

**PROPOSED WORKSHOP**

**CORNER BISHOP ROAD & GREAT NORTHERN HIGHWAY,  
MIDLAND**

**ENVIRONMENTAL ACOUSTIC ASSESSMENT**

**FEBRUARY 2024**

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ENVIRONMENTAL ACOUSTIC ASSESSMENT  
PROPOSED WORKSHOP

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FOR

CITY OF SWAN

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## 1. INTRODUCTION

Herring Storer Acoustics were commissioned by City of Swan to undertake an acoustic assessment of noise emissions associated with the proposed workshop development to be located at the existing operations centre at the corner of Bishop Road and Great Northern Highway, Midland.

This report is to provide an assessment of proposed noise emissions from the proposed workshop with respect to compliance with the requirements of the *Environmental Protection (Noise) Regulations 1997*.

## 2. SUMMARY

Based on the assessment, noise received at the neighbouring residential premises from the proposed Warehouse development would be deemed to comply with the requirements of the *Environmental Protection (Noise) Regulations 1997* for Scenario 1 during only the day period, and Scenario 2 during both the day and evening period.

If the workshop would be required to operate during the night period, then the doors of the workshop would have to be closed.

## 3. CRITERIA

The allowable noise level at the surrounding locales is prescribed by the *Environmental Protection (Noise) Regulations 1997*. Regulations 7 & 8 stipulate maximum allowable external noise levels. For highly sensitive area of a noise sensitive premises this is determined by the calculation of an influencing factor, which is then added to the base levels shown below in Table 3.1. The influencing factor is calculated for the usage of land within two circles, having radii of 100m and 450m from the premises of concern. For other areas within a noise sensitive premises, the assigned noise levels are fixed throughout the day, as listed in Table 3.1.

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

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

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

Under the Regulations, a highly sensitive area means that area (if any) of noise sensitive premises comprising –

- (a) A building, or a part of a building, on the premises that is used for a noise sensitive purpose; and
- (b) Any other part of the premises within 15 m of that building or that part of the building.

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

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

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

**TABLE 3.2 - ADJUSTMENTS TO MEASURED LEVELS**

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

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

The closest residence adjacent to the development has been identified as the residence at 60 Railway Avenue, with it's influencing factor calculated as shown below

**TABLE 3.3 – CALCULATION OF NOISE INFLUENCING FACTOR**

| Description                          | Influencing Factor |
|--------------------------------------|--------------------|
| Industrial (Inner Circle)            | 50% = +5           |
| Industrial (Outer Circle)            | 20% = +2           |
| Roads                                |                    |
| Great Eastern Highway (Outer Circle) | +2                 |
| Bishop Road (Outer Circle)           | +2                 |
| <b>TOTAL</b>                         | <b>+11</b>         |

The Assigned Noise Levels at the closest neighbouring residences would be as listed in Tables 3.4.

**TABLE 3.4 - ASSIGNED OUTDOOR NOISE LEVEL**

| Premises Receiving Noise | Time of Day                                                                                              | Assigned Level (dB) |                 |                   |
|--------------------------|----------------------------------------------------------------------------------------------------------|---------------------|-----------------|-------------------|
|                          |                                                                                                          | L <sub>A10</sub>    | L <sub>A1</sub> | L <sub>Amax</sub> |
| Residential Premises     | 0700 - 1900 hours Monday to Saturday (Day)                                                               | 56                  | 66              | 76                |
|                          | 0900 - 1900 hours Sunday and Public Holidays (Sunday / Public Holiday Day)                               | 51                  | 61              | 76                |
|                          | 1900 - 2200 hours all days (Evening)                                                                     | 51                  | 61              | 66                |
|                          | 2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and Public Holidays (Night) | 46                  | 56              | 66                |
| Commercial Premise       | All Hours                                                                                                | 60                  | 70              | 80                |
| Industrial Premise       | All Hours                                                                                                | 65                  | 80              | 90                |

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

#### 4. DEVELOPMENT

For the purpose of the development application, the activities would be centered around general repair, maintenance and fabrication type activities via the use of hand and fixed power tools.

