

PROPOSED RETAIL FOOD STORE, HUDDERSFIELD ROAD, MIRFIELD

NOISE IMPACT ASSESSMENT

On behalf of:
Morbaine Ltd

**PROPOSED RETAIL FOOD STORE, HUDDERSFIELD ROAD, MIRFIELD:
NOISE IMPACT ASSESSMENT**

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1.0 INTRODUCTION

- 1.1 Hepworth Acoustics Ltd was commissioned by Morbaine Ltd to carry out a noise assessment in connection with a proposed outline planning application for a retail food store on land at Huddersfield Road, Mirfield.
- 1.2 We understand that the noise assessment was requested by the Local Planning Authority following consultee comments from the Environmental Health Department dated 22 July 2019. The Environmental Health Officer (EHO) has requested that a noise assessment is undertaken for a number of residential properties that are located on the opposite side of Huddersfield Road from the proposed development. The noise assessment locations specified by the EHO are 238 Huddersfield Road and Nos. 1, 17, 21 and 31 The Maltings.
- 1.3 The planning application will be seeking outline approval only at this stage. Therefore, full details of the store development are not available at this stage and thus by necessity the noise assessment must also be in outline form.
- 1.4 The noise assessment has included:
- i. An inspection of the development site and environs;
 - ii. Measurement of the prevailing noise climate of the area;
 - iii. Assessment of the potential noise impact on nearby residents opposite.
 - iv. Recommendation of appropriate noise design limits for mechanical services plant.
- 1.5 The qualifications and experience of the author of this report are as follows:- BSc (Hons.) in Environmental Science; Institute of Acoustic's Diploma in Acoustics & Noise Control; MSc in Environmental Acoustics. He has 30 years of experience in monitoring and assessment of environmental noise and is an author of papers on environmental noise issues. He is a Fellow of the Institute of Acoustics.
- 1.6 The various noise units and indices referred to in this report are described in Appendix I. All noise levels mentioned in the text have been rounded to the nearest decibel, as fractions of decibels are imperceptible.

2.0 SITE DESCRIPTION AND PROPOSALS

- 2.1 The proposed development site is located on the south side of Huddersfield Road in Mirfield. The site has long established commercial use and is currently occupied by Kenmore Caravans. There are other commercial premises located adjacent to the west and east of the site. To the south of the site is the River Calder with grassland beyond. To the north of the development site, on the other side of Huddersfield Road, is a residential area and it is for a sample of these properties that the EHO has requested the noise assessment.
- 2.2 An illustrative layout of the proposed development is shown in Figure 1 and the noise assessment is based upon this layout. Figure 1 shows that the store will be located on the western part of the site with the central and eastern parts taken up by car parking. The site access will be from Huddersfield Road, the existing access point being retained and improved. The entrance to the store building will be in the eastern elevation. Deliveries will be made via a dock loading bay in the south elevation with all deliveries being received from within the building. External refrigeration plant will also be located outside the south elevation.
- 2.3 A store operator has not yet been established and thus at this outline stage the applicant would wish to maximise the flexibility of trading hours. However, we understand that as a minimum the trading hours of the store would need to be 07:00-22:00 hours on weekdays and Saturdays with Sunday opening being the usual 6 hours period anytime between 09:00-18:00 hours. Flexibility for store deliveries would need to be at least 06:00-23:00 hours on weekdays and Saturdays.

