



Report Number: AC23341 – 02 – R4

# Woolworths New Zealand Rolleston South

## Assessment of Environmental Noise Effects




*Prepared for:*  
Daniel Shao  
Woolworths New Zealand Ltd

*Issued:*  
16 February 2024

## Revision History

Reference	Status	Date
AC23341 – 02 – D1	DRAFT	19 January 2024
AC23341 – 02 – R1	Revision 1	26 January 2024
AC23341 – 02 – R2	Revision 2	2 February 2024
AC23341 – 02 – R3	Revision 3	8 February 2024
AC23341 – 02 – R4	Revision 4	16 February 2024

## Document Acceptance

Author	Signature
Mr Robin Chen BE Hons (Mech) Acoustic Engineer	
Reviewer	Signature
Mr William Reeve BE Hons (Mech) MASNZ Senior Associate	
Approver	Signature
Dr Jeremy Trevathan Ph.D. B.E.(Hons.) Assoc. NZPI@ MASNZ Managing Director	



*This report has been prepared by Acoustic Engineering Services Limited based on specific instructions including conditions and limitations with our Client. It is solely for our Client's use, for the purposes of which it is in accordance with the agreed scope of works. The concepts and information contained within this document remain the property of Acoustic Engineering Services Limited. Any use or reliance by any person contrary to the above of this report in whole or in part, to which Acoustic Engineering Services Limited has not given its prior written consent, is at that person's own risk, and may constitute an infringement of copyright in accordance with New Zealand Copyright Act 1994.*

## Table of Contents

<b>1.0</b>	<b>BACKGROUND .....</b>	<b>1</b>
1.1	Site and proposal.....	1
<b>2.0</b>	<b>ACOUSTIC CRITERIA.....</b>	<b>4</b>
2.1	Partially Operative Selwyn District Plan.....	4
2.2	New Zealand Standard NZS 6802:2008 .....	5
2.3	World Health Organisation .....	5
2.4	Existing noise environment .....	5
2.5	Discussion regarding appropriate noise levels .....	6
<b>3.0</b>	<b>NOISE GENERATED BY THE ACTIVITY .....</b>	<b>7</b>
3.1	Noise sources .....	7
3.2	Expected noise levels .....	9
<b>4.0</b>	<b>CONSTRUCTION NOISE.....</b>	<b>12</b>
<b>5.0</b>	<b>CONCLUSION .....</b>	<b>13</b>

*This page has been left intentionally blank.*

## 1.0 BACKGROUND

Acoustic Engineering Services Ltd (AES) have been engaged to provide acoustic engineering advice relating to a Resource Consent application for a proposed supermarket to be located at Goulds Road, in Faringdon, Rolleston. The Applicant requires an Assessment of Environmental Noise Effects (AENE) for the activity with regard to section 104 (1) of the Resource Management Act (RMA), which requires the actual and potential effects of the activity to be considered.

We have based our analysis on our correspondence to date, along with the following documentation:

- Faringdon Oval site plan titled *Hughes Developments Limited, Faringdon Oval, Rolleston*, as prepared by Davie Lovell-Smith, and dated January 2023.
- Proposed site plan titled *Rolleston South – Faringdon Oval*, as prepared by ASC Architects and dated the 29<sup>th</sup> of November 2023.
- Site analysis plan titled *Rolleston South – Faringdon Oval*, as prepared by ASC Architects and dated the 29<sup>th</sup> of November 2023.
- Landscape plan for project *Woolworths Supermarket*, Draft Issue, as prepared by Kamo Marsh Landscape Architects and dated the 26<sup>th</sup> of January 2024.

### 1.1 Site and proposal

The proposal is to establish a supermarket with a floor area of 3,500 m<sup>2</sup> (excluding canopy and staff mezzanine), two to four small scale retail tenancies within a total floor area of 380 m<sup>2</sup>, and a carpark. The supermarket and associated retail will operate between 0700 – 2200 hours daily and will include an online order pick-up drive through on the eastern side of the supermarket with courier van parks to the left of that. The development will be located within a portion of Stage 11 of the Faringdon Oval subdivision and will be bordered by residential lots located within the same stage, across the future road designation in stage 2, and across Goulds Road.

Faringdon Oval involves subdividing and developing land between Rangatira Street, Goulds Road, and Dunns Crossing Road, with legal description Lots 1 & 3 DP 57004, Lot 1 DP 61278, Lot 3 DP 70352 and Lots 1 & 2 RC 225693. The subdivision will consist of 26 stages with the intent to provide 1,146 houses, a modest neighbourhood centre, and associated infrastructure and amenities.

Under the Partially Operative Selwyn District Plan (PODP), the site is zoned General Rural. All nearby sites across Goulds Road, East Maddisons Road, and Rangatira Street, including on Jacobs Lane and Edgar Way, are zoned Medium Density Residential under the PODP. The closest rural dwellings are at 92 and 108 Dunns Crossing Road.

