

SCENTRE GROUP

**WESTFIELD HURSTVILLE  
ENTERTAINMENT & LEISURE  
PRECINCT EXTENSION  
NOISE IMPACT ASSESSMENT**

SEPTEMBER 2020



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## Westfield Hurstville Entertainment & Leisure Precinct Extension Noise Impact Assessment

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1	26 June 2020	Noise Impact Assessment Report
2	02 September 2020	Updated Noise Impact Assessment Report
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# EXECUTIVE SUMMARY

WSP Australia Pty Ltd (WSP) has been engaged by Scentre Group to conduct a noise impact assessment as part of the Development Application for the proposed redevelopment of Westfield Hurstville, a major regional shopping centre located in South-West Sydney at the corner of Cross Street and Park Road, Hurstville, NSW. The intent of the redevelopment is to extend the current entertainment and leisure precinct (ELP).

Measurements of the prevailing noise conditions were undertaken to determine the applicable industrial noise limits at nearby noise sensitive receivers as outlined in the NSW Noise Policy for Industry 2017. Further acoustic assessment criteria have been determined based on applicable NSW policies under the Protection of the Environment and Operations Act 1997 and Australian Standards.

Environmental noise emissions have been assessed to the noise sensitive receivers near the proposed ELP redevelopment.

Mechanical plant items have not yet been selected and environmental noise emissions from mechanical plant will need to be reviewed during the detailed design stages to comply with the nominated project criteria.

Construction noise limits have been determined based on the guidelines outlined in the NSW Interim Construction Noise Guideline. A detailed assessment should be undertaken once the design progresses to ensure that the proposed development will achieve compliance with the applicable environmental noise limits as outlined in this report.

Based on the assessments presented in this report, the proposed development is determined to be capable of complying with established environmental noise criteria.

# 1 INTRODUCTION

WSP Australia Pty Ltd (WSP) has been engaged by Scentre Group to provide acoustic consultancy services for the proposed ELP redevelopment of Westfield Hurstville, a major regional shopping centre at the corner of Cross Street and Park Road, Hurstville, NSW.

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## 1.1 DESIGN STANDARDS

Acoustic assessment criteria have been determined based on the applicable NSW policies and Australian Standards, including:

- NSW Environment Protection Authority (EPA) policy statements under the Protection of the Environment and Operations Act 1997
  - NSW EPA Noise Policy for Industry 2017 (NSW NPfI)
  - NSW EPA Interim Construction Noise Guideline 2015 (NSW ICNG)
  - NSW EPA Road Noise Policy 2011 (NSW RNP)
  - NSW Office of Liquor, Gaming and Racing standard conditions as noted in the EPA Noise Guide for Local Government 2013 (NSW OLGR standard conditions)
  - NSW EPA Noise Guide for Local Government 2013 (NSW NGLG)
  - NSW RMS Construction Noise and Vibration Guideline 2016 (NSW CNVG)
  - Hurstville Development Control Plan Number 2 (Amendment No. 5). Applies to sites within the Hurstville City Centre identified as 'deferred matters' on the Hurstville Local Environmental Plan 2012 Land Application Map (Hurstville Development Control Plan)
  - Association of Australasian Acoustical Consultants Guideline for Childcare Centre Acoustic Assessment, Version 2.0, dated October 2013 (*AAC Guideline for Childcare Centre*)
  - Association of Australasian Acoustical Consultants Licensed Premises Noise Assessment Technical Guideline, Version 1.0, dated August 2019 (*AAC Guideline for Licensed Premises*)
  - Georges River Council Pre-Lodgement Meeting Minutes, Application No: PRE2020/0078, dated 4 August 2020 (Pre-Lodgement Minutes)
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## 1.2 PROVIDED PROJECT INFORMATION

This report has been written with reference to the following documentation:

- Notice of Determination of Modification to Development Consent MOD2015/0032, dated 22/07/2015 (DA conditions for the existing Centre)
- Architectural drawings for Development Application No. 01.1003 Rev A, 01.1004 Rev A, 01.1005 Rev A and 01.1006 Rev A, dated 07/09/2020 (Architectural Documentation)
- 20200907-610.18808-Westfield Hurstville ELP - Traffic Impact Statement, dated 07/09/2020 (SLR Traffic Impact Assessment Report)

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## 1.3 PROJECT DESCRIPTION

The project site is located at the corner of Cross Street and Park Road, Hurstville, NSW. The proposed extension of the current entertainment and leisure precinct on Level 04 and Level 05 is shown in Appendix A. Noise from indoor areas such as the areas proposed for recreation facility with ancillary amusement has been assumed to be sufficiently attenuated by the building facade and no further assessment has been undertaken. Besides indoor premises the proposed extension includes outdoor areas that are proposed to operate between 7.00 am to 12.00 am midnight and are listed below. We understand the carpark and entries for access to the centre will remain open from 6.00 am to 12.00 am midnight as for the currently existing centre.

- Level 04:

- Courtyard:

We understand the Courtyard is proposed to be mainly a green area used for through access. Any noise from patrons in the courtyard has been assumed to be included in the assessment of the LSA's.

- Licensed service areas (LSA's):

Level 04 incorporates ten (10) LSA's with outdoor seating. The general usage of the proposed LSA's is expected to be for food and beverage consumption with background music playback whilst allowing for speech at a conversational level. We understand these areas have been designed for a maximum population density of 1m<sup>2</sup> per person.

- General circulation:

Any noise from patrons in the circulation areas has been assumed to be included in the assessment of the LSA's.

- Level 05:

- Community Green Space:

The Community Green Space is intended for a range of leisure activities. Activities with low noise impact which could include but not limited to yoga classes, social conversations, relaxation or reading in the seating areas of the garden. Areas with the potential for higher noise impacts at certain times include kids playground or recreational facilities. These noisy activities have been expected to typically not occur outside the NSW Noise Policy for Industry 2017 (NSW NPfI) day and evening time periods.

- LSA:

Level 05 incorporates one (1) LSA. The general usage of the proposed LSA is expected to be for food and beverage consumption with background music playback whilst allowing for speech at a conversational level. We understand this area has been designed for a maximum population density of 1 m<sup>2</sup> per person.

- General circulation:

Any noise from patrons in the circulation areas has been assumed to be included in the assessment of the Community Green Space and Terrace.

This assessment addresses the following emissions for the proposed extension:

- Patron noise from the Level 04 and Level 05 LSA's proposed to be open to the environment
- Amplified music noise in the outdoor areas
- Patron and activity noise from the Level 05 Community Green Space
- Noise from additional building services plant inclusive of all mechanical plant and the cooling tower relocation associated with the ELP redevelopment

- Noise from patrons entering and exiting the premise along the northern pedestrian accessway
- Noise from additional loading dock and waste pickup activities associated with the proposed extension (we understand the delivery and pickup location will be at the currently existing location in the carpark at Dock 1 facing The Avenue on Ground Floor)
- Noise from additional road traffic associated with the extension
- Noise from additional vehicle movements associated with the proposed extension. The noise from the two (2) additional car pick up bays proposed to be located along the western entrance on L5 has been assumed to be included in the assessment of the additional vehicle movements.

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## 1.4 SITE LOCATION AND SENSITIVE RECEIVERS

The site is bounded by four street frontages being Cross Street to the north, The Avenue to the east, Humphreys Lane to the south and west, and Park Road running through the centre of the site.

Receivers potentially sensitive to both noise in the following categories, as defined in the NSW NPfI, have been identified in the surrounding area.

Residential receivers are located adjacent to the proposed ELP redevelopment area along Cross Street, Park Road, and The Avenue. The closest residential property considered as the nearest sensitive receivers are 25 Park Road and 2A Cross Street, both are multi-storey residential apartment buildings located on the north side of the site and 2A Cross Street is overlooking the proposed re-development area. The project site is also surrounded by residential and commercial buildings.

Potential noise impacts from the operation of the development will be assessed at the sensitive receiver locations identified in Figure 1.1. Table 1.1 outlines the noise sensitive receivers and provides approximate distances from the proposed development.



Figure 1.1 Location map of identified nearest noise sensitive receivers in relation to the proposed ELP redevelopment

Table 1.1 Identified nearest noise sensitive receivers

RECEIVER (FIGURE 1.1)	LOCATION	TYPE OF RECEIVER (AS PER NSW NPfI)	APPROXIMATE DISTANCE FROM PROJECT SITE
R1	25 Park Road (multi-storey, overlooking)	Residential	20 m
R2	2A Cross Street (multi-storey)	Residential	25 m
R3	2-4 Cross Street	Commercial	20 m
R4	Residences along The Avenue	Residential	95 m

The residential receiver at 25 Park Road to the north of the site overlooks the Centre and compliance with the noise criteria at the closest residential receiver has been assumed to also result in compliance at all other receiver locations.

## 2 EXISTING NOISE ENVIRONMENT

This section provides a summary of the relevant baseline noise data, including the location, dates and measured noise levels.

To establish the acoustic performance for noise egress, the prevailing external noise environment must be established.

The prevailing background and ambient noise levels surrounding the site were determined through a combination of unattended and operator attended noise surveys in accordance with the Australian Standard 1055:1997 – *Acoustics – Description and Measurement of Environmental Noise* (AS 1055) and the NSW Noise Policy for Industry (NPfI).

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### 2.1 COVID-19 IMPACTS

Due to the COVID-19 restrictions and social isolation laws in place at the time of this study WSP have measured noise levels of up to 5-8dB lower during the COVID-19 pandemic and social isolation in place, when compared to noise survey results conducted pre COVID-19.

Due to the COVID-19 restrictions and social isolation laws in place at the time of this study, noise monitoring results are expected to be lower than the typical prevailing noise environment for the area. This is considered a conservative approach.

If further assessments are required in the future we recommend a new noise survey is conducted to establish the criteria based on background noise levels that are not influenced by Covid-19 restrictions.

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### 2.2 WEATHER CONDITIONS

During the surveys, the weather was recorded from the Sydney Airport weather station 66037.

In accordance with the NSW NPfI, any noise monitoring results during adverse weather conditions have been excluded from the dataset. A number of adverse weather conditions were noted as occurring during the monitoring period. Adverse weather conditions are defined in the NSW NPfI during periods with:

- Wind speeds higher than 5 m/s; and/or,
- Any rain in the 15-minute period

Noise logging graphs including periods where data has been excluded due to weather conditions are presented in Appendix A.

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### 2.3 INSTRUMENTATION AND QUALITY CONTROL

The monitoring equipment was fitted with windshields and field calibrated before and after monitoring. No significant drifts in calibration ( $\pm 0.5$  dB) were noted.

All the monitoring equipment has a current certified calibration certificate (National Association of Testing Authorities, NATA) at the time of use. Details of the equipment used to conduct the noise and vibration survey are outlined within Table 2.1.

Table 2.1 Noise and vibration monitoring equipment

MANUFACTURER AND MODEL NO.	SURVEY METHOD	SERIAL NO.	CALIBRATION DUE DATE
Rion NL-42	Unattended logging (NM01)	296507	12/06/2021



MANUFACTURER AND MODEL NO.	SURVEY METHOD	SERIAL NO.	CALIBRATION DUE DATE
Rion NL-42	Unattended logging (NM02)	296510	11/06/2021
Rion NC-73	Calibrator	11248294	22/07/2020
Norsonic 140	Attended measurements	1404791	09/10/2021

## 2.4 NOISE MONITORING LOCATIONS

The attended and unattended noise monitoring locations were conducted on the roof carpark level of the existing Centre as shown in Figure 2.1 to characterise the existing noise environment at the site.

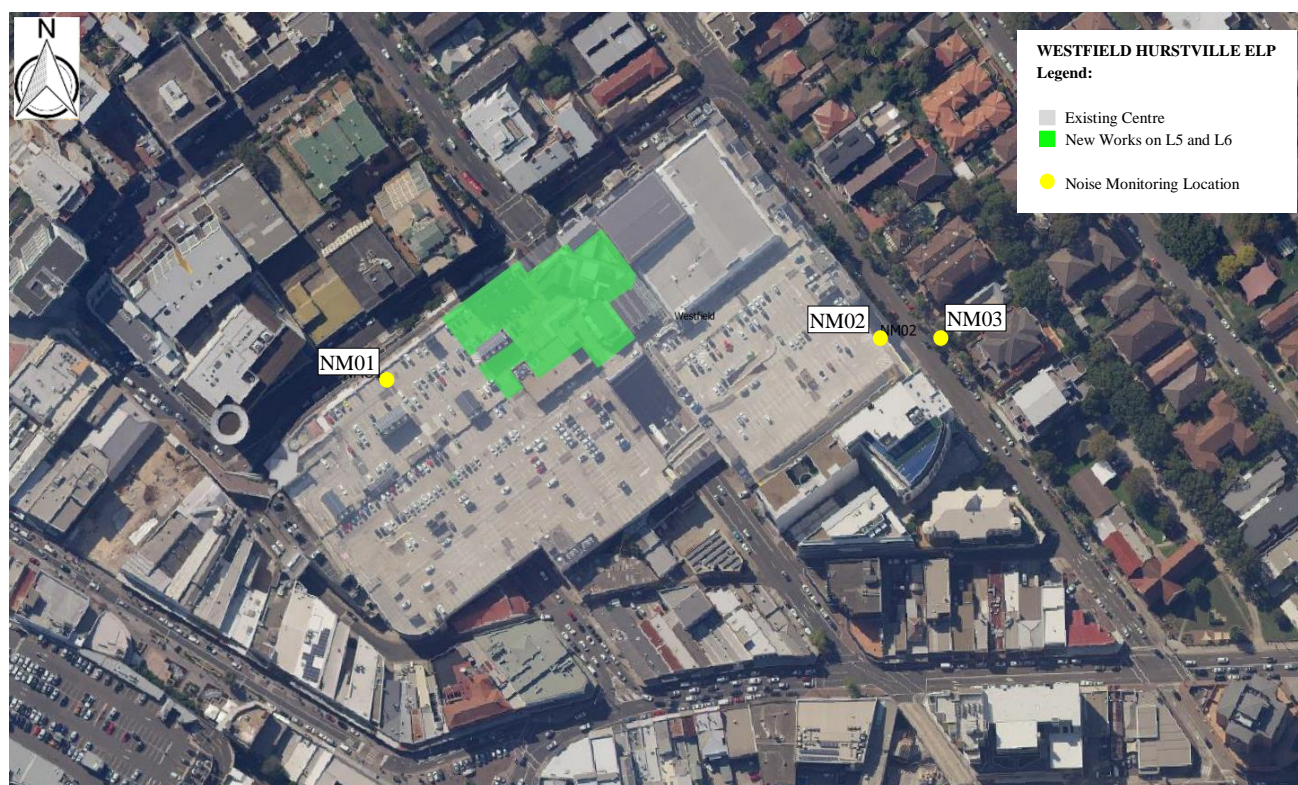


Figure 2.1 Noise monitoring locations

## 2.5 UNATTENDED NOISE MEASUREMENTS

Unattended noise monitoring was conducted from Monday 18 May to Wednesday 27 May 2020.

The Rating Background Noise Level (RBL) is the background noise level used for assessment purposes at the nearest potentially affected receiver. The RBL is defined as the 90<sup>th</sup> percentile of the daily background noise levels during each assessment period. A summary of the measured RBL levels and  $L_{Aeq,15\text{minute}}$  noise levels are presented in Table 2.2.

Table 2.2 Summary of unattended noise measurements

LOCATION ID	NSW NPfI TIME PERIOD <sup>1</sup>	Ambient Noise Level, dBA $L_{Aeq,15\text{minute}}$	RBL, dBA $L_{90}$
NM01	Day	61 <sup>2</sup>	55 <sup>2</sup>

LOCATION ID	NSW NPfI TIME PERIOD <sup>1</sup>	Ambient Noise Level, dBA $L_{eq,15minute}$	RBL, dBA $L_{90}$
NM02	Evening	56	49
	Night	52	47
	Day	58	52
	Evening	56	51
	Night	52	48

- (1) NSW NPfI periods as per Section 3.1.2
- (2) Measurements during the NPfI day time have been affected by noise from nearby construction works and results measured for location NM02 have been used for location NM01. This has been considered acceptable as results measured for the NPfI evening and night-time periods are comparable for location NM01 and NM02.

## 2.6 OPERATOR ATTENDED NOISE MEASUREMENTS

WSP carried out operator attended measurements to characterise the noise environment and identify the contributors to the acoustic environment. Operator attended measurements were conducted on Wednesday 27 May 2020.

The results of the attended noise surveys and observations are detailed in Table 2.3.

