

**Noise Assessment Report for
The Kingsmills, Kingsmills Road, Wrexham, LL13 0NS**

**Report Reference no. 2269.13/1
13th November 2014**

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On behalf of:

Marston's Estates Ltd
jointly with
Wm Morrison Convenience Stores Ltd

CONTENTS

	Page
1.0 INTRODUCTION	3
2.0 NOISE SURVEY	5
3.0 NOISE ASSESSMENT	8
4.0 NOISE MITIGATION MEASURES	14
5.0 SUMMARY AND CONCLUSIONS	15
FIGURE 1 – INDICATIVE NOISE MEASUREMENT LOCATION PLAN	16
FIGURE 2 – PROPOSED SITE LAYOUT	17
FIGURE 3 – SERVICE YARD AND PLANT AREA LOCATION	18
APPENDIX I – NOISE UNITS AND INDICES	19

1.0 INTRODUCTION

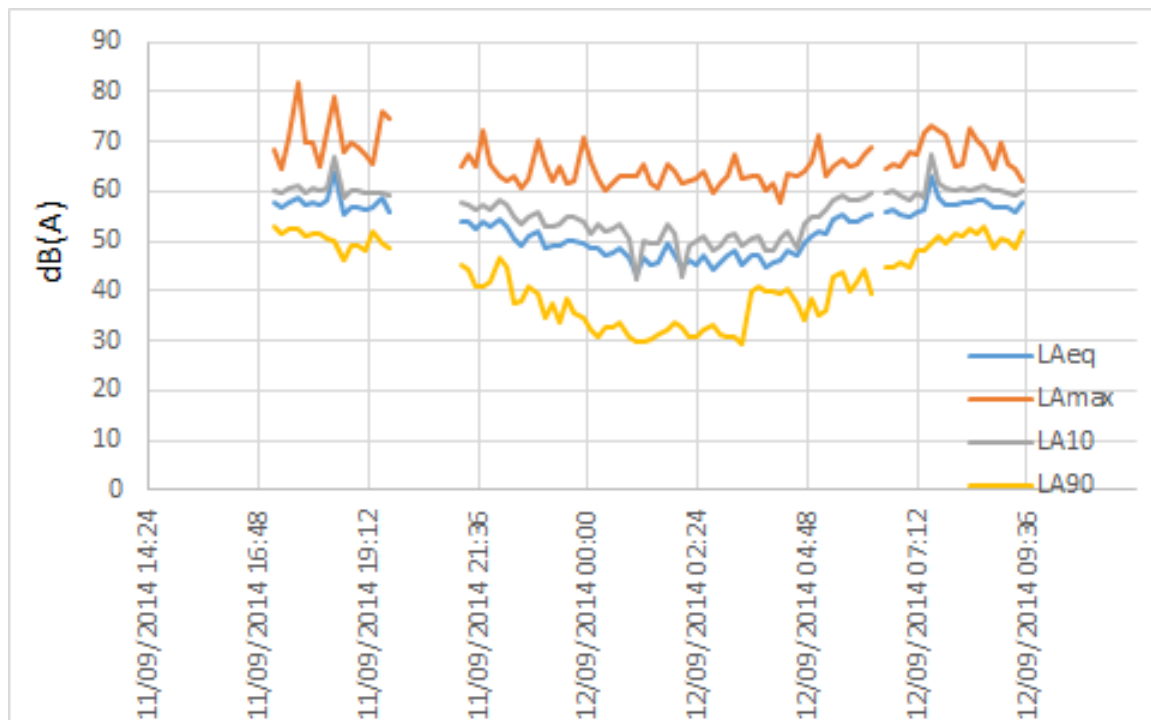
- 1.1 Blue Tree Acoustics was commissioned jointly by Marston's Estates Ltd and Wm Morrison Convenience Stores Ltd to carry out a noise survey assessment relating to a proposed new retail unit on land at the site of the existing Kingsmills public house located on Kingsmills Road, Wrexham, LL13 0NS.
- 1.2 The proposal is to partition the site and build a new retail unit to operate as a convenience store on an area of land at the eastern side of the site. A portion of the existing car park will be retained as a car park to serve both the new retail unit and existing public house. The public house will also be retained in its current configuration.
- 1.3 The Kingsmills premises are situated off Kingsmills Road in Wrexham. The surrounding area is predominantly residential in character.
- 1.4 This report considers the potential impact of operational noise from the proposed retail unit during the proposed opening and delivery times each day. Proposed opening hours are understood to be 0700-2300 hours daily. Proposed delivery times are understood to be 0700-2200 hours Monday to Saturday, and 1000-2000 hours on Sundays and bank holidays, with newspaper deliveries potentially outside of these times.
- 1.5 The assessment has included the measurement of existing noise levels in the vicinity of the nearby residential properties on both a weekday and a Sunday during representative daytime and night-time periods.
- 1.6 The assessment also includes prediction of noise levels likely to be generated at the site by the various activities that may occur from the operational retail unit, in comparison with the existing noise climate, including the current pub operation.
- 1.7 The combination of these two sets of data allows an objective noise assessment to be undertaken.

