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Acoustic Consultants

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# Noise Impact Assessment

96 - 100 Ballan Road, Werribee

## Project Details

### Site Location

96 - 100 Ballan Road, Werribee

### Client

Werribee Wash Works

### Project Description

Proposed carwash

### Project Reference

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## Project Details


Site Location	96 - 100 Ballan Road, Werribee
Client	Werribee Wash Works
Project Contact	
Project Reference	

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## Author Details

Author Details		
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## Release Details

Date	Version	Description
10/06/2024	01-A	For release.
08/07/2024	01-B	For release.

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# 1 INTRODUCTION

Soundscape Consulting Pty Ltd was commissioned by Werribee Wash Works to complete a noise impact assessment at 96 - 100 Ballan Road, Werribee. The report is to be submitted to the certifying authority as part of the development application.

The existing site contains three auto-wash bays, three self-serve bays and five vacuums. The proposal is to construct an additional auto-wash bay, two additional dog wash bays, and remove the existing northern vacuum bay (see appendix A). A copy of the plan drawings are available in appendix A.

The noise assessment follows the methodology of the *EPA VIC Publication 1826.4: Noise limit and assessment protocol for the control of noise from commercial, industrial and trade premises and entertainment venues* for assessing impacts to surround sensitive receivers.

The proposed scope of works are as follows:

1. **Review client data** including correspondence, operation details, plan drawings, aerial photos and specific material.
2. **Noise criteria** relevant to the project is identified based on the proposed operations, surrounding sensitive receivers and noise sources.
3. **Conduct noise measurements** of the background noise levels in accordance with the EPA 1826.4 requirements.
4. **Noise modelling** of the site operations to predict the likely impact on surrounding receivers. The results from the noise modelling are summarised to verify compliance with the noise criteria or otherwise. Where compliance is not achieved, recommendations for mitigation are provided.
5. **Recommendations** are provided as required, and may include relocation of noisy equipment, sound walls, operational changes, or adjustments to the development.

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## 2 NOISE CRITERIA

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### 2.1 VIC Environment Protection Act 2017

The Environment Protection Act 2017 states 'any person who is engaged in any activity that may give rise to risks of harm to human health or the environment from pollution or waste must minimise those risks, so far as reasonably practicable'. In addition, Section 156 of the Act makes it an offence for any individual to emit an unreasonable noise or permit an unreasonable noise to be emitted. Unreasonable Noise is defined in Section 3(1) of the Act as noise that is

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(a) unreasonable having regard to the following –

- (i) its volume, intensity or duration;
- (ii) its character;
- (iii) the time, place or other circumstances in which it is emitted;
- (iv) how often it is emitted;
- (v) any prescribed factors; or

(b) is prescribed to be unreasonable noise.

### 2.2 VIC Environment Protection Regulations 2021

The Environment Protection Regulations 2021 (Regulations) support the objectives of the Act, that is to prevent or minimise risks of harm to human health or the environment from pollution or waste. The Regulations provide clarity and further detail for duty holders on how to fulfil their obligations and are used to deal with matters in detail and penalties for breaches. The objectives of the Regulations in relation to noise are to further the purposes of, and give effect to, the Act by specifying matters in relation to noise emissions.

The Environment Protection Regulations requires that the prediction, measurement, assessment, or analysis of noise within a noise sensitive area for the purposes of the Act or the Regulations is undertaken in accordance with the Noise Protocol. Noise is assessed at NSAs where the maximum effective noise level occurs or, for proposed premises, is predicted to occur.

The legislated noise limits are applicable to the combined level of noise associated with all commerce industry and trade. Regulation 117 excludes a number of types of noise from the assessment including noise from mobile farm machinery, aircraft, construction activity and non-commercial vehicles. Extraneous noise must also be excluded from any measured noise levels which includes any noise that is not part of the commercial, industrial or trade premises such as local traffic, insects, or bird chirping.

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## 2.2.1 Cumulative Noise

The requirement to assess all sources of industrial and commercial noise cumulatively, is outlined in Regulation 119: "If 2 or more commercial, industrial and trade premises (whether existing or proposed) emit, or are likely to emit, noise that contributes to the effective noise level, a person in management or control of one or more of those premises must take all reasonable steps to ensure that the contribution from each of the premises, when combined, does not exceed the noise limit for the noise sensitive area."

Therefore, where there is more than one commercial, industrial or trade premises contributing to the noise received at a noise sensitive area, each premises would need to contribute a level lower than the applicable noise limit to avoid the cumulative noise level exceeding the noise limit. The definition of commercial, industrial and trade premises is included in the Regulations.

## 2.2.2 Time Periods

Different noise limits apply during the day, evening and night periods. The time periods are defined in Regulation 116 and are summarised as follows:

**Table 2.1:** Assessment time periods

Period	Day	Time
Day	Monday to Saturday	7 am – 6 pm
Evening	Monday to Saturday	6 pm – 10 pm
	Sunday and Public Holidays	7 am – 10 pm
Night	Monday to Sunday / Public Holidays	10 pm – 7 am

## 2.2.3 Base Noise Limit

As defined in the Regulation 118 (2)(b) the lowest decibel values that may be set as the noise limit are outlined in Table 2.2 below:

**Table 2.2** Base Noise Limit (dBA)

Period	Rural	Urban
Day	45	45
Evening	37	40
Night	32	35

Part (3) states "The noise limit for commercial, industrial and trade premises for the night period must not exceed 55dB(A)."

## 2.2.4 Effective Noise Limit

Effective noise levels The Noise Protocol defines an effective noise level which is determined for commercial, industrial and trade premises as a 30-minute equivalent sound pressure level LAeq,30 min adjusted where relevant for duration, noise character and measurement position. Noise character adjustments include factors such as duration, tonality, impulsivity and intermittency

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## 2.3 VIC EPA Publication 1826.4: Noise limit and assessment protocol for the control of noise from commercial, industrial and trade premises and entertainment venues

The EPA 1826.4 publication provides a protocol for determining noise limits for new and existing commercial, industrial and trade premises and entertainment venues (herein: the Noise Protocol). It also sets the methodology for assessing the effective noise level to determine unreasonable noise under the proposed Environment Protection Regulations.

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### 2.3.1: Urban Zone Levels

The zoning level for urban areas is calculated based on the surrounding zones and corresponding influence factor. For the subject site, the influence factor was calculated to be 0.013.

**Table 2.3** Influencing Factor Areas

Zone type	Area in 140m diameter circle	Area in 400m diameter circle
1 - residential, rural and open spaces	100%	95%
2 - commercial, business, office and light industry	0%	5%
3 - general industry and major roads	0%	0%

