

NOISE MANAGEMENT PLAN

COURTNEY DRIVE, UPPER COOMERA QLD 4209, STAGE 4 & 5



Document Control Sheet

Issue 1	Name	Signature
Prepared	Michael Jabbour	
Checked & Approved By	Michael Jabbour	

Document Revision Record

Issue Number	Date	Revision Details
1	10 th February 2025	Issue

Prepared By:	Aaron Fysh	Date Revised:	8.03.2024	Document No:	1458-S100-WIN-ENV-NMP-0002
Approved By:	Michael Jabbour	Date Approved:	12.03.2024	First Issued:	12/03/2024
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1 Introduction

HB QLD Pty Ltd (HB Land) have been engaged by Winslow to develop a Noise Management Plan (NMP) for the proposed Construction of a residential subdivision on Courtney Drive Stage 4 & 5 Upper Coomera Queensland 4209 (hereafter referred to as 'the site'). The site location and boundary has been further illustrated in **Figure 1**. It is understood from the information received from the client that the proposed works are to include the following:

- Bulk earthworks;
- Clearing and grubbing;
- Stormwater reticulation construction;
- Sewer reticulation construction;
- Watermain Reticulation Construction;
- Retaining Wall Construction;
- roadworks including concrete works and footpaths ; and
- Electrical installation.

Noise sensitive receptors as defined by the *Environmental Protection (Noise) Policy* 2019 (hereby referred to as 'the Policy') are located nearby the demolition site. Further details have been provided within **Section 4.2**. Noise assessments are undertaken as part of an environmental impact assessment to ensure that noise emissions comply with the Environmental Protection (Noise) Regulations 1997. long-term environmental noise exposure has been linked to community health impacts.

Movement of materials, demolition activities, and activities involving use of power tools have the potential to contribute to noise emissions, potentially impacting human health and the amenity value of the site if not effectively managed. As such, management is proposed in line with the *EP Act 1986 Section 49 and the Noise Regulations 1987*.

1.1 Objective

The objective of this NMP is to ensure appropriate management measures are implemented during the proposed works at the site to minimize potential noise impacts. Objectives of managing noise include:

- Provide a description of the proposed works;
- Identify the nearest sensitive receptors;
- Provide a description of the noise criteria within the Policy;
- The minimisation of noise on the construction site;

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- The provision of an effective communication link between adjoining residents and the construction site for the management of complaints regarding noise; and
- Assess the potential noise impacts.

1.2 Legislation

It is a requirement of the Queensland Government that noise and vibration limits for human comfort are met during active hours of demolition and construction activities. Queensland Government and the Gold Coast City Council ensures that the *Environmental Protection Act 1994* is referred to in order to establish a set of criteria restricting audible noise concentrations during construction works. Maximum internal noise criteria and predicted sound pressure levels are determined using the following Australian Standards:

- Australian Standard AS2436-2010 Guide to noise control on construction, maintenance, and demolition sites; and
- AS/NZS 2107: 2016 Acoustics – Recommended design sound levels and reverberation times for building interiors.

Maximum internal noise criteria and predicted sound pressure levels are determined using the Australian Standard AS/NZS 2107: 2016 Acoustics – Recommended design sound levels and reverberation times for building interiors.

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2 Description Proposal

Noise minimisation strategies incorporating industry best practice procedures and controls will be adopted to manage all noise generating activity within the work area, when managing the generation of noise, the most effective method is to ensure work practices generate minimal noise through alternative equipment or with silencer or muffler devices, this will additionally aid in reducing the impact on the sensitive areas on the site.

2.1 Site general description

The Construction work will take place at Courtney Drive Upper Coomera Queensland 4209; According to the Department of Planning, Land and Heritage database, the site is within the redevelopment area of interest, in line with the Urban Development Master Plan for Upper Coomera. Zoning and land use classification contribute to the diverse character of the site, combining elements of community facilities, open spaces, and potentially residential components.

2.2 Description of the proposed work

The proposed machinery/Equipment is listed below in Section 2.4. For the purposes of this Noise Management Plan, it will be assumed that the equipment listed will be operated in different stages and, as such, each phase provides potential noise impacts for receivers. In line with information supplied by Winslow, the project comprises of work at Courtney Drive Upper Coomera Queensland 4209. **Table 2.1** describes the phases of the project and activities to be undertaken during Construction work:

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Table 2.1 - Project Phases

Stage of Project	Methodology	Status
Stage 1	1.1 Bulk Earthworks and 1.2 Civils Works	Complete
Stage 2	2.1 Bulk Earthworks 2.2 Civils Works	In Progress
Stage 3	3.1 Civil Works	In Progress
Stage 4	4.1 Bulk Earthworks 4.2 Civil Works	In Progress
Stage 5	5.1 Bulk Earthworks 5.2 Civil Works	In Progress

2.3 Timing of Project

The aforementioned project located at Courtney Drive Upper Coomera Queensland 4209 is expected to be commenced on 1st March 2025. Overall, it is estimated that site operations will take 30 weeks to complete by September 2025.

