

PROPOSED MULTI-LEVEL WAREHOUSE DEVELOPMENT

15-21 BRITTON STREET SMITHFIELD, NSW 2164

NOISE & VIBRATION IMPACT ASSESSMENT

RWDI # 2402424

28 October 2024

SUBMITTED TO

Lendlease Real Estate Investments

CC TO

Billie Mascart

billie.mascart@lendlease.com

+61 418 897 610

SUBMITTED BY

Claire Graham-White

Project Engineer

Claire.Graham-White@rwdi.com

Roman Haverkamp

Senior Engineer

roman.haverkamp@rwdi.com

Davis Lai, B.Sc.(Civil Eng)

Senior Project Manager

davis.lai@rwdi.com

RWDI Australia Pty Ltd (RWDI)

ABN: 86 641 303 871



DOCUMENT CONTROL

Version	Status	Date	Prepared By	Reviewed By
A	Draft	21 March 2024	Claire Graham-White	Roman Haverkamp
B	Draft	28 May 2024	Claire Graham-White	Joshua Bollom
C	Final Update to revision of arch dwg	14 June 2024	Claire Graham-White	Joshua Bollom
D	Final Update to revision of arch dwg and project description	28 October 2024	Claire Graham-White	Davis Lai

NOTE

All materials specified by RWDI Australia Pty Ltd (RWDI) have been selected solely on the basis of acoustic performance. Any other properties of these materials, such as fire rating, chemical properties etc. should be checked with the suppliers or other specialised bodies for fitness for a given purpose.

The information contained in this document produced by RWDI is solely for the use of the client identified on the front page of this report. Our client becomes the owner of this document upon full payment of our **Tax Invoice** for its provision. This document must not be used for any purposes other than those of the document's owner. RWDI undertakes no duty to or accepts any responsibility to any third party who may rely upon this document.

WILKINSON MURRAY

In October 2020, Wilkinson Murray Pty Ltd merged with RWDI Group, a leading international consulting firm. Wilkinson Murrays core practice areas of noise, acoustics, vibration and air quality consulting built since 1962 servicing Australia and Asia-Pacific region will complement RWDI practice areas. Combined, RWDI+Wilkinson Murray is one of the largest teams globally specialising in the area of noise, acoustics, vibration and air quality.

RWDI

RWDI is a team of highly-specialised consulting engineers and scientists working to improve the built environment through three core areas of practice: building performance, climate engineering and environmental engineering. More information is available at www.rwdi.com.

AAAC

This firm is a member firm of the Association of Australasian Acoustical Consultants and the work here reported has been carried out in accordance with the terms of that membership.



QUALITY ASSURANCE



© 2024 RWDI Australia Limited. ("RWDI") ALL RIGHTS RESERVED
RWDI Australia Pty Ltd operates a Quality Management System which complies with the requirements of AS/NZS ISO 9001:2015 for the provision of consultancy services in acoustic engineering air quality and wind engineering; and the sale, service, support and installation of acoustic monitoring and related systems and technologies.
This document is intended for the sole use of the party to whom it is addressed and may contain information that is privileged and/or confidential. If you have received this in error, please notify us immediately. Accessible document formats provided upon request. © RWDI name and logo are registered trademarks in Canada and the United States of America.



RWDI Australia Pty Ltd operates a Quality Management System which complies with the requirements of AS/NZS ISO 9001:2015. This management system has been externally certified by SAI Global and Licence No. QEC 13457 has been issued for the following scope: The provision of consultancy services in acoustic engineering and air quality; and the sale, service, support and installation of acoustic monitoring and related systems and technologies.



GLOSSARY OF ACOUSTIC TERMS

Most environments are affected by environmental noise which continuously varies, largely as a result of road traffic. To describe the overall noise environment, a number of noise descriptors have been developed and these involve statistical and other analysis of the varying noise over sampling periods, typically taken as 15 minutes. These descriptors, which are demonstrated in the graph below, are here defined.

Maximum Noise Level (L_{Amax}) – The maximum noise level over a sample period is the maximum level, measured on fast response, during the sample period.

L_{A1} – The L_{A1} level is the noise level which is exceeded for 1% of the sample period. During the sample period, the noise level is below the L_{A1} level for 99% of the time.

L_{A10} – The L_{A10} level is the noise level which is exceeded for 10% of the sample period. During the sample period, the noise level is below the L_{A10} level for 90% of the time. The L_{A10} is a common noise descriptor for environmental noise and road traffic noise.

L_{A90} – The L_{A90} level is the noise level which is exceeded for 90% of the sample period. During the sample period, the noise level is below the L_{A90} level for 10% of the time. This measure is commonly referred to as the background noise level.

L_{Aeq} – The equivalent continuous sound level (L_{Aeq}) is the energy average of the varying noise over the sample period and is equivalent to the level of a constant noise which contains the same energy as the varying noise environment. This measure is also a common measure of environmental noise and road traffic noise.

ABL – The Assessment Background Level is the single figure background level representing each assessment period (daytime, evening and night-time) for each day. It is determined by calculating the 10th percentile (lowest 10th percent) background level (L_{A90}) for each period.

RBL – The Rating Background Level for each period is the median value of the ABL values for the period over all of the days measured. There is therefore an RBL value for each period – daytime, evening and night-time.

Typical Graph of Sound Pressure Level vs Time

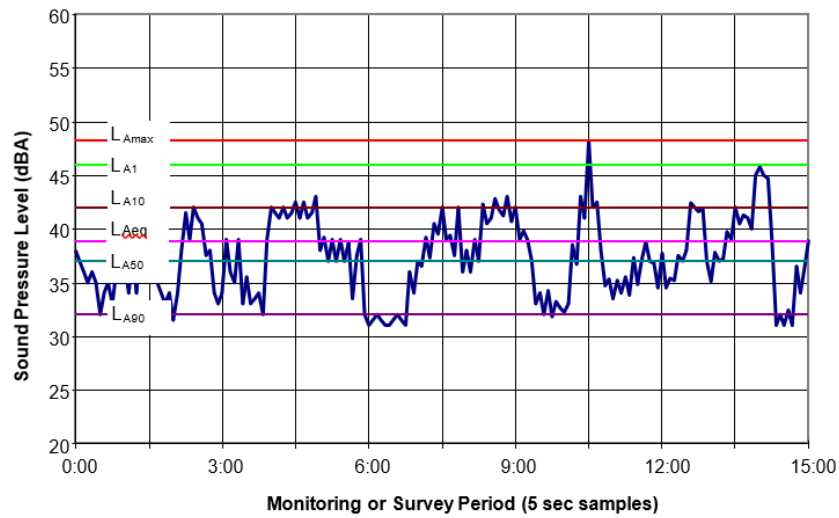


TABLE OF CONTENTS

GLOSSARY OF ACOUSTIC TERMS

1	INTRODUCTION	9
2	PROJECT BACKGROUND	10
2.1	Site Description and Surrounding Noise Sensitive Receivers.....	10
2.2	Proposal Description	15
3	OPERATIONAL NOISE CRITERIA.....	15
3.1	Cumberland Local Environmental Plan 2021.....	18
3.2	Noise Policy for Industry.....	18
3.2.1	Project Intrusiveness Noise Levels.....	18
3.2.2	Project Amenity Noise Levels	19
3.2.1	Project Noise Trigger Levels	20
3.2.2	Sleep Disturbance.....	20
4	OPERATIONAL NOISE ASSESSMENT.....	22
4.1	Noise Modelling.....	22
4.2	Source Noise Levels.....	22
4.3	Meteorological Conditions.....	24
4.4	Predicted Operational Noise Levels.....	24
5	ROAD TRAFFIC NOISE GENERATION.....	28
6	CONSTRUCTION NOISE & VIBRATION IMPACT ASSESSMENT	30
6.1	Proposed Construction Hours	30
6.2	Noise & Vibration Criteria / Management Levels	30
6.2.1	Noise – Interim Construction Noise Guideline (EPA, 2009).....	30
6.2.2	Vibration – Construction Noise & Vibration Strategy (TfNSW, 2018)	31
6.3	Construction Noise Assessment.....	33
6.3.1	Proposed Works.....	34
6.3.2	Predicted Construction Noise Levels	35
6.3.3	Construction Noise Mitigation.....	36
6.4	Construction Vibration Assessment.....	37
7	CONCLUSION.....	39

LIST OF FIGURES

Figure 2-1	Site Location and Surrounding Land Use.....	11
Figure 2-2	Aerial: Existing Site Context and Surrounding Area (Source: NearMap, 2023).....	12
Figure 2-3	Cadastral Map: Existing Site Context (Source: SIX Maps, 2023).....	13
Figure 2-4	Site Aerial and Nearby Receivers	14