**Table 2.3** Zoning Levels (dBA)

Period	Zoning level dB(A)
Day	50
Evening	44
Night	39

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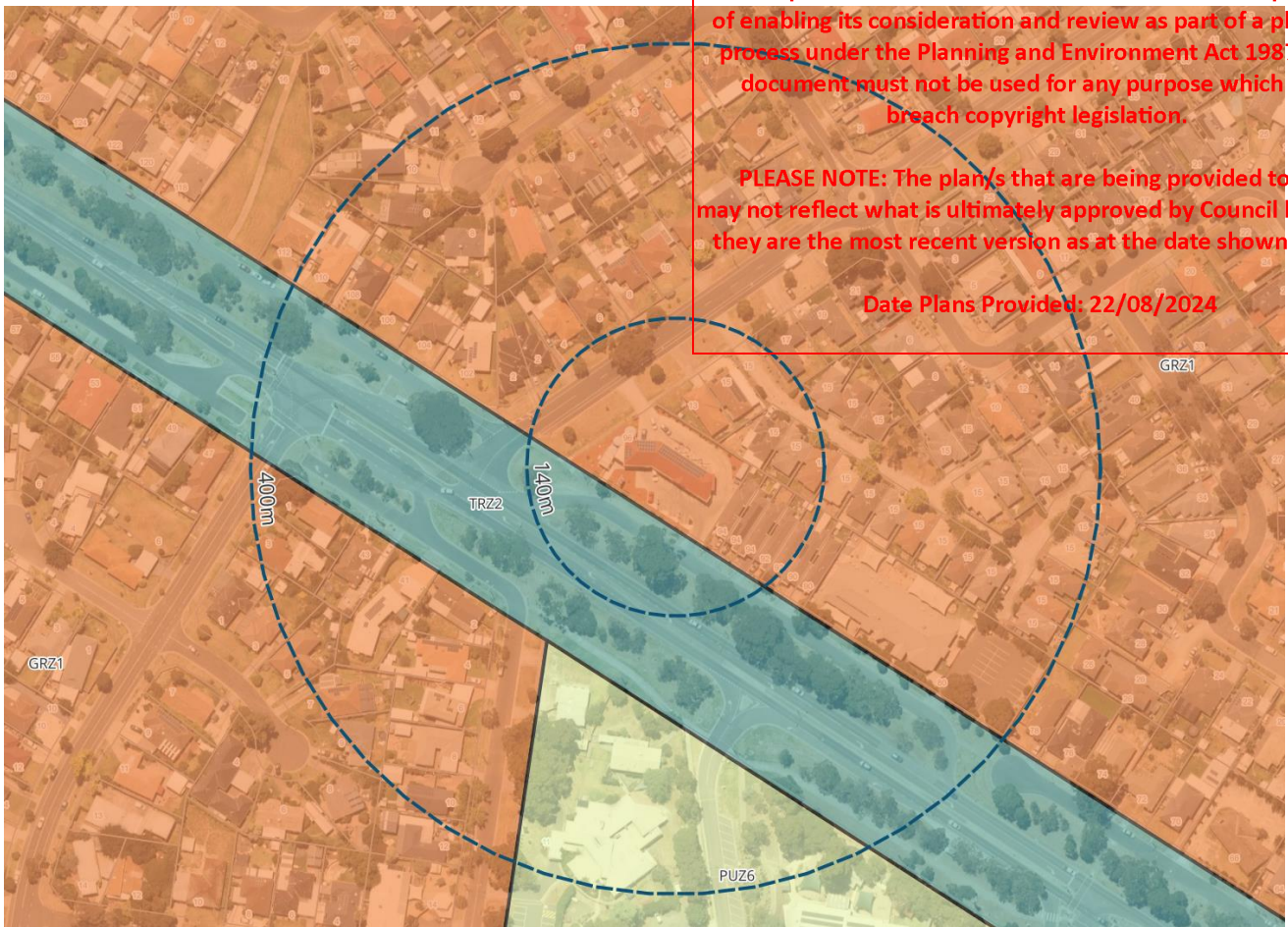


Figure 2.1: Land zoning and influencing factor circles.



Figure 2.2: Sensitive receivers and logger location (red)

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### 3 EXISTING NOISE ENVIRONMENT

As part of this assessment an acoustic logger was set up to conduct a noise survey of the existing acoustic environment. The logger location was selected to be representative of the nearest sensitive receiver while being shielded from current site operations. Consideration of reflections, biasing noise sources and security was given when selecting the positioning. The noise levels measured at this location are considered representative of the nearest noise sensitive receiver locations to the proposed development.

Noise logging was undertaken using a Rion NL-43 logger with the serial number 00710677. Directly prior and following the noise survey calibration was checked using a 1000hz signal at 94dBA, with no significant drift measured. The NATA calibration certificate is available on request.

The microphone was placed in a foam windshield 1.5m above the ground away from reflective surfaces. The survey began on the 22/05/2024 and ran for seven days.

**Table 3.1:** Noise Survey Results (dBA)

Period	LAeq	LA90
Day	59	44
Evening	53	43
Night	52	37

#### 3.1 Site Noise Limits

The results of the survey have been assessed based on the section 4 of the Noise Protocol and the base noise limits (section 4.2.3).

**Table 3.2** Project Noise Limits (dBA)

Period	Zoning level	Background noise level	Background relative to zoning level	Noise limit, Leq
Day	50	44	Neutral	50
Evening	44	43	Neutral	44
Night	39	37	Neutral	39

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## 4 EXTERNAL NOISE EMISSION ASSESSMENT

Noise modelling has been conducted utilising the ISO-9613 (2024) calculation methodology. The model is three dimensional, and includes the effects of reflections, ground absorption, meteorological conditions, and barriers. Noise modelling requires a simplification of real-world conditions into basic components. The layout, noise nodes, barriers, structures, and results from the noise modelling can be viewed in Appendix C.

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### 4.1 Operational assumptions

#### Car movements

Access to the site will be via a driveway off Hooker road, with vehicles exiting along Ballan service road. Line sources were used to model the vehicle movements entering, leaving and moving around the site assuming,

- 15 car movements within 30 minutes (day period)
- 10 car movements within 30 minutes (evening period)
- 2 car movements within 30 minutes (night period).

#### Patrons

In order to assess the noise impact from patrons, the following noise sources have been implemented into the noise model:

- Patrons speaking in raised voices,
  - 5 sources during the day/evening and
  - 1 source during the night period
- Music playing from cars with windows down / doors open,
  - 2 sources during the day/evening and
  - 1 source during the night

#### Equipment

The existing equipment consists of:

- Three auto-wash bays
- Three self-serve bays
- Five vacuum bays (*northern vacuum between wash bay 1 and 2 to be removed*)
- Two dog wash bays

It is proposed to add:

- One addition auto-wash bay
- Two dog wash bays

#### Waste collection

No changes to the waste collection are proposed, with collection completed once per week. No further assessment is deemed necessary.

#### Mechanical Plant

Mechanical plant has been measured with an SWL of 68dBA (LAeq 50 min) during daytime operations. The plant is located within a solid concrete structure with insulated roof, suitable for attenuating 40dBA, with a residual noise level of 28dBA (further assessment not required).

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## 4.2 Equipment usage rates

Carwash usage fluctuates significantly between the day, evening and night periods. Carwash usage is highly correlated with traffic volume, with peak usage occurring during peak traffic volumes. Soundscape have assessed data from a variety of carwashes to develop usage statistics for use when predicting noise impacts.

During the night period overall usage is significantly reduced, with typically usage of 2-4 auto wash and self washes across the entire night period. It is exceedingly rare that multiple pieces of equipment are operated at the same time. For the purposes of this assessment Soundscape have modelled the night period to include the simultaneous use of:

- 1x auto wash bay **OR** self wash bay
- 1x vacuum bay,
- 1x Dog wash bay and
- associated patron noise and vehicle movements

The adopted usage rates for the carwash presented in table 4.1 are based upon a busy (1st percentile) 30 minute period.

**Table 4.1:** Usage rates for carwash equipment

Source	Usage (Events per 30 mins)			Usage (% time in 30 minutes)		
	Day	Evening	Night	Day	Evening	Night
Auto-wash	8	4	1	50% <sup>1</sup>	40% <sup>2</sup>	25% <sup>3</sup>
Self-wash	7	2	1	65% <sup>4</sup>	65% <sup>5</sup>	30% <sup>6</sup>
Vacuum	8	2	1	50% <sup>7</sup>	25% <sup>8</sup>	25% <sup>9</sup>
Dog wash	8	4	1	50%	25%	25%

- 1) 8 wash cycles spread across 4 auto-wash bays. One premium cycle is seven minutes.
- 2) 4 wash cycles spread across 3 auto-wash bays.
- 3) 1 wash cycle across auto-wash bay only.
- 4) 7 washes spread across 3 self-serve bays, with a duration of 10 minutes.
- 5) 2 washes spread across 1 self-serve bay.
- 6) 1 wash spread across one self-wash bay only.
- 7) 8 events spread across 4 vacuum bays, with duration of 7 minutes.
- 8) 2 events spread across 2 vacuum bays.
- 9) 1 event at one vacuum bay only.

