# Acoustic Consulting Engineers

Sound and Vibration Consulting Engineers ABN 44 133 737 443

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Our Reference

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Acoustic Consulting Engineers Pty Ltd

Ferndell Street Pty Ltd; The Issa Family Superannuation Fund; and The Issa No. 2 Family Superannuation Fund C/- Ghazi Al Ali Architect Pty Ltd Suite 21, 47-55 John Street LEICHHARDT NSW 2040

For the attention of Ms Sally Nguyen

### DA Noise Assessment – Proposed Warehouse and Child Care Centre Development – 46-52 Ferndell Street, South Granville

### **1.0 INTRODUCTION**

At present, the subject site at 46-52 Ferndell Street, South Granville is occupied and operated by Trademaster, consisting of warehouse/manufacturing facilities, a show room and sales office for joinery and building supplies.

It is proposed to re-develop the site to provide warehouse units, ancillary offices for the warehouse units and a child care centre.

Acoustic Consulting Engineers Pty Ltd was commissioned by Ferndell Street Pty Ltd, The Issa Family Superannuation Fund and The Issa No. 2 Family Superannuation Fund to undertake a noise assessment for the proposed re-development to accompany the Development Application (DA).

This report provides the findings from the site inspection and assessment of potential environmental noise impact associated with the proposed re-development and road traffic noise intrusion into the proposed child care centre.

The findings from the noise assessment and recommendation are site specific and have been prepared for the particular investigation described in this report. The report should not be used in any other context or for any other purposes.

### 2.0 DESCRIPTION OF SITE AND PROPOSAL

*Figure 1* shows the location of the subject site and surrounding. The subject site is located within a commercial/industrial area and mainly surrounded by existing commercial/industrial developments.

There are residential receivers to the north-west and south-east. Residences to the northwest are well screened from the subject site by adjoining industrial development/buildings to the north and west.

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# <image>

### Figure 1 Location of Site and Surrounding

The proposal is to re-develop the site to provide:

- small warehouse units on Ground Level and mezzanine ancillary offices on Level
  A number of the warehouse unit will also be provided with ancillary offices on Level 2;
- a large warehouse unit with offices at the front of the site (Ferndell Street frontage) on Ground Level, Level 1 and Level 2; and
- a child care centre at the front of the site (Ferndell Street frontage) on Ground Level and Level 1

The small warehouse units will be provided with double garage doors for loading and unloading. Albeit, a loading/unloading bay for medium/large rigid truck is proposed at south-western corner of the site as needed for the small warehouse units from time to time. This loading bay would be shielded from residential receivers by surrounding industrial/ commercial development.

A separate loading bay will be provided for the large warehouse unit (behind the warehouse unit), also shielded from the residences.

Figures 2 to 4 show the site layouts/floor plans for the proposed development.

Residential receivers to the north-west and south-east are in the order of 90m and 150m from the nearest boundaries of the subject site respectively and are shielded by the existing surrounding industrial/commercial developments, particularly the residences to the north-west.

Proposed operational hours are from 6:00am to 6:00pm, Monday to Friday and 7:00am to 2:00pm on Saturday for the warehouse units and 7:00am to 6:30pm, Monday to Friday for the child care centre.



Proposed Loading Bays	
	NAME FOUND CALLER CALLE









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### **3.0 POTENTIAL ACOUSTIC ISSUES**

Potential acoustic issues associated with the proposed re-development would be:

- noise from vehicle access to and from the site;
- air-conditioning outdoor condensers for the ancillary offices of the warebouse units and child care centre; and
- road traffic noise intrusion into the child care centre

Vehicles entering and leaving the site would be mainly passenger vehicles, utes and vans and loading/unloading would be undertaken inside the small warehouse units. However, due to the nature of warehouse activities, an electric forklift and a medium/large rigid truck in the designated loading bay at the rear of the site could be used from time to time. For the large warehouse unit, load/unloading of trucks will be more frequent. Due to acoustic shielding and relatively large distance separation, it is not expected that operational noise from the development would be audible at the residential receivers.