3.0 AMBIENT NOISE SURVEY

- 3.1 A noise survey has been carried out to establish the prevailing noise climate of the area for the houses on the opposite side of Huddersfield Road from the proposed development.
- 3.2 This was achieved by measuring ambient noise levels by a combination of attended and unattended noise measurements.
- 3.3 The EHO requires background noise monitoring to be undertaken for five specified residential locations but it is not practicable for us to do this at individual properties for extended time periods over different days and nights. Therefore, as the noise climate at these houses is determined by traffic noise from Huddersfield Road, we have carried out long-term unattended automated noise monitoring at a location on the caravan site itself (i.e. for a weekday and weekend period) the data from which has been used taken to obtain representative long-term noise data at the houses on the other side of the road, as described below.
- 3.4 This long-term survey was supplemented by some short-term attended monitoring carried out at the five specific residential locations for representative periods of the daytime on a weekday. These attended noise level samples were timed to be undertaken simultaneously with the noise measurements carried out at the long-term noise survey locations. This approach of using a long-term 'control' noise survey location with synchronised 'satellite' short-term noise survey locations is an established method of obtaining noise data at multiple locations.
- 3.5 The difference between the synchronised attended noise measurements at each of the residential locations and the long-term survey location (the 'transfer function') has then been calculated. These differences are shown at the end of Appendix II. The synchronised noise level results at the residential locations were found to be within 2-3 dB of the levels measured at the long term monitoring location i.e. very little difference.
- 3.6 The long-term noise survey was carried out at in consecutive 5-minute periods from Thursday 12 September 2019 to Monday 16 September 2019 at a location 8 metres from the northern boundary of the development site (Location A in Figure 1).
- 3.7 This unattended noise monitoring at Location A was carried out using a Rion NL-52 sound level meter with an all weather kit and microphone mast. For security reasons this meter was chained to the palisade fence in the Location A area.

3.8 The satellite noise monitoring locations are indicated in Figure 1 and described below:

- Location B: 238 Huddersfield Road (on steps 5m from road)
- Location C: 31 The Maltings
- Location D: 17/21 The Maltings
- Location E: 1 The Maltings

3.9 The sample attended noise measurements at Locations B to E were taken on 16 September using a Brüel & Kjær 2250 sound level meter mounted to a tripod at a microphone height of approximately 1.4m above the ground. The sample noise levels were measured as a series of 5-minute periods synchronised with the same 5-minute periods being measured continuously at Location A.

3.10 Both sound level meters used have independent calibration certification. Additionally, the calibration of the sound level meters was checked before and after the noise measurements using a field acoustic calibrator and no significant variation in the calibration level occurred.

3.11 The survey was carried out during a period of dry and stable weather with generally mild temperatures and light to moderate wind conditions.

Results

3.12 The full results of the noise survey are shown in Appendix II and are described below.

3.13 The chart in Appendix II shows the noise levels measured over several days and nights and these levels can be taken to be representative of the noise levels at the residential locations opposite within 2-3 dB.

3.14 The chart shows that the prevailing daytime ambient noise levels of the area were found to be fairly high at around 65 dB L_{Aeq} on all days. Night-time ambient noise levels were generally within the range of 50-60 dB L_{Aeq} .

3.15 Short-term peaks of noise were generally within the range of 70-85 dB L_{Aeq} due to passing traffic.

3.16 The L_{A90} background noise levels were generally within the range of 50-60 dB L_{A90} in the daytime, reducing to 40-50 dB L_{A90} in the evening (19:00-23:00), and 30-45 dB L_{A90} at night (23:00-07:00).

- 3.17 Thus, due to traffic noise from Huddersfield Road, the prevailing ambient noise climate of the area is fairly high, with high peaks of noise from passing vehicles. The background noise of the area (in L_{A90}) is also fairly high in the daytime and evening but, as one would expect, is low in the middle of the night.
- 3.18 The results of the noise survey have been taken into account in the assessment in Section 5.

4.0 RELEVANT PLANNING GUIDELINES AND BRITISH STANDARDS

4.1 The *National Planning Policy Framework* (NPPF) 2019 states at paragraph 180 that planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects of pollution on health and living conditions i.e. they should 'avoid noise giving rise to significant adverse impacts on health and the quality of life'.

4.2 The *Noise Policy Statement for England* (NPSE) 2010 includes three aims:

- Avoid significant adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.
- Mitigate and minimise adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.
- Where possible, contribute to the improvement of health and quality of life through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.