For the workshop it has been assumed these could operate 7 days a week, hence noise emissions have been assumed to be present prior to 0900 on a Sunday, being the most stringent assessment criteria.

#### 5. MODELLING

To determine the noise that would be received at the surrounding premises from the facility, modelling of noise emission propagation was carried out using "SoundPlan".

To obtain noise emissions associated with the workshop, the existing workshop was visited on 4 January 2024 and measurements were conducted with a Larson Davis Sound Level Meter and the noise levels are listed in Table 5.1 below. Calibration certificates are available on request.

**TABLE 5.1 – MEASURED NOISE LEVELS**

| Noise Source  | Noise Level dB(A) |
|---------------|-------------------|
| Hammering     | 111 @ 1m          |
| Angle Grinder | 88 @ 1m           |
| Needle Gun    | 100 @ 1m          |

For the development, two scenarios have been proposed as shown in Figure 5.1 and 5.2 below.



FIGURE 5.1 – SCENARIO 1



FIGURE 5.2 – SCENARIO 2

The calculations used the following input data:

- a) Ground contours (site topography).
- c) DWER worst case day weather conditions.

Weather conditions for the modelling were undertaken using the “Default Conditions for Noise Modelling” as stipulated within the Environmental Protection Authority’s “*Draft Guidance for Environmental Noise for Prescribed Premises*” as listed in Table 5.2.

TABLE 5.2 – WEATHER CONDITIONS

| Condition               | Day    |
|-------------------------|--------|
| Temperature             | 20°C   |
| Relative humidity       | 50%    |
| Pasquil Stability Class | E      |
| Wind speed              | 4 m/s* |

\* From sources, towards receivers.

## 6. RESULTS

To obtain results for the various operations of the workshop, the two scenarios described above with doors open have been implemented.

**TABLE 6.1 WORST CASE NOISE LEVELS**

| Receiver Location | Calculated Noise Level dB(A) |            |
|-------------------|------------------------------|------------|
|                   | Scenario 1                   | Scenario 2 |
| R1                | 50 (55)                      | 45 (50)    |

\*Number in parenthesis contains adjustment for tonality.

## 7. ASSESSMENT

Based on the assessable noise levels, comparison against the relevant assigned noise level is contained in Table 7.1. It is noted that as the proposed operations would primarily operate during the day period, however, could operate from 07:00 on a Sunday or Public Holiday, i.e. prior to 09:00, therefore all time periods have been assessed.

**TABLE 7.1 – ASSESSMENT OF NOISE LEVELS – SCENARIO 1A – SEMI RIGID TRUCK MOVEMENTS**

| Scenario | Noise Assessable Noise Level dB(A) | Time of Day                                                                                              | Assigned Night L <sub>A1</sub> Level (dB) | Compliance |
|----------|------------------------------------|----------------------------------------------------------------------------------------------------------|-------------------------------------------|------------|
| 1        | 55                                 | 0700 - 1900 hours Monday to Saturday (Day)                                                               | 56                                        | Complies   |
|          |                                    | 0900 - 1900 hours Sunday and Public Holidays (Sunday / Public Holiday Day)                               | 51                                        | +4         |
|          |                                    | 1900 - 2200 hours all days (Evening)                                                                     | 51                                        | +4         |
|          |                                    | 2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and Public Holidays (Night) | 46                                        | +9         |
| 2        | 50                                 | 0700 - 1900 hours Monday to Saturday (Day)                                                               | 56                                        | Complies   |
|          |                                    | 0900 - 1900 hours Sunday and Public Holidays (Sunday / Public Holiday Day)                               | 51                                        | Complies   |
|          |                                    | 1900 - 2200 hours all days (Evening)                                                                     | 51                                        | Complies   |
|          |                                    | 2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and Public Holidays (Night) | 46                                        | +4         |

## 8. CONCLUSION

Based on the above assessment, noise received at the neighbouring residential premises from the proposed Warehouse development would be deemed to comply with the requirements of the *Environmental Protection (Noise) Regulations 1997* for Scenario 1 during only the day period, and Scenario 2 during both the day and evening period.

If the workshop would be required to operate during the night period, then the doors of the workshop would have to be closed.