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Acoustic Impact Report

for

Proposed Hair Salon at

No. 37 Brennan Road, Yagoona

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Date	***Revision History***	***Prepared By:***	***Reviewed and Authorised by:***
06/09/2022	Initial Report	Domeniki Tsagaris	Moussa Zaioor
12/09/2022	Final Report	Moussa Zaioor	Moussa Zaioor

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1.0 SCOPE OF WORK

Acoustic, Vibration & Noise Pty Ltd was engaged to investigate the environmental noise impact of the proposed change of use of an existing outbuilding to a hair salon at No. 37 Brennan Road, Yagoona (Figure 1 – Site Location) as per Canterbury Bankstown Council requirements and conditions.

This report is prepared in conjunction with the architectural plans by Obliq Design, dated July 8th, 2022, and the Statement of Environment Effects prepared by Pivotal Planning Pty Ltd, dated July 2022.

This report is also carried out in accordance with NSW Environmental Protection Authority's (EPA) Noise Policy for Industry (2017) and the Noise Guide for Local Government.

This commission involves the following:

- Inspect the site and environment.
- Measure the background noise levels at critical locations and times.
- Prepare an Environmental Noise Impact Report.
- Establish acceptable noise level criterion.
- Quantify noise emissions from the proposed hair salon.
- Calculate the level of noise emission, taking into account building envelope transmission loss, screen walls and distance attenuation.
- Provide in principle noise control recommendations (if necessary).

2.0 SITE & OPERATIONS DESCRIPTION

The proposed hair salon will occupy an existing outbuilding of an existing residential dwelling at No. 37 Brennan Road, Yagoona. The proposed salon will also use an area behind the garage for the purpose of storage (Figure 2 – Proposed Site Plan).

The site is located within a predominantly residential environment (Figure 3 – Surrounding Environment). There is an existing carport in front of the proposed salon to provide parking for residents and customers.

For the purpose of this report, the nearest potentially affected residential receivers will be the single-storey residential dwelling located north of the site at No. 35 Brennan Road (R1), and the double-storey residential dwelling located south of the site at No. 39 Brennan Road (R2) (Figure 4 – Nearest Residential Receivers).

The proposed hair salon will have the following operational details:

Hours of Operation	No. of Clients/Staff
Monday - Sunday: 7:00am – 9:00pm	- Max. two (2) clients - One (1) staff member

The existing background noise is dominated by noise generated by residential activities in the area and traffic noise from Brennan Road and Hume Highway.

The noise emissions from the operation of the proposed hair salon must not exceed the acceptable levels at the nearby receptor locations as determined in Section 4 of this report. Noise control will be required for the proposed hair salon to comply with the noise criteria set out in Section 4 of this report. The noise controls recommended in Section 6 of this report are reasonable and feasible in reducing the noise from the proposed premises to an acceptable level.

3.0 NOISE ASSESSMENT, INSTRUMENTATION AND RESULTS

On August 31st, 2022, an engineer from this office carried out unattended noise measurements on site to determine existing background noise levels at the rear of the site (Figure 5 - Noise Reading Location – Point A).

The measurement procedure and the equipment used for the noise survey are described below. All measurements were taken in accordance with the Australian Standards AS 1055:2018 *"Acoustics- Description and Measurements of Environmental Noise".*

All sound level measurements and analysis performed throughout this project are carried out with a NSRTW_MK3 wireless sound level data logger (Serial No. CPp0Dd04c1c9iLtiSwBRPD- Office Tag -Machine 1-). 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 manufacturer's calibration certificate dated 15/09/2021 is presented in Figure 6 – Calibration Certificate.

The microphone was positioned at a height above the existing fence on the northern boundary of the site. The factory calibrated noise reading machine was site calibrated prior to and after reading, using our Svantek SV 33A S/N: 90200 Class 1 Calibrator. Any readings affected by strong wind or rain have been disregarded.

The Full Average Statistical Noise Parameters $\mathbf{L_{(Aeq,\ 15\ minutes)}}$, $\mathbf{L_{(A90,\ 15\ minutes)}}$, $\mathbf{L_{(A10,\ 15\ minutes)}}$, $\mathbf{L_{(A1,\ 15\ minutes)}}$ are presented in Figure 7 – Noise Survey. A summary of the average statistical noise parameters is presented in the table below.

Table 3.1 - Existing Noise Survey Results
31st August, 2022 – 6th September, 2022

Unattended Noise Measurements	L_{Aeq} dB(A)	L_{A90} dB(A)	RBL
Daytime Hours 7:00am – 18:00	49	42	40
Evening Hours 18:00 – 22:00	47	40	38
Early Morning/Night Hours 22:00 – 7:00	43	37	34

$\mathbf{L_{90}}$ – the level of noise that is exceeded for 90% of the time over which a given sound is measured. This is considered to represent the background noise level.
RBL- Rated background noise levels as determined in accordance with Fact Sheet B as per the Noise Policy for Industry 2017.

4.0 ACCEPTABLE NOISE LEVELS

4.1 NOISE GUIDE FOR LOCAL GOVERNMENT

The Department of Environment and Conservation (NSW) published the amended *Noise Guide for Local Government* in October 2010. The policy is specifically aimed at assessing noise from light industry, shops, entertainment, public buildings, air

conditioners, pool pumps and other noise sources in residential areas.

Section 2.2.3 of the Noise Guide for Local Government recommends noise measurements and an intrusive noise level when attempting to achieve acceptable and achievable noise limits.