Table 2.3 Summary of attended noise monitoring results

LOCATION	TIME	dBA $L_{eq,15minute}$	OBSERVATIONS
NM02	4:28 pm	56	Cinema plant in background: 54dBA Road traffic on The Avenue: 57dBA Car movement in the car parking: 63dBA No noise from plant on rooftop
NM03	4:00 pm	69	Single car on road: 68dBA Birdsong: 58-60dBA Car horn: 63dBA Steady stream of cars: 71-73dBA Plant from Westfield (adjacent to Dock 1): 55-56dBA



### 3 ENVIRONMENTAL NOISE CRITERIA

Development approval criteria are determined by local council requirements, state policies and guideline documents. This section presents the noise criteria applicable to the proposed ELP redevelopment.

In the absence of specific environmental noise emission criteria in the Hurstville Development Control Plan, project noise criteria have been developed in general accordance with the Development Approval (DA) conditions for the existing Centre [the following principals have been applied: live music assumed to be not allowed without special permission as per (25a), EPA ‘offensive noise’ as per (25c), operating hours for external premises as per (25f), NSW OLGR standard condition criteria for licensed premises as per Acoustic Logic Report under (25h)] and requirements noted in the Pre-Lodgement Minutes [Protection of the Environment Operations Act 997 and the NSW EPA Noise Policy for Industry 2017].

A description of the noise sources associated with the ELP redevelopment and relevant environmental noise criteria are summarized in Table 3.1.

Table 3.1 Summary of noise sources and applicable policies and guidelines

SOURCE NO	NOISE SOURCE ASSOCIATED WITH EXTENSION	APPLICABLE POLICIES AND GUIDELINES
1	Building services noise  (assessed for noise from additional building services inclusive of all mechanical plant associated with the extension including the noise of the relocation from the existing cooling towers)	NSW NPfI criteria
2	Loading dock/waste pickup activities  (assessed for additional noise from delivery and pickup activities associated with the extension at the existing pickup Dock 1 on Ground Level facing The Avenue)	
3	Vehicle movements on site  (assessed for additional vehicle movements in the carparking and drop off areas associated with the extension)	
4	Road traffic noise  (assessed for additional traffic to road network surrounding the site associated with the extension)	NSW Road Noise Policy 2011 (NSW RNP) criteria
5	Patron and activity noise from community areas  (assessed for patron and activity noise from the Level 05 Community Green Space)	While noise impacts generated by patron activities in the Community Green Space area is not specifically addressed under NSW legislation, we propose an assessment as per the NSW Noise Guide for Local Government 2013 (NSW NGLG) – Offensive noise checklist is undertaken to determine whether the noise is offensive and requires mitigation.

SOURCE NO	NOISE SOURCE ASSOCIATED WITH EXTENSION	APPLICABLE POLICIES AND GUIDELINES
6	Patron noise from licensed venues (assessed for patron noise from all Level 04 and Level 05 LSA's)	NSW Office of Liquor, Gaming and Racing 2013 standard conditions (NSW OLGR standard conditions)
7	Amplified music noise (assessed for amplified music noise associated with the outdoor areas on Level 04 and Level 05 LSA's)	
8	Noise from patrons entering and exiting the premises along the northern pedestrian accessway (assessed for patron entering and exiting Level 04 and Level 05 LSA's)	
9	Construction noise (not assessed)	Construction Noise Management Levels (NMLs) as per the definitions in the NSW Interim Construction Noise Guideline 2015 (NSW ICNG) have been outlined for noise emissions from construction activities.  Prior to construction for the extension commencing a detailed Construction Noise and Vibration Management Plan (CNVMP) should be developed by the appointed builder to ensure compliance with the applicable construction noise limits as outlined in this report.

## 3.1 NSW NOISE POLICY FOR INDUSTRY

Noise assessed under the NSW Noise Policy for Industry (NPfI) typically includes noise from industrial type sources such as mechanical plant and loading dock activities.

To ensure that nearby noise sensitive receivers are not adversely affected, noise emissions from *Sources 1, 2 and 3* in Table 3.1 must be designed to comply with the NSW NPfI criteria.

The following section provides an overview of the relevant acoustic criteria applicable to the proposed ELP redevelopment based on the requirements of the NSW NPfI.

### 3.1.1 OVERVIEW

The NSW NPfI prescribes methods for determining the statutory environmental noise limits that apply to noise sensitive receivers (i.e. residences) with regards to noise due to individual noise sources only.

The assessment procedure for industrial noise sources has two components:

- Controlling intrusive noise impacts in the short term for residences
- Maintaining noise level amenity for particular land uses for residences and other land uses

In assessing the noise impact of industrial sources, both components must be considered for residential receivers. In most cases, only one will become the limiting criterion and form the project-specific noise levels for the industrial source under assessment. The intrusive noise criteria do not apply to commercial receivers, instead an amenity criterion is applicable to these receivers.

In addition to the above, the potential for sleep disturbance from maximum noise level events from premises during the night-time period needs to be considered.

### 3.1.2 NSW NPfI TIME PERIODS

Time periods defined by the NSW NPfI are presented in Table 3.2.

Table 3.2 NSW NPfI Time Periods

NSW NPfI TIME PERIODS	TIME
Day	7:00 am to 6:00 pm Monday to Saturday 8:00 am to 6:00 pm Sundays and public holidays
Evening	6:00 pm to 10:00 pm all days
Night	All other times

### 3.1.3 PROJECT INTRUSIVENESS NOISE LEVEL

With regard to the assessment of intrusive noise due to industrial sources, the NSW NPfI states:

*The intrusiveness of an industrial noise source may generally be considered acceptable if the level of noise from the source (represented by the **L<sub>Aeq</sub> descriptor**), measured over a 15-minute period, does not exceed the background noise level by more than 5 dB when beyond a minimum threshold.*

The intrusiveness criterion for residential receivers prescribed in the NSW NPfI may be summarised as:

$$L_{Aeq, 15\text{-minute}} \leq \text{Rating Background Level (L}_{A90}) + 5 \text{ dB}$$

Based on the background noise level measured during the day, evening and night periods, the RBL and intrusiveness criterion shown in Table 3.3 has been established for the proposed development in accordance with the NSW NPfI.

Table 3.3 Established Project Intrusiveness Noise Level, residential receivers only

RECEIVER LOCATION	NSW NPfI TIME PERIOD <sup>1</sup>	RBL dBA	PROJECT INTRUSIVENESS NOISE LEVEL (RBL + 5 dB) dBA L <sub>Aeq,15minute</sub>
Residential areas along Cross Street	Day	52	57
	Evening	49	54
	Night	47	52
Residential areas along The Avenue	Day	52	57
	Evening	51	56
	Night	48	53

(1) NSW NPfI periods as per Section 3.1.2.

### 3.1.4 PROJECT AMENITY NOISE LEVEL

To limit continuing increases in noise levels from application of the intrusiveness level alone, the ambient noise level within an area from all industrial noise sources combined should remain below the recommended amenity noise levels prescribed in the NSW NPfI where feasible and reasonable.

The recommended amenity noise levels represent the objective for **total** industrial noise at a receiver location, whereas the **project amenity noise level** represents the objective for noise from a **single** industrial development at a receiver location.

$$\text{Project amenity noise level for industrial development} = \text{recommended amenity noise level (Table 2.2)} \text{ minus } 5 \text{ dB(A)}$$

It is noted that, in order to standardise the time periods for the intrusiveness and amenity noise levels, the following conversion between  $L_{eq,period}$  and  $L_{eq,15minute}$  has been applied (as per Section 2.2 of the NSW NPfI):

$$L_{Aeq,15minute} = L_{Aeq,period} + 3 \text{ dB}$$

The amenity criterion has been established at the identified receivers based on the results of the unattended noise survey. The established amenity criteria applicable to the proposed development are presented in Table 3.4.

Table 3.4 Established Project Amenity Noise Level

LOCATION	TYPE OF RECEIVER (NSW NPfI)	NSW NPfI TIME PERIOD <sup>1</sup>	EXISTING AMBIENT NOISE LEVELS, dBA $L_{eq,15minute}$	RECOMMENDED AMENITY NOISE LEVEL (ANL), dBA $L_{eq,period}$	PROJECT AMENITY NOISE LEVEL (ANL – 5dB), dBA $L_{eq,period}$	PROJECT ADJUSTED ANL, dBA $L_{eq,period}$	PROJECT ADJUSTED AMENITY NOISE LEVEL dBA $L_{eq,15minute}$
Residential areas along Cross Street	Urban	Day	58	60	55	55	<b>58</b>
		Evening	56	50	45	$(56-10)^3$ 46	<b>49</b>
		Night	52	45	40	$(52-10)^3$ 42	<b>45</b>
Residential areas along The Avenue	Urban	Day	58	60	55	55	<b>58</b>
		Evening	56	50	45	$(56-10)^2$ 46	<b>49</b>
		Night	52	45	40	$(52-10)^2$ 42	<b>45</b>
Commercial	Commercial	When in use	D59/E56/N52	65	60	60	<b>63</b>

(1) NSW NPfI periods as per Section 3.1.2.

(2) Where the resultant project amenity noise level is 10 dB or more, lower than the existing industrial noise level and noise levels are unlikely to reduce over time. In this case the project amenity noise levels can be set at 10 dB below existing industrial noise levels (as per note 3 of Section 2.4 of the NSW NPfI)

### 3.1.5 MAXIMUM NOISE LEVEL EVENT ASSESSMENT

The potential for sleep disturbance from maximum noise level events from premises during the NSW NPfI night-time period needs to be considered. Sleep disturbance is considered to be both awakenings and disturbance to sleep stages.

Where the subject development/premises night-time noise levels at a residential location exceed the following, a detailed maximum noise level event assessment should be undertaken.

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

### 3.1.6 PROJECT NOISE TRIGGER LEVEL

In assessing the noise impact of the proposed development on surrounding residential receivers, the lower value of the project intrusiveness noise level and amenity noise level is selected as the project noise trigger level. Exceedance of the trigger level would indicate a potential noise impact on the community and ‘trigger’ a management response; for example, further investigation of mitigation measures.

As required in Section 2.2 of the NSW NPfI, all project noise trigger levels and limits are expressed as  $L_{Aeq,15min}$ , unless otherwise expressed. A summary of all relevant criteria is presented in Table 3.5. Please note that we have listed the criteria for the residential receivers along The Avenue and for the commercial receivers on Cross Street for reference. For the assessment we have assumed the compliance with the closest residential receiver on Cross Street demonstrates compliance with all other receivers.

Table 3.5 Summary of NSW Noise Policy for Industry Project Noise Trigger Levels (PNTL)

RECEIVER TYPE	NSW NPfI TIME PERIOD <sup>1</sup>	INTRUSIVE CRITERIA dBA $L_{eq,15minute}$	PROJECT ADJUSTED AMENITY NOISE LEVEL dBA $L_{eq,15minute}$	PROJECT NOISE TRIGGER LEVEL dBA $L_{eq,15minute}$	SLEEP DISTURBANCE
Residential areas along Cross Street	Day	57	58	<b>57</b>	n/a
	Evening	54	49	<b>49</b>	n/a
	Night	52	45	<b>45</b>	<b>52 dBA <math>L_{eq,15minute}</math></b> <b>62 dBA <math>L_{F,max}</math></b>
Residential areas along The Avenue	Day	57	58	<b>57</b>	n/a
	Evening	56	49	<b>49</b>	n/a
	Night	53	45	<b>45</b>	<b>53 dBA <math>L_{eq,15minute}</math></b> <b>63 dBA <math>L_{F,max}</math></b>
Commercial along Cross Street	When in use	-	63	<b>63</b>	n/a

(1) NSW NPfI periods as per Section 3.1.2.

## 3.2 ROAD TRAFFIC NOISE

To assess the effect of the proposed development in terms of the increase of traffic on the nearby residences, the NSW Road Noise Policy (RNP) provides objective criteria. The relevant criteria have been drawn out of the policy and detailed below.

The road policy is used in this assessment to address noise associated with potential traffic increases on the surrounding road network due to the proposed development. To ensure that nearby noise sensitive receivers are not adversely affected, noise emissions from *Source 4* in Table 3.1 must be designed to comply with the NSW RNP.

Noise generated by additional traffic on the road is to be assessed against façade corrected noise levels when measured in front of a building façade. The external criteria are assessed at 1 metre from the affected residential building façades and at a height of 1.5 metres from the floor.

Table 3.6 Noise assessment criteria - residential land uses (Source: NSW RNP Section 2.3.1)

PROJECT TYPE/LAND USE	ASSESSMENT CRITERIA	
	NSW RNP DAY (7AM-10PM)	NSW RNP NIGHT (10PM-7AM)
Land use development with potential to create additional traffic on local roads	55 dBA $L_{eq}$ (1 hour) (external)	50 dBA $L_{eq}$ (1 hour) (external)
Land use development with potential to create additional traffic on arterial, sub-arterial and collector roads	60 dBA $L_{eq}$ (15 hour) (external)	55 dBA $L_{eq}$ (9 hour) (external)

It is noted that the prevailing traffic noise levels measured on-site as outlined in Table 2.2 and Table 2.3, are already above the criteria for the local road network surrounding the site.

Where existing traffic noise levels are above the noise assessment criteria, the NSW RNP aims to protect against excessive decreases in amenity as the result of a project. Where road traffic noise increases by more than 2dB as a result of a land use development, mitigation should be considered to control excessive increase in noise level. An increase of up to 2dB represents a minor impact that is considered barely perceptible to the average person.

Therefore, a maximum 2dB increase in traffic noise levels is considered to be the applicable assessment criterion for receivers which are currently experiencing traffic noise levels greater than the assessment criteria in Table 3.6.

### 3.3 OFFENSIVE NOISE

To ensure that nearby noise sensitive receivers are not adversely affected, we propose noise emissions from *Sources 5* (Table 3.1) are assessed against the NSW Noise Guide for Local Government (NSW NGLG) – Offensive noise checklist.

Offensive noise is defined in the POEO Act as noise:

- a** *that, by reason of its level, nature, character or quality, or the time at which it is made, or any other circumstances:*
  - i** *is harmful to (or is likely to be harmful to) a person who is outside the premises from which it is emitted, or*
  - ii** *interferes unreasonably with (or is likely to interfere unreasonably with) the comfort or repose of a person who is outside the premises from which it is emitted, or*
- b** *that is of a level, nature, character, or quality prescribed by the regulations or that is made at a time, or in other circumstances, prescribed by the regulations*

The NSW NGLG provides guidance to determine if the noise is offensive, including the following:

- *The loudness of the noise, especially compared with other noise in the area*
- *The character of the noise*
- *The time and duration of the noise*
- *Whether the noise is typical for the area*

- *How often the noise occurs*
- *The number of people affected by the noise*

## 3.4 ENTERTAINMENT NOISE EMISSIONS

Noise assessed under the Office of Liquor, Gaming and Racing (OLGR) typically relates to entertainment noise associated with licensed premises including noise generated by patrons and music.

To ensure that nearby noise sensitive receivers are not adversely affected, noise emissions from *Sources 6, 7 and 8* (Table 3.1) must be designed to comply with the OLGR criteria outlined in the following:

- The  $L_{A10}$  noise level emitted from the licensed premises shall not exceed the background noise level in any Octave Band Centre Frequency (31.5 Hz – 8 kHz inclusive) by more than 5 dB between 07:00 am and 12:00 midnight at the boundary of any affected residence.*
- The  $L_{A10}$  noise level emitted from the licensed premises shall not exceed the background noise level in any Octave Band Centre Frequency (31.5 Hz – 8 kHz inclusive) between 12:00 midnight and 07:00 am at the boundary of any affected residence.*
- Notwithstanding compliance with the above, the noise from the licensed premises shall not be audible within any habitable room in any residential premises between the hours of 12:00 midnight and 07:00 am.*

Based on the octave band noise levels measured at receiver NM02 during the attended measurements, the above conditions have been translated into noise limits to be complied with at the boundary of the surrounding residential receivers applying the corrections detailed in the above OLGR criteria ‘a’. The proposed operating hours of the external premises are between 7.00 am and 12.00 am midnight during the OLGR daytime period. We understand the northern pedestrian accessway adjacent the residential receivers will be closed at midnight and any noise emissions from patrons leaving have been assessed against the OLGR daytime criteria. The OLGR night-time criteria (i.e. ‘b’ and ‘c’) are therefore not applicable to the LSA’s and have not been assessed.

Table 3.7 Octave band criteria at various noise sensitive receivers

RECEIVER	TIME	OLGR CRITERIA, dB L <sub>10</sub> AT 1/1 OCTAVE BAND CENTRE FREQUENCY (HZ)								
		31.5	63	125	250	500	1k	2k	4k	8k
Residential	OLGR daytime (07:00 am to 12:00 am midnight)	68	68	62	55	53	51	46	38	30

## 3.5 CONSTRUCTION NOISE AND VIBRATION

The construction process associated with the ELP redevelopment (*Source 9* in Table 3.1) should be managed to control construction noise. The principles and assessment methodologies as described in the NSW Interim Construction Noise Guideline (NSW ICNG) are recommended to determine appropriate construction noise and vibration criteria.