LIST OF TABLES

Table 1-1:	Project Specific SEARs requirements.....	9
Table 2-1	Site Identification	10
Table 2-2	Nearest Sensitive Receivers	14
Table 3-1	Project Intrusiveness Noise Levels.....	19
Table 3-2	Project Amenity Noise Levels	20
Table 3-3	<i>NPfI</i> Overall Project Trigger Noise Level Criteria	20
Table 3-4	Sleep Disturbance Criteria	21
Table 4-1	Operational Scenarios	22
Table 4-2	Operational Source Sound Power Levels	23
Table 4-3	Meteorological Conditions adopted for the Noise Modelling.....	24
Table 4-4	Predicted $L_{Aeq,15min}$ Operational Noise Levels at Receivers (Daytime).....	25
Table 4-5	Predicted $L_{Aeq,15min}$ Operational Noise Levels at Receivers (Evening)	25
Table 4-6	Predicted $L_{Aeq,15min}$ Operational Noise Levels at Receivers (Night Time)	26
Table 4-7	Predicted L_{Amax} Operational Noise Levels at Residential Receivers (Night Time).....	27
Table 5-1	Road Traffic Noise Assessment Baseline Criteria for Residential Land Uses	28
Table 5-2	Existing Traffic Volumes Cumberland Highway (both directions)	29
Table 5-3	Future Traffic Volumes Cumberland Highway (both directions)	29
Table 6-1	Interim Construction Noise Guideline Criteria at Residences	30
Table 6-2	Interim Construction Noise Guideline Criteria at sensitive land uses (other than residences)	31
Table 6-3	Site-Specific Construction Noise Management Levels.....	31
Table 6-4:	Sydney Water Threshold Vibration Limits for Buried Assets.....	32
Table 6-5	Recommended Minimum Working Distances from Vibration Intensive Equipment	33



Table 6-6	Indicative Construction Noise Source Levels, $L_{Aeq,15min}$ dBA	34
Table 6-7	Predicted Construction Noise Impacts	35
Table 6-8	Indicative Construction Noise Mitigation Measures	36



1 INTRODUCTION

This Noise and Vibration Impact Assessment (NVIA) has been prepared by RWDI Australia Pty Ltd (RWDI) on behalf of Lendlease Investment Management Ptd Ltd in support of a State Significant Development Application (SSDA) for the development of a multi-storey warehouse redevelopment (the Project) at 15-21 Britton Street, Smithfield (the site). The proposal will include demolition of existing structures, relocation of services, earthworks, and construction of a 2-3 storey multi-unit warehouse facility including ancillary spaces spanning 100,000 to 110,000 square metres (sqm).

The primary purpose of this report is to determine the potential impacts of noise emissions associated with industrial and vehicle noise sources upon nearby sensitive receivers. Noise emissions due to additional road traffic generated by the Project, and noise and vibration impacts during construction stage, are also addressed, including on the nearby Water NSW pipelines.

Due to the distance between the site and the nearest sensitive receivers, vibration impacts during operation of the development are not expected and have not been further discussed.

The following guidelines and standards have been referenced in this NVIA:

- *Noise Policy for Industry* (NSW EPA, 2017) (NPfI);
- *Interim Construction Noise Guideline* (DECC, 2009), (ICNG);
- *Road Noise Policy* (EPA, 2011) (RNP);
- *Construction Noise and Vibration Strategy* (Transport for NSW, 2023) (CNVS);
- *German Standard DIN 4150, Part 3: Structural Vibration in Buildings: Effects on Structures [DIN 4150-3;2016]*; and
- *Procedure D0001870 - Specialist Engineering Assessment* (Water NSW 2021).

The Secretary's Environmental Assessment Requirements (SEARs) relevant to the NVIA are presented in **Table 1-1**.

Table 1-1: Project Specific SEARs requirements

REPORT	SEARs Ref.	To Address
Noise and Vibration Impact Assessment	#11	▪ Prepared in accordance with the relevant EPA guidelines. The assessment must detail construction and operational noise and vibration impacts on nearby sensitive receivers and structures and outline the proposed management and mitigation measures that would be implemented. ▪ Consider impacts on the pipeline to the north of the Site and address consultation with Water NSW.

2 PROJECT DESCRIPTION

2.1 Site Description and Surrounding Noise Sensitive Receivers

The Site is identified as 15-21 Britton Street and 28-54 Percival Road, which is made up of the following land holdings identified in Table 2-1:

Table 2-1 Site Identification

Site Address	Legal Description	Land Area (approx.)
15 - 21 Britton Street, Smithfield	Lot 1 DP 597082	3.22 hectares
28 - 54 Percival Road, Smithfield	Lot 34 DP 617521	5.53 hectares
Total:		8.75 hectares

The Site is located within the eastern portion of the Smithfield Industrial Estate and is bound by established warehouse buildings and industrial land uses. The Site is made up of two allotments which currently operate independently. The western allotment (Lot 1 DP 597082) has frontage to Britton Street and comprises a warehouse building currently operating as a food processing and packaging facility and associated offices. Ancillary buildings and structures are positioned towards the northeastern boundary. The western boundary comprises a landscaped area of mature trees, which extend along the entire Britton Street frontage. An area of hard standing provides at-grade car parking at the southern end of the Site. Vehicular access to the Site is provided via Britton Street to the northeast via a controlled gate with egress provided to the southwest of the Site. A separate vehicle access to the car park is also provided via Britton Street to the south.

The eastern allotment (Lot 34 DP 617521) has frontage to Percival Road and comprises two warehouse buildings and a separate two-storey office building. An area of hard stand provides at-grade car parking at the northern end of the Site, and a landscaped area of mature trees exists at the southern edge. Primary vehicular access to the Site is provided via an entrance off Percival Road for both heavy vehicles and visitors. A secondary entrance is provided at the southern edge of the Site.

Whilst topography at each allotment is relatively flat, the eastern allotment sits higher than the western allotment and is currently separated by a retaining wall.

The Site is situated approximately 24 km from the Sydney CBD. It is within close proximity to transport infrastructure routes, including the Cumberland Highway, which has direct access from Percival Road to the south. Public transport options are also available, with the Liverpool-Parramatta Transitway located directly north of the Site.

In accordance with the Cumberland Local Environmental Plan 2021 (CLEP2021), the Site is zoned E4 General Industrial, as illustrated in Figure 2-1 below. Land uses surrounding the Site comprise the following zoning categories, including:

- E4 General Industrial;

- SP2 Infrastructure (Water Supply System and Strategic Bus Corridor);
- SP2 Infrastructure (Classified Road); and
- RE1 Public Recreation.

The nearest sensitive land uses comprise the R2 Low Density Residential zone located 560 m north of the Site and 590 m east of the Site. The Site and surrounding context are illustrated in Figure 2-2 and Figure 2-3 below.

