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Acoustic Report

- Traffic Noise Assessment -

Proposed Development at

No. 179 Henry Lawson Drive, Georges Hall

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1.0 SCOPE OF WORK & DESCRIPTION

The purpose of this report is to determine appropriate building materials and construction methods to ensure that the proposed development at No. 179 Henry Lawson Drive, Georges Hall achieves internal noise levels compliant with Canterbury Bankstown Council requirements.

The site is located on Henry Lawson Drive in the suburb of Georges Hall (Refer to Figure 1 – Site Location). Based on available mapping and traffic data, Henry Lawson Dr is classified as a classified road carrying a high volume of traffic (refer to Figure 2 – Surrounding Environment).

Internal noise levels are to comply with the limits adopted by the Australian Standard/New Zealand Standard AS/NZS 2107:2016 *"Acoustics – Recommended Design Sound Levels and Reverberation Times"*, and clause 2.120 of the State Environmental Planning Policy – (Transport and Infrastructure) 2021.

The architectural plans, prepared by Plans R US dated 31 January 2026, are for the proposed construction of a double storey dwelling (Figure 3 – Proposed Site Plan).

2.0 ACOUSTIC DESCRIPTORS

L_{Amax} – The maximum noise level over a sample period is the maximum level, measured on fast response, during the sample period.

L_{A1} – The L_{A1} level is the noise level exceeded for 1% of the measurement period. During the sample period, noise levels remain below the LA1 value for 99% of the time.

L_{A10} – The L_{A10} level is the noise level exceeded for 10% of the measurement period. During the sample period, noise levels remain below the L_{A10} level for 90% of the time. The L_{A10} is a common noise descriptor for environmental noise and road traffic noise.

L_{Aeq} – The equivalent continuous sound level (L_{Aeq}) is the energy average of the varying noise over the sample period and is equivalent to the level of a constant noise which contains the same energy as the varying noise environment. This measure is also a common measure of environmental noise and road traffic noise.

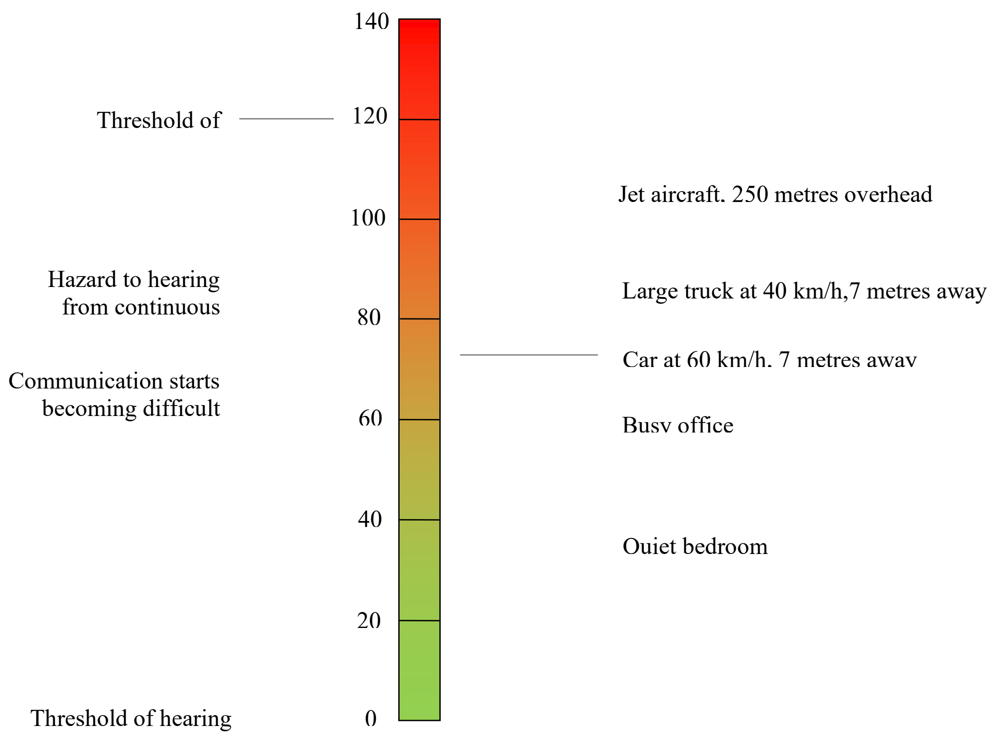
L_{A50} – The L_{A50} level is the noise level exceeded for 50% of the measurement period. During the sample period, noise levels remain below the L_{A50} level for 50% of the time.