The site is zoned General Rural Zone. However, it is subject to the Fast Track Consent and surrounded by residential and commercial zoned land. Therefore, the proposal site and surrounding area is effectively an urban environment.

We have been advised that the wider subdivision landowner has provided Affected Persons Approval for this Application.

The overall Faringdon Oval masterplan is shown in figure 1.1 below. Figure 1.2 shows the location of the proposed supermarket within that subdivision, with indicative residential lot boundaries shown. The figure also shows the layout of the supermarket, including the location of the carpark and loading area.

The proposal includes a 2.3-metre-high acoustic fence on the southern boundary of the supermarket site at the residential interface. In order to be acoustically effective, the fencing will need to meet the following



minimum specifications (as has been identified and volunteered as a condition of Consent – refer Section 4 of this Report):

- Surface mass – at least 10 kg/m<sup>2</sup>
- The fence must be continuous and maintained with no gaps or cracks. For timber fences, this will require palings to be well overlapped (25 mm minimum) or a “board and batten” system, and a sleeper rail connecting the base of the palings to the ground. We also recommend a paling thickness of at least 25 mm to help resist warping.
- Suitable fencing materials which are commonly used include 25 mm timber, 9 mm fibre cement, 19 mm plywood, masonry, and concrete, or a combination of the above.



Figure 1.1 – Overall Faringdon Oval site

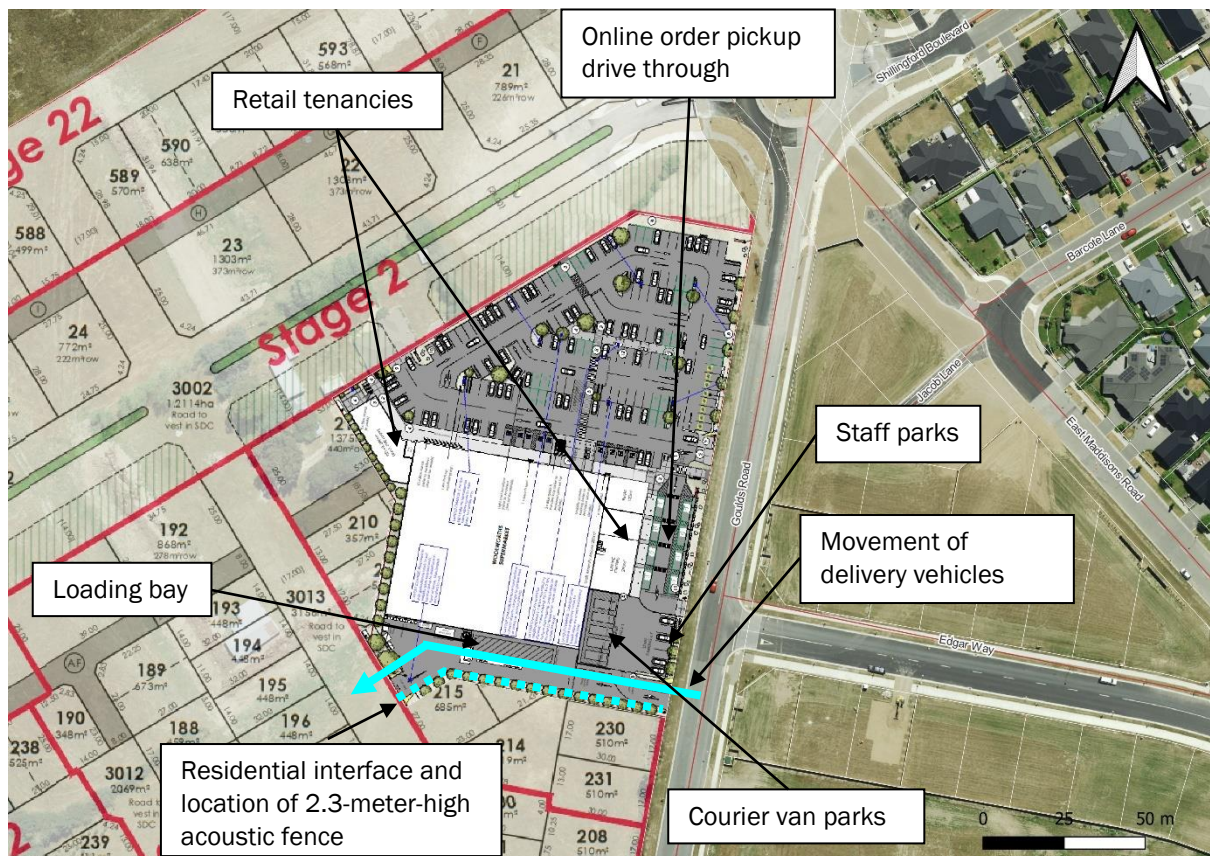


Figure 1.2 – Site plan



## 2.0 ACOUSTIC CRITERIA

The Resource Management Act 1991 requires consideration of the significance of any adverse effects associated with the proposal. Guidance as to the significance of any adverse noise effects may be obtained from several sources.

