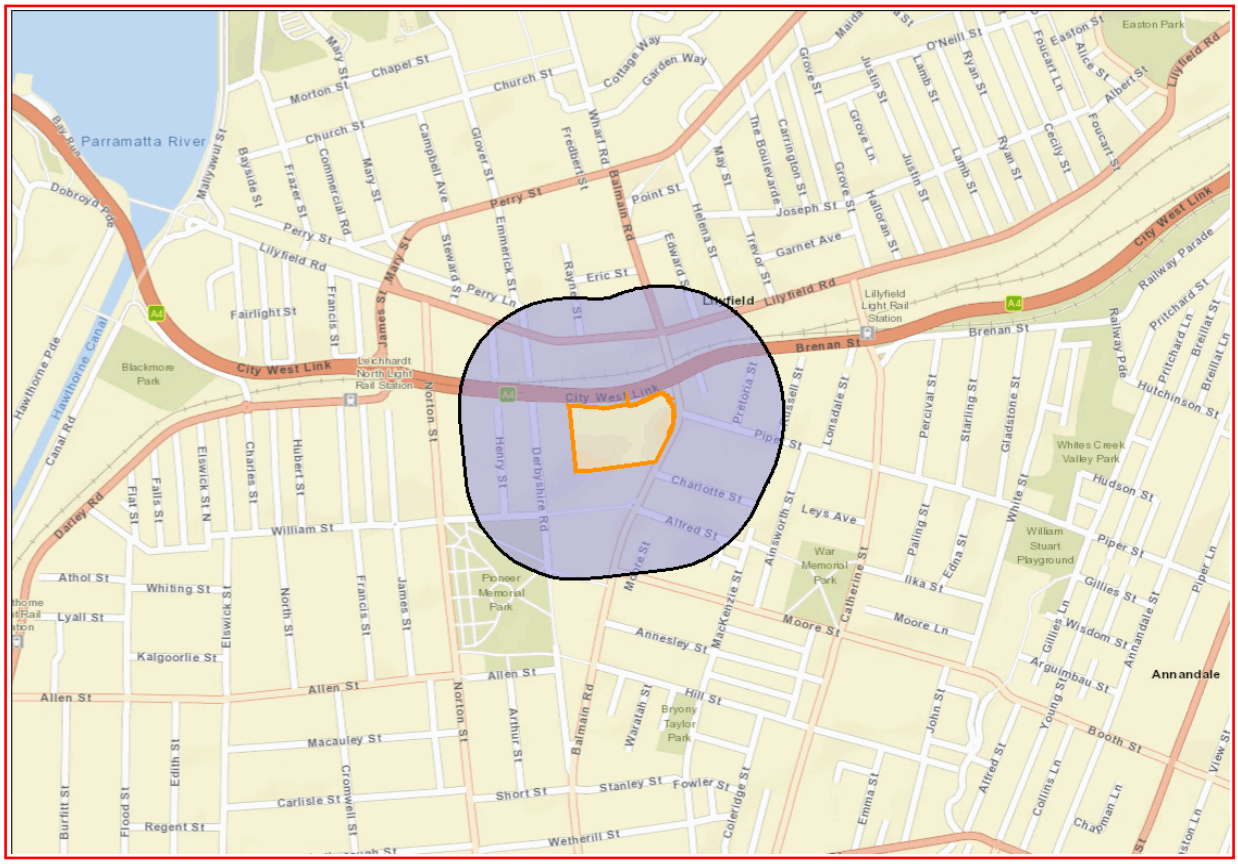
Attention: [redacted]

Email: [redacted]

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 2, DP:DP1244017, Section : - with a Buffer of 200 meters, conducted by [redacted] on 22 May 2024.

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) 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 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.

Level 6, 10 Valentine Ave, Parramatta 2150
Locked Bag 5020 Parramatta NSW 2124
Tel: (02) 9585 6345

ABN 34 945 244 274
Email: ahims@environment.nsw.gov.au
Web: www.heritage.nsw.gov.au

Attachment 5a: Native Title Register search

National Native Title Tribunal

Search National Native Title Register

The National Native Title Register (NNTR) is a register established under s. 192 of the *Native Title Act 1993* (Cth).

The NNTR contains determinations of native title made by:

- the High Court of Australia
- the Federal Court of Australia
- or a recognised body such as South Australia's Supreme Court and Environment Resources and Development Court.

Further information about the NNTR is available.

Tribunal file no.

Federal Court file no.

