

2-10 Clarke St, Abbotsford

## Acoustic Town Planning Report

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**MELBOURNE**  
41 Cobden St  
NORTH MELBOURNE VIC 3051  
(03) 9272 6800

ABN 98 145 324 714  
[www.acousticlogic.com.au](http://www.acousticlogic.com.au)

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## 1 INTRODUCTION

Acoustic Logic (AL) has been engaged to undertake an acoustic assessment of the retirement apartment building being constructed as part of the proposed Mercy Health Retirement development located at 2-10 Clarke Street, Abbotsford.

The assessment addresses external traffic noise intrusion and potential noise emission from subject site to comply with EPA Publication 1826.4. The assessment has been conducted based on the following documentation.

**Table 1 – Referenced Documents**

<b>Prepared By</b>	<b>Document</b>	<b>Reference</b>	<b>Date</b>
CHT Architects	Architectural Drawings	Town Planning drawings set	10 July2024
City of Yarra	Standard D16 of Clause 58.04-3 of the planning scheme	-	14 December 2023
-	Australian Standard AS/NZS 2107:2016	-	2016
EPA Victoria	Noise Limit and Assessment Protocol (Noise Protocol)	Publication 1826.4	2021

## 2 SITE DESCRIPTION

The subject development is located at 2-10 Clarke Street, Abbotsford. The subject site is bounded by Clarke Street to the west, St Heliers Street to the north, existing Good Shepherd Chapel and Abbotsford Convent to the east, and Convent Gardens to the south. There is industrial area approximately 25m to the southwest of subject site.

The proposal is for a 4-storey residential development. The proposed building will include single level of basement car parking with communal spaces on Ground Level and Level 1, and retirement apartment on Ground Level to Level 3.

Figure 1 below details the subject site and surrounding environment.



**Figure 1 Subject site and surrounding environments (source: Google Maps)**

### 2.1 LOCAL NOISE SOURCES

AL attended the site on multiple occasions and observed that the primary noise was noise associated with traffic noise along the Clarke Street and Studley Park Road. There is also industrial area approximately 25m to the southwest of subject site. However, the industrial noise was inaudible at the subject site. Therefore, no further assessment is undertaken for the industrial area.

### 3 ENVIRONMENTAL NOISE DESCRIPTORS

Environmental noise constantly varies in level, due to fluctuations in local noise sources including traffic and rail. Accordingly, a 15-minute measurement interval is normally utilised. Over this period, noise levels are monitored on a continuous basis and statistical and integrating techniques are used to determine noise description parameters.

In the case of environmental noise three principle measurement parameters are used, namely  $L_{10}$ ,  $L_{90}$  and  $L_{eq}$ .

The  $L_{10}$  and  $L_{90}$  measurement parameters are statistical levels that represent the average maximum and average minimum noise levels respectively, over the measurement intervals.

The  $L_{10}$  parameter is commonly used to measure noise produced by a particular intrusive noise source since it represents the average of the loudest noise levels produced by the source.

Conversely, the  $L_{90}$  level (which is commonly referred to as the background noise level) represents the noise level heard in the quieter periods during a measurement interval. The  $L_{90}$  parameter is used to set the allowable noise level for new, potentially intrusive noise sources since the disturbance caused by the new source depends on how audible it is above the pre-existing noise environment, particularly during quiet periods, as represented by the  $L_{90}$  level.

The  $L_{eq}$  parameter represents the average noise energy during a measurement period. This parameter is derived by integrating the noise levels measured over the measurement period.  $L_{eq}$  is important in the assessment of traffic and rail noise impact as it closely corresponds with human perception of a changing noise environment; such is the character of industrial noise.

The  $L_1$  parameter (or the noise level exceeded for 1% of the time) is used during the night period to assess potential sleep arousal effects due to transient noise sources.

## 4 NOISE LEVEL MEASUREMENTS

### 4.1 MEASUREMENT LOCATIONS AND DATE OF MEASUREMENTS

Unattended noise level measurements were conducted at the locations indicated in Figure 1. The noise level measurement locations are described below:

- Location 1 – An unattended noise monitor was installed on the western boundary of subject site to measure traffic along Clarke Street. The monitor was installed 4m above grade and affected by façade reflections. The monitor was installed on site between 27 June and 4 July 2024.
- Location 2 – An unattended noise monitor was installed within the subject site to measure the background noise level. The monitor was installed 1.5m above grade and affected by façade reflections. The monitor was installed on site between 27 June and 4 July 2024.

### 4.2 MEASUREMENT EQUIPMENT

The long-term unattended noise monitoring was conducted using two NGARA noise monitors. The equipment was calibrated at the beginning and the end of the measurement using a Rion NC-75 calibrator; no significant drift was detected. All measurements were taken on fast response mode.

### 4.3 MEASURED NOISE LEVELS

The tables below detail the measured noise levels obtained from the unattended noise monitoring at the subject site.

**Table 2 – Unattended Traffic Noise Level Measurements**

Measurement Location	Period	Measured Noise Levels <sup>1</sup>
Measurement Location 1 as indicated in Figure 1	Day (7:00-22:00)	52 dB(A) $L_{eq, 15hr}$ 59 dB(A) $L_{eq, 1hr}$
	Night (22:00-7:00)	45 dB(A) $L_{eq, 9hr}$ 51 dB(A) $L_{eq, 1hr}$

Note 1: Noise level has been corrected by -2.5dB(A) for façade reflections.

**Table 3 – Unattended Background Noise Level Measurements**

Period	Time	Measured Background $L_{90, Period}$ dB(A) <sup>1</sup>
Day	7am – 6pm (Mon – Sat)	38
Evening	6pm – 10pm (Mon – Sat) 7am – 10pm (Sun)	36
Night	10pm – 7am	36

Note 1: Noise level has been corrected by -2.5dB(A) for façade reflections.