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2.4 Equipment

The equipment required during the execution of the project is below in **Table 2.2**

Table 2.2 Proposed Machinery/equipment

Units	Machinery / Equipment
2	Dozers (D8)
1	Dozer (D10)
1	Mulcher
5	Excavators
3	Compactors 815/825
3	Rollers
5	Articulated Dump Trucks 40ton /45ton
1	Grader
More than 1	Watercarts sizes up to 35kL Articulated
More than 1	Trucks (Delivery of concrete & quarry materials)
	Various earthmoving plant and machines

2.5 Hours of work

According to the *Environmental Protection Act 1994*, Division 3 Default noise standards - 440R Building work, construction work must be carried out between 6.30 a.m. to 6.30 p.m. Monday to Saturday; Therefore, the project activities will be carried out within the hours of 6.30 am to 6.00pm, Monday to Saturday at Courtney Drive Upper Coomera Queensland 4209; No work on Sundays or Public Holidays is expected.

2.6 Noise Level of Equipment and Processes

The noise generating machinery and equipment expected to be used during the operating hours of the project being carried out at the site are estimated and included in **Table 2.3**. Noise levels are derived from Australian Standard *AS2436-2010 Guide to noise control on construction, maintenance, and demolition sites*. Table A1 of

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Appendix A.

Table 2.3 Equipment expected to be used during the operating hours.

Equipment	Indicative Sound Power Level (mid-point)	Indicative Sound Pressure Level at 10m Distance
Excavators	107	79
Watercarts	107	79
Trucks	107	79
Rollers	108	80
Dozers	109	80
Mulcher	109	80
Grader	110	82
Compactors	113	85
Trucks (Dump)	117	89

The Indicative Sound Power Level (mid-point) from each piece of machinery has been used to calculate the combined A-weighted Sound Power Level for the site works. This calculation is explained in Section 5 of this Management Plan.

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3 Noise Standards

3.1 Queensland environmental Law

In Queensland, the environmental impacts of noise emissions associated with environmentally relevant activities are regulated under the Environmental Protection Act 1994 and subordinate legislation, including the Environmental Protection Regulation 2019 and the Environmental Protection (Noise) Policy 2019.

3.2. Noise Standards

The *Environmental Protection (Noise) Policy 2019* regulates the level of noise emitted from any premise or public place that can be received at other premises. Schedule 1 stipulates the maximum allowable external noise levels with the combination of base levels, as shown in **Table 3.1** below. These are based on **Table 1** of Appendix A of The Australian Standards.

Table 3.1 Baseline Assigned Noise Levels for all works.

Sensitive receptor	Time of day	Acoustic quality objectives (measured at the receptor) <i>dB(A)</i>			Environmental value
		<i>L</i> _{Aeq,adj,1hr}	<i>L</i> _{A10,adj,1hr}	<i>L</i> _{A1,adj,1hr}	
Residence (for outdoors)	Daytime and evening	50	55	65	health and wellbeing
Residence (for indoors)	Daytime and evening	35	40	45	health and wellbeing
	Nighttime	30	35	40	health and wellbeing, in relation to the ability to sleep
Library and educational institution (including a school, college and university) (for indoors)	when open for business or when classes are being offered	35			health and wellbeing
Childcare centre or kindergarten (for indoors)	when open for business, other than when the children usually sleep	35			health and wellbeing
Childcare centre or kindergarten (for	when the children usually sleep	30			health and wellbeing, in relation to the

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Sensitive receptor	Time of day	Acoustic quality objectives (measured at the receptor) dB(A)			Environmental value
		L _{Aeq,adj,1hr}	L _{A10,adj,1hr}	L _{A1,adj,1hr}	
indoors)					ability to sleep
School or playground (for outdoors)	when the children usually play outside	55			health and wellbeing, and community amenity
Hospital, surgery or other medical institution (for indoors)	visiting hours	35			health and wellbeing
Hospital, surgery or other medical institution (for indoors)	anytime, other than visiting hours	30			health and wellbeing, in relation to the ability to sleep
Commercial and retail activity (for indoors)	when the activity is open for business	45			health and wellbeing, in relation to the ability to converse
Protected area or critical area	anytime	the level of noise that preserves the amenity of the existing area or place			Health and biodiversity of ecosystems
Marine Park	anytime	the level of noise that preserves the amenity of the existing marine park			Health and biodiversity of ecosystems
Park or garden that is open to the public (whether or not on payment of an amount) for use other than for sport or organised entertainment	anytime	the level of noise that preserves the amenity of the existing park or garden			Community amenity

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Due to the lack of specific clarification within the Environmental Protection (Noise) Policy 2019, the Environmental Protection (Noise) Regulations 1997 may be considered appropriate for further calculations in this report. The Environmental Protection (Noise) Regulations 1997 (as amended 2017) regulates the level of noise emitted from any premise or public place that can be received at other premises. Regulations 7 and 8 stipulate the maximum allowable external noise levels with the combination of base levels, as shown in **Table 3.2** below, to an influencing factor. These are based on Table 1 of Appendix A of The Australian Standards.

Table 3.2. Baseline Assigned Noise Levels for all works.