- 1.8 Figure 1 outlines the site location, the nearest residential properties, and the noise monitoring locations at the new development site.
- 1.9 A description of noise units and noise characteristics used in this report is provided in Appendix I.

2.0 NOISE SURVEY

- 2.1 Two attended noise surveys were carried out in the vicinity of the nearest residential properties to the development site on Thursday 11th to Friday 12th September 2014, and Sunday 14th September 2014, at the location indicated in Figure 1. Measurements were made over a series of contiguous 10-minute periods.
- 2.2 The instrumentation used for these surveys was a Rion NA28 Type 1 Sound Level Meter. The calibration level of the meter was checked before and after the surveys, and no variation in the calibration levels was noted. The sound level meter was within a valid period of laboratory calibration. The weather conditions during the noise surveys were dry and calm. The sound level meter was mounted on a tripod at an approximate height of 1.5m from local ground level and was fitted with the proprietary windshield.
- 2.3 The monitoring location is considered to be representative of the dwellings that may be most affected by noise from the proposed development.
- 2.4 The principal noise sources noted during the surveys were traffic on Kingsmills Road and surrounding roads, as well as existing mechanical services noise, primarily from the Kingsmills premises. There is also some noise generation from use of the existing Kingsmills customer car park and external drinking areas. The majority of this noise is remote from the monitoring location.
- 2.5 The following charts present the measured noise levels for the weekday and Sunday survey periods.

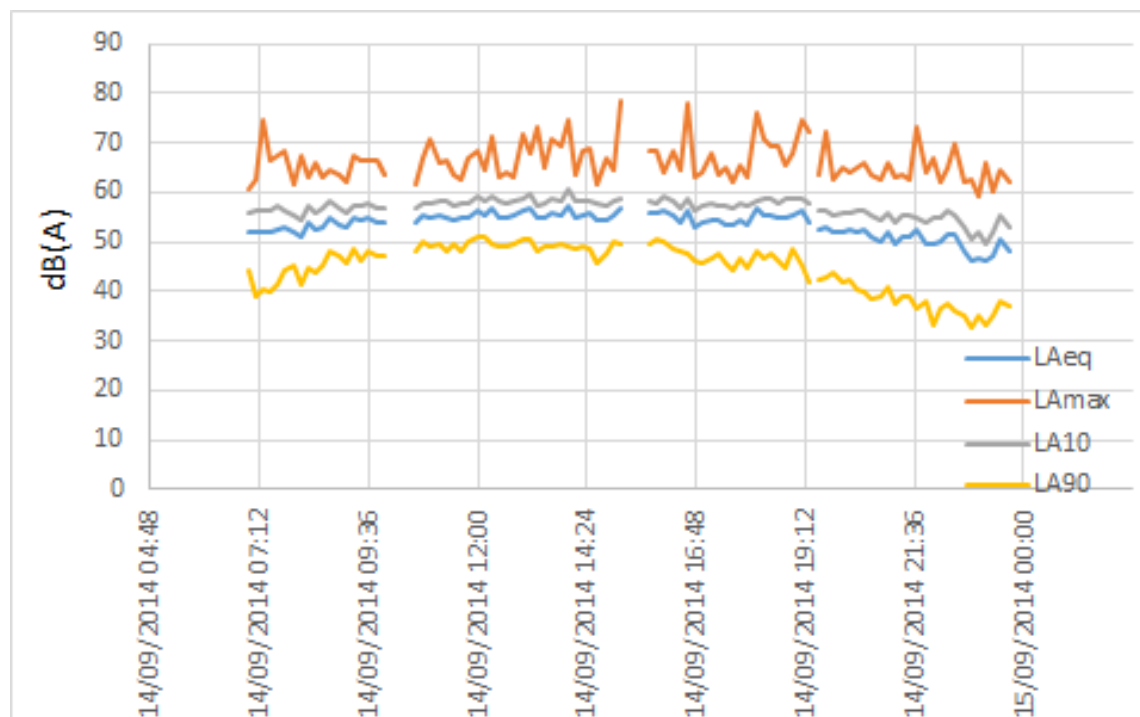
Chart 1: Location 1 – Existing Noise Levels, Thursday into Friday



