

PLANS AND DOCUMENTS  
referred to in the PDA  
DEVELOPMENT APPROVAL

Approval no: DEV2023/1468

Date: 19 September 2024



# Environmental Noise Assessment

Proposed Mixed Use Development

At Lot 5003 Carseldine Village

On behalf of De Luca Corporation Pty Ltd

23BRA0107 R01\_2



## About TTM

For 40 years, we've been at the centre of the Australian development and infrastructure industry. Our unique combination of acoustics, data, traffic and waste services is fundamental to the success of any architectural or development project.

We have over 50 staff, with an unrivalled depth of experience. Our industry knowledge, technical expertise and commercial insight allow us to deliver an exceptional and reliable service.

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## Revision Record

No.	Author	Reviewed/Approved	Description	Date
A	S Yorke	I Llamas	Internal draft	29/11/2023
0	S Yorke	I Llamas	Client issue	29/11/2023
1	S Yorke		Minor edits	05/12/2023
2	S Yorke		Plans update	13/12/2023

## Executive Summary

TTM was engaged by De Luca Corporation Pty Ltd to undertake an environmental noise assessment of a proposed mixed-use development located at Lot 5003 Carseldine Village. The assessment was based on the Fitzgibbon Urban Development Area Development Scheme (Dec 2021). For additional noise assessment parameters, Brisbane City Council City Plan 2014 planning scheme was also referenced.

Unattended noise monitoring was undertaken to establish the existing ambient noise levels. City Plan 2014 planning scheme codes and overlays were utilised where relevant and acceptable outcomes applied. Remaining noise sources were assessed onto the nearest noise sensitive receivers for the proposed operating hours.

Compliance with the Fitzgibbon Urban Development Area Development Scheme (and relevant City Plan 2014 codes) is predicted to be achieved based on the recommendations outlined in Section 7 of this report.

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# 1 Introduction

## 1.1 Background

TTM was engaged by De Luca Corporation Pty Ltd to undertake an environmental noise assessment of a proposed mixed-use development located at Lot 5003 Carseldine Village. This report will form part of a development application for consideration by Economic Development Queensland (EDQ).

## 1.2 References

This report is based on the following:

- Fitzgibbon Urban Development Area Development Scheme (Dec 2021)
- Brisbane City Council *City Plan 2014*
- *Noise impact assessment planning scheme policy* - Schedule 6, City Plan 2014
- Development plans shown in Appendix A
- Site inspection, noise measurements, analysis and calculations conducted by TTM

## 1.3 Scope

The assessment includes the following:

- Description of the development site and proposal.
- Measurement of existing ambient noise levels and statement of assessment criteria relating to environmental noise emissions.
- Assessment of noise generated by the development onto nearby noise sensitive receivers.
- Details of noise control recommendations to be incorporated to achieve predicted compliance.

## 2 Site Description

### 2.1 Site Location

The site is described by the following:

- Lot 5003 Carseldine Village

The site locality is shown in Figure 1.

Figure 1: Site Locality



### 2.2 Description of Surrounding Environment

The site is bound by Plaza Place to the east, future development land to the north and west, and an internal road to the south. Existing residential uses are located to the east. The current acoustic environment primarily consists of local road traffic noise.

The site is located outside the road traffic noise corridor of Beams Road as shown in Figure 2 and therefore road traffic noise was not assessed.



Figure 2: Road Traffic Noise Corridor – QDC Noise Category Mapping (City Plan 2014)



# 3 Proposed Development

## 3.1 Development Description

The proposal is a mixed-use development consisting of:

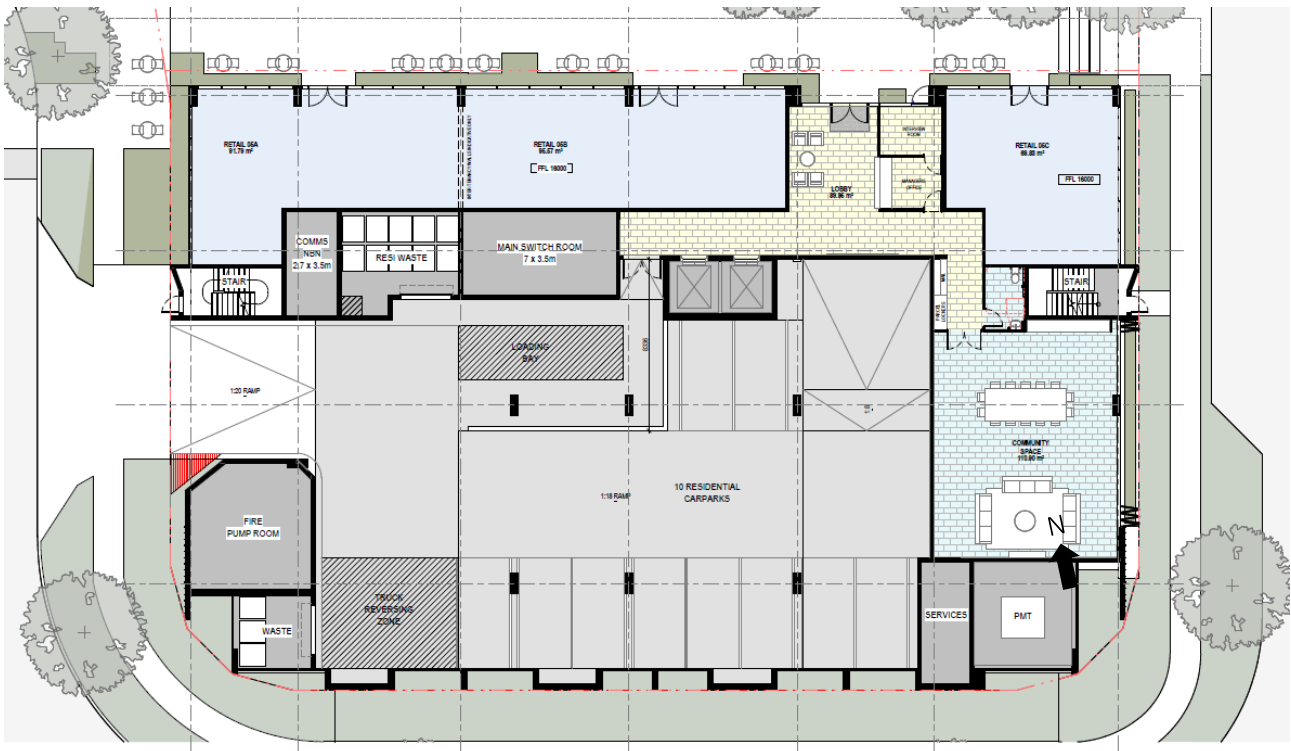
- Basement: car parking
- Ground floor: retail tenancies including outdoor dining, loading bay, car parking
- Level 1 – 7: residential apartments

Proposed hours of operation are:

- Retail: between 6am – 10:30pm

A plan of the development is shown in Figure 3. Further development plans are provided in Appendix A.

Figure 3: Proposed Development Plan – Ground Level



## 4 Measurements

### 4.1 Equipment

The following equipment was used to measure existing noise levels:

- ARL Ngara Environmental Noise Monitor (SN# 8782A5)
- Norsonic Nor131 Sound Level Meter (SN# 1313158)
- RION NC-73 Acoustical Calibrator (SN# 10697023)

All equipment was calibrated by a National Association of Testing Authorities (NATA) accredited laboratory. The equipment was field calibrated before and after the measurement session. No significant drift from the reference signal was recorded.

### 4.2 Unattended Noise Monitoring

Unattended noise monitoring was conducted to establish the existing ambient noise levels between Tuesday 5<sup>th</sup> September and Wednesday 13<sup>th</sup> September, 2023. The noise monitor was located on the site, as shown in Figure 4. The monitor position was considered representative of the ambient noise levels experienced by the nearby noise sensitive receivers with consideration to access and security requirements.