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### 4.3 Sound Power Levels

The following sound power levels in table 4.2 have been adopted for the assessment:

**Table 4.2:** Sound Power Levels

Source	Octave Band Centre Frequency (Hz) (L <sub>wp</sub> )								
	63	125	250	500	1k	2k	4k	8k	dBA
Auto-wash Bay (touchless)	68	79	90	96	97	97	93	89	<b>105</b>
Auto-wash Bay (touchless) with 2mm PVC door	65	73	80	85	86	82	77	72	<b>91</b>
Self-wash bay	81	82	83	84	86	84	84	79	<b>92</b>
Vacuum (3 phase)	44	51	63	72	80	80	73	68	<b>61</b>
Dog wash	70	71	71	73	74	74	74	71	<b>82</b>
Car movement 10km/hr (SEL)	88	85	78	76	75	70	68	62	<b>88</b>
Car door closure (Lamax)	105	103	95	96	87	83	82	77	<b>96</b>
One patron speaking (normally)	54	54	60	63	56	52	48	43	<b>63</b>
One patron speaking (Loudly)	59	61	70	77	76	72	65	56	<b>80</b>
Music (cars)	78	83	81	82	76	79	65	57	<b>84</b>

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### 4.4 Noise Modelling Results

Noise modelling has been conducted using software validated against the ISO-9613 (2024) calculation methodology. The model is three dimensional, and includes the effects of reflections, ground absorption, meteorological conditions, and barriers. Noise modelling requires a simplification of real-world conditions into basic components. The layout, noise nodes, barriers, structures, and results from the noise modelling can be viewed in Appendix C.

**Table 4.2.1:** Project Noise Limits (from section 3.1)

Day	Evening	Night
50	44	39

**Table 4.2.2:** Noise modelling results – day (with recommendations)

Receiver	L <sub>Aeq</sub>	Criteria	Complies	Attenuation Required
<b>R1</b>	47	50	Yes	--
<b>R2</b>	49	50	Yes	--
<b>R3a</b>	50	50	Yes	--
<b>R3b</b>	48	50	Yes	--
<b>R4</b>	44	50	Yes	--
<b>R5a</b>	41	50	Yes	--
<b>R5b</b>	48	50	Yes	--

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**Table 4.2.3:** Noise modelling results - evening (with recommendations)

Receiver	LAeq	Criteria	Complies	Attenuation Required
<b>R1</b>	41	44.0	Yes	--
<b>R2</b>	44	44.0	Yes	--
<b>R3a</b>	45	44.0	No	1.0 <sup>1</sup>
<b>R3b</b>	44	44.0	Yes	--
<b>R4</b>	42	44.0	Yes	--
<b>R5a</b>	39	44.0	Yes	--
<b>R5b</b>	43	44.0	Yes	--

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**Table 4.2.4:** Noise modelling results – night Auto-bay (with recommendations)

Receiver	LAeq	Criteria	Complies	Attenuation Required
<b>R1</b>	32	39.0	Yes	--
<b>R2</b>	35	39.0	Yes	--
<b>R3a</b>	34	39.0	Yes	--
<b>R3b</b>	33	39.0	Yes	--
<b>R4</b>	36	39.0	Yes	--
<b>R5a</b>	33	39.0	Yes	--
<b>R5b</b>	35	39.0	Yes	--

**Table 4.2.5:** Noise modelling results – night Self-wash Bay (with recommendations)

Receiver	LAeq	Criteria	Complies	Attenuation Required
<b>R1</b>	35	39.0	Yes	--
<b>R2</b>	36	39.0	Yes	--
<b>R3a</b>	40	39.0	No	1.0 <sup>1</sup>
<b>R3b</b>	29	39.0	Yes	--
<b>R4</b>	25	39.0	Yes	--
<b>R5a</b>	24	39.0	Yes	--
<b>R5b</b>	36	39.0	Yes	--

<sup>1</sup> An exceedance of 1-3 dBA is considered a minor impact, and represents a significant reduction compared with the current operations.



## 5 Recommendations

### 5.1 Operations

In order to ensure compliance with the noise criteria and nearby residences during the evening and night periods, the following operational management practices shall be implemented.

#### Evening period

- Auto Bay 1 shall be closed (wash bay 4 as per TMC plans)
- Self-wash Bays 2 and 3 shall be closed (wash bay 2 and 3 as per TMC plans)

#### Night Period

- Auto Bay 1, 2 and 3 shall be closed (wash bay 4, 5, 6 as per TMC plans)
- Self-wash Bays 2 and 3 shall be closed (wash bay 2 and 3 as per TMC plans)
- Vacuum bays 2, 3 and 4 shall be closed
- Dog wash bays 2, 3, and 4 shall be closed

### 5.2 Equipment Modification

All Auto-wash bays (existing and proposed) must utilise rapid acoustic automatic doors on the entrance to the wash bay, with a minimum noise reduction of 12dBA RW. The auto-wash bays must be acoustically sealed so there are no gaps between the doors, walls, ceilings and roof.

Existing vacuum bay between wash bay 1 and 2 is to be removed.

### 5.3 Acoustic barriers

#### Existing fences

The existing lapped and capped timber fences were in suitable condition to remain in use. These should be inspected for gaps and/or damaged on a yearly basis and repaired. In order to further mitigate noise impacts, some walls require modification to include a minimum 10mm Perspex screen as per figure 5.1 below.

#### Additional noise barrier

A new noise barrier shall be constructed from the existing water tank up to the entrance driveway of the site (see figure 5.1 and TMC drawings). It shall be constructed of a solid material free of gaps, such as lapped-and-capped wood fence, 10mm Perspex or a proprietary product. There should be no visible gap between the water tank and barrier.

### 5.4 Waste Collection

Waste collection completed by a private contractor shall occur during the day period only.

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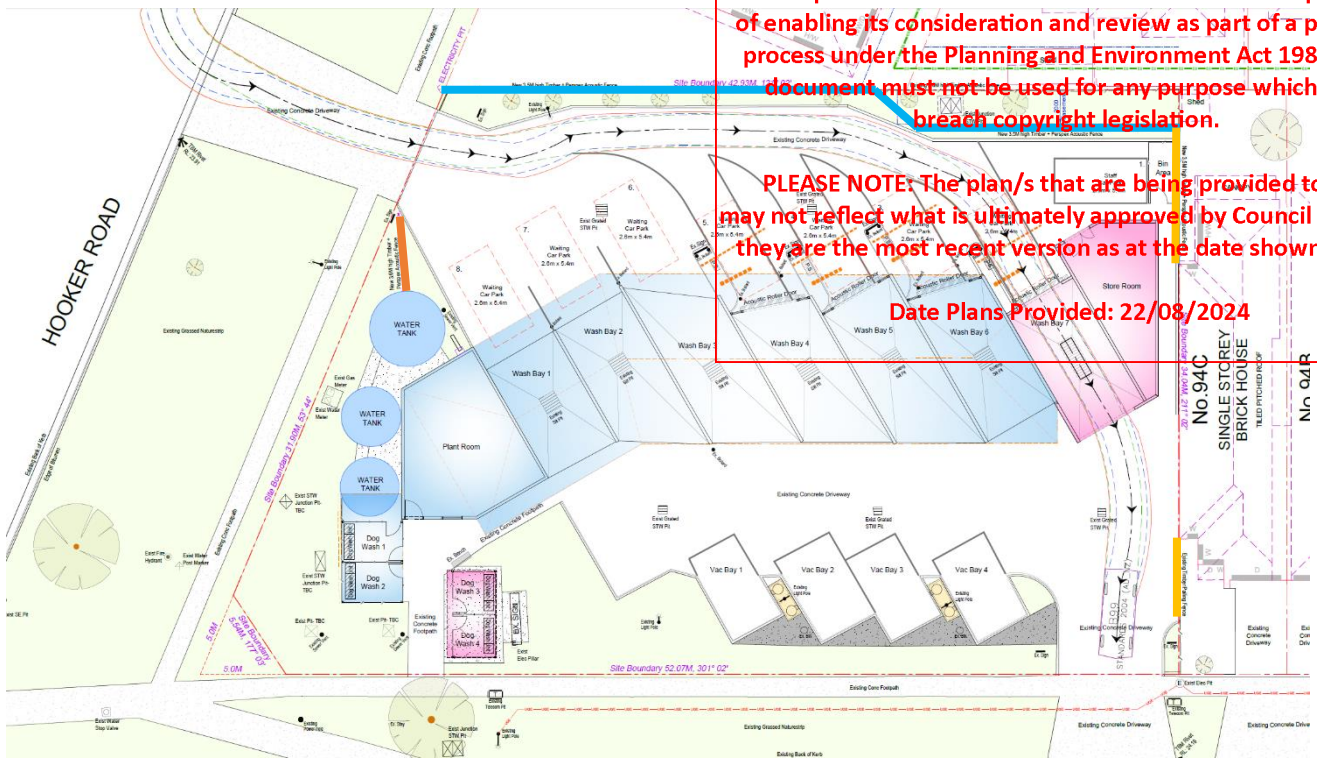
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**Figure 5.1:** Acoustic barriers (extract of appendix A)

Yellow: New barrier 2.6m high

Orange: New barrier 3.0m high

Blue: Extend existing fence to 3.5m high with min 10mm Perspex

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## 6 CONCLUSION

Soundscape Consulting Pty Ltd was commissioned by Werribee Wash Works to complete a noise impact assessment at 96 - 100 Ballan Road, Werribee. The report is to be submitted to the certifying authority as part of the development application.