L_{A90} – The L_{A90} level is the noise level exceeded for 90% of the sample period. During the sample period, the noise levels remain below the L_{A90} level for 10% of the time. This measure is commonly referred to as the background noise level.

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

RBL – The Rating Background Level for each period is the median value of the ABL values for the period over all of the days measured. There is therefore an RBL value for each period – daytime, evening and nighttime.

The level of common sounds on the dB(A) scale is as the figure below:



3.0 ACOUSTICAL STUDY

3.1 Australian Standards AS/NZS 2107:2016

The above standard provides the criteria for developments situated in urban areas.

As traffic noise levels are not constant, a L_{eq} noise level descriptor is used when assessing this type of noise source. The L_{eq} is the mean energy level of noise being measured and has been found to accurately describe the level of annoyance caused by traffic noise.

It is usual practice, when it is necessary to recommend internal sound levels in buildings to refer to Australian/New Zealand Standard AS/NZS 2107:2016 "Acoustics – Recommended Design Sound Levels and Reverberation Times for Building Interiors".

AS/NZS 2107:2016 sets out design internal noise levels and reverberation times for different buildings depending on the use of these structures. These noise levels, as recommended in AS/NZS 2107:2016 take into account the function of the area and apply to sound levels measured within an unoccupied space that is ready for occupancy.

In Table 1, Page 13, the standard recommends the following noise levels for residential buildings proposed next to major roads.

Type of occupancy/activity	Design sound level ($L_{Aeq,t}$) range	Design reverberation time (T) range, s
RESIDENTIAL BUILDINGS (see Note 5 and Clause 5.2)		
Houses and apartments in inner city areas or entertainment districts or near major roads—		
Apartment common areas (e.g. foyer, lift lobby)	45 to 50	—
Living areas	35 to 45	—
Sleeping areas (night time)	35 to 40	—
Work areas	35 to 45	—
Houses and apartments in suburban areas or near minor roads—		
Apartment common areas (e.g. foyer, lift lobby)	45 to 50	—
Living areas	30 to 40	
Sleeping areas (night time)	30 to 35	
Work areas	35 to 40	—

3.2 SECTION 2.120 OF THE SEPP (TRANSPORT AND INFRASTRUCTURE) 2021- INTERNAL NOISE LIMITS-

Section 2.120 of the SEPP (Transport & Infrastructure) 2021 replaced clause 102 of the SEPP 2007 which states that where a development for residential use is located in or adjacent to a relevant busy road or a transitway, a consent authority must not grant consent unless it is satisfied that appropriate measures will be taken to ensure that the following LAeq levels are not exceeded:

For Clauses 87 (Rail) and 102 (Road):

- If the development is for the purpose of a building for residential use, the consent authority must be satisfied that appropriate measures will be taken to ensure that the following LA_{eq} levels are not exceeded:
  - in any bedroom in the building : 35dB(A) at any time 10pm–7am
  - anywhere else in the building (other than a garage, kitchen, bathroom or hallway): 40dB(A) at any time.

Similar to the above, newly adopted section 2.120(3) of the SEPP (Transport & Infrastructure) 2021 states the following:

(3) If the development is for the purposes of residential accommodation, the consent authority must not grant consent to the development unless it is satisfied that appropriate measures will be taken to ensure that the following LAeq levels are not exceeded—

(a) in any bedroom in the residential accommodation—35 dB(A) at any time between 10 pm and 7 am,

(b) anywhere else in the residential accommodation (other than a garage, kitchen, bathroom or hallway)—40 dB(A) at any time.

