

Attention: Richard Nicholas

KINGSTON WAREHOUSES — NOISE ASSESSMENT

A new development is proposed at 37-59 Maranoa Road, Kingston, comprising seven warehouses and two showrooms. The development is within a General Business zone under the Kingbrough Interim Planning Scheme 2015 (the Scheme), and thus is required to demonstrate compliance with clauses 21.3.1, 21.3.2 and 21.3.4 relevant to noise. As such, a noise assessment has been requested by the developer to assess the likely compliance of the development against the Scheme. A noise assessment (23119) was previously completed by NVC in December 2023.

This version of the noise assessment (23119_01) has been amended to include noise emissions from medium vehicles and forklifts on site.

1. BACKGROUND

1.1. Site and Surrounding Area

The site is located at 37-59 Maranoa Road, Kingston, and is shown outlined in orange in Figure 1.1. The site is located within a General Business Zone (blue overlay in Figure 1.1), with other uses within this zone to the west and southwest being Kingston Town Shopping Mall and an Ampol service station, respectively. Directly northeast of the site boundary is a Community Purpose Zone (grey overlay in Figure 1.1). Directly southeast of the site boundary is a General Residential Zone (Red overlay in Figure 1.1). There is an Inner Residential Zone (dark red overlay in Figure 1.1) further to the southwest and northwest of the site.



FIGURE 1.1: SITE AND SURROUNDING AREA

1.2. Proposed Development

The proposed development comprises commercial use, and consists of seven warehouses for bulk goods sale, two showrooms and an extra 55 car parks to be added to the existing car park for Kingston Woolworths. The entrance for the site will utilise the existing entrance for Kingston Town off Maranoa Road. Figure 1.2 below shows the proposed site plan.

Operating hours for the proposed development are intended to be during daytime hours only (7:00AM to 7:00PM).



FIGURE 1.2: PROPOSED SITE PLAN

2. CRITERIA

2.1.Criteria

Section 21 of the Kingborough Interim Planning Scheme 2015 contains criteria for a General Business Zone. In particular, clauses 21.3.1, 21.3.2 and 21.3.4 detail criteria specific to noise emissions for non-residential use within a General Business Zone. These clauses are reproduced below.

21.3.1 Hours of Operation

Objective:	
To ensure that hours of operation do not have unreasonable impact on residential amenity on land within a residential zone.	
Acceptable Solutions	Performance Criteria
<p>A1</p> <p>Hours of operation of a use within 50 m of a residential zone must be within:</p> <p>(a) 6.00 am to 10.00 pm Mondays to Saturdays inclusive;</p> <p>(b) 7.00 am to 9.00 pm Sundays and Public Holidays.</p> <p>except for office and administrative tasks.</p>	<p>P1</p> <p>Hours of operation of a use within 50 m of a residential zone must not have an unreasonable impact upon the residential amenity of land in a residential zone through commercial vehicle movements, noise or other emissions that are unreasonable in their timing, duration or extent.</p>

21.3.2 Noise

Objective:	
To ensure that noise emissions do not cause environmental harm and do not have unreasonable impact on residential amenity on land within a residential zone.	
Acceptable Solutions	Performance Criteria
<p>A1</p> <p>Noise emissions measured at the boundary of a residential zone must not exceed the following:</p> <p>(a) 55dB(A) (LAeq) between the hours of 7.00 am to 7.00 pm;</p> <p>(b) 5dB(A) above the background (LA90) level or 40dB(A) (LAeq), whichever is the lower, between the hours of 7.00 pm to 7.00 am;</p> <p>(c) 65dB(A) (LAm_{ax}) at any time.</p> <p>Measurement of noise levels must be in accordance with the methods in the Tasmanian Noise Measurement Procedures Manual, second edition, July 2008, issued by the Director of Environmental Management, including adjustment of noise levels for tonality and impulsiveness.</p> <p>Noise levels are to be averaged over a 15 minute time interval.</p>	<p>P1</p> <p>Noise emissions measured at the boundary of a residential zone must not cause environmental harm within the residential zone.</p>

21.3.4 Commercial Vehicle Movements

Objective:	
To ensure that commercial vehicle movements not have unreasonable impact on residential amenity on land within a residential zone.	
Acceptable Solutions	Performance Criteria
A1	P1
Commercial vehicle movements, (including loading and unloading and garbage removal) to or from a site within 50 m of a residential zone must be within the hours of: (a) 6.00 am to 10.00 pm Mondays to Saturdays inclusive; (b) 7.00 am to 9.00 pm Sundays and public holidays.	Commercial vehicle movements, (including loading and unloading and garbage removal) to or from a site within 50 m of a residential zone must not result in unreasonable adverse impact upon residential amenity having regard to all of the following: (a) the time and duration of commercial vehicle movements; (b) the number and frequency of commercial vehicle movements; (c) the size of commercial vehicles involved; (d) the ability of the site to accommodate commercial vehicle turning movements, including the amount of reversing (including associated warning noise); (e) noise reducing structures between vehicle movement areas and dwellings; (f) the level of traffic on the road; (g) the potential for conflicts with other traffic.