The existing site contains three auto-wash bays, three self-serve bays and five vacuums. The proposal is to construct an additional auto-wash bay, two additional dog wash bays, and remove the existing northern vacuum bay (see appendix A).

A noise survey was conducted for 7 days to obtain statistical noise data at the critical location (see section 3). Noise modelling was employed to predict the noise levels at surrounding sensitive receivers for assessment against the relevant criteria (see sections 2 and 4).

Section 5 of the report provides recommendations to reduce the noise level from the development which shall be implemented (including specific equipment closures during the evening and night period). Provided these recommendations are implemented, it is our opinion that the proposed development will meet the requirements of the EPA Environment Protection (Commercial and Industrial Noise) Policy (2023) and is suitable for operating during all periods, seven days per week.

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**Plan: 17 of 29**

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## Appendix A – Client Plan Drawings

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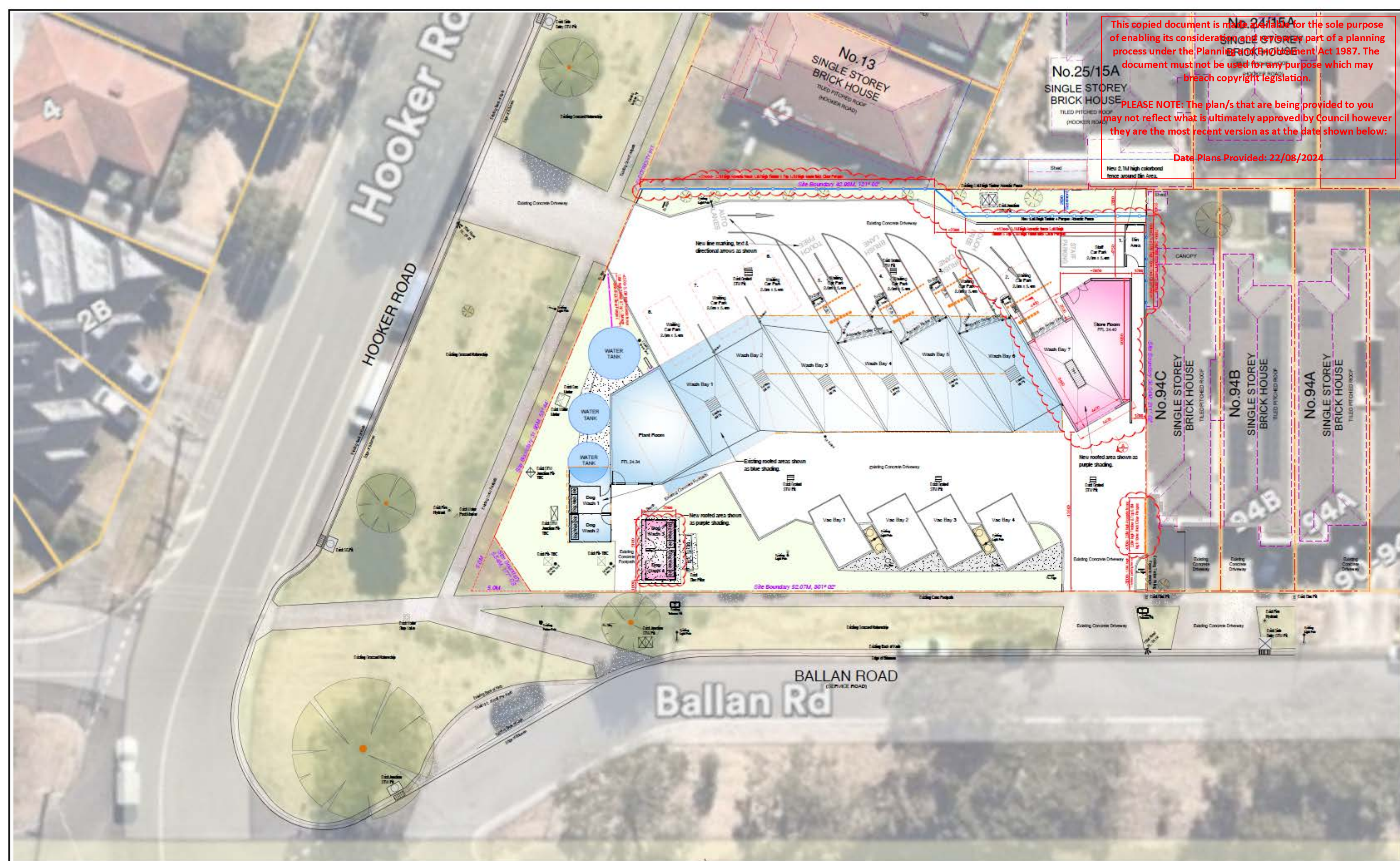
**Plan: 18 of 29**



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PROPOSED SITE LAYOUT PLAN

Scale 1 : 150

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A	Issued For Town Planning Approval	15-07-2024
ISSUE	DESCRIPTION	DATE
REVISIONS		

PRELIMINARY DRAWING

NOT TO BE USED FOR CONSTRUCTION PURPOSES

NORTH

DISCLAIMER:

The original Planning drawings previously approved (Permit No: WYP2526.06 & Approved Plans Sh: 1 to 2) has been used as a base for this Town Planning amendment submission.

TC: 12 July 2024 8:48 PM - T:\TMC\2024\24-002 Gurpreet Singh, Werribee\24-002 TP Prelim V1.DWG

PROPOSED CAR WASH ADDITION

AT: 96-100 BALLAN ROAD,  
WERRIBEE, VIC, 3030

FOR: WERRIBEE WASH WORKS

Drawn: T. MICHAELS

Designed: T. MICHAELS

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Town Planning

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Design Matters National

TMC Building Design Group

P.O. Box 3494, Morrong, VIC, 3031. Phone No. 0416 114 578

Plan: 19 of 29

Scale: 1:100 (A1)

Date: JULY 2024

Issue: A

Sheet No: 2 of 4

Job No: 24-002 TP



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## Appendix B: Noise Survey Graphs