As noted above the site and some of the surrounding land is zoned GRUZ but is subject to a consent for residential development. Further, the development is one of a commercial nature. Where this is the case the noise provisions for GRUZ receivers will technically apply. However, the Council may wish to be guided by the future residential and Commercial and Mixed Use (CMUZ) noise standards for the purpose of its effects assessment. Therefore, both the GRUZ related noise provisions and the residential and CMUZ noise standards have been assessed.

### 2.1 Partially Operative Selwyn District Plan

As noted above, although the existing zoning of the site and nearby sites to the west are Rural, residential development is also consented on the proposal site. The PODP noise provisions that would apply to nearby sites under the current zoning can be found in NOISE-TABLE5 with the relevant sections reproduced below.

**Table 2.1 – PODP noise provisions that apply given the current zoning**

Zone of the site generating noise	Zone of the site receiving noise	Assessment location	Hours and Limits
All zones	All residential zones	At any point with any site receiving noise	0700 to 2200: 50 dB $L_{Aeq(15min)}$ 2200 to 0700: 40 dB $L_{Aeq(15min)}$ / 70 dB $L_{AFmax}$
General Rural Zone (GRUZ)	GRUZ	At the notional boundary of any noise sensitive activity within any site receiving noise	0700 to 2200: 55 dB $L_{Aeq(15min)}$ 2200 to 0700: 45 dB $L_{Aeq(15min)}$ / 70 dB $L_{AFmax}$

The Selwyn District Plan defines the notional boundary as ‘...a line 20 metres from any side of a residential unit or other building used for a noise sensitive activity, or the legal boundary where this is closer to such a building’.

Since the Fast Track site is currently zoned GRUZ, a less stringent set of noise limits would apply at dwellings establishing on sites on the Fast Track site, compared to those in existing residential zones across Goulds Road, or Rangatira Street.

However, as the noise limits at residentially zoned sites are not dependent on what zoning the noise is generated in, the same controls would apply at residential sites if the Fast Track site were considered against a more urban zoning framework (i.e. it had residential, or commercial / mixed use zone types).

While none currently exist in the vicinity, if the Woolworths site were considered against the framework used for commercial or mixed-use zoned sites, there would be a less stringent set of noise limits applicable to other sites in a similar commercial or mixed-use zone. In that case a daytime limit of 60 dB  $L_{Aeq(15min)}$  (between 0700 to 2200 hours) and a night-time limit of 45 dB  $L_{Aeq(15min)}$  (between 2200 to 0700 hours) would be relevant.



## 2.2 New Zealand Standard NZS 6802:2008

NZS 6802:2008 *Acoustics – Environmental noise* outlines a guideline daytime limit of 55 dB  $L_{Aeq(15\text{ min})}$  and night-time noise limits of 45 dB  $L_{Aeq(15\text{ min})}$  / 75 dB  $L_{AFmax}$  for “the reasonable protection of health and amenity associated with the use of land for residential purposes”.

For town centres and mixed-use areas NZS 6802:2008 offers a guideline daytime and night-time limit of 60 dB  $L_{Aeq}$  for non-residential receivers.

For ‘mixed-use’ areas where there are no existing residential units, NZS 6802 suggests that a 24-hour limit of 60 dB  $L_{Aeq(15\text{ min})}$  may be appropriate.

The Standard also describes how a -3 dB adjustment may be applied to sound received for less than 50% of the daytime period, and a -5 dB adjustment may be applied to sound received for less than 30% of the daytime period.

Where the level of sound reduces significantly for large periods of time but does not stop completely, an energy average can be calculated across the whole daytime period, with a reduction of up to 5 dB permitted. No such adjustment is permitted for the night-time period.

## 2.3 World Health Organisation

*Guidelines for Community Noise*<sup>1</sup>, a document produced by the World Health Organisation (WHO) based on extensive international research recommends a guideline limit of 55 dB  $L_{Aeq}$  to ensure few people are seriously annoyed in residential situations. A guideline limit of 50 dB  $L_{Aeq}$  is recommended to prevent moderate annoyance.

Guideline night-time limits of 45 dB  $L_{Aeq}$  / 60 dB  $L_{AFmax}$  are recommended to allow occupants to sleep with windows open and meet internal limits of 30 dB  $L_{Aeq}$  / 45 dB  $L_{AFmax}$  within bedrooms to avoid sleep disturbance.

These guideline noise levels are measured at the façade of dwellings and other noise sensitive locations and the  $L_{Aeq}$  limits apply for 16 hours in the daytime, and 8 hours for the night-time.

