12 July 2021

Planning Secretary
Department of Planning, Industry, and Environment
Level 22, 320 Pitt Street
Sydney NSW 2000

Dear Secretary

SSD 7348: OAKDALE WEST INDUSTRIAL ESTATE – CONDITION D71 REQUEST

I refer to Condition D70 of SSD7348, Oakdale West Estate, which sets the permissible construction hours under approval SSD7348 for Oakdale West Estate (OWE), and Condition D71 which enables circumstances where works may be undertaken outside these hours, as follows:

D70. The Applicant must comply with the hours detailed in Table 5, unless otherwise agreed in writing by the Planning Secretary.

Table 5: *Hours of work*

Activity	Day	Time
Construction	Monday – Friday Saturday	7 am to 6 pm 8 am to 1 pm
Operation	Monday – Sunday (including public holidays)	24 hours

D71. Works outside of the hours identified in Condition D70 may be undertaken in the following circumstances:

(a) works that are inaudible at the nearest sensitive receivers;

(b) works agreed to in writing by the Planning Secretary;

(c) for the delivery of materials required outside these hours by the NSW Police Force or other authorities for safety reasons; or

(d) where it is required in an emergency to avoid the loss of lives, property or to prevent environmental harm.

Goodman hereby seek to obtain the Department's approval of proposed works outside the hours relating to precinct 1A of OWE.

Goodman Group
Goodman Limited | ABN 69 000 123 071
Goodman Funds Management Limited | ABN 48 067 796 641 | AFSL Number 223621
as responsible entity of Goodman Industrial Trust | ARSN 091213 839

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Goodman Logistics (HK) Limited | Company No. 1700359 | ARBN 155 911 149 | a Hong Kong company with limited liability
Suite 2008, Three Pacific Place, 1 Queen's Road East, Hong Kong | Tel +852 2249 3100 | Fax +852 2525 2070

info-au@goodman.com | www.goodman.com

Background

On 20 August 2021 Goodman requested, pursuant to Condition D71, an extension to construction hours permitted under Condition D70 to undertake concrete pouring works within the Lot 1A warehouse beyond the D70 hours up until 28 February 2022, between:

- 3:00am and 8:00pm, Monday to Saturday

This request was approved by the Department on 13 September 2021 (SSD-7348-PA-99).

Since this approval, the concrete pour works have been completed and the warehouse is completely enclosed, including wall and roof installation. It should be noted there was no complaints for any of these extended hours construction works.

Witron, Coles' automation systems contractor has commenced installation of the internal automations system. This is the purpose for this current D71 application.

Proposed extended hours of construction:

It is hoped the extended hours of construction for internal automation system by Witron is anticipated to commence from **1 August 2022** (or as soon the Department approves the application) to **30 April 2024**, and be for the following hours:

It is proposed to undertake the fit-out works outside the approved hours between:

- **Monday to Friday: 6.00 am to 10.00 pm**
- **Saturday: 6.00 am to 10.00 pm**
- **Sunday: 7.00 am to 7.00 pm (during late stage commissioning phase only)**

Reason for extended hours:

Increased construction hours are required to enable the extremely complex and time-consuming automation installation to occur in good time for Lot 1A, and enable the facility to start operation at its intended programme date.

Area subject to the extended construction hours:

Internal areas within Warehouse 1A – refer Fig.1 below.

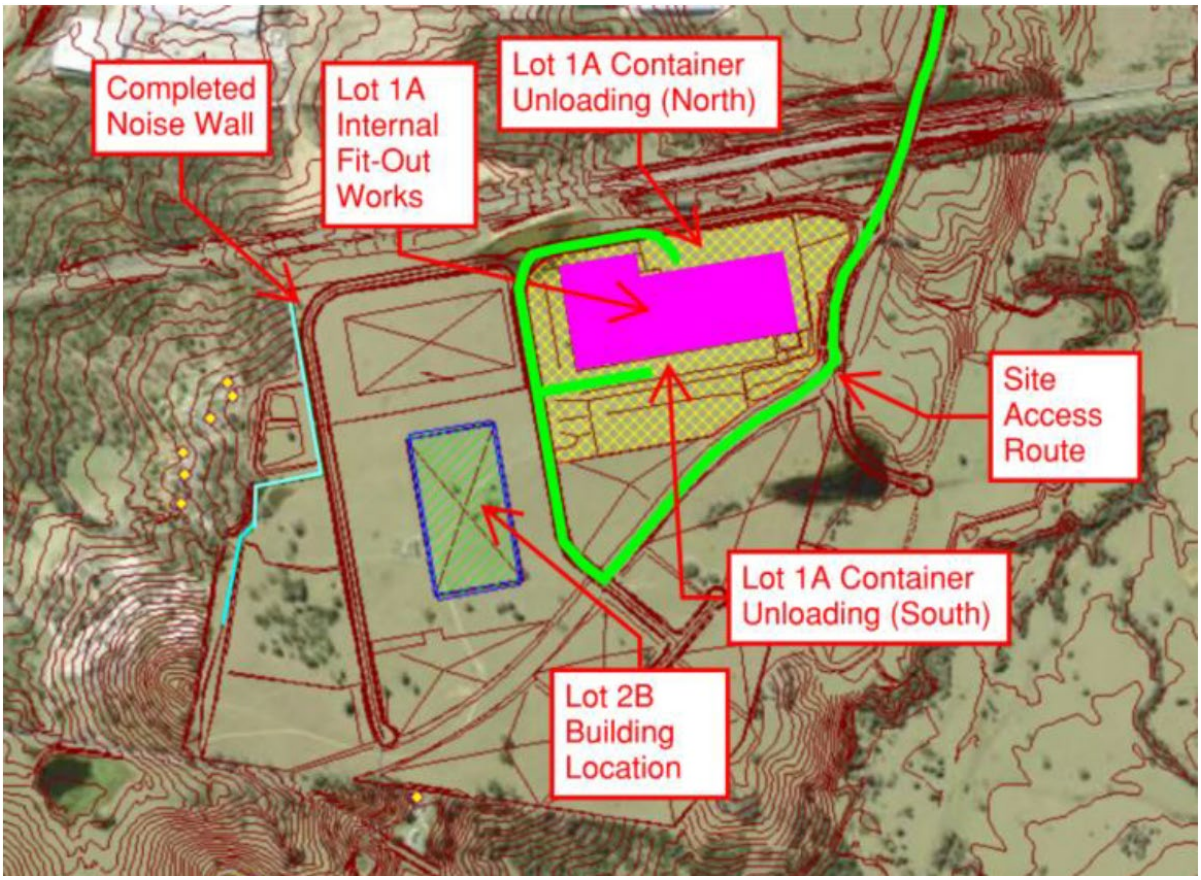
Noise Assessment

Please refer to **Annexure A**, Noise assessment by Acoustic Consultants Australia, dated 06.07.22 for full description of the proposal including:

1) Proposed out of hours fitout works
2) Assessment of surrounding sensitive receivers
3) Out of hours construction noise criteria
4) Noise predictions
5) Discussion of results
6) Recommendations

Annexure A includes all relevant information for the Department to review the application. Please advise if any additional information is required to help with the assessment.

Table 1 - Location of Lot 1A for proposed internal works



Conclusion

The Department is requested to review the Noise Assessment (**Annexure A**) and if satisfied, provide agreement pursuant to Condition D71(b) that the out of hours works are acceptable.

Yours sincerely

Guy Smith
Head of Planning

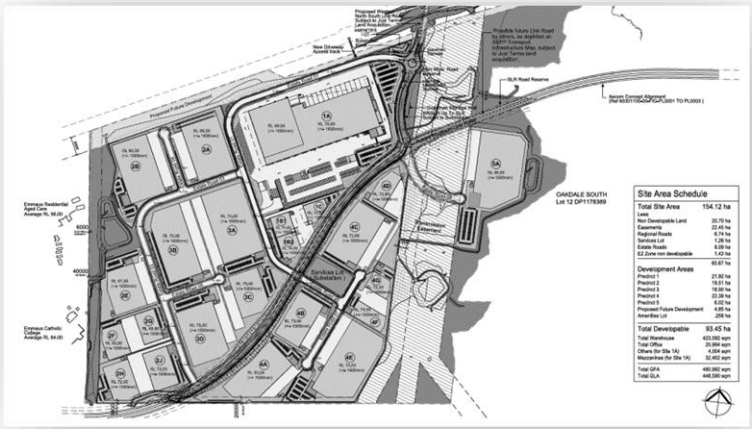
Annexure A - Noise Assessment

acoustics consultants AUSTRALIA

OAKDALE WEST ESTATE
LOT 1A OUT OF HOURS INTERNAL FIT-OUT WORKS
NOISE ASSESSMENT

Report 11.00374R-02

prepared for Goodman Limited
on 06/07/2022



REPORT PREPARED BY

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BASIS OF REPORT

This report has been prepared by **Acoustics Consultants Australia (ACA)** with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with the Client. Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from ACA. ACA disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

DOCUMENT CONTROL

REFERENCE	DATE	PREPARED	REVIEWED	AUTHORISED
11.00374R-01 – DRAFT	13/06/2022	SF	MdlM	SF
11.00374R-02	06/07/2022	SF	MdlM	SF

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Report 11.00374R-02

1. INTRODUCTION

This report presents the findings of an out-of-hours construction noise assessment conducted by Acoustics Consultants Australia (ACA) in relation to internal fit-out works proposed to be undertaken on Lot 1A of the Oakdale West Estate (OWE), located in Kemps Creek.

Specifically, the proposed works comprise the internal fitout and commissioning of the Coles' automation systems to be undertaken by the automation contractor, Witron.

The internal works involve the assembly and erection of steel mezzanine structures / racking systems / automation equipment installation and installation of associated electrical and fire services, followed by commissioning of the systems.

The identified fit-out works would be undertaken entirely within the Lot1A warehouse superstructure. As the warehouse is now in a state of completion, the warehouse structure and cladding would provide effective acoustic shielding, with respect to works undertaken within the warehouse.

The currently approved Lot 1A construction hours are:

- Monday to Friday: 7.00am to 6.00pm; and
- Saturday 8.00am to 1.00pm

It is proposed to undertake the fit-out works outside the approved hours between:

- Monday to Friday: 6.00 am to 10.00 pm
- Saturday: 6.00 am to 10.00 pm
- Sunday: 7.00 am to 7.00 pm (during very late stage commissioning phase only)

The aims of this assessment are:

- to identify the main sources of noise anticipated from the site during the works and the potential noise exposure of the nearest noise sensitive receivers;
- to conduct an objective noise assessment based on noise modelling of the proposed construction methodologies; and
- where necessary, to identify any practicable and effective noise mitigation measures recommended to control noise from the out-of-hours works to satisfactory levels.

The methodology and standards used to conduct the assessment and numeric assessment results are presented in the following sections.

Acoustic terms used in this report are defined in the Glossary in **Appendix A**.

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2. PROPOSED OUT OF HOURS FIT-OUT WORKS

The out-of-hours fit-out works that would be undertaken inside the Lot 1A warehouse comprise:

- Assembly and erection of steel mezzanine structures / racking systems
- Installation of associated electrical and fire services
- Installation of the automation equipment
- Commissioning of the systems (starting and testing the installed automation equipment).

The identified internal works would require the use of some noise generating equipment, including diesel cranes, scissor lifts, boom lifts, electric and LPG forklifts and fit-out hand tools. Noise from these works would be expected to be effectively attenuated by the warehouse superstructure, which is now complete.

In addition to the internal works, the materials would be required to be delivered to site in containers transported by heavy vehicles which would be unloaded externally to the warehouse.

Up to four heavy vehicles per hour would deliver the containers to the site, with the first deliveries commencing at 6.00am Monday to Saturday. The trucks would access the site from the north, via Lenore Drive, Compass Drive, Southern Link Road and Sepia Road.