4.3 There are a number of British Standards and other documents that provide guidance on environmental noise matters but the one that is most relevant to operational noise from the proposed new retail food store is BS4142:2014, particularly in terms of control of noise from mechanical services. This standard is summarised below.

British Standard 4142: 2014 'Methods for rating and assessing industrial and commercial sound'

4.4 BS 4142: 2014 describes methods for rating and assessing sound of an industrial and/or commercial nature, including sound from fixed installations which comprise mechanical and electrical plant and equipment. This requires the sound from a specific source (in L_{Aeq}) to be compared with the existing background sound level (L_{A90}) outside residential locations. The standard also puts weight on the importance of the context in which the sound will occur.

4.5 A '*character correction*' is added to the specific sound level where '*certain acoustic features can increase the significance of impact*' at the residential locations. Penalties ranging from 2 – 9 dB are

added where the sound sources are considered tonal or impulsive or *'otherwise are readily distinctive against the residual acoustic environment'*.

- 4.6 BS 4142 states that if the rated sound level exceeds the L_{A90} background sound level by around 10 dB or more it *'is likely to be an indication of significant adverse impact'*. An excess of around 5 dB over the background sound level is *'likely to be an indication of an adverse impact'* but not amounting to a significant adverse impact.
- 4.7 The lower the rating level is relative to the measured background sound level, the less likely it *'will have an adverse impact or a significant adverse impact'*. Where the rating level does not exceed the background sound level, *'this is an indication of the specific sound source having a low impact'*.
- 4.8 BS 4142 also states in respect of background sound levels that *"that values are reliable and suitably represent the particular circumstances and periods of interest... the objective is not simply to ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods"*.
- 4.9 The quantitative BS 4142 analysis is an 'initial assessment' and, where relevant, contextual factors also need to be taken into account.
- 4.10 BS4142 requires noise impact to be assessed over a 1 hour period in the daytime and over a 15 minute period at night.

5.0 ASSESSMENT OF NOISE IMPACT

5.1 There are three aspects of operational noise that need to be considered for the proposed food store; control of noise from mechanical services plant, noise from deliveries, and noise from customer car parking. These aspects are considered below.

External Mechanical Services Equipment

5.2 There are no details available on external plant that will be installed for the food store and it is therefore not possible to carry out a quantitative assessment of noise impact at this juncture. However, it is assumed that there will be a need for external air conditioning equipment and cooling/refrigeration condensers that may run on a 24-hour basis. However, we understand that the equipment would be located in a plant compound located in the south-west corner of the site behind (i.e. to the south of) the store building. This plant location is so far away from, and so effectively acoustically screened from, the houses in Huddersfield Road that it is inconceivable that there will be any adverse noise impact at the dwellings from such plant.

5.3 However, in case there will be any other external plant (or flue/ventilation outlets) at other locations (e.g. on the roof) we recommend that appropriate noise design criteria are adopted for any such equipment in order to ensure the safeguarding of residential amenity.

5.4 The standard approach in such circumstances is to use the results of the background noise survey, in conjunction with the methodology of British Standard 4142:2014, as a basis for recommending appropriate noise design limits for mechanical plant installations. For design purposes we recommend that the Rating Level of plant noise (assessed to BS 4142) should be controlled so as not to exceed the representative background sound levels at the houses in Huddersfield Road.

5.5 On this basis, our recommended criteria, which will need to be taken into account by the M&E consultants/contractors during the detailed design/reserved matters stage, are set out in Table 1.