The WHO also recommends a 24 hour noise limit of 70 dB  $L_{Aeq}$  for “industrial, commercial, shopping and traffic areas.”

## 2.4 Existing noise environment

William Reeve of AES visited the proposed site location on the 17<sup>th</sup> of January 2024 (a Wednesday) to observe the ambient environment between 0900 and 0945 hours, to give an indication of the background noise levels of the surrounding area at a time relevant to the operation of the supermarket. Noise measurements were taken in general accordance with NZS 6801:2008 *Acoustics – Measurement of Environmental Sound*.

At the first measurement location, west of the Goulds Road and Shillingford Boulevard roundabout, noise from low-speed vehicles negotiating the roundabout (3 to 4 a minute), and children playing at the nearby Neemo Childcare Centre were the dominant sources in the area. A level of 52 dB  $L_{Aeq}$  was measured at this location.

Further south on Goulds Road, vehicles were travelling faster, and a level of 60 dB  $L_{Aeq}$  was measured at a location approximately 10 metres from the road. Noise from construction on several new dwellings in the

---

<sup>1</sup> Edited by Berglund, B et al. *Guidelines for community noise*. World Health Organization 1999.

wider area (nail guns in particular), and an aircraft overflight also influenced the measurement results at this location.

Background noise levels at both locations in the absence of more transient sources such as traffic noise were lower, with a level of 43 dB  $L_{A90}$  observed. We expect that traffic on Goulds Road (a Collector road), and therefore background noise levels in the area will continue to increase as more residential development is completed in this area. Sites which are further from major roads will receive lower noise levels. For example, in our experience it is not uncommon for ambient noise levels at locations close to neighbourhood centres and collector roads to be in the order of 55 – 60 dB  $L_{Aeq}$  during the daytime, and 45 – 50 dB  $L_{Aeq}$  around 2200 hours during the night-time period. We expect noise levels in the area may approach these values in the future.

## **2.5 Discussion regarding appropriate noise levels**

For sites in existing residential zones (across Goulds Road and Rangatira Street) we note that the applicable District Plan noise limits are 5 dB more stringent than the upper guideline limits outlined in national and international guidance for the protection of residential amenity. However, the District Plan daytime limit is consistent with the lower guideline limit outlined in the WHO guidance.

Based on the above we consider that where noise from the proposed activity complies with the residential District Plan limit of 50 dB  $L_{Aeq(15min)}$  at the site boundary of any residentially zoned site, noise effects will be less than minor. Noise levels which remain below the upper guideline daytime value of 55 dB  $L_{Aeq}$  outlined in NZS 6802 will also result in less than minor adverse noise effects at locations close to Goulds Road that are exposed to higher levels of traffic noise.

Given the current rural zoning, a daytime limit of 55 dB  $L_{Aeq}$  would apply at sites containing dwellings establishing within the Faringdon Oval development. As above, since this limit is consistent with upper guideline limits for the protection of residential amenity, we consider that compliance with this limit would result in less than minor adverse noise effects for residential use of nearby sites. We also understand that potential purchasers of these lots will be made aware of the supermarket location.

During the night-time period compliance with the District Plan noise limits for residential zones of 40 dB  $L_{Aeq}$  / 70 dB  $L_{AFmax}$  would also ensure that noise effects are minimal. However, if there is a small exceedance of this limit (in the order of 2 dB) arising from a small number of customers, or staff departing the site after 10 pm, this is expected to continue to have a less than minor effect, in the context of potential traffic volumes on Goulds Road.

Given the current rural zoning, night-time limits of 45 dB  $L_{Aeq}$  / 70 dB  $L_{AFmax}$  would apply at sites where dwellings (or other noise sensitive uses) establish within the Faringdon Oval development. Since compliance with these limits would mean that noise levels remain consistent with residential guideline values appropriate to provide protection against sleep disturbance, we consider that any noise effects arising would be less than minor.

### 3.0 NOISE GENERATED BY THE ACTIVITY

We have assessed noise from the types of activities that are likely to be associated with this development. Key noise sources are expected to be as follows:

- Noise associated with the back of house operations. This includes service and goods vehicles using the loading bay for deliveries and rubbish collection, forklifts to unload and move pallets, courier vans.
- Noise associated with the carpark and online order pickup drive through, including customers and delivery vehicles travelling on the site and using the carpark (engine noise, exhaust noise, road/tyre noise and the like).
- Noise associated with courier vans entering and exiting the site.
- Mechanical plant noise associated with the various activities including outdoor condensers and extract systems.
- Although the tenants for the small-scale retail tenancies have not yet been confirmed there may potentially be breakout noise from music and people for hospitality tenancies (i.e., cafés, restaurants).