## 5 ASSESSMENT CRITERIA

### 5.1 STANDARD D16 OF CLAUSE 58.04-3

Standard D16 of Clause 58.04-3 contains the following condition:

#### **Standard D16**

*Noise sources, such as mechanical plants should not be located near bedrooms of immediately adjacent existing dwellings or small second dwellings.*

*The layout of new dwellings and buildings should minimise noise transmission within the site.*

*Noise sensitive rooms (such as living areas and bedrooms) should be located to avoid noise impacts from mechanical plants, lifts, building services, non-residential uses, car parking, communal areas and other dwellings.*

*New dwellings should be designed and constructed to include acoustic attenuation measures to reduce noise levels from off-site noise sources.*

*Buildings within a noise influence area specified in Table D5 should be designed and constructed to achieve the following noise levels:*

- *Not greater than 35dB(A) for bedrooms, assessed as an LAeq,8h from 10pm to 6am.*
- *Not greater than 40dB(A) for living areas, assessed LAeq,16h from 6am to 10pm.*

*Buildings, or part of a building screened from a noise source by an existing solid structure, or the natural topography of the land, do not need to meet the specified noise level requirements.*

*Noise levels should be assessed in unfurnished rooms with a finished floor and the windows closed.*

**Table D5 Noise influence area**

<b>Noise Source</b>	<b>Noise influence area</b>
<b>Zone interface</b>	
<i>Industry</i>	<i>300 metres from the industrial 1, 2 and 3 zone boundaries</i>
<b>Roads</b>	
<i>Freeways, tollways and other roads carrying 40,000 Annual Average Daily Traffic Volume</i>	<i>300 metres from the nearest trafficable lane</i>
<b>Railways</b>	
<i>Railway servicing passengers in Victoria</i>	<i>80 metres from the centre of the nearest track</i>
<i>Railway servicing freight outside Metropolitan Melbourne</i>	<i>80 metres from the centre of the nearest track</i>
<i>Railway servicing freight in Metropolitan Melbourne</i>	<i>135 metres from the centre of the nearest track</i>

Note: The noise influence area should be measured from the closest part of the building to the noise source.

**Decision guidelines**

Before deciding on an application, the responsible authority must consider:

- The design response.
- Whether it can be demonstrated that the design treatment incorporated into the development meets the specified noise levels or an acoustic report by a suitably qualified specialist submitted with the application.
- Whether the impact of potential noise sources within a development have been mitigated through design, location and siting.
- Whether the layout of rooms within a dwelling mitigates noise transfer within and between dwellings.
- Whether an alternative design meets the relevant objectives having regard to the amenity of the dwelling or small second dwelling and the site context.

Based on these conditions, the subject site has been reviewed as follows:

1. The development **is** within 300m of an industrial zone.
  - The nearest industrial zone is located approximately 25m to the southwest from the subject site. As mentioned in Section 2.1, the industrial noise is inaudible at the subject site, and it is dominated by traffic noise. Therefore, no further assessment is undertaken regarding the industrial zone.
2. The development is **not** within 300m of a freeway, tollway or road carrying an AADT >40,000.
3. The development is **not** within 80m of railway servicing passengers and freight.

## 5.2 AS/NZS 2107:2016

Australian Standard AS/NZS2107:2016 “Recommended Design Sound Levels and Reverberation Times for Building Interiors” sets out recommended design sound levels for residential developments depending on locality to minor or major roads. Table 4 below details the criterion set for this development.

**Table 4 – Internal Noise Criteria – Surrounding Traffic**

Location	Required Internal Noise Level <sup>1</sup>	
	dB(A) L <sub>eq</sub> 1hr (7am – 10pm)	dB(A) L <sub>eq</sub> 1hr (10pm – 7am)
Bedrooms	35-45 <sup>2</sup>	35-40
Living Areas	35-45	N/A

**Note 1:** Assessment is based on apartments suitably furnished ready for occupation.

**Note 2:** Bedrooms assessed as living rooms outside 10pm-7am.

## 5.3 EPA VICTORIA PUBLICATION 1826.4

To ensure that noise emissions from the proposed development site do not impact adversely on the amenity of the surrounding noise sensitive areas, the proposed development should be designed to comply with the EPA Noise Protocol Publication 1826.4 – Part 1.

### 5.3.1 Zoning Level

The ‘Zoning’ level is determined by the Influencing Factor (IF) and is calculated by the formula and the ‘Zoning Level versus Influencing Factor’ graph nominated in Section 1.1 of the EPA Noise Protocol and VicPlan Mapping. The IF is calculated from the proportion of industrial and commercial land around noise sensitive areas. Review of the surrounding area indicates an IF of approximately **0.24** which results in the zoning limits detailed in Table 5 below.

**Table 5 - Zoning Levels**

Period	Zoning Level dB(A)
Day time	54
Evening	48
Night time	43

### 5.3.2 EPA Noise Protocol – Part 1

Table 6 below details the assessment criteria based on both the zoning levels and the measured background noise levels.

**Table 6 – Noise Limits**

<b>Period</b>	<b>Background dB(A) <math>L_{90,Period}</math></b>	<b>Zoning limit</b>	<b>Classification</b>	<b>Project Noise Limits dB(A) <math>L_{eq}</math></b>
<b>Day</b> Monday – Saturday (7am – 6pm)	38	54	Low	<b><u>51</u></b>
<b>Evening</b> Monday – Saturday (6pm – 10pm) Sunday (7am – 10pm)	36	48	Low	<b><u>45</u></b>
<b>Night</b> Monday – Friday (10pm – 7am)	36	43	Neutral	<b><u>43</u></b>

## 6 EVALUATION OF EXTERNAL NOISE INTRUSION

Internal noise levels will primarily be as a result of noise transfer through the windows, doors and roof as these are relatively light building elements that offer less resistance to the transmission of sound. Walls that are proposed to be heavy masonry elements will not require upgrading.

The predicted noise levels through the windows, doors and roof are discussed below. The predicted noise levels have been based on the expected level and spectral characteristics of the external noise, the area of building elements exposed to noise, the absorption characteristics of the rooms and the noise reduction performance of the building elements.

Glazing/façade treatment was determined based on the measured noise levels, the predicted loss across the site, and the transmission loss of the façade. The constructions set out below are necessary for the satisfactory control of external noise to comply with the internal noise level criteria.

### 6.1 RECOMMENDED GLAZING

The glass thicknesses shown in the schedule do not take into account thermal, structural, safety or any other requirements other than acoustic requirements and thus may require upgrading in some instances. In these instances, increasing the glass thickness beyond the acoustic requirement will be acceptable. Where the glazing thickness has not been specified, standard glazing will be acceptable.

Table 7 below details the minimum  $R_w$  performance requirements for the glazing assembly installed. Where open-able windows or sliding doors are installed, the total  $R_w$  performance of the system shall not be lower than the values listed in this table. It is noted that the system supplied shall meet the overall minimum  $R_w$  ratings nominated based on a laboratory test report for the system. If an alternative system is proposed the system shall be reviewed and will require approval by a suitably qualified acoustic consultant to ensure that the proposed system is acceptable and will ensure compliance with the nominated internal noise design criteria.