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**Plan: 20 of 29**

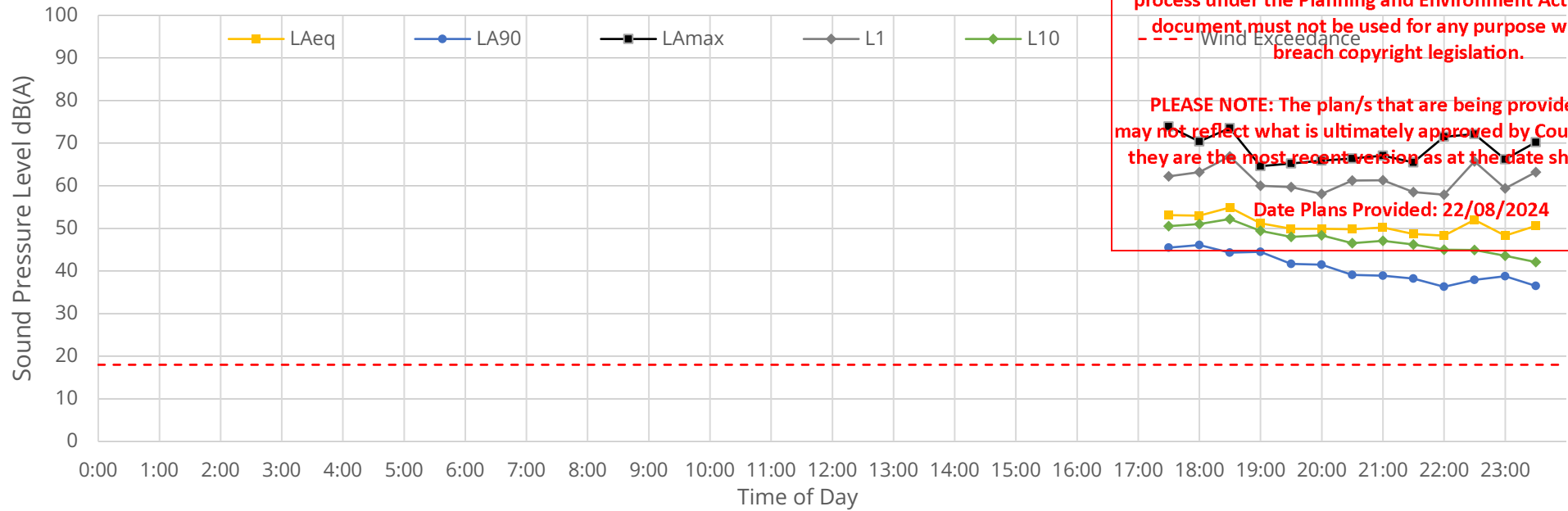


22/05/2024

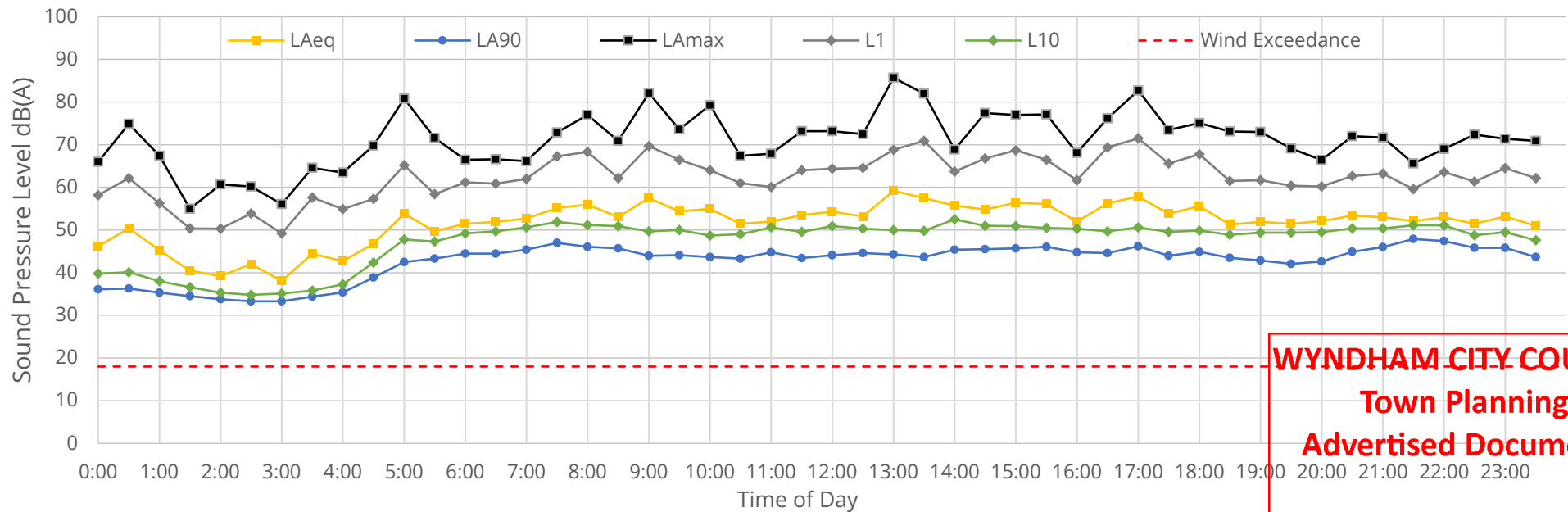
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23/05/2024



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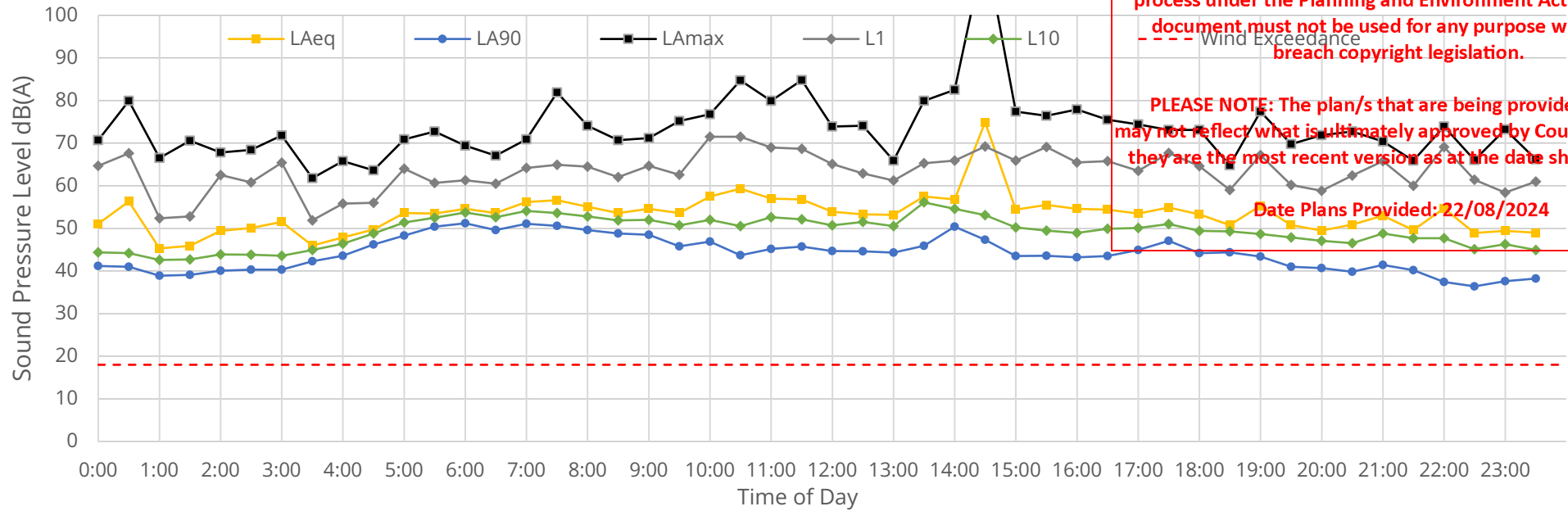
**Plan: 21 of 29**