2.1.Project Criteria

Based on measurements conducted by NVC, shown in Table 3.1 below, to satisfy the Acceptable Solutions clause 21.3.2-A1, noise levels at the nearest residential boundaries must be less than or equal to:

Day time	7:00AM - 7:00PM	55 dBA
Night time	7:00PM - 7:00AM	40 dBA

It is taken that, if the noise requirements under clause 21.3.2-A1 are satisfied, then clauses 21.3.1-P1 and 21.3.4-P1 will also be satisfied in regards to noise.

3. NOISE MEASUREMENTS & PREDICTIONS

3.1.Noise Measurements

Unattended noise measurements were made on site between the 22nd and the 29th of November, 2023, to quantify ambient and background noise levels in the area from local traffic and patrons coming and going from the existing Woolworths. Measurements used a Svan Type 1 sound level meter, logging in A-weighted decibels with a *Fast* response time. The data set comprised overall levels, one-third octave spectra and full statistical data at 10 minute intervals, with spectra and overall level data also recorded at 1s intervals. The measurements were made at location 1 (see Figure 1.1). This location was approximately 9 meters from the closest car parking space, and has a clear line of sight to the entrance and exit for Kingston Town, and thus is deemed to be representative of the noise levels in the area.

The measurements are summarised in Table 3.1, with Figure 3.1 showing the noise trend and spectrogram.

TABLE 3.1: SUMMARY OF NOISE LEVEL TREND

Time Period	Sound Pressure Level, dBA		
	L10	L90	LEQ
Day Time (0600 - 2000 hours)	55.0	46.7	52.8
Night Time (2000 - 0600 hours)	44.7	36.4	42.3

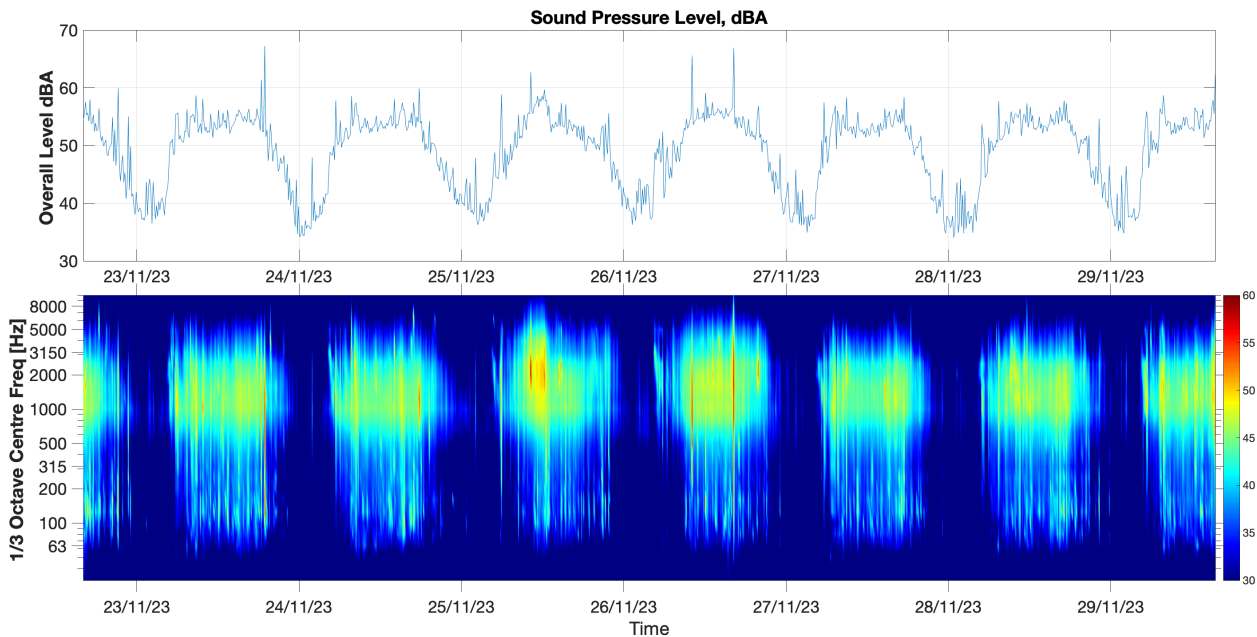


FIGURE 3.1: NOISE TREND & SPECTROGRAM

The following comments are relevant to the noise measurements:

- During NVC’s attendance on site, the dominant noise source was the traffic coming and going from the Woolworths car park, along with patron noise associated with this. It is noted the logger was set up approximately 9 meters from the closest car park.
- There was a clear line of sight to the mechanical plant associated with Woolworths; however, during NVC’s site visits, it was not audible.

3.1.Noise Predictions

Noise levels across the site have been predicted using *iNoise*¹ software, which implements the ISO9613 algorithms for environmental noise. The predictions account for geometric divergence, barrier attenuation, atmospheric absorption, reflections/screening from buildings, and ground absorption. The following assumptions have been made in the predictions:

- 1m topographical contours (from LIDAR data) have been used for the site and surrounding area.
- The primary source of vehicular noise is the tyres, and so the source is modelled as 0.5m above the road surface.
- The ground has been assumed to have a ground factor of 0.5 (50% reflective). The surroundings are a combination of foliage, carpark, roads and gravel/ earth. A 0.5 ground factor is thus deemed appropriate.
- The building façades and barrier construction are modelled with a reflection factor of 0.8 (80% reflective).
- As per the Tasmanian Noise Measurement Procedures Manual, noise levels across the site are predicted at 1.2m above ground level.
- Modelled noise emissions from within the building include patrons in the showroom.
 - Internally, patron noise is modelled assuming full capacity, based on one person per 1.5m², where 90% of the patrons are using a normal speaking voice and 10% are using a raised voice, with voice sound power levels as per the AAAC Guidelines². In this case 20 patrons have been modelled.
 - The transmission loss of the facades has been calculated assuming the worst-case (the entire facade being glazed). For these calculations, it is assumed that windows are single-glazed, using 6 mm glazing.
- Mechanical plant details have been assumed to be typical of this style of building, with the model sources comprising 3 typical air conditioning outdoor units.
 - The AC units have been modelled with a sound power level of 71 dBA each, located on the roof of the building on the southeast corner (i.e. nearest the residents). This is conservative.
- Traffic for the car park has been modelled for peak-hour flow of 55 vehicles per hour. Assuming the worst-case scenario of cars accessing all the car park spaces within a one-hour period.
 - Vehicles' sound power levels have been taken from NVC's database of previously measured data for light vehicles during low-speed manoeuvring and idling.
- Medium vehicle noise has been modelled to be representative of all 7 warehouse spaces receiving deliveries at the same time.
 - Nominally 7 vehicles per hours have been modelled to be accessing site, representative of one vehicle per warehouse space per hour.
 - Nominally 1 medium vehicle has been modelled idling for 15 minutes at the entrance of the car park during peak hour.
 - The modelled sound power level of medium vehicles has been taken from NVC's database of previously measured data for medium vehicles during low-speed manoeuvring and idling.
- Forklift noise has been modelled based on a worst case of all 7 warehouse spaces operating a forklift simultaneously and continuously for the whole of the site's operating hours.

¹ iNoise V2022.1 Pro, DGMR Software

² *Licensed Premises Noise Assessment Technical Guideline V2*, Association of Australasian Acoustic Consultants, November 2020

- Forklift sound power levels have been modelled to be 93 dBA and have been taken from NVC’s database of previously measured data for forklift movements.

The noise sources modelled are listed in Table 3.2, along with their sound power levels when they are operating. Figure 3.1 below shows the location of the modelled sources. The following is noted:

- The sound power levels are per item.

TABLE 3.2: SOURCE SOUND POWER LEVEL DATA

Source	Sound Power Level, SWL, dBA
Patrons - Internal Showroom	84
Light Vehicle (per vehicle)	77
AC (per unit)	71
Medium Vehicle (per vehicle)	102
Forklift	93