Additionally, construction staff would arrive/depart the site by light vehicles at the commencement and completion of work shifts, with up to 50 light vehicle movements anticipated between 6.00am to 7.00am Monday to Saturday.

The containers would generally be placed on the ground to the north of the Lot 1A warehouse using side loader trailers. Once placed on the ground the containers would be unloaded by two LPG forklifts (5t-12t) or Manitou.

Depending on the delivery, some containers may be directly rear loaded into the building at the recessed docks. There will be short periods when up to three on-grade roller doors under the northern awning will need to open to allow the transport of the materials from under awning into the building via forklift. The opening of the roller doors would be coordinated to not coincide with noise generating internal fit-out works.

Figure 2.1 shows the location of the proposed Lot 1A internal fit-out works and identifies the on-site transportation routes and loading areas.

The fitout / installation works are to be undertaken between July 2022 to December 2023. Commissioning works are proposed to be undertaken between October 2023 and April 2024.

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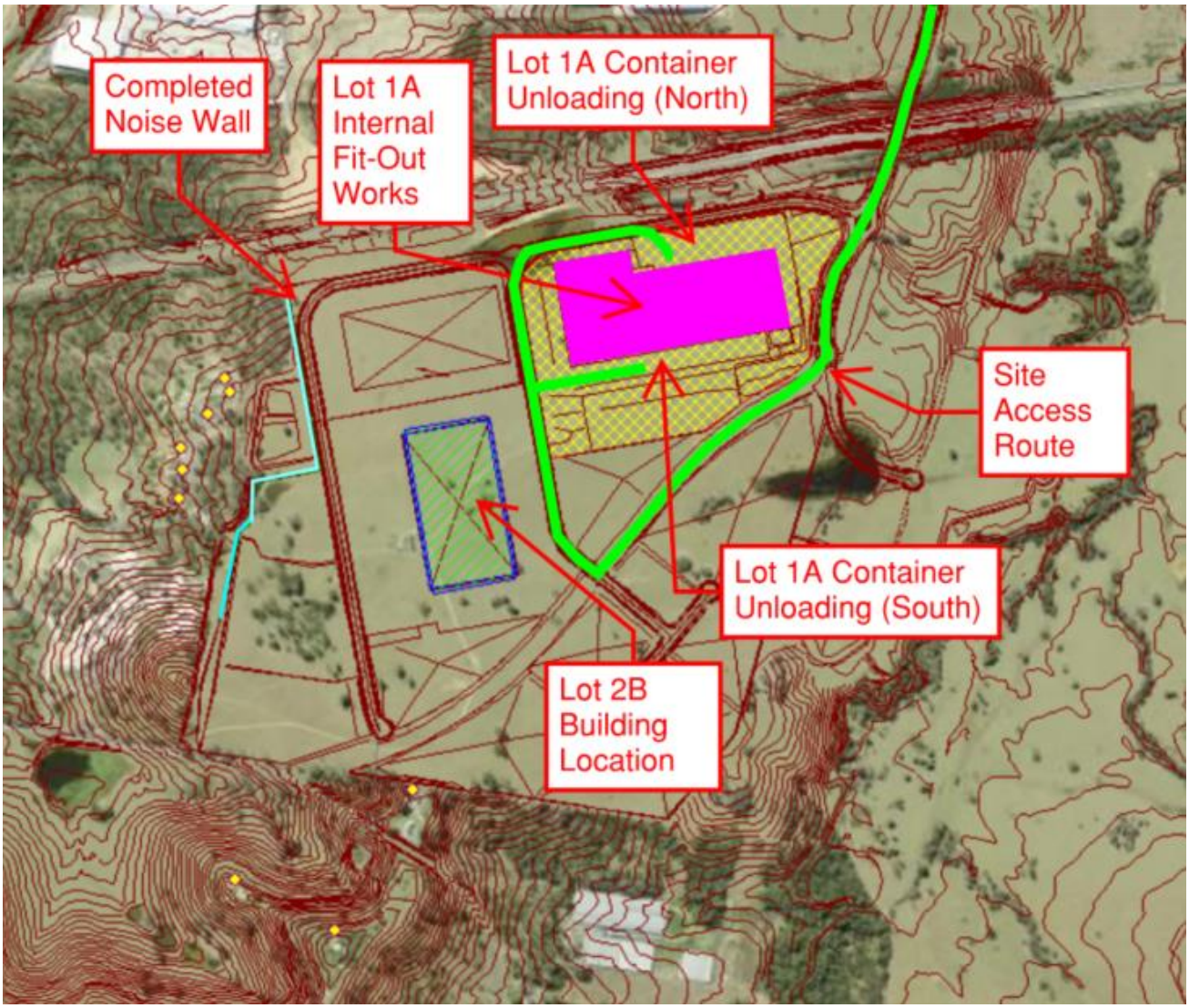
Figure 2.1 Aerial View of Site Showing the Location of the Lot 1A Fit-Out Works



The principal construction noise emissions from the site would be expected to be from:

- on-site heavy and light vehicle movements;
- container unloading activities; and
- the operation of the fit-out equipment within the Lot 1A warehouse.

It is proposed to undertake the fit-out works outside the approved hours between:

- Monday to Friday: 6.00 am to 10.00 pm

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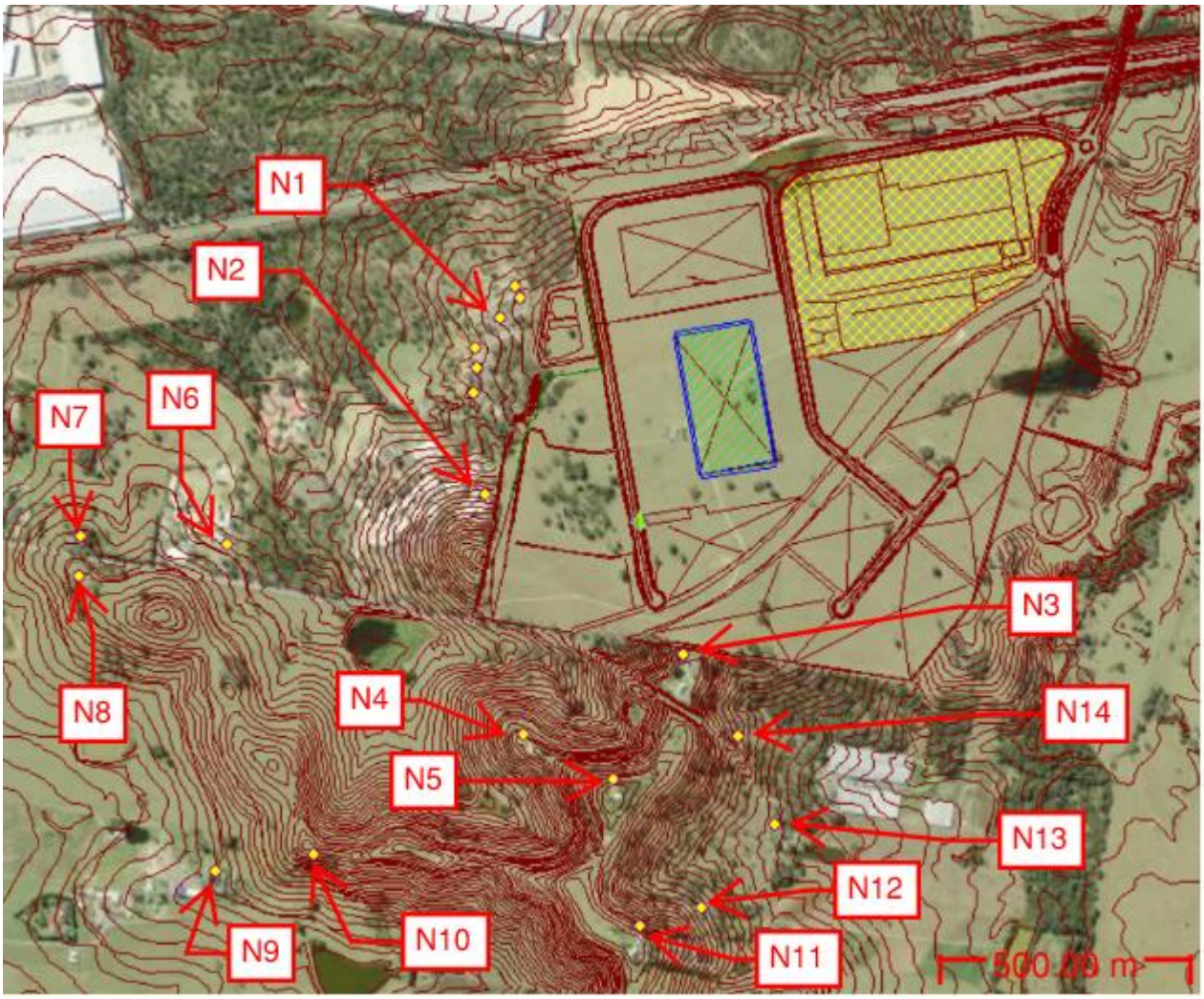
- Saturday: 6.00 am to 10.00 pm
- Sunday: 7.00 am to 7.00 pm (during very late stage commissioning phase only, as noted above)

3. SENSITIVE RECEIVERS

Based on details provided by Goodman, ACA has undertaken a detailed assessment of potential construction noise impacts. The locations of the sensitive receivers considered by this assessment are shown in **Figure 3.1**.

Figure 3.1 Sensitive Receivers Considered



The sensitive receiver of principal interest is the Emmaus Village aged care facility located to the west of the OWE (Receiver N1) as the potential for disturbance is greatest at this location.

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The Emmaus College located to the west of the OWE (Receiver N2) would not be occupied during the proposed out of hours works, and therefore no impacts on this receiver are anticipated.

Construction noise levels have been predicted at the Receivers N3, N4 and N5. However, as fully executed noise agreements are in place with the N3, N4, N5 landowners there is no requirement to consider noise impacts on these receivers.

Additionally, construction noise levels have been predicted at the further receivers N6-N14. Receivers N6-N13 are located within the IN1 General Industrial zone under the State Environmental Planning Policy (Western Sydney Employment Area) 2009 [SEPP WSEA].

Receiver N6 is Mamre Anglican College – the school would not be occupied during the proposed out of hours works and therefore no impacts on this receiver are anticipated.

Receivers N7-N13 are residences and residential criteria have been considered for these receivers.

Receiver N14 is a residence located within the Environmental Conservation zone under the SEPP WSEA. Residential criteria have been considered for this receiver.

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4. OUT OF HOURS CONSTRUCTION NOISE CRITERIA

This assessment establishes out-of-hours Construction Noise Management Levels (CNMLs) determined in general accordance with the provisions of the *NSW Interim Construction Noise Guideline* (ICNG).

For this purpose, the Rating Background Noise Levels (RBLs) determined by the recent Oakdale West Estate (OWE) modification noise assessment have been considered (ref Modification 7 – Noise Assessment prepared by RWDI Report No. 2102730A).

Based on analysis of data obtained between 1 May 2021 and 29 June 2021 from the existing Sentinex real-time noise and weather monitoring stations located at the western and southern OWE site boundaries, the MOD 7 assessment determined the RBLs set out in **Table 4.1**.

The locations of the Sentinex real-time noise & weather monitoring systems are indicated in **Figure 4.1**.

Figure 4.1 Sentinex Real-Time Noise & Weather Monitoring Station Location

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Table 4.1 Rating Background Noise Levels (1 May 2021 and 29 June 2021)

Location	RBL[1] L_{A90} (dBA)		
	Day	Evening	Night
South OWE Boundary	42	37	37
West OWE Boundary	39	38	37

Note 1: RBLs consistent with OWE Modification 7 Noise Assessment (RWDI Report No. 2102730A)

Note 2: Day 7.00am–6.00pm; Evening 6.00pm–10.00pm; Night 10.00pm-7.00am.

The western boundary monitoring station RBLs have been used to determine CNMLs for the Emmaus Village and the southern boundary monitoring station RBLs have been used to determine CNMLs for the residential receivers to the south.