### 3.5.1 AIRBORNE NOISE MANAGEMENT LEVELS

The measured background noise levels (RBL) presented in Section 2 have been used to determine the construction Noise Management Levels (NMLs) as per the definitions in the NSW ICNG.

### 3.5.1.1 RESIDENTIAL RECEIVERS

NMLs are the level of noise above which receivers are considered to be ‘noise affected’. They are based on the measured RBL plus an additional allowance of 10 dB during standard hours and 5 dB outside of standard hours.

Where construction noise levels are above 75 dBA at residential receivers during standard hours, they are considered ‘highly noise affected’ and require additional considerations to mitigate potential impacts.

Table 3.8 Construction noise management levels for residential receivers and working hours (Source: Table 2 of the NSW ICNG)

NSW ICNG TIME OF DAY	NML dBA $L_{eq,15 \text{ minute}}^{1,2}$	HOW TO APPLY
<p>Recommended standard hours: Monday - Friday 7:00 am – 6:00 pm</p> <p>Saturday 8:00 am – 1:00 pm</p> <p>No work on Sundays or public holidays</p>	<p>Noise affected</p> <p>RBL + 10 dB</p>	<p>The noise affected level represents the point above which there may be some community reaction to noise.</p> <ul style="list-style-type: none"> <li>Where the predicted or measured dBA <math>L_{eq,15 \text{ minute}}</math> is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level.</li> <li>The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.</li> </ul>
	<p>Highly noise affected</p> <p>75 dBA</p>	<p>The highly noise affected level represents the point above which there may be strong community reaction to noise.</p> <ul style="list-style-type: none"> <li>Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account: <ol style="list-style-type: none"> <li>times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid-morning or mid-afternoon for works near residences)</li> <li>if the community is prepared to accept a longer period of construction in exchange for restrictions on construction times</li> </ol> </li> </ul>



NSW ICNG TIME OF DAY	NML dBA $L_{eq,15 \text{ minute}}^{1,2}$	HOW TO APPLY
Outside recommended standard hours	Noise affected RBL + 5 dB	<ul style="list-style-type: none"> <li>— A strong justification would typically be required for works outside the recommended standard hours.</li> <li>— The proponent should apply all feasible and reasonable work practices to meet the noise affected level.</li> <li>— Where all feasible and reasonable practices have been applied and noise is more than 5 dB above the noise affected level, the proponent should negotiate with the community.</li> </ul>

- (1) Noise levels apply at the property boundary that is most exposed to construction noise, and at a height of 1.5 m above ground level. If the property boundary is more than 30 m from the residence, the location for measuring or predicting noise levels is at the most noise-affected point within 30 m of the residence. Noise levels may be higher at upper floors of the noise affected residence.
- (2) The RBL is the overall background noise level representing each assessment period (NSW ICNG day/evening/night) over the whole monitoring period. The term RBL is described in detail in the NSW NPfI.

### 3.5.1.2 OTHER SENSITIVE LAND USES

The NSW ICNG provides maximum noise levels for typical industrial premises, offices and retail outlets Table 3.9 presents the NMLs for non-residential sensitive receivers at the building exterior. External noise levels are to be assessed at the most affected point within 50 m of the area boundary.

Table 3.9 Construction noise management levels at sensitive land uses (other than residences) (Source: Table 3 of the NSW ICNG)

RECEIVER	NML dBA $L_{eq,15 \text{ minute}}$ (applies when properties are being used)
Industrial premises	75 - external
Offices, retail outlets	70 - external

### 3.5.1 CONSTRUCTION TRAFFIC NOISE

The NSW ICNG does not specify appropriate criteria for noise arising from construction traffic. The NSW RMS CNVG refers to the NSW RNP for assessment of construction traffic on public roads (as described in Section 3.2).

A screening test of 2 dB increase due to construction traffic or a temporary reroute from road closure is used to determine further assessment in accordance with the Roads and Maritimes Criteria Guideline. Where noise generated by the proposed construction works is 2 dB or less, no further assessment is required.

# 4 ASSESSMENT

This section outlines the assessment of the noise emissions associated with the proposed ELP redevelopment to nearby noise sensitive receivers.

---

## 4.1 BUILDING SERVICES PLANT

As the proposed ELP redevelopment is in the early design stages, detailed design of building services equipment has not been undertaken. Therefore, a detailed noise emission assessment is not possible during this stage. However, all additional external building services plant associated with the ELP redevelopment including the re-location of the cooling towers will be assessed during the detailed design stages to ensure compliance with the applicable acoustic criteria as outlined in Section 3.1.6. The assessment will include typical day, evening and night-time operation and emergency operations. Where necessary, acoustic mitigation measures will be applied to the design. These may include:

- Attenuators and/or internally lined sections of duct
- Quiet unit selections
- Consideration to location of units
- Timed systems
- Acoustic barriers and/or acoustic louvres

We understand the existing cooling towers are currently located on the SW corner of the Level 4 ELP area and are proposed to be re-located to the SW corner of the Level 4 carpark. The re-location will move the cooling towers further away from the residential receivers along the northern boundary and the noise impact from the new location to the receivers along the northern boundary is expected to be lower than with the current design. This will be further assessed during the detailed design stage as noted above and compliance with the Protection of the *Environment Operations Act 1997* and the *Noise Policy for Industry (2017)* - NSW EPA will need to be ensured.

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## 4.2 SERVICE VEHICLES AND CAR MOVEMENT ON SITE

### 4.2.1 LOADING DOCK AND WASTE PICKUP ACTIVITIES

We understand all goods and waste associated with the operations of this ELP redevelopment will be delivered and picked up from the existing pickup location at Dock 1 which is located in the carpark on Ground Level and is shielded from The Avenue. The delivery and pickup locations are located in the carpark shielded from the noise sensitive receivers across The Avenue. Additional events due to the extension are only expected to increase the frequency of the delivery and pickup events. Noise emissions of the delivery and pickup activities are expected to remain the same for any 15-minute period. Based on the assumption that current delivery and pickup events comply with the NSW NPfI project noise trigger levels outlined in Section 3.1.6 we expect that additional events will also comply.

### 4.2.2 CARPARK VEHICLE MOVEMENTS

The SLR Traffic Impact Assessment Report predicts the following vehicle movements into/out of the Centre carpark for the existing Centre and the proposed extension combined. We understand entrances to the carpark are located along Cross Street, Park Road, Rose Street and The Avenue.

- 2,778 during the Thursday afternoon peak hour (typically 4pm to 5pm or 5pm to 6pm) and
- 3,473 vehicle movements during the Saturday mid-day peak hour (typically 12pm to 1pm or 1pm to 2pm).

The noise assessment for car movements on site has been based on the assumed hourly contribution of 1 vehicle to the  $L_{eq}$  and  $L_{max}$  shown in Table 4.1. The values are based on the data provided by RWTUV Fahrzeug GmbH “*Investigations on Noise Emission of Motor Vehicles in Road Traffic*” (February 2005).

Table 4.1 Hourly Contribution of 1 vehicle to the  $L_{eq}$  and  $L_{max}$

ACTIVITIES	SOUND PRESSURE LEVEL, dBA		SOUND POWER LEVEL, dBA $L_{max}$
	hourly contribution of 1 vehicle to $L_{eq}$ at 25m	$L_{max}$ at 7.5m	
Car 20km/h free flowing traffic	24	60	-
Car 20km/h accelerating	27	63	-
Car door slam	-	-	98
Normal car door close	-	-	88

The following information and assumptions have been made in predicting the noise emissions from vehicle movements on site:

- Cars are moving at maximum 20km/h on site.
- Maximum 868 car movements (driving in or out or carpark) per 15 minute period during the NSW NPfI day and evening time (as per Section 3.1.2).
- Noise levels of free flowing traffic and of accelerating vehicles as noted in Table 4.1; each assumed for 50% of the cars.
- One maximum noise levels per car based on data for car door closing events with the levels noted in Table 4.1; car door slams have been assumed to occur for up to 25% of cars with the rest being normal car door closing events.
- The assessment was based on the information provided for the worst case Saturday afternoon peak hour.
- Cars have been assumed to be evenly distributed across the car parking levels.
- Vehicle movements for the operation of the Centre during the NSW NPfI night time period (as per Section 3.1.2) have been assumed to reduce to 50% or less compared to the number of movements during the peak hour.
- Shielding effects from blocked sections of the carpark facades have currently not been allowed for which is considered a conservative approach.

The predicted noise  $L_{eq}$  levels associated with vehicle movements on site from the existing Centre and the proposed extension are presented in Table 4.2. Car movements during the NSW NPfI night time operation period (as per Section 3.1.2) have also been assessed against the  $L_{eq,15min}$  sleep disturbance criteria as noise emissions are expected to be intermittent during this time.

Table 4.2 Predicted Boundary Noise Levels associated with car movements on site

RECEIVER	EXTERNAL NOISE LEVEL AT RECEIVER dBA $L_{eq,15min}$						COMPLIES?
	NSW NPfI Day Period <sup>(1)</sup>		NSW NPfI Evening Period <sup>(1)</sup>		NSW NPfI Night Period <sup>(1)</sup>		
	Predicted	PTNL Criteria	Predicted	PTNL Criteria	Predicted	PTNL Criteria (Sleep disturbance screening level)	
25 Park Road (Residential)	<47	57	<47	49	<44	45 (52)	Yes

(1) NSW NPfI periods as per Section 3.1.2

As shown in Table 4.2, the predicted noise levels associated with the car movements on site are expected to comply with the NSW NPfI project noise trigger levels at the nearest affected residential receiver for all assessment periods.

According to the NSW NPfI the potential for sleep disturbance from maximum noise level events needs to be considered in residential areas during the night-time period. Typically, car door slams are the potential impact from carpark activities that would cause sleep awakening reactions to the occupants in any residential receivers. Additional maximum noise level events due to the extension are only expected to increase in frequency but not in overall level. Based on the assumption that current maximum noise level events comply with the NSW NPfI sleep disturbance criteria outlined in Section 3.1.6 we expect that additional events will also comply and it is anticipated that additional car park activities would not result in sleep awakening reactions.

## 4.3 ROAD TRAFFIC NOISE

The assessment of additional noise from road traffic due to the extension has been based on a maximum increase of 4% of the currently existing traffic volume. The SLR Traffic Impact Assessment Report estimates a 4% increase of the combined vehicle entry and exit movements per hour due to the proposed extension. Assuming the 4% increase also applies to the surrounding road is considered conservative.

A 4% increase in road traffic is expected to result in an increase in 15 minute  $L_{eq}$  noise levels of less than 0.2 dB.

Based on the assumed traffic noise increase associated with the extension, road traffic noise levels for the surrounding local road network including Cross Street, The Avenue, Park Road and Humphreys Lane is not expected to increase by more than 2 dB.

The predicted road traffic noise therefore complies with the established NSW RNP requirements.

## 4.4 PATRON AND ACTIVITY NOISE FROM COMMUNITY GREEN SPACE

For the assessment of the noise impact from the Level 05 Community Green Space to the nearest sensitive receivers, the following assumptions have been made:

- Maximum number of 200 patrons evenly distributed across the Level 05 Community Green Space area with up to 40% of people talking with a raised voice at any time during a 15 minute period. The assessment is based on sound

power voice levels for raised speech in accordance with information provided in the *AAC Guideline for Licensed Premises* as shown in Table 4.3 and noise spectrums for 50% male and 50% female have been used.

- We understand the outdoor areas will not be occupied after midnight and expect occupancy of the outdoor areas to drop during the night time.
- No significant noise impact is expected from quiet activities such as (but not limited to) yoga, reading or relaxation.
- Noisy activities such as children's playground and recreational activities to not exceed 85 dBA  $L_{eq}$  at 1 m distance. This is based on the average Sound Power Level for groups of 10 children playing aged 2 to 3 years (SWL of 83-87dBA), 10 children playing aged 3 to 6 years (SWL of 84-90dBA) provided in the *AAC Guideline for Childcare* and of the average noise levels for male and female shouting voices (SPL of 89dBA at 1m for male voice and 82dBA at 1m for female voice) provided in the *AAC Guideline for Licensed Premises*. We have assumed noisy activities to typically not occur outside the NSW NPfI day and evening time periods (as per Section 3.1.2).

Table 4.3 Patron sound power level spectrums in accordance with AAC Guideline for Childcare

SOURCE	SOUND PRESSURE LEVEL $L_{eq}$ AT 1m, dB OCTAVE BAND FREQUENCY, Hz							
	125	250	500	1000	2000	4000	8000	OVERALL dBA
Male raised voice	56	63	65	62	57	52	46	<b>66</b>
Female raised voice	54	61	62	60	55	50	44	<b>64</b>
Male loud voice	59	67	73	72	67	62	53	<b>76</b>
Female loud voice	56	64	71	70	64	59	50	<b>73</b>

Patron and recreational activity noise emissions from the proposed community Green Space area may impact nearby sensitive receivers. An assessment to determine whether the noise is offensive has been undertaken in line with guidance provided in the NSW NGLG. This assessment is outlined in Table 4.4.

Table 4.4 Offensive noise assessment

ITEM	CONSIDERATION	COMMENT	RESPONSE TO CONSIDERATION
1	Is the noise loud in an absolute sense? Is it loud relative to other noise in the area?	<p>Patron and recreational activity noise from the Community Green Space is predicted to be below currently measured noise emissions from the existing Centre and the existing environment during the NPfI day and evening time periods.</p> <p>Up to approximately 55 dBA <math>L_{eq}</math> are predicted at the closest residential receiver across Cross Street from the Community Green Space when the area is occupied. Existing ambient noise levels measured along Cross Street are 58 dBA <math>L_{eq}</math> during the day, 56 dBA <math>L_{eq}</math> during the evening and 52 dBA during the night period.</p> <p>It is noted that the measured background noise levels are expected to be lower than the typical prevailing noise environment for the area due to the COVID-19 lockdown restrictions that were in place at the time of the assessment (please also refer to 2.1).</p>	No

ITEM	CONSIDERATION	COMMENT	RESPONSE TO CONSIDERATION
2	Does the noise include characteristics that make it particularly irritating?	The noise would be predominantly comprised of voices which are not typically classified as irritating	No
3	Does the noise occur at times when people expect to enjoy peace and quiet?	Noisy activities in the Community Green Space are expected to typically occur during the NPfI day and evening time. People would typically be expected to enjoy peace and quiet during the NPfI night time period.	No
4	Is the noise atypical for the area?	The noise is not atypical of the existing Westfield Centre noise environment.	No
5	Does the noise occur often?	Noisy activities are expected to be intermittent throughout the NPfI day time depending on patron occupancy and the activities patrons engage in.	No
6	Are a number of people affected by the noise?	Residential receivers identified along northern side of the proposed ELP redevelopment may be affected. However, the noise impact is predicted to be limited as per the comment under item (1) in this assessment.	Limited impact on the affected people.

The offensive noise assessment was concluded with five 'No' responses versus one 'limited impact' response. On balance, the NSW NGLG assessment of the noise emissions is considered not offensive.

## 4.5 PATRON AND AMPLIFIED MUSIC NOISE FROM L4 LSA'S & L5 TERRACE

Patron activity noise and amplified music noise from the Level 04 and Level 05 LSA's has been assessed based on the following assumptions:

- Maximum occupancy numbers:
  - LSA's on Level 04: 265 patrons total (1 person per 1 m<sup>2</sup>)
  - LSA's on Level 05: 80 patrons total (1 person per 1 m<sup>2</sup>)
- Level 5 LSAs at the northern building façade will be shielded with a 3m high glass screen. Based on the drawings we understand there will also be shielding through canopies which have not been allowed for in the calculation. Hence, this assessment is expected to be conservative to the actual situation.
- Sound Power Levels L<sub>10</sub> for crowd noise have been estimated according to *Prediction of Noise from Small to Medium Sized Crowds* (2011) as follows:

$$L_{WA10} = 15 \log N + 67 \text{ dBA} \quad (N - \text{crowd size})$$

The assessment is based on voice spectrums for raised speech raised speech in accordance with information provided in the *AAC Guideline for Licensed Premises* as shown in Table 4.3. Noise spectrums for 50% male and 50% female have been used and have been adjusted to the predicted overall sound power level for each Level 04 and Level 05 LSA based on a crowd size of 1 person per m<sup>2</sup>.

- We have assumed up to one loudspeaker for amplified music in each of the LSA's on Level 04 and Level 05 with the maximum noise level of 65dBA at 3m as per the existing DA condition 25h Acoustic Logic Report and the noise spectrum outlined in Table 4.5. Speakers should be directional and installed to be facing away from the sensitive receivers at the boundary.
- Live music has been assumed to be not allowed or assumed to require special permission as per the existing DA condition 25a and has not been included for this assessment.
- We understand the northern entrance/exit will be closed at midnight. The assessment for noise from patrons leaving during the OLGR daytime period has been based on the assumption of groups of people leaving with potentially 2 patrons getting rowdy with loud speech for up to 10 minutes during a 15 minute period. The assessment is based on sound power voice levels for loud speech in general accordance with information provided in the *AAC Guideline for Licensed Premises* as shown in Table 4.3 and noise spectrums for 50% male and 50% female have been used.