Table 1: Recommended Noise Design Limits for External M&E Plant at dwellings in Huddersfield Road

Time of Day	Noise Rating Level L_{Ar} (dB)
Daytime (07:00-19:00)	55 (1 hour)
Evening (19:00-23:00)	45 (1 hour)
Night (23:00-07:00)	35 (15 mins) - Monday to Saturday nights 30 (15 mins) - Sunday night

- 5.6 The criteria recommended in Table 1 will ensure the protection of residential amenity.
- 5.7 Depending on the plant type/location it may be necessary to implement one, or more, of the noise mitigation measures listed below:-
- Selection of low-noise items of machinery;
 - Locating equipment away from dwellings and/or in shielded locations.;
 - Housing of equipment within acoustic enclosures or behind acoustic screens;
 - Orientating duct/vent outlets away from dwellings;
 - Using equipment that has a 'quiet mode' setting for night-time operation.

Delivery Noise

- 5.8 The proposed delivery area will be located at the southern area of the building (i.e. behind the building) and will comprise a sloping access for the delivery lorry to reverse down to a dock loading bay. This area will be acoustically screened from the houses in Huddersfield Road by the store building itself.
- 5.9 We assume that there would only be one main delivery a day made by an articulated lorry and that use of the dock loading bay means that all unloading of the goods vehicle will be carried out from within the building and not in the open. It is assumed that deliveries would be made in the daytime only and that the vehicle engine, and any on-vehicle refrigeration equipment, would be switched off during the unloading.
- 5.10 On this basis, the only noise from the main delivery would be from the vehicle arriving and reversing into position and then later driving off after completion of the delivery. In the context of the high ambient noise climate due to road traffic noise and the anticipated delivery times, it is inconceivable that this would result in any adverse noise impact at the dwellings in Huddersfield Road.
- 5.11 Similarly, on the same basis, it is considered that any other minor deliveries to the store such as newspapers, fresh flowers, etc would not result in any significant noise impact on residential amenity.

Car Parking

- 5.12 The illustrative layout drawing shows a total of 101 car parking spaces. Cars manoeuvring at slow speeds in supermarket car parks generate low levels of noise but higher levels can be generated (albeit briefly) from car doors being closed.
- 5.13 Thus, in order to determine the likely car park noise levels outside the nearest dwellings in Huddersfield Road, calculations have been undertaken based on a typical SEL (sound exposure level) value of 72 dB(A) at 5 metres for car doors/boots that we have measured previously.
- 5.14 SEL is the total sound energy generated by one discrete noise event normalised to a 1 second duration. The approach of using SEL values for discrete events is useful since it allows calculation of 'equivalent noise levels' (L_{eq}) over a longer period.
- 5.15 As shown in Figure 1, some of the residential properties in Huddersfield Road are not opposite the car park, however the more easterly properties are, albeit with the busy road in between. We have therefore assessed car park noise for 1 The Maltings (the property indicated as Location E in Figure 1) which is opposite the main area of the car park.
- 5.16 The majority of the parking spaces will be away from the houses in Huddersfield Road and in the late evening the number of visiting customers is likely to be low. However, during busy periods of the daytime it is assumed that the car park could be fully used.
- 5.17 For a worst-case assessment, we have assumed that during a busy daytime hour period each of the 19 car parking spaces opposite and nearest to 1 The Maltings will be occupied. For each parking space we have assumed that one car departs and one car arrives during the hour.
- 5.18 The resulting noise level at the dwelling has been calculated from the following formula:

$$L_{Aeq(T)} = SEL + 10 \log N - 20 \log d/5 - 10 \log T$$

where $L_{Aeq(T)}$ = L_{Aeq} over time period T

SEL_{average} = 'Sound Exposure Level' @ 5 metres

N = Number of events in time period T

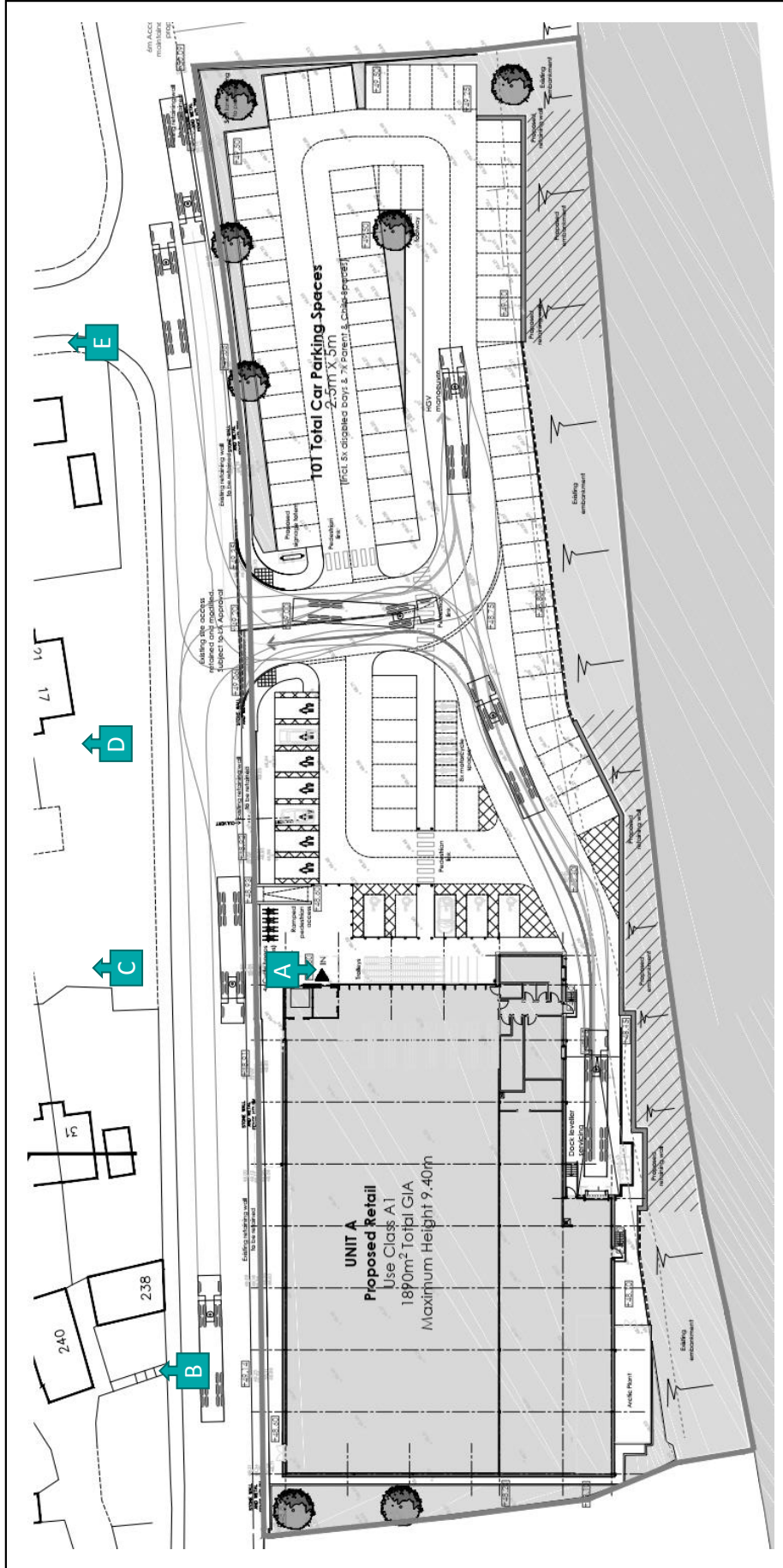
d = Distance from dwelling to car park spaces in metres

T = Time period in seconds, (i.e. 3600s for a 1 hr period)

5.19 The result of the calculation is 45 dB $L_{Aeq(1 \text{ hour})}$. This is a low level of noise that is some 20 dB below the existing level of daytime ambient noise in the area and some 10 dB below the prevailing background noise level. This means that the sound of car parking would not give rise to any adverse noise impact at the residential area on the other side of Huddersfield Road.