Type of premises receiving noise	Time of day	Assigned level (dB)		
		L _{A10}	L _{A1}	L _{Amax}
Noise sensitive premises: highly sensitive area	0700 to 1900 hours Mon-Sat	45+IF	55+IF	65+IF
	0900 to 1900 hours Sun and Pub Hols	40+IF	50+IF	65+IF
	1900 to 2200 hours all days	40+IF	50+IF	55+IF
	2200 to 0700 Mon to Sat 2200 to 0900 Sun and Pub Hols	35+IF	45+IF	55+IF
Noise sensitive premises: any area other than highly sensitive area	All hours	60	75	80
Commercial premises	All hours	60	75	80
Industrial and utility premises other than those in the Industrial Area	All hours	75	85	90

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4 Noise Sensitive Receptors

The Environmental Protection (Noise) Regulations 1997 Schedule 3 indicates that two concentric circles, having radii of 100m and 450m, are required to determine noise sensitive receptors. The distance to sensitive receptors is measured from the boundary of the proposed prescribed premise to the boundary of the residential/public purpose Lot.

There are 45 sensitive receptors located within 100m of the construction site. This has been detailed and listed below in **Table 4.1**. The location of these sensitive receptors has been outlined in **Figure 2**.

Table 4.1. Distance from construction works to noise-sensitive receptors (<100m)

Receiver	Description	Location	Proximity to site boundary (m)
1	Residential	33 Gordon dr, upper Coomera QDL 4209	79.8
2	Residential	4 Patterson ct, upper coomera QDL 4209	50
3	Residential	31 Gordon dr, upper coomera QDL 4209	98
4	Residential	7 Patterson ct, upper coomera QDL 4209	20
5	Residential	5 Patterson ct, upper coomera QDL 4209	20
6	Residential	3 Patterson ct, upper coomera QDL 4209	53
7	Residential	6 Mackellar dr, upper coomera QDL 4209	3
8	Residential	4 Mackellar dr, upper coomera QDL 4209	33
9	Residential	2 Mackellar dr, upper coomera QDL 4209	62
10	Residential	5 Mackellar dr, upper coomera QDL 4209	2
11	Residential	3 Mackellar dr, upper coomera QDL 4209	26
12	Residential	1 Mackellar dr, upper coomera QDL 4209	53
13	Residential	23 Gordon dr, upper coomera QDL 4209	2
14	Residential	4113/25 Gordon dr, upper coomera QDL 4209	26
15	Residential	21 Gordon dr, upper coomera QDL 4209	28
16	Residential	79 Courtney dr, upper coomera QDL 4209	13
17	Residential	19 Gordon dr, upper coomera QDL 4209	41
18	Residential	17 Gordon dr, upper coomera QDL 4209	59
19	Residential	15 Gordon dr, upper coomera QDL 4209	60
20	Residential	13 Gordon dr, upper coomera QDL 4209	61
21	Residential	11 Gordon dr, upper coomera QDL 4209	50.5
22	Residential	9 Gordon dr, upper coomera QDL 4209	48.5

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Receiver	Description	Location	Proximity to site boundary (m)
23	Residential	65 Courtney dr, upper coomera QDL 4209	13
24	Residential	7 Gordon dr, upper coomera QDL 4209	65
25	Residential	5 Gordon dr, upper coomera QDL 4209	66
26	Residential	3 Gordon dr, upper coomera QDL 4209	103
27	Residential	42 Richardson cres, upper coomera QDL 4209	107
28	Residential	40 Richardson cres, upper coomera QDL 4209	116
29	Residential	2 Gordon dr, upper coomera QDL 4209	130
30	Residential	36 Richardson cres, upper coomera QDL 4209	170
31	Residential	4 Gordon dr, upper coomera QDL 4209	128
32	Residential	8 Gordon dr, upper coomera QDL 4209	111
33	Residential	9 Gordon dr, upper coomera QDL 4209	111
34	Residential	10 Gordon dr, upper coomera QDL 4209	110.9
35	Residential	12 Gordon dr, upper coomera QDL 4209	111
36	Residential	14 Gordon dr, upper coomera QDL 4209	114
37	Residential	16 Gordon dr, upper coomera QDL 4209	91
38	Residential	18 Gordon dr, upper coomera QDL 4209	65
39	Residential	20 Gordon dr, upper coomera QDL 4209	70
40	Residential	96 Courtney dr, upper coomera QDL 4209	76
41	Residential	94 Courtney dr, upper coomera QDL 4209	138
42	Residential	90 Courtney dr, upper coomera QDL 4209	112
43	Residential	76 Courtney dr, upper coomera QDL 4209	103
44	Residential	68 Courtney dr, upper coomera QDL 4209	111
45	Residential	64 Courtney dr, upper coomera QDL 4209	145

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5 Calculations

5.1. Sensitive Premises Defined in the Regulations

For the purpose of determining assigned levels for each sensitive receptor and estimating the noise impacts of construction works being undertaken at the site, land use will be defined into noise-sensitive, commercial, and industrial land uses, as defined in Schedule 1 of the Regulations.

5.1.1 100m Buffer Zone

The proportions of the land within 100m of the site boundary are detailed in **Table 5.1** below.

Table 5.1. Land use distribution within 100m

Land Use	Percentage (%) Cover
Noise-sensitive	90
Commercial	0
Industrial	0
Vacant/under construction/roads/verges	10

5.1.2 450m Buffer Zone

The proportions of the land within 450m of the site boundary are detailed in **Table 5.2** below.