SoundPlan computational noise modelling based on ISO 9613 *Acoustics – Attenuation of sound outdoors – Part 2: General method of calculation* has been used to calculate the propagation of noise from the site, accounting for screening from buildings and site fencing, worst-case downwind conditions, and sound power levels for each of the noise sources.

#### 3.1 Noise sources

##### 3.1.1 Carpark

The carpark will be located on the northern side of the site, accessed via either Goulds Road from the east or a future internal road designation to the north. There are 184 customer carparks (which includes 8 drive through parks), and 7 staff parks.

The predominant noise associated with the carpark will be from vehicle movements. Calculations of vehicle movements in the carpark have been based on the method described in *Parking Area Noise, 6<sup>th</sup> Edition* produced by the Bavarian State Agency for Environment (2007), implemented into SoundPlan. We have used separated driving lanes, assuming each vehicle movement generates a sound power of 85 dB L<sub>WA</sub> when travelling at 10 km/hr. A single movement has been assumed to be a car entering the carpark, stopping in a parking space at random, and exiting the carpark.

Based on correspondence with the traffic engineer we have based our modelling on there being up to 450 – 500 vehicles entering and exiting the carpark in a peak one hour period, and around 2,650 vehicles over the period of an entire day. Traffic volumes in the carpark are expected to gradually increase throughout the day, peaking between 1700 – 1800 hours before rapidly tapering off towards closing time.

##### 3.1.2 Loading Bay

The loading bay is located on the southern side of the supermarket as shown in figure 1.2. Delivery vehicles will access the loading bay via Goulds Road and exit onto the future internal road designation.

We understand from correspondence with Woolworths that there may be up to 10 – 15 truck deliveries per day. Three of these will be 23 meter long truck and trailers from Woolworths distribution centres, and the rest will be direct deliveries from suppliers. The largest trucks may be up to 4.3 meters at the highest point. Refrigeration units (for trucks that require them) will be located just below the highest point of the truck, on top of the cab.

Truck deliveries will occur during the daytime period and generally fall between 0700 and 1600 hours. Woolworths has advised that whilst trucks may leave their engines running for quick drop offs, trucks that require a longer period to unload goods (more than 5 minutes) will turn off their engines during unloading. Refrigeration units will also be turned off when unloading to avoid triggering the defrost / condensation cycle of the truck. We have based our analysis on the assumption that these managerial measures are complied with.

As noted above the amount of time taken for deliveries will vary. Some longer deliveries may take up to around 30 minutes, but on the other hand, shorter deliveries may take less than 5 minutes. For the purposes of this assessment this means that for the majority of the day there will be minimal heavy vehicle activity in the loading bay, with noise mostly only expected from the movement of pallets and general unpacking activity.

Based on past measurements and our experience with similar operations, we have assumed that the loudest delivery vehicle to arrive at the site will have a sound power of 110 dB  $L_{WA}$  when moving, and 100 dB  $L_{WA}$  when idling. We have assumed a sound power of 98 dB  $L_{WA}$  for a refrigeration unit located on top of the cab as the truck drives through the site.

Goods will be unloaded manually and through the use of forklifts. We have been advised by Woolworths that they are moving towards a new fleet of electric forklifts for this development. In our experience the noise produced by the motors of electric forklifts will be negligible compared to the other expected noise sources in the loading bay area. We recommend that a condition is adopted to ensure that non-tonal reversing alarms are fitted to the forklifts.

### **3.1.3 Online order pickup drive through**

On the eastern side of the supermarket there will be a dedicated online order pick up drive through area for up to eight customer vehicles at any one time. Customers will drive into the site via the customer carpark entrance, park (or idle) their cars, have their online order delivered to them by supermarket staff, and then depart the site via a back entrance. Compared to the main customer carpark (which has in the order of 24 times more parking spaces) vehicle movements in this location are not expected to contribute meaningfully to the overall noise emissions. Regardless, we have investigated all eight loading spots filling and emptying twice in a 15 minute period, based on a vehicle with a sound power of 85 dB  $L_{WA}$ , travelling at 10 km/hr. We expect this to be a conservative estimate given that Woolworths typically provide half an hour slots for customers to pick up orders from lockers at other sites across the country.

### **3.1.4 Courier vans**

Courier vans will both enter and exit the site via the same entrance as the heavy vehicle deliveries. We have assessed all 5 courier van spots filling and emptying once in a 15 minute period. We have based our analysis on a medium to heavy motor vehicle with a sound power of 95 dB  $L_{WA}$ , travelling at 10 km/hr.

### **3.1.5 Small scale retail activity**

As noted above, the exact tenants for the three small scale retail tenancies have not been confirmed. However, we understand that there is currently no intent to restrict the nature of activity. In our experience small scale retail tenancies such as a takeaway or post office would produce a minimal level of noise. However, tenants such as cafés, restaurants, and gyms may produce noise via breakout from people and music. We have assumed a worse-case internal reverberant level within these tenancies of 80 dB  $L_{Aeq}$ , operating continuously throughout the day. This level of noise is representative of a high level of internal capacity and with respect to noise emissions is expected to represent a 'worse-case' tenant.