External façade recommendations are provided in Section 5.0 of this report to ensure compliance with the above internal amenity criteria.

4.0 NOISE SURVEY, INSTRUMENTATION & RESULTS

On 2 July 2026, an engineer from our office attended the site at the above address to carry out attended and unattended acoustic measurements near the front building line in direct line of sight of Henry Lawson Drive. Figure 4 – Noise Reading Location (Point A).

The unattended noise monitoring was conducted to determine equivalent sound pressure levels during the daytime–evening period [7:00–22:00] and nighttime period [22:00–7:00], expressed as LAeq.

The unattended sound level measurements and analysis carried out throughout this study were performed using a wireless sound level data logger NSRT-mk4 (Serial Number AtlWrt2a2d0XKjNyw8D5FD Office tag – machine 5 -). The sound logger specification is as follows:

Type 1 digital MEMS microphone

- Non-volatile 128 Mb recording memory
- Records L-max, L-min and Leq levels
- Log interval adjustable from 125 ms (8 points per second) up to hours
- A, C and Z weighting curves
- Oscilloscope and spectrum analyser features
- Observes and records 100% of the acoustic signal
- Software calculates global Leq according to ISO and OSHA methods
- WIFI connectivity to report measured levels remotely
- Weatherproof casing designed for indoor/outdoor applications
- Activity detection and logging.
- Long-term measurement and recording of acoustic levels for environmental impact studies.

The logger is factory calibrated, and the calibration certificate dated 02/02/2025 is presented in Figure 5 – Calibration Certificate.

The logger microphone was positioned at around 1.5 m from ground level. The logger was field calibrated before and after monitoring using a Svantek SV 33A Class 1 acoustic calibrator (S/N 90200). No significant drift was observed. Any readings affected by strong wind or rain have been disregarded[1]. A summary of calculated noise readings is presented in Table 4.1 below:

Table 4.1- Results of Noise Readings from 2nd July – July 3rd, 2026*

Location	**LAeq (15 hr)- Day** ***dB(A)***** ***Logarithmic Average***	**LAeq (9 hr)- Night** ***dB(A)***** ***Logarithmic Average***
Point A	65 dB(A)	53 dB(A)

***Noise readings are carried out during the peak traffic flow volume of the week– (Most conservative)-**

During the monitoring period, the dominant noise source at the site was road traffic along Henry Lawson Drive.

The measured external noise levels represent a conservative assessment of the site conditions, as monitoring was undertaken during peak weekday traffic conditions and additional allowances have been applied to account for façade reflections and future traffic growth.

Note [1]: Noise data was validated using the Weatherzone website addresses:

https://www.weatherzone.com.au/station/SITE/66137/observations/2026-07-02

to
https://www.weatherzone.com.au/station/SITE/66137/observations/2026-07-03

5.0 BUILDING FACADE & ROOF RECOMMENDATIONS

The external building envelope (façade and roof) for the proposed development has been assessed to determine practical construction specifications capable of achieving the internal noise criteria nominated in Section 3.0 of this report. Recommendations are based on the measured external traffic noise levels presented in Table 4.1 and on the required internal design levels adopted from AS/NZS 2107:2016 and Section 2.120 of the SEPP (Transport and Infrastructure) 2021.