Mechanical plant associated with the proposed development would mainly be due to airconditioning outdoor condensers for the ancillary offices and child care centre. Due to relatively large distance separation, noise from air-conditioning outdoor condensers would readily be controlled with appropriate equipment selection and siting.

Noise intrusion into the child care centre can readily be controlled by appropriate building construction systems and provision of acoustic barriers for the outdoor play areas.

### 4.0 NOISE ENVIRONMENT

### 4.1 Background and Ambient Noise

Existing background and ambient noise environment representative of that at the residential receivers to the north-west and south-east was measured from Tuesday 8 August 2023 to Wednesday 16 August 2023. *Figure 1* shows the noise monitoring locations.

Measurement instrumentation consisted of Type 1 SVAN977 sound and vibration analysers and Type 1 ACO Pacific 7052E prepolarised condenser microphones. The instrumentation was checked before and after the measurements with a Type 1 SVAN SV30A acoustic calibrator and the drift in calibration was negligible.

As environmental noise varies with time and the human ear is not equally sensitive to noise at different frequencies, A-weighted statistical levels are used to describe environmental noise. The common parameters used to describe environmental noise are the  $L_{Amax}$ ,  $L_{A1}$ ,  $L_{A10}$ ,  $L_{A90}$  and  $L_{Aeq}$  levels measured over 15-minute intervals.

<sup>231423-02</sup>L-DD.doc

The  $L_{Amax}$  level is the maximum A-weighted sound pressure level over the sampling period. The  $L_{A1}$ ,  $L_{A10}$  and  $L_{A90}$  levels are the A-weighted sound pressure levels exceeded for 1%, 10% and 90% of the sampling periods respectively. The  $L_{A90}$  level is usually referred to as the background noise level. The  $L_{Aeq}$  level is the A-weighted continuous equivalent (energy average) sound pressure level over the sampling period.

The  $L_{A90}$  acoustic parameter of the noise monitoring result is used for the present noise assessment. Other acoustic parameters are provided for information only.

Appendices 1 and 2 provide graphical presentation of the measured statistical noise levels at 15-minute intervals. Table 1 presents the day/evening/night and night-time shoulder period (6:00am-7:00am)  $L_{A90}$  background noise levels.

Dete	Measured Existing L <sub>A90</sub> Noise Environment, dB(A)					
Date	6am-7am	Day <sup>1</sup>	Evening <sup>2</sup>	Night <sup>3</sup>		
Location 1 – North-West (61 Dudley Road, Guildford) (rear site boundary)						
Tuesday 8 August 2023			44.4	39.9		
Wednesday 9 August 2023	45.7	44.2	43.1	40.5		
Thursday 10 August 2023	48.0	46.1	43.2	39.0		
Friday 11 August 2023	45.8	42.2	41.7	40.0		
Saturday 12 August 2023	43.0	40.1	42.0	38.5		
Sunday 13 August 2023	40.4	39.5	39.0	42.9		
Monday 14 August 2023	42.6	43.2	42.7	40.1		
Tuesday 15 August 2023	47.1	46.1	44.0	39.7		
Wednesday 18 August 2023	45.4					
Rating L <sub>A90</sub> Background Level	46	43	43	40		
Location 2 – South-East (35 Everley Road, South Granville) (front yard)						
Tuesday 8 August 2023			47.5	38.3		
Wednesday 9 August 2023	50.2	50.2	47.6	39.4		
Thursday 10 August 2023	51.6	51.2	47.5	37.4		
Friday 11 August 2023	49.6	49.4	48.2	38.6		
Saturday 12 August 2023	46.4	47.0	46.5	37.4		
Sunday 13 August 2023	39.9	42.9	44.1	43.1		
Monday 14 August 2023	49.3	50.6	46.1	38.3		
Tuesday 15 August 2023	50.8	50.3	48.2	39.0		
Wednesday 18 August 2023	49.1					
Rating L <sub>A90</sub> Background Level	50	50	48	38		

### Table 1Measured Existing Background Noise Environment, dB(A)

Notes: 1. Day is from 7:00am-6:00pm, Monday to Saturday and 8:00am-6:00pm, Sunday

2. Evening is from 6:00pm-10:00pm

3. Night is from 10:00pm-7:00am, Monday to Saturday and 10:00pm-8:00am, Sunday

### 4.2 Road Traffic Noise

Existing road traffic noise exposure to the site was measured at approximately 12m from the eastern site boundary (refer to *Figure 1*) from Wednesday 16 August 2023 to Wednesday 23 August 2023. *Appendix 3* provides graphical presentation of the measured statistical noise levels at 15-minute intervals.