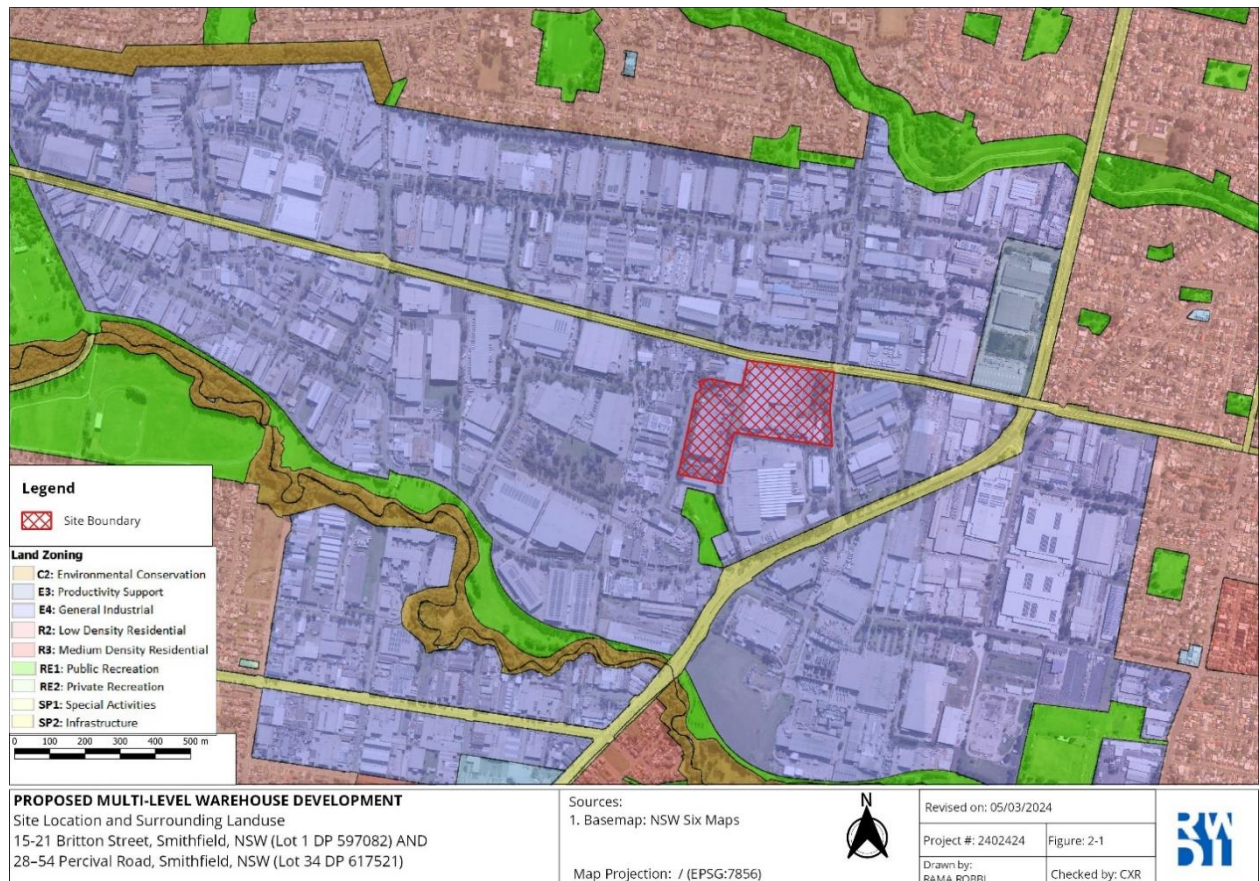


Figure 2-1 Site Location and Surrounding Land Use

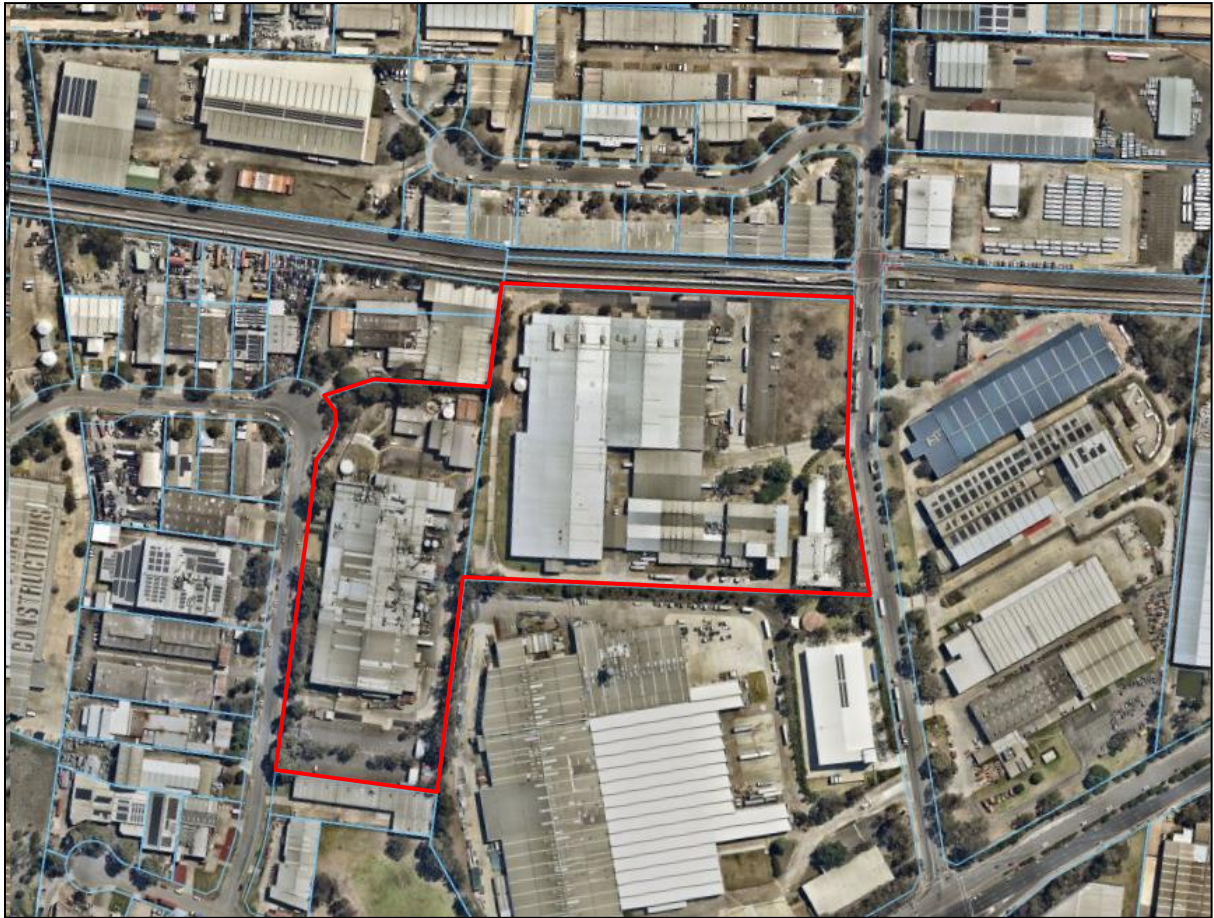


Figure 2-2 Aerial: Existing Site Context and Surrounding Area (Source: NearMap, 2023)

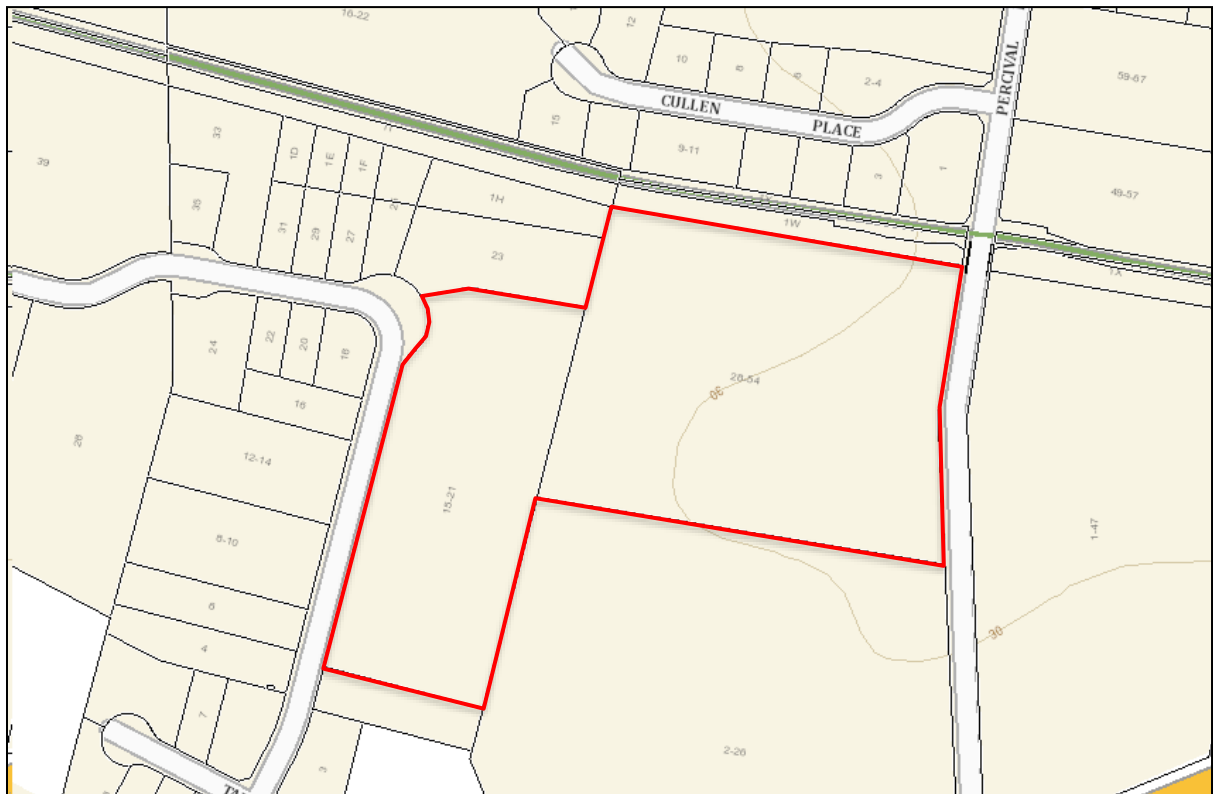


Figure 2-3 Cadastral Map: Existing Site Context (Source: SIX Maps, 2023)

The receiver points considered in this assessment are shown in **Figure 2-4**. Only the nearest residential receivers have been considered. A description of the receivers is included in **Table 2-2**.