Section 2.2.1 of the Noise Guide for Local Government states that a noise source is generally considered to be intrusive if the noise from the source when measured over a 15-minute period exceeds the background noise by more than 5 dB(A). Therefore, the noise criteria are as follows:

- **Day period:** **42 + 5 = 47 dB(A)**
- **Evening period:** **40 + 5 = 45 dB(A)**
- **Night period:** **37 + 5 = 42 dB(A)**

The appropriate regulatory authority (Local Council) may, by notice in writing given to such a person, prohibit the person from causing, permitting, or allowing:

1. any specified activity to be carried on at the premises, or
2. any specified article to be used or operated at the premises.

or both, in such a manner as to cause the emission from the premises, at all times or on specified days, or between specified times on all days or on specified days, of noise that, when measured at any specified point (whether within or outside the premises,) is in excess of a specified level.

It is an offence to contravene a noise control notice. Prior to being issued with a noise control notice, no offence has been committed.

4.2 NSW NOISE POLICY FOR INDUSTRY (2017)

The noise from the proposed hair salon is governed under Section 2 of the Noise Policy for Industry 2017. The above policy seeks to promote environmental well-being through preventing and minimizing noise by providing a framework and process for deriving noise limits conditions for consent and licenses.

The Noise Policy for Industry 2017 recommends two separate noise criteria to be considered, the Intrusiveness Noise Criteria and the Amenity Noise Criteria. A project noise trigger level being the lowest of the amenity and the intrusiveness noise level is then determined.

If the predicted noise level L_{Aeq} from the proposed project exceeds the noise trigger level, then noise mitigation is required. The extent of any 'reasonable and feasible' noise mitigation required whether at the source or along the noise path is to ensure that the

predicted noise level L_{Aeq} from the project at the boundary of the most affected residential receiver above is not greater than the noise trigger level.

4.2.1 AMENITY NOISE CRITERIA

The amenity noise levels presented for different residential categories are presented in Table 2.2 of the Noise Policy for Industry 2017. These levels are introduced as a guide for appropriate noise levels in residential areas surrounding industrial areas.

For the proposed hair salon at No. 37 Brennan Road, Yagoona, the recommended amenity noise levels are presented in Table 4.2.1.1 below:

Table 4.2.1.1- Recommended Amenity Noise Levels

Type of Receiver	Noise Amenity Area	Time of Day	Recommended Leq Noise Level, dB(A)
Residence	Suburban	Day	55
		Evening	45
		Night	40

Where a noise source contains certain characteristics such as tonality, impulsiveness, intermittency, irregularity or dominant low-frequency content, a correction is to be applied which is to be added to the measured or predicted noise levels at the receiver, before comparison with the criteria. Shown below are the correction factors that are to be applied:

Table 4.2.1.2 – Modifying Factor Corrections as per Fact Sheet C (Noise Policy for Industry 2017)

FACTOR	CORRECTION
Tonal Noise	+ 5 dB
Low Frequency Noise	+ 5 dB
Impulsive Noise	Apply difference in measured fast and impulse response levels, as the correction, up to a maximum of 5 dB.
Intermittent Noise	+ 5 dB

According to Section 2.4 of the above policy, the project amenity noise level is determined as follows:

Project amenity noise level for industrial developments = recommended amenity noise level (Table 2.2) minus 5 dB(A)

To convert from a period level to a 15-minute level, a plus 3 is added as per Section 2.2 of the policy.

Therefore, the project amenity noise levels for the proposed hair salon are as follows:

- **Day Time:** **55 – 5 + 3 = 53 dB(A)**
- **Evening Time:** **45 – 5 + 3 = 43 dB(A)**
- **Night-time:** **40 – 5 + 3 = 38 dB(A)**

4.2.2 INTRUSIVE NOISE CRITERIA

Section 2.3 of the Noise Policy for Industry summarizes the intrusive criteria as below:

$L_{Aeq,\ 15\ minute} \leq$ rating background level plus 5

The background noise level known as $L_{A90,15\ minutes}$ is the Noise exceeded 90% percent of a time period over which annoyance reactions may occur (taken to be 15 minutes),

For the short-term method, the rating background noise level is simply the lowest measured LAF90,15min level.

For the long-term method, the rating background noise levels is defined as the median value of the daily/evening/night lowest tenth percentile of L_{90} background noise levels as calculated in accordance with Fact Sheet B of the NPfI 2017.

Therefore, the acceptable L_{eq} noise intrusiveness criterion for broadband noise during the day, evening and night are as follows:

- **Day Time:** **40 + 5 = 45 dB(A)**
- **Evening Time:** **38 + 5 = 43 dB(A)**
- **Night-time:** **34 + 5 = 39 dB(A)**

4.2.3 PROJECT NOISE TRIGGER LEVEL

A summary of intrusiveness and amenity noise levels as determined in Sections 4.2.1 and 4.2.2 are shown in Table 4.2.3.1 below:

Table 4.2.3.1 - Summary of Intrusiveness and Amenity Noise Levels

Period	Intrusiveness Noise Level	Project Amenity Noise level
Day Time (7:00am – 6:00pm)	45	53
Evening Time (6:00pm – 10:00pm)	43	43
Night-Time (10:00pm – 7:00am)	39	38

The project noise trigger level is the lower (that is, the most stringent) value of the amenity and intrusiveness noise levels for the day, evening, and night. Therefore, the project noise trigger levels in relation to the nearest residential receivers are shown below:

- **Daytime:** $L_{Aeq,15\ min}$ **45 dB(A)**
- **Evening-time:** $L_{Aeq,15\ min}$ **43 dB(A)**
- **Night-Time:** $L_{Aeq,15\ min}$ **38 dB(A)**

5.0 NOISE & VIBRATION EMISSIONS FROM PROPOSED HAIR SALON

The main sources of noise from the proposed hair salon may include but are not limited to:

- Noise emission from salon equipment, such as hair dryers
- Noise from clients talking indoors

5.1 NOISE FROM USE OF HAIR DRYER

A range of electrical equipment will be used at the proposed hair salon to carry out hairdressing services. Hair dryers are likely to produce the most noise out of the range of electrical equipment at the salon. Hair dryers will be required to dry and style clients' hair. Noise emitted by the use of the hair dryer is assessed by the NSW Noise Policy for Industry 2017 and Canterbury-Bankstown Council requirements.

Typical noise levels for hair dryers are presented in Table 5.1.1 below.

Table 5.1.1 – Typical Hair Dryer Sound Power Levels

FREQUENCY [Hz]	63	125	250	500	1k	2k	4k	8k	dB(A)
Hair Dryer	50	65	66	85	80	77	75	68	**87**

5.2 NOISE IMPACT FROM CLIENTS TALKING INSIDE SALON

The proposed hair salon will offer hairdressing services for a maximum of two (2) clients at any one time with one (1) stylist and no background music being played.

The sound power level of male and female vocal levels (at any octave band centre frequency) are shown in Table 5.2.1 below:

Table 5.2.1 – Different Male & Female Vocal Levels (at any Octave Band Centre Frequency) *Average Speech Levels - Pearson, Bennet, & Fidell (1977) Report.

Vocal Effort	No. of Talkers	Sound Power Levels [dB] at Octave Band Centre Frequencies [Hz]*,**							
		125	250	500	1000	2000	4000	8000	dB(A)
Females									
Casual	1	37.0	55.0	56.0	47.0	46.0	41.0	44.0	55.7
Normal	1	37.0	58.0	61.0	53.0	49.0	51.0	45.0	60.8
Raised	1	36.0	64.0	68.0	63.0	58.0	56.0	50.0	68.4
Loud	1	31.0	66.0	70.0	72.0	68.0	64.0	56.0	75.2
Shouted	1	31.0	61.0	75.0	83.0	81.0	75.0	66.0	86.2
Males									
Casual	1	55.0	57.0	59.0	48.0	46.0	46.0	43.0	58.1
Normal	1	59.0	63.0	65.0	56.0	51.0	49.0	43.0	64.0
Raised	1	62.0	67.0	71.0	64.0	58.0	55.0	49.0	70.3
Loud	1	61.0	71.0	79.0	76.0	70.0	66.0	57.0	80.0
Shouted	1	53.0	77.0	85.0	89.0	84.0	79.0	70.0	91.4

Internal noise from the salon is expected to peak [worst case scenario] when the salon is at capacity (maximum 2 clients). Table 5.2.2 presents the maximum cumulative noise level anticipated from the operation of the salon at maximum capacity (max. 2 clients) with clients and staff talking and the hair dryer operating.

Table 5.2.2 - Noise Level of Hair Salon Operating at Maximum Capacity Including Staff + Patrons and Hair Dryer On

Description	**Sound Pressure Levels (dB) at Octave Band Centre Frequencies (Hz)**								
	63	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**	**dB(A)**
Total Cumulative Noise from Operational Activities at Maximum Capacity (including Staff + Patrons)	50	65	66	85	80	77	75	68	87

5.2.1 SOUND LEVEL AT NEAREST RESIDENTIAL RECEIVERS (AIRBORNE)

All operational activities for the proposed hair salon will occur inside the premises. Sound loss will be experienced through the existing façade and roof of the salon , distance mitigation between the hair salon and residential buildings located north, south , east of the site and existing fencing along the boundaries.

SoundPLAN 8.2 and its geo-database module were utilised to calculate the noise levels and noise contours along the nearest residential receivers R1, R2 (Figure 8 – 3D SoundPLAN Model). **SoundPLAN 8.2** allows for predicted noise levels and contours to be generated whilst accounting for ground elevation, distance and barrier attenuations, reflections, and reverberation (Figure 9 – Predicted Noise Level Contours).

Using the maximum noise levels anticipated from the hair salon as per Table 5.2.2, the predicted noise level at No. 35 Brennan Road are presented in Table 5.2.1.1 below.

Table 5.2.1.1 – Predicted L_{eq} Noise Levels at the Boundary of No. 35 Brennan Road (R1) Between 7:00am – 9:00pm*

Activities	Predicted L_{eq} dB(A)	Complies with Noise Guide for Local Government [Day and Evening]*	Complies with NSW Noise Policy for Industry (2017) [Day and Evening]*
Predicted L_{eq} of 3 People Inside with Hair Dryer On - at Residential Receiver	**41**	**Yes ✓** $L_{eq} < L_{90} + 5$ = 47, 45 dB(A)	**Yes ✓** $L_{eq} < 45$, 43 dB(A)

***The hair salon will not operate outside these hours.**

Similarly, the predicted noise level at No. 39 Brennan Road are presented below in Table 5.2.1.2.

