Annual Noise Monitoring Assessment

Rooty Hill Distribution Centre, Rooty Hill, NSW
February 2021

Prepared for: Holcim (Australia) Pty Ltd
February 2021
MAC180611-01RP9

Muller Acoustic Consulting

Document Information

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1 Introduction

Muller Acoustic Consulting Pty Ltd (MAC) has been commissioned by Holcim (Australia) Pty Ltd (Holcim) to complete a Noise Monitoring Assessment (NMA) for the Holcim Regional Distribution Centre (RDC), at Rooty Hill, NSW.

This assessment has been undertaken at four representative monitoring locations as part of the Noise Monitoring Program (NMP) to address conditions outlined in the Development Consent.

The assessment has been conducted in accordance with the following documents:

- NSW Environment Protection Authority (EPA), Noise Policy for Industry (NPI), 2017;
- Rooty Hill RDC Operational Noise Management Plan (NMP), 2015;
- Rooty Hill, Consolidated Consent, 2017 (Mod 2);
- Australian Standard AS 1055:2018 - Acoustics - Description and Measurement of Environmental Noise; and
- Australian Standard AS/NZS IEC 61672.1:2019 (AS 61672) – Electro Acoustics - Sound Level Meters Specifications Monitoring;

A glossary of terms, definitions and abbreviations used in this report is provided in Appendix A.

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2 Noise Criteria

The noise criteria for each receiver location are outlined in the NMP and consolidated consent for the RDC are presented in **Table 1**.

Table 1 Noise Criteria, dBA

Location	Monitoring Location	Morning Shoulder[1,2]	Day[1,2]	Evening[1,2]	Night[1,2]	
		$L_{Aeq(15min)}$	$L_{Aeq(15min)}$	$L_{Aeq(15min)}$	$L_{Aeq(15min)}$	$L_{A1(1min)}$
Any residences in Station Street	N1	39	44	44	39	53
Any residences in Coughlan Crescent	N2	40	40	39	39	53
Any residences in Mavis Street	N1/N4	35	35	35	35	53
Nurragingy Reserve	N3	When Reserve is in use – 50dB, L_{Aeq}				
Colebee Centre	N3	When the Centre is in use – 50dB, L_{Aeq}				
Blacktown Olympic Park (Active recreation areas)	N4	When active recreational areas of the Park are in use – 55dB, L_{Aeq}				

Note 1: Noise criteria adopted from NMP.

Note 2: Morning shoulder 6am-7am Monday to Saturday and 6am-8am Sundays and public holidays; Day 7am-6pm Monday to Saturday and 8am-6pm Sundays and public holidays; Evening 6pm-10pm Monday to Sunday; Night 10pm-7am Monday to Saturday and 10pm-8am Sunday.

The RDC is located at Rooty Hill, NSW approximately 1km east of the railway station and town centre. Receivers in the locality surrounding the RDC are primarily industrial, recreational and urban residential. The RDC is bounded by the railway line to the south, industry to the west and recreational areas to the east. The residential areas potentially affected by noise from the operation are to the east, beyond the Nurragingy Reserve in Doonside, NSW (Crawford Street and Knox Road); and to the west, beyond industrial zones and the M7 Motorway in Station Street, Rooty Hill, NSW. Road traffic from the M7 Motorway is a dominant noise source in the area along with urban hum and railway noise.

Monitoring locations were selected in accordance with the NMP and are representative of the nearest noise sensitive receivers to the RDC.

The operational compliance monitoring locations with respect to the RDC are presented in the locality plan shown in **Figure 1** and **Table 1** along with the relevant noise criteria for each location.

FIGURE 1

Site Locality

MAC180611-01

Holcim Rooty Hill DC

KEY

Noise Monitoring Locations

Site Location

0 50 100 150 200 250 m

N

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3 Methodology

Noise monitoring consisted of attended monitoring during the daytime, evening and night time periods.

3.1 Attended Noise Monitoring

Attended noise monitoring was conducted in general accordance with the procedures described in Australian Standard AS 1055:2018 and the RDC Consolidated Consent. The measurements were carried out using a Svantek Type 1, 971 noise analyser on Thursday 4 February 2021. The acoustic instrumentation used carries current NATA calibration and complies with AS/NZS IEC 61672.1:2019 Calibration of all instrumentation was checked prior to and following measurements. Drift in calibration did not exceed ±0.5dBA.