Table 4.5 Maximum  $L_{eq}$  music noise level spectrum at 3m

SOURCE	SOUND PRESSURE LEVEL, $L_{eq}$ dB OCTAVE BAND FREQUENCY, Hz									
	31.5	63	125	250	500	1000	2000	4000	8000	OVERALL dBA
Background Music playback at 3m from loudspeaker	59	67	71	65	57	54	55	57	55	65

The results of the assessment are summarized in Table 4.6.

Table 4.6 Predicted noise spectrum levels from patrons and amplified music

LOCATION		OLGR CRITERIA L <sub>10</sub> , dB OCTAVE BAND FREQUENCY, Hz								
		31.5	63	125	250	500	1000	2000	4000	8000
25 Park Road (Residential)	Predicted	≤46	≤54	≤57	≤53	≤52	≤49	≤42	≤37	≤30
OLGR daytime period (7:00 am to 12:00 am midnight)	Criteria	68	68	62	55	53	51	46	38	30
	Complies?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

As can be seen from Table 4.6 patron and amplified music noise from the Level 04 and Level 05 LSA's is predicted to comply with the NSW OLGR daytime noise criteria when all areas are occupied at full capacity.

## 4.6 CONSTRUCTION NOISE AND VIBRATION EMISSION

A detailed Construction Noise and Vibration Management Plan (CNVMP) should be developed by the builder in consultation with the Stakeholders and an Acoustic Engineer prior to construction commencement on site to ensure the final construction methodology and program comply with the applicable construction noise limits as outlined in Section 3.5.

## 5 CONCLUSION

WSP Australia Pty Ltd has undertaken an environmental noise impact assessment for the proposed ELP redevelopment of Westfield Hurstville located in South-West Sydney at the corner of Cross Street and Park Road, Hurstville, NSW.

Measurements of the prevailing noise conditions were undertaken to determine the applicable project criteria at nearby noise sensitive receivers. Noise criteria were set out in accordance with the industrial noise limits outlined in the following policies and guidelines:

- NSW Environment Protection Authority (EPA) policy statements under the Protection of the Environment and Operations Act 1997
- NSW EPA Noise Policy for Industry 2017,
- NSW EPA Office of Liquor, Gaming and Racing 2013 standard conditions,
- Pre-Lodgement Meeting Minutes and existing DA conditions,
- NSW EPA Road Noise Policy 2011
- NSW EPA Noise Guide for Local Government 2013 and
- NSW EPA Interim Construction Noise Guidelines 2015.

Environmental noise emissions associated with the ELP redevelopment have been assessed to the noise sensitive receivers near the proposed redevelopment.

It is concluded that the proposed development, with implementation of typical noise control measures, can be designed to achieve applicable noise criteria as outlined in this report.

As the development is in the early design stages, mechanical plant items have not yet been selected and a detailed environmental noise emissions assessment has not been undertaken. The proposed development will need to be designed to achieve compliance with the applicable environmental noise limits as outlined in this report.

Prior to commencement of construction a detailed Construction Noise and Vibration Management Plan (CNVMP) should be developed by the appointed contractor to ensure the final construction methodology and program comply with the applicable construction noise limits as outlined in this report.



# APPENDIX A

ARCHITECTURAL DRAWINGS OF  
PROPOSED EXTENSION



REFER TO TRAFFIC REPORT  
FOR PEDESTRIAN ANALYSIS  
STUDY EXTERNAL TO THE  
SITE

ENTRY WILL BE UPGRADED  
TO ACCESS CONSULTANTS  
REPORT & RECOMMENDATIONS,  
INCLUDING LIGHTING AND  
SIGNAGE

REMOVE EXISTING METAL  
SCREENING TO STAIR

REPLACE EXISTING FENCE  
WITH GLAZING, FROSTED TO  
HEAD HEIGHT

REPLACE EXISTING AWNING  
WITH NEW FABRIC COVER

NEW BALLUSTRADE

NEW PAVING  
TO MATCH  
EXISTING

NEW SECURE GLAZED  
ENTRY PORTAL

NEW GLAZED SHOPFRONT  
REFER TO ELEVATION

NEW STAIRS  
TO R04 PROPOSED  
DEVELOPMENT

EXISTING  
STAIRS

REFER TO 01.2000 FOR  
ELEVATION OF NEW FACADE

PROPOSED PLANTER  
FOR EDGE LANDSCAPING  
REFER TO LANDSCAPE  
CONSULTANT PACKAGE

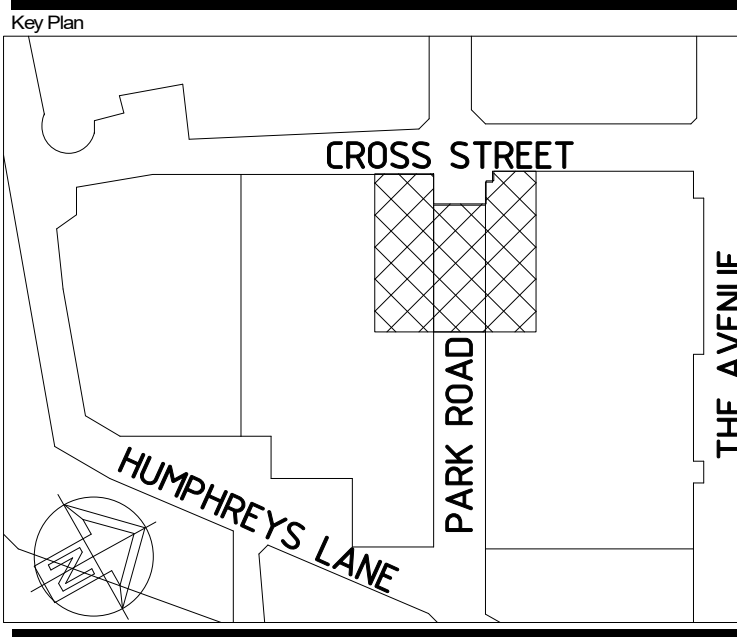
CROSS STREET

PROPOSED AREAS LEGEND

RECREATION FACILITY WITH  
ANCILLARY AMUSEMENT

WORKS NOT PART  
OF THIS DA

- This document describes a Design Intent only.  
- Further information shall be provided in the final design and shall be checked on site.  
- Check for all relevant information before construction work.  
- All dimensions shall be in accordance with the design and shall be checked on site.



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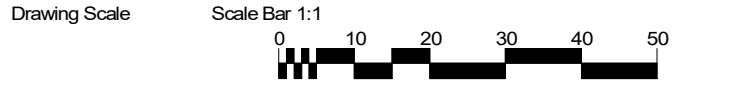
**SCENTRE GROUP**

**WESTFIELD  
HURSTVILLE**

**DEVELOPMENT  
APPLICATION**

Scentre Design & Construction Pty Limited  
85 Castlereagh Street Sydney NSW 2000  
Phone: (02) 9558 7000 Fax: (02) 9558 6500  
GPO Box 4004 Sydney NSW 2001  
H20/000 001 001

PROPOSED PLAN  
LEVEL RETAIL 03



Project No: Drawing No: Revision:

4639 01.1003 A



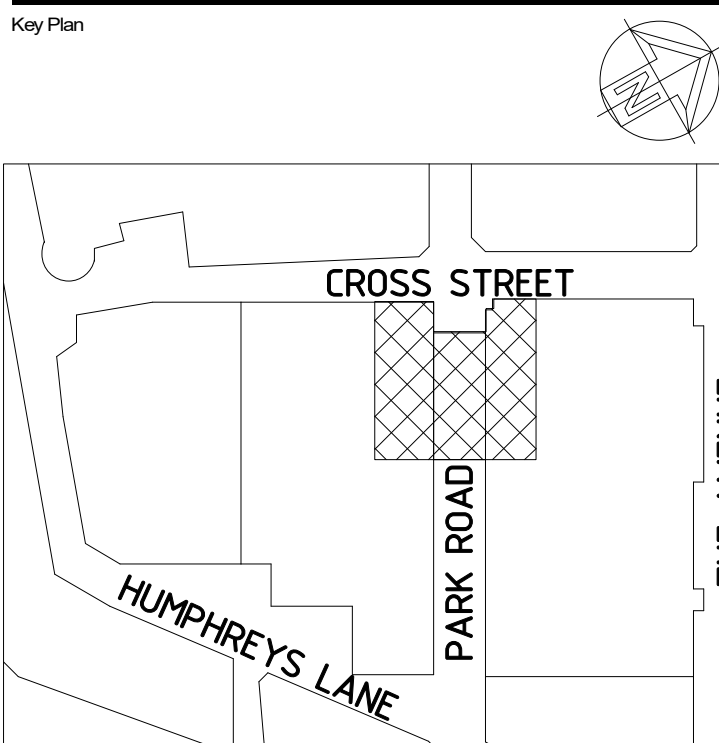


PROPOSED AREAS LEGEND

- AMENITIES
- RECREATION FACILITY WITH ANCILLARY AMUSEMENT
- LSA
- MALLS
- PLANT/SERVICES
- RESTAURANT
- STORAGE
- VERTICAL TRANSPORT

WORKS NOT PART OF THIS DA

Key Plan  
- This document describes a Design Intent only  
- Written dimensions take precedence over scaling and are to be checked on site  
- Refer to all project documentation before commencing work  
- Copyright is retained by Scentre Design and Construction  
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SCENTRE GROUP

WESTFIELD HURSTVILLE

DEVELOPMENT APPLICATION

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GPO Box 4004 Sydney NSW 2001  
HCD/000/001/001

Title

PROPOSED PLAN  
LEVEL RETAIL 04  
(PARKING P5)

Drawing Scale: 1:200@A0 Scale Bar: 0 10 20 30 40 50

Project No: Drawing No: Revision:

4639 01.1004 A

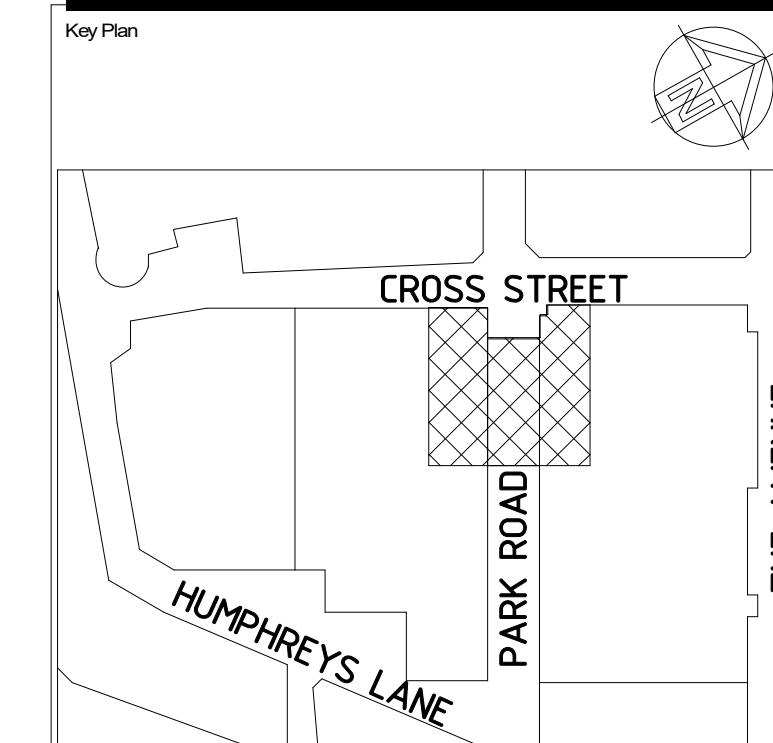




PROPOSED AREAS LEGEND

- LSA
- PLANT/SERVICES
- RESTAURANT
- VERTICAL TRANSPORT

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WESTFIELD  
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GPO Box 4004 Sydney NSW 2001  
HCD/000 287 265

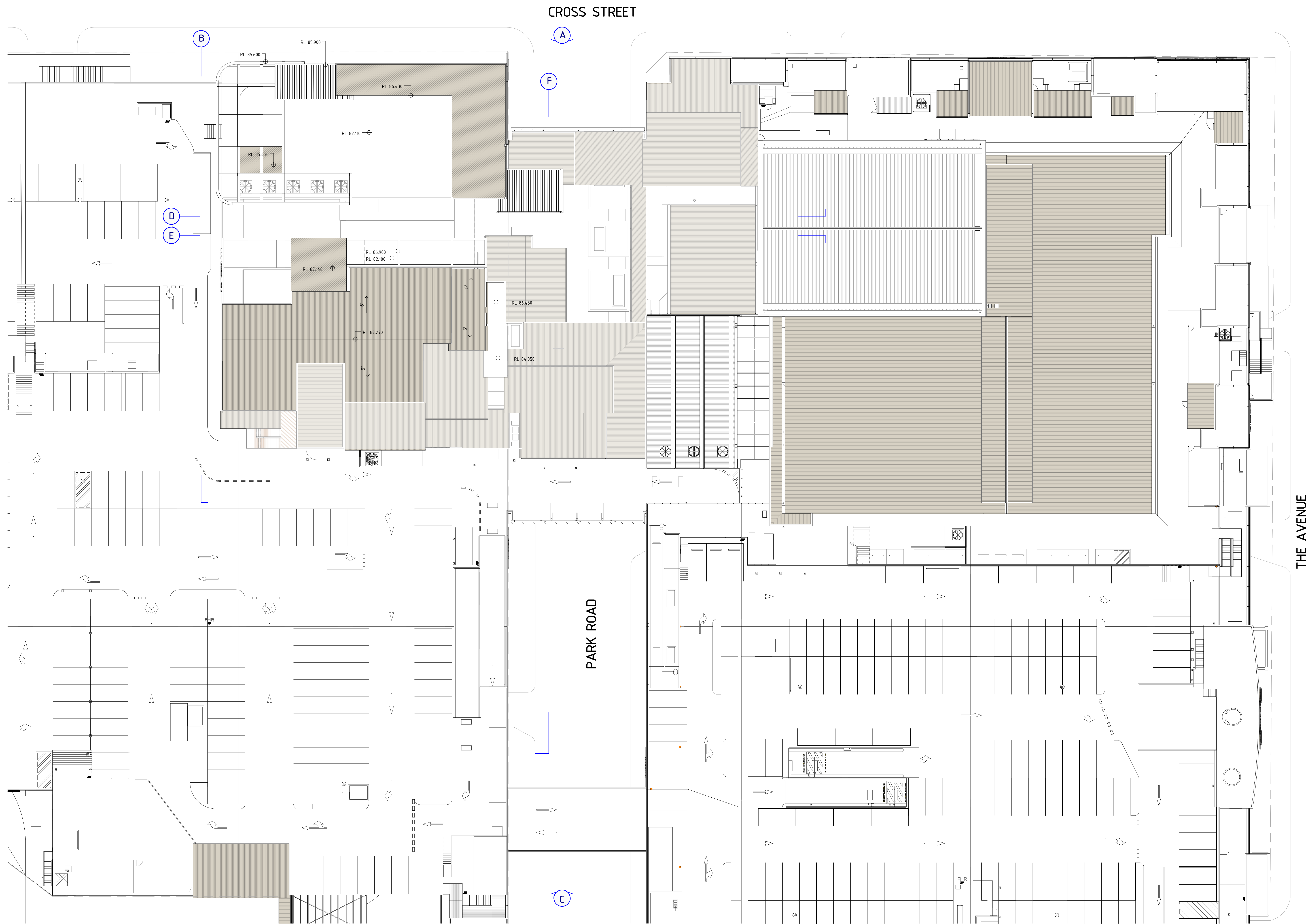
Title

PROPOSED PLAN  
LEVEL RETAIL 05  
(PARKING P6)