Short name

Case name

State or Territory ALL

Registered Native Title Body Corporate*

Representative A/TSI body area

Local government area Inner West Council

Determination type ALL

Legal process ALL

Determination outcome ALL

Determination date between and

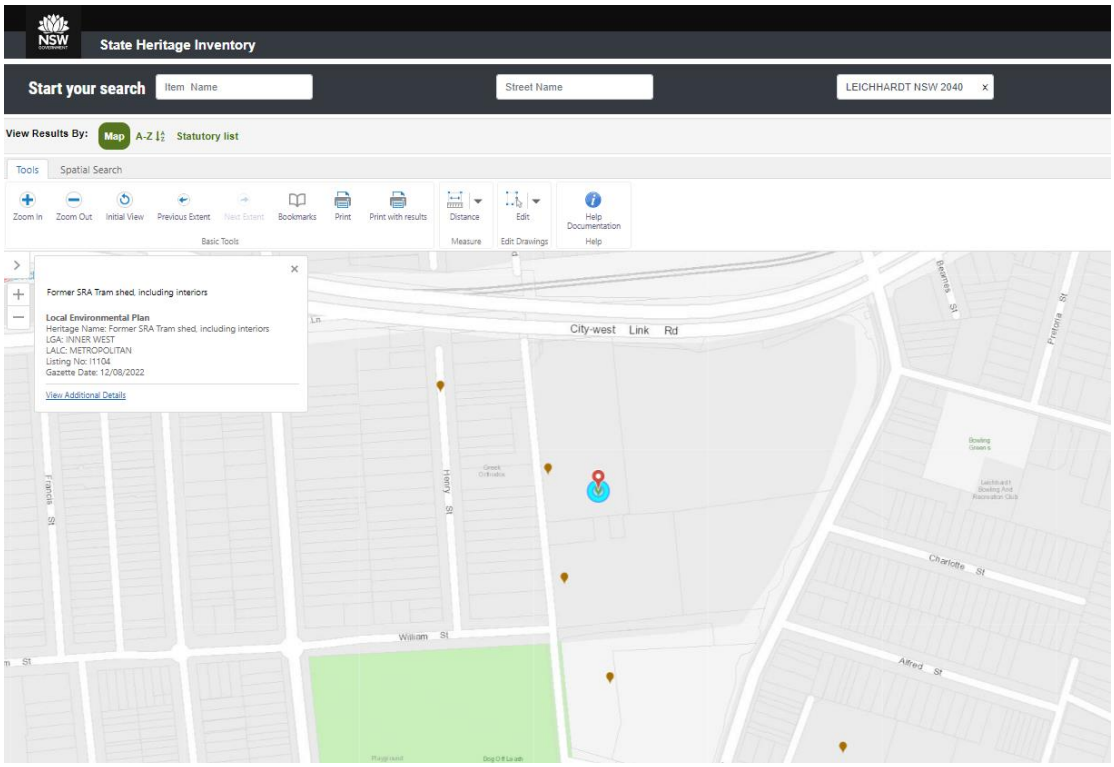
Sort by Determination date

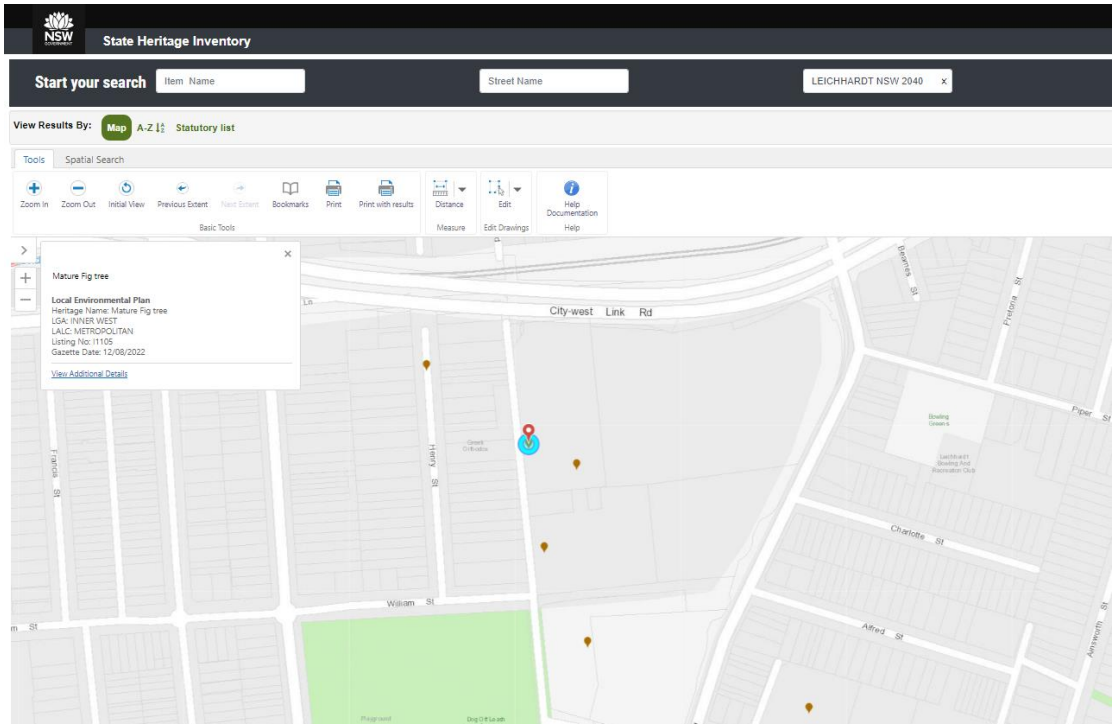
Search

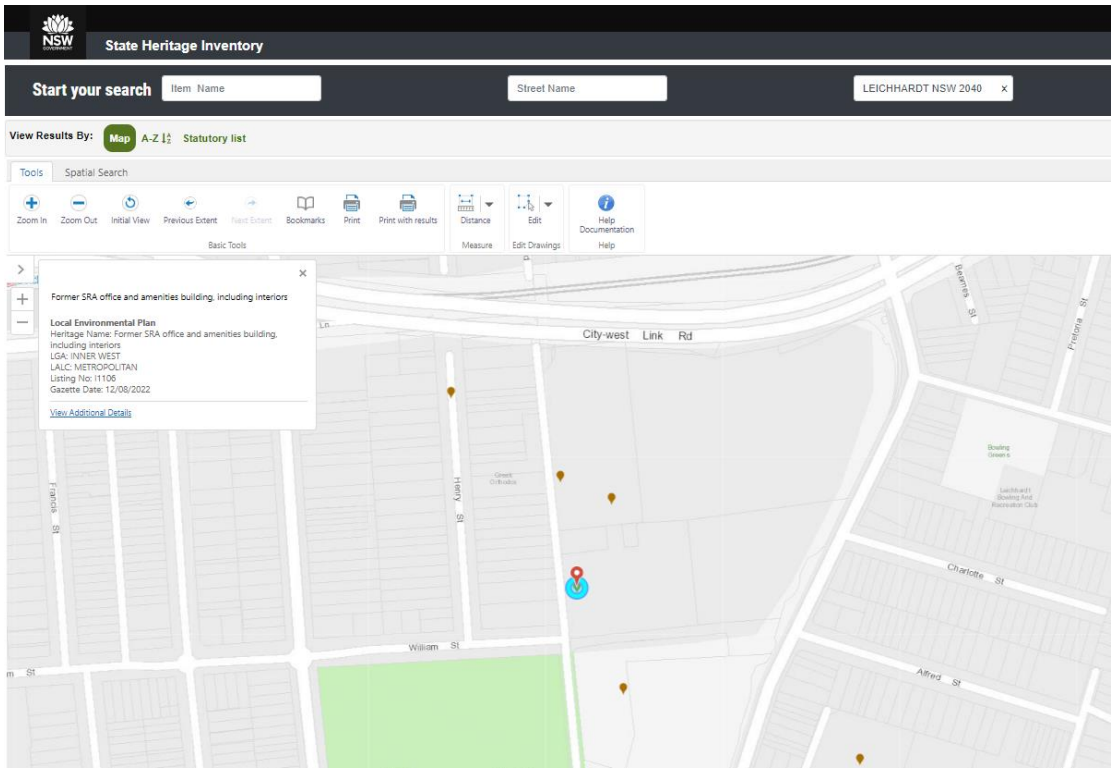
*Please note: current contact details for the Registered Native Title Body Corporate are available from the Office of the Registrar of Indigenous Corporations www.oric.gov.au

No results for current search criteria

Attachment 5b: State Heritage Inventory search






State Heritage Inventory
Start your search
Item Name
Street Name
LEICHHARDT NSW 2040
View Results By:
Map
A-Z
Statutory list
Tools
Spatial Search
Zoom In
Zoom Out
Initial View
Previous Extent
Next Extent
Bookmarks
Print
Print with results
Distance
Edit
Help Documentation
Basic Tools
Measure
Edit Drawings
Help
Former SRA office and amenities building, including interiors
Local Environmental Plan
Heritage Name: Former SRA office and amenities building, including interiors
LGA: INNER WEST
LALC: METROPOLITAN
Listing No: I1106
Gazette Date: 12/08/2022
View Additional Details
City-west Link Rd
Parramatta St
Victoria St
Francis St
Henry St
Charlotte St
William St
Alfred St

Attachment 5c: Australian Heritage Database search

Search Results

9 results found.

All Souls Anglican Church, Rectory & Minor Church Buildings Marion St	Leichhardt, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Australia's 3 Little Italys - Norton Street Precinct Norton St	Leichhardt, NSW, Australia	(Nomination now ineligible for PPAL) National Heritage List
Leichhardt Civic Precinct Marion St	Leichhardt, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Leichhardt Fire Station 1 Marion St	Leichhardt, NSW, Australia	(Indicative Place) Register of the National Estate (Non-statutory archive)
Leichhardt Post Office Norton St	Leichhardt, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Leichhardt Public School Buildings Marion St	Leichhardt, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Leichhardt Town Hall Marion St	Leichhardt, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
St Andrews Presbyterian Church (former) 2 Marion St	Leichhardt, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Whites Creek Sewer Aqueduct Piper St	Annandale, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)

Report Produced: Wed May 22 09:51:30 2024

23rd of July 2024

[redacted]
Senior Environment & Sustainability Officer
Safety, Environment and Regulation Division
Transport for NSW

Dear [redacted]

Preliminary assessment results for Leichhardt Bus Depot Upgrade – Zero Emissions Bus Program 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 Transport for NSW 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 me 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 Transport for NSW *Unexpected Archaeological Finds Procedure*.

For further assistance in this matter do not hesitate to contact me.

Yours sincerely

[redacted]
Aboriginal Cultural Heritage Advisor – Greater Sydney

Appendix F: Heritage Impact Assessment

[redacted]
Snr Environment & Sustainability Officer
Transport for NSW
[redacted]

Re: Zero Emission Buses, Tranche 1 heritage Impact assessment for changes to the Leichhardt bus depot

8 January 2025

Dear [redacted]

The NSW Government has committed to achieving net zero emissions by 2050. Supporting this outcome, Transport for NSW (Transport) has developed a Zero Emission Buses Transition Plan to stage the transition of the state's 8,000 plus diesel and natural gas public transport buses to zero emission technology[1].

As part of the ZEB program, it is proposed to fully convert the Leichhardt Bus Depot to a complete battery electric bus fleet. This process commenced with an earlier tranche of electric bus infrastructure being installed in 2022. Leichhardt Bus Depot (the study area) is shown in Figure 1. It fronts 230 Balmain Road, Leichhardt in the Inner West Local Government area.

This shortform heritage impact assessment will be used to inform the assessment of the project's impacts in support of a planning approval for the proposed change.

Figure 1: Location of the Leichhardt bus depot in Sydney (the study area), Source Six Maps. Accessed, 9 December 2024

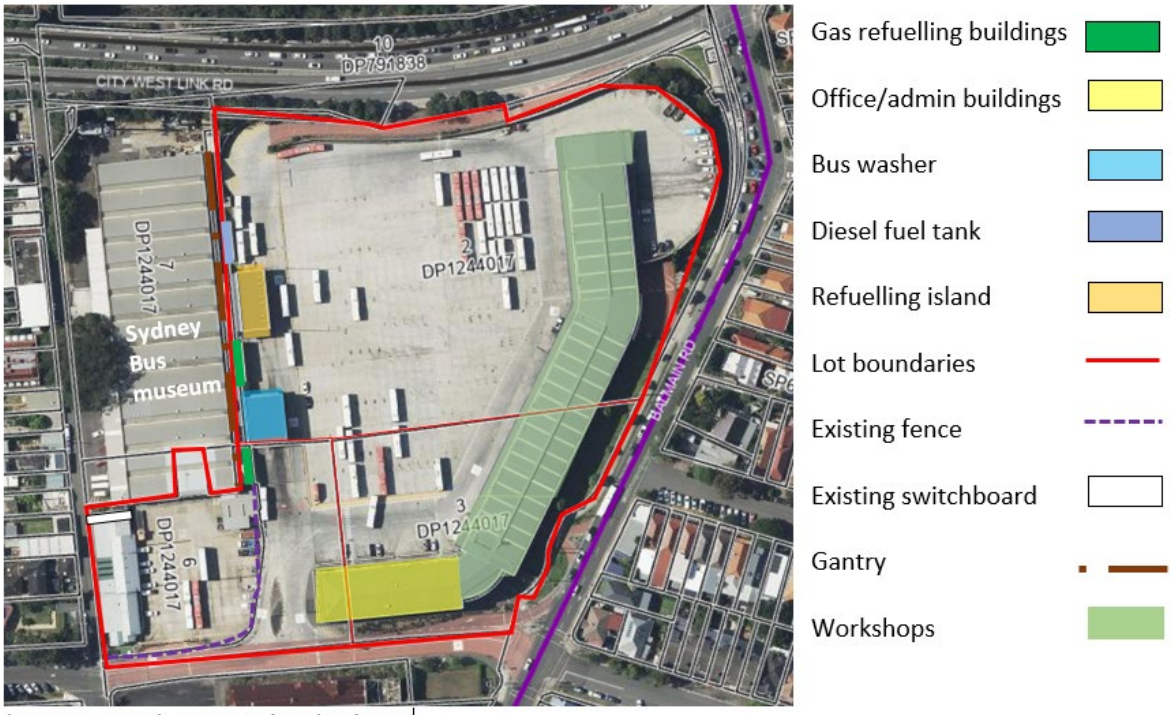
[1] Transport for NSW, Zero *Emission Buses*, https://www.transport.nsw.gov.au/projects/programs/zero-emission-buses , dated 8 November 2024, accessed 9 December 2024

Existing site arrangements and layout

The study area excludes activities within the former State Rail Authority (SRA) tram sheds themselves which house the Sydney Bus Museum (Lot 7, DP 1244017). The current proposal includes activities within the former SRA office and amenities building yard (Lot 6, DP 1244017) which is part of a separate lease arrangement and the current bus depot site (formerly used for the tram depot) in Lots 2 and 3 of DP 1244017 (Figure 2). The bus depot together with its associated compressed natural gas, diesel and electric vehicle fuelling infrastructure are currently managed by Transit Systems.

The main bus depot contains two above ground compressed natural gas refuelling buildings and an additional above ground diesel tank; a refuelling island, a bus washing and degreasing station, an array of existing electric vehicle (EV) charging infrastructure in the yard aligned in a north-south grid pattern of 25 bays, and office/administrative buildings and workshops along the south and eastern boundaries of the site. The north boundary contains a noise wall separating the site from the City West link. Buses are parked in a north-south alignment in a series of marked lanes. The existing EV refuelling plinths are in the last four rows in the northeast part of the site.