**Table 7 – Glazing Requirements**

<b>Location</b>	<b>Required Glazing Construction<sup>1</sup></b>	<b>Minimum <math>R_w</math> of Installed Window System</b>	<b>Acoustic Seals<sup>2</sup></b>
All Apartment Habitable Room	6mm <u>or</u> 6/12/6 IGU	29	Yes

Note 1 – Alternative glazing system may be installed provided they are approved by a suitable qualified acoustic consultant.

Note 2 – Mohair Seals in windows and doors are **not** acceptable where acoustic seals are required. Seals in these instances shall be equal to Schlegel Q-Ion. In principle awning windows and hinged doors to contain multi-point latching system.

### 6.2 EXTERNAL WALL CONSTRUCTION

Any non-glazed sections of the façade which are proposed to be constructed from lightweight materials shall be designed to ensure compliance with the nominated internal noise criteria. Penetrations in walls must be sealed gap free with a flexible sealant. Any ventilation openings in walls shall be acoustically treated to maintain the acoustic performance of the external wall construction.

### 6.3 ROOF CONSTRUCTION

The roof construction proposed is concrete. Concrete roof areas will not require upgrading acoustically. If lightweight roof construction is proposed, it shall be reviewed by a suitably qualified acoustic consultant to ensure compliance with the internal traffic noise level criteria detailed in Section 5 are achieved.

Penetrations in ceilings (such as for light fittings etc.) must be sealed gap free with a flexible sealant. Any ventilation openings in the ceilings would need to be acoustically treated to maintain the acoustic performance of the ceiling construction.

## 7 ASSESSMENT OF PLANT AND EQUIPMENT

To ensure that noise emissions from mechanical plant and equipment serving the development do not impact adversely on the amenity of neighbouring residential properties specifically to the existing residential development, noise emissions from the mechanical plant and equipment shall comply with Noise Protocol – Part I.

Note that the mechanical plant and equipment selections / design have not yet been finalised at this stage. Therefore, to ensure amenity for future residents and nearby noise sensitive receivers is preserved, the mechanical plant and equipment serving the development shall be reviewed during the detailed design stage by a suitably qualified acoustic consultant to ensure that compliance with Noise Protocol – Part I is achieved. This will be achieved by the use of standard acoustic treatment such as internally lined ductwork, acoustic louvres, acoustic attenuators, variable speed drives, and vibration isolation mounts.

## 8 CONCLUSION

This report details our acoustic assessment of the proposed Mercy Health Retirement development located at 2-10 Clarke Street, Abbotsford. The recommendations detailed in Section 6 and 7 will ensure compliance with criteria detailed in Section 5.

We trust this information is satisfactory. Please contact us should you have any further queries.

Yours faithfully,

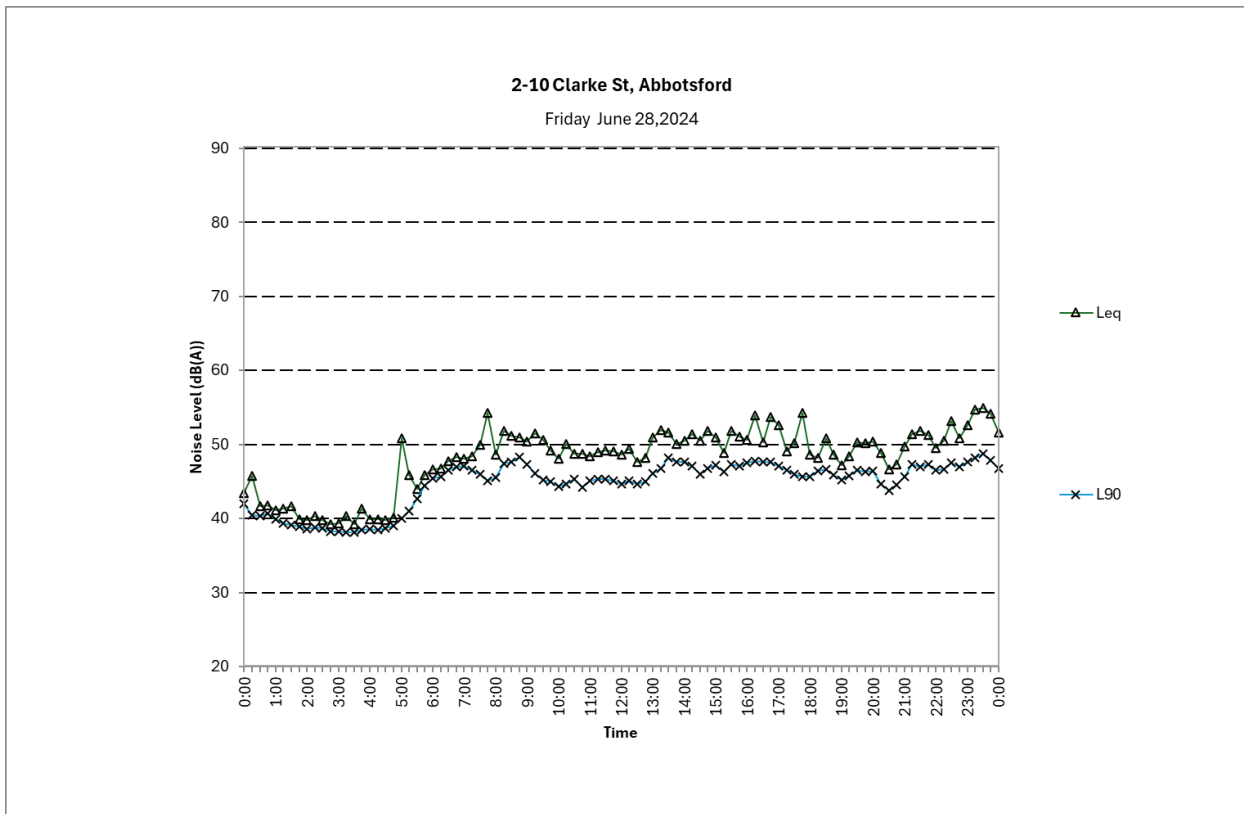
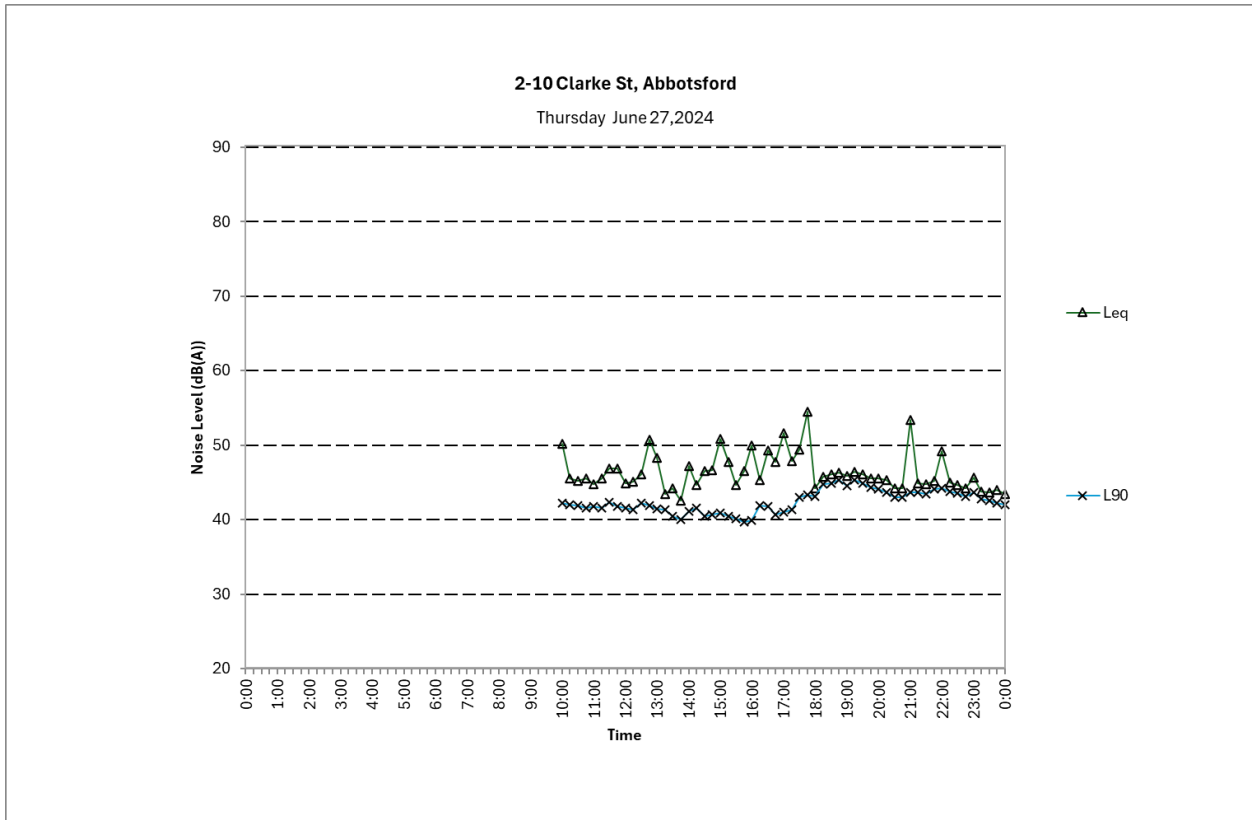