Table 5.2.1.2 – Predicted L_{eq} Noise Levels at the Boundary of No. 39 Brennan Road (R2) Between 7:00am – 9:00pm*

Activities	Predicted L_{eq} dB(A)	Complies with Noise Guide for Local Government [Day and Evening]*	Complies with NSW Noise Policy for Industry (2017) [Day and Evening]*
Predicted L_{eq} of 3 People Inside with Hair Dryer On - at Residential Receiver	**35**	**Yes ✓** $L_{eq} < L_{90} + 5$ = 47, 45 dB(A)	**Yes ✓** $L_{eq} < 45$, 43 dB(A)

***The hair salon will not operate outside these hours.**

Therefore, provided the following recommendations in Section 6 are adhered to, noise emissions from the proposed hair salon will adhere to the Noise Guide for Local Government and NSW Noise Policy for Industry 2017 criteria.

5.3 NOISE FROM EXISTING CARPORT

The arrival and departure of client vehicles will utilize the existing carport on the site. As the existing carport has been previously approved, there will be no need for further assessment of vehicle movements for the proposed hair salon. All recommendations presented in the previously approved acoustic report for the site at No. 37 Brennan Road are to be maintained and followed.

6 NOISE CONTROL RECOMMENDATIONS

6.1 MECHANICAL PLANT

No new mechanical plant or AC is proposed to be installed.

6.2 WINDOWS AND SLIDING DOORS OF THE HAIR SALON

We recommend maintaining the parameter acoustic seals around the door and the drop seal at the bottom of the door. The front sliding door can be left 20% open while hairdressing sessions are in place to allow for natural ventilation. However, if people are talking in raised or loud voices while the hair dryer is also being used, the entry sliding door and windows must be closed.

6.3 ENTERING AND EXITING THE HAIR SALON

Clients of the hair salon must be informed of the nearest residential receivers and the importance of minimising noise produced. The salon owner is to ensure that clients enter and leave the site in an orderly fashion and do not congregate outside the salon.

6.4 NOISE MANAGEMENT PLAN

A Noise Management Plan should be implemented and should include the following:

- Install a contact number at the front of the Salon so that complaints regarding the operation can be made.
- Implement a complaint handling procedure. If a noise complaint is received the complaint should be recorded on a Complaint Form. The Complaint Form should contain the following:

    - Name and Address of the Complainant
    - Time and Date the Complaint was received
    - The nature of the complaint and the time/date the noise was heard
    - The name of the employee that received the complaint
    - Actions taken to investigate the complaint and the summary of the results of the investigation
    - Indication of what was occurring at the time the noise was happening (if applicable)
    - Required remedial action (if applicable)
    - Validation of the remedial action
    - Summary of feedback to the complainant

A permanent register of complaints should also be held on the premises which shall be reviewed monthly by staff to ensure all complaints are being responded to. All complaints received shall be reported to management with initial action/investigation commencing within 7 days. The complainant should also be notified of the results and actions arising from the investigation.

7 CONCLUSION

Measurements and calculations presented in this report show that the noise emissions from the proposed hair salon at No. 37 Brennan Road, Yagoona will not exceed the noise criteria set out in Section 4 of this report. Additional noise controls recommendations are outlined in Section 6 to ensure compliance through the operation of the salon.

The proposed hair salon complies with the various criteria detailed in this report, including Canterbury Bankstown Council conditions, NSW Noise Guide for Local Government, and NSW Noise Policy for Industry 2017, and will not create any offensive noise to the surrounding environment.

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

Yours sincerely,

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M.S. Eng'g Sci. (UNSW).
M.I.E.(Aust), CPEng.
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8 APPENDIX