Observations during the site inspections confirmed that the noise environment was due to road traffic noise from Ferndell Street. However, trade vehicles entering, leaving and manoeuvring in the car-park associated with Trademaster's show room/sales office also contributed to the measured noise levels.

Short-term site attended noise measurements were also conducted on Wednesday 16 August 2023 at various distances, representing the nearest to furthest locations of the proposed child care centre's outdoor play areas to Ferndell Street.

At the nearest location of the proposed child care centre's outdoor play areas to Ferndell Street, peak-hour road traffic noise levels are  $60-61dB(A) L_{Aeq,1hr}$ . At the furthest location of the proposed child care centre's outdoor play areas to Ferndell Street, peak-hour road traffic noise level is  $59dB(A) L_{Aeq,1hr}$ .

From observation of the measurement results presented in *Appendix 2*, existing road traffic noise levels exposed to the residential receivers along Ferndell Street are higher than  $60dB(A) L_{Aeq,1hr}$  during the peak morning and afternoon hours.

### 5.0 NOISE ASSESSMENT OBJECTIVES

### 5.1 Environmental Noise

### 5.1.1 Steady Noise Sources

The EPA Noise Policy for Industry (NPfI) is used as a reference to assess environmental noise associated with steady/quasi-stationary noise sources from the proposed development.

The EPA:NPfI recommends that the:

- L<sub>Aeq,15min</sub> noise levels from a proposed development not to exceed the day/ evening/night rating background L<sub>A90</sub> noise levels by more than 5dB(A) at the residential receivers; and
- L<sub>Aeq,period</sub> noise levels (period being entire day/evening/night) from a proposed development to be at least 5dB below the recommended amenity noise levels from existing and/or future industrial sources for the particular receiver areas.

As the intrusiveness and amenity noise levels are determined over different time intervals, the same numerical value does not necessarily represent the same amount of noise for different time periods. To standardise the time periods for the intrusiveness and amenity noise levels, the NPfI assumes a default correction of +3dB to convert the  $L_{Aeq,period}$  to  $L_{Aeq,15min}$  noise level.

*Table 2* provides the recommended  $L_{Aeq,15min}$  noise levels from the proposed development with operational hours from 6:00am to 6:00pm, established from the measured background noise levels presented in *Table 1* and the EPA:NPfI guideline. The recommended amenity noise levels are based on an urban residential area.

The project noise trigger levels are the lower of the intrusive and amenity noise levels. That is, noise from the development will achieve with both the intrusive and amenity noise levels, provided that the project noise trigger levels are achieved.

Assessment	Recommended L <sub>Aeq,15min</sub> Noise Level					
Period	Intrusiveness Level	Amenity Level	Trigger Level			
Residential receivers to the north-west						
Shoulder Period (6am-7am)	51	43	43			
Day (7am-6pm)	48	58	48			
Residential receivers to the south-east						
Shoulder Period (6am-7am)	55	43	43			
Day (7am-6pm)	55	58	55			

Table 2Recommended  $L_{Aeq,15min}$  Noise Assessment Level, dB(A)

### 5.1.2 Maximum Noise Level

Operational hours from 6:00am - 7:00am is categorised as night-time operation. Accordingly, potential sleep disturbance needs to be assessed.

Both the  $L_{Aeq,15min}$  and  $L_{Amax}$  noise levels are to be considered for the assessment of potential sleep disturbance. However, the  $L_{Aeq,15min}$  noise levels, addressed in *Section 5.1.1*, will also address this component of potential sleep disturbance.