The resultant CNMLs determined in general accordance with the provisions of the *NSW Interim Construction Noise Guideline* (ICNG) are set out in **Tables 4.2** and **4.3**. Additionally, the sleep disturbance trigger levels recognised by the *NPfI* are shown.

Table 4.2 Out of Hours Construction Noise Management Levels – South Receivers

Time	Measured Noise Levels	Construction Noise Criteria	
	RBL[1] L_{A90} (dBA)	ICNG Construction Noise Criteria[2] $L_{Aeq,15min}$ (dBA)	Sleep Disturbance Noise Level[3] L_{Amax} (dBA)
Standard Hours	42	n/a	n/a
Out-of-Hours - Day	42	47	n/a
Out-of-Hours - Evening	37	42	n/a
Out-of-Hours - Night	37	42	52

Note 1: RBL = Rating Background Level.

Note 2: The ICNG considers standard hours as Monday to Friday 7.00am to 6.00pm and Saturday 8.00am to 1.00pm (with no work on Sundays or public holidays). Works undertaken outside these timeframes are considered 'out-of-hours works'.

Note 3: With consideration to the proposed work timeframes, the following out-of-hours periods apply. Out-of-Hours - Day: Saturday 1.00pm to 6.00pm; OOH Evening: Monday to Saturday 6.00pm to 10.00pm; OOH Night: Monday to Friday 6.00am to 7.00am and Saturday 6.00am to 8.00am.

Note 4: ICNG criteria for out of hours works are based on the RBL + 5 dB.

Note 5: Sleep disturbance criteria are based on the guidance provided by the *NSW Noise Policy for Industry* (NPfI). The NPfI requires a detailed maximum noise level event assessment to be undertaken where the development's night-time noise levels at a residential location exceed L_{AFmax} 52dBA or the prevailing RBL plus 15 dB (whichever is the greater).

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Table 4.3 Out of Hours Construction Noise Management Levels - Emmaus Village

Time	Measured Noise Levels	Construction Noise Criteria	
	RBL[1] L_{A90} (dBA)	ICNG Construction Noise Criteria[2] $L_{Aeq,15min}$ (dBA)	Sleep Disturbance Noise Level[3] $L_{Amax,15min}$ (dBA)
Standard Hours	39	n/a	n/a
Out-of-Hours - Day	39	44	n/a
Out-of-Hours - Evening	38	43	n/a
Out-of-Hours - Night	37	42	52

Note 1: RBL = Rating Background Level.

Note 2: The ICNG considers standard hours as Monday to Friday 7.00am to 6.00pm and Saturday 8.00am to 1.00pm (with no work on Sundays or public holidays). Works undertaken outside these timeframes are considered 'out-of-hours works'.

Note 3: With consideration to the proposed work timeframes, the following out-of-hours periods apply. Out-of-Hours - Day: Saturday 1.00pm to 6.00pm; OOH Evening: Monday to Saturday 6.00pm to 10.00pm; OOH Night: Monday to Friday 6.00am to 7.00am and Saturday 6.00am to 8.00am.

Note 4: ICNG criteria for out of hours works are based on the RBL + 5 dB.

Note 5: Sleep disturbance criteria are based on the guidance provided by the *NSW Noise Policy for Industry* (NPfI). The NPfI requires a detailed maximum noise level event assessment to be undertaken where the development's night-time noise levels at a residential location exceed L_{AFmax} 52dBA or the prevailing RBL plus 15 dB (whichever is the greater).

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5. OUT OF HOURS FIT-OUT WORKS NOISE PREDICTIONS

For the identified out of hours construction timeframes, this assessment considers the construction equipment and sound power levels set out in **Table 5.1** and the estimated on-site peak hourly vehicle movements provided by Witron as shown in **Table 5.2**.

The sound power levels are consistent with previous OWE construction noise assessments and have been verified against ACA's internal noise source database.

Table 5.1 Sound Power Levels for Construction Equipment

Lot 1A Construction Activity	Equipment	Number of Equipment Items	Sound Power Level (dBA)		
			L_{Aeq} (dBA)	$L_{Aeq,15min}$ (dBA)	$L_{Amax,15min}$ (dBA)
			per Item	Activity	Activity
Mezzanines/ Racking / Machine Installation	Diesel Crane	2	100	113	118
	Scissor Lift	2	90		
	Boom Lift	2	90		
	Rattle Gun	2	114		
	Hammer Drill	1	110		
	LPG Forklift	2	93		
Electrical and Fire Services Works	Angle Grinder (5")	1	109	112	118
	Impact Drill	1	110		
	Rattle Gun	1	114		
	Scissor Lift	2	90		
Commissioning	Power Up and Testing of Automation Systems	-	-	80-100	115
External Materials Unloading	Heavy Vehicle	1	103	103	115
	LPG Forklift	2	93		
	Manitou	1	93		
On-Site Vehicles	Heavy Vehicle	Refer Table 6.2	103	-	115
	Light Vehicle	Refer Table 6.2	96	-	

Notes: The $L_{Aeq,15min}$ activity sound power level conservatively assumes the coinciding operation of the all identified plant items and that each item would actively generate noise at the respective sound power levels for 5 minutes within each 15-minute period.
The $L_{Amax,15min}$ sound power levels conservatively represent the maximum nose levels that may be expected from an occasional impact noise within Lot1A or from the unlikely event of an engine/air brake event during travel on the site access road.

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Table 5.2 Estimated Peak On-Site Vehicle Movements per Hour

Out of Hours Periods	Estimated Number of Vehicle Movements per Hour	
	Heavy Vehicles	Light Vehicles
Out-of-Hours Day (Saturday 1.00pm - 6.00pm)	4	50
Evening (6.00pm-8.00pm)	-	20
Night (6.00am-7.00am)	4	50

Construction noise emissions from the site have been predicted using a model created with the SoundPLAN (Ver 8.2) environmental noise prediction software, implementing the Concawe calculation algorithm. This program is used and recognised internationally as a preferred computer noise model.