Drawing Scale: 1:200@A0  
Scale Bar: 0 10 20 30 40 50

Project No: 4639  
Drawing No: 01.1005  
Revision: A



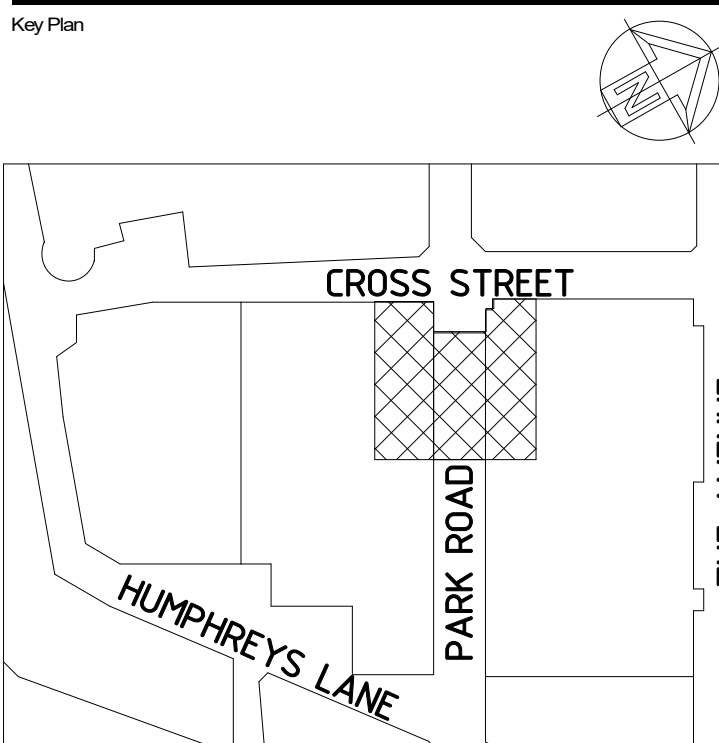


THE AVENUE

CROSS STREET

PARK ROAD

Key Plan  
- This document describes a Design Intent only  
- Written dimensions take precedence over scaling and are to be checked on site  
- Refer to all project documentation before commencing work  
- Copyright is retained by Scentre Design and Construction  
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**dexus**

**SCENTRE GROUP**

**WESTFIELD HURSTVILLE**

**DEVELOPMENT APPLICATION**

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85 Castlereagh Street Sydney NSW 2000  
Phone (02) 9555 7000 Fax (02) 9555 6500  
GPO Box 4004 Sydney NSW 2001  
HKS/000 287 265

**PROPOSED PLAN  
LEVEL ROOF**

# APPENDIX B

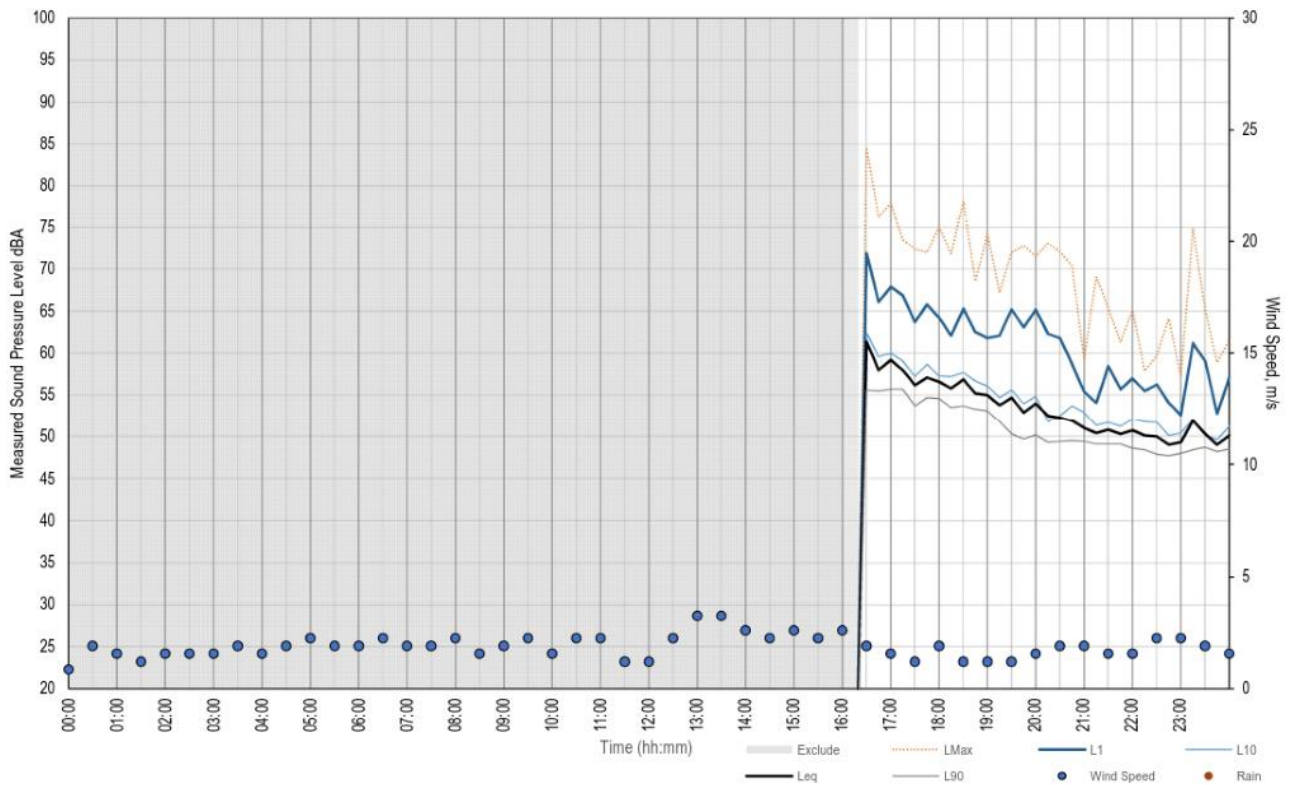
## NOISE MEASUREMENT RESULTS



Location: NM01

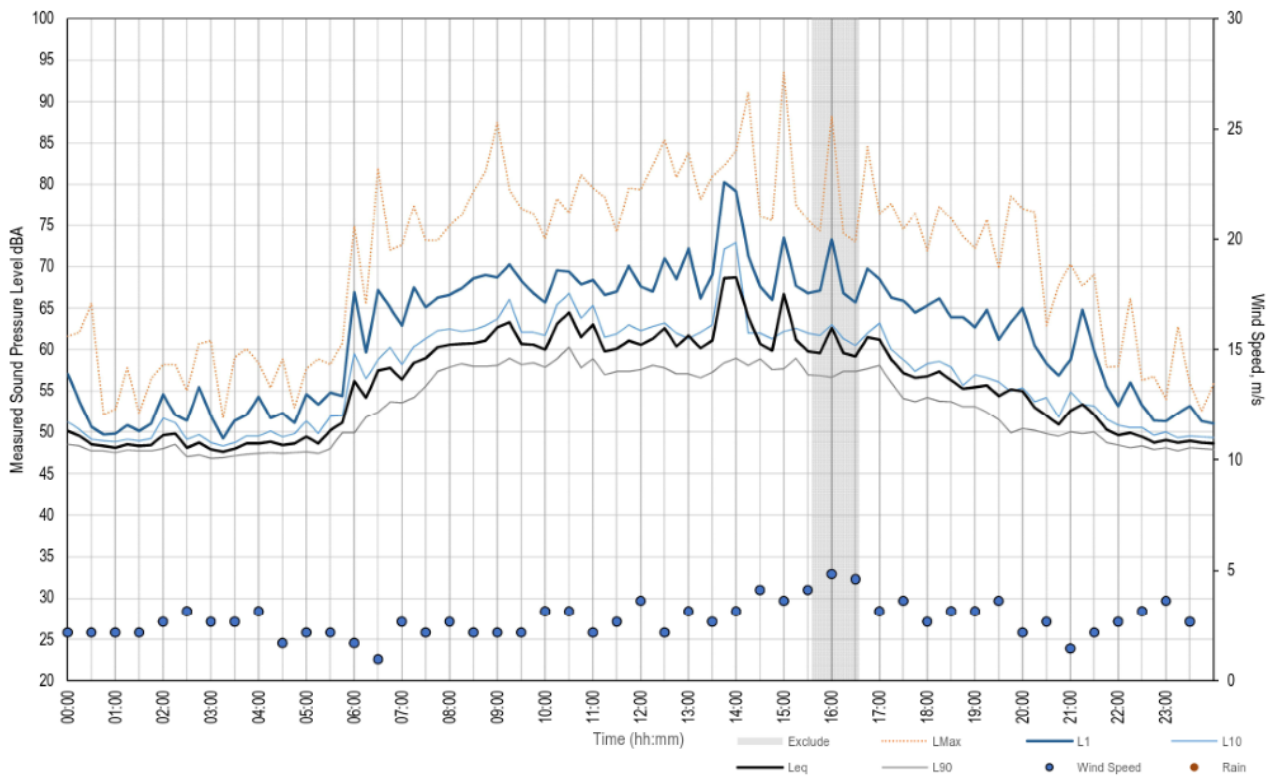
Measured Noise Levels - Westfield Car Park Roof facing Cross St (Trolley bay of rooftop carpark - Level P4)

Monday, 18 May 2020



Measured Noise Levels - Westfield Car Park Roof facing Cross St (Trolley bay of rooftop carpark - Level P4)

Tuesday, 19 May 2020

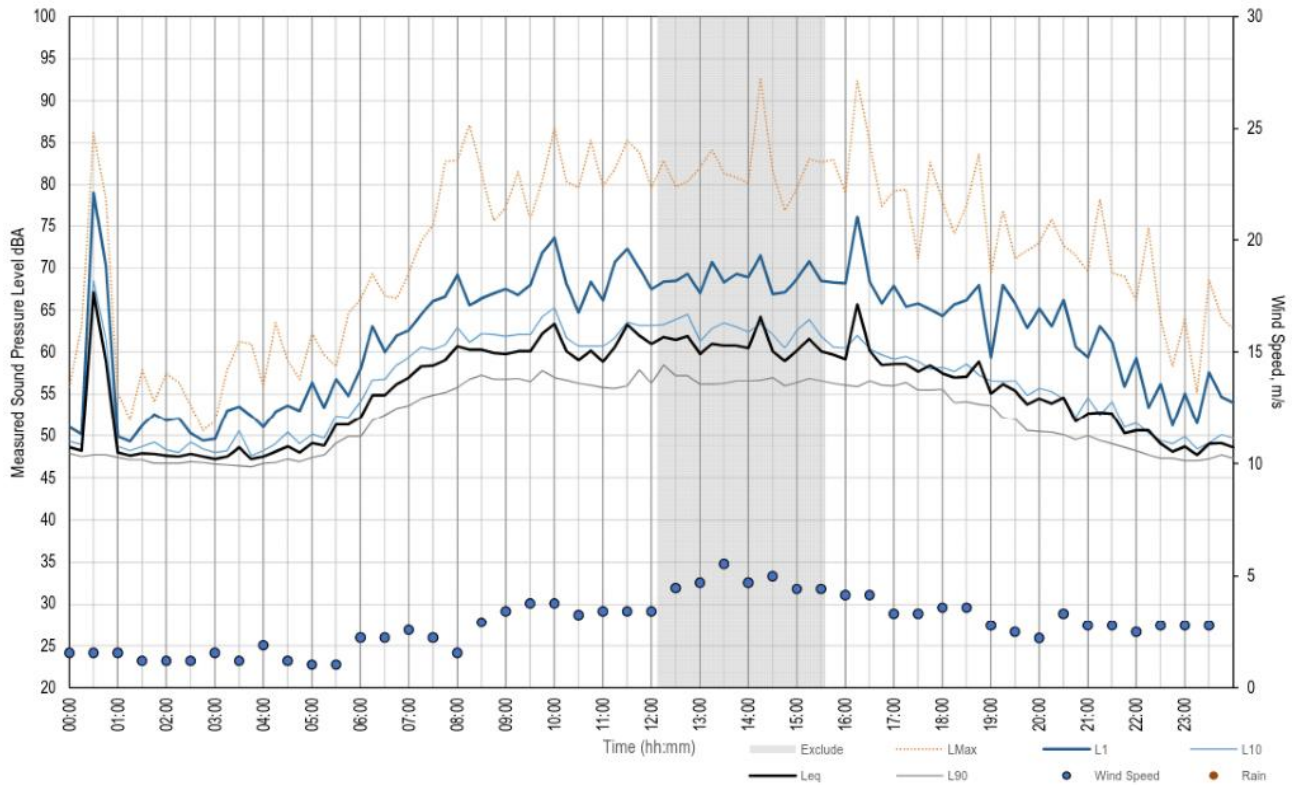




Location: NM01

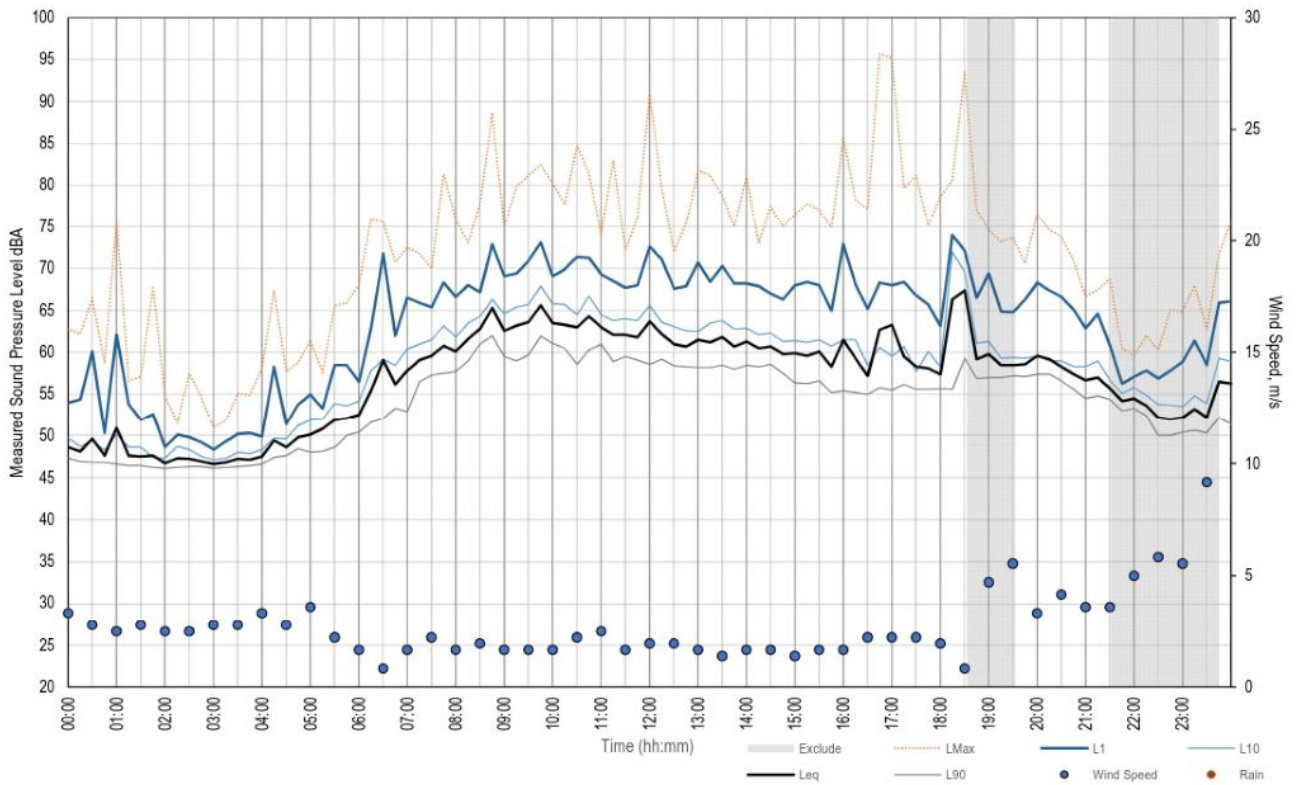
Measured Noise Levels - Westfield Car Park Roof facing Cross St (Trolley bay of rooftop carpark - Level P4)

Wednesday, 20 May 2020



Measured Noise Levels - Westfield Car Park Roof facing Cross St (Trolley bay of rooftop carpark - Level P4)