Table 5.2. Land use distribution within 450m

Land Use	Percentage (%) Cover
Noise-sensitive	70
Commercial	10
Industrial	0
Vacant/under construction/roads/verges	20

5.2. Determination of Assigned Levels for noise-sensitive premises

The following calculations represent the assigned level for noise, and is calculated as follows:

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5.2.1. Industrial (I)

$$I = (\% \text{ industrial within 100m buffer} + \% \text{ industrial within 450m buffer}) \times 1/10$$

$$I = (0 + 0) \times 1/10$$

$$I = 0$$

5.2.2. Commercial (C)

$$C = (\% \text{ commercial within 100m buffer} + \% \text{ commercial within 450m buffer}) \times 1/10$$

$$C = (0 + 10) \times 1/10$$

$$C = 1$$

5.2.3. Transport Factor

The impact of traffic is also considered when determining the noise influencing factor. Roads are graded based on their proximity to the site and the volume of traffic that they carry. The influencing factor is calculated as follows:

- Major roads (carrying more than 15,000 vehicles per day) within 100 metres of the site have a transport factor of 6;
- Major roads within 450 metres of the site have a transport factor of 2; and
- Minor roads (carrying 6,000 – 15,000 vehicles per day) within 100 metres of the site have a transport factor of 2.

The transport influencing factor cannot exceed 6.

Traffic data was obtained from the Traffic Census Data – Google Earth Pro from the Queensland Government Open Portal website. Minor roads within 100 metres and there is one major road within 2.95 km of the site. This equates to a transport factor of 2.

5.1.4 Influencing Factor

The Assigned Levels are standard and set out in the Regulations. The calculations incorporate background noise, represented as an influencing factor (IF) which is a reflection of the site characteristics.

$$\text{Influencing Factor} = I + C + TF$$

$$\text{Influencing Factor} = (0 + 1 + 2)$$

$$\text{Influencing Factor} = 3$$

According to the Regulations, the sensitive land use assigned noise limit is outlined in **Table 4.3** below.

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Table 5.3. Assigned noise levels for all works

Type of premises receiving noise	Time of day	Assigned level (dB)		
		L _{A10}	L _{A1}	L _{Amax}
Noise sensitive premises: highly sensitive area	0700 to 1900 hours Mon-Sat	48	58	68

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5.3. Noise estimation within sensitive receptor

To determine the estimated noise generated during the works, calculations have been undertaken using the method listed in Appendix B (Estimating Noise from Sites) of the *Australian Standard (AS) 2436:2010- Guide to Noise and vibration control on Construction, demolition, and Maintenance Sites*. This method accounts for the sound level of the equipment and the distance of receptors from the noise source. All areas listed in **Table 4.1** have been taken into consideration as sensitive noise receptors. The typical sound levels from construction, maintenance, and demolition plant equipment listed in Table A1 of Appendix A of AS 2436- 2010 have been used to estimate the equipment for the project (**Tables 2.2. and 2.3**). The calculations have been based on a worst-case scenario with all equipment operating simultaneously, however, it should be noted that it is unlikely all equipment will be operating at the same time. The results of these calculations are displayed in **Table 5.4 and 5.5** and the detailed calculations are included in **Appendix A**.

Table 5.4 Cumulative sound pressure level (L_{wa}) of proposed site equipment

Equipment	Indicative Sound Pressure Level at 10m Distance	Cumulative Sound Pressure Level (L_{wa}) (dB)
Trucks (Dump)	89	-
Compactors	85	90
Grader	82	91
Rollers	80	91
Dozers	80	91
Mulcher	80	91
Excavators	79	91
Watercarts	79	91
Trucks	79	91

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Table 5.5 List of receptors areas of the site and assigned noise level

Receptor	Distance to Site boundary (m)	Cumulative sound pressure level (L_{wa})	Log Values of distance ($\log_{10}R$)	Estimated Sound Level (L_{pa})	Assigned Level (dBA)- (LA_{max})	Exceeds Assigned Level
33 Gordon dr, upper Coomera QDL 4209	79.8	91	1.9	45	68	No
4 Patterson ct, upper coomera QDL 4209	50	91	1.7	49	68	No
31 Gordon dr, upper coomera QDL 4209	98	91	1.99	43	68	No
7 Patterson ct, upper coomera QDL 4209	20	91	1.3	57	68	No
5 Patterson ct, upper coomera QDL 4209	20	91	1.3	57	68	No
3 Patterson ct, upper coomera QDL 4209	53	91	1.72	49	68	No
6 Mackellar dr, upper coomera QDL 4209	3	91	0.48	73	68	yes
4 Mackellar dr, upper coomera QDL 4209	33	91	1.52	53	68	No
2 Mackellar dr, upper coomera QDL 4209	62	91	1.79	47	68	No
5 Mackellar dr, upper coomera QDL 4209	2	91	0.3	77	68	Yes
3 Mackellar dr, upper coomera QDL 4209	26	91	1.41	55	68	No
1 Mackellar dr, upper coomera QDL 4209	53	91	1.72	49	68	No
23 Gordon dr, upper coomera QDL 4209	2	91	0.3	77	68	Yes