24/05/2024

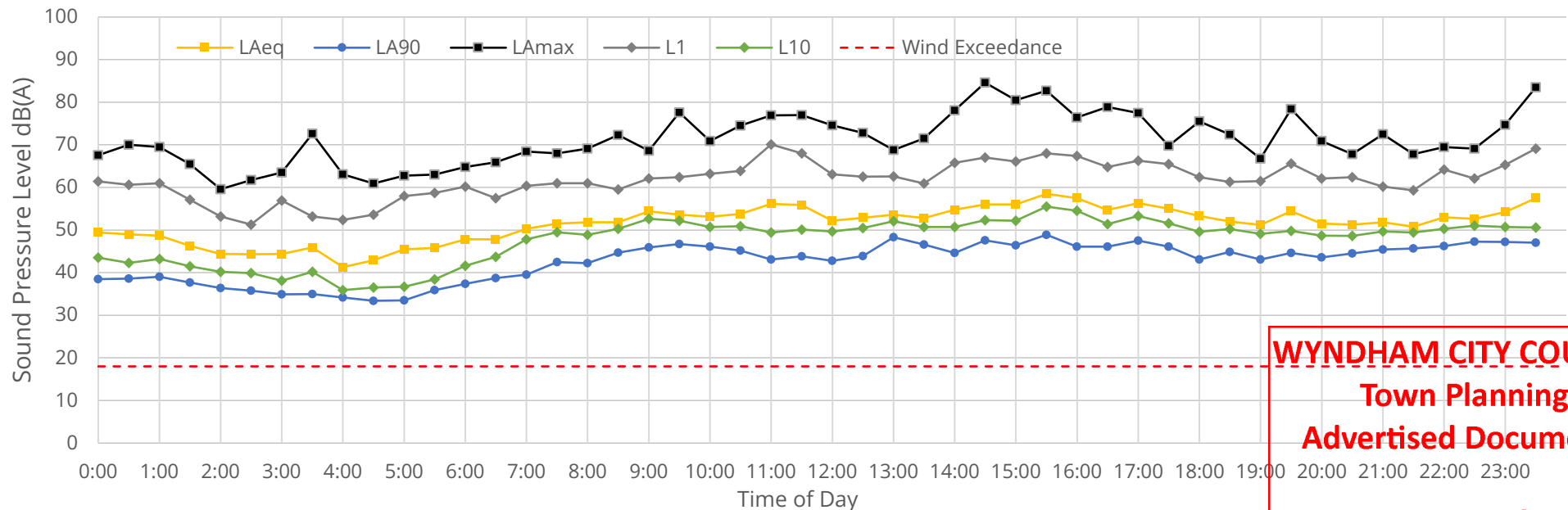
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25/05/2024



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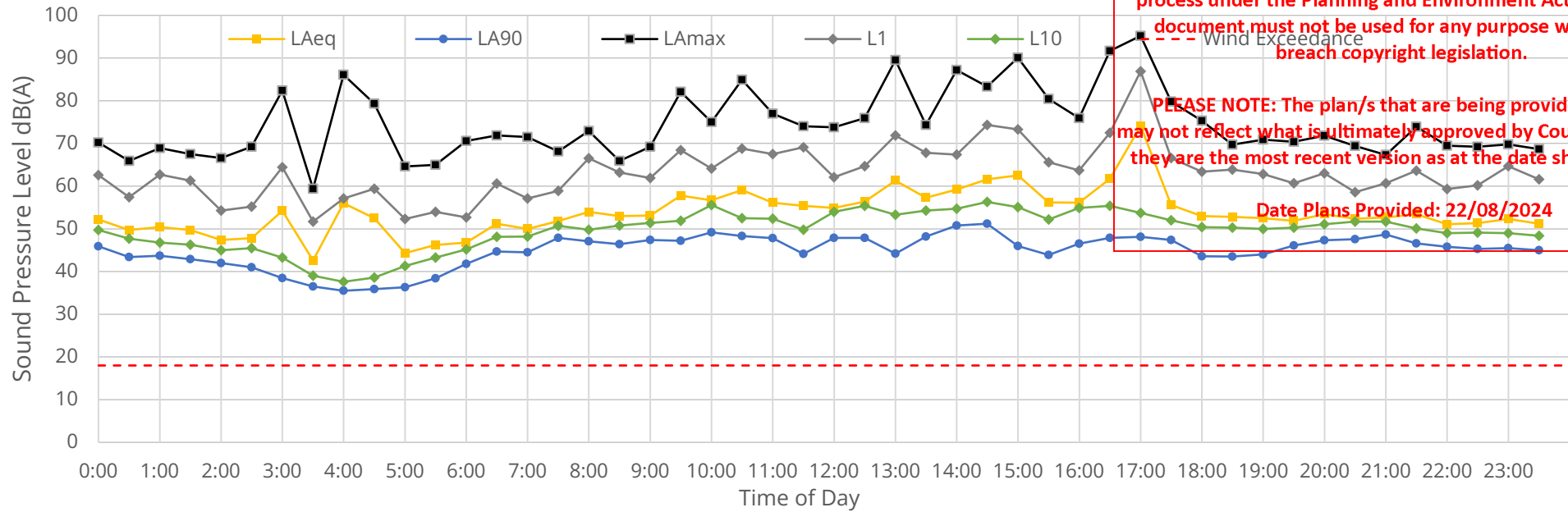
**Plan: 22 of 29**

26/05/2024

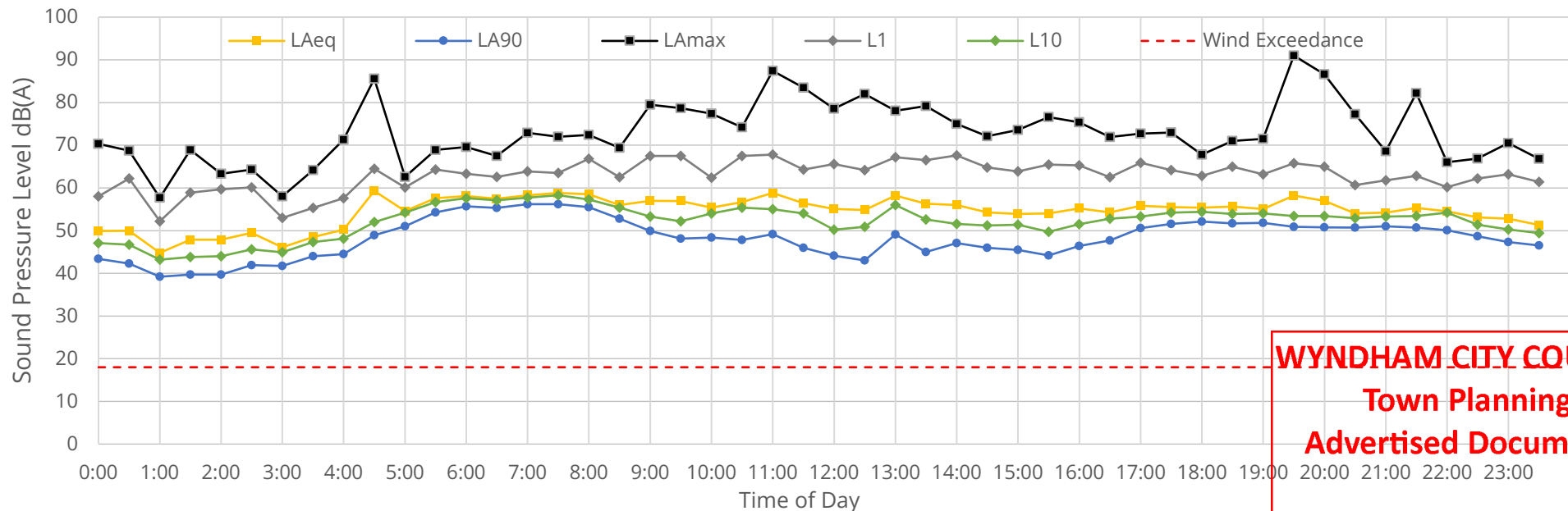
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27/05/2024