2.6 As can be seen above, the background noise levels during a weekday were found to generally range between 38-53dB L_{A90} in the day, and 29-46dB L_{A90} during the night. Ambient noise levels range between 49-64dB L_{Aeq} in the day.

2.7 There were occasional car movements in the car park up to midnight, but the primary noise source was road traffic on Kingsmills Road.

Chart 2: Location 1 – Existing Noise Levels, Sunday



- 2.8 As can be seen above, the background noise levels at Location 1 during Sunday daytime were found to generally range between 33-51dB L_{A90} . Sunday ambient daytime noise levels typically range between 46-57dB L_{Aeq} .
- 2.9 The primary noise source was again road traffic noise. During the afternoon and evening, the pub external drinking area was in use, as well as the car park. Some occasional noise from people using the recycling bins located in the car park was also observed during the day. These noise sources are all remote to Location 1.

3.0 NOISE ASSESSMENT

New Noise Sources

- 3.1 Activities associated with the new development will generate noise. There are a number of types of noise source that should be considered.

Deliveries and Unloading Activities

- 3.2 The development will receive deliveries from vans and HGVs. HGVs would drive into the parking area and reverse into the service yard between the existing pub and new store building, as indicated in Figure 2. Deliveries would then be unloaded in this area. Delivery activities and unloading activities would potentially take place between 0700–2200 hours Monday to Saturday and 1000-2000 hours on Sunday. (It is possible that there may be the occasional newspaper van delivery to the front of the store before 0700 hours, but considering the distance and position relative to residential properties, we do not anticipate that this will be a significant issue in noise terms.)
- 3.3 We have previously measured HGV unloading activities as generating noise levels of around 80dB L_{Aeq} at 2m. In a similar manner to the unloading, we have representative data for HGV delivery vehicles driving and reversing. Our data includes reversing alarms and engine noise, and we anticipate source noise levels of up to 77dB L_{Aeq} at 2m.

Plant Noise

- 3.4 The development will have a number of items of plant to be located in the plant area as shown in Figure 2 and Figure 3. The end tenant proposes the following items of mechanical services:
- a) 1nr Low Noise Remote Condenser (ASR-ZAP-EC-146-ECMP-400-H):
Daytime 28dB(A) at 10m; Night time 28dB(A) at 10m
 - b) 1nr External Air Conditioning Unit (Hitachi RAS-4-HVRNS3E):
Daytime 52dB(A) at 1m; no night time use

- c) 1nr External Air Conditioning Unit (Hitachi RAC-50YH6):

Daytime 50dB(A) at 1m; no night time use

- d) 1nr External Air Conditioning Unit (Hitachi RAS-8HRNSE):

Daytime 55dB(A) at 1m; no night time use

Customers

- 3.5 Customers may access the store during the opening hours of 0700-2300 hours.
- 3.6 Clearly, during the day, customers will access the store, and during time spent in the car park and on footpaths, they may make some noise, primarily from talking. The most relevant standard providing source noise data for speech is BS8233. This states typical sound pressure levels of around 57dB(A) at 1m for normal speech.