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Receptor	Distance to Site boundary (m)	Cumulative sound pressure level (L_{wa})	Log Values of distance ($\log_{10}R$)	Estimated Sound Level (L_{pa})	Assigned Level (dBA)- ($L_{A_{max}}$)	Exceeds Assigned Level
4113/25 Gordon dr, upper coomera QDL 4209	26	91	1.41	55	68	No
21 Gordon dr, upper coomera QDL 4209	28	91	1.45	54	68	No
79 Courtney dr, upper coomera QDL 4209	13	91	1.11	61	68	No
19 Gordon dr, upper coomera QDL 4209	41	91	1.61	51	68	No
17 Gordon dr, upper coomera QDL 4209	59	91	1.77	48	68	No
15 Gordon dr, upper coomera QDL 4209	60	91	1.78	47	68	No
13 Gordon dr, upper coomera QDL 4209	61	91	1.79	47	68	No
11 Gordon dr, upper coomera QDL 4209	50.5	91	1.7	49	68	No
9 Gordon dr, upper coomera QDL 4209	48.5	91	1.69	49	68	No
65 Courtney dr, upper coomera QDL 4209	13	91	1.11	61	68	No
7 Gordon dr, upper coomera QDL 4209	65	91	1.81	47	68	No
5 Gordon dr, upper coomera QDL 4209	66	91	1.82	47	68	No
3 Gordon dr, upper coomera QDL 4209	103	91	2.01	43	68	No

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Receptor	Distance to Site boundary (m)	Cumulative sound pressure level (L _{wa})	Log Values of distance (Log ₁₀ R)	Estimated Sound Level (L _{pa})	Assigned Level (dBA)- (LA _{max})	Exceeds Assigned Level
42 Richardson cres, upper coomera QDL 4209	107	91	2.03	42	68	No
40 Richardson cres, upper coomera QDL 4209	116	91	2.06	42	68	No
2 Gordon dr, upper coomera QDL 4209	130	91	2.11	41	68	No
36 Richardson cres, upper coomera QDL 4209	170	91	2.23	38	68	No
4 Gordon dr, upper coomera QDL 4209	128	91	2.11	41	68	No
8 Gordon dr, upper coomera QDL 4209	111	91	2.05	42	68	No
9 Gordon dr, upper coomera QDL 4209	111	91	2.05	42	68	No
10 Gordon dr, upper coomera QDL 4209	110.9	91	2.04	42	68	No
12 Gordon dr, upper coomera QDL 4209	111	91	2.05	42	68	No
14 Gordon dr, upper coomera QDL 4209	114	91	2.06	42	68	No
16 Gordon dr, upper coomera QDL 4209	91	91	1.96	44	68	No
18 Gordon dr, upper coomera QDL 4209	65	91	1.81	47	68	No

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20 Gordon dr, upper coomera QDL 4209	70	91	1.85	46	68	No
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Receptor	Distance to Site boundary (m)	Cumulative sound pressure level (L_{wa})	Log Values of distance ($\log_{10}R$)	Estimated Sound Level (L_{pa})	Assigned Level (dBA)- (LA_{max})	Exceeds Assigned Level
96 Courtney dr, upper coomera QDL 4209	76	91	1.88	45	68	No
94 Courtney dr, upper coomera QDL 4209	138	91	2.14	40	68	No
90 Courtney dr, upper coomera QDL 4209	112	91	2.05	42	68	No
76 Courtney dr, upper coomera QDL 4209	103	91	2.01	43	68	No
68 Courtney dr, upper coomera QDL 4209	111	91	2.05	42	68	No
64 Courtney dr, upper coomera QDL 4209	145	91	2.16	40	68	No

The estimated noise levels for the receivers considering the distance between the noise source and the Sensitive receptors, the calculated noise level is shown in **Table 5.5**. Were values of 73 dB and 77 dB were estimated for three of the receptors, which exceed the maximum permitted level for Noise sensitive premises. However, in any case of noise exceedance identified, the noise management measures mentioned in section 6 will become applicable.

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6 Noise Management

Potential construction noise control has been determined in accordance with the guidance of *Australian Standard 2436- 2010 Guide for the control of noise and vibrations in construction, demolition, and maintenance works*, which describes various sources of noise, possible solutions, and their effectiveness. Proposed Controls have also been drawn from the noise assessment.

To effectively manage the impacts of noise on surrounding sensitive receptors and reduce impacts as much as practically possible, the following management methods have been produced to the place:

- All machinery/ equipment proposed across the site will be used in accordance with appropriate manufactures instructions;
- All machinery/ equipment will be kept up to date with service and maintained to ensure no excess noise emissions are received;
- Any non-operational personnel or stakeholders will be required to undertake a site induction to ensure compliance with this management plan;
- Working hours will be as described in Section 2.4 of this report;
- Where a particular machine or activity is found to generate noise levels that exceed the criteria, it may be possible to select an alternate approach or machine. During the Construction works, the equipment will be as quiet as practically possible. All equipment which is used will be maintained to the highest standards throughout the Construction activities or operator to ensure optimum noise attenuator.
- Equipment will be switched off when not in use;
- Where machinery projects noise in a preocular director, the machinery will be positioned as not to direct the noise towards sensitive receptors;
- The use of horns and audible signals will be limited as much as practically possible;
- Equipment will only be used during permitted hours;
- Good relationships must be established with people close to the workplace from the beginning of the project and maintained throughout the project, as this is of utmost importance.
- Where the use of excavators is to be utilised, aggregates within the bucket should not be allowed to fall from excessive heights;
- Temporary screening will be installed around high-risk activities, including the use of saw cutters and excavators during non-standard hours and the use of generators where applicable;
- All site supervisors, contractors and workers will be made aware of the noise limits established for the site and noise control measures to be implemented; and

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- Project Managers should review daily expected noise emissions from activities and prepare options for noise control, providing respite to specific noise-sensitive areas when possible.
- All events exceeding chosen trigger levels will be logged, the email alert system will be activated, and all required personnel will be notified as soon as possible. **Appendix B.**

7 Noise Control Methods

Noise control methods available for the site are outlined below.