5.1 Required Façade Sound Insulation

For each habitable room, the required façade sound insulation performance has been determined using the following relationship (consistent with standard engineering practice for façade sound insulation assessment):

$$Rw = L_{ext} - L_{int} + 10\log_{10}\left(\frac{S}{A}\right) + ADJ$$

Where:

- **Rw** = required weighted sound reduction index of the room façade (dB)
- $\mathbf{L_{ext}}$ = external A-weighted equivalent continuous sound level at the façade over the relevant assessment period, LAeq (dB(A)) (refer Table 4.1)
- $\mathbf{L_{int}}$ = internal design A-weighted equivalent continuous sound level, LAeq (dB(A)) (35 dB(A) for bedrooms; 40 dB(A) for living areas unless otherwise stated)
- **S** = total external surface area of the room envelope separating the room from outdoors (m^2)
- **A** = total room absorption expressed in sabins (m^2), determined from room finishes and dimensions (as applicable)

- **ADJ** = adjustment term to account for source characteristics and façade geometry, defined as:

$$ADJ = 3 + F + G$$

Where:

- **F** = source correction factor
    - F = 2 for rail noise
    - F = 4 for road traffic noise with negligible heavy vehicles (heavy vehicles < 10%)
    - F = 6 for road traffic noise where heavy vehicles are significant (heavy vehicles ≥ 10%)
- **G** = façade incidence/angle correction factor (based on the primary angle of incidence of the sound field to the façade), determined in accordance with standard façade assessment practice.

5.2 Composite Façade Performance (Multiple Elements)

The façade of a room typically comprises multiple elements (e.g., glazing, doors, wall components, vents), each with different sound insulation properties. The overall façade performance is governed by the area-weighted transmission of each element. The effective composite façade sound reduction index is determined from:

$$R_{w,total} = -10\log_{10}\left(\sum_{i=1}^{n} \frac{S_i}{S_{total}} \times 10^{-R_{w,i}/10}\right)$$

Where:

- **Rw,total** = composite weighted sound reduction index of the complete façade (dB)
- **$R_{w,i}$** = weighted sound reduction index of façade element *i* (dB)
- **S_i** = area of façade element *i* (m^2)
- **S_{total}** = total façade area, i.e., $\sum S_i$(m^2)
- **n** = number of façade elements considered

This approach ensures that elements with comparatively low acoustic performance (typically glazing and doors) are appropriately weighted and that the final recommendation is governed by the weakest façade components, consistent with acoustic transmission principles.

5.3 Recommended Building Envelope Specifications

Based on the measured external traffic noise levels, the internal noise criteria adopted in Section 3.0, the architectural plans, and the calculations presented in section 5.1, the practical façade and roof construction recommendations presented in Table 5.3.1 are considered suitable to achieve compliance with:

- AS/NZS 2107:2016 internal design noise levels, and

- Section 2.120 of the SEPP (Transport and Infrastructure) 2021 internal noise limits.

Table 5.3.1 Windows/Sliders, Doors, Walls & Roof Specifications

Building Component	***Rw Rating to be Achieved on Site***
Windows and Sliding Doors in Guest Bedroom, Master Bedroom and Bedroom 2 are to be 12.5VLam Hush with full perimeter Fin Mohair woven brush acoustic seals in a commercial frame section (1)(2)(3).	**39**
Windows and Sliding Doors in all other Bedroom Areas are to be minimum 10.38 mm Laminated with full perimeter Fin Mohair woven brush acoustic seals in a commercial frame section (1)(2)(3).	**35**
Windows and Sliding Doors in all other Habitable Areas are to be minimum 6.38mm Laminated with full perimeter Fin Mohair woven brush acoustic seals in a commercial frame section (1)(2)(3).	**32**
Windows, Sliding Doors in all other Non-Habitable Areas (Toilets, laundries, ….) are to be min. 6 mm float in accordance with Australian Standard AS 2047 (Windows in Buildings) (1),(2),(3).	**28**
Entry Doors are to be solid core OR glass doors with acoustic seals fitted around the doors. A drop seal is also required at the base of the doors (2),(3).	**30-33**
External Walls & Parapet Upstand are to be Double skin cavity brick walls minimum 270/250 mm double brick/brick veneer construction with R2, 75 mm thick insulation in the stud cavity and 13 mm plasterboard internal lining (2)(3) OR 90 mm conventional timber stud-framed walls clad externally with min. 6.0 mm thick selected cladding and lined internally with 13 mm plasterboard (soundcheck or 2 x 10 mm standard plasterboard) plus cavity filled with 75 mm 11 kg/m³ insulation. (2)(3)	**50** **43**
Roof to be Colorbond Steel Roofing + 50mm Bradford Anticon insulation over battens + 13mm standard plasterboard and Bradford 115 Soundscreen™ R3.0 RW insulation in the ceiling cavity (3).	**43**

NB: This report is to be read in conjunction with the BASIX/NatHERS certificate and any other related building specification.