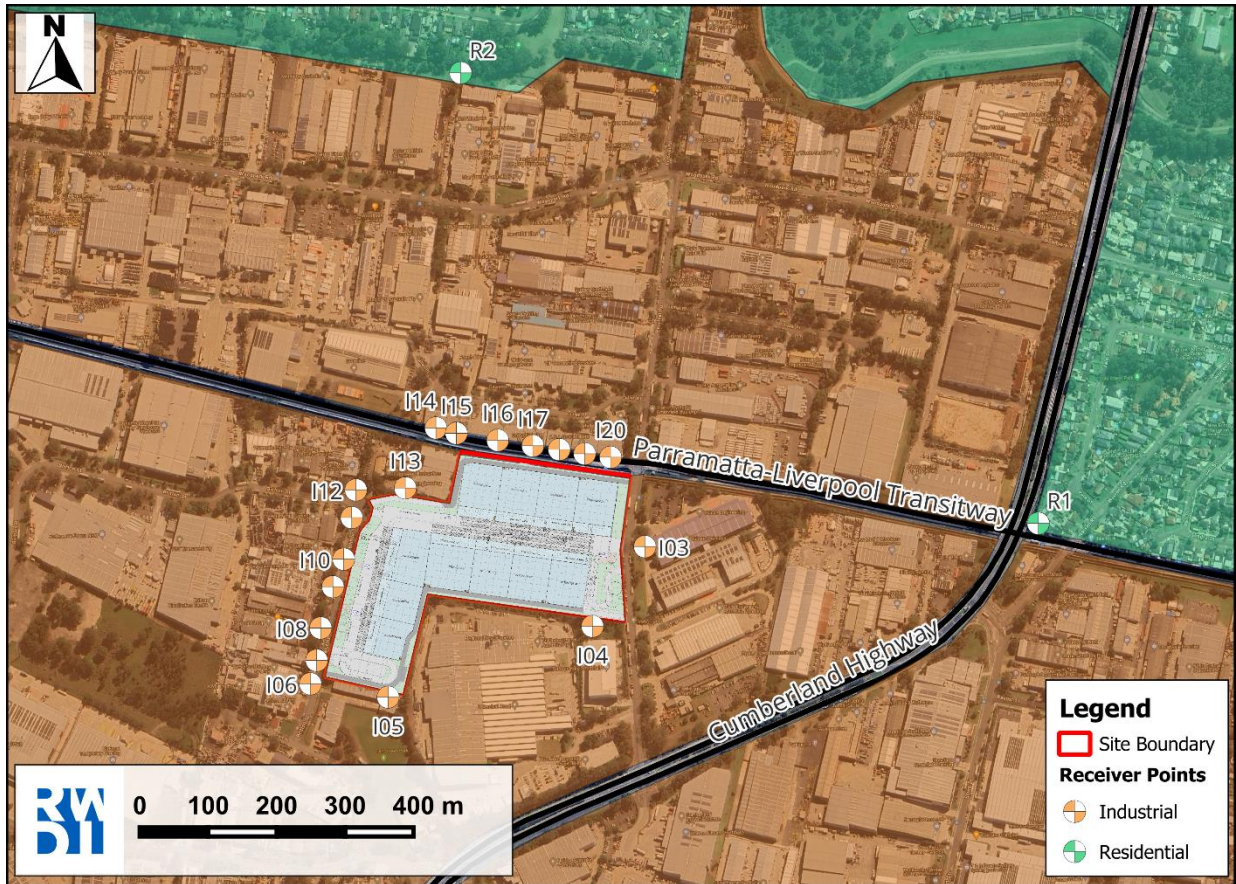


Figure 2-4 Site Aerial and Nearby Receivers

Table 2-2 Nearest Sensitive Receivers

ID	Type	Receiver Description
R01	Residential	Suburb of Woodpark
R02	Residential	Suburb of Greystanes
I03	Industrial	23-47 Percival Rd, Smithfield NSW 2164
I04	Industrial	2 Percival Rd, Smithfield NSW 2164
I05	Industrial	3 Britton St, Smithfield NSW 2164
I06	Industrial	4 Britton St, Smithfield NSW 2164
I07	Industrial	6 Britton St, Smithfield NSW 2164

ID	Type	Receiver Description
I08	Industrial	8-10 Britton St, Smithfield NSW 2164
I09	Industrial	12-14 Britton St, Smithfield NSW 2164
I10	Industrial	16 Britton St, Smithfield NSW 2164
I11	Industrial	18 Britton St, Smithfield NSW 2164
I12	Industrial	25 Britton St, Smithfield NSW 2164
I13	Industrial	23 Britton St, Smithfield NSW 2164
I14	Industrial	Unit 2/15 Cullen Pl, Smithfield NSW 2164
I15	Industrial	13 Cullen Pl, Smithfield NSW 2164
I16	Industrial	9-11 Cullen Pl, Smithfield NSW 2164
I17	Industrial	7 Cullen Pl, Smithfield NSW 2164
I18	Industrial	5 Cullen Pl, Smithfield NSW 2164
I19	Industrial	3 Cullen Pl, Smithfield NSW 2164
I20	Industrial	1 Cullen Pl, Smithfield NSW 2164

2.2 Proposal Description

The proposed development consists of three warehouse buildings, with frontage to both Britton Street and Percival Road. Warehouse A and B will be located on Lot 34 DP 617521 (Percival Road frontage) at an RL of 33.75. Each building will be two-storey, with a maximum height of 28.6 m (including roof plant).

Warehouse C will be located on Lot 1 DP 597082 (Britton Street frontage) at an RL of 23.75. Warehouse C accommodates an additional storey at lower ground level, due to the 10 m difference in proposed Site levels. Whilst this building height is 38.6 m (including roof plant), the height of all three (3) buildings is consistent at RL 62.35. The three warehouses will be connected at ground level and level 1 via a hardstand that allows for vehicle circulation across the whole Site.

Each building will involve individual warehouse units, with ancillary office at mezzanine level. On the first floor, each building will have access to a shared outdoor amenity area. A café will be located at lower ground level within Warehouse C to accommodate the needs of employees.

The Gross Floor Area (GFA) for each building and each tenancy is outlined in Table 2-3.

Table 2-3 Gross Floor Areas

Building No.	Warehouse GFA	Office GFA	Other Facilities	Total GFA
Building A	29,630 m ²	2,297 m ²	Shared amenities: 132 m ²	32,059 m ²
Building B	30,122 m ²	2,300 m ²	Shared amenities: 133 m ² End of Trip Facilities: 110 m ²	32,665 m ²
Building C	29,224 m ²	2,439 m ²	Cafe: 71 m ² End of Trip Facilities: 110 m ²	31,844 m ²
Total	88,976 m²	7,036 m²	556 m²	96,568 m²

The proposal involves new vehicle crossings, which will provide separate ingress and egress for heavy vehicles at both Britton Street and Percival Road. Ingress is provided at Britton Street, whilst egress is provided at both Britton Street and Percival Road. Ramps are provided in each location to allow vehicle circulation to the upper levels. Each warehouse is connected via a hardstand that will allow for vehicle circulation, loading and unloading for each warehouse tenancy. Separate vehicle crossings are provided for cars, enabling access to the at-grade parking at Percival Road, as well as southern end of Britton Street. A third vehicle crossing is provided at the northern end of Britton Street, which provides access to a carparking area at ground floor, mezzanine level. A total of 482 carparks are provided across the three (3) carparking areas.

The proposal will require the removal of several trees across the whole Site and will incorporate landscaping and tree planting at the side boundaries, as well as along Britton Street and Percival Road.

The proposal involves the construction and operation of a multi-level warehouse estate comprising:

- Site preparation and establishment works, including:
 - Demolition of all existing buildings and structures;
 - Clearing of nominated vegetation within the proposed development area;
 - Bulk earthworks to create proposed site levels;
 - Decommissioning of existing vehicle crossings; and
 - In-ground building services and utility work.
- Construction and operation of three (3) multi-level warehouse buildings across the two (2) allotments, comprising the following:
 - Two (2) two-storey warehouse buildings located on Lot 34 DP 617521 (Warehouse A and B), comprising of 12 individual warehouse units and ancillary office;
 - A three-storey building located on Lot 1 DP 597082 (Warehouse C), comprising of 9 individual warehouse units, ancillary office, and a café;
 - Shared outdoor amenity areas provided for employees on level 1;
 - Connected hardstand on ground floor and level 1 that will allow for vehicle circulation across the whole site;
 - A total of 482 carparking spaces within three separate carparking areas;
 - A total Gross Floor Area (GFA) of 96,568m², including 88,976m² of warehouse, 7,036m² of office, 71m² of café, 220m² of end of trip facilities and 265m² of shared amenities;

- o o Four (4) new vehicle crossings on Percival Road and four (4) new vehicle crossings on Britton Street to provide separate entry and exit for heavy and light vehicles; and
- o o Extensive ground and on-building landscaping works.

The layout of the proposal is shown in Figure 2-5, and a 3D Section View of the Project is presented in Figure 2-6.



Figure 2-5 Site Layout

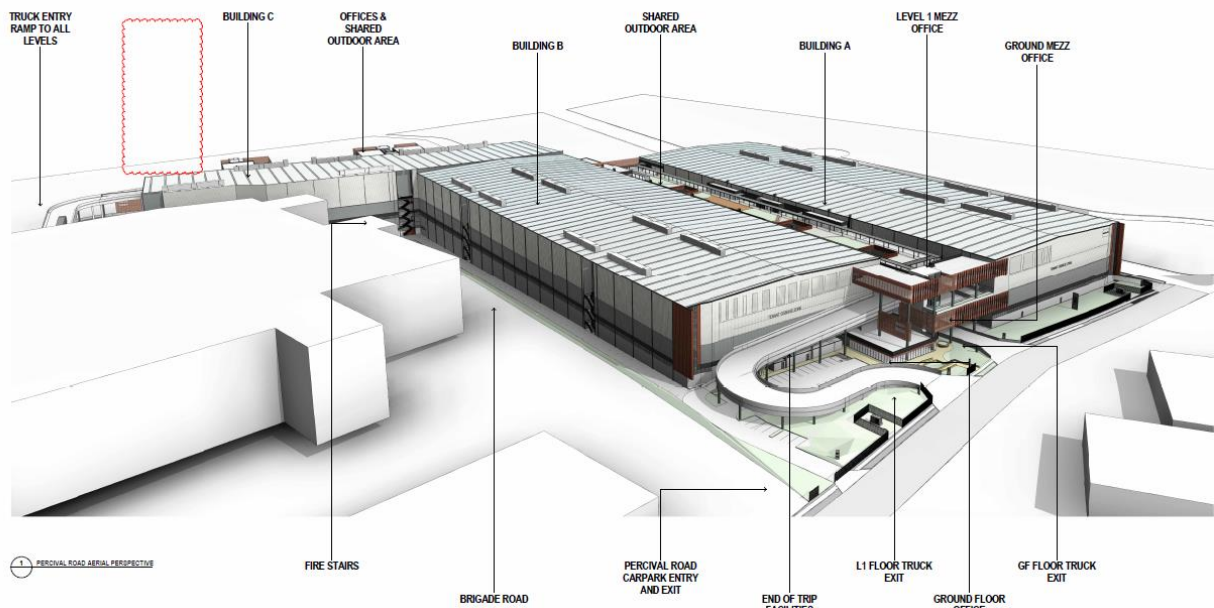


Figure 2-6 Proposed 3D Section View

3 OPERATIONAL NOISE CRITERIA

3.1 Cumberland Local Environmental Plan 2021

There are no specific provisions relating to acoustics in the *Cumberland Local Environmental Plan 2021*.

3.2 Noise Policy for Industry

The *Noise Policy for Industry (NPfi)* provides a framework for assessing environmental noise impacts from industrial premises and industrial development proposals in New South Wales.