With reference to the EPA Noise Policy or Industry (NPfI), as a "screen test", it is recommended maximum noise levels from site activities not to exceed the relevant night-time background levels by more than 15dB at the residential receivers.

From the measured shoulder night-time background noise levels presented in *Table 1*, as a "*screen test*" assessment, it is recommended that maximum noise levels from site activities not to exceed 61dB(A)  $L_{Amax}$  and 65dB(A)

L<sub>Amax</sub> at the residences to the north-west and south-east respectively.

### 5.1.3 Noise from Additional Traffic Generation

Ferndell Street serves the industrial area and would be classified as a subarterial road. With reference to the EPA Road Noise Policy (RNP), it is recommended that additional road traffic noise generated by the proposal not to exceed 60dB(A)  $L_{Aeq,15hr}$  during night-time and 55dB(A)  $L_{Aeq,9hr}$ during night-time.

Where these noise levels are already exceeded, additional road traffic noise generated by the proposal should not increase the existing road traffic noise levels by more than 2dB.

Noise from traffic generation by the proposed development, when averaged and assessed over the entire daytime and night-time periods, will be minimal. For conservative assessment, noise due to additional traffic generation is also assessed during the peak morning and afternoon hours.

With reference to Appendix 2, existing peak morning (7:00am – 9:00am) and afternoon (4:00pm – 6:00pm) traffic noise levels at the residential receivers along Ferndell Street already exceed 60dB(A)  $L_{Aeq,1hr}$ . It is recommended that additional road traffic noise generated by the proposed development not to increase the existing road traffic noise levels by more than 2dB during the peak-hours.

### 5.2 External Noise Intrusion into Child Care Centre

### 5.2.1 Indoor Road Traffic Noise Level

Sleeping areas/cot rooms are proposed behind the indoor play rooms, separating from Ferndell Street by the building envelop and internal building partitions. Accordingly, road traffic noise intrusion into sleeping areas/cot rooms will be minimal.

For indoor playrooms, it is recommended that that indoor peak-hour road traffic noise level not to exceed  $40dB(A) L_{Aeq.1hr}$ .

### 5.2.2 External Road Traffic Noise Level

For outdoor children play areas, it is recommended that that peak-hour road traffic noise level not to exceed  $55dB(A) L_{Aeq.lhr}$ .

### 6.0 NOISE CONTROL MEASURES

### 6.1 Warehouse Development

For the small warehouses, loading/unloading will mainly take place inside the warehouses. However, a loading bay for medium/large rigid truck will be provided at the rear of the subject site for use from time to time as would be expected for warehouse activities.

For the large warehouse, a separate loading bay will be provided behind the building. The loading bays will be shielded from the residential receivers.

Air-conditioning for ancillary offices and child care centre will be selected taking account of acoustic performance and located taking account of acoustic shielding provided by the buildings/structures.

### 6.2 Child Care Development

It is recommended that façade glazing exposed to Ferndell Street be consisted of a minimum of 6mm float glass and acoustic rated seals be installed where required to control indoor noise levels.

For external road traffic noise levels exposed to the outdoor play areas, it is recommended that:

- 2.1m high acoustic barrier (*Figure 5*) be provided for the Ground Level outdoor play area;
- 1.8m high acoustic barriers (*Figure 6*) be provided for the Level 1 outdoor play areas;
- the height of the barriers shall be relative to the finished floor levels of the outdoor play areas;
- the barriers may be constructed of brick, masonry, safety glass or propriety modular wall panels achieving a weighted sound reduction index of not less R<sub>w</sub>28; and
- any gap between the barrier elements or between the bottom of the barriers and ground/floor shall be detailed/filled



Figure 5 Recommended Barrier Height and Location (Ground Level)

recommended 2.1m high acoustic barrier



### Figure 6 **Recommended Barrier Height and Location (Level 1)**

# NOISE PREDICTION AND ASSESSMENT

# 7.1

# **Environmental Noise**

### 7.1.1 Steady Noise Sources

Operational noise will mainly be due to light vehicles (cars, utes, vans and medium vehicle) entering and leaving the site. Due to nature of warehouse activities, vehicular noise would be intermittent. From time to time, electric forklifts may be used to unload/load rigid trucks.