Attended noise monitoring was conducted for 15-minutes in duration during the daytime, evening and night time periods over one day. Where possible, throughout each measurement the operator(s) quantified the contribution of each significant noise source.

Extraneous noise sources were excluded from the analysis to determine the $LA_{eq(15min)}$ RDC noise contribution for comparison against the relevant criteria. Where the RDC was inaudible, the RDC contribution is estimated to be at least 10dB below the ambient noise level.

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4 Results

4.1 Attended Noise Monitoring Results

4.1.1 Attended Assessment Results - Location N1

The monitored noise level contributions and observed meteorological conditions for each assessment period at location N1 for the NMA are presented in **Table 2**.

Table 2 Operator-Attended Noise Survey Results – Location N1

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		L_{Amax}	L_{Aeq}	L_{A90}		
04/02/2021	14:02 (Day)	91	64	57	WD: N WS: 0.8m/s Rain: Nil	Distant Traffic 58-67 Local Traffic 67-91 Birds 50-53 Insects 55-62 RDC Inaudible
RDC $L_{Aeq(15min)}$ Contribution						<47
04/02/2021	20:00 (Evening)	75	55	49	WD: E WS: 0.2m/s Rain: Nil	Distant Traffic 50-59 Local Traffic 60-75 Birds 48-54 Insects 40-43 Dogs 50-54 RDC Inaudible
RDC $L_{Aeq(15min)}$ Contribution						<39
04/02/2021	23:08 (Night)	71	54	46	WD: N WS: 0.2m/s Rain: Nil	Local Traffic 60-71 Distant Traffic 45-67 Insects <45 RDC Inaudible
RDC $L_{Aeq(15min)}$ Contribution						<36
RDC $L_{A1(1min)}$ Contribution						<53

Note: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

4.1.2 Attended Assessment Results - Location N2

The monitored noise level contributions and observed meteorological conditions for each assessment period at location N2 for the NMA are presented in **Table 3**.

Table 3 Operator-Attended Noise Survey Results – Location N2

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		L_{Amax}	L_{Aeq}	L_{A90}		
04/02/2021	15:00 (Day)	72	50	42	WD: E WS: 0.5m/s Rain: Nil	Distant Traffic 44-50 Local Traffic 50-69 Train horn 72 Train 54-58 Insects 38-42 Birds 37-54 RDC Inaudible
RDC $L_{Aeq(15min)}$ Contribution						<32
04/02/2021	20:53 (Evening)	72	52	47	WD: N WS: 0.2m/s Rain: Nil	Distant Traffic 48-56 Local Traffic 67-72 Insects 48-52 Dog Barking 48-56 RDC Inaudible
RDC $L_{Aeq(15min)}$ Contribution						<37
04/02/2021	22:20 (Night)	73	50	44	WD: N WS: 0.2m/s Rain: Nil	Distant Traffic 44-48 Local Traffic 63-73 Train 48-63 Insects 44-47 Aircraft 40-52 RDC Inaudible
RDC $L_{Aeq(15min)}$ Contribution						<34
RDC $L_{A1(1min)}$ Contribution						<53

Note: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

4.1.3 Attended Assessment Results - Location N3

The monitored noise level contributions and observed meteorological conditions for each assessment period at location N3 for the NMA are presented in **Table 4**.

Table 4 Operator-Attended Noise Survey Results – Location N3

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		L_{Amax}	L_{Aeq}	L_{A90}		
04/02/2021	15:23 (Day)	71	59	53	WD: E WS: 0.7m/s Rain: Nil	Traffic 49-71 Aircraft 50-58 Train 60-63 RDC Inaudible
RDC $L_{Aeq(15min)}$ Contribution						<43
04/02/2021	21:17 (Evening)	78	65	55	WD: N WS: <0.1m/s Rain: Nil	Traffic 56-78 Insects <50 RDC Inaudible
RDC $L_{Aeq(15min)}$ Contribution						<45
04/02/2021	22:00 (Night)	78	65	55	WD: N WS: <0.1m/s Rain: Nil	Traffic 56-78 Insects <50 Aircraft 55-60 RDC Inaudible
RDC $L_{Aeq(15min)}$ Contribution						<45

Note: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

4.1.4 Attended Assessment Results - Location N4

The monitored noise level contributions and observed meteorological conditions for each assessment period at location N4 for the NMA are presented in **Table 5**.