Acoustic Logic Pty Ltd  
Stanley Sinatra

## APPENDIX 1 – GRAPHICAL RESULTS OF NOISE MONITORING

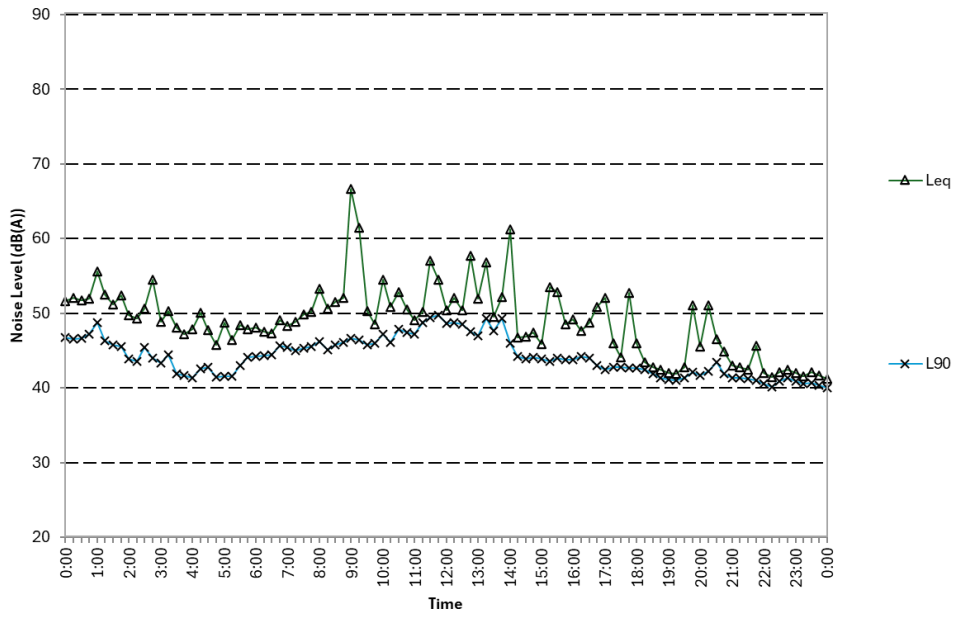
Graphical results of noise monitoring are presented below. Note the levels indicated in the graph has not been corrected for façade reflections.

