



**LASER TOUCHLESS CARWASH**

**941 WANNEROO ROAD  
WANNEROO**

**ENVIRONMENTAL ACOUSTIC ASSESSMENT**

**MARCH 2023**

**OUR REFERENCE: 30813-1-23088**



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**ENVIRONMENTAL ACOUSTIC ASSESSMENT  
PROPOSED LASER TOUCHLESS CARWASH**

Job No: 23088

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FOR

**LASER TOUCHLESS CARWASH**

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## 1. INTRODUCTION

Herring Storer Acoustics were commissioned to undertake an acoustic assessment of noise emissions associated with the proposed car wash development to be located at 941 Wanneroo Road, Wanneroo.

This report assesses noise emissions from the premises with regards to compliance with the requirements of the *Environmental Protection (Noise) Regulations 1997*. It is understood that the car wash development consists of two automatic car wash bays.

Therefore, noise sources considered as part of this assessment for the carwash area include:

- Auto car wash.

For reference, the plan for the proposed development is attached in Appendix A.

## 2. SUMMARY

Analysis has been undertaken of the proposed development, with compliance with the applicable assigned noise levels stipulated by the Environmental Protection (Noise) Regulations 1997 with the inclusion of the following noise mitigation measures :

- Auto carwash required to have roller doors and operate with them down.
- Car wash operations to not occur during the “night period”. I.e. Not before 7am Monday to Friday (or 9am on Sundays and Public Holidays) and not after 10pm at night.

From the analysis undertaken, noise emissions from the proposed development has been assessed to comply with the requirements of the *Environmental Protection (Noise) Regulations 1997* at all times, provided the noise mitigation and operating restrictions to the carwash, as outlined above is incorporated into the development.

## 3. CRITERIA

The allowable noise level for noise sensitive premises in the vicinity of the proposed Facility site is prescribed by the *Environmental Protection (Noise) Regulations 1997*. Regulations 7 and 8 stipulate maximum allowable external noise levels or assigned noise levels that can be received at a premise from another premises. For residential premises, this noise level is determined by the calculation of an influencing factor, which is then added to the base levels shown below. The influencing factor is calculated for the usage of land within two circles, having radii of 100m and 450m from the premises of concern. The base noise levels for residential premises and the assigned noise levels for industrial premises are listed in Table 3.1.

**TABLE 3.1 - BASELINE ASSIGNED OUTDOOR NOISE LEVEL**

Premises Receiving Noise	Time of Day	Assigned Level (dB)		
		L <sub>A10</sub>	L <sub>A1</sub>	L <sub>Amax</sub>
Noise sensitive premises: highly sensitive area	0700 - 1900 hours Monday to Saturday (Day)	45 + IF	55 + IF	65 + IF
	0900 - 1900 hours Sunday and Public Holidays (Sunday / Public Holiday Day)	40 + IF	50 + IF	65 + IF
	1900 - 2200 hours all days (Evening)	40 + IF	50 + IF	55 + IF
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and Public Holidays (Night)	35 + IF	45 + IF	55 + IF

Note: L<sub>A10</sub> is the noise level exceeded for 10% of the time.  
 L<sub>A1</sub> is the noise level exceeded for 1% of the time.  
 L<sub>Amax</sub> is the maximum noise level.  
 IF is the influencing factor.

It is a requirement that received noise be free of annoying characteristics (tonality, modulation and impulsiveness), defined below as per Regulation 9.

- “impulsiveness”** means a variation in the emission of a noise where the difference between  $L_{Apeak}$  and  $L_{Amax(Slow)}$  is more than 15 dB when determined for a single representative event;
- “modulation”** means a variation in the emission of noise that –
- (a) is more than 3 dB  $L_{AFast}$  or is more than 3 dB  $L_{AFast}$  in any one-third octave band;
  - (b) is present for more at least 10% of the representative assessment period; and
  - (c) is regular, cyclic and audible;
- “tonality”** means the presence in the noise emission of tonal characteristics where the difference between –
- (a) the A-weighted sound pressure level in any one-third octave band; and
  - (b) the arithmetic average of the A-weighted sound pressure levels in the 2 adjacent one-third octave bands,
- is greater than 3 dB when the sound pressure levels are determined as  $L_{Aeq,T}$  levels where the time period T is greater than 10% of the representative assessment period, or greater than 8 dB at any time when the sound pressure levels are determined as  $L_{ASlow}$  levels.

Where the noise emission is not music, if the above characteristics exist and cannot be practicably removed, then any measured level is adjusted according to Table 3.2 below.

**TABLE 3.2 - ADJUSTMENTS TO MEASURED LEVELS**

Where <b>tonality</b> is present	Where <b>modulation</b> is present	Where <b>impulsiveness</b> is present
+5 dB(A)	+5 dB(A)	+10 dB(A)

Note: These adjustments are cumulative to a maximum of 15 dB.

For this development, the closest residential premises of concern are located, as shown on Figure 3.1 below.