Figure 4: Noise Monitoring Location



The ambient noise monitor was in a free-field location and 1.5m above ground level. The monitor was set to measure statistical noise levels in 'A'-weighting, 'Fast' response, over 15 minute intervals. Ambient noise levels were measured in accordance with Australian Standard AS1055:2018 *Acoustics – Description and Measurement of Environmental Noise* (AS1055).

Weather during the monitoring period was generally fine (source: Bureau of Meteorology).

## 4.3 Noise Source Measurements

Noise levels associated with typical activities which may impact noise sensitive receivers were taken from similar investigations conducted by TTM. Measurements were conducted generally in accordance with Australian Standard AS1055.

## 4.4 Results of Noise Measurements

### 4.4.1 Ambient Noise Levels

Table 1 presents the measured ambient noise levels. The Rating Background Level (RBL) was determined in accordance with the BCC *Noise Impact Assessment Planning Scheme Policy* (NIAPSP). Graphical presentation of the measured levels is shown in Appendix B. The measurement results were used to determine the assessment criteria for the development.

Table 1: Measured Ambient Noise Levels

Time Period	Measured Noise Levels, dB(A)	
	RBL L <sub>90</sub>	L <sub>eq</sub>
Daytime (7am – 6pm)	48	56
Evening (6pm – 10pm)	44	54
Night time (10pm – 7am)	40	51
<b>Relevant operating hours (night)</b>		
Night time (6am – 7am)	48	54
Night time (10pm – 10:30pm)	43	50

## 5 Noise Criteria

The applicable planning scheme for the site location is the Fitzgibbon Urban Development Area Development Scheme. For greater noise assessment parameters, Brisbane City Council City Plan 2014 planning scheme was also referenced.

### 5.1 Fitzgibbon Urban Development Area Development Scheme

The Fitzgibbon Urban Development Area Development Scheme states in relation to noise requirements:

#### **General noise requirements**

*The design, siting and layout of development must address noise impacts and where necessary incorporate appropriate noise mitigation measures. Within 100m of the rail corridor boundary, noise sensitive uses must comply with best practice acoustic standards.*

The scheme provides only general noise requirements. The City Plan 2014 planning scheme also applies for the Brisbane area and provides more detail for noise assessment. The applicable noise assessment aspects are potential onsite noise emissions from external retail activities such as outdoor dining. Onsite noise activities may be addressed by utilising City Plan 2014 code acceptable outcomes and noise criteria.

### 5.2 City Plan 2014

The Brisbane City Council City Plan 2014 details site specific planning scheme zones, overlays, and codes relevant to a site in the BCC local government area. Table 2 summarises the planning scheme requirements for the site which are relevant to the acoustic assessment.

Table 2: City Plan 2014 - Site Specific Acoustic Requirements

Location	Zone	Development Code
Site	Emerging Community	Multiple Dwelling Code Centre or Mixed-Use Code
Noise Sensitive Receivers	Emerging Community Low Density Residential Zone	N/A

#### 5.2.1 Multiple Dwelling Code

The development includes residential accommodation units which are applicable for assessment under the *Multiple Dwelling Code*. Table 3 summarises the acoustic requirements that apply to the site.

Table 3: Multiple Dwelling Code

Performance Outcomes	Acceptable Outcomes
<p><b>PO22</b></p> <p>Development that includes mechanical plant (including air conditioning plant, heat pumps and swimming pool pumps) ensures it is located, designed and attenuated to achieve the following criteria:</p> <ul style="list-style-type: none"> <li>• <math>L_{Aeq,adj,T}</math> emitted from mechanical plant is not greater than the rating background level plus 3 at a sensitive use not associated with the development.</li> </ul> <p>Note — Where T is</p> <ul style="list-style-type: none"> <li>• Day (7am to 6pm): 11hr,</li> <li>• Evening (6pm to 10pm): 4hr,</li> <li>• Night (10pm to 7am): 9hr.</li> </ul> <p>Where</p> <ul style="list-style-type: none"> <li>• <math>L_{Aeq,adj,T}</math> is the A-weighted equivalent continuous sound pressure level during measurement time T, adjusted for tonal and impulsive noise characteristics, determined in accordance with the methodology described in the Noise impact assessment planning scheme policy.</li> <li>• The rating background level is determined in accordance with the methodology described in the Noise impact assessment planning scheme policy.</li> </ul> <p>Note—A noise impact assessment report prepared in accordance with the Noise impact assessment planning scheme policy can assist in demonstrating achievement of this performance outcome.</p>	<p><b>AO22</b></p> <p>Development ensures mechanical plant is acoustically screened from nearby sensitive uses.</p>

It is recommended acoustic screening is utilised for exposed mechanical plant with the potential to impact adjacent sensitive receivers to comply with *Acceptable Outcome AO22*.

## 5.2.2 Centre or Mixed Use Code

The proposed development includes retail use that is applicable for assessment by the *Centre or Mixed Use Code*. Table 4 summarises the primary acoustic requirements that apply.

Table 4: Centre or Mixed-Use Code Requirements

Performance Outcomes	Acceptable Outcomes
<p><b>PO1</b></p> <p>Development:</p> <p>(a) has hours of operation which are controlled so that the use does not detrimentally impact on the amenity of adjoining residents;</p> <p>(b) where not located in a Special entertainment precinct identified in a neighbourhood plan, does not result in noise emissions that exceed the noise (planning) criteria in Table 9.3.3.3.F, low frequency noise</p>	<p><b>AO1.1</b></p> <p>Development:</p> <p>(a) for accommodation activities, dwelling unit or emergency services has unlimited hours of operation;</p> <p>(b) for a club, if licensed, function facility, hotel or nightclub entertainment facility does not generate noise which is clearly audible and detectable, or impacts on the amenity of a resident, in a dwelling or other sensitive use;</p>

Performance Outcomes	Acceptable Outcomes
<p>criteria in Table 9.3.3.3.G and night-time noise criteria in Table 9.3.3.3.H in a sensitive zone or a nearby sensitive use.</p> <p>Note—A noise impact assessment report prepared in accordance with the Noise impact assessment planning scheme policy can assist in demonstrating achievement of this performance outcome.</p>	<p>Note-Development for a club, if licensed, function facility, hotel or nightclub entertainment facility is not expected to achieve this outcome.</p> <p>(c) for any other use:</p> <ul style="list-style-type: none"> <li>i. Where in the Principal centre zone or Major centre zone has unlimited hours of operation;</li> <li>ii. Where in District centre zone, Neighbourhood centre zone or Mixed use zone: <ul style="list-style-type: none"> <li>a. Has hours of operation, including deliveries, which are limited to 6am to 10pm; or</li> <li>b. Does not generate noise which is clearly audible and disturbing in a dwelling or other sensitive use;</li> </ul> </li> <li>iii. Where in any other zone: <ul style="list-style-type: none"> <li>a. Has hours of operation, including for deliveries, which are limited to 6am to 8pm; or</li> <li>b. Does not generate noise which is clearly audible and disturbing in a dwelling or other sensitive use.</li> </ul> </li> </ul> <p><b>A01.2</b> Development ensures mechanical plant or equipment is acoustically screened from an adjoining sensitive use.</p>
<p><b>PO7</b></p> <p>Development mitigates impacts on residential amenity in or adjoining the building through:</p> <ul style="list-style-type: none"> <li>(a) providing an outdoor dining area that is appropriately located</li> <li>(b) ensuring external dining and entertainment areas are visually and acoustically screened from an adjoining dwelling.</li> </ul>	<p><b>AO7</b></p> <p>Development provides for external dining or entertainment areas to be:</p> <ul style="list-style-type: none"> <li>(a) located in or directly adjacent to the public realm</li> <li>(b) visually and acoustically screened from an adjoining dwelling.</li> </ul>
<p><b>PO62</b></p> <p>Development of garages, driveways and parking structures minimise impacts on the amenity of neighbouring dwellings.</p>	<p><b>AO62.1</b></p> <p>Development for a car park:</p> <ul style="list-style-type: none"> <li>(a) provides a 2m-high acoustic fence and a landscaped area 1.5m wide where located adjacent to a neighbouring dwelling;</li> <li>(b) is acoustically screened where the car park is used at night and where located adjacent to a neighbouring dwelling.</li> </ul> <p><b>AO62.2</b></p> <ul style="list-style-type: none"> <li>(a) Development for a driveway or vehicle movement area is screened by a 2m-high acoustic fence along the side or rear boundary if located adjacent to a residential dwelling.</li> </ul>

The site is located in an Emerging community zone and therefore *Acceptable Outcome A01.1 (c)(iii)* is applicable and allows hours of operation, including deliveries from 6am to 8pm.