### Background Logger



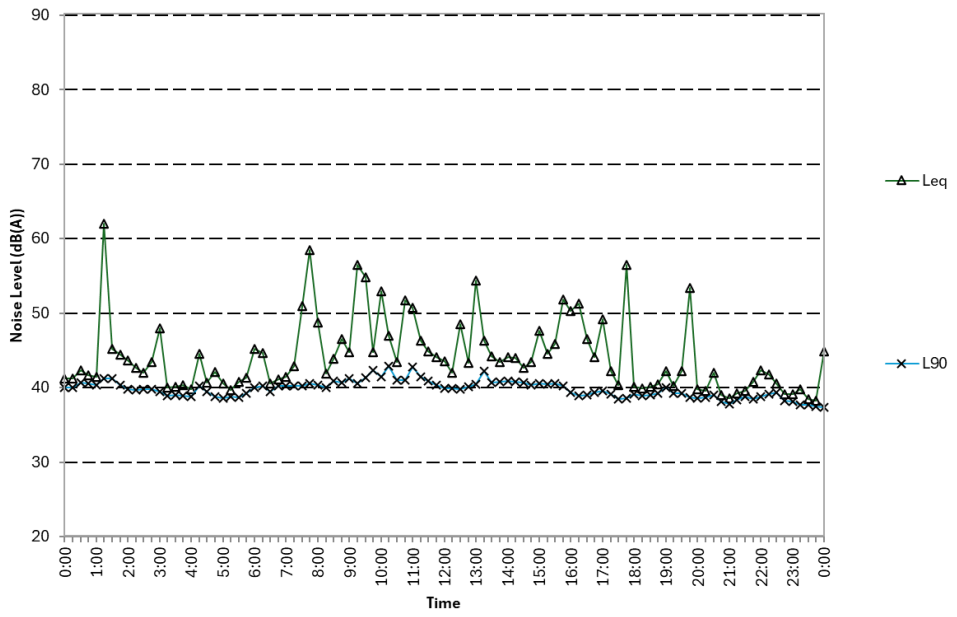
2-10 Clarke St, Abbotsford

Saturday June 29, 2024



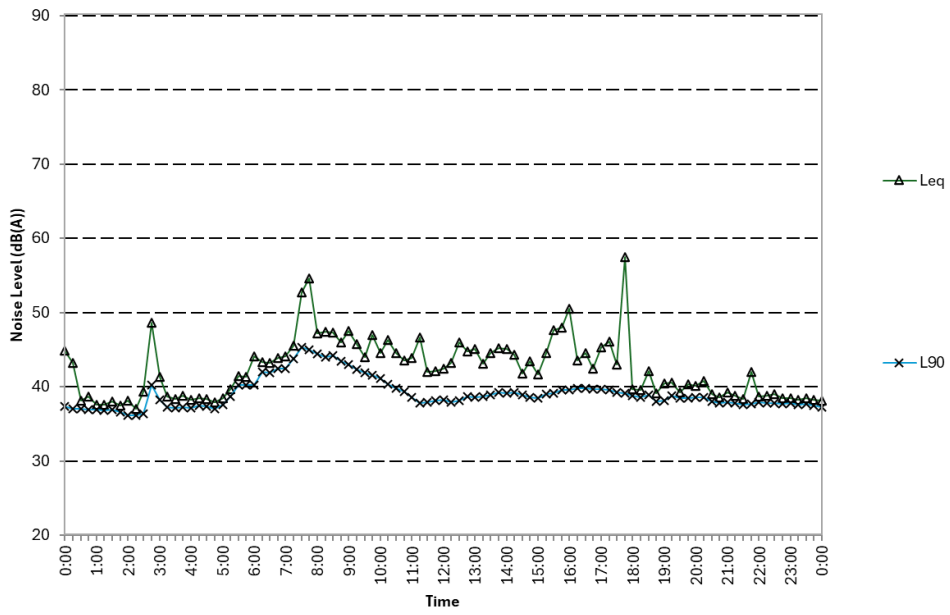
2-10 Clarke St, Abbotsford

Sunday June 30, 2024



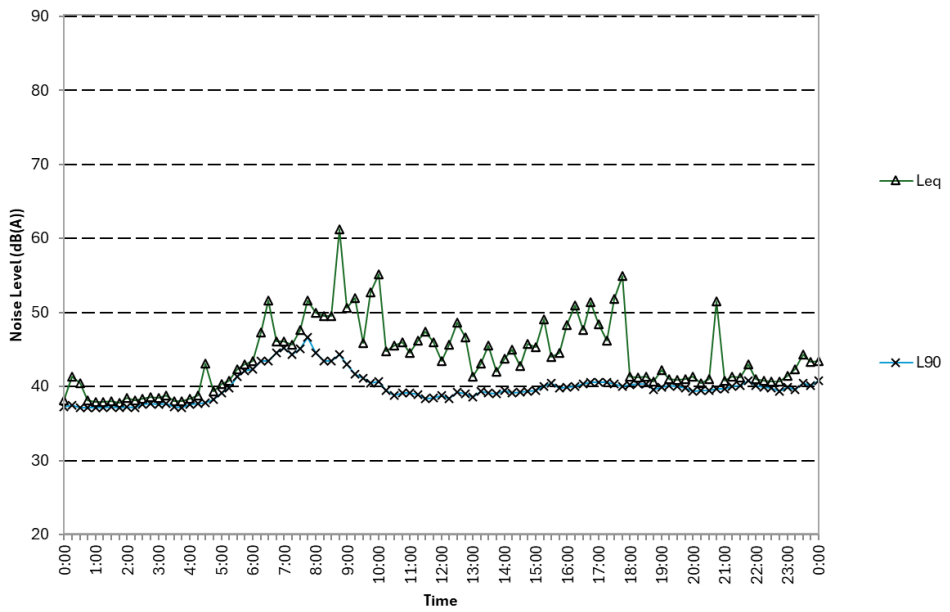
2-10 Clarke St, Abbotsford