Figure 1 - Site Location

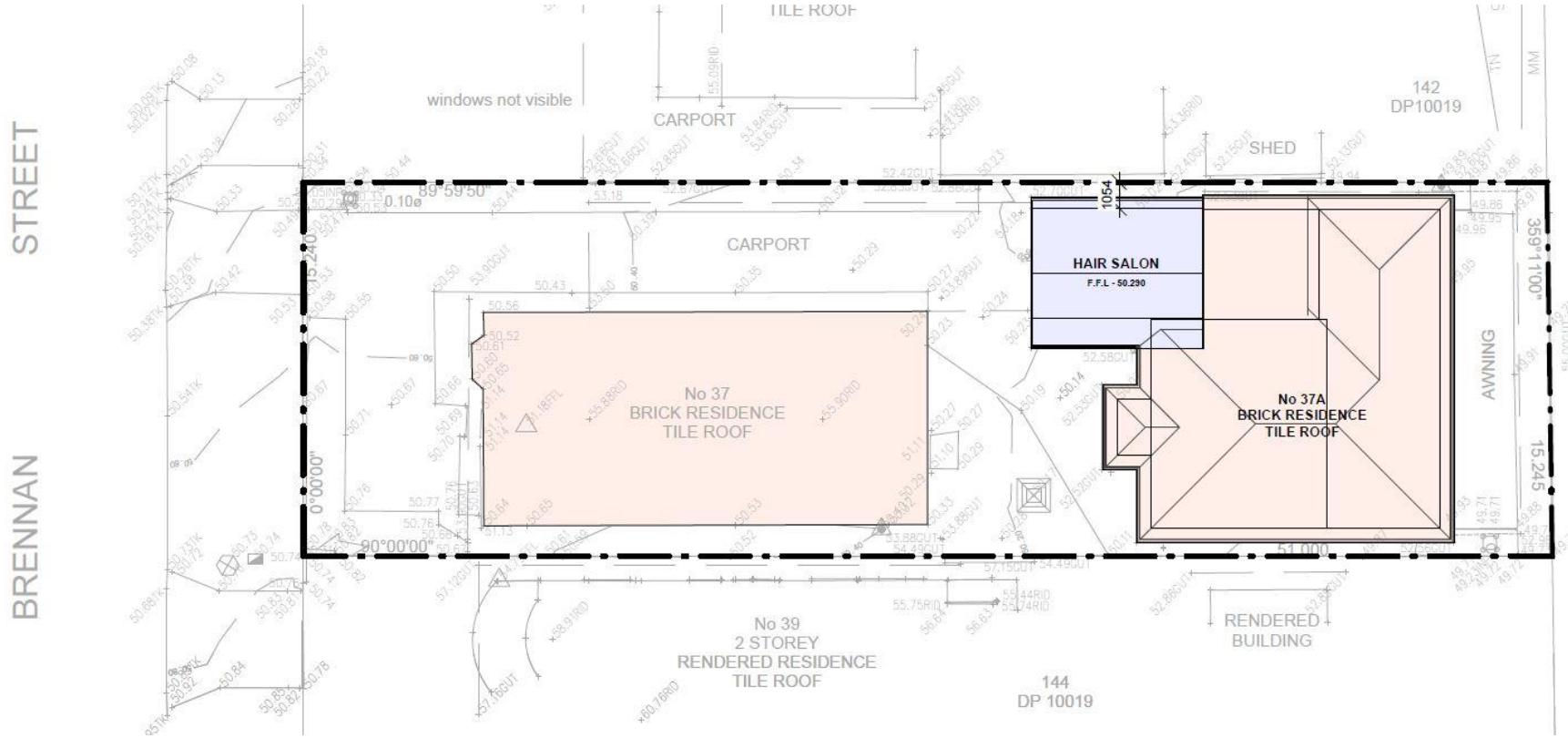

Figure 2 – Proposed Site Plan

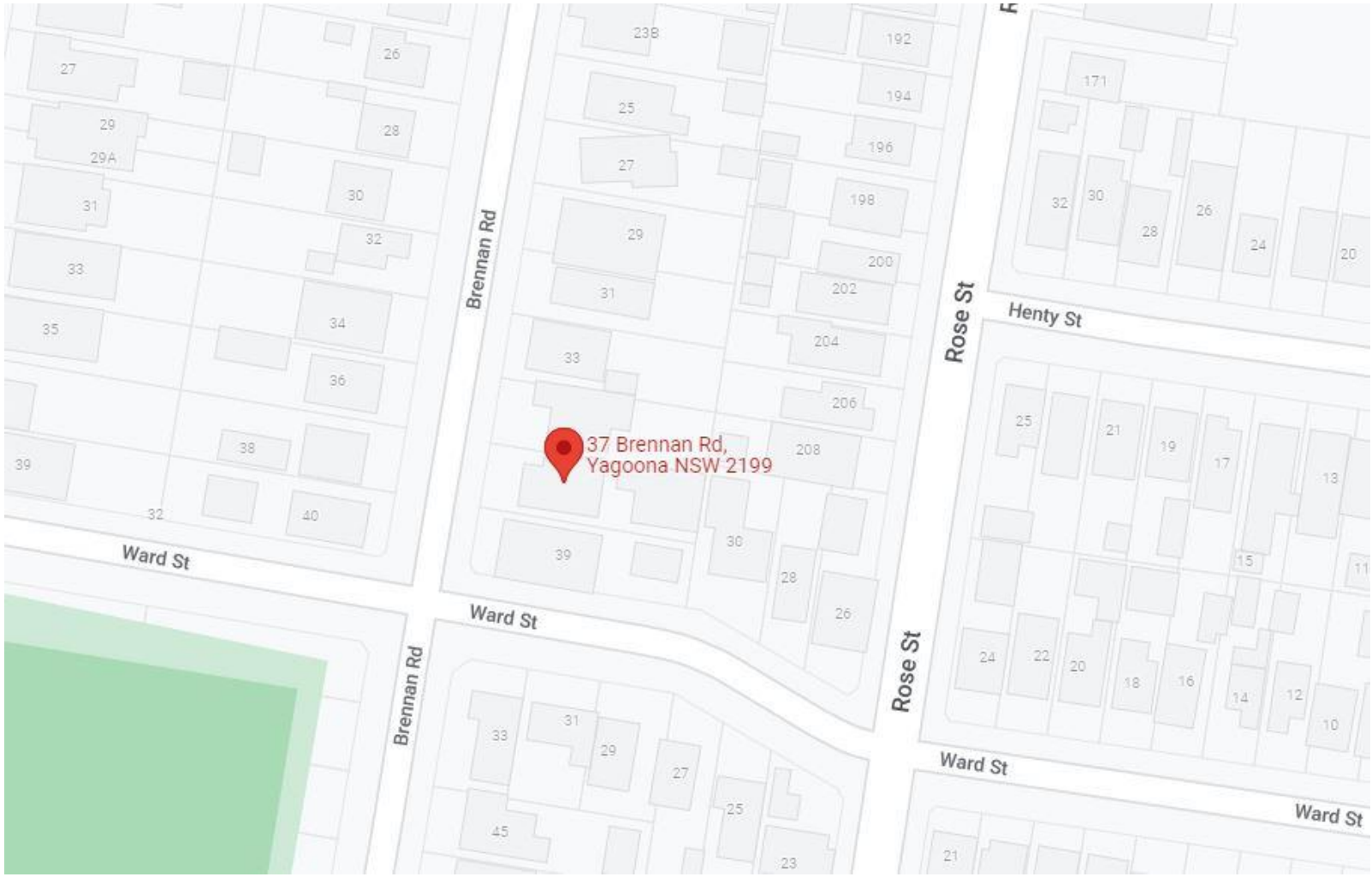

Figure 3 - Surrounding Environment

Figure 4 – Nearest Residential Receivers

Figure 5 – Noise Reading Location (Point A)