7.1 Acoustic Barriers

Barriers or screens can be effective in reducing noise levels and can be located at either the source or the receiver. Barriers at the source are generally only effective for static equipment. The degree of noise reduction achieved is dependent on the extent to which the line of sight is blocked. During work, ear plugs can also be used by project's personnel as a barrier to reduce the effects of elevated noise. If required, ear plugs could be also offered to receptors for short duration of very loud activities.

7.2 Site induction and training

All site supervisors, contractors, and workers will be made aware of the noise limits established for the site and noise control measures to be implemented. Project Managers should review daily expected noise emissions from activities and prepare options for noise control, providing respite to specific noise-sensitive areas when possible.

7.3 Safe work distances

Proposed equipment to be used during the project will be located as much distance as possible between receivers and the working area.

7.4 Strategic Positioning of Processes on Site

Strategic positioning involves formulating work practices to reduce noise exposure at sensitive receptors in close proximity to operations. The following procedures will be adopted on site:

- Where possible, noisy equipment will be located away from sensitive areas, and doors will be ensured to be closed at all times,
- Equipment known to emit a lot of noise in one direction will be oriented so that the noise is not directed towards sensitive receivers, where possible.

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7.5 Relative Effectiveness of Noise Control

Implementation of noise control measures, such as those suggested in Australian Standard 2436-2010 “Guide to Noise Control on Construction, Demolition and Maintenance Sites”, are expected to reduce predicted construction noise levels. **Table 7.1** below presents noise control methods, practical examples, and expected noise reductions according to AS 2436-2010.

Table 7.1 Relative effectiveness of various forms of noise control

Group	Practical Examples	Typical Noise Reduction Possible in Practice (LpA dB)	Max Noise Reduction Possible in Practice (LpA dB)
Distance	Doubling of distance between sources and receiver	6	6
Screening	Acoustic barriers such as earth mounds, temporary or permanent noise barriers	5 - 10	15
Acoustic Enclosures	Engine casing lagged with acoustic. (insolation and plywood)	15 - 20	50
Engine Silencing	Residential class mufflers	5 – 10	20

7.6 Personal Protective Equipment

Personal hearing protectors should be selected and maintained in accordance with AS/NZS 1269.3 Occupational noise management – hearing protector programme; When selecting personal hearing protectors, Consider the necessary attenuation, avoid overprotection, Adapt the protectors to the environment and tasks, manage use and disposal, Evaluate the frequency of use, evaluate comfort and fit, and clearly signal areas requiring hearing protection. Recommended class of hearing protector is included in **Table 6.2**. Class 5 hearing protectors are recommended for workers on this project.

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8 Stakeholder consultation

For the management of noise levels to be effective, it requires continual and direct communication between the contractors, the Local Government Authority, and any other affected parties. This communication link establishes a dynamic response process that allows for the adjustment of work methods and criteria for the benefit of all parties impacted by the proposed activities. An example of a notification letter has been presented in **Appendix C**.

The objectives of the community contact procedure are to:

- Inform all groups about the project and the particles noise control being implemented;
- Increase understanding of potential impacts associated with activities involved during the construction work;
- Identify community concerns so that they can be addressed.

The relevant identified stakeholders of this project include:

- Sensitive receptors within 200m radius of the project area;
- Adjacent residents to the project area;
- Indirectly affected members of the public; and
- Government departments.

8.1 Complaints Management

The client will implement a firm commitment to best work practices, i.e. such that scheduling of activities and selection of equipment are considered to minimise the potential impacts. A community contact/complaints process will be established by the client, whereby the Site Supervisor/ Project Manager ensure any complaints regarding environmental noise levels are recorded, investigated, and followed up with the complainant. The receivers to be notified of remediation works will be based on identified sensitive receptors within section 4 of this NMP. Information regarding any complaints of exceedance of noise levels events must be documented and passed onto the Project Manager for review and action as soon as possible. The following information will be recorded in the incident register. A noise incident register will be maintained as illustrated in **Appendix B**.

The complaints procedure includes:

- Registration of complaint;
- Name and contact details of complainant;
- Date and time of complaint and date and time of occurrence of issue;
- Details of complaint and effect of noise on property.
- Identification of source;

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- Assessment of level;
- Corrective action to mitigate emission if found to be unreasonable;
- Re-assessment to ensure control procedures implements are successful;
- Follow up with complainant; and Close-out.

At the time of receiving the complaint, the client will offer an explanation for the nuisance, if possible. If an explanation cannot be made the person receiving the complaint shall advise the complainant that the matter will be investigated, and the complainant will be notified of the outcome or appropriate action taken.