Thursday, 21 May 2020

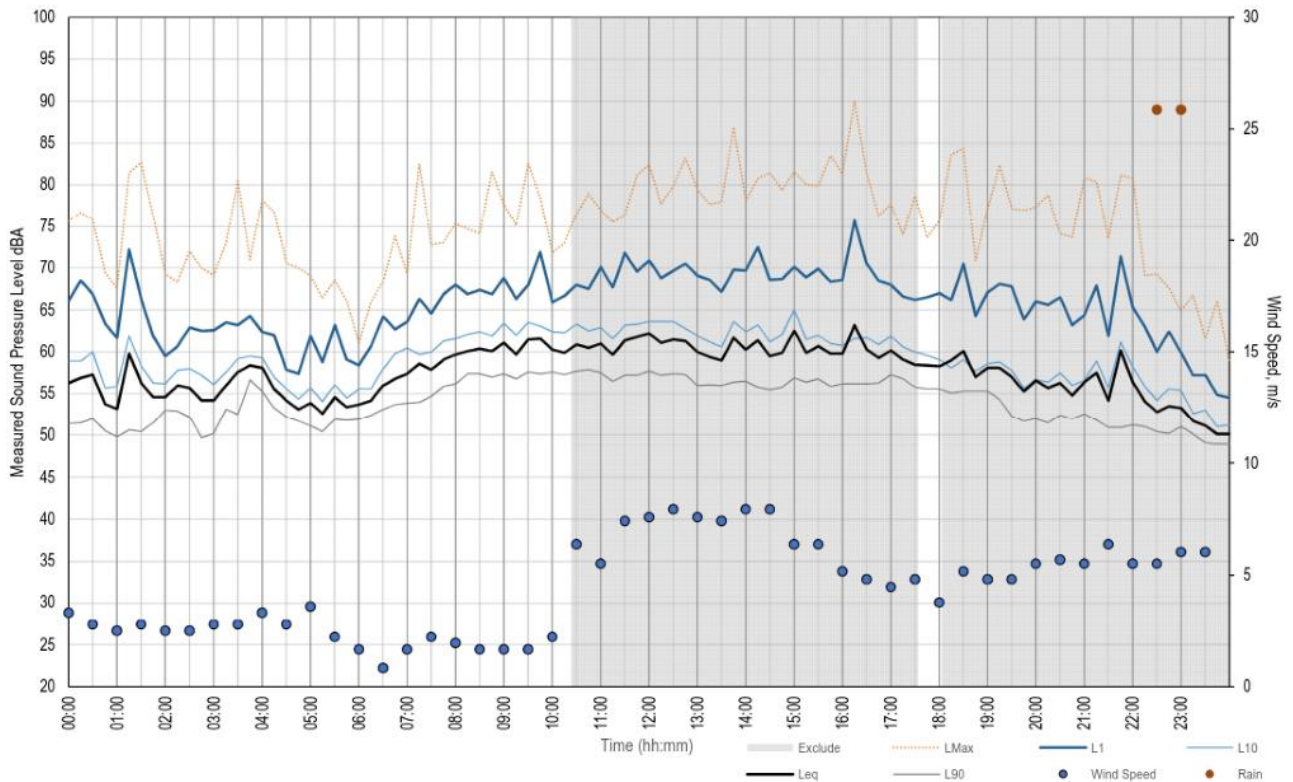




Location: NM01

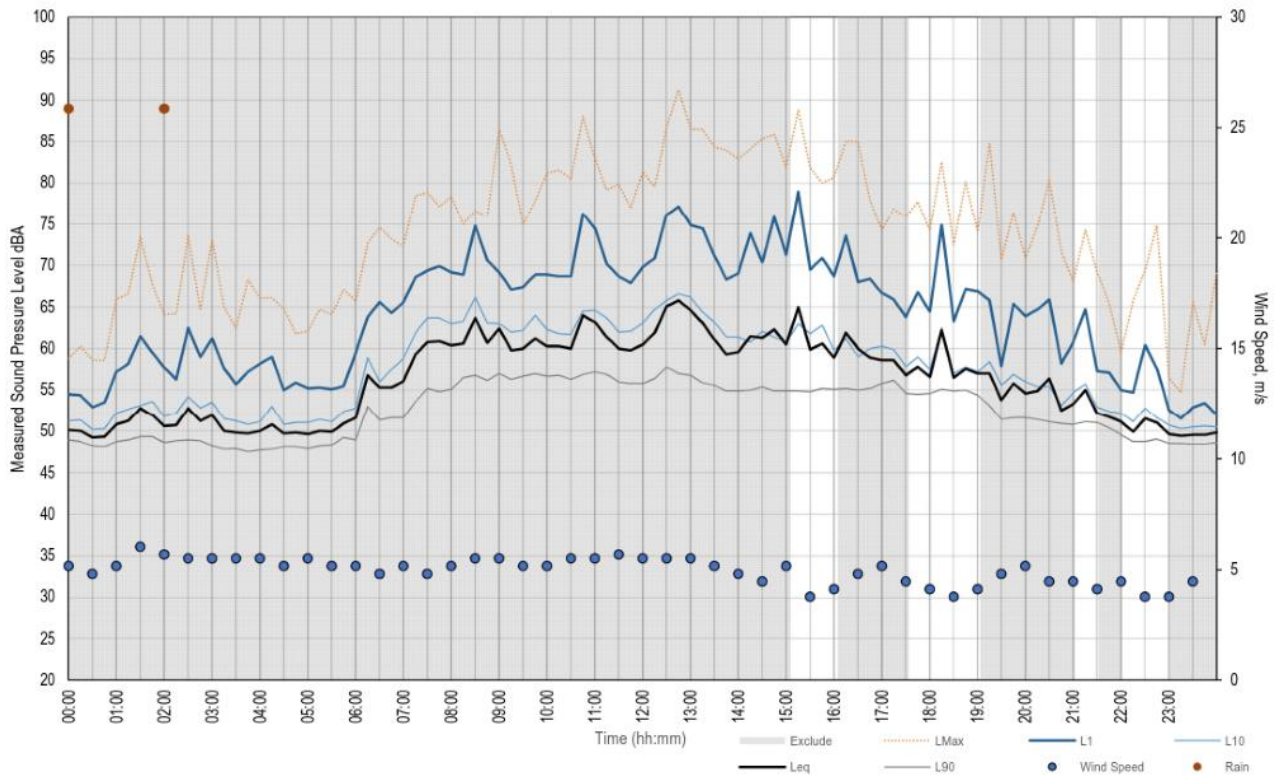
Measured Noise Levels - Westfield Car Park Roof facing Cross St (Trolley bay of rooftop carpark - Level P4)

Friday, 22 May 2020



Measured Noise Levels - Westfield Car Park Roof facing Cross St (Trolley bay of rooftop carpark - Level P4)

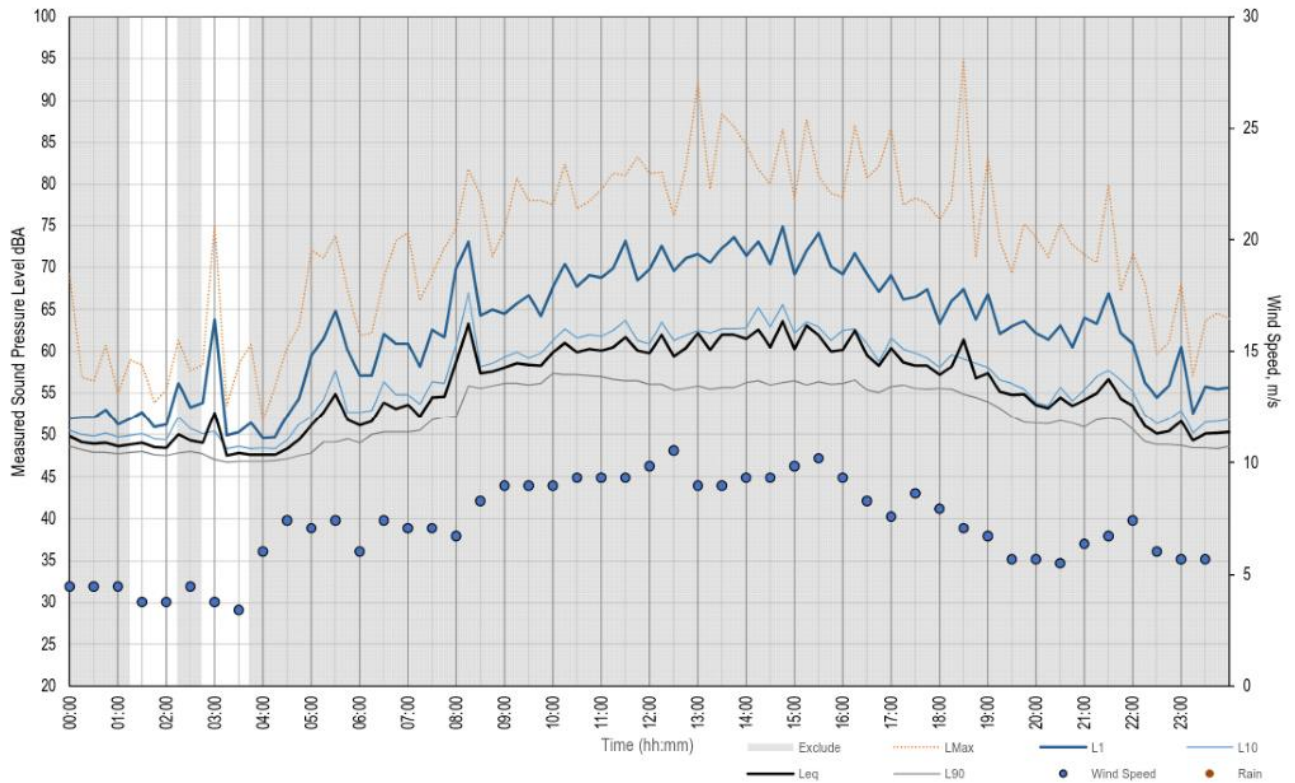
Saturday, 23 May 2020



Location: NM01

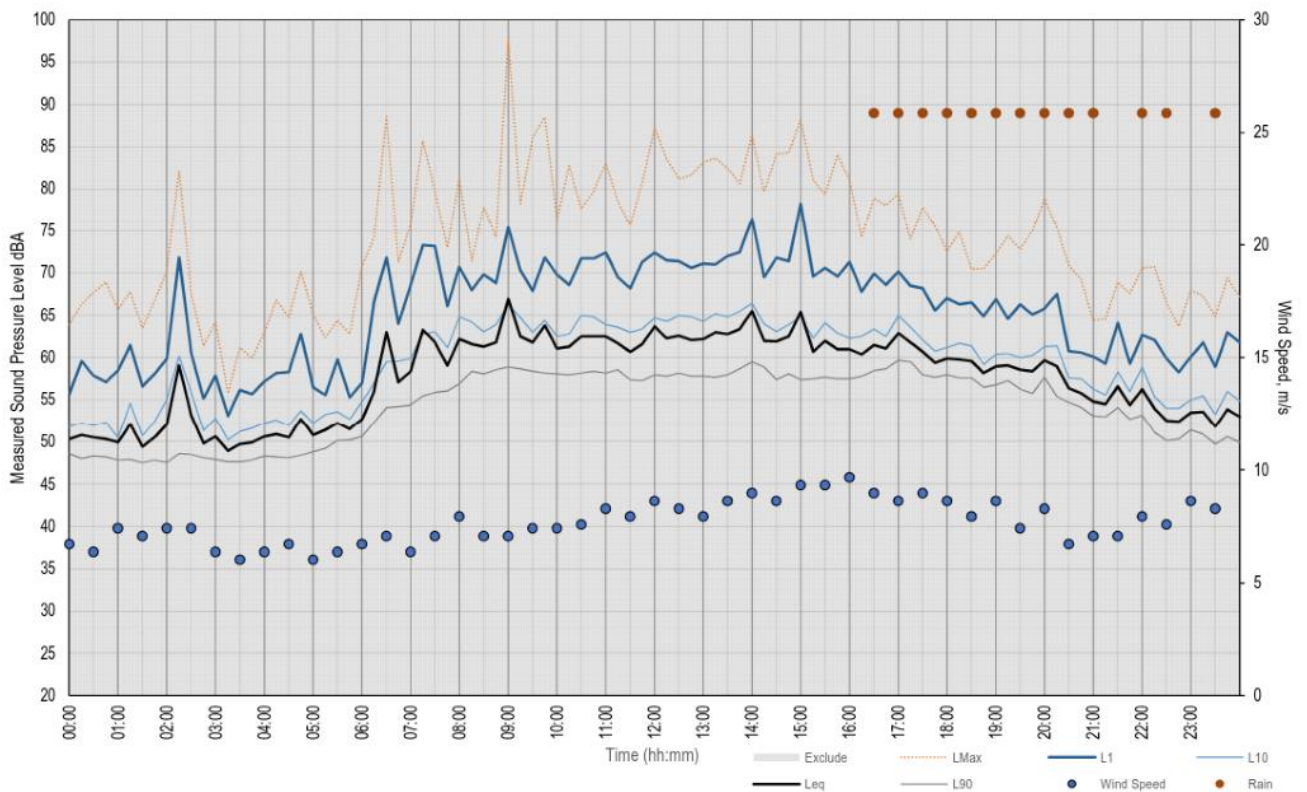
Measured Noise Levels - Westfield Car Park Roof facing Cross St (Trolley bay of rooftop carpark - Level P4)

Sunday, 24 May 2020



Measured Noise Levels - Westfield Car Park Roof facing Cross St (Trolley bay of rooftop carpark - Level P4)

Monday, 25 May 2020

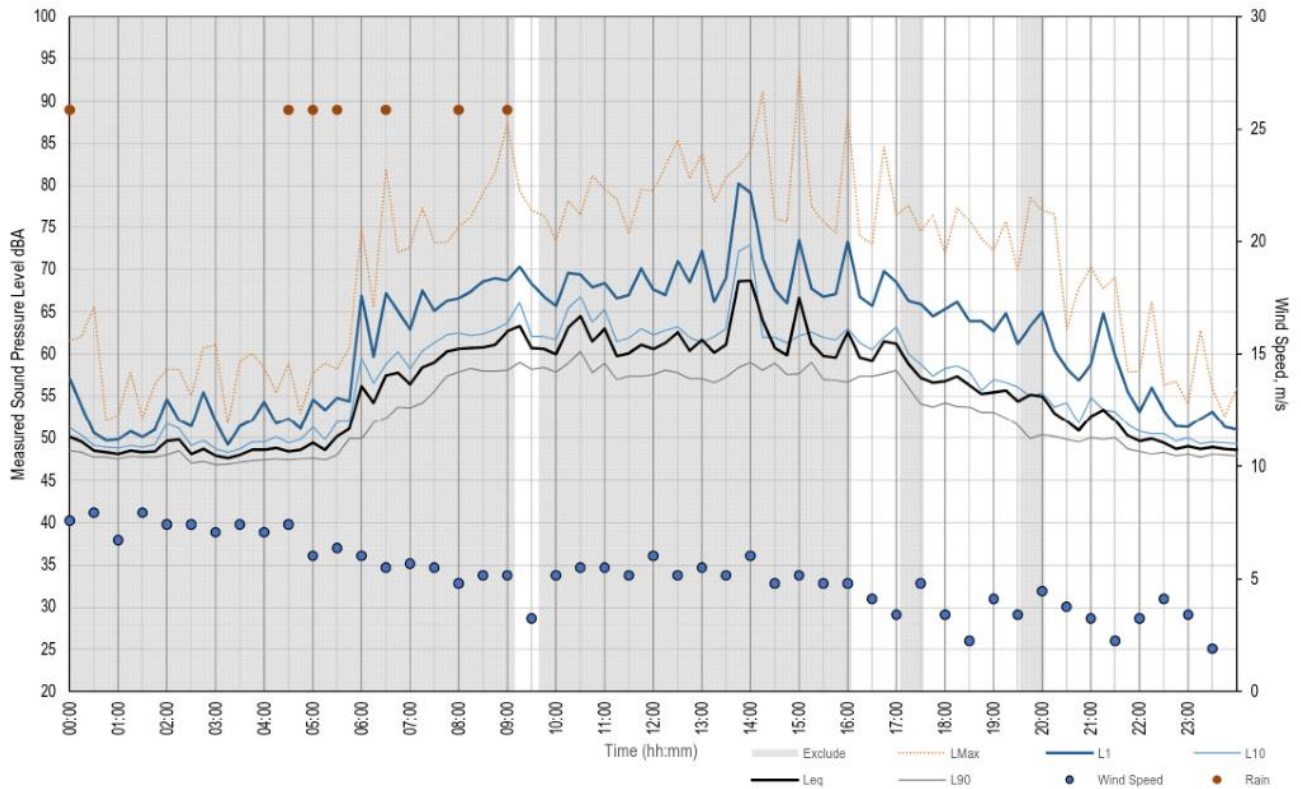




Location: NM01

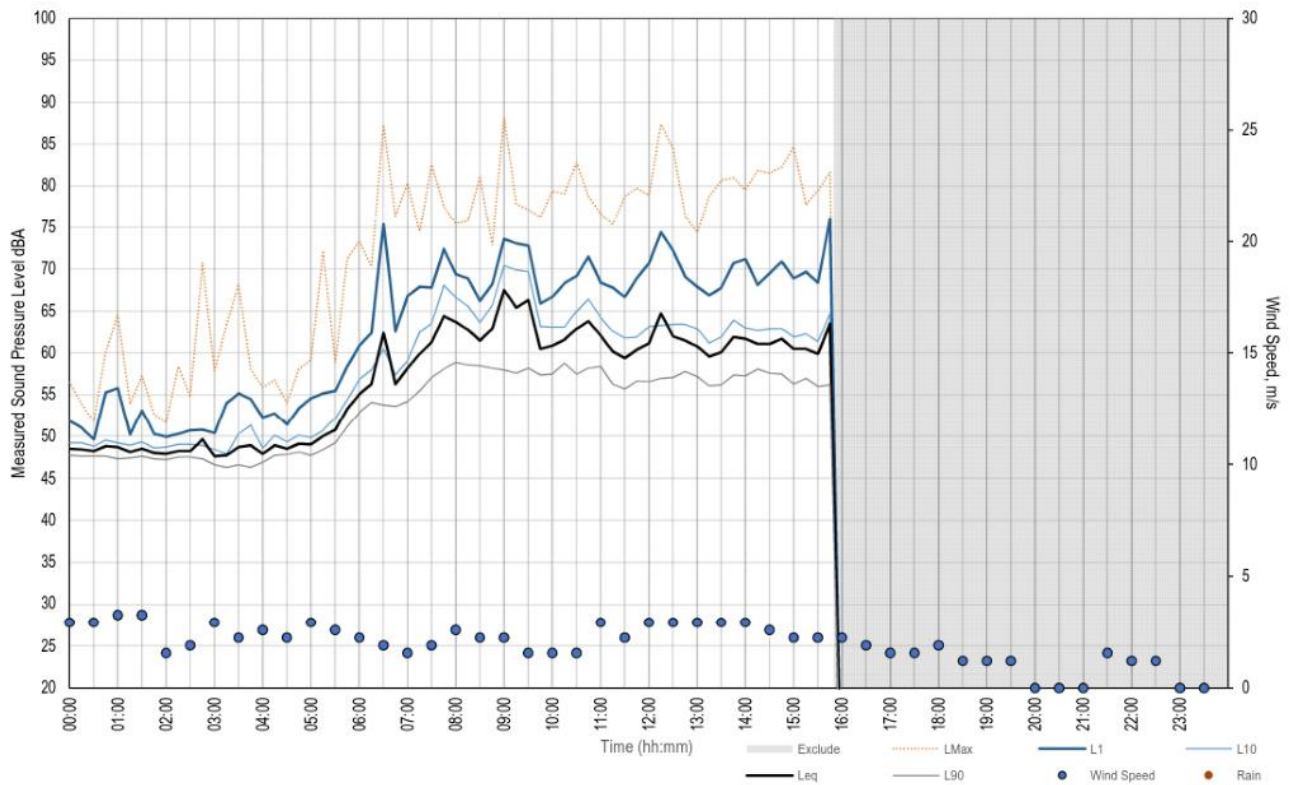
Measured Noise Levels - Westfield Car Park Roof facing Cross St (Trolley bay of rooftop carpark - Level P4)