Proposed retail hours of operation, including outdoor dining, are between 6am –10:30pm. These noise activities will be assessed in accordance with the PO1 noise criteria.

It is recommended the development comply with *Acceptable Outcome AO1.2* by applying acoustic screening to exposed mechanical plant with the potential to impact adjacent sensitive receivers.

The proposed outdoor dining area is located within a public access area (a “village plaza”). The nearest noise sensitive receivers (onsite and offsite) were assessed for outdoor dining noise impacts.

The car parking area complies with AO62.1/62.2 in relation to noise, as there are no adjacent neighbouring dwellings and the car park area is enclosed within the building envelope at the basement and ground floor levels.

Waste collection and deliveries in the loading bay area is also enclosed within the building envelope.

### 5.2.2.1 Noise (Planning) Criteria

The noise emission criteria of Performance Outcome PO1 of the Centre or Mixed Use Code (Table 9.3.3.F) is presented in Table 5.

Table 5: Noise (Planning) Criteria (Table 9.3.3.3.F)

Criteria Location	Intrusive noise criteria, dB(A) Day, evening and night $L_{Aeq,adj,T}$ are not greater than the RBL plus the value shown in Column 1				Acoustic amenity criteria, dB(A) Day, evening and night $L_{Aeq,adj,T}$ are not greater than the values in this column for the relevant criteria location		
	Column 1	Day	Evening	Night 6am-7am / 10pm-10:30pm	Day	Evening	Night
Emerging community zone boundary	+5	53	49	53 / 48	55	50	45
Project Specific Criteria*		<b>53</b>	<b>49</b>	<b>53 / 48</b>			
Low density residential zone boundary	+3	51	47	51 / 46	55	45	40
Project Specific Criteria*		<b>51</b>	<b>47</b>	<b>51 / 46</b>			

Day: 7am – 6pm. Evening: 6pm – 10pm. Night 10pm – 7am.

\*The ambient noise environment is elevated due to the proximity of road traffic noise (Beams Road). Therefore, the Intrusive noise criteria is considered to be more applicable in this case than the Amenity criteria.

### 5.2.2.2 Night-time Noise Criteria

The night-time noise criteria for ‘impact / short duration’ type noise sources are outlined in *Table 9.3.3.3.H* of the Centre or Mixed Use Code. This criteria is reproduced in Table 6.

Table 6: Night-time Criteria (Table 9.3.3.3.H)

Criteria Location	Where the existing $L_{Aeq,9hr}$ night at the criteria location is:	Average of the highest 15 single $L_{Amax}$ events over a given night period is not greater	The Absolute highest single $L_{Amax}$ event over a given night period is not greater than the



		than the following values at the relevant criteria location	following values at the relevant criteria location
At the zone boundary of: Low density residential zone	<45dB(A)	50dB(A)	55dB(A)
	45 to 60dB(A) <b>51</b>	$L_{Aeq,9hr\ night} + 5dB(A)$ <b>56</b>	$L_{Aeq,9hr\ night} + 10dB(A)$ <b>61</b>
	>60dB(A)	65dB(A)	70dB(A)

### 5.3 Future Noise Sensitive Receivers

Where onsite noise emissions may impact proposed noise sensitive receivers (residential uses) that are part of this site or future stages of this development area, these receivers can be designed and constructed with a specified façade acoustic rating so that habitable rooms achieve acceptable internal noise levels. Applicable internal noise criteria are specified in AS2107<sup>1</sup> and reproduced in Table 7.

Table 7: Internal Noise Limits for Residential Dwellings (AS2107)

Type of Occupancy	Recommended Design Sound Level $L_{Aeq}$ dB(A)
<b>7. RESIDENTIAL BUILDINGS</b>	
Houses and apartments near minor roads -	
Living areas	30-40
Sleeping areas	30-35

Operating hours are proposed within the night period (10pm – 7am). Sleep disturbance internal criteria can be sourced from the *Planning for Noise Control Guideline* (Department of Environment and Science, Qld Government), which specifies maximum noise levels for sleep disturbance based on research by the World Health Organization (WHO). An appropriate internal  $L_{max}$  criteria is 50dB(A).

<sup>1</sup> Australian Standard AS2107:2016 Acoustics – Recommended Design Sound Levels and Reverberation Times for Building Interiors.

## 6 Assessment – Onsite Noise

The following section presents an assessment of noise associated with the development to determine the potential impacts at the nearest sensitive receivers. The relevant transient noise activities, not addressed by acceptable outcomes (Section 5.2), with the potential to adversely impact the nearest noise sensitive receivers are:

- Outdoor dining: between 6am – 10:30pm

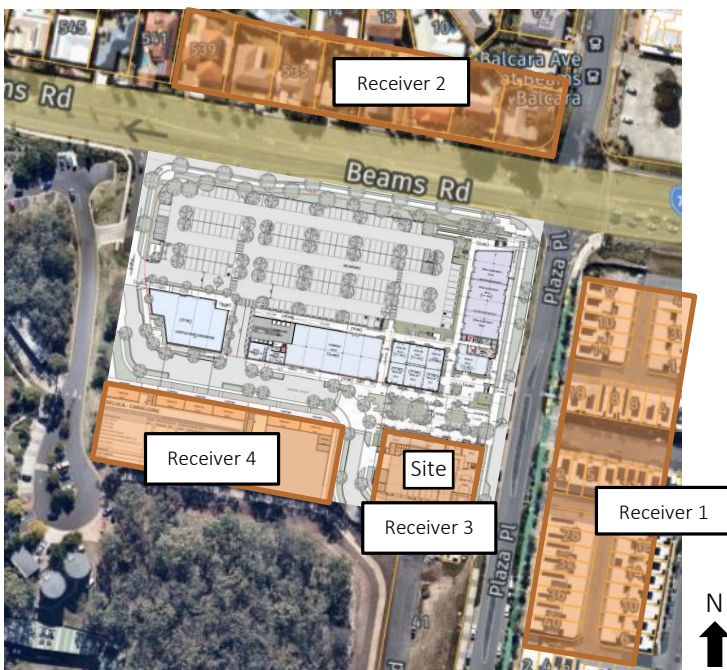
As outlined in Section 5.2.2, car movements, waste collection and deliveries in the loading bay area are enclosed within the building envelope.

### 6.1 Noise Sensitive Receivers

This assessment will focus on the nearest noise sensitive receivers as outlined below and shown in Figure 5. If compliance can be achieved at these nearest receivers, then all remaining noise sensitive locations are expected to comply.

- Receiver 1: Residential use in an Emerging community zone to the east of the site
- Receiver 2: Residential use in a Low density residential zone to the north of the site
- Receiver 3: Onsite residential use
- Receiver 4: Potential residential use (future) in an Emerging community zone to the west of the site

Figure 5: Noise Sensitive Receivers



## 6.2 Noise Source Levels

Table 8 presents the typical external, transient noise sources with the potential to impact noise sensitive receivers. The noise source levels were calculated to one metre and include corrections for tonality and impulsiveness as per AS1055 where applicable.