Table 5 Operator-Attended Noise Survey Results – Location N4

Date	Time (hrs)	Descriptor (dBA re 20 µPa)			Meteorology	Description and SPL, dBA
		L_{Amax}	L_{Aeq}	L_{A90}		
04/02/2021	14:36 (Day)	64	53	59	WD: E WS: 0.7m/s Rain: Nil	Distant Traffic 45-47 Local Traffic 50-58 Train 53-64 Birds 44-46 Insects 46-57 RDC Inaudible
		RDC $L_{Aeq(15min)}$ Contribution				<49
04/02/2021	20:27 (Evening)	71	65	52	WD: E WS: <0.1m/s Rain: Nil	Train 56-62 Local traffic 65-71 Insects 44-46 Sport Centre Speaker 49-60 RDC Alarm 48-50 (10 seconds)
		RDC $L_{Aeq(15min)}$ Contribution				<45
04/02/2021	22:42 (Night)	75	52	42	WD: N WS: 0.2m/s Rain: Nil	Local Traffic 43-75 Trains 54-64 Domestic Noise 52-62 RDC Industrial Hum <40
		RDC $L_{Aeq(15min)}$ Contribution				<40

Note: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

5 Discussion

5.1 Discussion of Results - Location N1

RDC noise emissions were inaudible during all attended measurements conducted on Thursday 4 February 2021. RDC noise contributions were estimated to satisfy the relevant noise criteria for all periods. Extraneous noise sources included birds, local traffic noise, insects, and barking dogs with ambient noise levels dominated by distant traffic noise.

5.2 Discussion of Results - Location N2

RDC noise emissions were inaudible during all attended measurements conducted on Thursday 4 February 2021. RDC noise contributions were estimated to satisfy the relevant noise criteria for all periods. Extraneous sources measured include traffic, birds, aircraft, trains, barking dogs and insects.

5.3 Discussion of Results - Location N3

RDC noise emissions were inaudible during all measurements conducted on Thursday 4 February 2021. RDC noise contributions were estimated to satisfy the relevant noise criteria for all periods. Extraneous sources audible during the attended surveys included traffic, aircraft, insects and train noise.

5.4 Discussion of Results - Location N4

RDC noise emissions were audible during the evening and night measurements on Thursday 4 February 2021. RDC noise contributions were estimated to satisfy the relevant noise criteria for all periods. Extraneous noise sources included local traffic, birds, traffic, the sports park sound system and trains.

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6 Conclusion

Muller Acoustic Consulting Pty Ltd (MAC) has completed a Noise Monitoring Assessment (NMA) on behalf of Holcim (Australia) Pty Ltd for the Regional Distribution Centre (RDC), at Rooty Hill, NSW. The assessment was completed to review compliance against relevant noise criteria which is required to be completed annually as part of the RDC NMP.

Attended noise monitoring was conducted on Thursday 4 February 2021. The assessment has identified that noise emissions generated by RDC were not audible at the nearest residential receivers during the attended monitoring, with all measurements satisfying the relevant noise criteria at all assessed residential receivers.

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Appendix A – Glossary of Terms