### **3.1.6 Mechanical Plant**

We understand that external mechanical plant for the development is yet to be confirmed at this stage. However, it is likely to include chiller compressors and outdoor condenser units.



It is reasonable to expect that these systems can be designed, installed and operated using standard good practice to emit acceptable levels of noise at all times.

We recommend that a Condition of Consent is drafted requiring all mechanical plant systems (except for emergency backup generators) to be designed to achieve 35 dB  $L_{Aeq}$  at the site boundary of nearby sites containing residential activity at all times. This will ensure that the mechanical plant noise emissions do not meaningfully contribute to the cumulative daytime noise levels, and that compliance with the night-time noise limits can be realistically achieved.

A combination of the following mitigation measures may need to be considered in order to achieve these noise levels:

- Placement of external mechanical plant as far from noise sensitive receivers as practical
- Use of solid screens or enclosures to interrupt line of sight of noise emitting equipment to nearby noise sensitive receivers
- Selection of low noise generating units
- Oversizing units and running on lower operating modes
- Inclusion of vibration isolating mounts
- Attenuators on extract fan discharges

### **3.2 Expected noise levels**

#### **3.2.1 Daytime period**

Predicted noise rating levels during the daytime period from concurrent carpark activity, loading bay usage, courier van deliveries, online order pickup drive through, and retail activity, are provided below. Activity from the site is expected to be continuous throughout the day. However, the level of activity will not be constant throughout the day, either in the carpark or the loading bay. Therefore, the levels given below include a calculated duration adjustment of -4 dB at receivers mainly exposed to carpark noise, or -5 dB if exposed to loading bay noise, calculated in line with section 6.4.6 of NZS 6802:2008.

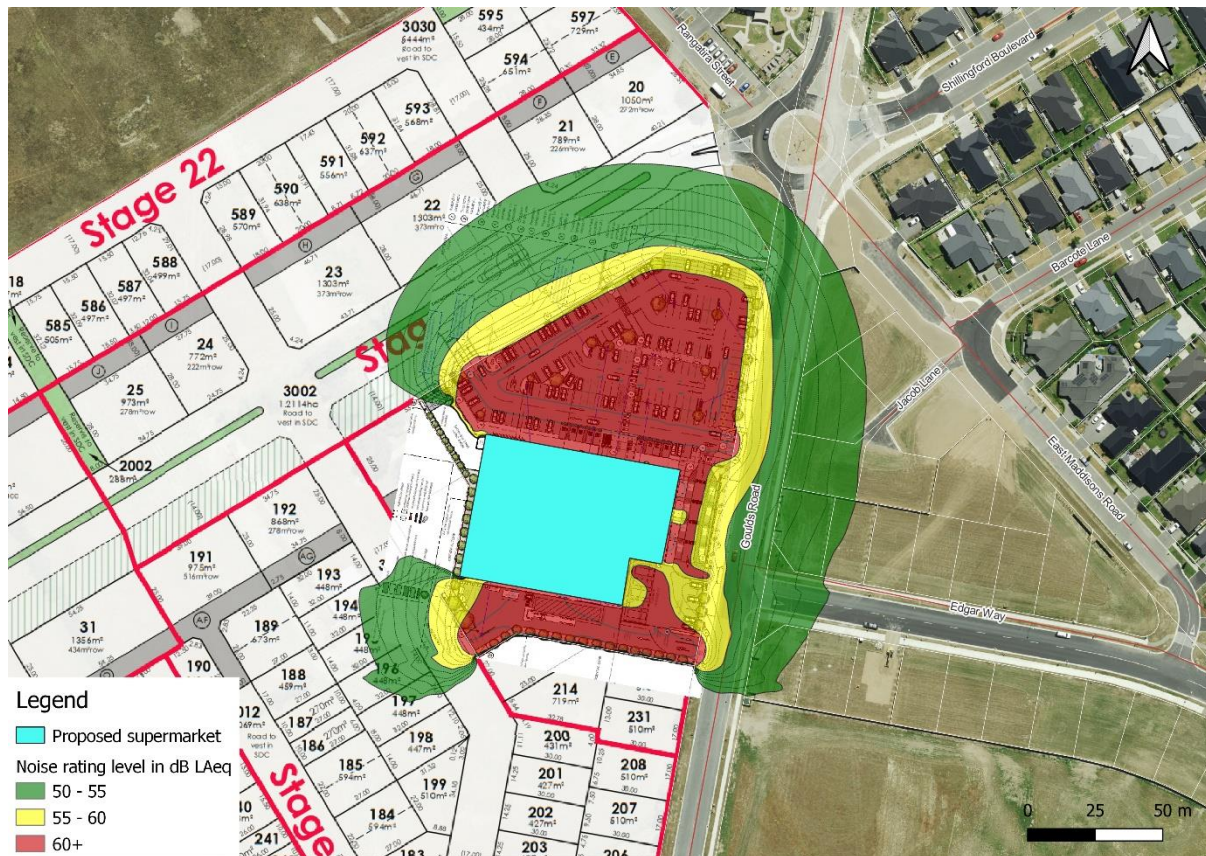


Figure 3.1 – Predicted noise rating levels during daytime

The predicted noise levels and likely noise effects at locations surrounding the site are described below.