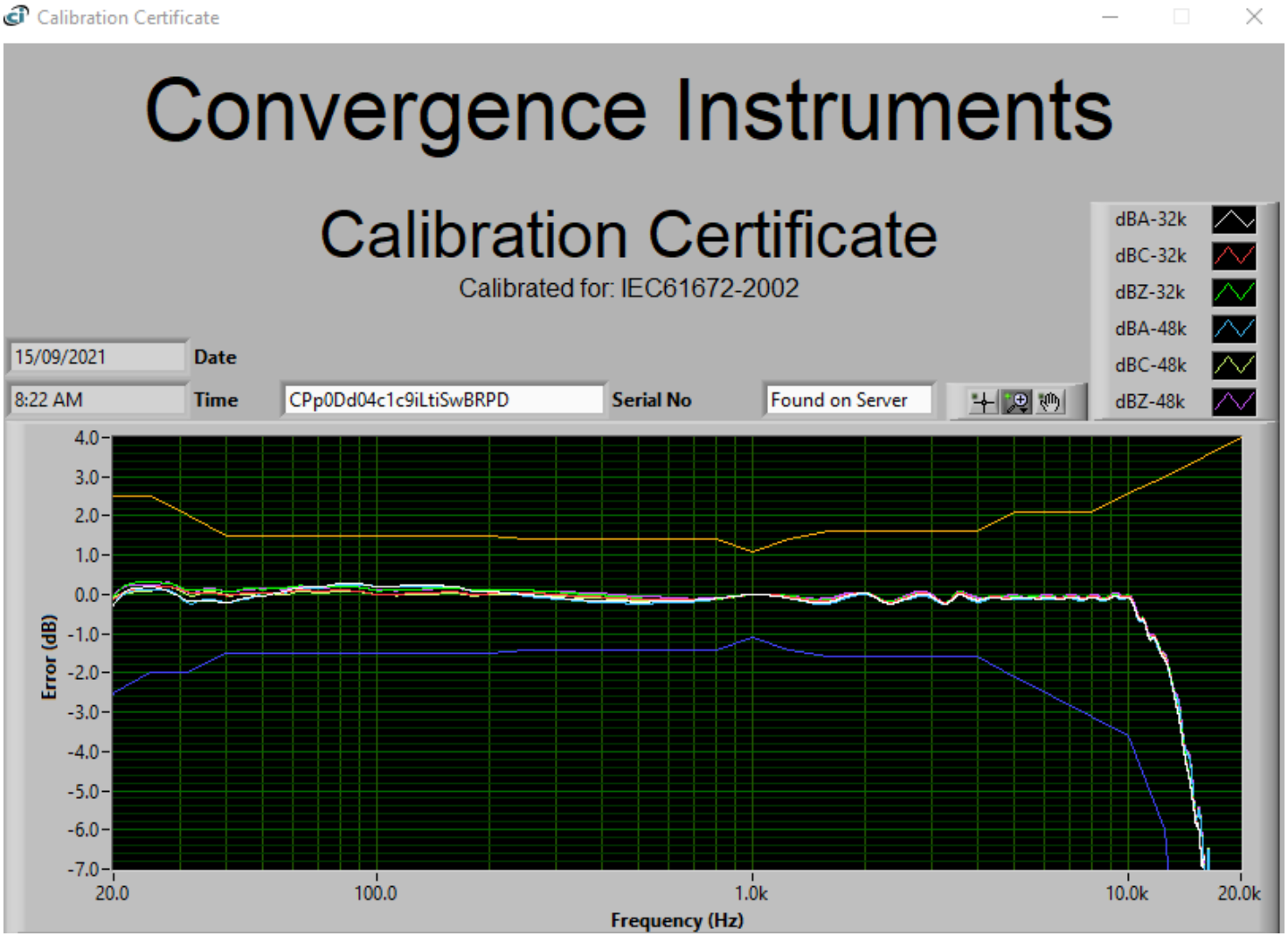

Figure 6 – Calibration Certificate

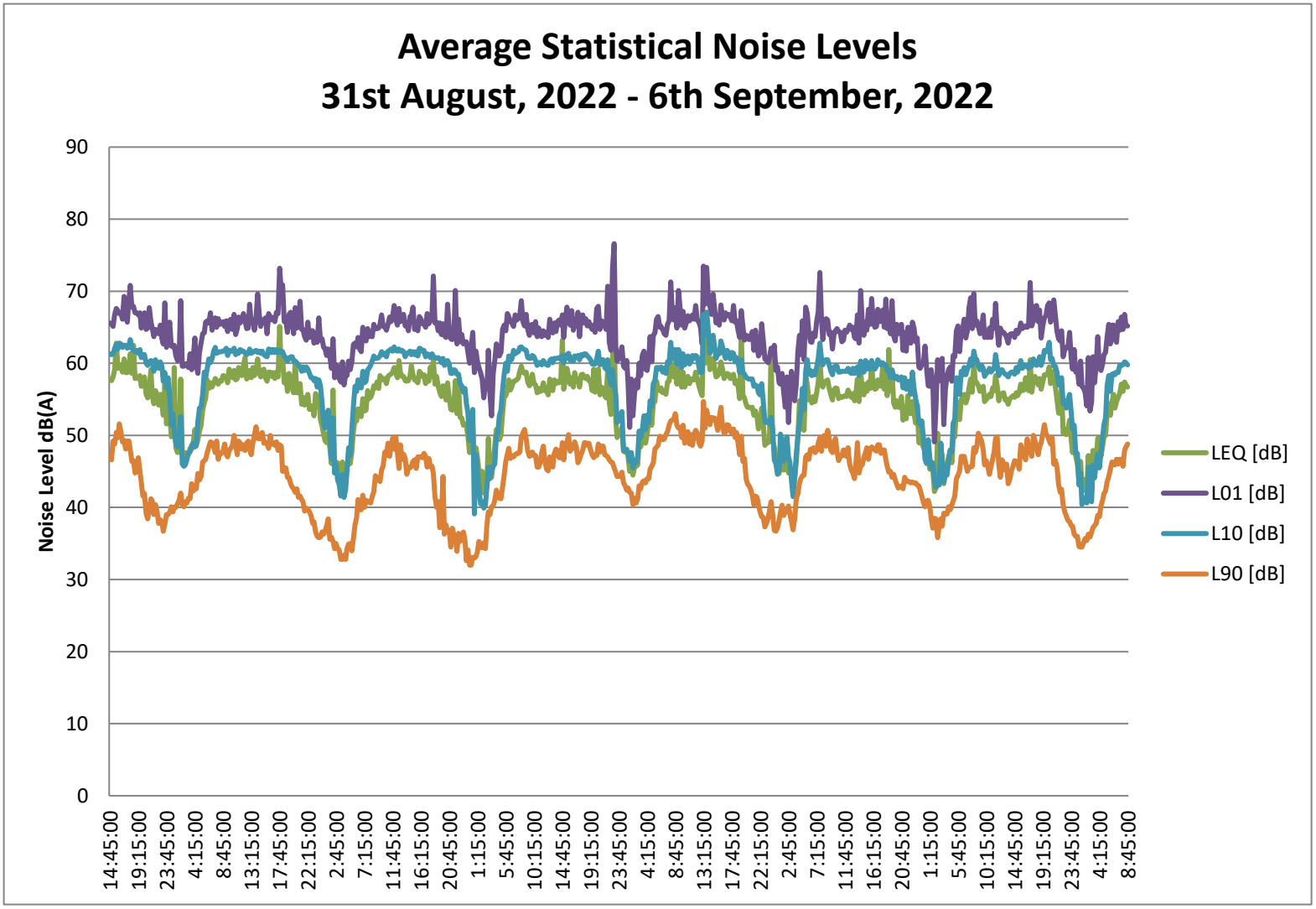