Cars

- 3.7 Customers may access the store during the opening hours of 0700-2300 hours.
- 3.8 In a similar manner to the unloading noise, we have representative data for car movements in car parks. We anticipate source noise levels of around 63dB L_{Aeq} per car at 2m.

Shopping Trolleys

- 3.9 We do not anticipate any significant noise from use of shopping trolleys.

Relevant Guidance

- 3.10 The commonly used British Standard for assessing noise impact from industrial premises upon residential dwellings is *British Standard 4142:1997 'Method for rating industrial noise affecting mixed residential and industrial areas'* (BS4142). This requires the noise from the industrial operation (in L_{Aeq}) to be compared with the existing Background Noise Level (L_{A90}) at nearby residential property. If the

noise is described by any of the following: “*contains a distinguishable, discrete continuous note (whine, hiss, screech, hum etc); contains distinct impulses (bangs, clicks, clatters, or thumps); is irregular enough to attract attention*”, then a 5dB acoustic feature correction is applied.

- 3.11 BS4142 states that if the Rating Level exceeds the L_{A90} Background Noise Level by around 10dB, then complaints would be likely. An excess of around 5dB over the Background Noise Level is viewed as being ‘of marginal significance’. A Rating Level more than 10dB below the Background Noise Level is regarded as a positive indication that complaints are unlikely.
- 3.12 The scope of BS4142 states that the standard refers to assessing noise levels from factories, or industrial premises, or fixed installations, or sources of an industrial nature in commercial premises. Clearly, BS4142 is applicable to plant noise. Although debatable, it is considered reasonable that BS4142 be applied to delivery noise and HGV movements. BS4142 is, however, not appropriate for considering noise from the car park generally, given that these noise sources are not industrial in nature, as would be required for BS4142 to apply. Furthermore, other activities such as customer speech are also clearly not industrial in nature, and this report therefore considers plant noise, HGV deliveries and unloading only in accordance with BS4142.
- 3.13 *British Standard 8233: 2014, ‘Guidance on sound insulation and noise reduction for buildings’* (BS8233) provides information on the design of internal acoustics in buildings. It deals with control of noise from outside the building, noise from plant and services within it, and room acoustics for non-critical situations.
- 3.14 BS8233 guidance regarding indoor ambient noise criteria for residential accommodation is presented below.

Table 1: BS8233:2014 Guidance Criteria for Indoor Ambient Noise Levels

Activity	Location	0700 to 2300 hrs	2300 to 0700 hrs
Resting	Living rooms	35 dB L_{Aeq} (16 hour)	-
Dining	Dining room/area	40 dB L_{Aeq} (16 hour)	-
Sleeping (daytime resting)	Bedroom	35 dB L_{Aeq} (16 hour)	30 dB L_{Aeq} (8 hour)

- 3.15 BS8233 does not stipulate any criteria for maximum noise levels within rooms in terms of dB L_{Amax} , but does state that:

“Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or $L_{Amax,F}$, depending on the character and number of events per night. Sporadic noise events could require separate values.”

- 3.16 In addition, BS8233 makes reference to noise levels in gardens and balconies, etc., and states that it is desirable that the steady noise level does not exceed 50dB $L_{Aeq,T}$ dB, and that 55dB $L_{Aeq,T}$ should be regarded as the upper limit. Living room and garden criteria apply to daytime use (0700 to 2300 hours), and bedroom criteria apply to night-time use (2300 to 0700 hours).