Monday July 1, 2024



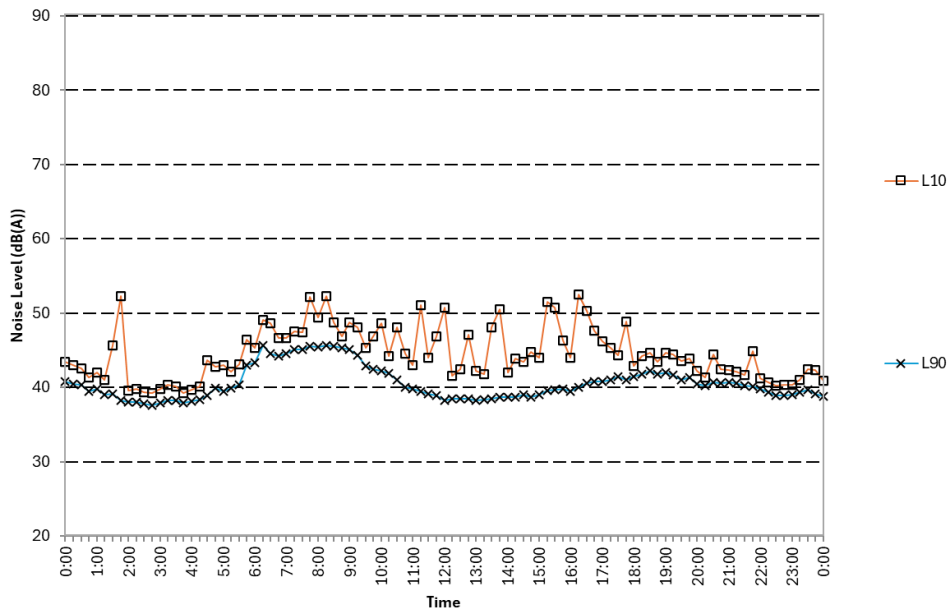
2-10 Clarke St, Abbotsford

Tuesday July 2, 2024



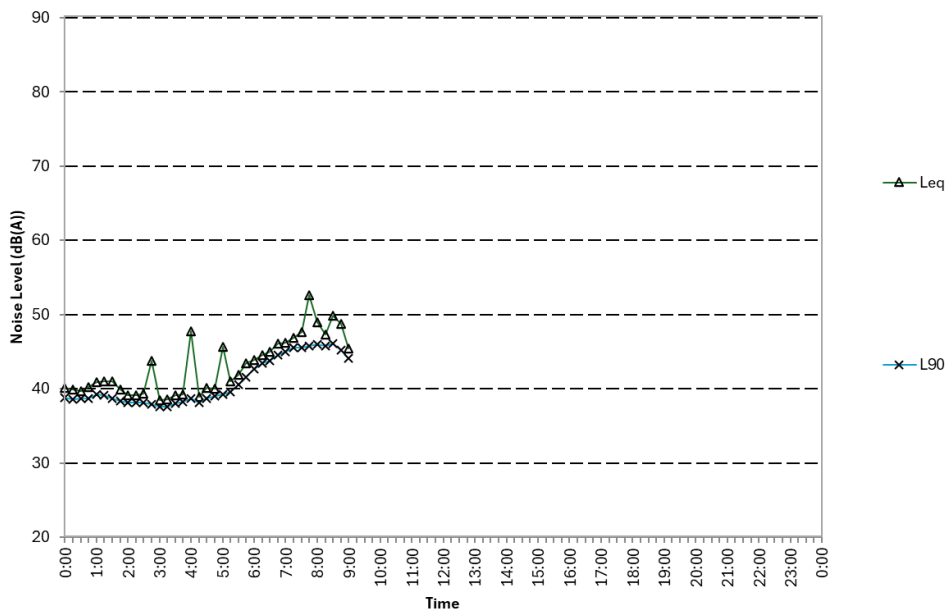
2-10 Clarke St, Abbotsford

Wednesday July 3, 2024

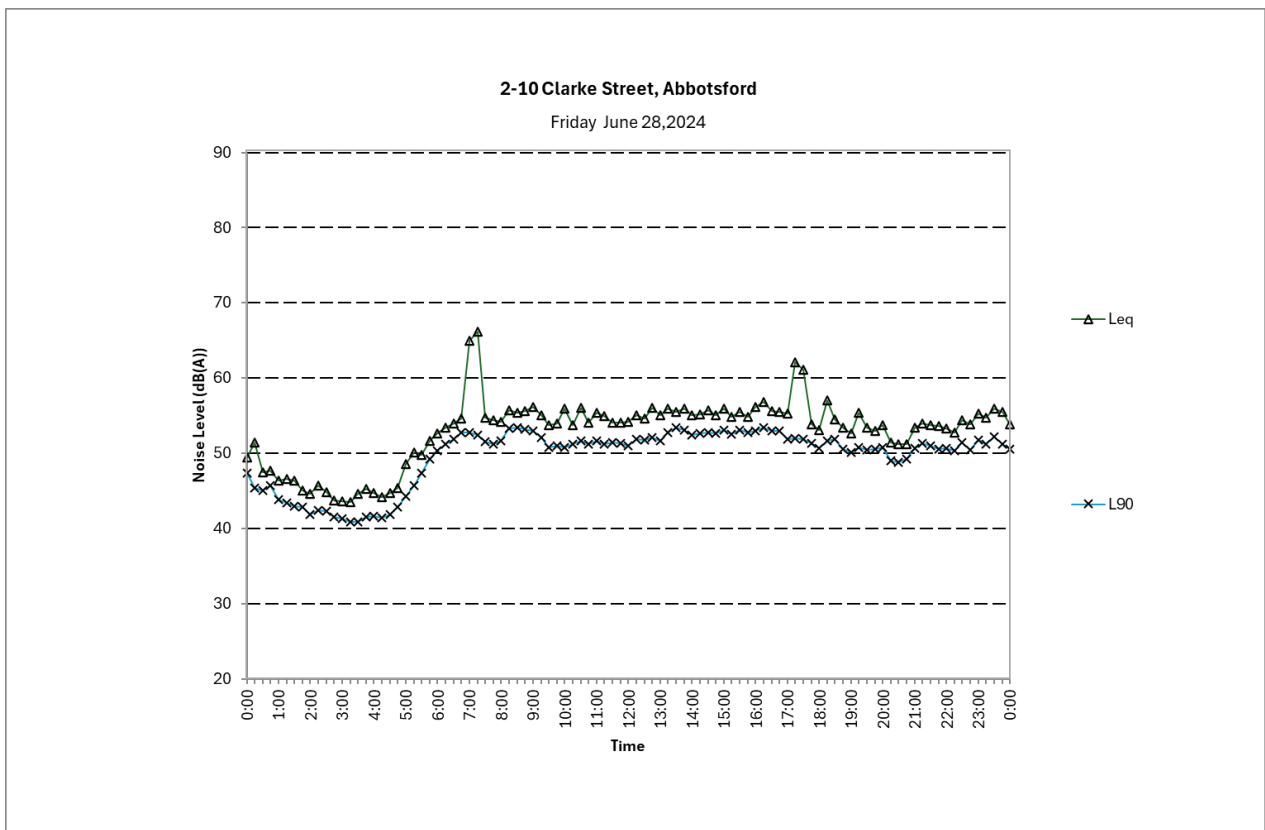
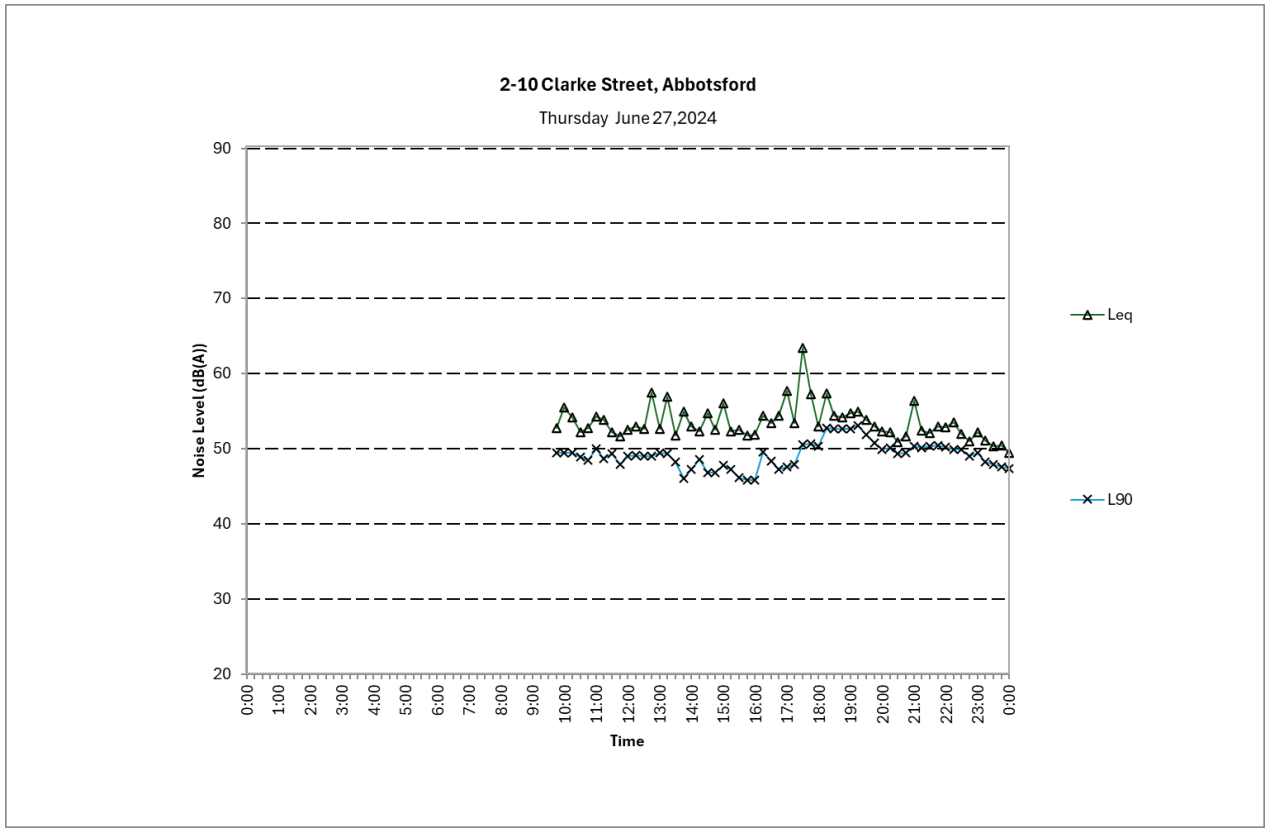