**FIGURE 3.1 – AREA AROUND PROPOSED DEVELOPMENT**

The influencing factor at the nearest residential locations to the proposed development have been determined as summarised in Table 3.3.

**TABLE 3.3 – INFLUENCING FACTOR**

Influencing Factor Parameter	Influencing Factor (dB)
Major Road within inner circle	+ 6
Commercial Premises within inner circle	+ 2
Commercial Premises within outer circle	+1
<b>TOTAL IF</b>	<b>+9</b>

Based on the above, the assigned noise levels are as listed in Table 3.4.

**TABLE 3.4 - ASSIGNED OUTDOOR NOISE LEVEL**

Premises Receiving Noise	Time of Day	Assigned Level (dB)		
		L <sub>A 10</sub>	L <sub>A 1</sub>	L <sub>A max</sub>
Noise sensitive premises: Highly sensitive area	0700 - 1900 hours Monday to Saturday	54	64	74
	0900 - 1900 hours Sunday and Public Holidays	49	59	74
	1900 - 2200 hours all days	49	59	64
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and Public Holidays	44	54	64

#### 4. MODELLING

Modelling of the noise propagation from the proposed development was carried out using an environmental noise modelling computer program, "SoundPlan". Calculations were carried out using the EPA weather conditions as stated in the Environmental Protection Authority's "Draft Guidance for Assessment of Environmental Factors No.8 - Environmental Noise".

Noise emissions from the development, include:

- Auto car wash.

The calculations were based in the sound power levels listed in Table 4.1.

**TABLE 4.1 – CAR WASH SOUND POWER LEVELS**

Plant Item	Sound Power Level dB(A)
Auto Car Wash Equipment – No Doors	87
Auto Car Wash Equipment – Doors	77

Based upon preliminary noise modelling, consideration for the auto wash car bays to have a door to the entrance to the bays has been considered.

The above noise sources need to comply with the following assigned noise levels:

$L_{A10}$  - Carwash

#### 5. RESULTS

Calculations were undertaken to all the residences noted on Figure 3.1. The resultant noise levels are listed below in Table 5.1.

**TABLE 5.1 – CALCULATED NOISE LEVELS**

Location	Calculated Noise Levels (dB(A))	
	Auto Wash – No Doors	Auto Wash – With Door
R1	42	31
R2	53	42
R3	40	30
R4	38	28

## 6. ASSESSMENT

The following provided the acoustic assessment for the noise sources requiring compliance, as listed in Table 5.1.

During operation, noise emissions from the carwash would at times occur for more than 10% of the time for all operations except for those associated with trucks.

Thus, noise received at the neighbouring residences needs to comply with the assigned  $L_{A10}$  noise levels.

The carwash activities are considered to contain tonal characteristics. Hence, a + 5dB adjustment is applicable to the car wash noise emissions.

Hence, the assessable noise levels associated with the proposed development are summarised in Table 6.1 below.

**TABLE 6.1 – ASSESSABLE NOISE LEVELS**

Location	Calculated Noise Levels (dB(A))	
	Auto Wash – No Doors	Auto Wash – With Door
R1	47	36
R2	58	47
R3	45	35
R4	43	33

Table 6.2 and 6.3 below summarises the assessable noise levels and compares them against the relevant assigned noise levels.

**TABLE 6.2 – ASSESSMENT OF  $L_{A10}$  NOISE LEVEL EMISSIONS  
 CAR AUTO WASH – NO DOORS**

Location	Assessable Noise Level, dB(A)	Applicable Times of Day	Applicable Assigned $L_{A10}$ Noise Level (dB)	Exceedance to Assigned Noise Level (dB)
R1	47	Day Period	54	Complies
		Sunday Day Period	49	Complies
		Evenings	49	Complies
		Night	44	+ 3 dB
R2	58	Day Period	54	+ 4 dB
		Sunday Day Period	49	+ 9 dB
		Evenings	49	+ 9 dB
		Night	44	+ 14 dB
R3	45	Day Period	54	Complies
		Sunday Day Period	49	Complies
		Evenings	49	Complies
		Night	44	+ 1 dB
R4	43	Day Period	54	Complies
		Sunday Day Period	49	Complies
		Evenings	49	Complies
		Night	44	Complies