The Sydney Bus Museum is separated from the bus depot by a gantry and retaining wall. The former SRA office and amenities building, and its associated yard are separated from the bus depot by an internal fence. A switch board is attached to the north end of the SRA Office and amenities building. Appendix A of this letter includes photographs of the existing site arrangements and layout at the site which are discussed in this section and this report.



(Source, PIMS), accessed 12/12/2024

Figure 2: Location of the real property lots within the study area, TfNSW Property Information Management System, accessed 12 December 2024.

Leichhardt Bus Depot (formerly the tram depot)

The site of the Leichhardt bus depot (formerly the tram depot) is within traditional lands of the Wangal people. It forms part of a land grant made to Thomas Biggers in 1796 with several changes of ownership, subdivision and leases over the years, including to John Piper, William Henry Mackenzie, Walter Beames, Henry Burrows and William Inglis. Henry Burrows purchased the property in 1868 and built a substantial residence with outbuildings known as "Annesley House." The estate was sold to Thomas Field in the 20th century and resumed c1910-1912 for the establishment of the tram depot[2]. Annesley House and outbuildings were demolished c1913[3]. Trams were first introduced in NSW from 1861 in varying forms and were supported in their construction and maintenance with the later *Tramways Extension Act, 1880*[4].

Following the successful electrification of the first tram in 1898, the Leichhardt tram line was opened in 1901. The Leichhardt tram depot and its associated offices were originally constructed as one of the depots supporting the Sydney electrified tram network. The tram depot was opened in June 1915 providing additional capacity in the broader Sydney tram network. It provided extra capacity and storage to supplement the existing depots at Newtown and Rozelle. The Lilyfield to Leichhardt electrified line opened in 1914. Although originally designed to store overhead wiring, 116 operational and spare tramcars, and as a siding for the electric trams, its purpose changed to tram storage (garaging and overnight servicing) only in 1914[5]. Maintenance and repairs were conducted in the Tram sheds allowing undercarriage inspection and servicing.

The depression, together with improvements to the road, bus and motorcar industries caused the tram system to decline, such that by 1930 it was announced that the tram network would be replaced by diesel and trolley buses. This aligned with the government's decision to make public transport a public utility rationalising services and facilities. In 1937 the depot was converted to accommodate buses when the main shed was reconfigured, and its tram tracks removed from the site. During World War 2 the Navy leased part of the site for storage including building several sheds. These were removed when their lease ended in 1984[6].

From 1958 when the last tram lines, including Leichhardt's closed, the Leichhardt depot was used to support the Ryde depot and maintenance activities were then moved to Chullora. Additions to the existing Amenities/Office building fronting Derbyshire Road were made and the south end of the Tramshed modified for routine bus servicing[7].

The 1990s saw larger changes to the buildings and yards of the bus depot, including demolition of a large part of the Amenities/office building and alterations to the remaining building for reuse. Additional changes included introduction of a new automatic bus wash, administration and maintenance facilities to the yard, demolition of additions to the tram car shed and the former

[2] State Heritage Inventory form for "Former SRA Tram Shed, including interiors" LEP I1104, accessed 9 December 2024
[3] Dig International Pty Ltd Cultural Heritage Management, Re: Archaeological Monitoring of Site of Former Annesley House, Leichhardt Bus Depot, Leichhardt, NSW, 21 December 2006, p 3 (summary).
[4] NW Legislation, "Tramways Extension Act, 1880" No XXV, act-1880-11a, accessed 17 December 2024
[5] State Heritage Inventory form for "Former SRA Tram Shed, including interiors" LEP I1104, accessed 9 December 2024
[6] Dig International Pty Ltd Cultural Heritage Management, Re: Archaeological Monitoring of Site of Former Annesley House, Leichhardt Bus Depot, Leichhardt, NSW, 21 December 2006, p7.
[7] State Heritage Inventory form for "Former SRA Tram Shed, including interiors" LEP I1104, accessed 9 December 2024

stabling building. Two new compressed natural gas refuelling buildings were added to the eastern edge of the tram sheds in the yard supporting lower emission buses.

From 1 July 2018 the State Government transitioned operation of the bus network from the State Transit Authority to a service provider model under Transport systems Australia[8]. The former tram depot sheds now house the Sydney Bus Museum. The installation of the first series of EV chargers at the depot was completed in 2022[9].

Heritage listings

The study area includes two heritage listings within the Inner West Council Local Environmental Plan (LEP) 2022, and four additional heritage items located immediately south, west, east and southwest of the study area. These items are included in Table 1 and Figure 3. There are no heritage conservation areas relevant to the study area or any items currently listed on the NSW State heritage register[10].

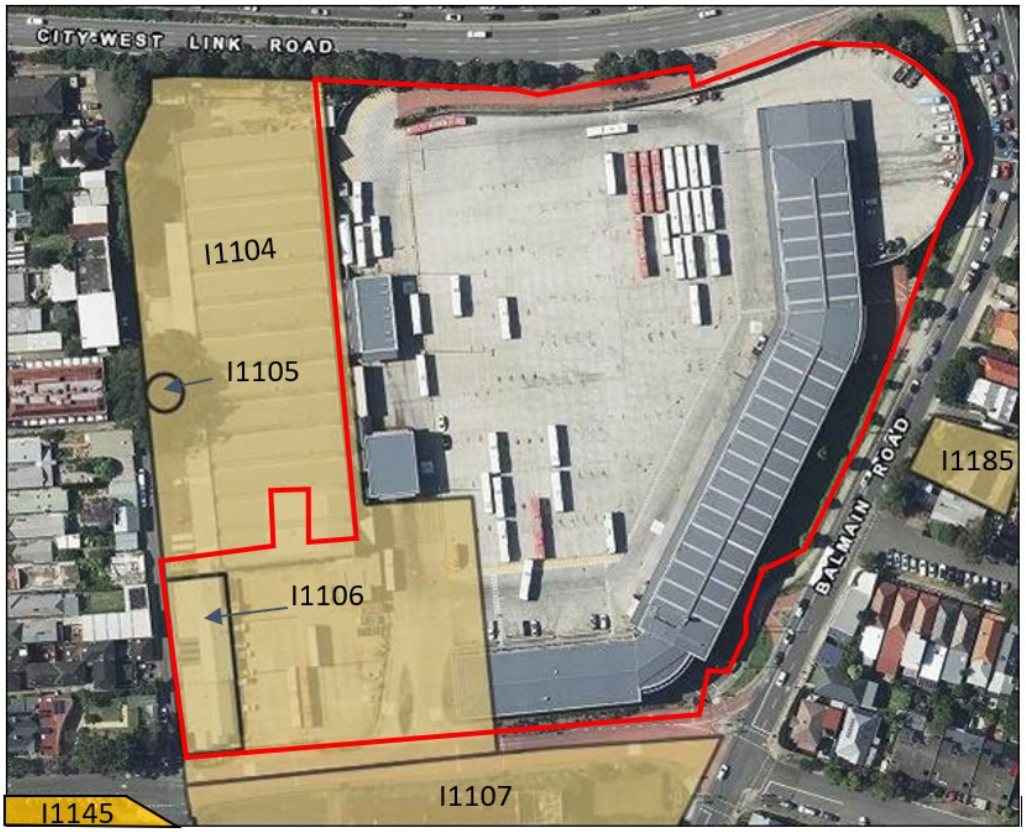


Figure 3: Location of heritage items within and immediately adjacent to the study area, Source, Inner West LEP 2022 and Six maps.

[8] Transportnswblog, Farewell Section 6 – The network, dated 30/06/2018, accessed 9 December 2024.
[9] Australisian Bus & Coach, Transit Systems delivers electric depot blueprint in Leichhardt, Transit Systems delivers electric depot blueprint in Leichhardt | News, dated December 19, 2022, accessed 18 December 2024.
[10] Searches of the Inner West Local Environmental Plan 2022, Leichhardt Heritage Conservation Areas and NSW State Heritage Register were conducted on 9 December 2024.

Table 1 Heritage items within and immediately adjacent to the study area

Details of heritage items	Proximity to the study area
Former SRA Tram shed, including interiors, (Lots 7 and 8, DP 791838; Lots 1,5,6 and 7, DP 1244017), LEP I1104	within
Former SRA office and amenities building, including interiors, LEP I1106 (Lot 6, DP 1244017)	within
Mature Fig tree, (Lot 7, DP 1244017), LEP I1105	Adjacent (west)
Former SRA cable store and traffic office, including interiors, LEP I1107.	Adjacent (south)
Pioneer Memorial Park	Adjacent (southwest)
Rutherford, 243 Balmain Road, LEP I1185	Adjacent (east)

Potential for Aboriginal objects and historical archaeological relics

A basic search of the Aboriginal Heritage Information Management System (AHIMS) was conducted on 18 December 2024. No known registered sites have been recorded within or within 200m of the study area (Appendix B). There are no gazetted Aboriginal Places within or adjacent to the study area. There are no other sensitive landscape features in the study area as identified in the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW*, 2010[11].

The historical record indicates the presence of Annesley House, a substantial structure with outbuildings which was built in 1868 within the bus depot site. An archaeological assessment was prepared for the site in 2006 by Archaeologist Adam Ford which was followed by a monitoring program in the same year. The monitoring results concluded there was no remaining archaeological potential for relics to remain at the site. The report identified "the Construction of the Navel [sic] stores involved the bulk excavation and leveling of the site of Annesley House and beyond to the clay sub-soil"[12].

It is possible that the former tramlines from the SRA tramshed and SRA office and amenities building may remain in part under the ground, although it is understood from historical accounts that these were removed during the transformation of the site to a bus depot. Based on historic images of the site (Figures 13-14) it may be expected that tramlines may be found leading into the bays of the former SRA Tramshed.