Tuesday, 26 May 2020



Measured Noise Levels - Westfield Car Park Roof facing Cross St (Trolley bay of rooftop carpark - Level P4)

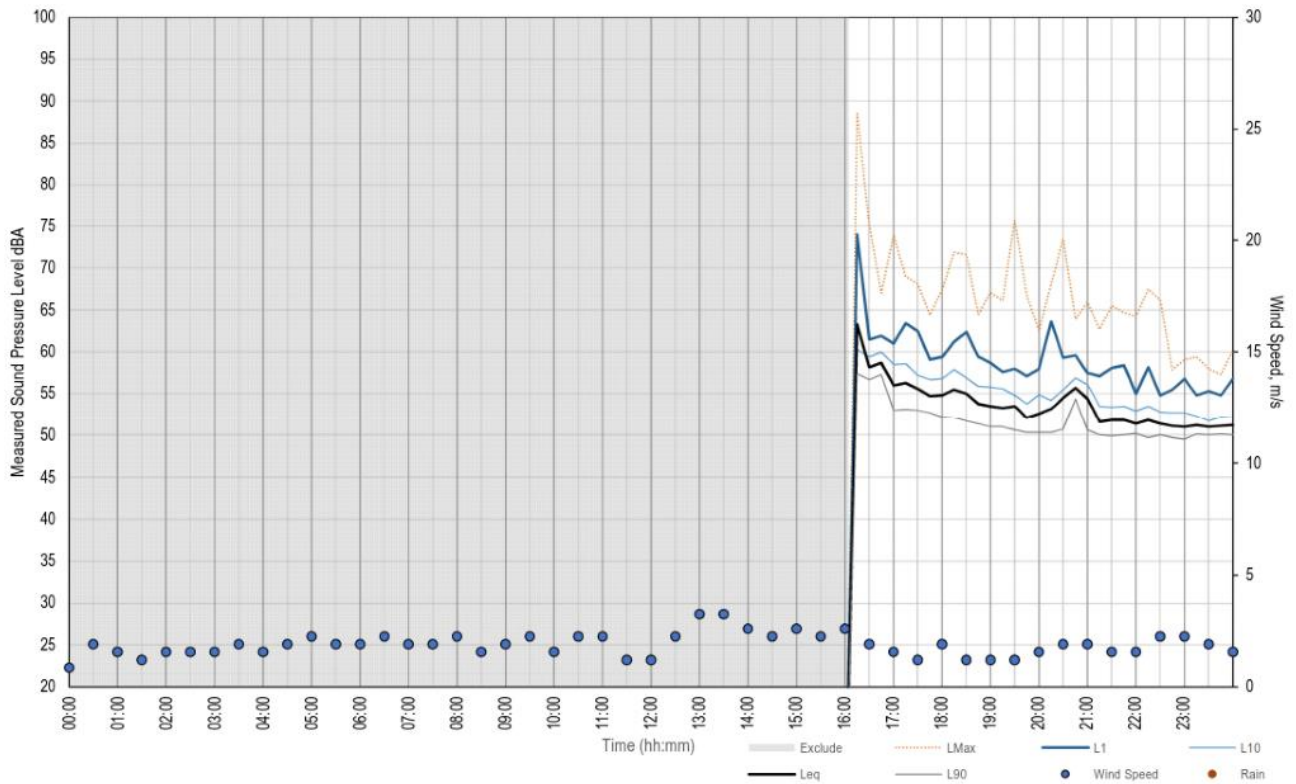
Wednesday, 27 May 2020



Location: NM02

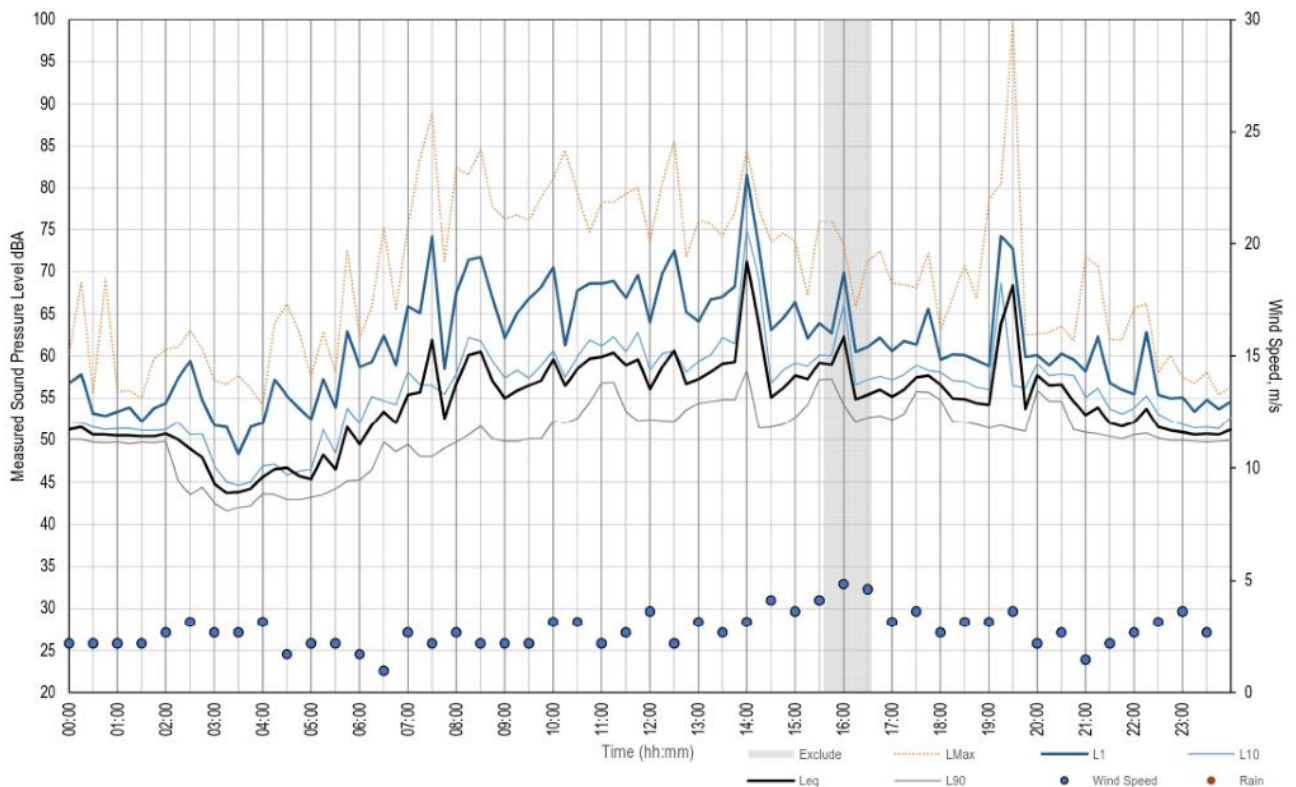
**Measured Noise Levels - Westfield Car Park Roof facing The Avenue (Edge of rooftop carpark - Level P5)**

Monday, 18 May 2020



**Measured Noise Levels - Westfield Car Park Roof facing The Avenue (Edge of rooftop carpark - Level P5)**

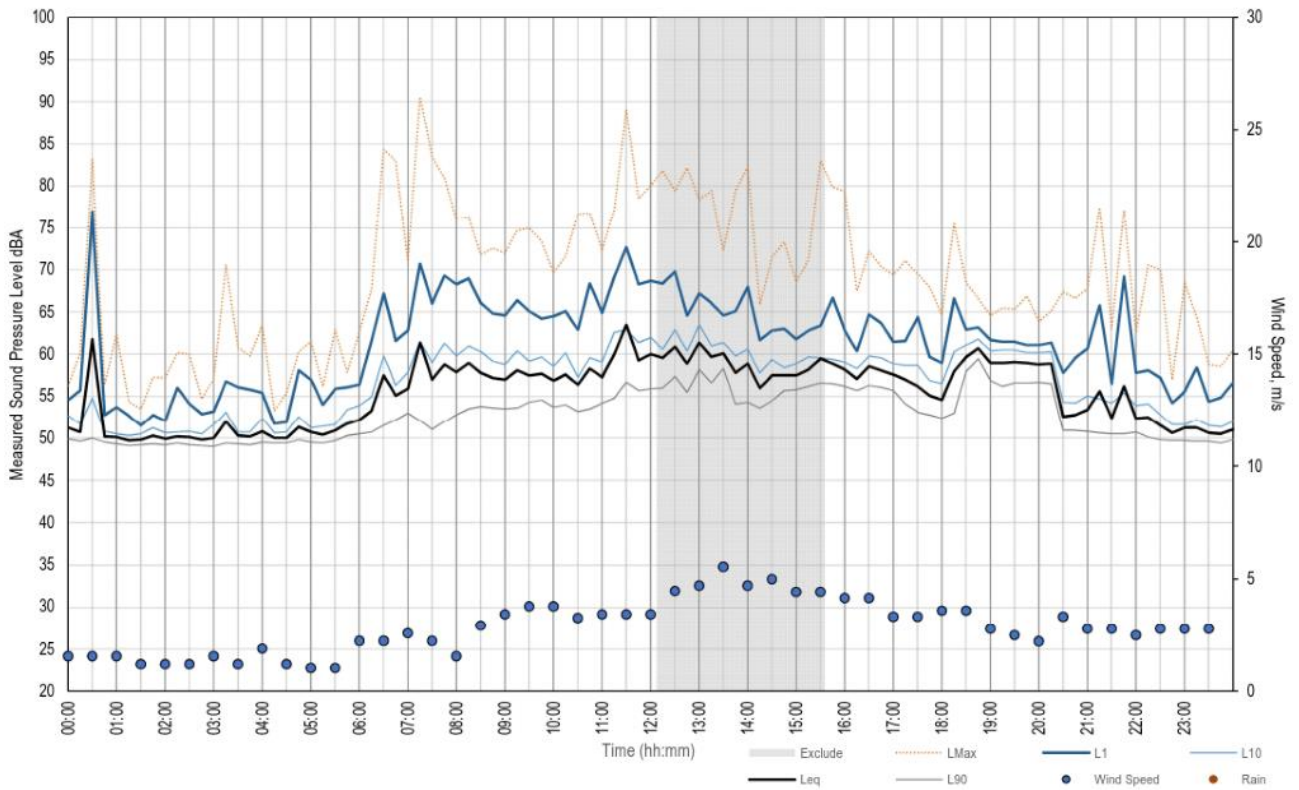
Tuesday, 19 May 2020



Location: NM02

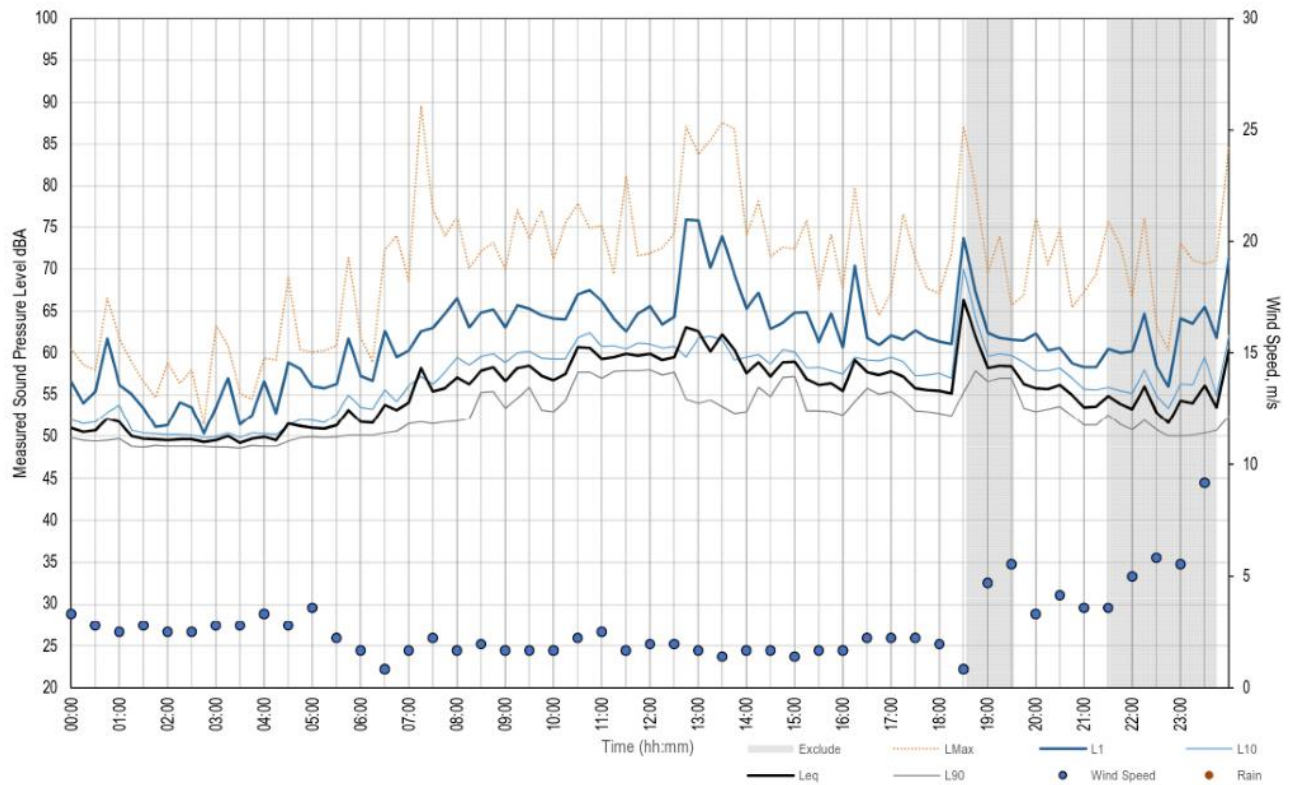
Measured Noise Levels - Westfield Car Park Roof facing The Avenue (Edge of rooftop carpark - Level P5)

Wednesday, 20 May 2020



Measured Noise Levels - Westfield Car Park Roof facing The Avenue (Edge of rooftop carpark - Level P5)