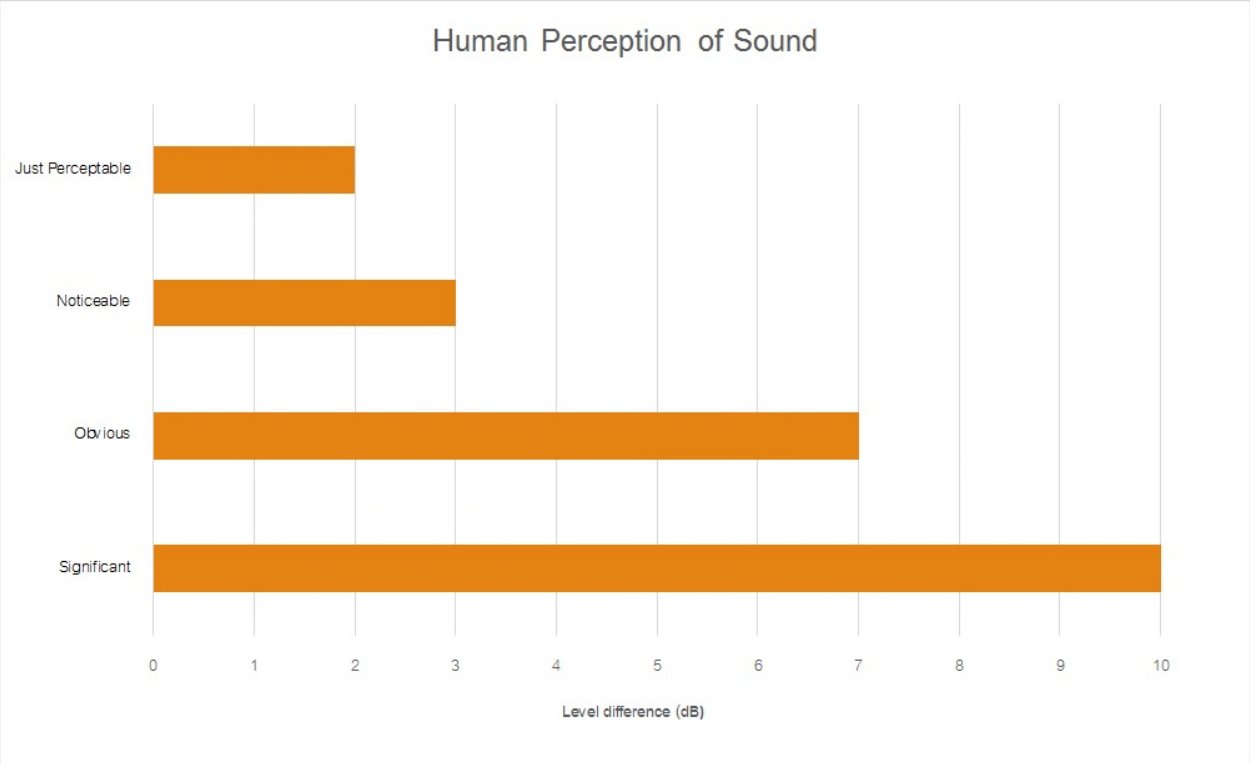
Table A1 provides a number of technical terms have been used in this report.

Table A1 Glossary of Terms	
Term	Description
1/3 Octave	Single octave bands divided into three parts
Octave	A division of the frequency range into bands, the upper frequency limit of each band being twice the lower frequency limit.
ABL	Assessment Background Level (ABL) is defined in the NPI as a single figure background level for each assessment period (day, evening and night). It is the tenth percentile of the measured LA90 statistical noise levels.
Adverse Weather	Weather effects that enhance noise (that is, wind and temperature inversions) that occur at a site for a significant period of time (that is, wind occurring more than 30% of the time in any assessment period in any season and/or temperature inversions occurring more than 30% of the nights in winter).
Ambient Noise	The noise associated with a given environment. Typically a composite of sounds from many sources located both near and far where no particular sound is dominant.
A Weighting	A standard weighting of the audible frequencies designed to reflect the response of the human ear to noise.
dBA	Noise is measured in units called decibels (dB). There are several scales for describing noise, the most common being the 'A-weighted' scale. This attempts to closely approximate the frequency response of the human ear.
dB(Z), dB(L)	Decibels Linear or decibels Z-weighted.
Hertz (Hz)	The measure of frequency of sound wave oscillations per second - 1 oscillation per second equals 1 hertz.
LA10	A noise level which is exceeded 10 % of the time. It is approximately equivalent to the average of maximum noise levels.
LA90	Commonly referred to as the background noise, this is the level exceeded 90 % of the time.
LAeq	The summation of noise over a selected period of time. It is the energy average noise from a source, and is the equivalent continuous sound pressure level over a given period.
LAmax	The maximum root mean squared (rms) sound pressure level received at the microphone during a measuring interval.
RBL	The Rating Background Level (RBL) is an overall single figure background level representing each assessment period over the whole monitoring period. The RBL is used to determine the intrusiveness criteria for noise assessment purposes and is the median of the ABL's.
Sound power level (LW)	This is a measure of the total power radiated by a source. The sound power of a source is a fundamental location of the source and is independent of the surrounding environment. Or a measure of the energy emitted from a source as sound and is given by: = 10.log10 (W/Wo) Where: W is the sound power in watts and Wo is the sound reference power at 10-12 watts.

Table A2 provides a list of common noise sources and their typical sound level.

Table A2 Common Noise Sources and Their Typical Sound Pressure Levels (SPL), dBA	
Source	Typical Sound Level
Threshold of pain	140
Jet engine	130
Hydraulic hammer	120
Chainsaw	110
Industrial workshop	100
Lawn-mower (operator position)	90
Heavy traffic (footpath)	80
Elevated speech	70
Typical conversation	60
Ambient suburban environment	40
Ambient rural environment	30
Bedroom (night with windows closed)	20
Threshold of hearing	0

Figure A1 – Human Perception of Sound



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