(1). No see-through weep holes in windows/sliders.

(2) All gaps between window & door frames and the masonry walls are to be sealed using acoustic foam Hilti CP620 or similar (Bostik/Parfix/Sika). Glass wool batts should be applied prior to the application of the foam to seal larger gaps.

(3) All gaps are to be acoustically sealed.

*****Glazing Notes -Leaks & Glazing Attenuation-**

- The acoustic performance of a glazing system highly depends on the leaks around and within the glazing frame and façade. A double-glazing system with Rw of 40 will have its acoustic performance dropped to Rw of 30 (less than that of 6.38 mm glass) at a leak of 0.1 %. Moreover, a double-glazing system with Rw of 40 will have its acoustic performance dropped to Rw of 20 (less than that of 3.0 mm float glass) at a leak of 1 % of the glazing area.

- A 10.38 mm laminated glazing system with Rw of 35 will have its acoustic performance dropped to Rw of 29 (less than that of 6.38 mm glass) at a leak of 0.1 %. Moreover, 10.38 mm laminated glazing system with Rw of 35 will have its acoustic performance dropped to Rw of 20 (less than that of 3.0 mm float glass) at a leak of 1 % of the glazing area.

- A double-glazing system with Rw of 40, a 10.38 mm laminated glazing system with Rw of 35, and a 6.38 mm laminated glazing system with Rw of 32 will all attain almost the same Rw of around 20 (less than that of 3.0 mm float glass) at a leak of 1 % in the façade or within/around the glazing system.

The graph below shows the actual transmission loss achieved inside a room with different glazing thicknesses relative to small leaks occurring along the window frame and façade.

- Awning windows- upon testing awning windows, small parts of the chain winder remain visible when the windows are shut, resulting in the window sash not achieving a very tight closure against the frame. We expect a drop of around 10dB in the sound reduction index 'Rw' of the window when this occurs, deeming the window acoustically noncompliant. When selecting a suitable awning frame, ensure the chain winder to be fully and securely enclosed with no portion of the chain hanging outside the chainwide compartment. The exterior seals are not a replacement for the necessity of the windows closing very tightly.

A test report is to be provided from a recognized acoustic laboratory, verifying that the glazing system (glass, frame and seals) will meet the nominated sound rating required.

6.0 DISCUSSION & CONCLUSION

The acoustic assessment presented in this report has been undertaken in accordance with accepted acoustic engineering practice and relevant Australian Standards. The measured external noise levels and adopted assessment methodology provide a conservative representation of the site conditions.

Based on the measured external traffic noise levels presented in Table 4.1, the internal noise criteria outlined in Section 3.0, and the façade calculations detailed in Section 5.1, the building envelope recommendations in Table 5.3.1 are considered suitable to achieve compliance with Section 2.120 of the SEPP (Transport and Infrastructure) 2021 and AS/NZS 2107:2016, provided all recommendations are implemented in full.

Should you require any further information, please do not hesitate to contact us.