Daytime BS4142 Noise Impact – Plant Noise, HGV Deliveries & Unloading

- 3.17 The layout of the site is beneficial in that the distance between noise sources and noise receivers is maximised.
- 3.18 Our calculations indicate that unloading activities would typically generate 43dB $L_{Aeq}(1 \text{ hour})$ within the nearest residential gardens (i.e., the gardens closest to the northern boundary of the site). Applying the BS4142 acoustic feature correction, the Rating Level would become 48dB. Comparing this to the lowest background noise level of 41dB L_{A90} during proposed daytime delivery hours on a weekday or Sunday, the BS4142 result would become +7dB. This is ‘of marginal significance’ as defined in BS4142. We would propose that this represents an acceptable level of noise impact from delivery activity, particularly given that prevailing ambient noise levels are greater than this and that the predicted noise level is below the BS8233 desirable limit of 50dB L_{Aeq} in gardens. More remote

gardens and properties will experience lower resulting noise levels due to increased distance and/or shielding from the service yard location.

- 3.19 Our calculations indicate that HGV movements within the car park and service yard access would typically generate 35dB $L_{Aeq(1 \text{ hour})}$ to the nearest gardens. Applying the acoustic feature correction, this becomes a Rating Level of 40dB. This would generate a BS4142 assessment of less than marginal significance, both on a Sunday and during the week. At other locations, the delivery vehicle access will be at further distance, and therefore noise impact will be less than that predicted above.
- 3.20 Plant items are to be located within an external plant area located to the site of the store.
- 3.21 During the day, assuming the plant items listed at paragraph 3.4, the combined noise generated by the plant items would be 38dB $L_{Aeq(1 \text{ hour})}$ at 10m. Based on the charts above and given the additional distance provided in this installation, the noise level within gardens would typically be 25dB $L_{Aeq(1 \text{ hour})}$. Applying the acoustic feature correction, the Rating Level would become 30dB, which provides a difference of -3dB. This is less than 'of marginal significance' as defined in BS4142 and is lower than both the existing ambient and background noise levels measured and shown in the charts above.
- 3.22 As such, it is the unloading activities that will potentially generate the highest noise levels. It should be noted that the HGV driving activities do not occur simultaneously with the unloading activities.

Night-time BS4142 Noise Impact

- 3.23 During the night, the BS4142 assessment method is to consider potential noise in any 5-minute period and to compare this to typical background noise levels in the vicinity of residential properties.
- 3.24 As there will be no deliveries or unloading at night, the only noise source will be plant items that operate even when the store is closed.

- 3.25 During the night, assuming the plant items listed at paragraph 3.4, the combined noise generated by the plant items would be 28dB $L_{Aeq(5 \text{ minute})}$ at 10m. Based on the charts above and given the additional distance provided in this installation, the noise level at nearby properties would typically be 15dB $L_{Aeq(5 \text{ minute})}$. Applying the acoustic feature correction, the Rating Level would become 20dB, which provides a difference of -9dB. Being below the lowest existing background noise level shown in the charts above, and being of less than 'marginal significance' in BS4142 terms, and very nearly at a level representing a positive indication that complaints are unlikely during the night. As such, night time noise impact will be very low.
- 3.26 Noise levels at other, more remote, residential window locations will not be significantly higher than this.

Daytime BS8233 Noise Impact

- 3.27 Non-industrial noise source types, including customer and car noise, have been assessed with reference to criteria given in BS8233. Typically, existing ambient noise levels were found to be in the region of 50dB L_{Aeq} .
- 3.28 The assessment has allowed for twenty customers to be talking at locations scattered across the site simultaneously, together with ten car movements, again spread across the site.
- 3.29 Speech is calculated as being 41dB L_{Aeq} in the worst-affected gardens. Car noise is calculated as being 50dB L_{Aeq} in the worst-affected gardens. The sum of this is 50dB L_{Aeq} , i.e., speech noise is not significant.
- 3.30 The predicted noise level of 50 dB L_{Aeq} is lower than typical existing noise levels and is acceptable in BS8233 terms for garden spaces. In addition, if the level of 50dB L_{Aeq} were summed with the existing typical levels of around 55dB L_{Aeq} , the result would be 56dB L_{Aeq} . This represents a negligible increase, and effectively noise levels will not perceptibly change.
- 3.31 The store will not operate at night, and therefore there is no night-time assessment of car and/or customer noise.