- At the Faringdon Oval residential interface (lots 215 and 230) – 50 dB LAeq
- At the closest sites in Stage 2 of Faringdon Oval (lots 21 and 22) – 51 dB LAeq

Carpark usage may result in a noise level of 51 dB LAeq at Stage 2 residential sites which complies with the 55 dB LAeq daytime limit that applies given the current underlying Rural zoning. We expect this would result in less than minor adverse effects, even if these sites were considered against the more stringent residential zone standard of 50 dB LAeq, noting that levels remain at the lower end of international guidance for protection of residential amenity. and a 1 dB increase in noise level is subjectively imperceptible.

- Across Goulds Road on Edgar Way (opposite where delivery vehicles enter the site) – 52 dB LAeq

Heavy vehicle deliveries may result in a noise level of 52 dB LAeq at the closest residential sites across Goulds Road on Edgar Way. We expect this 2 dB exceedance of the residential District Plan noise limits to result in less than minor adverse effects, noting that levels remain at the lower end of international guidance, and a 2 dB increase in noise level is subjectively imperceptible.

- At Lots 194 – 197 in Faringdon Oval opposite where delivery vehicles depart the site – 54 dB LAeq

This remains below the 55 dB LAeq daytime limit that applies given the current underlying Rural zoning. When considering the residential nature of these sites, we expect that this level due to heavy vehicle deliveries will result in less than minor adverse effects, even considering the

residential use of these sites, given that the predicted value remains within the upper environmental amenity protection guideline of 55 dB  $L_{Aeq}$  (as outlined in WHO and NZS 6802:2008).

- Across Goulds Road on Jacobs Lane (opposite the carpark) – 53 dB  $L_{Aeq}$

Peak carpark usage may result in noise rating levels of 53 dB  $L_{Aeq}$  at residential sites across Goulds Road which is a 3 dB exceedance of the PODP standard. However, given that the character of the noise (predominantly vehicle movements) will be consistent with the envisaged ambient environment, we expect less than minor adverse noise effects. Noting also that this is within the upper end of environmental noise guidance during the daytime period.

- A small corner of the Faringdon Oval residential sites located to the west of the supermarket (i.e., Lot 210), might receive noise levels of up to 55 dB  $L_{Aeq}$  – which complies with the underlying Rural zone limit. However, due to the shielding provided by the supermarket buildings, most of the site will receive less than 50 dB  $L_{Aeq}$ . We expect any adverse effects on this site to be less than minor.

As discussed in section 1.1, the envisaged future environment will be similar to that of a neighbourhood centre, and additional vehicle movements on roads are expected from the increased number of residential and commercial tenancies in the locality. In our experience, ambient noise levels in the order of 55 dB  $L_{Aeq}$  are not uncommon close to moderately busy roads in a suburban neighbourhood.

Based on the above we expect the level of adverse noise effects from daytime operation of the supermarket to be less than minor.

### 3.2.2 Night-time period

During the night-time period (2200 – 0700 hours) the only noise sources expected from the supermarket will be customer and staff vehicles departing the site, as well as mechanical plant, which has been covered in section 3.1.6. above.

Traffic information indicates that there may be in the order of 100 vehicles entering and exiting the site in the one hour period from 2100 to 2200 hours. Typically, the number of people entering the supermarket will decrease the closer it gets to closing time. We expect it is reasonable to assume that, including departure of staff vehicles, up to 50 vehicles may depart the site in a 30 minute period after 2200 hours.

In this case the noise level received at the boundary of residential sites across Goulds Road will be up to 42 dB  $L_{Aeq}$ . This is a 2 dB exceedance of the District Plan night-time noise limit. However, we expect that any noise effects will be less than minor, given that a 2 dB change in noise level is subjectively imperceptible, the level remains within the sleep protection limit of 45 dB  $L_{Aeq}$  with windows open outlined in WHO and NZS 6802:2008, and the character of the noise will not be out-of-place compared to general vehicle movements on Goulds Road (travelling at a higher speed). This exceedance will only be expected between 2200 – 2230 hours, with little to no activity expected on site after this time.

We also expect noise from door slams and engine starts to comply with District Plan night-time limit of 70 dB  $L_{AFmax}$  at all nearby properties and we would expect less than minor adverse effects at any site from door slams and engine starts.