Yours sincerely,

M. Zaioor
M.S. Eng'g Sci. (UNSW).
M.I.E.(Aust), CPEng
Australian Acoustical Society (Member)

7.0 APPENDIX

Figure 1 - Site Location

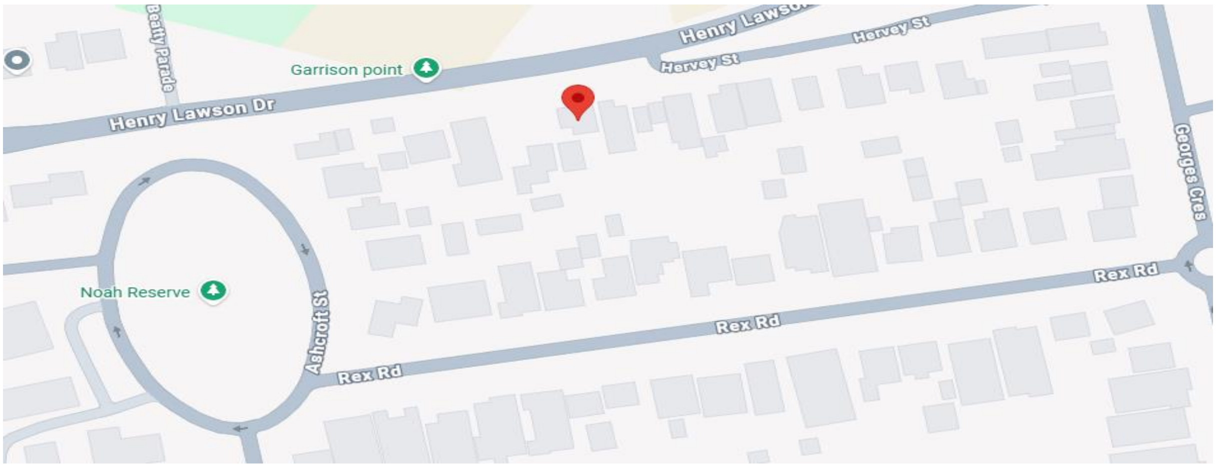


Figure 2 - Surrounding Environment

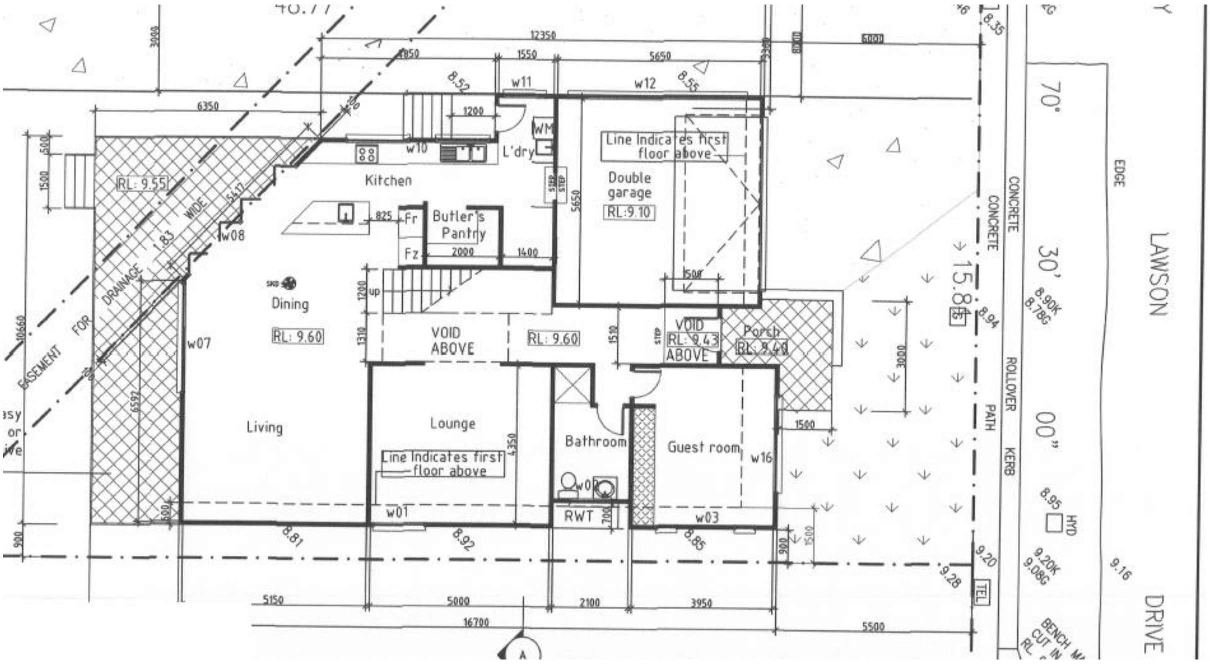


Figure 3 - Proposed Site Plan

Figure 4 - Noise Reading Location (Point A)