Figure 7 – Noise Survey

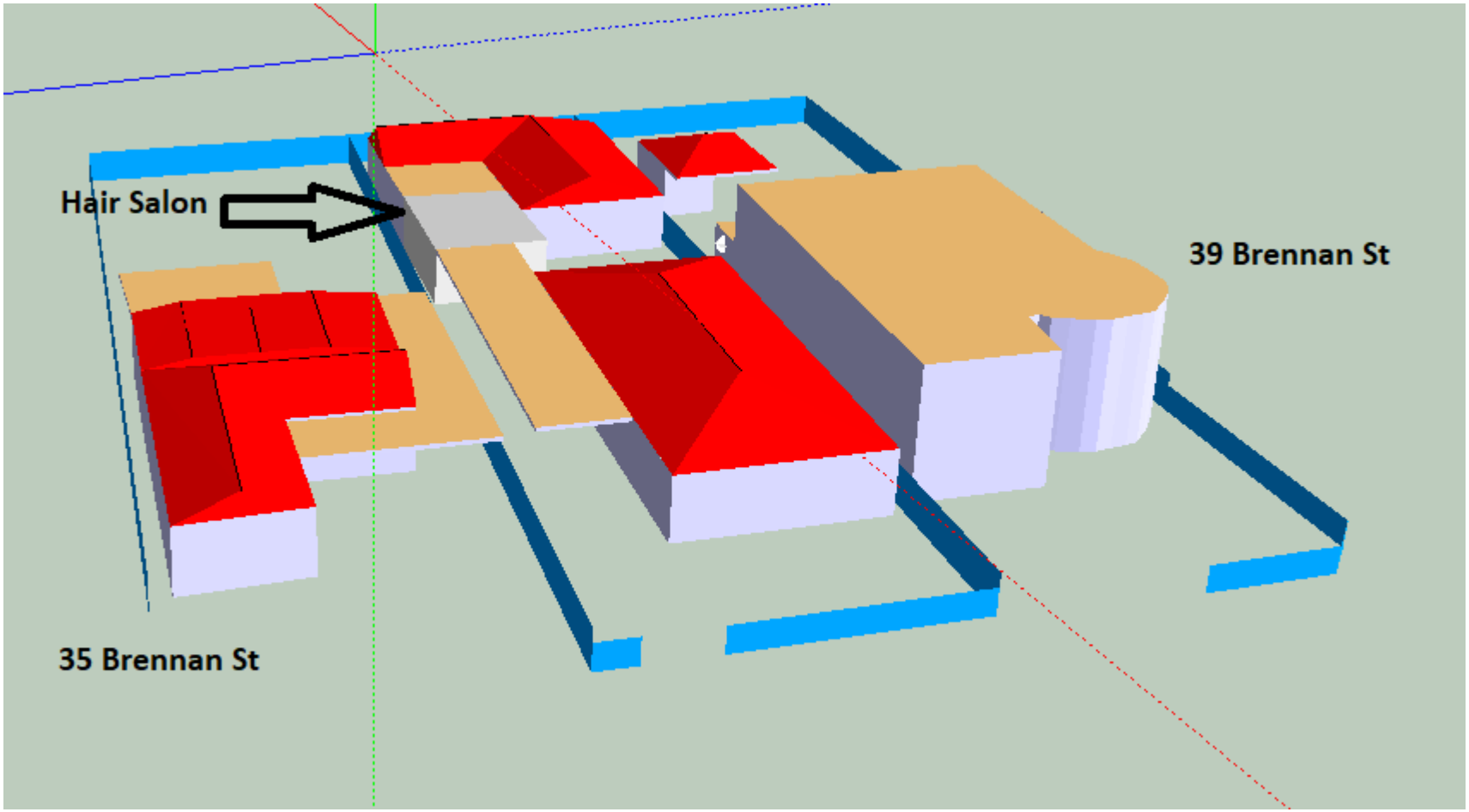

Figure 8 - Noise Survey- 