The *NPfi* recommends the development of project noise trigger levels, which provide a benchmark for assessing a proposal or site. The project noise trigger levels should not be interpreted as mandatory noise criteria but, rather, as noise levels that, if exceeded, would indicate a potential noise impact on the community.

The project noise trigger level is the lower value of the project intrusiveness noise level and the project amenity noise level. The project intrusiveness noise level assesses the likelihood of noise being intrusive above the ambient noise level and is applied to residential receivers only. The project amenity noise level ensures the total industrial noise from all sources in the area does not rise above a maximum acceptable level.

3.2.1 Project Intrusiveness Noise Levels

The intrusiveness noise level applies only to residential receivers and is the noise level 5 dB above the background noise level for each time period (daytime, evening or night-time). The Rating Background Level (RBL), representative of the background noise level, is derived from the measured L_{A90} noise levels determined

using unattended monitoring. Due to the significant distance between the Site and the nearest residential receivers, no background noise survey has been conducted for this project. Instead, the intrusiveness criteria have been derived based on the minimum assumed RBLs presented in Table 2.1 of the *NPfI*.

Intrusiveness noise criteria levels for the project are summarised in **Table 3-1**.

Table 3-1 Project Intrusiveness Noise Levels

Assessment Period ¹	Minimum assumed Rating Background Level (RBL) dBA	Project Intrusiveness Noise Level L _{Aeq,15min} dBA
Day	35	40
Evening	30	35
Night	30	35

Note 1: Day = 7am – 6pm; Evening = 6pm – 10pm; Night = 10pm – 7am,

3.2.2 Project Amenity Noise Levels

Project amenity noise levels aim to set a limit on continuing increases in noise levels from all industrial noise sources affecting a variety of receiver types; that is, the ambient noise level in an area from all industrial noise sources remains below recommended amenity noise levels.

The amenity assessment is based on noise criteria specific to land use and associated activities. The criteria relate only to industrial-type noise and do not include transportation noise (when on public transport corridors).

The recommended amenity noise level represents the objective for total industrial noise at a receiver location. The project amenity noise level represents the objective for noise from a single industrial development at a receiver location. For the purposes of this assessment, residential receivers in Woodpark and Greystanes have been classified as ‘suburban’.

To prevent increases in industrial noise due to the cumulative effect of several developments, the project amenity noise level for each new source of industrial noise is set at 5 dB below the recommended amenity noise level.

The project amenity noise levels for the Project are presented in **Table 3-2**. Due to different averaging periods for the L_{Aeq,15min} and L_{Aeq,period} noise descriptors, the values of project intrusiveness and amenity noise levels cannot be compared directly when identifying noise trigger levels (i.e., the most stringent values of each category). In order to make a comparison between descriptors, the *NPfI* assumes that the L_{Aeq,15min} equivalent of an L_{Aeq,period} noise level is equal to the L_{Aeq,period} level plus 3 dB.

Table 3-2 Project Amenity Noise Levels

Receiver	Assessment Period ¹	Recommended Amenity Noise Level $L_{Aeq,period}$ dBA	Project Amenity Noise Level $L_{Aeq,period}$ dBA	Project Amenity Noise Level $L_{Aeq,15min}$ dBA
Suburban Residential	Day	55	50	53
	Evening	45	40	43
	Night	40	35	38
Industrial	When in use	70	65	68

Note 1: Day = 7am – 6pm; Evening = 6pm – 10pm; Night = 10pm – 7am

3.2.1 Project Noise Trigger Levels

The project noise trigger levels (PNTLs) are defined as the lower of the project intrusiveness and the project amenity noise levels. The PNTLs are summarised in **Table 3-3** below.

Table 3-3 NPfI Overall Project Trigger Noise Level Criteria

Location	Assessment Period ¹	Intrusiveness Criteria $L_{Aeq,15min}$ dBA	Amenity Criteria $L_{Aeq,15min}$ dBA	Project Noise Trigger Criteria $L_{Aeq,15min}$ dBA
Residential	Day	40	53	40
	Evening	35	43	35
	Night	35	38	35
Industrial	When in use	-	68	68

Note 1: Day = 7am – 6pm; Evening = 6pm – 10pm; Night = 10pm – 7am, Early Night = 10pm – 12am

3.2.2 Sleep Disturbance

Guidance for assessing the potential for sleep disturbance impacts on nearby residences is provided in Section 2.5 of the *NPfI*, which states:

Where the subject development/premises night-time noise levels at a residential location exceed:

- $L_{Aeq,15min}$ 40 dB(A) or the prevailing RBL plus 5 dB, whichever is the greater, and/or
- L_{Amax} 52 dB(A) or the prevailing RBL plus 15 dB, whichever is the greater,

a detailed maximum noise level event assessment should be undertaken.

Based on the above, the night-time sleep disturbance screening noise level for the residential areas in the vicinity of the development is presented in **Table 3-4**.



Table 3-4 Sleep Disturbance Criteria

Suburb	Assessment Period	Minimum assumed Rating Background Level (RBL)	Sleep Disturbance Criteria, $L_{Aeq,15min}$	Sleep Disturbance Criteria, L_{Amax}
Residential	10pm-7am	30	40	52

Where the sleep disturbance screening noise level is predicted to be exceeded then a detailed maximum noise level event assessment should be undertaken. The detailed assessment should discuss the predicted level of the events, the exceedance of the screening level, existing maximum noise levels, and consider guidance from current literature regarding sleep disturbance, such as the *Road Noise Policy*.

4 OPERATIONAL NOISE ASSESSMENT

4.1 Noise Modelling

Site related noise emissions were modelled using the CadnaA v2023 noise prediction software. To complete this, a representative 3-D model within the software was constructed of the site and surrounding receivers. Factors that are addressed in the modelling are:

- equipment sound level emissions (in octave bands) and locations
- screening effects from buildings and barriers
- receiver locations
- ground topography
- noise attenuation due to geometric spreading
- ground absorption and atmospheric absorption
- meteorological effects

The following assumptions have been made:

- Site layout based on architectural plans dated May 2024
- A ground absorption factor of 0.0 was conservatively adopted for all areas surrounding the Site
- Operational noise sources as discussed in section 4.2
- Meteorological conditions as discussed section 4.3

4.2 Source Noise Levels

Operational noise emissions have been predicted to the most sensitive receivers around the site. The scenarios used in noise modelling are presented in **Table 4-1**. Predicted hourly vehicle counts of vehicles accessing the site across a 24-hour period have been provided. Based on the volume of heavy vehicles, the worst-case scenario for each assessment period has been presented in **Table 4-1**. The number of vehicles using the carpark has been modelled as the capacity of each carpark, although it is noted that this is unlikely to be physically possible. With regards to loading/unloading activities, one forklift was assumed as operating outside for each of the warehouse tenancies, except for tenancies A1, A2, B1, and B2, which were assumed to have two forklifts. This is deemed conservative as loading/unloading activities would not likely occur at all the warehouse tenancies at the same time, and not all forklifts would operate outside.

Table 4-1 Operational Scenarios

Time of Day	Noise Source	Number of Vehicles during busiest 15 minutes
Day	Heavy Vehicles	11 entering and exiting (22 movements)
Evening		5 entering and exiting (10 movements)
Night		3 entering and exiting (6 movements)

Time of Day	Noise Source	Number of Vehicles during busiest 15 minutes
Any	Light Vehicle	60 using Western Carpark 51 using Eastern Carpark
	Forklifts	Up to 4 working outside on Lower Ground hardstand Up to 11 working outside on Ground and Level 1 hardstand
	Mechanical Plant	Total of 21 condenser units servicing all tenancy office spaces Total of 17 extraction fans serving all warehouse spaces.

Note: The mechanical services of the site have been assumed based on typical operations of a warehousing facility

The additional assumptions adopted for assessment purposes are summarised as follows:

- Heavy Vehicles include semi-trailer trucks and B-double trucks;
- All heavy vehicle movements conservatively assumed on Level 1 hardstand, which does not benefit from cover shielding noise propagating upward.

The noise level data used for the assessment is presented in **Table 4-2**. Entries for heavy vehicles conservatively include all heavy vehicle types to be B-Double size. Noise generated by semi-trailer trucks and B-double trucks is typically very similar, with overall noise levels controlled by the truck engine.

An L_{Amax} noise impact associated with truck airbrake brake release valves is modelled to assess potential sleep disturbance impacts.

All noise levels presented in **Table 4-2** are taken from RWDI's internal database.

Table 4-2 Operational Source Sound Power Levels

Noise Source	Noise Characteristic	SWL, dBA
Gas Powered Forklift operational on hardstand	Quasi-steady (assumed as steady for assessment purposes)	93 L_{Aeq}
Light Vehicles on site, up to speed of 10 km/h	Quasi-steady	90 L_{Aeq}
Heavy Vehicle, loaded/unloaded up to speed of 20 km/h, at grade	Quasi-steady	107 L_{Aeq}
Heavy Vehicle, loaded/unloaded travelling uphill (ramp sections)	Quasi-steady	111 L_{Aeq}
Truck Airbrake Release and reversing alarm	Instantaneous	115 L_{Amax}
Air Conditioner Condenser Unit	Steady	80 L_{Aeq}

Noise Source	Noise Characteristic	SWL, dBA
Extraction Fan	Steady	85 L _{Aeq}

4.3 Meteorological Conditions

The meteorological effects on noise propagation such as temperature inversion and wind are considered in the noise prediction model. Two meteorological scenarios are considered, one under neutral conditions where temperature inversion and wind have minimal effect on the noise. The second is a worst-case scenario, where temperature inversion and wind affect the noise emissions. Both conditions conservatively assume an ambient temperature of 10 degrees and relative humidity 70%.