Assuming a rigid truck entering/leaving the subject site every fifteen (15) minutes and an electric forklift would be used for unloading/loading. It is expected that a vehicle manoeuvring and entering/leaving the site would be within one (1) minute and unloading/loading would be completed within 5-10 minutes.

7.0

Based on previous measurements, sound power levels of 105dB(A) (L<sub>Aeq</sub>) for a rigid truck manoeuvring and entering/leaving and 96dB(A) for a gas/electric forklift are adopted for assessment purposes.

Taking account of distance separation and acoustic screening provided by building structures and adjoining industrial/commercial buildings, the predicted operational noise levels are in the order of  $30dB(A) L_{Aeq,15min}$  at the nearest and most affected residences to the north-east and  $35dB(A) L_{Aeq,15min}$  at the nearest and most affected residences to the south-west. The predicted noise levels comply with the recommended noise assessment objectives in *Table 2*.

### 7.1.2 Maximum Noise Level

The predicted maximum noise level is 35dB(A)  $L_{Amax}$  at the nearest and most affected residences to the north-east and complies with the recommended "*screen test*" noise assessment objective of 61dB(A)  $L_{Amax}$  for sleep disturbance.

The predicted maximum noise level is 45dB(A)  $L_{Amax}$  at the nearest and most affected residences to the south-west and complies with the recommended "*screen test*" noise assessment objective of 65dB(A)  $L_{Amax}$  for sleep disturbance.

### 7.1.3 Noise from Additional Traffic Generation

With reference to the Traffic Impact Assessment Report prepared by PDC Consultants, forecast additional traffic generation by the proposed development are ninety-six (96) vehicle trips during the morning (7:00am-9:00am) and eighty-four (84) vehicle trips during the afternoon (4:00pm-6:00pm).

Based on posted traffic speed on Ferndell Street of 60km/hr and the residential receivers are in the order of 15m from the centre of Ferndell Street, the predicted road traffic noise level due to additional traffic generation is 54dB(A)  $L_{Aeq,peak-hour}$  at 1m from the residential building façade, below the existing peak morning and afternoon noise levels of 60dB(A)  $L_{Aeq,1hr}$  (or higher) and increase the existing peak-hour road traffic noise levels by less than 1dB.

### 7.2 External Noise Intrusion into Child Care Centre

### 7.2.1 Indoor Road Traffic Noise

With the incorporation of a minimum of 6mm float glass and acoustic rated seals (where required) for the façade glazing exposed to Ferndell Street, indoor road traffic noise levels will be below the recommended level of 40dB(A) L<sub>Aeq,peak-hour</sub> for the indoor playrooms.

### 7.2.2 External Road Traffic Noise for Outdoor Play Area

With the provision of acoustic barriers recommended in *Section 6.2*, road traffic noise levels will be below the recommended level of 55dB(A)  $L_{Aeq,peak-hour}$  for the outdoor play areas.

### 7.3 Environmental Noise from Mechanical Plant

As Development Approval has not been granted, mechanical plant has not been determined at this time. However, given the distance separation, shielding from the existing industrial/commercial development and with equipment selection based on acoustic performance and appropriate siting, noise from mechanical plant would readily be controlled.

### 8.0 CONCLUSION

The assessment has shown that the predicted amenity, intrusive and maximum operational noise levels from vehicles and loading/unloading activities will comply with the recommended noise assessment objectives at the nearest and most affected residential receivers to the north-east and south-west.

With appropriate glazing and provision of acoustic barriers, road traffic noise levels will comply with the indoor and outdoor assessment objectives for the proposed child care centre.

Noise from additional traffic generation will increase the existing road traffic noise levels by less than 1dB during the peak morning and afternoon hours and unlikely to be noticeable at the residential receivers along Ferndell Street.

With equipment selection based on acoustic performance and appropriate siting, noise from mechanical plant (air-conditioning for the ancillary offices) would readily be controlled.