[11] NSW Department of Environment Climate Change and Water, *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW, 2010*, p12

[12] Dig International Pty Ltd Cultural Heritage Management, *Archaeological Monitoring of site of former Annesley House, Leichhardt Bus Depot, Leichhardt, NSW*, 21 December 2006, P8

Statements of Significance

The following statements of significance exist for the *former SRA tram shed*, the *former SRA office and amenities building* and *Rutherford*. The proposed changes will be considered against these significant values in this report:

Former SRA tramshed (inc. interiors)[13]

The Tram Shed, located at No. 25 Derbyshire Road is of historical, aesthetic and social significance as a good and relatively rare Federation period former Tramways building and Tram Shed. The building has significantly been used as part of the local tram and bus public transport network since its construction in 1914-1915. Despite some additions and alterations and modifications the building retains its overall form, scale, character and details particularly its saw-tooth wall and roof form and profile, skillion roofed sections, face brick façades and parapets and associated brick detailing which make a positive contribution to the site and local area.

Former SRA office and amenities building (inc. interiors)[14]

The Office/ Amenities building, located at No. 27 Derbyshire Road is of historical, aesthetic and social significance as part of a relatively rare group of purpose built former Tramways buildings constructed in the early 20th century to cater for the public transport needs of the local community. The building has continued to provide a meals and amenities area for tram and bus staff and has been in continuous use since its construction in c. 1914. Despite successive additions and alterations and modifications the building retains a sense of its earlier form, character and details face brick walls, gabled roof form and bracketed eave/ verandah detailing of the northern section of the building which makes a positive contribution to the site and local area.

House, "Rutherford", (inc interiors)[15]

No. 243 Balmain Road is of local historic and aesthetic significance as a good and highly intact representative example of a Victorian Regency style detached dwelling probably constructed sometime between 1860s and 1880s. The building significantly retains its original form, scale, character and details including brick facades, main roof form and chimneys, open verandahs and simple pattern of openings. The building is setback from the street frontage, however, retains a garden setting and makes a positive contribution to the area.

Proposed Scope of Works

The project fully converting the Leichhardt Bus Depot to a complete battery electric bus fleet includes the following elements:

1. Install 77 new (AC – alternative current and DC - direct current) plug-in pedestal chargers, including plinths and their associated infrastructure and surrounding traffic deflection barriers and reconfiguring the bus depot's bus bays and light vehicle parking arrangements these changes.
2. Install a raised cable containment culvert in the depot yard along the current bus parking lane 11/12. The approximate dimensions of this structure including to the top of the containers

[13] State Heritage Inventory form for "Former SRA Tram Shed, including interiors" LEP I1104, accessed 9 December 2024

[14] State Heritage Inventory form for "Former SRA office and amenities building, including interiors" LEP I1106, accessed 9 December 2024

[15] State Heritage Inventory form for "House, "Rutherford, including interiors" LEP I1185, accessed 18 December 2024

atop it which will be used for charging infrastructure will be 9.159m (H) x 8.0m (W) x 40.278m (L).
3. Adding bus parking and charging in the adjacent yard of 27 Derbyshire Road Leichhardt and changing existing depot perimeter fencing to accommodate this.
4. Decommissioning existing compressed natural gas (CNG) refuelling facilities, and above ground diesel storage tank and associated services. Removal of the northern CNG refuelling facility.
5. Excavation and installation of new utilities and upgraded power supply infrastructure
6. Installing new connections to an existing switchboard attached to the former SRA office and amenities building.

The parameters for the project identified the need to limit new earthworks, and to either install utility connections above ground or within existing utility conduits. The design of the depot including the location of existing infrastructure (bus wash bays etc) and the movement of vehicles within the site was also factored into the current design.

As there is existing charging infrastructure within the site, these elements were considered in the design options available for the rest of the depot. Broadly there are two main options for EV charging infrastructure which includes an overhead gantry system and pedestal charging systems, with both systems requiring the same level of charging infrastructure to support their use.

Heritage impact assessment

These works are located within the curtilage of the *Former SRA Tram shed* and the *Former SRA office and amenities building*. No direct changes are proposed to these buildings by the project. The following section discusses the proposed changes and their anticipated impacts to these items, both physically and visually.

1. Install 77 new AC and DC plug-in pedestal chargers, including plinths and their associated infrastructure and surrounding traffic deflection barriers and reconfiguring the bus depot's bus bays and light vehicle parking arrangements these changes.

This proposal seeks to supplement an existing series of AC and DC fast pedestal chargers across the yard with an additional 77 units. The height of the proposed pedestal chargers at 1900mm (H) x 800mm (W) x 650mm (D) is lower than the lowest bus height identified for Transport buses in the bus specification guide (3500mm)[16]. The deflection barriers to be placed around the pedestal chargers are likely to be three beam barriers (Appendix A) rather than the standing pedestals shown in Figure 4.

[16] Transport, *Zero Emission Bus Panel Specification No 3*, undated, https://www.transport.nsw.gov.au/system/files/media/documents/2020/Zero_Emission_Bus_%28G%29_Specification.pdf

Figure 4 shows the existing chargers are quite slim and unobtrusive in the yard. Additional chargers will be added to this existing charging array. When the depot is full of buses, the chargers will be less noticeable. Based on the existing configuration of chargers as shown in Figures 4 and 5 the additional chargers in the yard are a minor impact to the broader setting of the former SRA tram shed and will not affect its significant values.

Given the enclosed nature of the depot, with a noise wall to the north, and existing buildings on the east, west and southwest of the site, views to and from the depot are unlikely to be affected by this change.

Figure 4 Existing view of DC and AC chargers in the depot to indicate the marginal visual change from their introduction across the depot

Figure 5 Existing view of yard viewed from within it facing north-east from the current office/administrative buildings.

2. **Install a raised cable containment culvert in the depot yard along the current bus parking lane 11/12. The gantry to hold metal shipping containers (cable containment deck elements) which will house associated charging infrastructure (cable containment deck).**

Installation of a new raised steel cable containment culvert/deck platform in a north/south orientation in the depot yard aligned with lane 11/12 and will be visible above the buses in the yard (Figure 6). The yard is currently mostly enclosed with an existing noise wall on the north, the existing bus workshops along the Balmain Roadside of the site on the east, the former SRA tramsheds to the west and the former SRA office and amenities building in the southwest of the site (Figure 3/Table 1).

The approximate dimensions of this structure including to the top of the containers atop it will be 9.159m (H) x 8.0m (W) x 40.278m (L) (Figure 9). The structure will be steel with steel shipping containers above the culvert holding additional charging infrastructure (cable containment deck elements). The culvert will extend 40.278m from the south end of the yard to the north end. Currently the design proposes white shipping containers which will display large “Zenobe” lettering in black text on their sides (Figures 7-8).

The design height for bus infrastructure for Transport buses is 4.3m for single storey buses[17]. The height from the ground to the underside of the culvert is 6m, indicating there will be a further difference of 1.7m between the design height for bus infrastructure and the base of the culvert (Figure 9).

The culvert and shipping containers together will be a further 3.159m above the underside of the culvert to reach the 9.158m anticipated total height of the structure with the cable containment deck elements. This will be a visual change to the yard, when viewed from or to the former SRA tram sheds, however its placement in the centre of the yard, aligned with the north-south bus lanes, and its open design should reduce the visual impact to the setting of this item. The height of the existing bus workshops along the eastern boundary of the site is approximately 4.3m. While lower than the 9.1m maximum height of the new culvert with cable containment deck elements would be partially obscured by the existing workshops along the Balmain Rd frontage, however there may be a visual impact to the heritage listed *Rutherford* which also faces Balmain Road. The new culvert will also be obscured by the height of the existing amenities building which extends between the bus depot and the heritage listed *former SRA cable store and traffic office.* The new culvert and cable containment deck will be visible from the *former SRA office and amenities building* and to a lesser degree from *Pioneer Memorial Park and* the *Former SRA cable store and traffic office*. While no direct impacts will result from this change, the introduction of design guidance so the new culvert and cable containment deck elements are as visually recessive, slim and open in form should reduce the visual change to the view catchments of the adjacent heritage items surrounding the bus depot yard.

To reduce the visual impact to the broader yard and adjacent heritage items to the south-west and east from the new culvert the following guidance is recommended for the detailed design of the proposed cable containment culvert and the cable containment deck elements.

- The form of the culvert should remain slim and as open as possible and not be infilled.
- Where the height of the culvert can be reduced in detailed design, and also maintaining safety requirements, this is desirable to reduce potential visual impacts to view catchments of adjacent heritage items.
- The cable containment decking above the culvert should be as uncluttered as possible.
- The colour of the steel culvert and cable containment deck elements should be recessive in colour such as a light grey. Signage in colours that stands out should be avoided.

[17] Transport, *State Transit Bus Infrastructure Guide*, Issue 2, Rev 1, July 2011, p2

Figure 6 Proposed future layout of the Leichhardt Bus Depot. The layout shows the proposed gantry in the centre of the site, the proposed layout of the new charging array including the areas in the former SRA office and amenities building yard.

Figure 7 Visualisation of the proposed raised cable containment culvert and shipping containers above it.

Figure 8 Additional visualisation of proposed raised cable containment culvert and shipping containers above it from ground level.

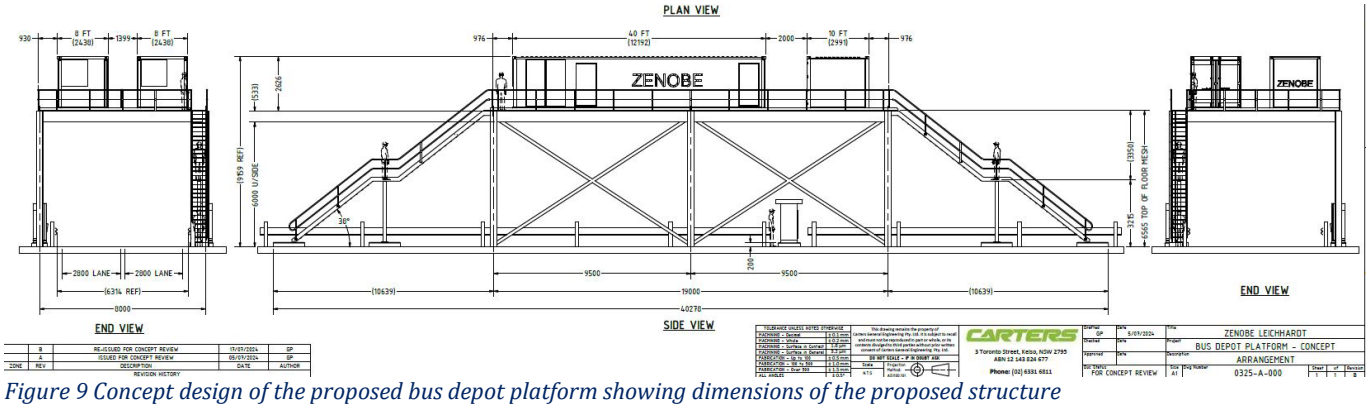


Figure 9 Concept design of the proposed bus depot platform showing dimensions of the proposed structure

3. Adding bus parking and charging in the adjacent yard of 27 Derbyshire Rd Leichhardt and changing existing depot perimeter fencing to accommodate this.