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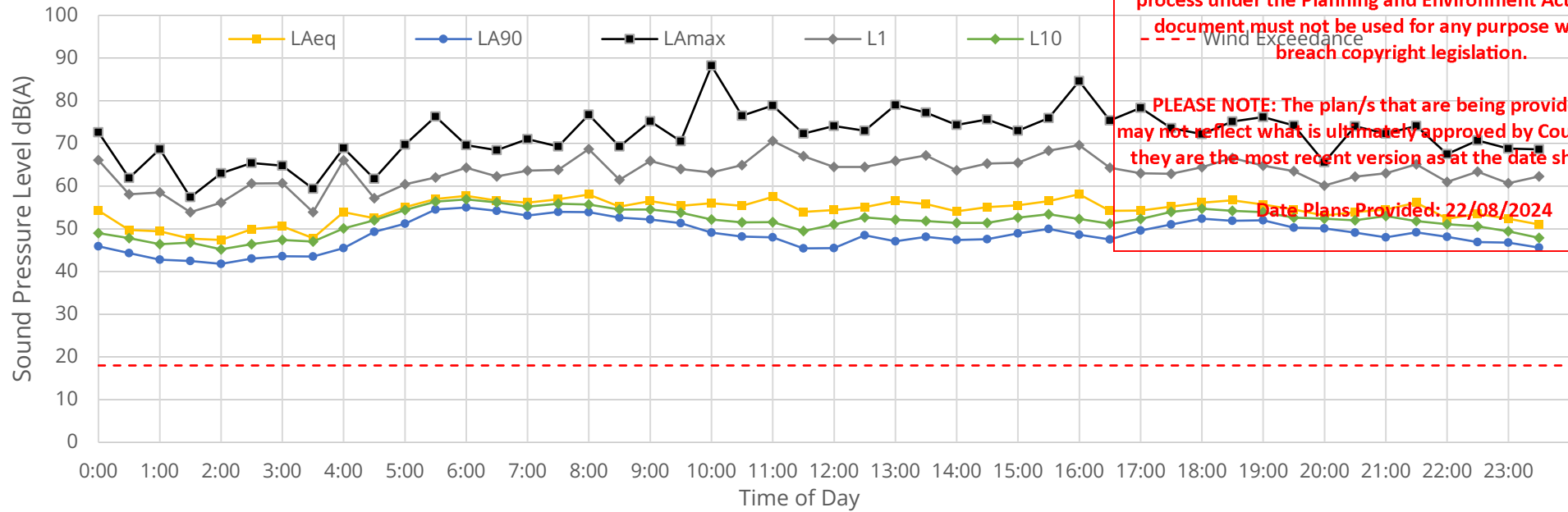
**Plan: 23 of 29**

28/05/2024

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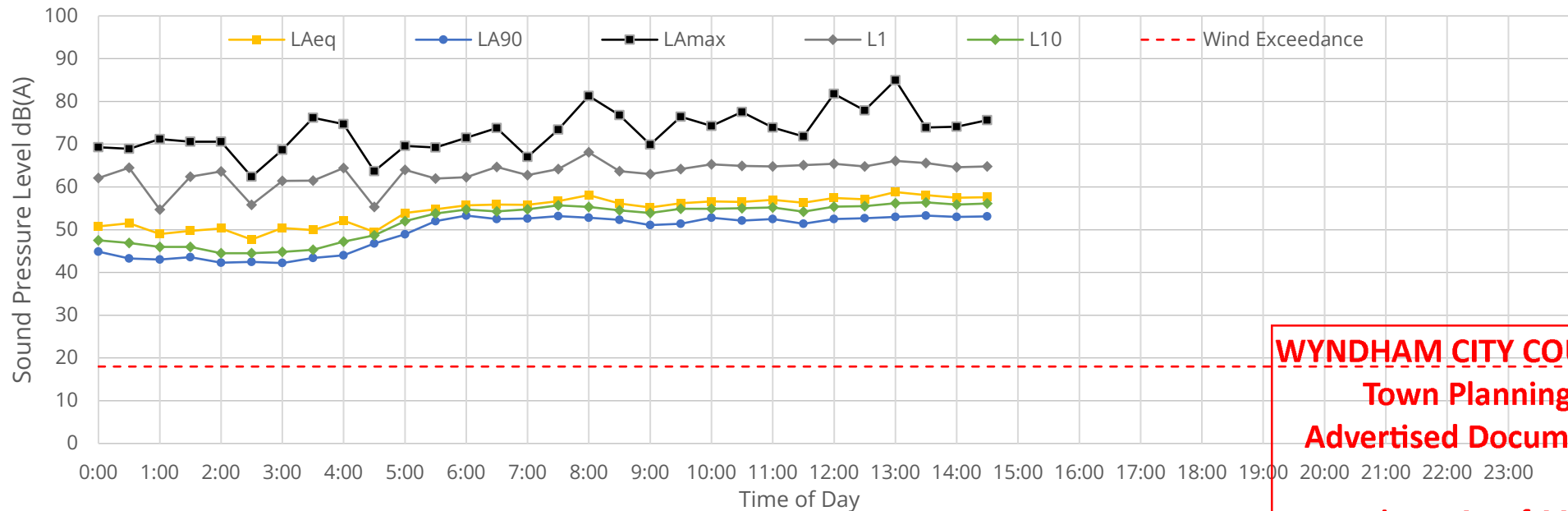
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29/05/2024

Wind Exceedance



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## Appendix C – Noise Modelling

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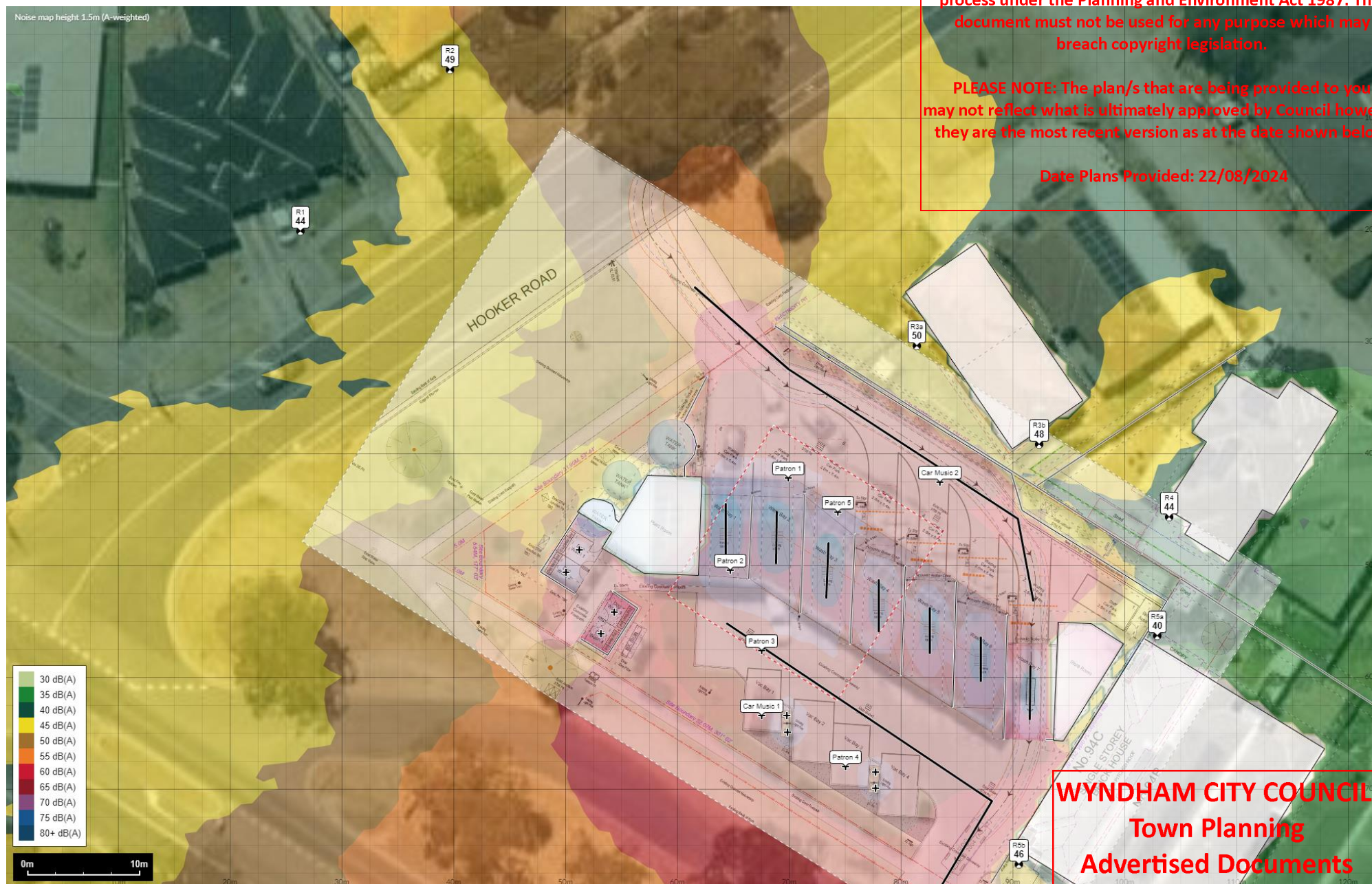
**Plan: 25 of 29**