6.0 SUMMARY AND CONCLUSION

- 6.1 A noise assessment has been carried out by Hepworth Acoustics in connection with a proposed outline planning application for a retail food store development at Huddersfield Road, Mirfield. The local Environmental Health Officer has requested that the noise assessment be undertaken in respect of the nearest dwellings on the opposite side of Huddersfield Road.
- 6.2 The assessment has included carrying out an ambient noise measurement survey over several days and nights. The prevailing noise climate of the area was found to be fairly high due to traffic noise from Huddersfield Road. The potential noise impact of the proposed food store development is therefore low in the context of the existing noise environment.
- 6.3 The assessment has concluded that there is no reason why deliveries to the store or use of the car park would give rise to any adverse noise impact on the amenity of residents in Huddersfield Road.
- 6.4 Also, appropriate noise control design limits have been specified for external plant in order to protect residential amenity.
- 6.5 Therefore, it is concluded that, there are no environmental noise impact reasons which would impede granting of the outline planning permission for the proposed development.



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Key:

X Noise survey locations

Title: Figure 1: Proposed Development Layout & Noise Survey Locations

Project: P19-409

Do not scale from this figure

Appendix I: Noise Units & Indices

Sound and the decibel

A sound wave is a small fluctuation of atmospheric pressure. 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. In order to cope with this wide range of pressure variations, a logarithmic scale is used to convert the values into manageable numbers. Although it might seem unusual to use a logarithmic scale to measure a physical phenomenon, it has been found that human hearing also responds to sound in an approximately logarithmic fashion. 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 120dB (threshold of pain).

Due to the logarithmic nature of decibels, when two noises of the same level are combined together, the total noise level is (under normal circumstances) 3 dB(A) higher than each of the individual noise levels e.g. 60 dB(A) plus 60 dB(A) = 63 dB(A). In terms of perceived 'loudness', a 3 dB(A) variation in noise level is a relatively small (but nevertheless just noticeable) change. An increase in noise level of 10 dB(A) generally corresponds to a doubling of perceived loudness. Likewise, a reduction in noise level of 10 dB(A) generally corresponds to a halving of perceived loudness.

The ear is not equally sensitive to sound at all frequencies. It is less sensitive to sound at low and very high frequencies, compared with the frequencies in between. Therefore, when measuring a sound made up of different frequencies, it is often useful to 'weight' each frequency appropriately, so that the measurement correlates better with what a person would actually hear. This is usually achieved by using an electronic filter called the 'A' weighting, which is built into sound level meters. Noise levels measured using the 'A' weighting are denoted dB(A) or dBA.

Frequency and Hertz (Hz)

As well as the loudness of a sound, the frequency content of a sound is also very important. 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 frequency values are written as kiloHertz (kHz), where 1 kHz = 1000 Hz.

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

Glossary of Terms

When a noise level is constant and does not fluctuate, it can be described adequately by measuring the dB(A) level. However, when the noise level varies with time, the measured dB(A) level will vary as well. In this case it is therefore not possible to represent the noise climate with a simple dB(A) value. In order to describe noise where the level is continuously varying, a number of other indices can be used. The indices used in this report are described below.

L_{Aeq} This is the A-weighted 'equivalent continuous noise 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. It is increasingly being used as the preferred parameter for all forms of environmental noise.