The modelled results are summarised in Table 3.3

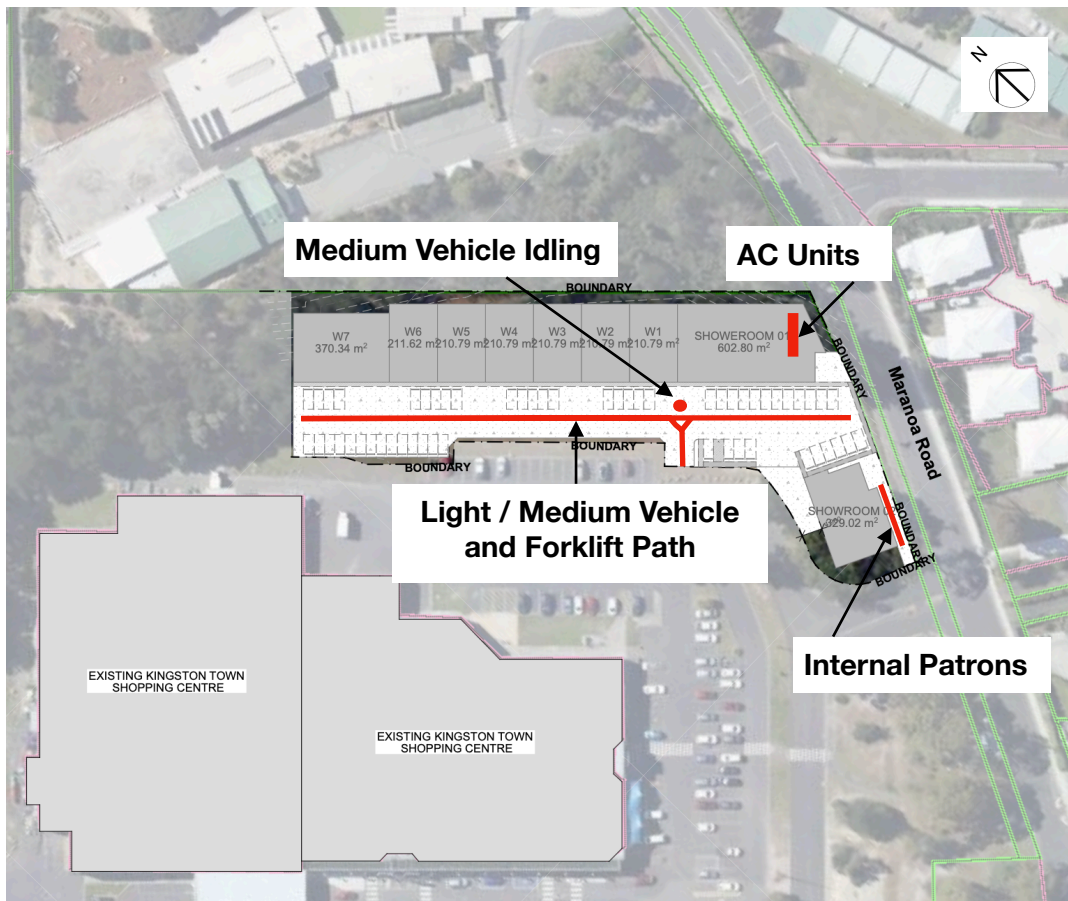


FIGURE 3.1: MODELLED NOISE SOURCES

TABLE 3.3: PREDICTED NOISE LEVELS WITHIN THE RESIDENTIAL ZONE

Noise Source	Sound Pressure Level, SPL, dBA	
	A	B
Patrons - Internal Showroom	27	35

Noise Source	Sound Pressure Level, SPL, dBA	
	A	B
Light Vehicles	17	27
AC Units	21	24
Medium Vehicles	35	45
Medium Vehicle Idling	30	26
Forklift	29	39
Total - Day Time	37	46

The following comments are relevant to the predicted results:

- See Figure 1.1, above, for the location of receivers A and B
- Noise emissions from uses internal to the building are predicted to be minimal, with other sources being dominant.
- Predicted noise levels at locations A and B are controlled by noise emissions from medium vehicles.

4. ASSESSMENT

Expected noise emissions from the proposed development at 37-59 Maraoa Road, Kingston, have been predicted using a software noise model. The modelled sources include the building mechanical plant, light vehicle movements for patrons visiting the warehouses and showrooms, medium vehicles on site for deliveries, forklifts manoeuvring around the site and patrons in the showroom. The predicted noise emissions from each source are outlined in section 3 of this report.

All noise sources have been predicted to be significantly below the daytime criterion of 55 dBA. Therefore, the proposal demonstrates likely compliance with Clauses 21.3.1-A1, 21.3.2-A1 and 21.3.4-A1 of the Kingborough Interim Planning Scheme 2015, provided the hours of operation are limited to daytime use, 7:00AM to 7:00PM, and no commercial vehicles access the site outside of 6:00AM to 10:00PM according to the Scheme.

Should you have any queries, please do not hesitate to contact me directly.

Kind regards,



Samuel Williamson