2-10 Clarke St, Abbotsford

Thursday July 4, 2024

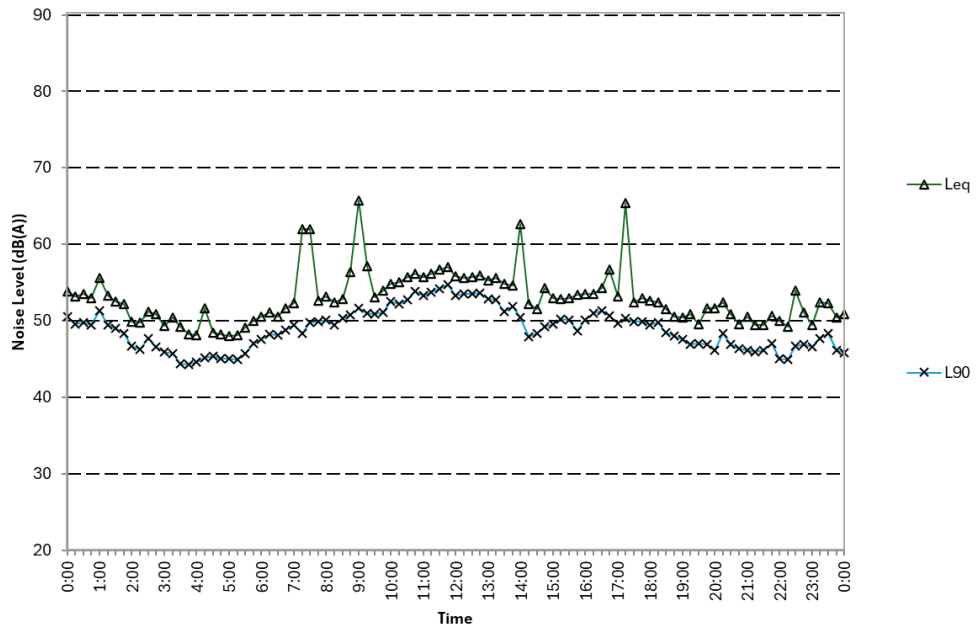


# Traffic Logger



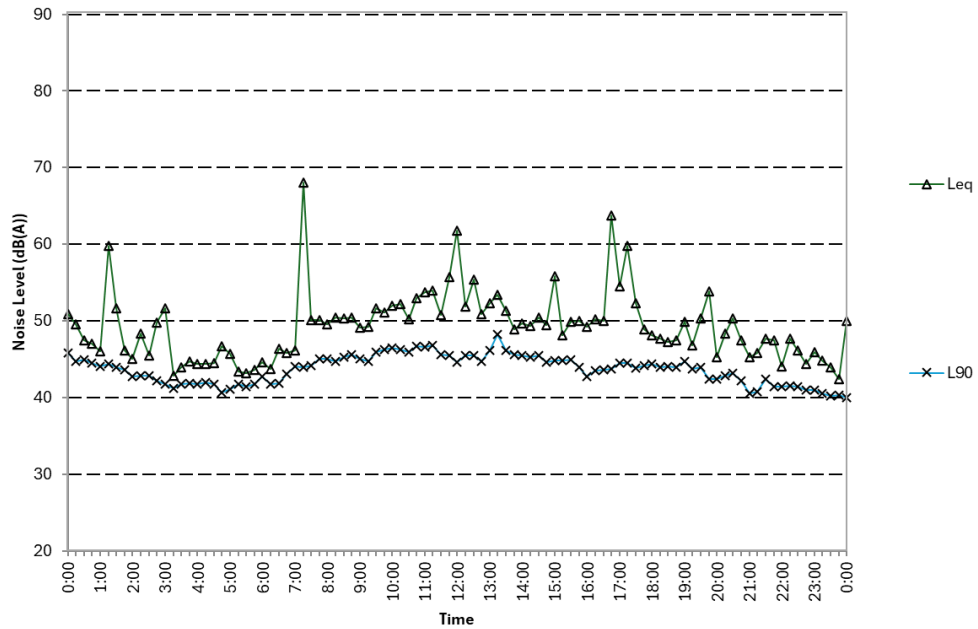
2-10 Clarke Street, Abbotsford

Saturday June 29, 2024



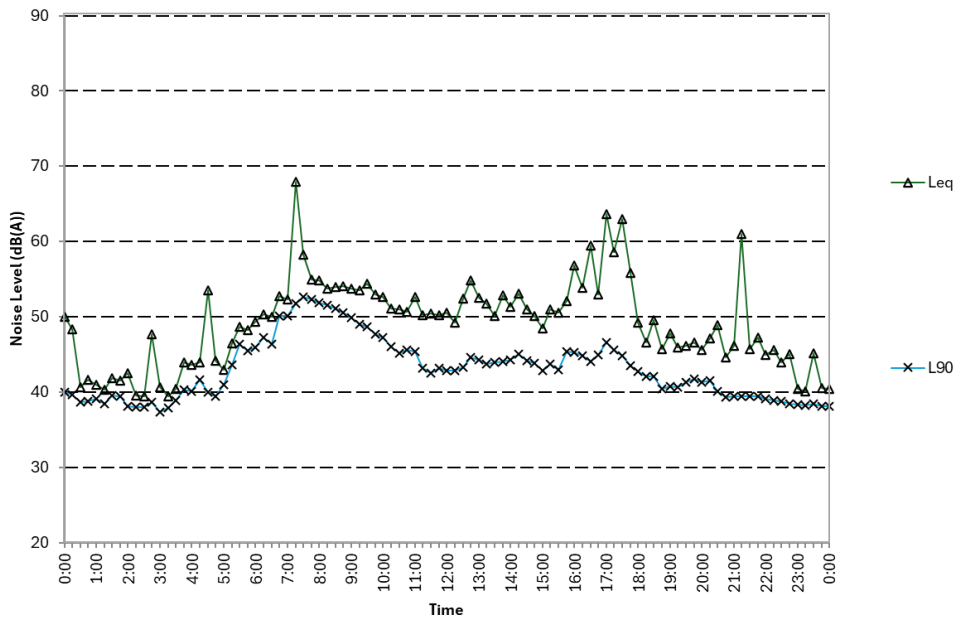
2-10 Clarke Street, Abbotsford

Sunday June 30, 2024