These changes to the configuration of the neighbouring *Former SRA office and amenities building* yard for additional chargers and bus stabling in this yard also fall within the curtilage of the *Former SRA tram sheds* (Figure 10).

Currently there is an existing black fence which separates the *Former SRA office and amenities building* yard from the broader bus depot (Figure 11-12). This fence will need to be moved to accommodate the proposed change. The layout will need to maintain a distance (offset of min. 15m) from the existing *Former SRA office and amenities building* to accommodate bus clearances (Figure 15). This means that there is space to ensure that the buses will not damage the structure.

The existing SRA tram shed has a linear design in the podium of its southern façade (Figures 11 & 14). To ensure consistency with the existing design, new fencing on the southern site boundary should align with the linear design elements in the existing southern façade of the tram shed (Figure 14).

The 1943 historic aerial photograph demonstrates that the yard adjacent to the former SRA office and amenities building yard was historically used for bus stabling (Figure 13) so the use will remain unchanged. The area will also include new utility connections and several podium chargers to be installed to enable EV charging while stabled in this area (Figure 10).

Visually there is not likely to be much change in the interpretation or understanding of the yard as the use remains unchanged. However, for visual consistency across the yard, it is recommended that:

- new fencing within the site should match the existing black perimeter (and internal) fencing at 29 Derbyshire Rd (the former SRA office and amenities building).
- The new fencing should align with the south facing podium façade of the former SRA tramshed, and ensure a minimum 15m separation from the former SRA office and amenities building is achieved.

Figure 10 Detail of proposed Leichhardt Depot expansion showing the current proposed alignment of new chargers and buses in the former SRA office and amenities building

Figure 11 Existing fence separating the former SRA office and amenities building relative to the tram shed alignment, Photo facing north. Note alignment of the moving security fence with the tram building's façade, which once contained a series of bays used for tram storage and maintenance. (refer to red arrow in image)

Figure 12 Existing fence between the former SRA office and amenities building yard and the broader bus depot yard.

Figure 13 1943 Historic Aerial Photograph showing the Leichhardt Bus Depot yard, Source: Six Maps, accessed 17 December 2024

Figure 14 Historic image of the Leichhardt Tram shed from c1920, Source: GBA Leichhardt Bus Depot Conservation and Development Heritage Impact Assessment, dated 30 October 2006, p3The south facing podium of the tramshed façade contains a series of bays used for tram storage and maintenance.

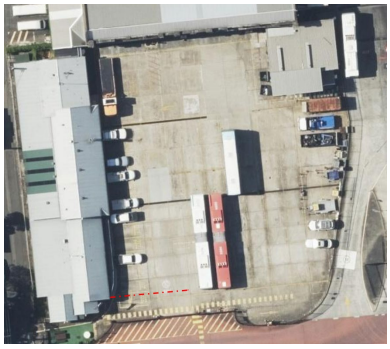


Figure 15 Six maps aerial with 15m measured from the edge of the former SRA office and amenities building shown by a red dashed line. The 15m area roughly aligns with the edge of the movable site entry/security fence.

4. Decommissioning existing compressed natural gas (CNG) refuelling facilities, and above ground diesel storage tank and associated services. Removal of the northern CNG refuelling facility.

The refuelling (compressed natural gas and diesel) elements within the site are located on the eastern side of the former SRA tramshed building (Figure 2). Their decommissioning and retention will not cause any physical or visual change to the site.

The proposal will demolish the northern CNG refuelling building, located parallel to the former SRA tramshed and south of the refuelling island (Figure 2). This building dates to the 1990s when compressed natural gas buses were incorporated into the bus network. Like the current ZEB program, the earlier conversion from diesel to gas infrastructure sought to reduce greenhouse gas emissions. However, retaining this building is not necessary to telling the story of the bus depot.

This building, constructed from bessablock and metal (Figure 16), is not sympathetic to the former brick SRA tramsheds and it is not necessary to the understanding of the operation or layout of the

bus depot or the former SRA tramshed yard. Its careful removal is appropriate, provided it does not cause damage to the former SRA tramshed.

To ensure the former SRA Tramshed is not damaged by the removal of the northern CNG refuelling building, care will need to be taken in the demolition process.

It is recommended that:

- Vibration monitoring, including selection of machinery within the recommended limits, identified in the supporting Noise and Vibration Impact Assessment for this project should be identified and inform the development and delivery of the demolition plan for the northern CNG refuelling building.

Figure 16 North Gas Refuelling building, Photographs facing west

5. Excavation and installation of new utilities and upgraded power supply infrastructure

Excavation and installation of new utilities is required to support the upgrades to the power supply infrastructure across the site (Figure 17).

There are no known Aboriginal archaeological constraints for the study area. This is discussed above. Previous archaeological monitoring in 2006 to investigate the site of the former Annesley House involved historical archaeological investigation of the three separate parts of the site in 2006. This work confirmed there are no *in situ* elements of Annesley House remaining at the site. The former Naval use of the site completely removed any such evidence and there are no surviving archaeological deposits or relics anticipated within the depot.

While former tramlines are not expected to survive in the depot, it is possible they may not have been fully removed during the conversion of the site to a bus depot. If so, they may be found during excavation for the installation of the proposed infrastructure and associated utilities. Former tramlines would not be considered "relics" within the meaning of the *Heritage Act 1977* and its supporting guidelines[18]. However, if tramlines are uncovered by the project, the project should aim to avoid them in the placement of new infrastructure or utilities, leaving them *in situ* wherever

[18] Refer to s4 of the *Heritage Act 1977 and* Office of Environment and Heritage, *Assessing historical archaeological sites and relics,* 2009.

possible. If they are unable to remain *in situ*, they can be removed provided their location has been recorded in survey to support interpretation of the site and to inform future work within the depot.

There should be no limitations to the positioning of new utilities from a heritage perspective by the project, however the approach to collocating utilities in dedicated areas would assist ease of relocation and repair in future.

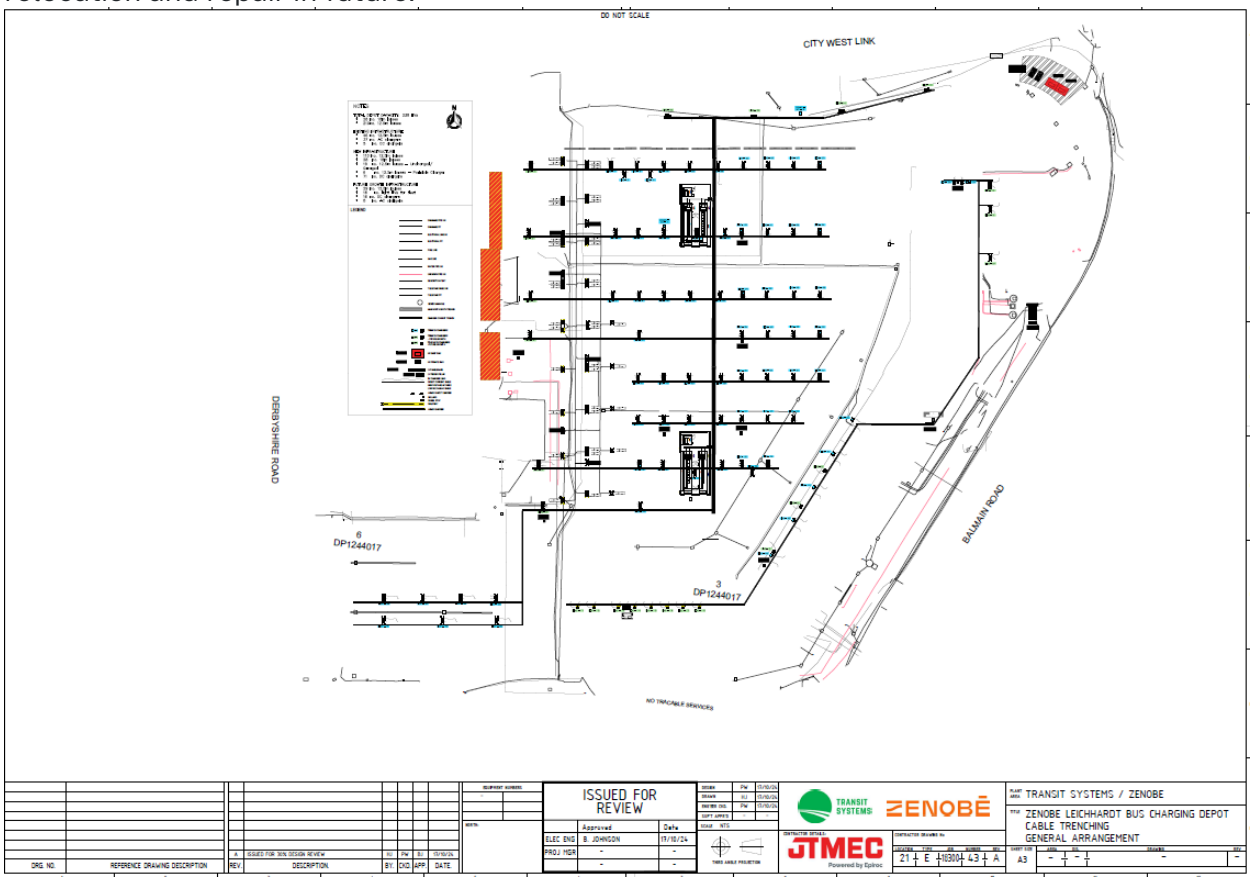


Figure 17 Proposed Leichhardt Bus Charging Depot cable trenching general arrangement

6. Installing new connections to an existing switchboard attached to the former SRA office and amenities building.

Currently the switch board is attached to the north face of the *Former SRA office and amenities building* (Figure 18). There are connections at the top of the switchboard, to the side and underneath it. There is also an electricity substation to the west of the switchboard (see Appendix A).