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

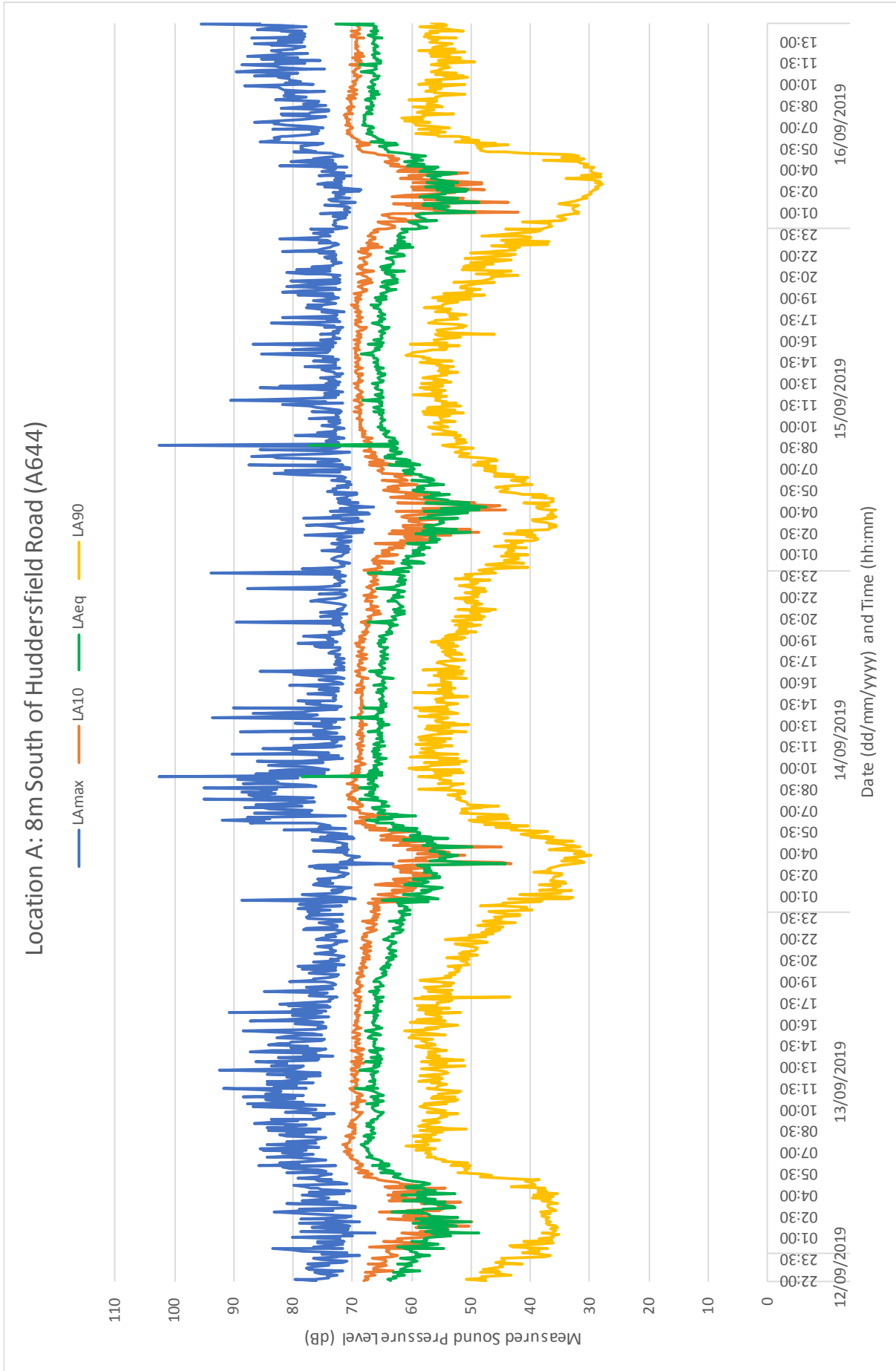
L_{A10} This is the A-weighted noise level exceeded for 10% of the time period. L_{A10} is usually used as a measure of traffic noise.

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

SEL This is the A-weighted 'Sound Exposure Level' which is used for measuring discrete noise events. Essentially it is a measure of the sound energy of the whole noise event normalised to a period of 1 second. The SEL value can be used to calculate the actual L_{Aeq} value for a given time period if the number of noise events is known.