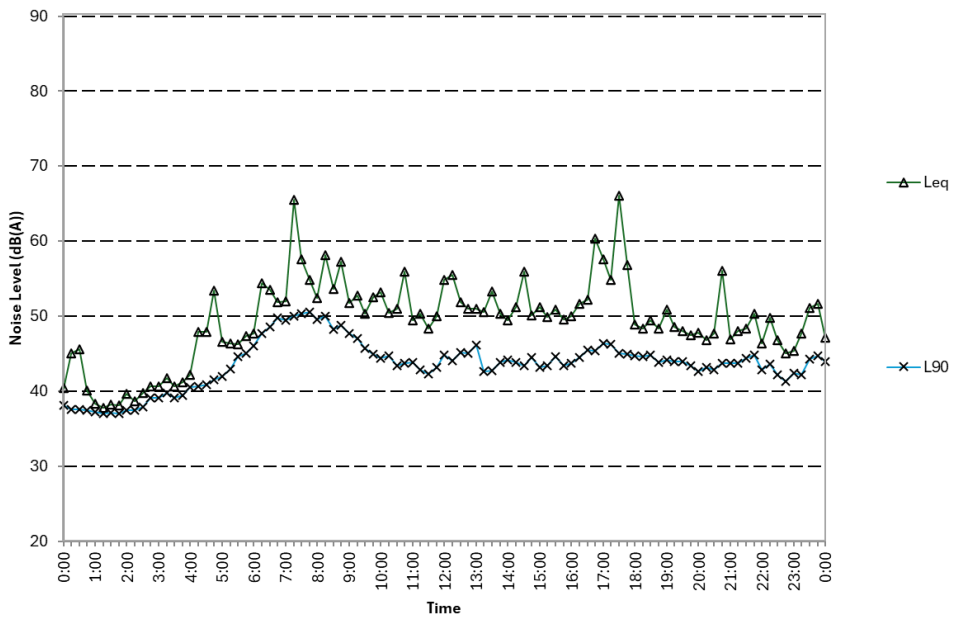
2-10 Clarke Street, Abbotsford

Monday July 1, 2024



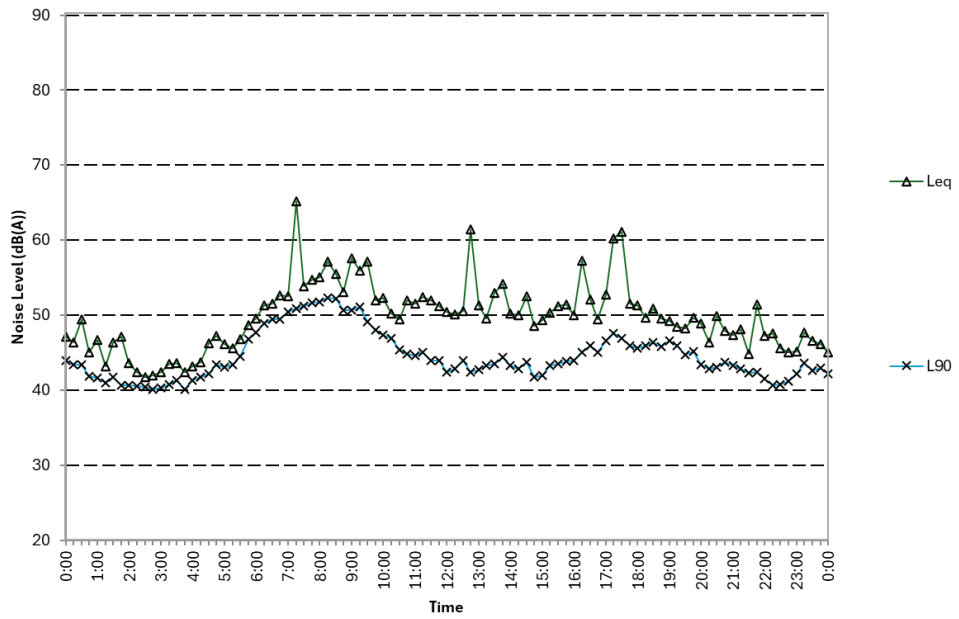
2-10 Clarke Street, Abbotsford

Tuesday July 2, 2024



2-10 Clarke Street, Abbotsford

Wednesday July 3, 2024



2-10 Clarke Street, Abbotsford

Thursday July 4, 2024