3D SoundPLAN Model

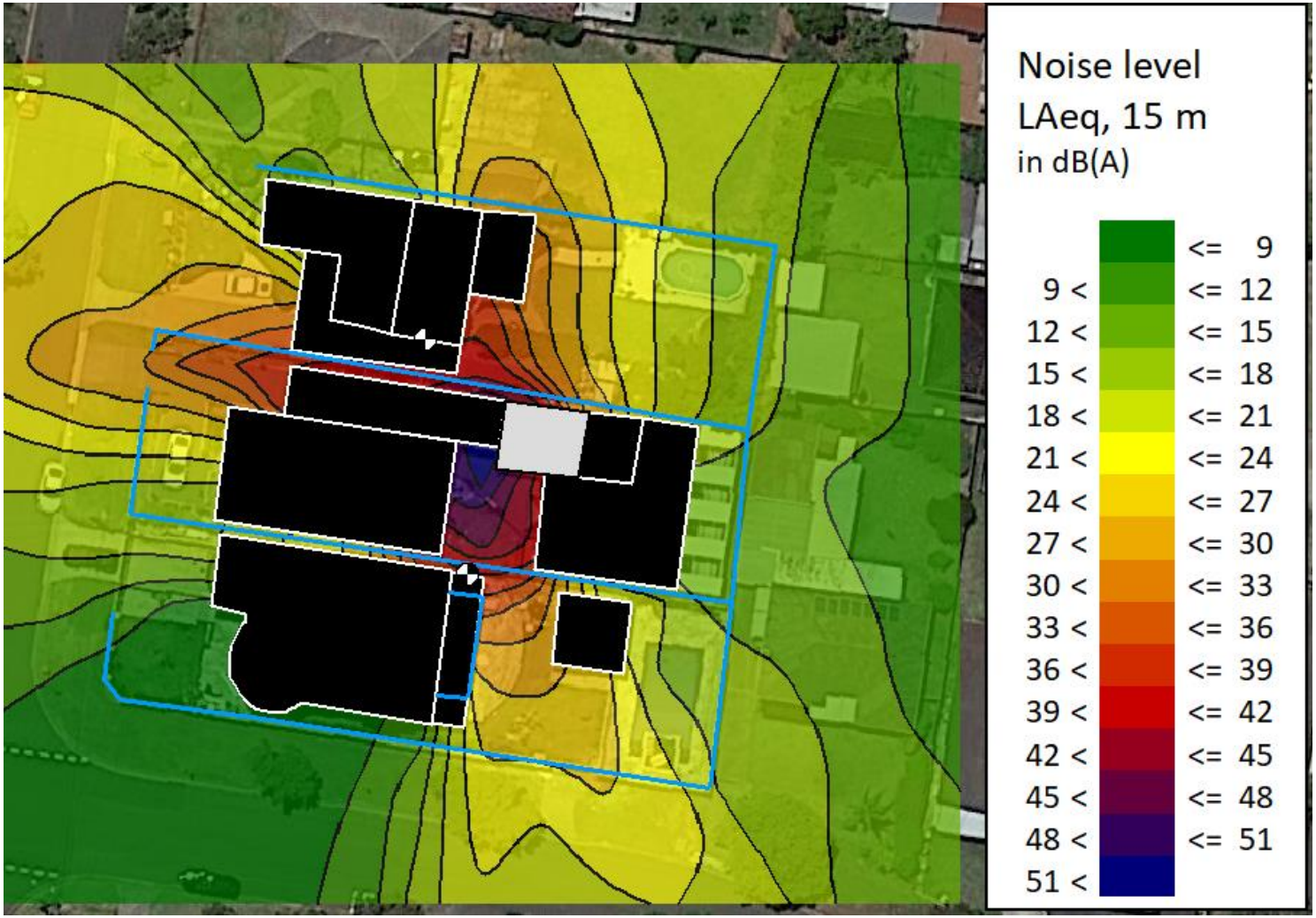

Figure 9 - Predicted Noise Level Contours