The standardised neutral and worst-case weather conditions outlined in Fact Sheet D of the *NPfI* are used in the noise prediction model. A summary of the meteorological conditions is outlined in Table 4-3.

Table 4-3 Meteorological Conditions adopted for the Noise Modelling

Assessment period	Meteorological condition	Wind speed (m/s)	Wind direction (°)	Stability category (A to G)
Day/Evening	Standard	0.5	Worst-Case	D Class
	Noise Enhancing (NE) (wind)	3	Worst-Case	D Class
Night	Standard	0.5	Worst-Case	D Class
	Noise Enhancing (wind)	3	Worst-Case	D Class
	Noise Enhancing (temperature inversion with light wind)	2	Worst-Case	F Class

4.4 Predicted Operational Noise Levels

The predicted L_{Aeq,15min} noise levels at surrounding receivers are presented in **Table 4-4**. Comparison has been made to the night-time PNTL for the relevant time period, as presented in Section 3.2.1.

The predicted L_{Amax} noise levels due to short duration high noise events that may potentially result in sleep disturbance are presented in **Table 4-7**. Compliance with the Sleep Disturbance Criteria (refer to **Table 3-4**) is demonstrated in

Table 4-6 for L_{Aeq} criteria and **Table 4-7** for L_{AFmax} criteria.

Table 4-4 Predicted $L_{Aeq,15min}$ Operational Noise Levels at Receivers (Daytime)

Location	Predicted worst case noise level during period $L_{Aeq,15min}$ dBA		Project Noise Trigger Criteria ¹ $L_{Aeq,15min}$ dBA	Compliance (Y/N)
	Standard MET	NE MET		
R01	31	32	40	Y
R02	33	34	40	Y
I03	54	55	68	Y
I04	56	57	68	Y
I05	59	59	68	Y
I06	55	55	68	Y
I07	56	57	68	Y
I08	56	57	68	Y
I09	55	56	68	Y
I10	56	56	68	Y
I11	55	56	68	Y
I12	54	54	68	Y
I13	57	57	68	Y
I14	48	49	68	Y
I15	48	48	68	Y
I16	35	35	68	Y
I17	35	35	68	Y
I18	35	35	68	Y
I19	35	35	68	Y
I20	34	35	68	Y

Table 4-5 Predicted $L_{Aeq,15min}$ Operational Noise Levels at Receivers (Evening)

Location	Predicted worst case noise level during period $L_{Aeq,15min}$ dBA		Project Noise Trigger Criteria ¹ $L_{Aeq,15min}$ dBA	Compliance (Y/N)
	Standard MET	NE MET		
R01	29	30	35	Y
R02	32	33	35	Y
I03	51	52	68	Y
I04	53	53	68	Y
I05	56	56	68	Y
I06	52	52	68	Y
I07	53	54	68	Y
I08	53	54	68	Y
I09	53	53	68	Y

Location	Predicted worst case noise level during period		Project Noise Trigger Criteria ¹ L _{Aeq,15min} dBA	Compliance (Y/N)
	L _{Aeq,15min} dBA			
	Standard MET	NE MET		
I10	53	53	68	Y
I11	53	53	68	Y
I12	51	52	68	Y
I13	54	54	68	Y
I14	46	46	68	Y
I15	45	46	68	Y
I16	34	35	68	Y
I17	35	35	68	Y
I18	34	35	68	Y
I19	34	35	68	Y
I20	34	34	68	Y

Table 4-6 Predicted L_{Aeq,15min} Operational Noise Levels at Receivers (Night Time)

Location	Predicted worst case noise level during period		Project Noise Trigger Criteria ¹ L _{Aeq,15min} dBA	Compliance (Y/N)
	L _{Aeq,15min} dBA			
	Standard MET	NE MET		
R01	28	30	35	Y
R02	31	33	35	Y
I03	50	52	68	Y
I04	51	53	68	Y
I05	54	56	68	Y
I06	50	52	68	Y
I07	52	54	68	Y
I08	52	54	68	Y
I09	51	53	68	Y
I10	52	53	68	Y
I11	51	53	68	Y
I12	49	52	68	Y
I13	52	54	68	Y
I14	44	46	68	Y
I15	44	46	68	Y
I16	34	35	68	Y
I17	34	35	68	Y
I18	34	35	68	Y
I19	34	35	68	Y



Location	Predicted worst case noise level during period L _{Aeq,15min} dBA		Project Noise Trigger Criteria ¹ L _{Aeq,15min} dBA	Compliance (Y/N)
	Standard MET	NE MET		
I20	33	34	68	Y

Table 4-7 Predicted L_{Amax} Operational Noise Levels at Residential Receivers (Night Time)

Suburb	Predicted Noise Level L _{Amax} dBA		Sleep Disturbance Criteria L _{Amax} dBA	Compliance (Y/N)
	Standard MET	NE MET		
Woodpark	29	29	52	Y
Greystanes	41	41	52	Y

5 ROAD TRAFFIC NOISE GENERATION

Guidance for the assessment of traffic noise generated on public roads by new developments is set out in the EPA's *Road Noise Policy (RNP)*.

Table 3 of the *RNP* is reproduced in **Table 5-1** and presents the relevant baseline criteria for traffic noise impacts from various road categories on residential uses.

It is assumed that all Site bound traffic accesses the site via the Cumberland Highway, entering via Britton Street and exiting via Percival Street. The nearest residential receivers which will be affected by an increase in traffic on public roads because of the development, are those next to the Cumberland Highway to the north-east of the site. The Cumberland Highway has been classified as an arterial road.

Table 5-1 Road Traffic Noise Assessment Baseline Criteria for Residential Land Uses

Road category	Type of project/land use	Assessment criteria – dB(A)	
		Day (7 a.m.–10 p.m.)	Night (10 p.m.–7 a.m.)
Freeway/ arterial/ sub-arterial roads	1. Existing residences affected by noise from new freeway/arterial/sub-arterial road corridors	L _{Aeq} , (15 hour) 55 (external)	L _{Aeq} , (9 hour) 50 (external)
	2. Existing residences affected by noise from redevelopment of existing freeway/arterial/sub-arterial roads	L _{Aeq} , (15 hour) 60 (external)	L _{Aeq} , (9 hour) 55 (external)
	3. Existing residences affected by additional traffic on existing freeways/arterial/sub-arterial roads generated by land use developments		
Local roads	4. Existing residences affected by noise from new local road corridors	L _{Aeq} , (1 hour) 55 (external)	L _{Aeq} , (1 hour) 50 (external)
	5. Existing residences affected by noise from redevelopment of existing local roads		
	6. Existing residences affected by additional traffic on existing local roads generated by land use developments		

Where existing road traffic noise exceeds the relevant base line criteria stipulated in **Table 5-1**, the *RNP* requires additional analysis to evaluate whether traffic noise levels at residences would increase by more than 2 dB as a result of increased flows associated with the development. If the increase in overall traffic noise levels is less than 2 dB, this would typically be considered as a barely perceptible increase in noise level to the average person and is unlikely to result in any adverse impacts on residential receivers.

5.1 Traffic Noise Generation Assessment

The traffic volumes recorded in 2018 on the section of the Cumberland Highway nearest to the site by the NSW Roads and Maritime Service (RMS) are presented in **Table 5-2**. The percentage of heavy vehicles has been conservatively assumed to be 10% based on RWDI experience.

Table 5-2 Existing Traffic Volumes Cumberland Highway (both directions)

Vehicle Type	Day (7am-10pm)	Night (10pm-7am)	Total Daily
Light Vehicles	47148	9670	56818
Heavy Vehicles	5239	1074	6313
All Vehicles	52387	10744	63131

Source: RMS Traffic Volume Viewer <https://roads-waterways.transport.nsw.gov.au/about/corporate-publications/statistics/traffic-volumes/aadt-map/index.html#/z=6>

The predicted future volumes including trip generation from the redevelopment of the site are presented in **Table 5-3**. This conservatively assumes all traffic resulting from the proposed redevelopment would access the Site from the same directions (either north or south). In reality, Project-related traffic is likely to be split with some vehicles accessing the Site from the north and others from the south.

Table 5-3 Future Traffic Volumes Cumberland Highway (both directions)

Cumberland Highway	Day (increase)	Night (increase)
Light Vehicles	47148 (86)	9670 (30)
Heavy Vehicles	5239 (352)	1074 (44)
All vehicles	52387 (1212)	10744 (344)

Due to the negligible traffic volumes anticipated to be generated, relative to the existing traffic flows along the Cumberland Highway, changes to traffic noise levels will be less than 0.5 dB. As such, the increase in noise level due to the additional traffic generated by the proposal is considered as barely perceptible to the average person and is unlikely to result in any adverse impacts on residential receivers.

6 CONSTRUCTION NOISE & VIBRATION IMPACT ASSESSMENT

6.1 Proposed Construction Hours

Where possible, works should be completed during the standard daytime construction hours of Monday to Friday 7.00am to 6.00pm and Saturday 8.00am to 1.00pm. Where Out-of-Hours Works (OOHWs) are required (for emergency works/delivery, etc) it is likely that they would require separate approval.

6.2 Noise Management Levels – Interim Construction Noise Guideline (EPA, 2009)

The NSW EPA *Interim Construction Noise Guideline (ICNG)* requires project-specific Noise Management Levels (NMLs) to be established for noise affected receivers. In the event construction noise levels are predicted to be above the NMLs, all feasible and reasonable work practices are investigated to minimise noise emissions.