It should be noted that, depending on the types of usages, the warehouse units may be subject to separate development applications.

We trust the information in this report is satisfactory. Please do not hesitate to contact our office should further information or clarification be required.

Yours sincerely,

Dan Dang Principal Acoustic Engineer Acoustic Consulting Engineers Pty Ltd

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# Appendix 1

### NOISE MEASUREMENT RESULTS

(61 Dudley Road, Guilford)

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Tuesday, 8 August 2023

Notes

Proposed Warehouse and Child Care Centre Development 46-52 Ferndell Street, South Granville

1. Tabulated LAeq are logarithically averaged

2. Tabulated  $L_{A01}$  and  $L_{A10}$  are arithmetically averaged





Measurement Date Wednesday, 9 August 2023

Notes

Proposed Warehouse and Child Care Centre Development 46-52 Ferndell Street, South Granville

1. Tabulated  $L_{Aeq}$  are logarithically averaged

2. Tabulated  $L_{A01}$  and  $L_{A10}$  are arithmetically averaged





Measurement Date Thursday, 10 August 2023

Notes

Proposed Warehouse and Child Care Centre Development 46-52 Ferndell Street, South Granville

1. Tabulated LAeq are logarithically averaged

2. Tabulated  $L_{A01}$  and  $L_{A10}$  are arithmetically averaged





Friday, 11 August 2023

Notes

Proposed Warehouse and Child Care Centre Development 46-52 Ferndell Street, South Granville

1. Tabulated LAeq are logarithically averaged

2. Tabulated  $L_{A01}$  and  $L_{A10}$  are arithmetically averaged





Saturday, 12 August 2023

Notes

Proposed Warehouse and Child Care Centre Development 46-52 Ferndell Street, South Granville

1. Tabulated LAeq are logarithically averaged

2. Tabulated  $L_{A01}$  and  $L_{A10}$  are arithmetically averaged





Sunday, 13 August 2023

Notes

Proposed Warehouse and Child Care Centre Development 46-52 Ferndell Street, South Granville

1. Tabulated  $L_{Aeq}$  are logarithically averaged

2. Tabulated  $L_{A01}$  and  $L_{A10}$  are arithmetically averaged





Monday, 14 August 2023

Notes

Proposed Warehouse and Child Care Centre Development 46-52 Ferndell Street, South Granville

1. Tabulated LAeq are logarithically averaged

2. Tabulated  $L_{A01}$  and  $L_{A10}$  are arithmetically averaged





Tuesday, 15 August 2023

Notes

Proposed Warehouse and Child Care Centre Development 46-52 Ferndell Street, South Granville

1. Tabulated LAeq are logarithically averaged

2. Tabulated  $L_{A01}$  and  $L_{A10}$  are arithmetically averaged





Proposed Warehouse and Child Care Centre Development 46-52 Ferndell Street, South Granville

1. Tabulated LAeg are logarithically averaged

2. Tabulated  $L_{A01}$  and  $L_{A10}$  are arithmetically averaged



# Appendix 2

### NOISE MEASUREMENT RESULTS

(35 Everley Road, South Granville)

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LAeq,24hr

60.5











## Appendix 3

### NOISE MEASUREMENT RESULTS

<sup>231423-02</sup>L-DD.doc



2. Tabulated  $L_{A01}$  and  $L_{A10}$  are arithmetically averaged





Proposed Warehouse and Child Care Centre Development

**Measurement Location** 



Proposed Warehouse and Child Care Centre Development

**Measurement Location** 



Proposed Warehouse and Child Care Centre Development

**Measurement Location** 



**Measurement Location** 

46-52 Ferndell Street, South Granville 12m from eastern site boundary

**Project Title** 

Proposed Warehouse and Child Care Centre Development 46-52 Ferndell Street, South Granville

1. Tabulated  $L_{Aeq}$  are logarithically averaged





Proposed Warehouse and Child Care Centre Development

**Measurement Location** 



2. Tabulated  $L_{A01}$  and  $L_{A10}$  are arithmetically averaged