Table 8: Typical Transient Noise Source Levels

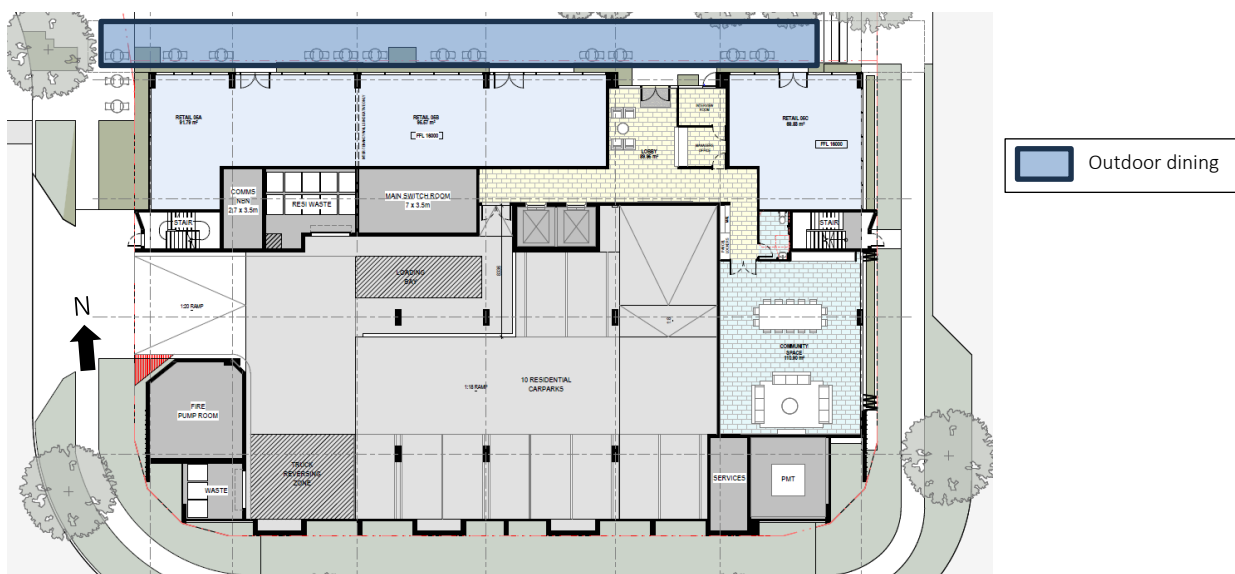
Noise Source	Prediction Location (Figure 6)	Measured Duration (sec)	Noise Level at 1m, dB(A)		'Peak' events per hour or % of period
			L <sub>Aeq,T</sub>	L <sub>Amax</sub>	
Outdoor dining	Outdoor dining area	60	75	N/A <sup>^</sup>	100%

<sup>^</sup>People and vehicle pass-by noise is excluded from L<sub>max</sub> assessment in accordance with NIAPSP

## 6.3 Noise Assessment Methodology

- Outdoor dining was predicted from the nearest outdoor dining area. The noise duration was assumed to be continuous during the assessment time period.
- Attenuation from building screening was included where applicable.
- As outlined in Section 5.3, onsite and future receivers (receivers 3 and 4) can be designed with facades with required noise attenuation to achieve acceptable internal noise levels. Façade attenuation amounts used were:
  - Receiver 3 façade attenuation: 30dB
  - Receiver 4 façade attenuation: 18dB (standard façade construction)
- Figure 6 presents the relevant noise activity locations.

Figure 6: Noise Activity Locations



## 6.4 Predicted Noise Levels at Receivers

The predicted noise levels from typical onsite activities are based on the noise sources presented in Table 8 and the assumptions outlined in Section 6.3. Calculations are included in Appendix C.

### 6.4.1 Noise Planning Criteria – $L_{eq}$

Table 9 presents the predicted noise emission levels at existing noise sensitive receivers.

Table 9: Predicted Noise Planning Impacts – Existing Receivers

Receiver	Noise Source	Predicted External Noise Level $L_{Aeq}$ dB(A)	Complies with Criteria?		
			Day 7am-6pm 53dB(A)	Evening 6pm-10pm 49dB(A)	Night 6am-7am / 10pm-10:30pm 53 / 48 dB(A)
1	Outdoor dining	47	✓	✓	✓
			Day 7am-6pm 51dB(A)	Evening 6pm-10pm 47dB(A)	Night 6am-7am / 10pm-10:30pm 51 / 46 dB(A)
2	Outdoor dining	33	✓	✓	✓

As outlined in Section 5.3, onsite and future receivers can be designed with facades with required noise attenuation to achieve acceptable internal noise levels. Table 10 presents the predicted noise emission levels at future noise sensitive receivers.

Table 10: Predicted Noise Planning Impacts – Future Receivers

Receiver	Noise Source	Predicted Internal Noise Level $L_{Aeq}$ dB(A)	Complies with Criteria?
			Internal (AS2107) Day/Evening/Night 35dB(A)
3	Outdoor dining	31	✓
4	Outdoor dining	31	✓

Noise activities are predicted to comply with the relevant noise criteria at all receivers with the inclusion of recommended noise attenuation measures (see Section 7).

## 7 Recommendations

Recommended noise mitigation measures are presented in this section to achieve predicted compliance with the relevant assessment criteria.

### 7.1 Management Strategies

The following management strategies are recommended to achieve predicted compliance and minimise noise annoyance:

- a. Recommended acoustic treatment for onsite and future dwellings:
  - i. Onsite residential apartments (Receiver 3):
    - (1) Minimum façade noise reduction: 30dB (min. Rw35) for the north facing façade (Levels 1-7).  
Glazing: indicatively 10.38mm laminated.
  - ii. Receiver 4 (future):
    - (1) Minimum façade noise reduction: standard façade construction is adequate.
- b. Any speed humps should be bitumen, concrete (as part of the slab), or rubber, and not metal.
- c. Any grates or other protective covers in the car park and access driveways must be rigidly fixed in position to eliminate movement and be maintained.

### 7.2 Mechanical Plant

As detailed mechanical plant selections are not available at this stage, it is not possible to carry out a detailed examination of any attenuation measures that may be required to achieve the noise criteria.

To comply with planning scheme acceptable outcomes for mechanical plant (City Plan 2014), we recommend the following for plant with the potential to adversely impact nearby sensitive receivers:

*Development ensures mechanical plant is acoustically screened from nearby sensitive uses.*

The definition of 'acoustically screened' is provided in Table SC1.2.3.B of Brisbane City Plan 2014, Schedule 1 Definitions:

*The source of noise is completely screened from view of habitable rooms (including balconies, patios, decks and verandas) of an adjoining sensitive use by solid, gap free material and construction e.g. acoustic fence, building, or enclosure.*

*Acoustic barrier: Solid, gap free barrier with minimum surface density of 12.5kg/m<sup>2</sup>*

Furthermore, it is also recommended that a mechanical plant noise assessment is conducted once plant selections are finalised to ensure noise emissions comply with criteria.

## 8 Conclusion

An environmental noise assessment was conducted of a proposed mixed-use development located at Lot 5003 Carseldine Village.

Compliance with the Fitzgibbon Urban Development Area Development Scheme (Dec 2021) (and relevant City Plan 2014 codes) is predicted to be achieved based on the recommendations outlined in Section 7 of this report.

## Appendix A Development Plans

architectus Conrad Gargitt

100% COMPLETE  
 ALL DIMENSIONS AND FINISHES TO BE SHOWN ON ALL DRAWINGS  
 TO BE USED FOR CONSTRUCTION

NO.	DESCRIPTION	DATE
1	ISSUED FOR PERMIT	10/10/20
2	ISSUED FOR PERMIT	10/10/20
3	ISSUED FOR PERMIT	10/10/20
4	ISSUED FOR PERMIT	10/10/20
5	ISSUED FOR PERMIT	10/10/20
6	ISSUED FOR PERMIT	10/10/20
7	ISSUED FOR PERMIT	10/10/20

Client DELUCA

Project THE VILLAGE CARSELDINE

Sheet 5003 - GROUND FLOOR - 1-100

At Scale 1:100  
 Project No. 23.0159  
 Revision J

Name SK-AR-DR-DA-121

10/10/20  
 ALL DIMENSIONS AND FINISHES TO BE SHOWN ON ALL DRAWINGS  
 TO BE USED FOR CONSTRUCTION



PRELIMINARY





Alle Informationen zu diesem Gebäude sind  
 nur für den Auftraggeber und die  
 Bauherren vorgesehen und sind  
 nicht für die Öffentlichkeit bestimmt.