Having investigated all feasible and reasonable work practices, if construction noise levels are still predicted to exceed the NMLs then the potential noise impacts would be managed via site specific construction noise management plans, to be prepared in the detailed design phase. **Table 6-1** and **Table 6-2** detail the *ICNG* noise management levels.

Table 6-1 Interim Construction Noise Guideline Criteria at Residences

Time of Day	NML	How to Apply
Standard Hours	Noise Affected RBL+10 dBA	The noise affected level represents the point above which there may be some community reaction to noise. Where the predicted or measured $L_{Aeq}(15min)$ 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 dBA	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: - 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; - if the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.

Time of Day	NML	How to Apply
Outside Standard Hours	Noise Affected RBL+5 dBA	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 dBA above the noise affected level, the proponent should negotiate with the community. For guidance on negotiating agreements see section 7.2.2 of the ICNG.

Table 6-2 Interim Construction Noise Guideline Criteria at sensitive land uses (other than residences)

Land Use	Management level ¹ $L_{Aeq,15min}$
Industrial premises	External noise level 75 dB(A)

Note 1: Applies when properties are being used.

Based on the above, **Table 6-3** presents the applicable noise management levels for construction activities at surrounding receivers that have been adopted for all applications. We note that these criteria will be conservative, as they use the minimum assumed RBLs as discussed in section 3.2.1.

Table 6-3 Site-Specific Construction Noise Management Levels

Receiver Type	Construction Noise Management Level (NMLs) - $L_{Aeq,15min}$				Highly Noise Affected Noise Level - $L_{Aeq,15min}$
	Day Standard Hours	Day OOH	Evening OOH	Night OOH	
Residential ¹	45	40	35	35	75
Industrial ²	75	75	75	75	NA

Note 1: The same RBL will be used for all residential receivers.

Note 2: Applies when in use.

6.3 Vibration Management Levels

When assessing vibration there are two components that require consideration:

- human exposure to vibration; and
- the potential for building or structure damage from vibration

There are currently no Australian Standards or guidelines to provide guidance on assessing the potential for building damage from vibration. It is common practice to derive goal levels from international standards.

British Standard BS 7385:1993 and German Standard DIN 4150:2016 both provide goal levels, below which vibration is considered insufficient to cause building damage. Of these, DIN 4150 is the more stringent.

6.3.1 Sydney Water Specialist Engineering Guideline

There are two above ground public water supply pipelines running along the northern boundary of the site which are the property of Water NSW. The threshold vibration limits for underground assets are provided in Table 6 of Sydney Water's *Specialist Engineering Assessment* guideline, reproduced in **Table 6-4**. However, it is noted that these criteria are specified for underground services only, and there are no criteria stipulated for above ground assets. In the absence of specialised criteria for above ground services, it is recommended to screen the risk of effects based on DIN 4150-3:2016

Table 6-4: Sydney Water Threshold Vibration Limits for Buried Assets

Asset Type	Threshold values for velocity (PPV) measured on the asset in mm/s
Brittle Pipe assets – RC, VC/ EW, CICL	Maximum PPV for intermittent vibrations 10mm/s
	Maximum PPV for continuous vibrations 5mm/s
Ductile Pipe assets – SCL, DI, PVC, PE, PP, GRP	Maximum PPV for intermittent vibrations 20mm/s
	Maximum PPV for continuous vibrations 10mm/s
Masonry	3 mm/s
Unreinforced concrete	3 mm/s

Note: Table 6 is applicable for buried assets, in sound condition, and laid in a typical soil trench in stable ground. Alternative criteria shall be developed for other asset types, above ground assets, concrete encased pipes, pipes on piled/ special supports and pipes in tunnels or of other unusual construction or ground conditions.

6.3.2 Construction Noise & Vibration Strategy (TfNSW, 2023)

In order to limit the risk of vibration based damage, minimum working distances for typical vibration intensive construction equipment are provided in the Transport for NSW's (TfNSW) *Construction Noise and Vibration Strategy (CNVS)*. The minimum working distances presented in Appendix D of the *CNVS* are based on the vibration criteria for cosmetic damage to structures given in British Standard BS 7358-2:1993 - *Evaluation and measurement for vibration in buildings – Part 2 for typical buildings*, and for effects to human comfort (from the NSW EPA *Assessing Vibration – A Technical Guideline*).

Empirical data has been used to suggest screening distances at which if vibration intensive works are conducted outside these distances, adverse vibration impacts are unlikely.

The recommended minimum working distances for vibration intensive activities from the *CNVS* are presented in **Table 6-5**. The empirical data has also been extrapolated to provide screening distances as concerns DIN 4150-3 criteria.

Table 6-5 Recommended Minimum Working Distances from Vibration Intensive Equipment

Plant Item	Approx. Size / Weight / Model	Minimum Distance		
		Cosmetic Damage (BS 7385)	Cosmetic Damage (DIN 4150-3)	Human Response (NSW EPA Guideline)
Vibratory Roller	1-2 tonnes	5 m	14 m	15 m to 20 m
	2-4 tonnes	6 m	16 m	20 m
	4-6 tonnes	12 m	33 m	40 m
	7-13 tonnes	15 m	41 m	100 m
	13-18 tonnes	20 m	54 m	100 m
	> 18 tonnes	25 m	68 m	100 m
Small Hydraulic Hammer	300 kg (5t to 12t excavator)	2 m	5 m	7 m
Medium Hydraulic Hammer	900 kg (12t to 18t excavator)	7 m	19 m	23 m
Large Hydraulic Hammer	1600 kg (18 to 34t excavator)	22 m	60 m	73 m
Pile Driver – Vibratory	Sheet Piles	2 m to 20 m	50 m	20 m
Piling Rig – Bored	≤ 800 mm	2 m (nominal)	5 m	4 m
Piling Rig – Hammer	12 t down force	15 m	2 m	50 m
Jackhammer	Handheld	1 m (nominal)	14 m	Avoid contact with structure

6.4 Construction Noise Assessment

Noise modelling of the construction noise emissions was undertaken using the CadnaA version 2023 modelling software.

The noise model was constructed from a combination of aerial photography, existing ground topography, design ground topography and proposed design. The local terrain, receiver buildings and structures have been digitised in the noise model to develop a three-dimensional representation of the construction works and surrounding environment.

6.4.1 Proposed Works

At this stage, a detailed list of equipment likely to be used during the construction project was not provided. Therefore, based on experience from similar projects, the construction project is divided into three separate work stages. The typical equipment expected to be used is also assumed in each construction stage. The stages and assumptions include:

- Stage 1: Site Clearing, Demolition, and Remediation/Earthworks
 - Typical plant will be dozer/front end loader, haul trucks, and excavators
 - It has been assumed that no rock-breaking would be required.
 - Total sound power level for such works is typically 112 dBA to 118dBA
- Stage 2: Concrete Works
 - Bored piling/auger expected in this stage initially
 - Concrete trucks and pumps will largely dominate the main works in this stage
 - Total sound power level for such works is typically 105 dBA to 109 dBA for bored piling but during the concreting part of this stage, typically 108 dBA to 115 dBA is expected depending on the number of teams of trucks and pumps.
- Stage 3: Building Construction
 - This stage is largely expected to include truck deliveries, cranes, and the use of elevated platforms and powered hand tools.
 - There will be up to several teams on each warehouse with expected sound power levels of 108 dBA to 114 dBA expected with some of the work elevated to greater than 10 m when roofing works are being conducted.

Given the early stage of the Project, preliminary assumptions to provide noise predictions are provided in **Table 6-6**. These assumptions can be revisited at detailed design stage and once a construction contractor has been appointed.

Table 6-6 Indicative Construction Noise Source Levels, $L_{Aeq,15min}$ dBA

Stage	Total Sound Power Level ($L_{Aeq,15min}$)
Stage 1 – Site Clearing, Demolition, and Remediation/Earthworks	118
Stage 2 –Concrete Works	115
Stage 3 – Building Construction	114

Consistent with the requirements of the *ICNG*, and to inform the scheduling of construction activity and management of noise during the detailed design phase, the construction noise impacts are based on an expected typical worst-case scenario. The *ICNG* recommends that the realistic worst-case or conservative noise levels from the source should be predicted for assessment locations representing the most noise exposed residences or other sensitive land uses. For each receiver area the noise levels are predicted at the most noise-exposed location, which would usually be the closest receiver.

For most construction activities, it is expected that the construction noise levels would frequently be lower than predicted at the most-exposed receiver as the noise levels presented in this report are based on a realistic worst-case assessment.

6.4.2 Predicted Construction Noise Levels

Preliminary noise levels from construction activities have been quantitatively assessed for the receivers surrounding the Site. The activities considered are described in Section 6.4.1.

These results assume the standard meteorological conditions outlined in Section 4.3.

The typical worst case $L_{Aeq,15min}$ noise levels at the surrounding receivers are provided in **Table 6-7**. Each of the construction activities are representative of the 'noisiest' construction periods where there may be simultaneous operation of noise intensive construction plant on site. It is anticipated that construction will occur during standard hours only.

Table 6-7 Predicted Construction Noise Impacts

Stage	Receiver	Noise Level – L _{Aeq,15min} dBA						
		Predicted Noise Level at Nearest Receivers ¹		Noise Affected Noise Management Levels (NMLs)				Highly Noise Affected NML
		Std MET	NE MET	Day Standard	Day OOH	Eve OOH	Night OOH	
Demolition & Earthworks	Woodpark	<44	<45	45	40	35	35	75
	Greystanes	<42	<44	45	40	35	35	75
	Industrial	61-71	62-71	75	75	75	75	NA
Concrete Works	Woodpark	<48	<49	45	40	35	35	75
	Greystanes	<43	<44	45	40	35	35	75
	Industrial	60-70	61-70	75	75	75	75	NA
Building Construction	Woodpark	<48	<49	45	40	35	35	75
	Greystanes	<43	<44	45	40	35	35	75
	Industrial	60-70	61-70	75	75	75	75	NA

Note 1: Standard MET conditions.