8.2 Roles and Responsibilities

The roles and responsibilities associated with the implementation of this noise Management Plan, and the point of contact for any complaints, will be the Project Manager/Director. Details are as per **Table 8.1** below.

Table 8.1. Contact details for complaints

Name	Title	Contact number	e-mail
Michael Williams	Senior Project Manager	0472 723 733	michael.williams@winslow.com.au

END OF MANAGEMENT PLAN

DISCLAIMER

This Management Plan is prepared for a particular client objective and is formulated on this basis only. All limitations and conditions in the writing of this Management Plan are clearly agreed to by the client and Winslow prior to its formulation and may not be suitable or applicable for any other use other than that of the original intended objective. No other parties other than the client and Winslow should use this information without firstly conferring with Winslow.

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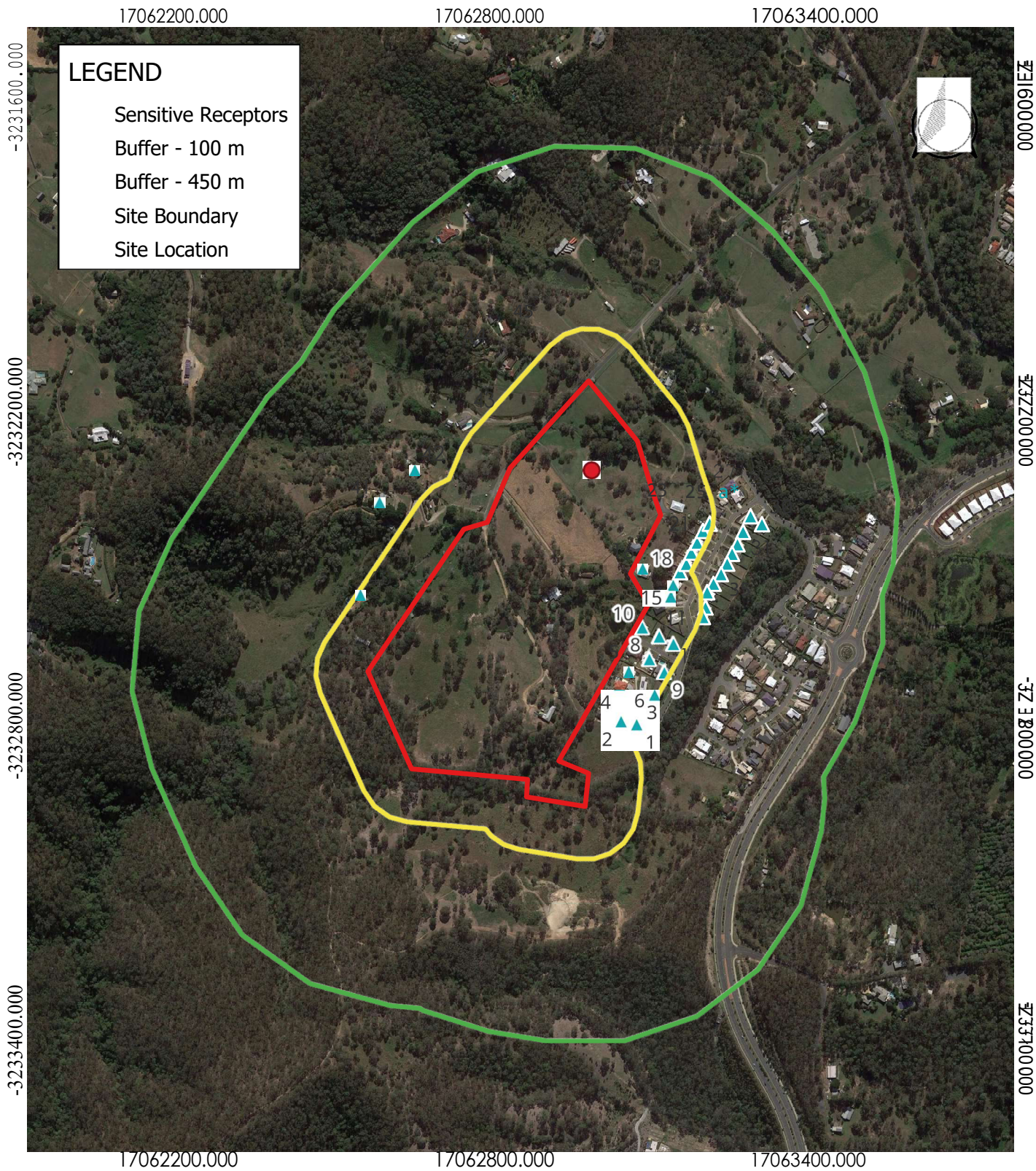
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PREPARED FOR

0 5 10 km



Figure 2 – Sensitive Receptors



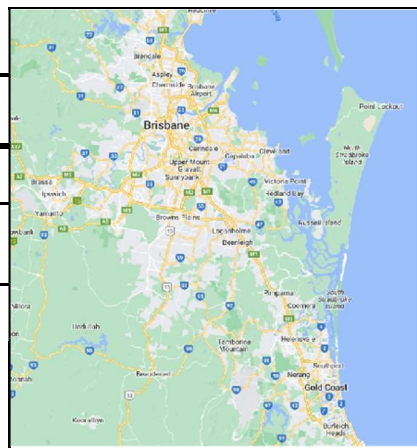
TITLE **Figure 1. Sensitive Receptors - Bufferd 100 m**