Item	NO.	DATE
1. PROJECT START	10.01.2018	10.01.2018
2. PROJECT END	10.01.2018	10.01.2018
3. PROJECT START	10.01.2018	10.01.2018
4. PROJECT END	10.01.2018	10.01.2018
5. PROJECT START	10.01.2018	10.01.2018
6. PROJECT END	10.01.2018	10.01.2018

Client  
 DELUCA

Project  
 THE VILLAGE  
 CARSELDINE

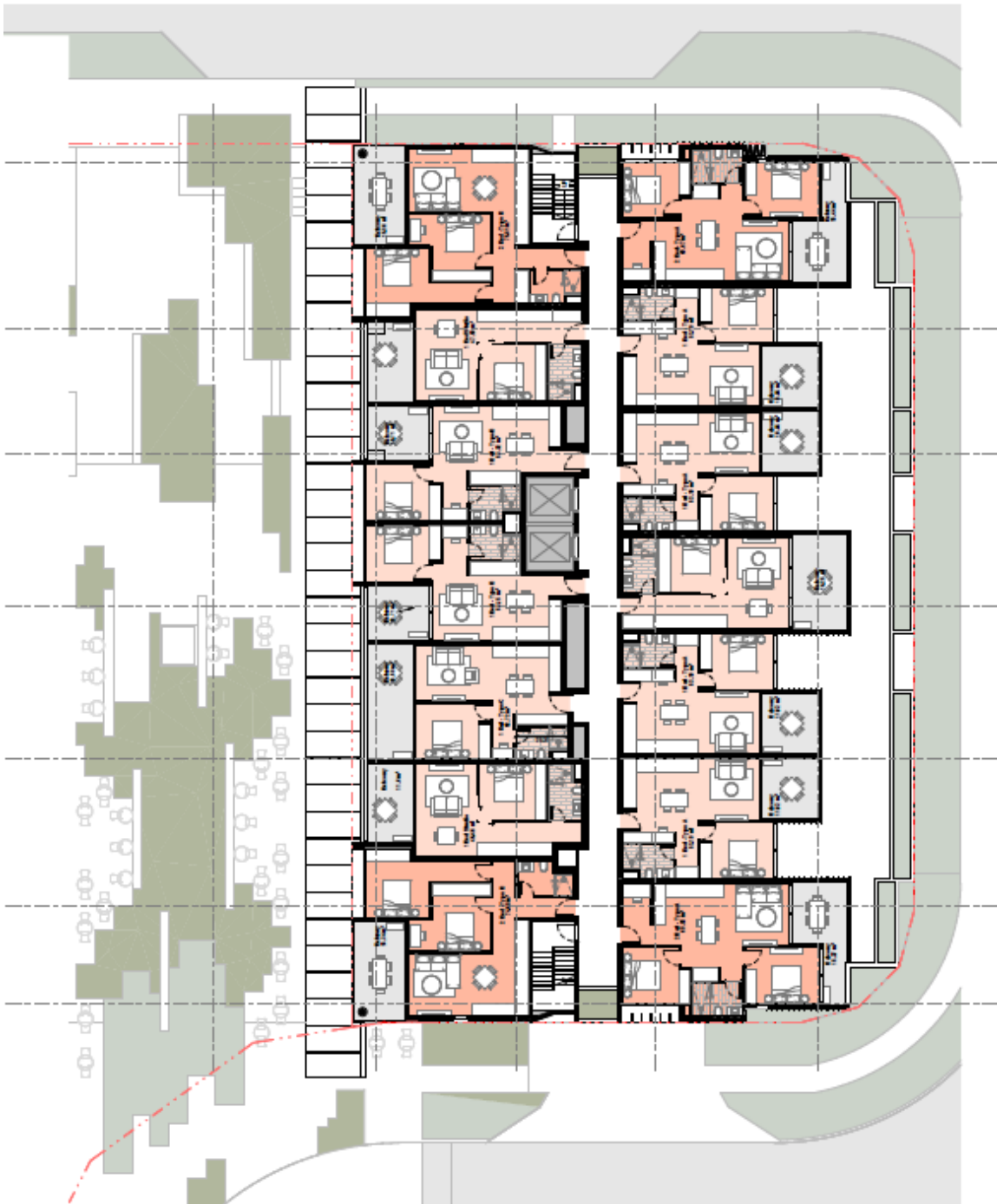
Design  
 8003 - LEVEL 1 - 1:100

At Scale: 1:100  
 Project No: 23.0159  
 Issue: H

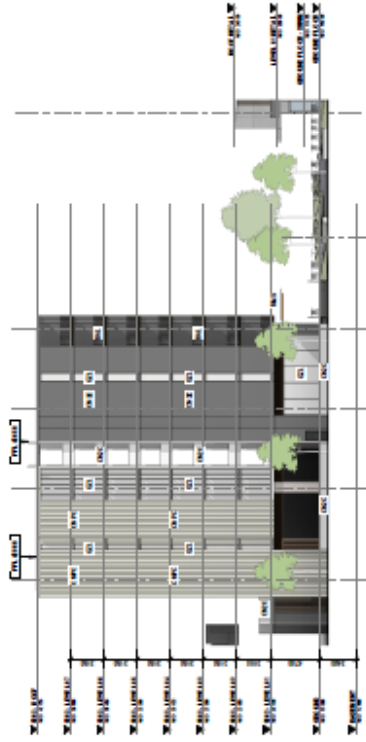
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Notes:  
 1. All dimensions are in millimeters unless  
 otherwise stated.  
 2. All dimensions are to face unless  
 otherwise stated.  
 3. All dimensions are to centerline unless  
 otherwise stated.

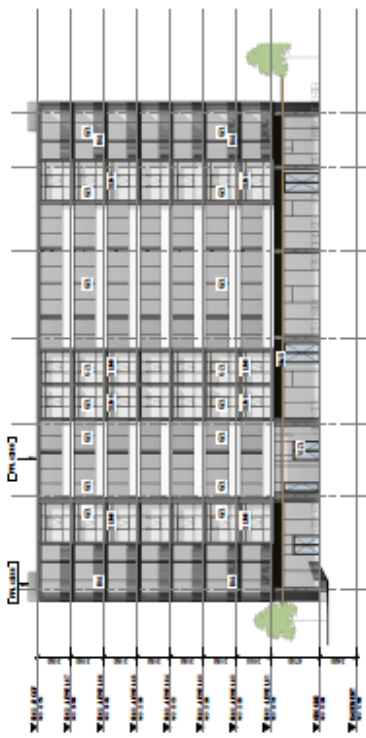
PRELIMINARY



NO RENDIMENTO IN VENDITA. È OBBLIGO DEL CLIENTE VERIFICARE IL CONTENUTO DEL PROGETTO E IL SUO STATO DI AVANZAMENTO. IL CLIENTE È RESPONSABILE DELLA VERIFICA DEL CONTENUTO DEL PROGETTO.