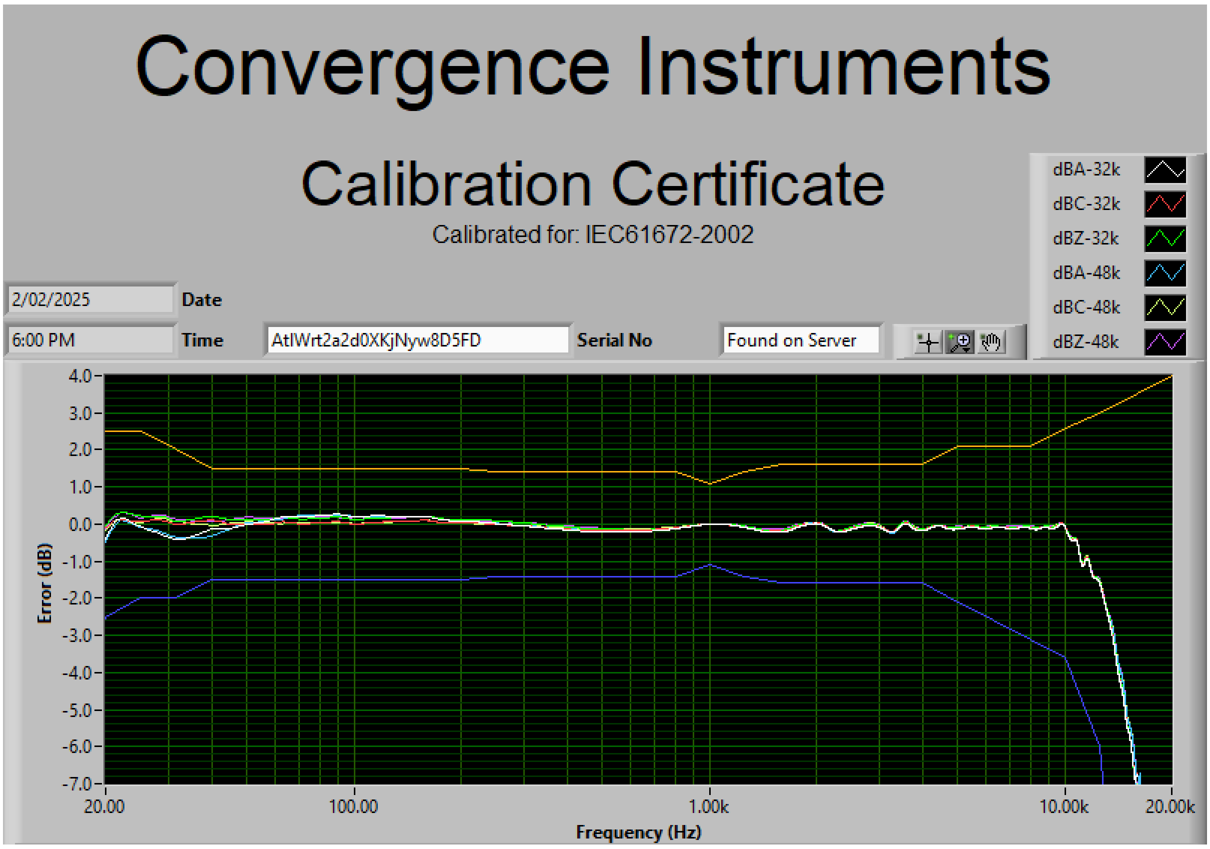


Figure 5 - Calibration Certificate