The results of the assessment can be summarised as follows:

- No exceedances to the NMLs at industrial receivers at any times
- No exceedances to the NMLs in the suburb of Greystanes during standard hours

- Minor exceedances of up to 4 dB to the NMLs in the suburb of Woodpark during standard hours with adverse meteorological conditions, and up to 3 dB during standard meteorological conditions, during concrete works and building works
- No exceedances to the highly noise affected NML are expected
- The NMLs are based on the minimum assumed RBLs in the *Npfi*; in reality, it is likely that the noise levels in Woodpark and Greystanes (and therefore the NMLs) are higher than what has been assumed.

The above conclusions apply to a worst-case scenario, in which works occur in the regions of site in closest proximity to the receivers. Only the nearest receivers in the suburb of Woodpark may exceed NMLs during standard hours for concreting works. Measures to manage construction noise emissions are discussed in Section 6.4.3.

6.4.3 Construction Noise Mitigation

As discussed in Section 6.4.2, noise levels from construction activities during standard hours may marginally exceed the NMLs of the *ICNG* at the nearest receivers in the suburb of Woodpark. Therefore, in accordance with the *ICNG*, all reasonable and feasible measures should be applied to manage construction noise emissions from the site. In particular, the following is recommended:

A detailed Construction Noise and Vibration Management Plan (CNVMP) should be prepared and should include, but not be limited to the following:

- Identification of nearby residences and other sensitive land uses;
- Description of approved hours of work;
- Description and identification of construction activities, including work areas, equipment and duration;
- Description of what work practices (generic and specific) will be applied to minimise noise;
- Consider the selection of plant and processes with reduced noise emissions;
- A complaints handling process;
- Noise monitoring procedures;
- Overview of community consultation required for identified high impact works;
- Overview of community consultation process and assessment required for identified additional works outside of standard construction hours; and
- Induction and training will be provided to relevant staff and sub- contractors outlining their responsibilities regarding to noise.

Examples of typical construction noise mitigation measures are provided in **Table 6-8**, along with the likely reduction in noise levels. Where reasonable and feasible, these measures should be employed during the construction of the development.

Table 6-8 Indicative Construction Noise Mitigation Measures

Mitigation Measure	Anticipated Noise Reduction, dBA
Administrative Controls	
Operate during approved hours	N/A

Mitigation Measure	Anticipated Noise Reduction, dBA
Undertake regular noise monitoring to determine the impact of operating plant on sensitive receivers	N/A
Appropriate training of onsite staff	N/A
Undertake community consultation and respond to complaints in accordance with established project procedures	N/A
Turning off machinery when not in use	0-5
Respite periods for pile drivers and rock breakers (if applicable)	N/A
Conducting regular maintenance of plant to ensure that they are operating as efficiently and quietly as practicable	N/A
Engineering Controls	
Portable temporary screens	5-10
Screen or enclosure for stationary equipment	10-15
Maximising the offset distance between noisy plant items and sensitive receivers	3-6
Avoiding using noisy plant simultaneously and / or close together, adjacent to sensitive receivers	2-3
Orienting equipment away from sensitive receivers	3-5
Carrying out loading and unloading away from sensitive receivers	3-5
Using dampened tips on rock breakers	3-6
Using noise source controls, such as the use of residential class mufflers, to reduce noise from all plant and equipment including bulldozers, cranes, graders, excavators and trucks	5-10
Selecting site access points and roads as far as reasonably practicable away from sensitive receivers	3-6
Using spotters, closed circuit television monitors, "smart" reversing alarms, or "squawker" type reversing alarms in place of traditional reversing alarms	2-5
Employ non-noise-generating structures such as site offices, storage sheds, stockpiles, and tanks as noise barriers	5-10

6.5 Construction Vibration Assessment – Building Damage & Human Comfort

Based on the CNVS's recommended minimum working distances for vibration sensitive equipment (refer to **Table 6-5**), no vibration impacts are predicted at any residential receiver.

Vibration impacts are possible at neighbouring industrial sites if vibration intensive equipment is to be operated in close proximity to the site boundary. Should these pieces of plant be operated within the minimum recommended distances of the CNVS of a sensitive receiver, or if there are any other vibration intensive plant items that the Contractor has concerns for causing disruption at a neighbouring receiver, it is recommended that a preliminary vibration survey (typically attended vibration measurements) be undertaken of each vibration generating piece of plant.

This vibration survey will determine whether there will be any exceedances of the relevant construction vibration criteria. If exceedances are observed, vibration mitigation and management strategies can be developed to minimise vibration impacts as far as practicable, and ideally to be compliant with the vibration criteria.

The vibration management strategy may also include the installation of unattended vibration monitors at sensitive receivers to notify the contractor of any exceedances of the vibration criteria. Any such vibration management strategy should be developed as part of a CNVMP.

6.6 Construction Vibration Assessment – Underground Pipework

The nearest pipeline is approximately 3 meters from the northern site boundary. Based on the safe working distances derived for German Standard DIN 4150-3:2016 presented in **Table 6-5**, there is a potential risk of vibration impacts to the Sydney Water pipeline if certain equipment is used on or near the northern boundary.

Should any plant be operated within the minimum recommended distances of the CNVS of the pipeline, or if there are any other vibration intensive plant items that the Contractor has concerns for, it is recommended that a preliminary vibration survey (typically attended vibration measurements) be undertaken of each vibration generating piece of plant.

This vibration survey will determine whether there will be any exceedances of the relevant construction vibration criteria. If exceedances are observed, vibration mitigation and management strategies can be developed to minimise vibration impacts as far as practicable, and ideally to be compliant with the vibration criteria.

The vibration management strategy included in the CNVMP should address potential vibration impact on the pipeline and should be developed in consultation with Sydney Water.

7 CONCLUSION

This Acoustic Report was prepared by RWDI Australia on behalf of Lendlease Investment Management Pty Ltd in support of a State Significant Development Application for the multi-storey warehouse redevelopment at 15-21 Britton Street Smithfield, NSW 2164.

Due to the significant distance between the Site and the nearest residential receiver, no noise logging has been conducted for this Project. Instead, noise criteria were conservatively derived from the minimum assumed RBLs set in the *Npfl*. An operational noise assessment was conducted and indicated that no exceedances to the relevant criteria are predicted.

Based on high level assumptions, no exceedances to Noise Management Levels are predicted at the industrial receivers or the suburb of Greystanes during the construction phase, assuming standard construction hours. Minor exceedances of up to 4 dB are predicted depending on MET conditions at the nearest receivers in the suburb of Woodpark during standard hours. However, the NMLs for the residential receivers are based on the minimum assumed RBLs in the *Npfl*. It is likely that the noise levels in Woodpark and Greystanes (and therefore the NMLs) are higher than what has been assumed.

All reasonable and feasible construction noise mitigation measures should still be implemented. A Construction Noise Management Plan should be developed collaboratively with the builder prior to construction.

No construction vibration impacts are predicted at residential receivers, provided that the safe working distances presented in this report are adhered to.

Vibration impacts are possible at neighbouring industrial sites and to the Sydney Water pipeline if vibration intensive equipment is to be operated in close proximity to the site boundary. Should relevant pieces of plant be operated within the minimum recommended distances of the CNVS, or if there are any other vibration intensive plant items that the Contractor has concerns for causing disruption at a neighbouring development or at the pipeline, it is recommended that a preliminary vibration survey (typically attended vibration measurements) be undertaken of each vibration generating piece of plant.

The vibration management strategy included in the CNVMP should address potential vibration impact on the pipeline and should be developed in consultation with Sydney Water.

The nearest residential receivers potentially affected by an increase in traffic noise are located next to the Cumberland Highway to the north-east of the site. The assessment indicated that the increase in noise level due to the additional traffic generated by the proposal is considered as barely perceptible to the average person and is unlikely to result in any adverse impacts on residential receivers.



STATEMENT OF LIMITATIONS

This report entitled *Smithfield Industrial Facility – Noise & Vibration Impact Statement*, dated 14 June 2024 was prepared by RWDI Australia (“RWDI”) for Lendlease Investment Management Pty Ltd (“Client”). The findings and conclusions presented in this report have been prepared for the Client and are specific to the project described herein (“Project”). The conclusions and recommendations contained in this report are based on the information available to RWDI when this report was prepared. Because the contents of this report may not reflect the final design of the Project or subsequent changes made after the date of this report, RWDI recommends that it be retained by Client during the final stages of the project to verify that the results and recommendations provided in this report have been correctly interpreted in the final design of the Project.

The conclusions and recommendations contained in this report have also been made for the specific purpose(s) set out herein. Should the Client or any other third party utilize the report and/or implement the conclusions and recommendations contained therein for any other purpose or project without the involvement of RWDI, the Client or such third party assumes any and all risk of any and all consequences arising from such use and RWDI accepts no responsibility for any liability, loss, or damage of any kind suffered by Client or any other third party arising therefrom.

Finally, it is imperative that the Client and/or any party relying on the conclusions and recommendations in this report carefully review the stated assumptions contained herein and to understand the different factors which may impact the conclusions and recommendations provided.