Factors that are addressed in the noise modelling are:

- Equipment noise level emissions and locations
- Shielding/reflection effects from structures
- Receiver locations
- Ground topography
- Noise attenuation due to geometric spreading
- Ground absorption
- Atmospheric absorption and
- Influence of meteorology, per Concawe methodologies.

Predicted worst-case $L_{Aeq,15min}$ night and evening construction noise levels at the identified receivers are set out in **Tables 5.3** and **5.4** and predicted L_{Amax} night maximum construction noise levels are set out in **Table 5.5**.

The predictions assume the identified internal fit-out equipment is located within the Lot 1A building and that noise from these sources would conservatively be attenuated by approximately 15 dB by the warehouse structure.

Additionally, the predictions include the attenuation effects of the completed western site boundary noise wall, as shown in **Figure 2-1**.

The noise predictions undertaken are considered reasonably representative of ‘typical worst case’ scenarios and it is expected that actual noise levels would typically be less than the identified levels.

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Table 5.3 Predicted $L_{Aeq,15min}$ Night Noise Levels (6.00am to 7.00am Mon-Fri / 6.00am to 8.00am Sat)

Receiver	ICNG Criteria	Predicted $L_{Aeq,15min}$ Noise Level (dBA)							
		Internal Lot 1A Fit-Out		Heavy Vehicles on Access Road		Light Vehicles on Access Road		External Lot 1A Container Unloading	
		Neutral Met	Noise Enhancing Met	Neutral Met	Noise Enhancing Met	Neutral Met	Noise Enhancing Met	Neutral Met	Noise Enhancing Met
N1	42	31	32	<25	26	<25	<25	<25	<25
N2	n/a	<25	<25	<25	<25	<25	<25	<25	<25
N3	n/a	27	28	<25	28	<25	<25	27	32
N4	n/a	<25	<25	<25	<25	<25	<25	<25	<25
N5	n/a	<25	<25	<25	<25	<25	<25	<25	28
N6	n/a	<25	<25	<25	<25	<25	<25	<25	<25
N7	42	<25	<25	<25	<25	<25	<25	<25	<25
N8	42	<25	<25	<25	<25	<25	<25	<25	<25
N9	42	<25	<25	<25	<25	<25	<25	<25	<25
N10	42	<25	<25	<25	<25	<25	<25	<25	<25
N11	42	<25	<25	<25	<25	<25	<25	<25	25
N12	42	<25	<25	<25	<25	<25	<25	<25	26
N13	42	<25	<25	<25	27	<25	<25	<25	28
N14	42	25	26	<25	28	<25	<25	26	30

Notes:

- For the purposes of assessment, it has been assumed the internal fit-out work may occur from 6.00am, however, in practice these works are unlikely to commence prior to 7.00am. Additionally, it has been assumed that the container unloading may occur to the north or the south of the Lot1A warehouse.
- Receiver N2 (Emmaus College) would not be occupied during the proposed out of hours works, and therefore no impacts on this receiver are anticipated.
- Fully executed noise agreements are in place with the N3, N4, N5 landowners and as such there is no requirement to consider noise impacts on these receivers.
- Receiver N6 (Mamre Anglican College) would not be occupied during the proposed out of hours works, and therefore no impacts on this receiver are anticipated.
- Receivers N7-N13 are residences located within the IN1 General Industrial zone under the State Environmental Planning Policy (Western Sydney Employment Area) 2009 [SEPP WSEA]. Residential criteria have been considered for these receivers.
- Receiver N14 is a residential receiver located within the Environmental Conservation zone under the SEPP WSEA. Residential criteria have been considered for this receiver.
- Predictions are provided for neutral meteorological conditions and noise enhancing meteorological conditions (moderate strength F-Class temperature inversion).

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Table 5.4 Predicted $L_{Aeq,15min}$ Evening Noise Levels (6.00pm to 10.00pm Mon to Sat)

Receiver	ICNG Criteria	Predicted $L_{Aeq,15min}$ Noise Level (dBA)							
		Internal Lot 1A Fit-Out		Heavy Vehicles on Access Road		Light Vehicles on Access Road		External Lot 1A Container Unloading	
		Neutral Met	Noise Enhancing Met	Neutral Met	Noise Enhancing Met	Neutral Met	Noise Enhancing Met	Neutral Met	Noise Enhancing Met
N1	43	31	32	-	-	<25	<25	<25	<25
N2	n/a	<25	<25	-	-	<25	<25	<25	<25
N3	n/a	27	28	-	-	<25	<25	27	32
N4	n/a	<25	<25	-	-	<25	<25	<25	<25
N5	n/a	<25	<25	-	-	<25	<25	<25	28
N6	n/a	<25	<25	-	-	<25	<25	<25	<25
N7	42	<25	<25	-	-	<25	<25	<25	<25
N8	42	<25	<25	-	-	<25	<25	<25	<25
N9	42	<25	<25	-	-	<25	<25	<25	<25
N10	42	<25	<25	-	-	<25	<25	<25	<25
N11	42	<25	<25	-	-	<25	<25	<25	25
N12	42	<25	<25	-	-	<25	<25	<25	26
N13	42	<25	<25	-	-	<25	<25	<25	28
N14	42	25	26	-	-	<25	<25	<25	30

Notes:

- For the purposes of assessment, it has been assumed that the container unloading may occur to the north or the south of the Lot1A warehouse.
- Receiver N2 (Emmaus College) would not be occupied during the proposed out of hours works, and therefore no impacts on this receiver are anticipated.
- Fully executed noise agreements are in place with the N3, N4, N5 landowners and as such there is no requirement to consider noise impacts on these receivers.
- Receiver N6 (Mamre Anglican College) would not be occupied during the proposed out of hours works, and therefore no impacts on this receiver are anticipated.
- Receivers N7-N13 are residences located within the IN1 General Industrial zone under the State Environmental Planning Policy (Western Sydney Employment Area) 2009 [SEPP WSEA]. Residential criteria have been considered for these receivers.
- Receiver N14 is a residential receiver located within the Environmental Conservation zone under the SEPP WSEA. Residential criteria have been considered for this receiver.
- Predictions are provided for neutral meteorological conditions and noise enhancing meteorological conditions (moderate strength F-Class temperature inversion). The likelihood of such noise enhancing meteorological conditions occurring during the evening period is considered to be low.