Thursday, 21 May 2020

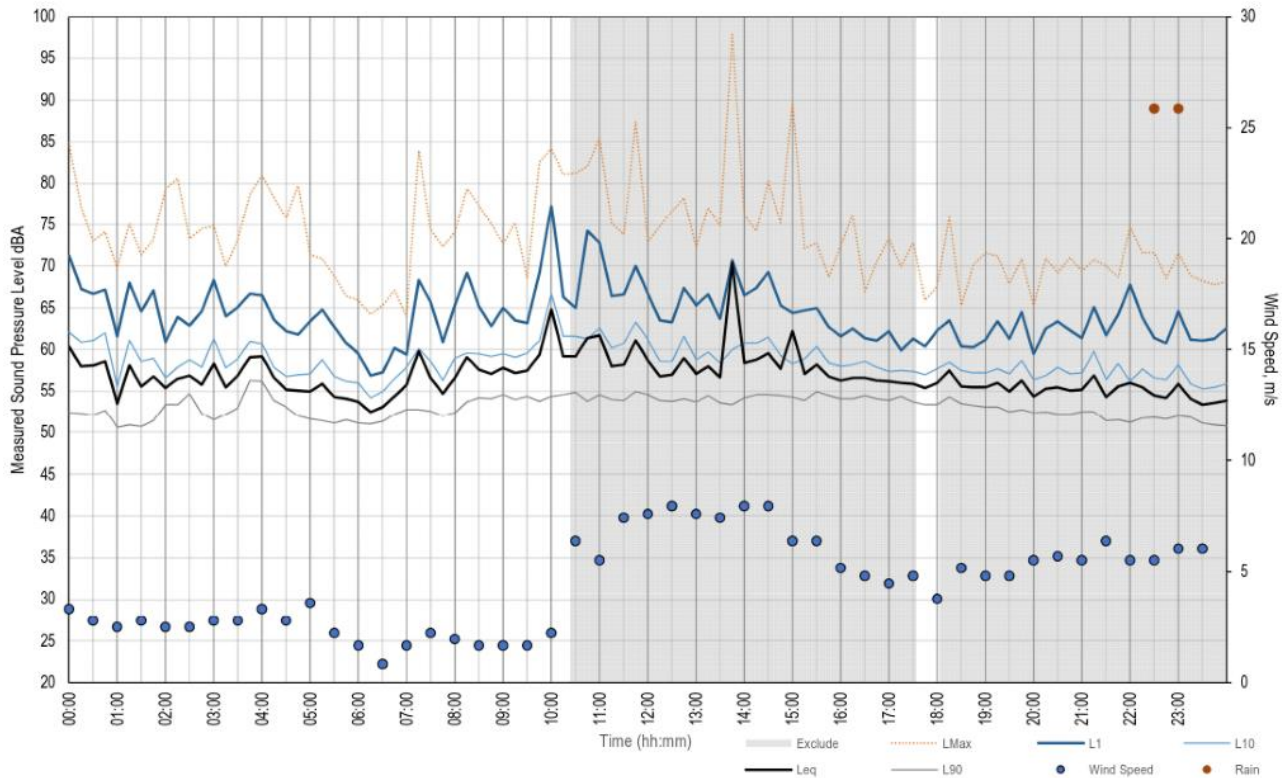




Location: NM02

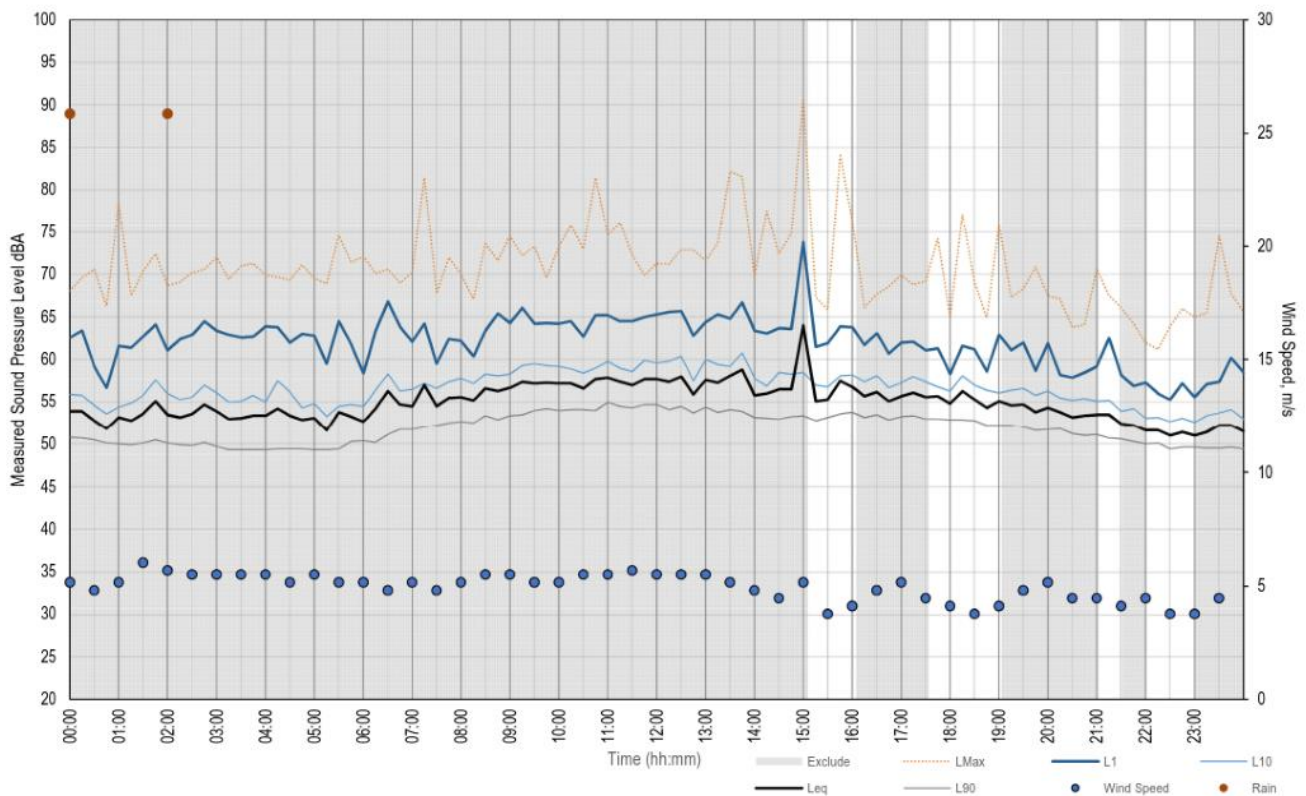
Measured Noise Levels - Westfield Car Park Roof facing The Avenue (Edge of rooftop carpark - Level P5)

Friday, 22 May 2020



Measured Noise Levels - Westfield Car Park Roof facing The Avenue (Edge of rooftop carpark - Level P5)

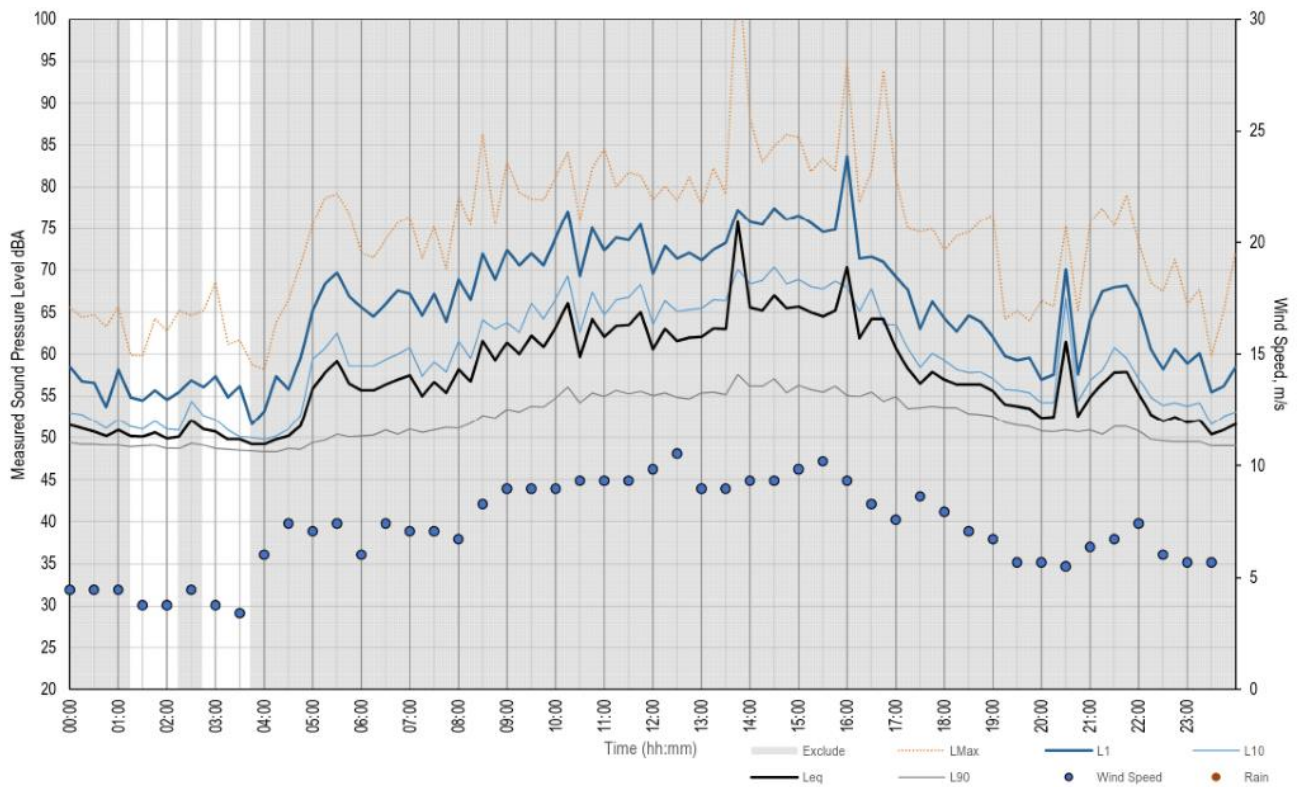
Saturday, 23 May 2020



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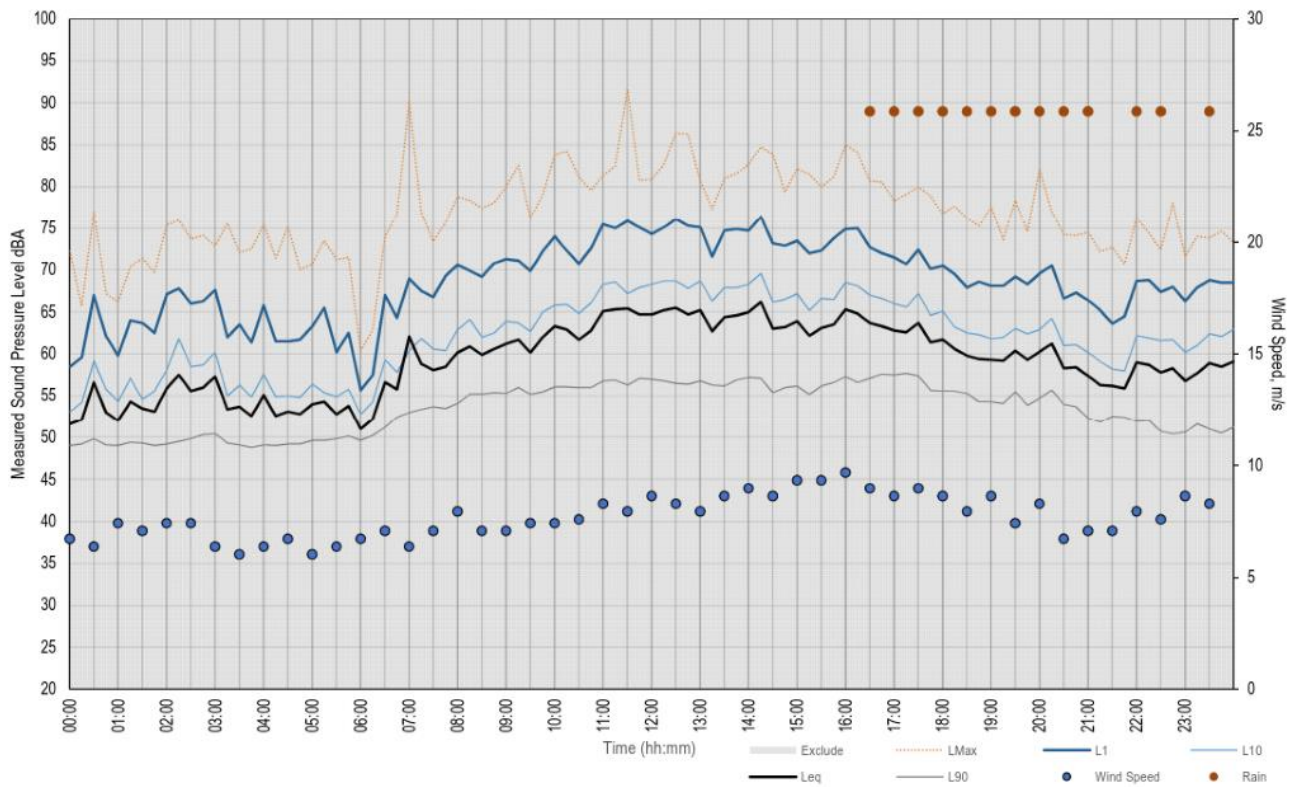
Measured Noise Levels - Westfield Car Park Roof facing The Avenue (Edge of rooftop carpark - Level P5)

Sunday, 24 May 2020



Measured Noise Levels - Westfield Car Park Roof facing The Avenue (Edge of rooftop carpark - Level P5)

Monday, 25 May 2020

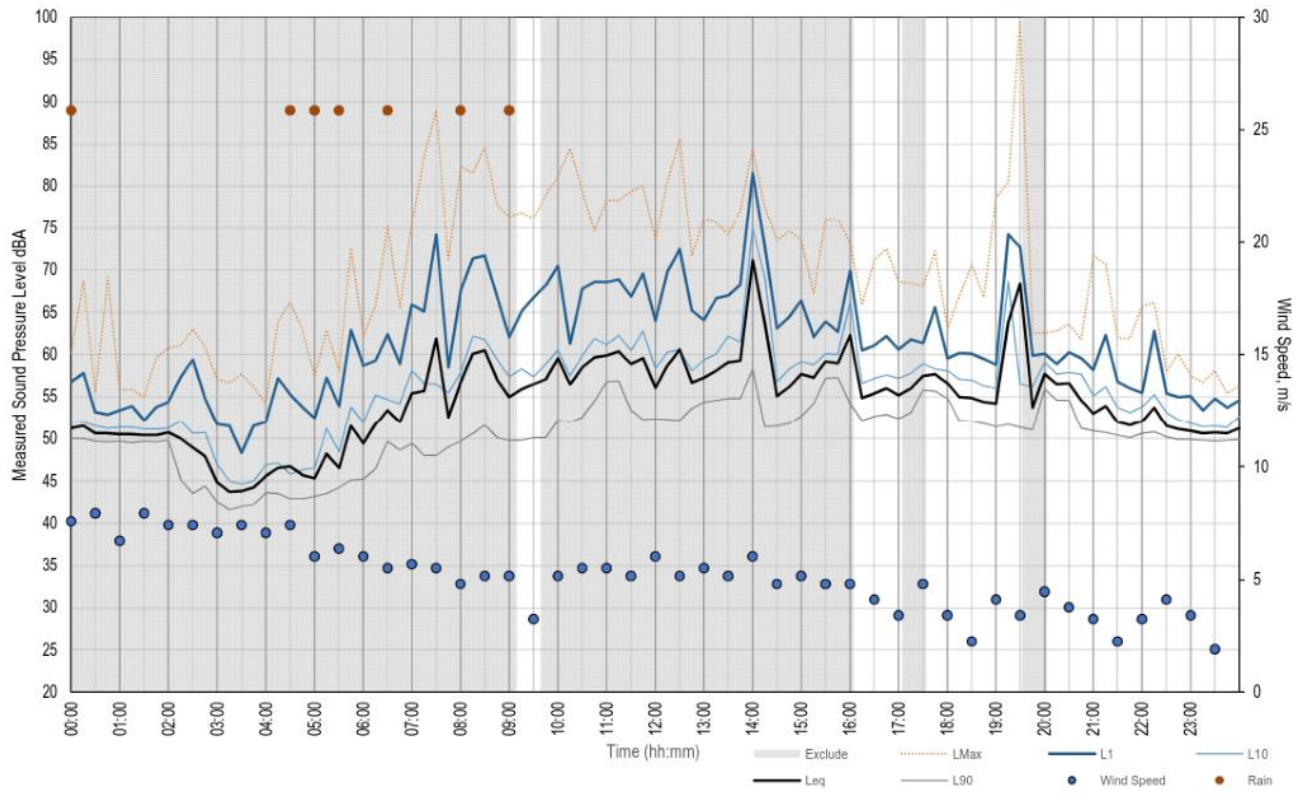




Location: NM02

Measured Noise Levels - Westfield Car Park Roof facing The Avenue (Edge of rooftop carpark - Level P5)

Tuesday, 26 May 2020



Measured Noise Levels - Westfield Car Park Roof facing The Avenue (Edge of rooftop carpark - Level P5)

Wednesday, 27 May 2020