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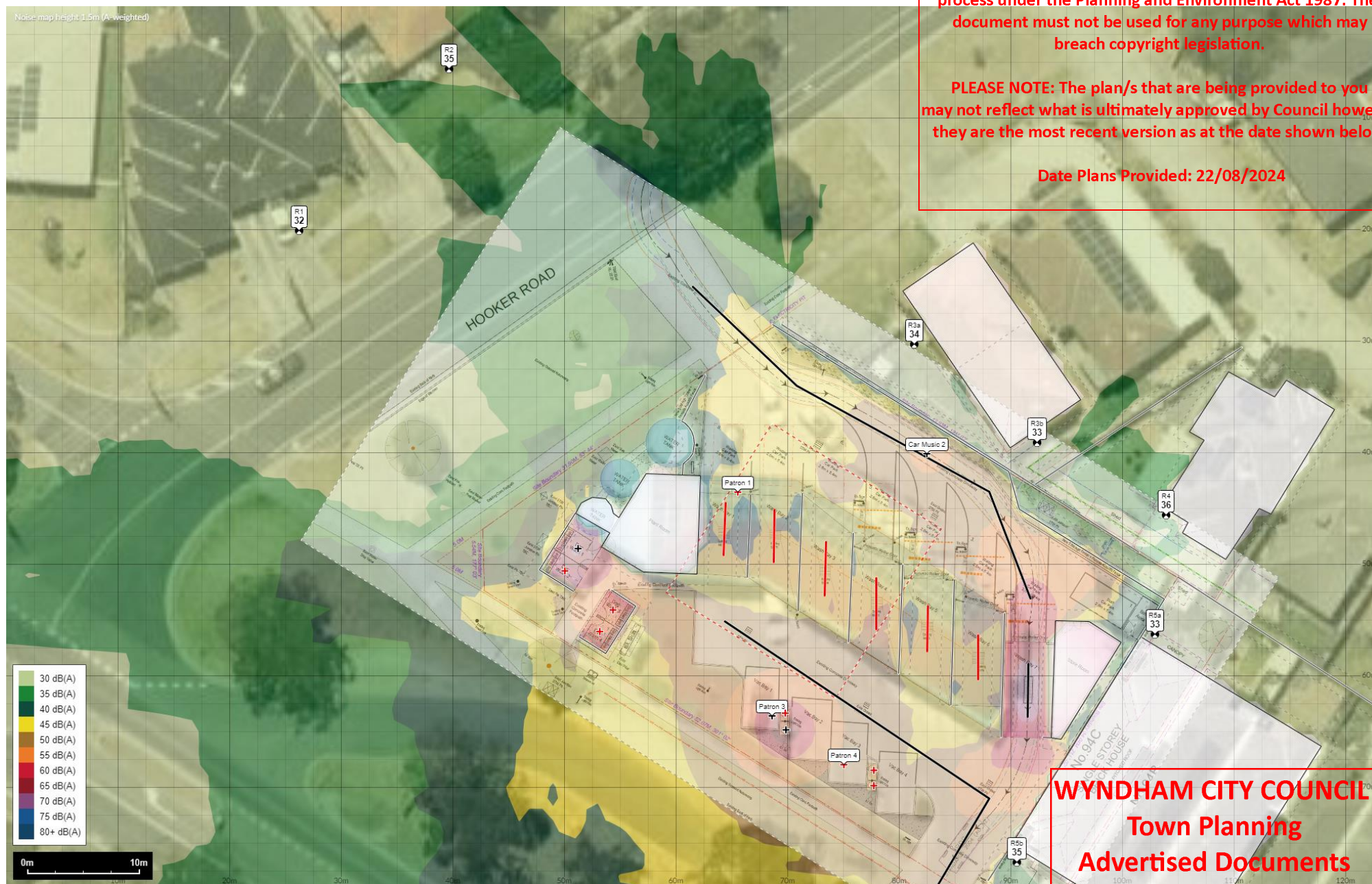
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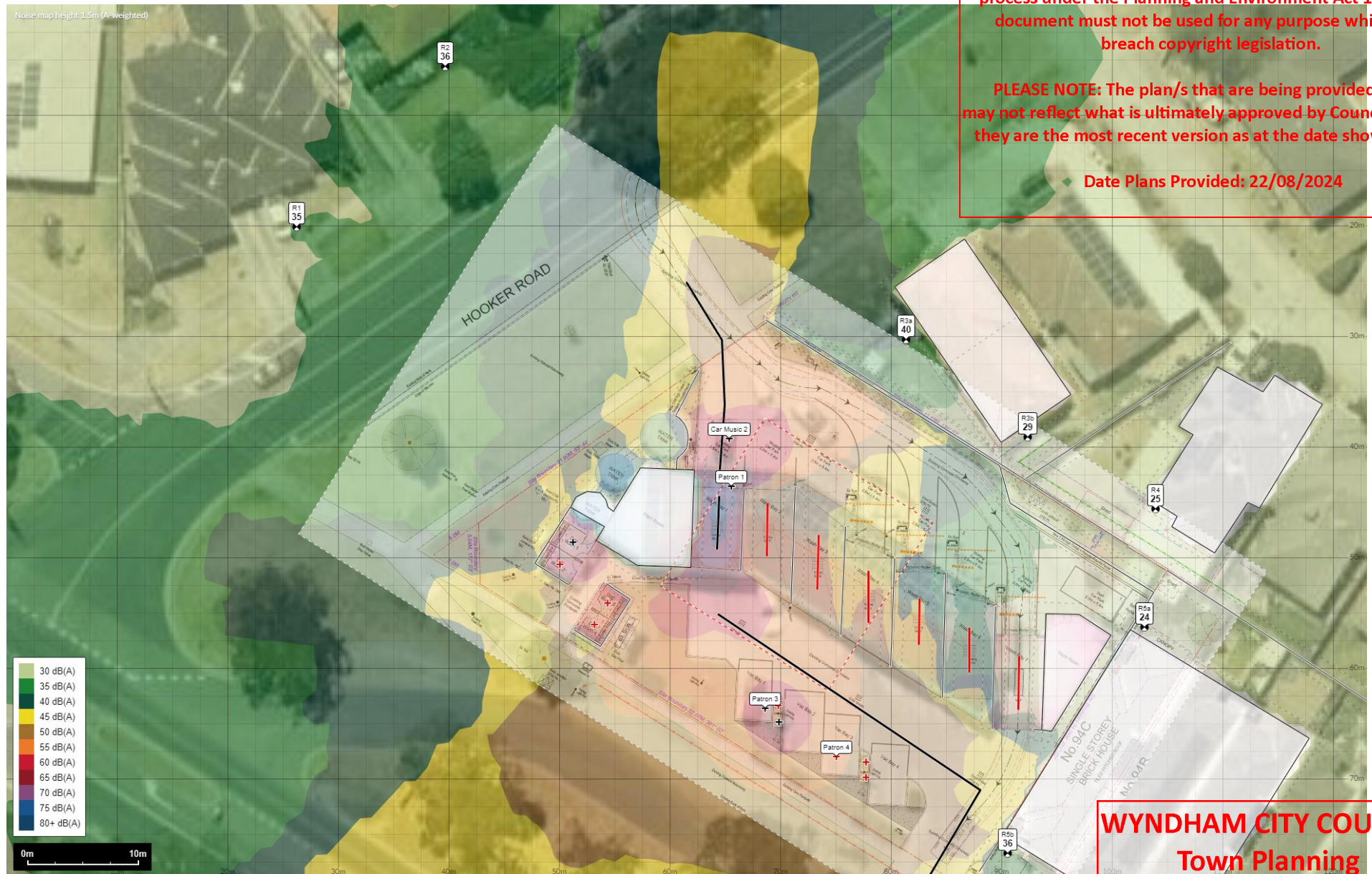
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**Plan: 29 of 29**