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Table 5.5 Predicted L_{Amax} Maximum Noise Levels (6.00am to 7.00am Mon-Fri / 6.00am to 8.00am Sat)

Receiver	Sleep Disturbance Noise Level $L_{A1,1min}$ (dBA)	Predicted $L_{A1,1min}$ Noise Level (dBA)					
		Internal Lot 1A Fit-Out		Trucks on Access Road		External Lot 1A Container Unloading	
		Neutral Met	Noise Enhancing Met	Neutral Met	Noise Enhancing Met	Neutral Met	Noise Enhancing Met
N1	52	37	38	41	45	32	36
N2	n/a	<25	25	37	41	<25	<25
N3	n/a	35	37	43	47	39	44
N4	n/a	29	32	37	41	<25	<25
N5	n/a	30	33	37	42	35	40
N6	n/a	25	28	32	37	<25	<25
N7	52	<25	25	30	35	<25	<25
N8	52	<25	25	29	34	<25	<25
N9	52	<25	<25	<25	<25	<25	<25
N10	52	<25	27	30	35	<25	<25
N11	52	27	31	34	39	32	37
N12	52	28	31	35	40	33	38
N13	52	30	33	38	43	35	40
N14	52	33	35	41	45	38	42

Notes:

- Sleep disturbance criteria are based on the guidance provided by the NSW Noise Policy for Industry (NPfI).
- For the purposes of assessment, it has been assumed the internal fit-out work may occur from 6.00am, however, in practice these works are unlikely to commence prior to 7.00am. Additionally, it has been assumed that the container unloading may occur to the north or the south of the Lot1A warehouse.
- Receiver N2 (Emmaus College) would not be occupied during the proposed out of hours works, and therefore no impacts on this receiver are anticipated.
- Fully executed noise agreements are in place with the N3, N4, N5 landowners and as such there is no requirement to consider noise impacts on these receivers.
- Receiver N6 (Mamre Anglican College) would not be occupied during the proposed out of hours works, and therefore no impacts on this receiver are anticipated.
- Receivers N7-N13 are residences located within the IN1 General Industrial zone under the State Environmental Planning Policy (Western Sydney Employment Area) 2009 [SEPP WSEA]. Residential criteria have been considered for these receivers.
- Receiver N14 is a residential receiver located within the Environmental Conservation zone under the SEPP WSEA. Residential criteria have been considered for this receiver.

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6. DISCUSSION OF RESULTS

The predictions indicate that the ICNG CNMLs would be expected to be met at all surrounding receivers including N1 (Emmaus Village aged care facility) throughout the Lot 1A out-of-hours fit-out works undertaken between 6.00am to 7.00am and between 6.00pm to 10.00pm Monday to Saturday.

Additionally, maximum construction noise levels would not be expected to trigger the sleep disturbance trigger levels recognised by the NPfI at any receiver.

Works would not be undertaken on Sundays, other than at a very late stage for commissioning. The commissioning and testing would generate materially lower noise levels than the fit-out works and would be undertaken entirely inside the building, with minimal associated on-site vehicle movements. Accordingly, no noise impacts are anticipated from these works.

N2 (Emmaus College) and N6 (Mamre Anglican College) would not be occupied during the proposed out of hours works, and therefore no impacts on these receivers are anticipated.

Fully executed noise agreements are in place with the N3, N4, N5 landowners and as such there is no requirement to consider noise impacts on these receivers. Nevertheless, the predictions indicate that the ICNG CNMLs and the identified sleep disturbance criterion would be expected to be met at these receivers.

It should be noted that the noise levels set out in **Tables 5.3** to **5.5** are those predicted to arise externally to the dwellings. Inside the dwellings the internal levels may be expected to be some 10 dB lower assuming partially open windows, or some >20-25 dB lower with windows closed. On this basis, the anticipated internal noise levels from the construction works, may be expected to be less than typical background noise levels within the dwellings/bedrooms and would not be expected to be a cause of disturbance for most people.

The noise mitigation measures identified by the OWE Construction Noise Management Plan (CNMP) would be applied throughout the works.

Additionally, **Section 8** of this report recommends a number of specific measures that can be applied to manage noise emissions from the site as much as reasonably possible and maintain noise within acceptable levels.

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7. RECOMMENDATIONS

Whilst it is predicted that compliance with the ICNG criteria can be achieved, Goodman proposes to implement specific measures to mitigate noise emissions during the extended construction hours.

Goodman proposes to closely manage the extended construction hours works and proactively manage noise emissions. This would be achieved by undertaking the following:

- Goodman will inform the Emmaus Village aged care facility Management prior to Witron undertaking the extended construction hours works by way of their approved community consultation procedures.

- In the event of any raised concerns, Goodman and Witron will work with the Emmaus Village Management to reduce any further impacts as far as practicable.

- Goodman and Witron site representatives will be provided access to the real-time noise monitoring data collected by the Sentinex noise monitoring stations located at the western and southern OWE site boundaries. Noise levels will be proactively and continuously monitored by Witron on-site representatives throughout the extended construction hours. Witron will closely monitor the Sentinex real-time data for any approaches or exceedances of the noise criteria identified in **Tables 4.2** and **4.3** during the works. In the case of an exceedance of the identified criteria, the reason for exceedance would be immediately investigated by Witron. If it is found that the exceedance is attributable to Witron works, the works are to be immediately reviewed and work practices are to be amended and/or remedial measures will be put in place where necessary.

- Remedial measures may include review of noise emissions from plant / activities / works locations and implementation of restrictions where necessary, such as restricting use of non-complying plant or ensuring all door openings orientated towards the relevant receiver are closed during out of hours works.

- All Witron staff and contracted truck drivers that access the site are to be briefed on appropriate truck routes, unloading locations, compliance with on-site speed limits, the requirements for good driving behaviours and the minimisation of noise including the use of horns, reversing alarms and air brakes. Witron will proactively manage truck movements on site.