The project has advised the connections into the switchboard will reuse existing penetrations into the *Former SRA office and amenities building*. This approach, without causing new penetrations into the building, is appropriate and unlikely to cause any negative changes to the *Former SRA office and amenities building* or its interiors. No impact to heritage fabric or values is anticipated from this approach.

Figure 18 switch board attached to former SRA office and amenities building, facing west, note the existing connections into the building at the top and into the connections at the side. Connections also extend under the switchboard.

Conclusion

The changes proposed to the Leichhardt Bus depot from full conversion to ZEB charging and bus infrastructure will not directly impact the significant values of the *Former SRA tramshed* or the *Former SRA office and amenities building.*

This project at Leichhardt bus depot will complete an earlier conversion commenced in 2022, which established a smaller array of podium EV chargers and infrastructure. Overall the project ensures the continued use of the depot for refuelling and storage activities for public transportation, consistent with its construction as an electric tram depot in 1915 and 1930s bus depot conversion.

The changes proposed present minor impacts to the visual catchment and interpretation of the adjoining former SRA tramshed yard and visual catchment of adjacent heritage items (Rutherford, Pioneer Memorial Park and the Former SRA cable store and traffic office). The project has incorporated an approach to reduce impacts to the yard as discussed under “proposed scope of work” which consider reducing excavation, reusing existing penetrations into the former SRA office and amenities building for new connections into the adjoining switchboard and aligning the new raised cable containment culvert with the existing yard configuration.

This report recommends some further guidance for the detailed design process to support and minimise the visual impact to the broader curtilage of the former SRA tramshed as discussed above and summarised in ‘Recommendations’ below.

Recommendations

The following measures are recommended to support the proposal's minor impact to the significant values of the *Former SRA tramshed* and *Former SRA office and amenities building*:

- new fencing within the site should match the existing black perimeter (and internal) fencing at 29 Derbyshire Rd (the former SRA office and amenities building).
- The new fencing should align with the south facing podium façade of the former SRA tramshed and ensure a minimum 15m separation from the former SRA office and amenities building is achieved.
- Vibration monitoring, including selection of machinery within the recommended limits, identified in the supporting Noise and Vibration Impact Assessment for this project should be identified and inform the development and delivery of the demolition plan for the northern CNG refuelling building.

The following guidance is recommended for the detailed design of the proposed cable containment culvert and the cable containment deck elements.

- The form of the culvert should remain as open as possible and not be infilled.
- Where the height of the culvert can be reduced in detailed design, and also maintaining safety requirements, this is desirable to reduce potential visual impacts to view catchments of adjacent heritage items.
- The cable containment decking above the culvert should be as uncluttered as possible.
- The colour of the steel culvert and cable containment deck elements should be recessive in colour such as a light grey. Signage in colours that stands out should be avoided.

If you have following questions regarding the advice in this letter, please don't hesitate to contact me to discuss.

Yours sincere [redacted] 8 January 2025

[redacted]
Snr Environment Officer (Heritage)
Transport for NSW

Mobile: [redacted]
Environment Safety, Environment and Regulation
transport.nsw.gov.au

7 Harvest Street
MACQUARIE PARK NSW 2113

Attachments

Appendix A: Photographs of the existing site arrangement of layout of the bus depot and adjoining former SRA office and amenities building.
Appendix B: Results of basic AHIMS search 18 December 2024.

Appendix A: Photographs of the existing site arrangement of layout of the bus depot and adjoining former SRA office and amenities building.

Existing charging plinths in the bus depot yard and surrounding three beam deflection barriers (AC)

Existing charging plinths in the bus depot yard and surrounding deflection barriers (DC)

General view of the bus depot yard. Photo facing north east

General view facing north across the yard.

North gas Refuelling building, Photographs facing west

Diesel fuel tank is on the left hand side of image, the gas refuelling building is immediately south of it and the tram sheds and access gantry on the right hand side. Photo facing south.

Bus washer, photo facing north

Existing fence between the former SRA office and amenities building yard and the broader bus depot yard.

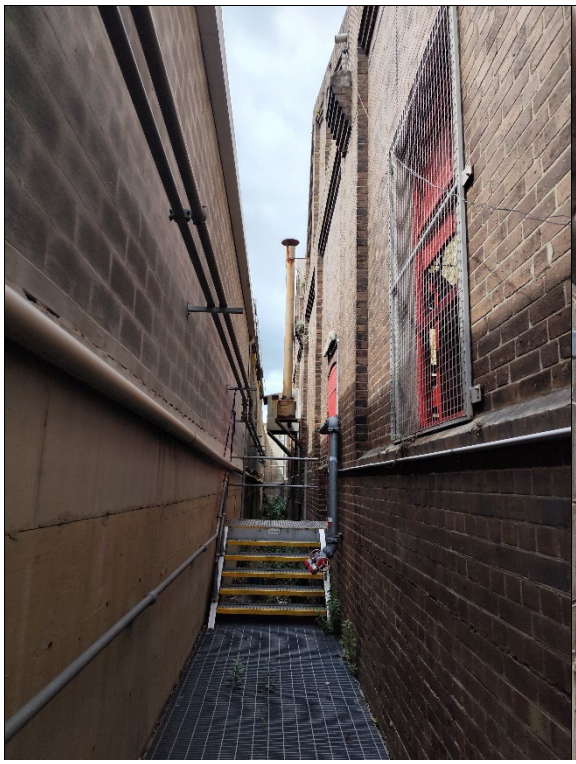
Refuelling island (in centre of image, gas refuelling building is to the left hand side), photo facing north west

Existing fence separating the former SRA office and amenities building relative to the tram shed alignment, Photo facing north.

Note alignment of the moving security fence with the tram building façade.

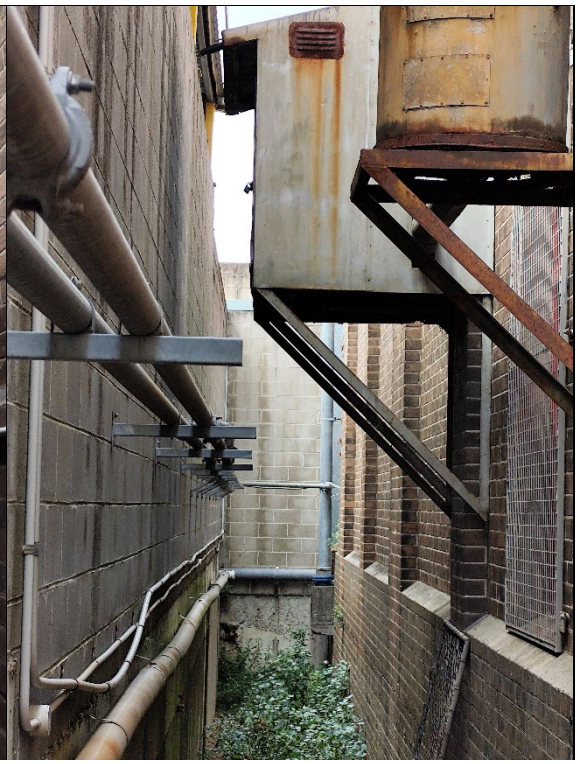
Existing switchboard relative to the north wall of the former SRA office and amenities building, Photograph facing west sourced from Transit Systems

Existing switchboard relative to the north wall of the former SRA office and amenities building



Gantry attached to the former tram shed and separating the tram shed from the bus depot, Photograph facing south sourced from Transit Systems

Note the connection of elements on the gantry to the refuelling island on left hand side.



Gantry attached to the former tram shed and separating the tram shed from the bus depot, Photograph facing south sourced from Transit Systems

Note the existing services attached to the gas refuelling and refuelling island on left hand side.

View of former tram sheds from Derbyshire Street (now part of Sydney Bus Museum). Photo facing northeast

View of former SRA Office/Amenities building from the bus lane. Photo facing north.

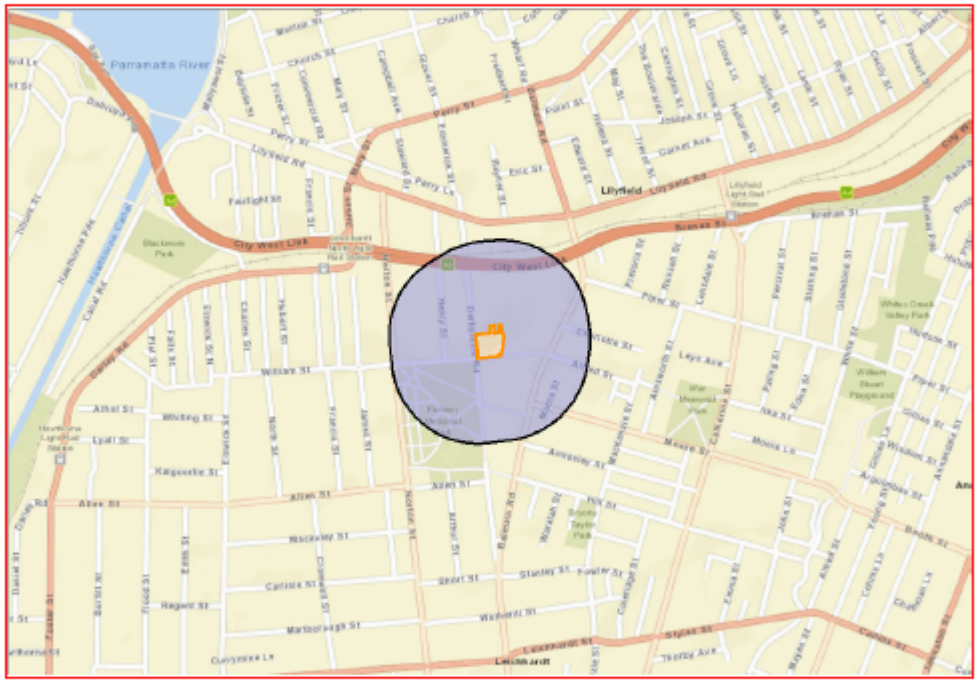
View of heritage listed fig tree adjacent to study area, Photo facing east from Derbyshire Road

Appendix B: Results of basic AHIMS search 18 December 2024.