Because of the layout of the site, there is an increased setback, and / or screening from the carpark to future residential sites within the Faringdon Oval development. Compliance with the underlying Rural limit of 45 dB  $L_{Aeq}$  is expected, and predicted noise levels would also meet a lower 40 dB  $L_{Aeq}$  residential standard at these locations.

#### 4.0 CONSTRUCTION NOISE

Noise generated by construction activities associated with the establishment of the supermarket has the potential to adversely affect nearby properties, especially if carried out during the early morning or evening hours.

We recommend that the applicant adopts best practice procedures to reduce the likelihood of annoyance, nuisance, and adverse health effects to people in the vicinity of construction work, and that these activities are planned and managed in accordance with NZS 6803:1999 *Acoustics Construction Noise*, and that construction is undertaken to ensure as far as practical that noise does not exceed the sound levels specified in Rule NOISE REQ-2 of the PODP and in Table 2 of the Standard.

Given the setbacks to the closest dwellings this is likely to be achievable.



## 5.0 CONCLUSION

Noise from all sources expected to be associated with the operation of a proposed Woolworths located on Goulds Road in Faringdon, Rolleston, has been assessed.

Based on our review of the relevant Partially Operative Selwyn District Plan noise limits, NZ Standards, WHO guidelines, and ambient noise measurements in the area, we consider that daytime noise levels of 50 dB  $L_{Aeq}$  when received at nearby residentially zoned sites (whether existing – such as across Goulds Road, or future sites as part of the consented Faringdon Oval fast track development) would ensure noise effects are less than minor. In addition, we expect that noise levels which remain below the upper guideline daytime value of 55 dB  $L_{Aeq}$  outlined in NZS 6802 will also result in less than minor effects at locations close to Goulds Road (and therefore exposed to higher levels of traffic noise) or located within the Faringdon Oval development.

During the night-time period, compliance with the residential District Plan limit of 40 dB  $L_{Aeq}$  will also ensure noise effects are less than minor; however, a 2 dB exceedance from customer vehicles departing the site is also expected to result in less than minor effects, given that a 2 dB increase in noise levels in subjectively imperceptible, in the context of other traffic on Goulds Road. We conclude that these effects (even in the absence of affected party approval) are less than minor.

Based on our analysis, noise levels during the daytime period from heavy vehicle deliveries, carpark movements, online order pickup drive through, courier vans, and small scale retail tenancies is expected to result in a maximum noise level of up to 54 dB  $L_{Aeq}$  at residential sites across Goulds Road and within the future subdivision. While this represents a 4 dB exceedance of the District Plan at the residentially zoned properties across Gould Road, predicted levels are consistent with the acoustic criteria we have defined in section 2.5, and we expect effects on residential amenity to be less than minor for sites across Goulds Road.

During the night-time period the departure of vehicles from customers and staff after 2200 hours may result in a noise level of up to 42 dB  $L_{Aeq}$  at residential sites across Goulds Road – which represents a 2 dB exceedance of the District Plan residential limits in that location. As outlined above we expect this to meet the acoustic criteria and resulting adverse effects to be less than minor.

Overall, we expect that adverse noise effects associated with the operation of the proposed Woolworths located at Goulds Road, Faringdon, Rolleston, will be less than minor.

To ensure noise emissions from the development are appropriately managed, we recommend that the following conditions of consent or advice notes are adopted:

- *All external mechanical plant (except for the emergency backup generator) shall be designed to achieve a 35 dB  $L_{Aeq}$  noise level at the site boundary at all times.*
- *Truck deliveries to be limited to the daytime hours of the District Plan (0700 – 2200 hours).*
- *A Noise Management Plan should be adopted for the loading bay, which describes best practice to reduce adverse noise effects, including limiting deliveries to the daytime period and describing managerial measures such as signage to ensure that truck deliveries which take longer than 5 minutes to unload will turn off their engine, and refrigeration units attached to delivery trucks are turned off during unloading.*
- *Non-tonal reversing alarms shall be installed on forklifts, and they shall be set so that they are no louder than required for safety reasons.*
- *Any future hospitality tenancy should provide a Noise Management Plan to prior to operation, outlining best practice managerial measures to ensure that adverse noise effects on nearby sites are minimized as far as practical. Any future hospitality tenancy should not operate after 2200 hours.*

- *Noise barriers shall be erected along the western boundary of the site as shown in figure 1.2, meeting the following minimum specifications:*
  - *Height – at least 2.3 meters*
  - *Surface mass – at least 10 kg/m<sup>2</sup>*
  - *The fence must be continuous and maintained with no gaps or cracks. For timber fences, this will require palings to be well overlapped (25 mm minimum) or a “board and batten” system, and a sleeper rail connecting the base of the palings to the ground. We also recommend a paling thickness of at least 25 mm to help resist warping.*