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Table 7.1 outlines the considerations of various noise mitigation options to reduce impact on residents from operations at the site. The table is divided in 3 sections:

- Treating the source: This refers to ways of reducing emissions directly at the source of sound generation (i.e. vehicles).
- Treating the path: This refers to treatment to the medium that is physically in between the source and the receivers (i.e. air paths, buildings, reflective surfaces, supporting structures).
- Management: This refers to measures that will be required by the site management to minimise noise from operations.

Table 7.1 Noise Mitigation Options

Item #	Recommendation
Treating the Source	
1	Maintain good driving behaviour and practices on the access road and within the site. Horns not to be used, unless in safety critical situations. Quacker reversing alarms to be used in lieu of beepers on-site. Air brakes not to be used, unless in safety critical situations.
2	Trucks to access site in controlled manner and not exceed speeds of 25 km/hour when on site.
3	Ensure vehicles accessing the site and equipment items used on site are generally well maintained and serviced to minimise their noise emissions.
4	Ensure the access road is generally well maintained to avoid noise arising from potholes etc.
Treating the Path	
5	The Lot 1A warehouse doors are to be kept closed throughout the fit-out works, save for brief periods for materials loading into the warehouse. Opening of doors to be coordinated to not coincide with noise generating fit-out works, to minimise noise spill. Acoustic shielding from the Lot1A warehouse to be exploited at all times.
6	Effective acoustic screening will be provided by the existing western boundary noise wall.
Management	
7	Maintain good management practices on site at all times and review procedures periodically.
8	Witron to proactively monitor real time noise levels from the Sentinex system located at the western and southern boundaries and in the case of any encroachment on the identified CNMLs, modify work practices accordingly.
9	Goodman to advise Emmaus Village aged care facility Management prior to undertaking the extended construction hours works and to promptly follow up any complaints received from Emmaus Village or other receivers during the works to alleviate and/or address any concerns.
10	Continue ongoing adherence with the measures set out in the OWE CNMP.

It is expected that with the implementation of the identified noise control measures, noise levels at sensitive receivers would generally comply with the *ICNG* stipulations and not generate undue disturbance to the surrounding receivers.

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APPENDIX A: Glossary of Acoustic Terms

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1 Sound Level (or Noise Level)

Sound may be defined as any pressure variation that the human ear can detect. The human ear responds to a wide range of changes in sound pressure. As the greatest sound pressures to which the human ear responds are 10,000,000 times greater than the lowest, the decibel (dB) scale, by the use of logarithms is used to express sound pressure levels more conveniently.

The standard reference sound pressure used to define a Sound Pressure Level is 2×10^{-5} Pascals (Pa).

The decibel is defined as ten times the logarithmic ratio of two pressures. The smallest perceptible change is approximately 1 dB.

Sound Pressure Level is typically abbreviated as SPL, L_P, or L.

2 "A" Weighted Sound Pressure Level

The most common frequency rating is 'A-Weighting'. The A-weighting frequency response curve is designed to approximate the sensitivity of the human ear. The symbol L_A represents A-weighted Sound Pressure Level - The overall broadband level of a sound/noise is typically expressed as a dB(A) level.

Human hearing is most sensitive mid frequencies sounds (500 Hz to 4000 Hz), and less sensitive at higher and lower frequencies. Therefore, the level expressed in dB(A) correlates strongly with the perceived loudness of the sound/noise.

A change in sound pressure level of 1-2 dB is barely noticeable to most people, whilst a 3-5 dB change is perceived as a small but noticeable change in loudness. A 10 dB change is perceived as an approximate doubling or halving in loudness. The table below present the sound pressure levels of some common sources.

Sound Pressure Level (dB)	Sound Source	Typical Subjective Description
140	Propeller aircraft; artillery fire, gunner's position	Intolerable
120	Riveter; rock concert, close to speakers; ship's engine room	
110	Grinding; sawing	
100	Punch press and wood planers, at operator's position; pneumatic hammer or drilling (at 2 m)	Very noisy
80	Kerbside of busy highway; shouting; Loud radio or TV	Noisy
70	Kerbside of busy traffic	
60	Department store, restaurant, conversational speech	
50	General office	Moderate to quiet
40	Private office; Quiet residential area	Quiet
30	Theatre; quiet bedroom at night	
20	Unoccupied recording studio; Leaves rustling	Very quiet
10	Hearing threshold, good ears at frequency of maximum sensitivity	
0	Hearing threshold, excellent ears at frequency maximum response	

In addition to A-weighting, other less commonly applied frequency weightings include B, C and D weightings. Unweighted or Linear levels are sound levels measured without any weighting. These are expressed as simply dB, or dB(lin) or dB(Z).

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3 Sound Power Level

The rate at which a noise source emits acoustic energy is defined by its Sound Power Level. Sound Power Levels are also expressed in decibel units (dB or dB(A)). Sound Power is typically identified as SWL or LW. The standard reference sound power used to define a Sound Power Level is 1×10^{-12} Watts (W).

4 Statistical Noise Levels

Environmental noise levels from various sources in the environment will vary in level over time. Statistical exceedance levels are typically expressed as L_{AN} levels (i.e. the A-weighted sound pressure level exceeded for N% of a specific measurement period.

The most commonly used statistical noise levels are as follows:

L_{Amax} Maximum noise level over a sample period (typically measured on fast time-weighting response).

L_{A1} Noise level exceeded for 1% of a sample period (typically 15-minute interval).

L_{A10} Noise level exceeded for 10% of a sample period (typically 15-minute interval).

L_{A90} Noise level exceeded for 90% of a sample period. This noise level is commonly used to describe the background noise level (in the absence of the source under investigation).

L_{Aeq} A-weighted equivalent noise level. This is equivalent to the steady sound level containing the same amount of acoustical energy as the time-varying sound. Often referred to as the average noise level.

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

RBL Rating Background Level. This is the median value of the ABL values for each period (day, evening, night), determined over several days of measurements.

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