PROJECT	Courtney Drive Upper Coomera QLD 4209	PROJECTCODE	170642
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DESIGN/DRAW	LM	Checked By	BD	VERSION	00	DATE	28/11/2023
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PREPARED BY	Source	NearMaps
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PREPARED FOR	Scale	0 5 10 km
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Appendices

Appendix A – A-weighted sound pressure levels

Calculate A-weighted sound pressure levels at the receiving position from each on-site machine and on-site process individually. (AS 2436:2010) The A-weighted sound pressure level was calculated in Section 5 of this document. Assigned Levels were calculated incorporating an Influencing Factor from Part 1, Item 8 Assigned Levels (Table 1) as per The Regulations. The results were completed using the below calculation. The results of this calculation are shown in Table 5.4 and Table 5.5 of this Noise Management Plan.

$$L_{pppp} = L_{wwpp} - 20 \log_{10} R - 8$$

- A-weighted Sound Pressure Level – L_{pppp}
- Distance from the source – R
- A-weighted Sound Power Level – L_{wwpp}
- Hard ground

The following table is used to establish the cumulative sound pressure as if all machinery were working concurrently.

Method:

Add the higher of the individual levels to a factor reflective of the difference between the two levels.

Table A-1 Addition of Total Sound Pressure Levels (AS 2436:1020)

Difference between the two levels (dB)	Addition to higher level (dB)
0	3
1	3
2	2
3	2
4	1
5	1
6	1
7	1
8	1
9	1
10	0

Transport Noise Management Code of Practice - Volume 2 (2016)

Sensitive land uses have the potential to be impacted by construction noise and vibration. Sensitive land uses/receptors considered in this Code include:

Noise-sensitive premises

- a dwelling (detached or attached) including house, townhouse, unit, reformatory institution,
- caravan park or retirement village;
- a library, child care centre, kindergarten, school, school playground, college, university,
- museum, art gallery or other educational institution, hospital, respite care facility, nursing home, aged care facility, surgery or other medical centre;
- a community building including a place of public worship;
- a court of law;
- a hotel, motel or other premises which provides accommodation for the public;
- a commercial (office) or retail facility;
- a protected area, or an area identified under a conservation plan as a critical habitat or an area of major interest under the Nature Conservation Act 1992;
- an outdoor recreational area (such as public park or gardens open to the public, whether or not on payment of a fee, for passive recreation other than for sport or organised entertainment) or a private open space.

While outdoor recreational areas are considered to be noise and vibration sensitive sites, for the durations involved in construction activities, it is not considered necessary or justified for mitigation measures to be required.

Critical facilities, infrastructure and utilities

This Code defines critical facilities, infrastructure and utilities (critical receptor) as those buildings, infrastructure and utilities which, by their nature or by the nature of the activities conducted therein, are particularly sensitive to disruption due to construction noise and vibration effects, or where the consequences of such disruption would be severe. Critical facilities, infrastructure and utilities are a subset of sensitive receptors and include the following:

Critical receptors

- Critical facilities include medical/health buildings, educational/research facilities, courts of law and community buildings. The latter three are only considered when in use. Critical facilities are usually sensitive to both construction noise and vibration.
- Critical infrastructure and utilities include dams, electrical and telecommunications facilities (including railway signalling systems), oil and gas pipelines and other petrochemical installations and utilities such as water mains and sewers. Critical infrastructure and utilities are typically sensitive to construction vibration. Volume 2 – Construction Noise and Vibration: Chapter 3 – Criteria Transport Noise Management Code of Practice, Transport and Main Roads, March 2016 21;
- Other facilities, infrastructure or utilities (for example bridges) which may be deemed to be of critical importance on a project-specific basis.

Appendix B – Noise Incident Register

Number	Incident Date	Reported By (Name & Contact Details)	Duration of Incident	Description of Incident	Location of Incident	Management Controls Employed	Date Completed
		Name:					
		Contact Number:					
		Name:					
		Contact Number:					
		Name:					
		Contact Number:					
		Name:					
		Contact Number:					
		Name:					
		Contact Number:					
		Name:					
		Contact Number:					
		Name:					
		Contact Number:					
		Name:					
		Contact Number:					

Appendix C - Example Notification Letter

Construction Works at Courtney Drive Upper Coomera

Dear Occupant,
(Insert site address).

Winslow has scheduled remediation works at Courtney Drive Upper Coomera Queensland 4209. Construction activities will be conducted on (Insert date) commencing at (Insert hour) and concluding on (Insert date) according to the following schedule:

Date	Schedule	Activities to be completed	Potential impact
(Insert date)	(Insert period /time)	(Insert description of activity)	

This letter has been developed to advise you that these works will be undertaken within the vicinity of the project, generally for (Insert number) days with the dates and locations above provided as a guide only. Some changes may be required without notice depending on specific conditions, productivity, and other logistical considerations.

We appreciate your cooperation and patience while these project and related works are undertaken.

Where you have queries in relation to these works, please do not hesitate to contact us as per the contact details provided below.

Kind Regards,

Winslow

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