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 6, DP:DP1244017, Section : - with a Buffer of 200 meters, conducted by [redacted] on 18 December 2024.

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) 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 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.

Appendix G: Biodiversity Searches

Data from the BioNet Atlas website, which holds records from a number of custodians. The data are only indicative and cannot be considered a comprehensive
Report generated on 10/12/2024 1:34 PM

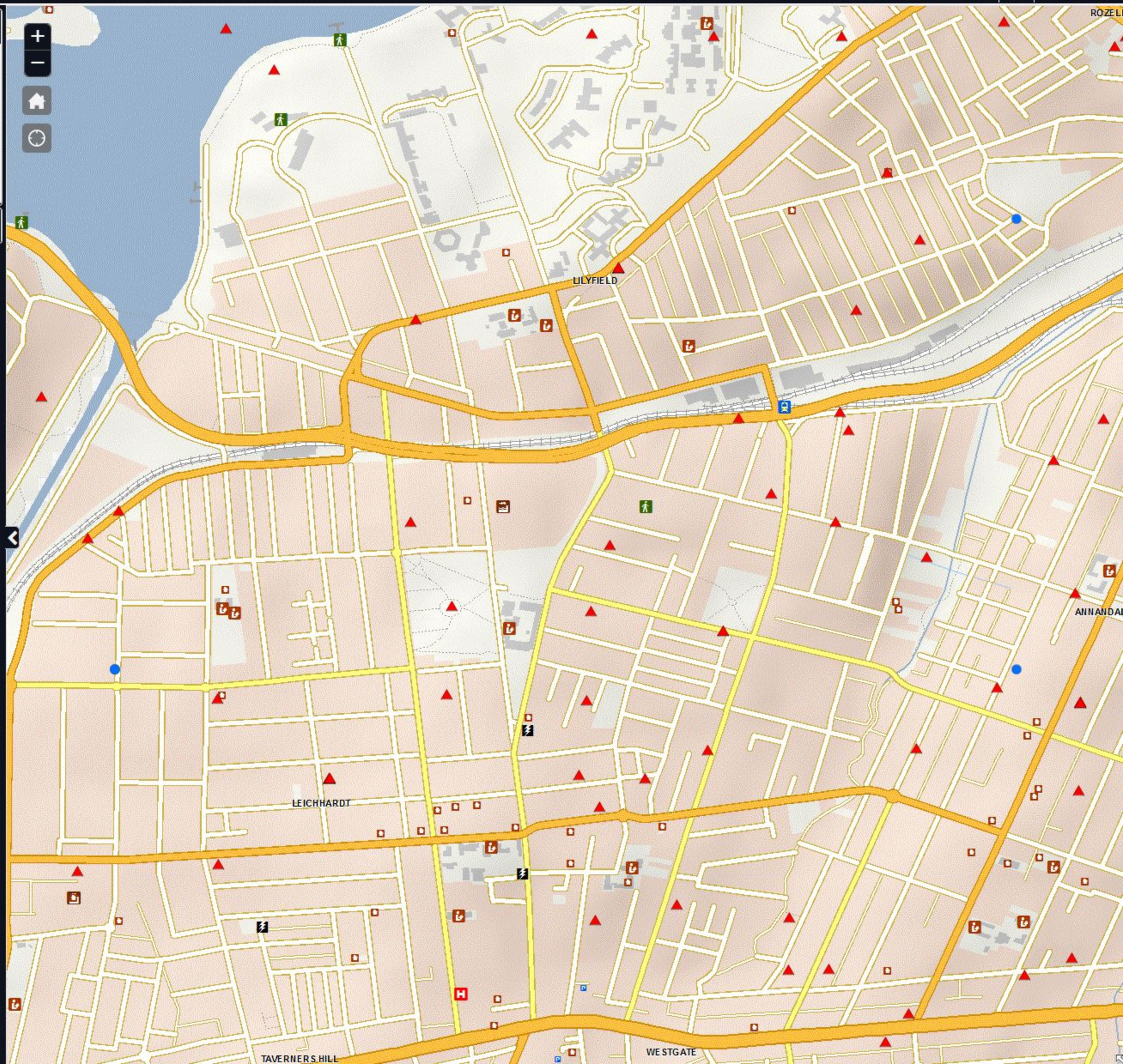
Kingdom	Class	Family	Species Code	Scientific Name	Exotic	Common Name	NSW status	Comm. status	Records	Info
Animalia	Amphibia	Hylidae	3166	*Litoria aurea*		Green and Golden Bell Frog	E1,P	V	14	Species Description PDF file
Animalia	Reptilia	Cheloniidae	2004	*Caretta caretta*		Loggerhead Turtle	E1,P	E	9	Species Description PDF file
Animalia	Reptilia	Elapidae	2675	*Hoplocephalus bitorquatus*		Pale-headed Snake	V,P		1	Species Description PDF file
Animalia	Aves	Columbidae	0021	*Ptilinopus regina*		Rose-crowned Fruit-Dove	V,P		1	Species Description PDF file
Animalia	Aves	Columbidae	0023	*Ptilinopus superbus*		Superb Fruit-Dove	V,P		6	Species Description PDF file
Animalia	Aves	Apodidae	0335	*Apus pacificus*		Fork-tailed Swift	P	C,J,K	1	
Animalia	Aves	Procellariidae	0070	*Ardenna grisea*		Sooty Shearwater	P	J	1	
Animalia	Aves	Procellariidae	0069	*Ardenna pacifica*		Wedge-tailed Shearwater	P	J	7	
Animalia	Aves	Procellariidae	0071	*Ardenna tenuirostris*		Short-tailed Shearwater	P	C,J,K	5	
Animalia	Aves	Ardeidae	0197	*Botaurus poiciloptilus*		Australasian Bittern	E1,P	E	1	Species Description PDF file
Animalia	Aves	Ardeidae	0196	*Ixobrychus flavicollis*		Black Bittern	V,P		1	Species Description PDF file
Animalia	Aves	Accipitridae	0226	*Haliaeetus leucogaster*		White-bellied Sea-Eagle	V,P		25	Species Description PDF file
Animalia	Aves	Accipitridae	0225	*Hieraaetus morphnoides*		Little Eagle	V,P		1	Species Description PDF file
Animalia	Aves	Accipitridae	0230	*^^Lophoictinia isura*		Square-tailed Kite	V,P,3		1	Species Description PDF file
Animalia	Aves	Burhinidae	0174	*Burhinus grallarius*		Bush Stone-curlew	E1,P		5	Species Description PDF file
Animalia	Aves	Haematopodidae	0130	*Haematopus longirostris*		Pied Oystercatcher	E1,P		2	Species Description PDF file
Animalia	Aves	Charadriidae	8006	*Pluvialis fulva*		Pacific Golden Plover	P	C,J,K	8	
Animalia	Aves	Charadriidae	0136	*Pluvialis squatarola*		Grey Plover	P	C,J,K	4	
Animalia	Aves	Scolopacidae	0157	*Actitis hypoleucos*		Common Sandpiper	P	C,J,K	3	
Animalia	Aves	Scolopacidae	0129	*Arenaria interpres*		Ruddy Turnstone	P	C,J,K	4	
Animalia	Aves	Scolopacidae	0163	*Calidris acuminata*		Sharp-tailed Sandpiper	P	C,J,K	40	
Animalia	Aves	Scolopacidae	0164	*Calidris canutus*		Red Knot	P	E,C,J,K	3	Species Description PDF file
Animalia	Aves	Scolopacidae	0161	*Calidris ferruginea*		Curlew Sandpiper	E4A,P	CE,C,J,K	15	Species Description PDF file
Animalia	Aves	Scolopacidae	0162	*Calidris ruficallis*		Red-necked Stint	P	C,J,K	6	
Animalia	Aves	Scolopacidae	0168	*Gallinago hardwickii*		Latham's Snipe	V,P	V,J,K	9	Species Description PDF file
Animalia	Aves	Scolopacidae	0153	*Limosa lapponica*		Bar-tailed Godwit	P	C,J,K	21	
Animalia	Aves	Scolopacidae	0149	*Numenius madagascariensis*		Eastern Curlew	E4A,P	CE,C,J,K	1	Species Description PDF file
Animalia	Aves	Scolopacidae	0151	*Numenius minutus*		Little Curlew	P	C,J,K	1	
Animalia	Aves	Scolopacidae	0155	*Tringa brevipes*		Grey-tailed Tattler	P	C,J,K	3	
Animalia	Aves	Stercorariidae	0945	*Stercorarius pomarinus*		Pomarine Jaeger	P	C,J,K	1	
Animalia	Aves	Laridae	0112	*Hydroprogne caspia*		Caspian Tern	P	J	3	
Animalia	Aves	Laridae	0953	*Sterna hirundo*		Common Tern	P	C,J,K	6	
Animalia	Aves	Laridae	0117	*Sternula albifrons*		Little Tern	E1,P	C,J,K	2	Species Description PDF file
Animalia	Aves	Laridae	0115	*Thalasseus bergii*		Crested Tern	P	J	24	
Animalia	Aves	Psittacidae	0260	*Glossopsitta pusilla*		Little Lorikeet	V,P		2	Species Description PDF file
Animalia	Aves	Psittacidae	0309	*Lathamus discolor*		Swift Parrot	E1,P	CE	2	Species Description PDF file
Animalia	Aves	Psittacidae	0302	*^^Neophema pulchella*		Turquoise Parrot	V,P,3		1	Species Description PDF file
Animalia	Aves	Strigidae	0246	*^^Ninox connivens*		Barking Owl	V,P,3		1	Species Description PDF file
Animalia	Aves	Strigidae	0248	*^^Ninox strenua*		Powerful Owl	V,P,3		102	Species Description PDF file
Animalia	Aves	Meliphagidae	0603	*^Anthochaera phrygia*		Regent Honeyeater	E4A,P,2	CE	1	Species Description PDF file
Animalia	Aves	Meliphagidae	0598	*Grantiella picta*		Painted Honeyeater	V,P	V	1	Species Description PDF file
Animalia	Aves	Artamidae	8519	*Artamus cyanopterus cyanopterus*		Dusky Woodswallow	V,P		4	Species Description PDF file
Animalia	Aves	Petroicidae	0380	*Petroica boodang*		Scarlet Robin	V,P		2	Species Description PDF file
Animalia	Aves	Estrildidae	0652	*Stagonopleura guttata*		Diamond Firetail	V,P	V	1	Species Description PDF file
Animalia	Mammalia	Dasyuridae	1008	*Dasyurus maculatus*		Spotted-tailed Quoll	V,P	E	1	Species Description PDF file
Animalia	Mammalia	Peramelidae	1097	*Perameles nasuta*		Long-nosed Bandicoot population in inner western Sydney	E2,P		26	Species Description PDF file
Animalia	Mammalia	Phascolarctidae	1162	*Phascolarctos cinereus*		Koala	E1,P	E	8	Species Description PDF file
Animalia	Mammalia	Pteropodidae	1280	*Pteropus poliocephalus*		Grey-headed Flying-fox	V,P	V	1915	Species Description PDF file
Animalia	Mammalia	Emballonuridae	1321	*Saccolaimus flaviventris*		Yellow-bellied Sheathtail-bat	V,P		11	Species Description PDF file
Animalia	Mammalia	Molossidae	1329	*Micronomus norfolkensis*		Eastern Coastal Free-tailed Bat	V,P		11	Species Description PDF file
Animalia	Mammalia	Vespertilionidae	1353	*Chalinolobus dwyeri*		Large-eared Pied Bat	E1,P	E	1	Species Description PDF file
Animalia	Mammalia	Vespertilionidae	1372	*Falsistrellus tasmaniensis*		Eastern False Pipistrelle	V,P		5	Species Description PDF file
Animalia	Mammalia	Vespertilionidae	1357	*Myotis macropus*		Southern Myotis	V,P		24	Species Description PDF file
Animalia	Mammalia	Vespertilionidae	1361	*Scoteanax rueppellii*		Greater Broad-nosed Bat	V,P		1	Species Description PDF file
Animalia	Mammalia	Miniopteridae	1346	*Miniopterus australis*		Little Bent-winged Bat	V,P		15	Species Description PDF file
Animalia	Mammalia	Miniopteridae	3330	*Miniopterus orianae oceanensis*		Large Bent-winged Bat	V,P		75	Species Description PDF file
Animalia	Mammalia	Muridae	1466	*Pseudomys gracilicaudatus*		Eastern Chestnut Mouse	V,P		1	Species Description PDF file
Animalia	Mammalia	Otariidae	1882	*Arctocephalus pusillus doriferus*		Australian Fur-seal	V,P		1	Species Description PDF file
Animalia	Insecta	Petaluridae	I007	*Petalura gigantea*		Giant Dragonfly	E1		1	Species Description PDF file
Plantae	Flora	Casuarinaceae	8321	*^^Allocasuarina portuensis*		Nielsen Park She-oak	E1,3	E	5	Species Description PDF file
Plantae	Flora	Convolvulaceae	2234	*Wilsonia backhousei*		Narrow-leafed Wilsonia	V		3	Species Description PDF file
Plantae	Flora	Elaeocarpaceae	6205	*Tetratheca glandulosa*			V		1	Species Description PDF file
Plantae	Flora	Elaeocarpaceae	6206	*Tetratheca juncea*		Black-eyed Susan	V	V	13	Species Description PDF file
Plantae	Flora	Ericaceae	7752	*Epacris purpurascens var. purpurascens*			V		1	Species Description PDF file
Plantae	Flora	Fabaceae (Mimosoideae)	3728	*Acacia bynoeana*		Bynoe's Wattle	E1	V	1	Species Description PDF file
Plantae	Flora	Fabaceae (Mimosoideae)	3860	*Acacia pubescens*		Downy Wattle	V	V	1	Species Description PDF file
Plantae	Flora	Fabaceae (Mimosoideae)	15210	*Acacia terminalis subsp. Eastern Sydney*		Sunshine wattle	E1	E	11	Species Description PDF file
Fungi	Flora	Hygrophoraceae	F001	*Hygrocybe austropratensis*			E1		3	Species Description PDF file
Plantae	Flora	Lamiaceae	3418	*^^Prostanthera marifolia*		Seaforth Mintbush	E4A,3	CE	1	Species Description PDF file
Plantae	Flora	Myrtaceae	4134	*Eucalyptus nicholii*		Narrow-leaved Black Peppermint	V	V	6	Species Description PDF file
Plantae	Flora	Myrtaceae	4163	*Eucalyptus pulverulenta*		Silver-leafed Gum	V	V	1	Species Description PDF file
Plantae	Flora	Myrtaceae	4248	*Melaleuca deanei*		Deane's Paperbark	V	V	7	Species Description PDF file
Plantae	Flora	Myrtaceae	4293	*Syzygium paniculatum*		Magenta Lilly Pilly	E1	V	20	Species Description PDF file
Plantae	Flora	Orchidaceae	4386	*^Caladenia tessellata*		Thick Lip Spider Orchid	V,P,2	V	2	Species Description PDF file
Plantae	Flora	Orchidaceae	4464	*^Genoplesium baueri*		Bauer's Midge Orchid	E1,P,2	E	4	Species Description PDF file
Plantae	Flora	Proteaceae	9680	*Macadamia integrifolia*		Macadamia Nut		V	2	Species Description PDF file
Plantae	Flora	Proteaceae	5458	*^^Persoonia hirsuta*		Hairy Geebung	E1,P,3	E	3	Species Description PDF file
Plantae	Flora	Thymelaeaceae	6965	*Pimelea curviflora var. curviflora*			V	V	1	Species Description PDF file