2 NORD-OVEST ELEVATION



1 SUD-OVEST ELEVATION



4 NORD-EST ELEVATION



3 SUD-EST ELEVATION

PROGETTO  
 1. ARCHITETTURA  
 2. INGEGNERIA  
 3. PIANIFICAZIONE  
 4. INTERI  
 5. ARREDI

CLIENTE  
 DELUCA

PROGETTO  
 THE VILLAGE  
 CARSELDINE

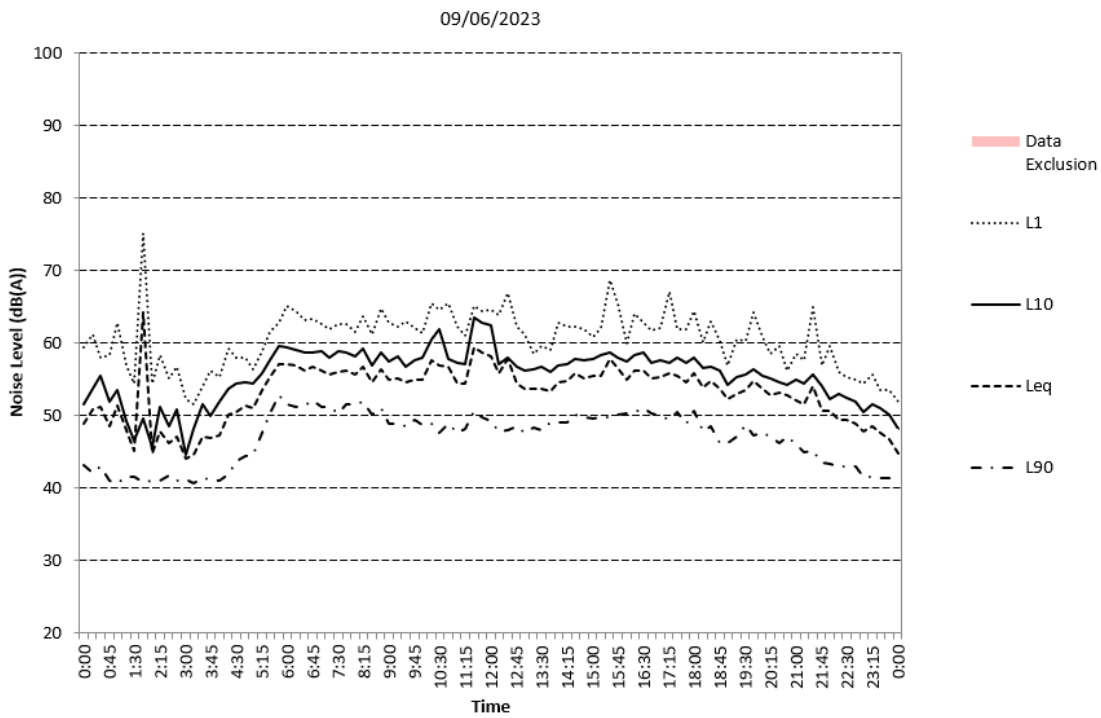
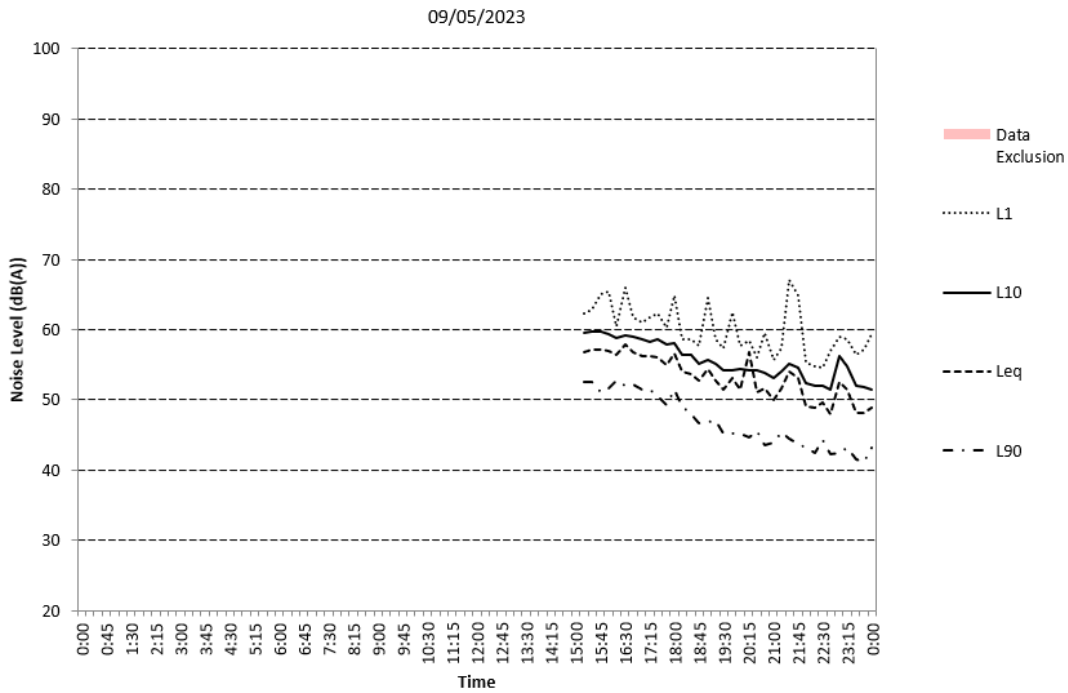
NUMERO  
 5003 - ELEVATION  
 SHEET 1

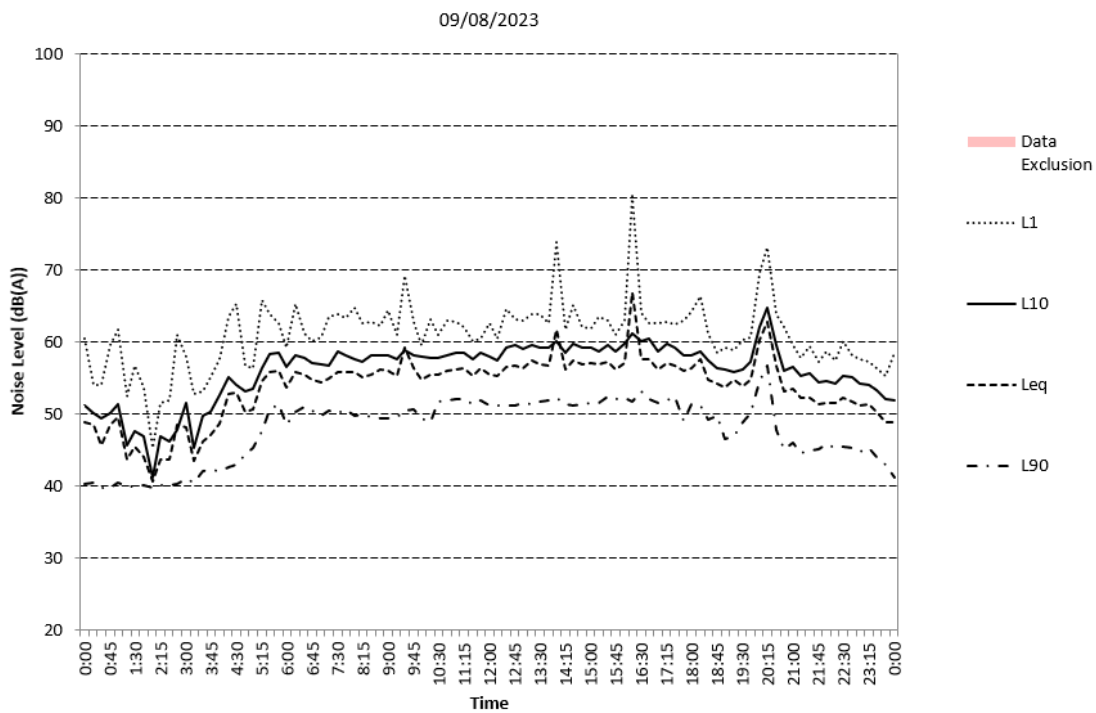
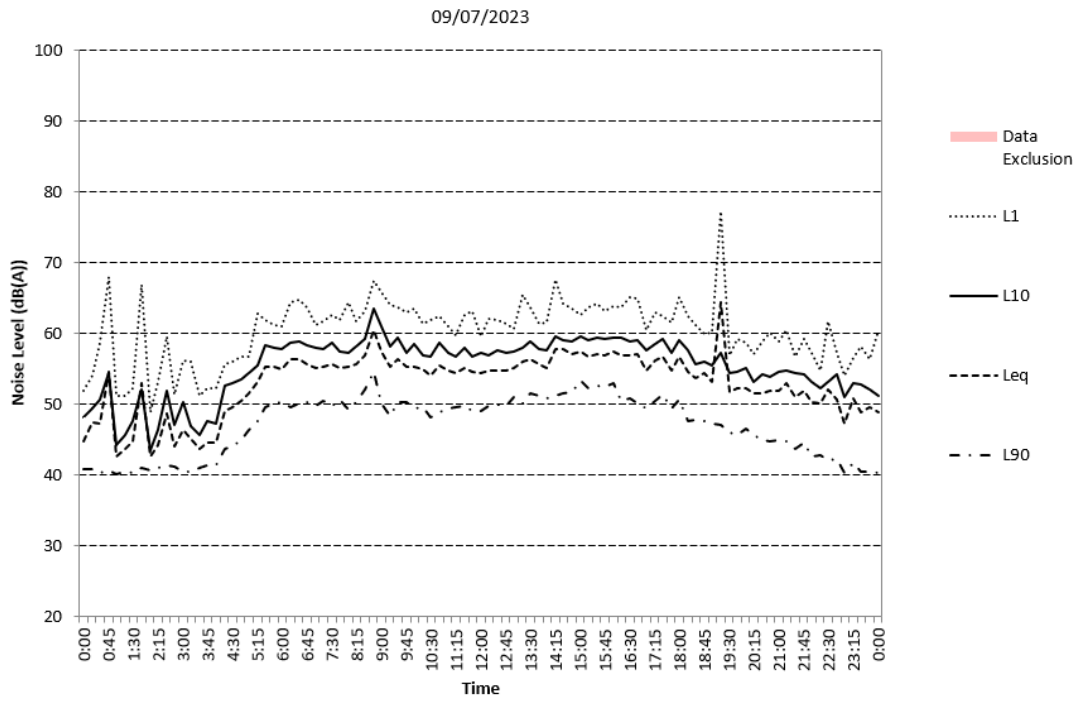
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 AT SCALE 1:200  
 PROJECT NO. 23.0159  
 VERSIONE D