4.0 NOISE MITIGATION MEASURES

- 4.1 It is considered that no additional noise mitigation measures are required in order to meet the noise levels and associated noise impacts as set out above.

5.0 SUMMARY AND CONCLUSIONS

- 5.1 A noise assessment has been carried out relating to a proposed retail unit on land at the existing Kingsmills public house located at Kingsmills Road, Wrexham, LL13 0NS. The proposed retail unit would operate daily between the hours of 0700 and 2300 only.
- 5.2 Noise surveys have been undertaken during a weekday, weeknight and on a Sunday in order to determine the existing noise climate at the site.
- 5.3 Where appropriate, noise impact from sources of an industrial nature has been assessed with reference to BS4142. The result of the assessment shows that, at worst, the operation of the site will generate a 'marginal significance' BS4142 situation.
- 5.4 Non-industrial noise impact has been assessed with reference to residential noise criteria given in BS8233. The result of the assessment shows that, at worst, the operation of the site will generate noise levels that do not exceed the appropriate BS8233 criteria.
- 5.5 Considering the above, the operation of the site between the hours of 0700 and 2300 daily will not have a negative effect on the amenity of occupants of nearby residential properties by way of noise.
- 5.6 In addition, night-time noise will comprise of one plant item, which will generate a very low level of noise, and as such between the hours of 2300 and 0700 the site will not have a negative effect on the amenity of occupants of nearby residential properties by way of noise.