Appendix II: Noise Survey Results

Date(s):	Longer Term : 12 to 16 September 2019 (Unattended) Afternoon: 16 September 2019 (Attended)
Equipment:	Rion NL-52 'Class/Type 1' sound level meter (S/N: 00242747) with calibrator, microphone mast and environmental kit Brüel & Kjær 2250 'Class/Type 1' sound level meter (S/N: 3011706) with calibrator and tripod
Weather:	Thursday/Friday; Evening/Night: Dry, mild ~12°C with low winds <4m/s and overcast Friday; Daytime: Dry, mild ~15°C with low winds <3m/s and moderate cloud coverage Friday/Saturday; Evening/Night: Dry, mild ~10°C with low winds <2m/s and moderate cloud coverage Saturday; Daytime: Dry, warm ~18°C with low winds <3m/s and low/moderate cloud coverage Saturday/Sunday; Evening/Night: Dry, mild ~13°C with low winds <2m/s and moderate cloud coverage Sunday; Daytime: Dry, warm ~17°C with low winds <3m/s and moderate cloud coverage Sunday/Monday; Evening/Night: Dry, mild ~12°C with low winds <2m/s and overcast Monday; Daytime: Dry, mild ~15°C with low winds <2m/s and overcast



Location B: On steps next to no. 238 Huddersfield Road; 5m from edge of road

Date	Time		Measured Noise Levels (dB)				Comments
	Start	End	L _{Amax}	L _{A10}	L _{Aeq}	L _{A90}	
16/09/2019	13:35	13:40	89.3	76.1	73.4	59.3	Road traffic noise.
16/09/2019	13:40	13:45	87.8	75.5	72.3	58.5	Road traffic noise.

Location C: North of road in line with no. 31 The Maltings

Date	Time		Measured Noise Levels (dB)				Comments
	Start	End	L _{Amax}	L _{A10}	L _{Aeq}	L _{A90}	
16/09/2019	13:50	13:55	82.6	72.4	68.9	54.9	Road traffic noise.
16/09/2019	13:55	14:00	77.7	71.5	67.5	49.6	Road traffic noise.

Location D: North of road in line with no. 17 The Maltings

Date	Time		Measured Noise Levels (dB)				Comments
	Start	End	L _{Amax}	L _{A10}	L _{Aeq}	L _{A90}	
16/09/2019	14:05	14:10	80.1	71.8	68.0	55.8	Road traffic noise.
16/09/2019	14:10	14:15	76.3	71.5	68.6	62.0	Road traffic noise.

Location E: North of road in line with no. 1 The Maltings

Date	Time		Measured Noise Levels (dB)				Comments
	Start	End	L _{Amax}	L _{A10}	L _{Aeq}	L _{A90}	
16/09/2019	14:20	14:25	79.3	70.0	67.0	53.0	Road traffic noise.
16/09/2019	14:25	14:30	81.8	71.0	67.6	52.9	Road traffic noise.

Analysis of Difference between Synchronised Noise Measurements (in dB LA90)**Location B - Location A: Difference between Synchronised Levels**

Measurement Location	Start	End	LA90
Location A	13:35	13:40	57
Location B	13:35	13:40	59
Difference =			2
Location A	13:40	13:45	58
Location B	13:40	13:45	59
Difference =			1
Average difference between A and B			2

Location C - Location A: Difference between Synchronised Levels

Measurement Location	Start	End	LA90
Location A	13:50	13:55	57
Location C	13:50	13:55	55
Difference =			-2
Location A	13:55	14:00	51
Location C	13:55	14:00	50
Difference =			-2
Average difference between A and C			-2

Location D - Location A: Difference between Synchronised Levels

Measurement Location	Start	End	LA90
Location A	14:05	14:10	55
Location D	14:05	14:10	56
Difference =			1
Location A	14:10	14:15	59
Location D	14:10	14:15	62
Difference =			3
Average difference between A and D			2

Location E - Location A: Difference between Synchronised Levels

Measurement Location	Start	End	LA90
Location A	14:20	14:25	55
Location E	14:20	14:25	53
Difference =			-1
Location A	14:25	14:30	57
Location E	14:25	14:30	53
Difference =			-4
Average difference between A and E			-3