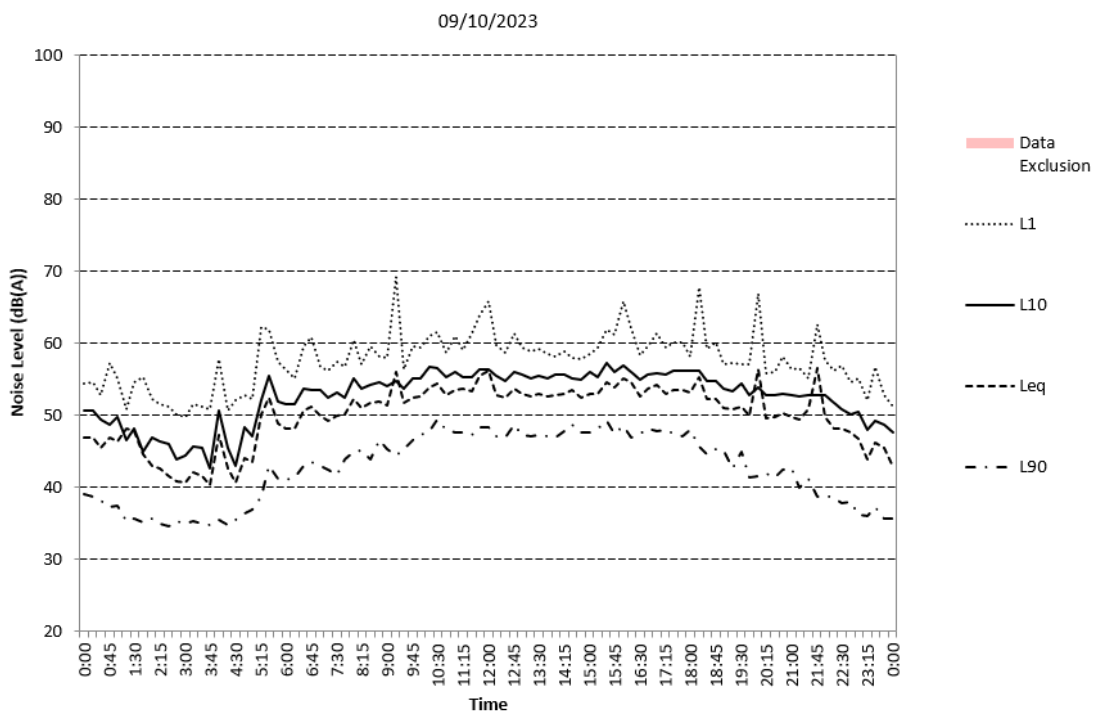
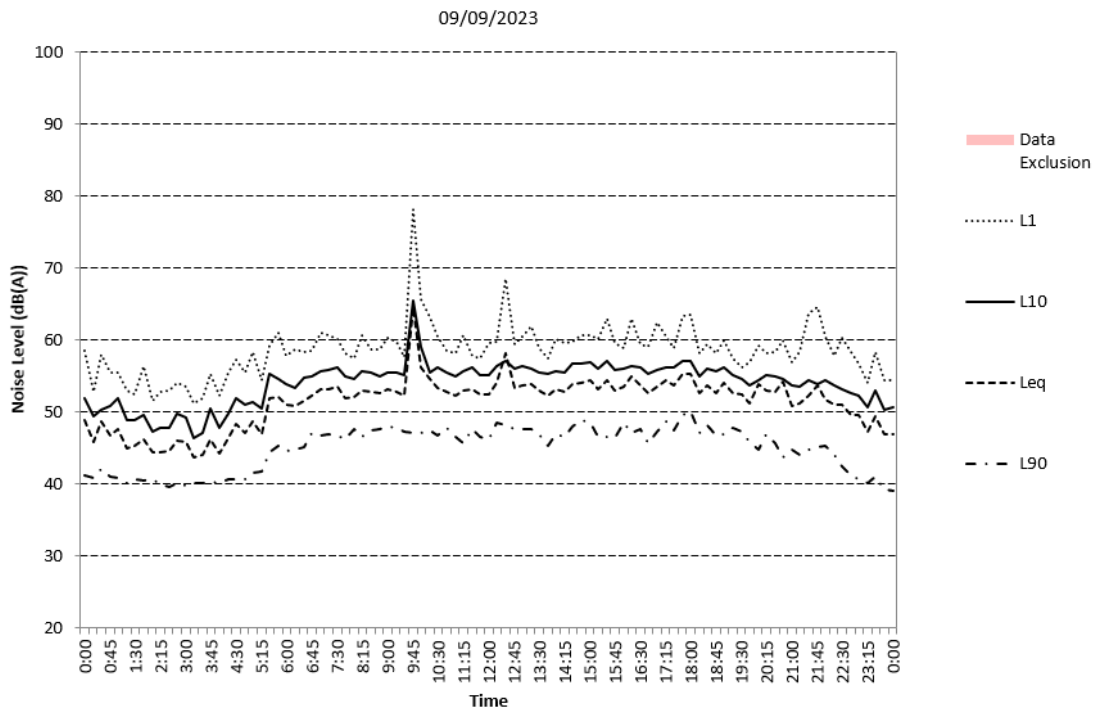
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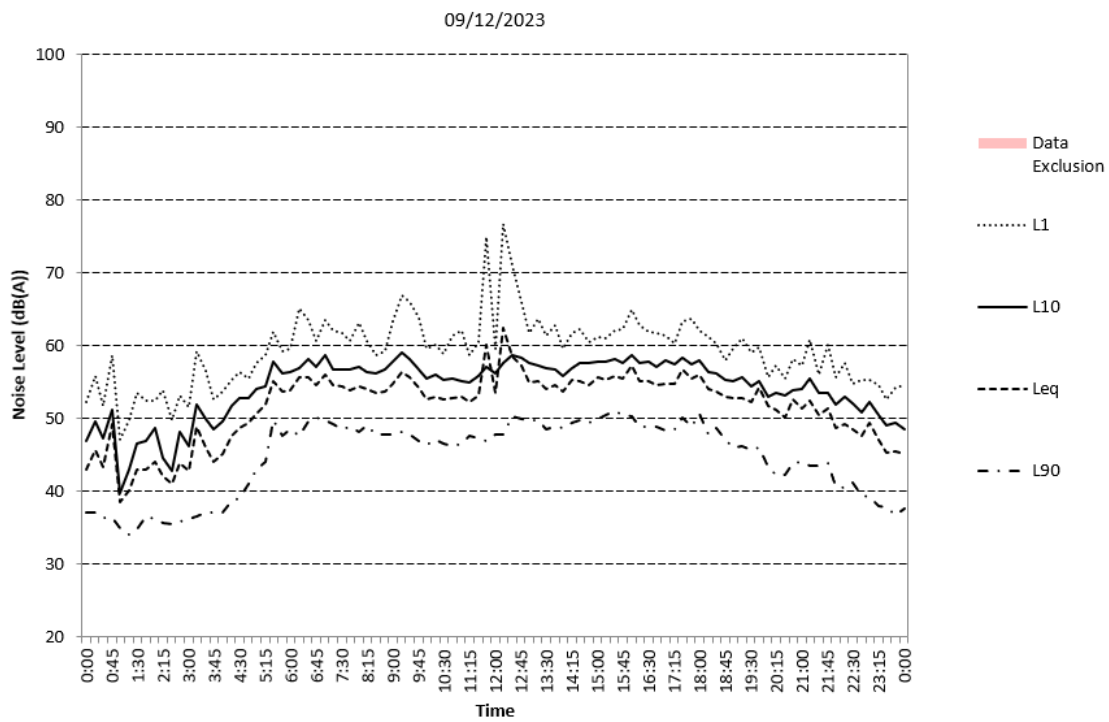
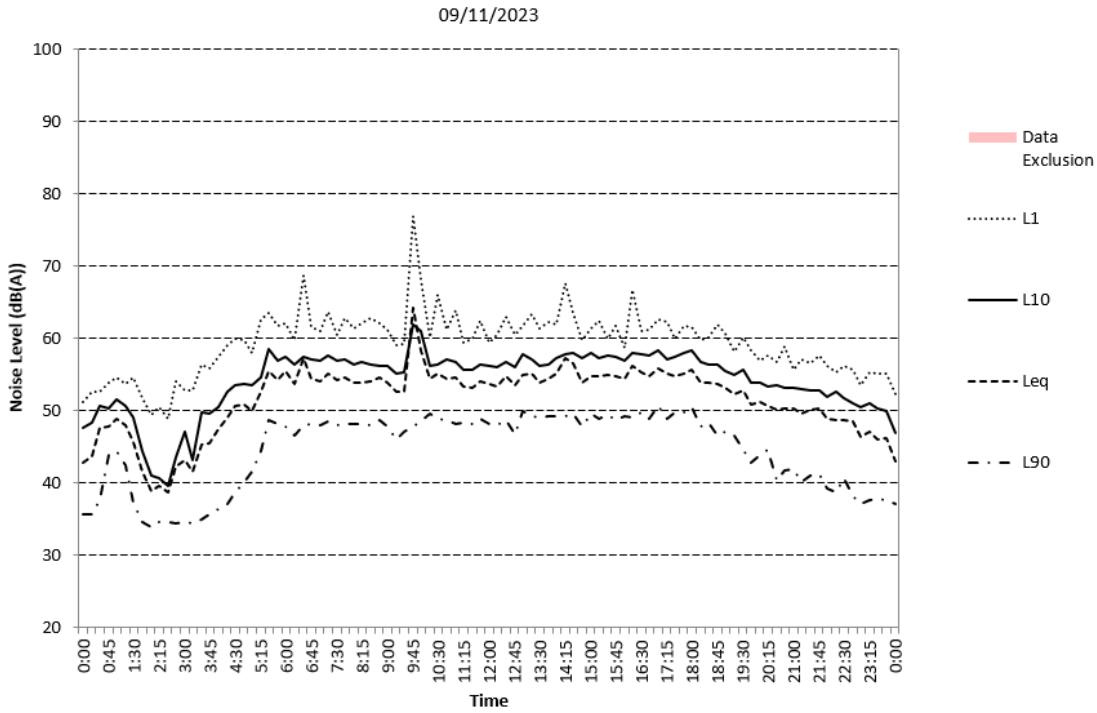
PRODOTTO DA  
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 INTERI  
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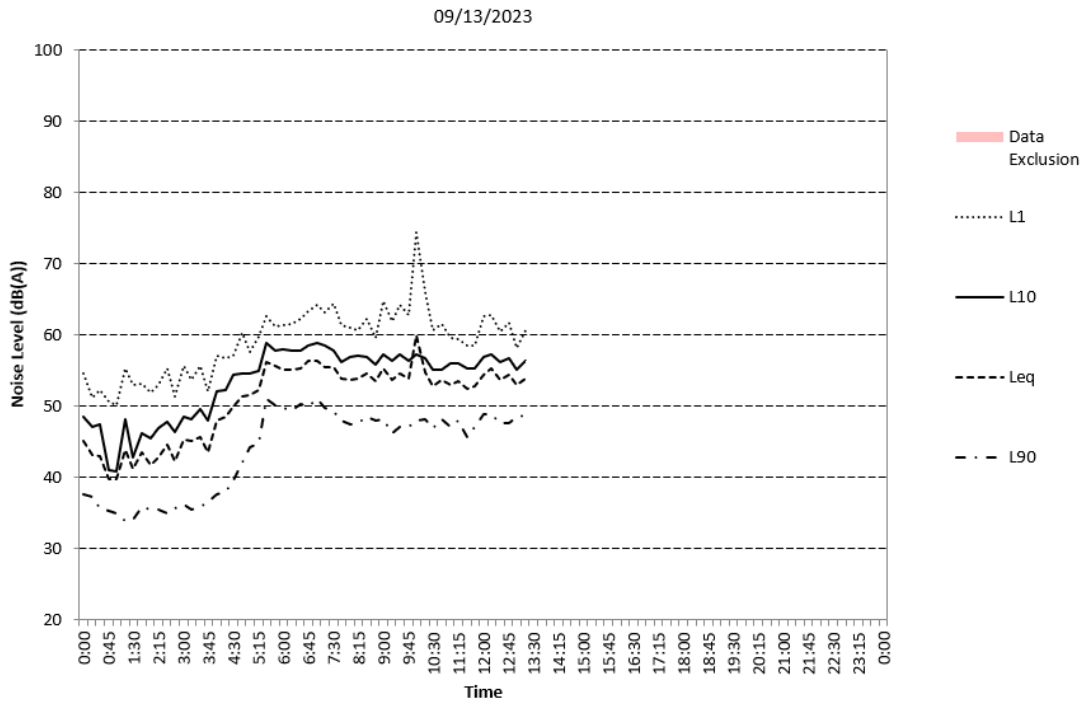
## Appendix B Unattended Noise Monitoring Graphs













## Appendix C    Calculations

PROJECT #:

Activity Noise

1 Hour  
Period  
(sec)

Distance to Receivers

Noise Source	Duration (sec)	Leq	1 Hour Period (sec)	Events	Leq Level	R1	R2	R3	R4
Outdoor dining	60	75	3600	60	75	25	128	5	20

Noise level due to Distance loss									
Outdoor dining						47	33	61	49

Shielding (building, barrier)						R1	R2	R3	R4
Outdoor dining						0	0	0	0

Noise Level at Receiver - External - Existing Receivers						R1	R2	R3	R4
Outdoor dining						47	33	n/a	n/a

Noise Level at Receiver - Internal - Onsite & future receivers						Façade attenuation (dB):	30	18	
Outdoor dining						n/a	n/a	31	31