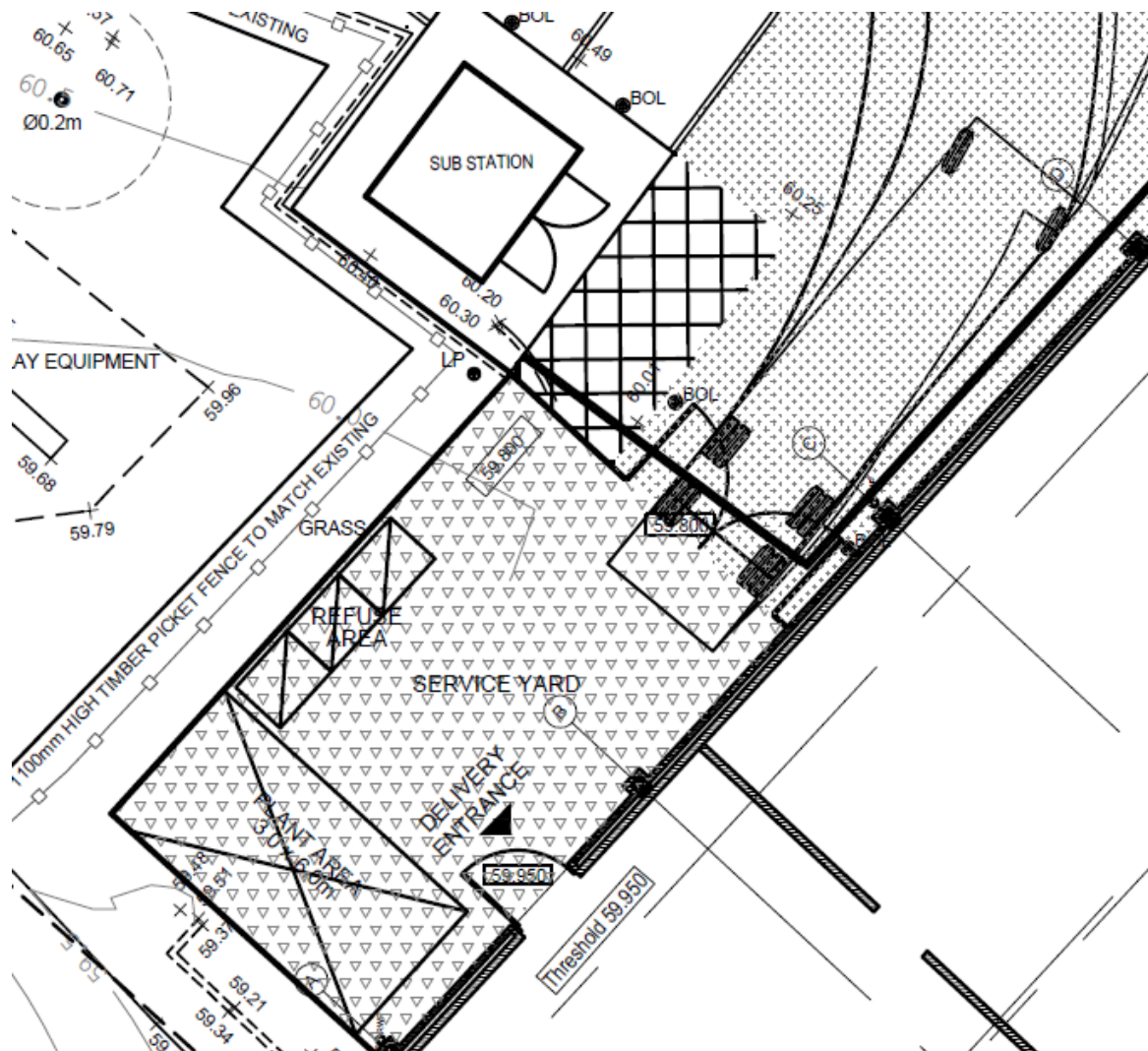
FIGURE 1 – INDICATIVE NOISE MEASUREMENT LOCATION PLAN



FIGURE 2 – PROPOSED SITE LAYOUT



FIGURE 3 – SERVICE YARD AND PLANT AREA LOCATION



APPENDIX I – NOISE UNITS AND INDICES

a) Sound Pressure Level and the decibel (dB)

A sound wave is a small fluctuation of pressure in air. The human ear responds to these variations in pressure, producing the sensation of hearing. The ear can detect a very wide range of pressure variations. Due to the wide range of pressure variations detectable by the ear, a logarithmic scale is used to convert the values into manageable numbers. The dB (decibel) is the logarithmic unit used to describe sound (or noise) levels. The usual range of sound pressure levels is from 0 dB (threshold of hearing) to 120 dB (threshold of pain).

b) Frequency and Hertz (Hz)

Frequency is a measure of the rate of fluctuation of a sound wave. The unit used is cycles per second, or Hertz (Hz). Sometimes large frequencies are often written as kilohertz (kHz), where 1kHz = 1000Hz.

Young people with normal hearing can hear frequencies in the range 20Hz to 20kHz. However, the upper frequency limit gradually reduces as a person gets older.

As the ear hears some frequencies better than others, the A-weighting scale is used to mimic human hearing. A-weighting applies a correction to the sound level at a given frequency depending on how well the ear hears that frequency.

c) Glossary of Terms

In order to describe noise where the level is continuously varying, a number of other indices, including statistical parameters, are used. The indices used in this report are described below.

L_{Aeq} This is the A-weighted equivalent continuous sound level which is an average of the total sound energy measured over a specified time period. In other words, L_{Aeq} is the level of a continuous noise which has the same total (A-weighted) energy as the real fluctuating noise, measured over the same time period.

L_{Amax} This is the maximum A-weighted sound level that was recorded during the monitoring period.

L_{A90} This is the A-weighted sound level exceeded for 90% of the time period. L_{A90} is used as a measure of background noise.

L_{A10} This is the A-weighted sound level exceeded for 10% of the time period and is often used in the assessment of road traffic noise.

SEL The SEL is the single event level (also sometimes called the sound exposure level). This is commutable with L_{Aeq} using the following formula:

$$SEL = L_{Aeq} + 10\log(t)$$

where t is time in seconds.