bionet
Atlas of NSW Wildlife

Layers

- Species records mapped as held
- Category 3 sensitive spp. 0.01°(~1km) rounded
- Category 2 sensitive spp.0.1°(~10km) rounded

Print



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: 11-Dec-2024

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:	3
National Heritage Places:	8
Wetlands of International Importance (Ramsar	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	14
Listed Threatened Species:	119
Listed Migratory Species:	77

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:	573
Commonwealth Heritage Places:	62
Listed Marine Species:	106
Whales and Other Cetaceans:	10
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

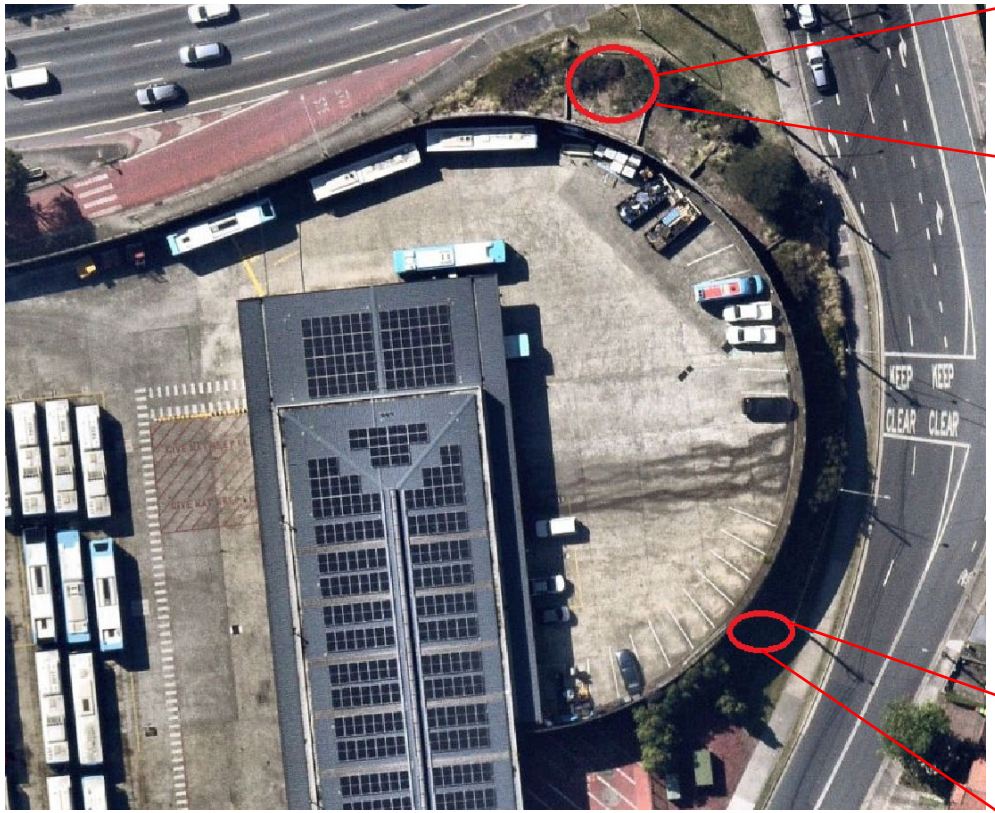
Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	8
Regional Forest Agreements:	None
Nationally Important Wetlands:	4
EPBC Act Referrals:	92
Key Ecological Features (Marine):	None
Biologically Important Areas:	2
Bioregional Assessments:	1
Geological and Bioregional Assessments:	None

Note: See project Objective folder for full EPBC Act Protected Matters search results

Appendix H: Vegetation to be removed


KEEP CLEAR
KEEP CLEAR


Leichhardt Depot

NSW GOVERNMENT