**TABLE 6.2 – ASSESSMENT OF L<sub>A10</sub> NOISE LEVEL EMISSIONS  
 CAR AUTO WASH – WITH DOORS DOWN**

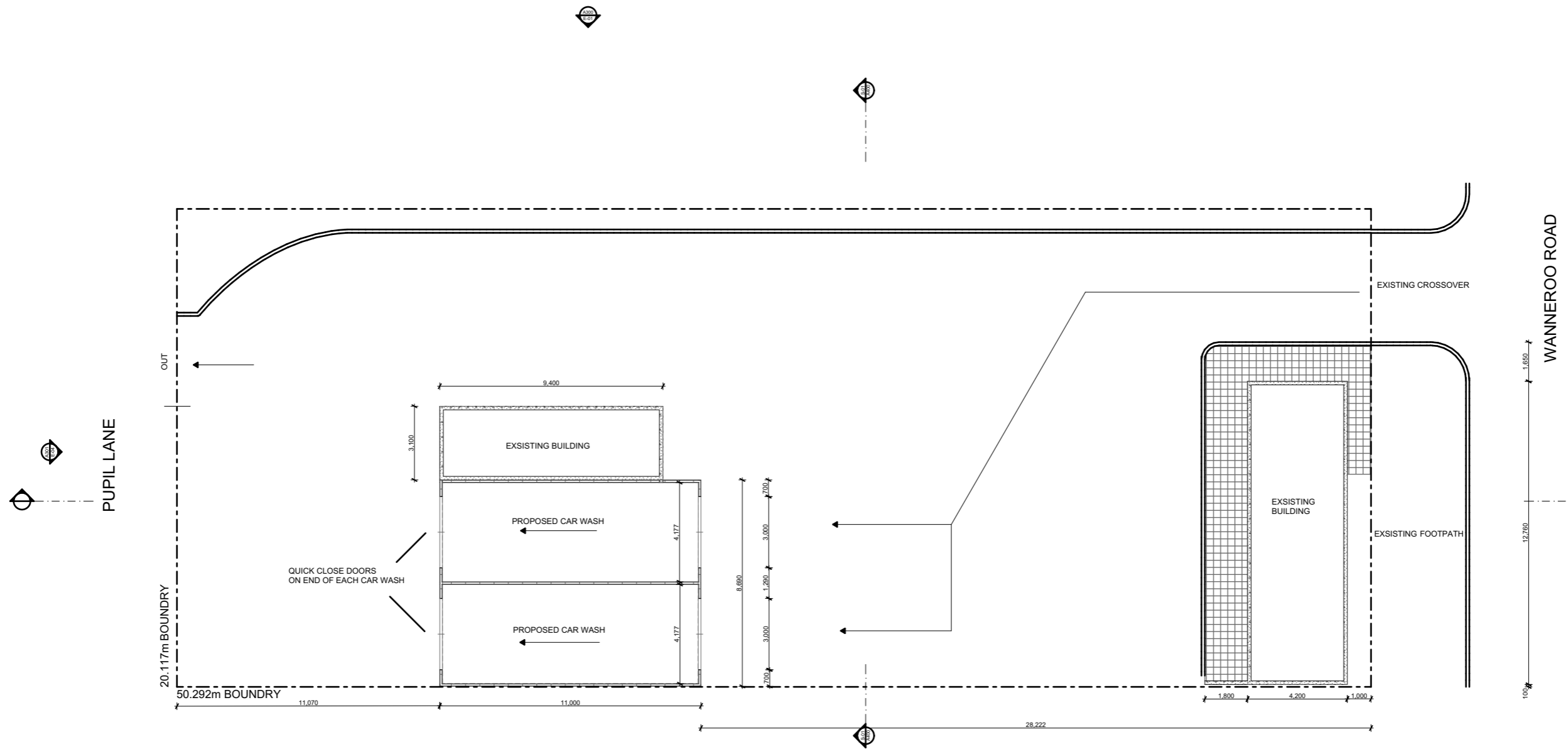
Location	Assessable Noise Level, dB(A)	Applicable Times of Day	Applicable Assigned L <sub>A10</sub> Noise Level (dB)	Exceedance to Assigned Noise Level (dB)
R1	36	Day Period	54	Complies
		Sunday Day Period	49	Complies
		Evenings	49	Complies
		Night	44	Complies
R2	47	Day Period	54	Complies
		Sunday Day Period	49	Complies
		Evenings	49	Complies
		Night	44	+ 3 dB
R3	35	Day Period	54	Complies
		Sunday Day Period	49	Complies
		Evenings	49	Complies
		Night	44	Complies
R4	33	Day Period	54	Complies
		Sunday Day Period	49	Complies
		Evenings	49	Complies
		Night	44	Complies

From the above assessments, it can be seen that noise received at the neighbouring residences, complies with the requirements of the *Environmental Protection (Noise) Regulations 1997* during all periods, with the following noise mitigation applied:

- Auto carwash required to have roller doors and operate with them down.
- Car wash operations to not occur during the “night period”. I.e. Not before 7am Monday to Friday (or 9am on Sundays and Public Holidays) and not after 10pm at night.

# **APPENDIX A**

## PLANS



Replace with your LOGO

Drawn | Checked LWP |  
 Plot Date: 20/03/2023  
 Project NO. #Project ID  
 Project Status #Project Status

Client Mr Brett Carboni  
 Climate Zone #Climate Zone  
 Wind Region #Wind Region  
 Site: 941 WANNEROO ROAD  
 WANNEROO WA

DRAWING TITLE :

Site and Location Drawings  
**Proposed Layout**

PROJECT NAME :

**Laser Touchless Carwash**

REVISION NO.

DRAWING NO.

**A03**