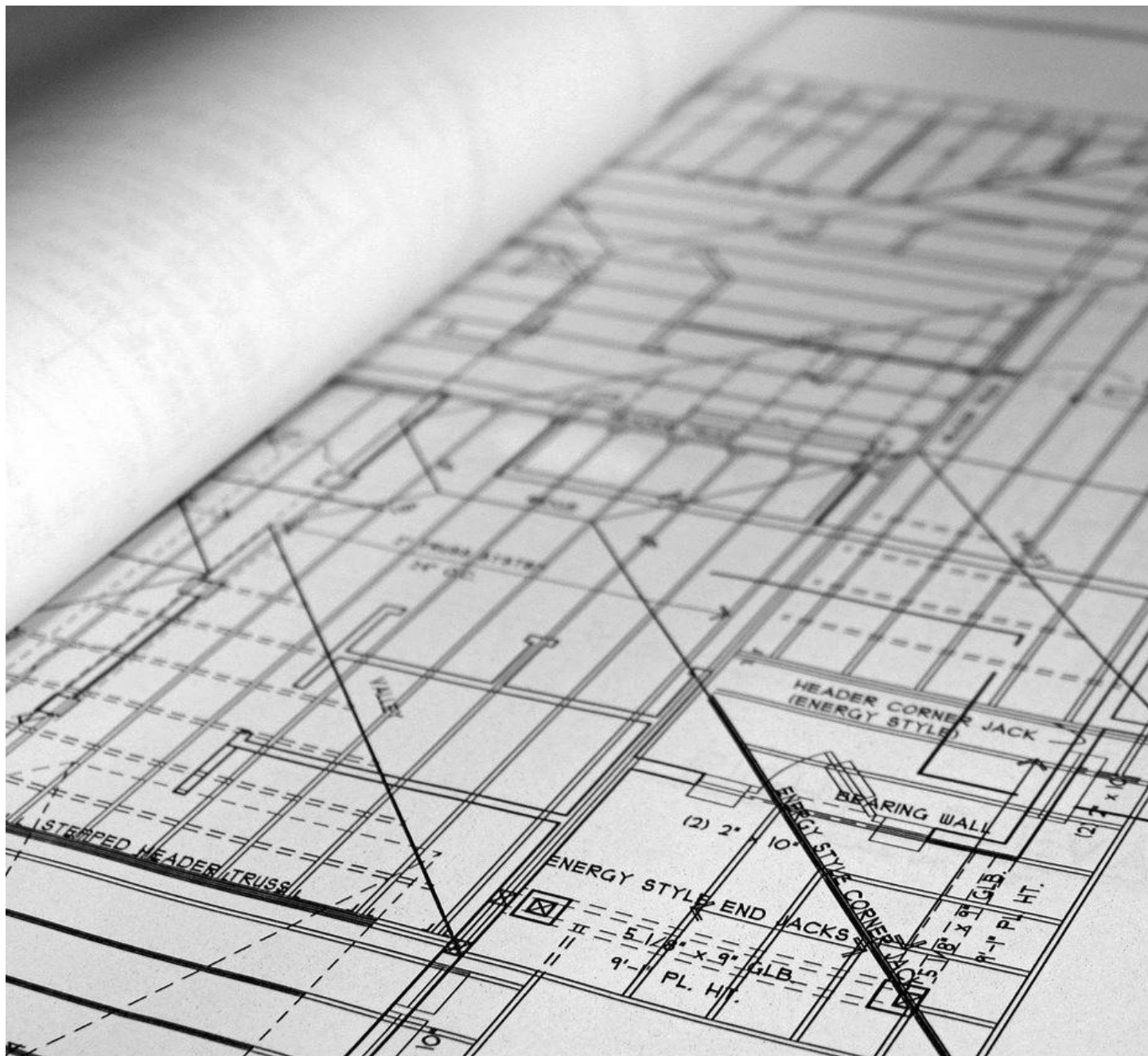




Holcombe Mill, Ramsbottom

Noise Impact Assessment

Client: Eccleston Homes

Project Number: 1792022-001

Date: 26th October 2023

JPM
ACOUSTICS

REPORT ISSUE AND STATUS LOG

	Revision Number		
	1	2	3
Author	Adam Barr BSc (Hons) MIOA		
Position	Director		
Date of Issue	26 th October 2023		
Comment	For Issue		

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1 INTRODUCTION

1.1 OVERVIEW

- 1.1.1 JPM Acoustics Ltd has been appointed by Eccleston Homes to undertake a noise impact assessment to support a planning application for a proposed residential development at the Holcombe Mill site in Ramsbottom.
- 1.1.2 This report presents an assessment of the suitability of the site for the proposed development with regard to noise and draws on the results of a baseline noise survey on the site. The assessment has been undertaken with due consideration to relevant British Standards and current guidance relating to noise.
- 1.1.3 This report is necessarily technical in nature. Therefore, to assist the reader, a glossary of acoustic terminology is provided in **Appendix A**.

1.2 SITE DESCRIPTION AND PROPOSED DEVELOPMENT

- 1.2.1 The proposed development site is the disused Holcombe Mill site in Ramsbottom. The site is bounded by Bridge Street to the north, the River Irwell, Ramsbottom cricket club and Ramsbottom United FC to the east, open land to the south and East Lancashire Railway to the west, beyond which are commercial and industrial premises.
- 1.2.2 The proposed residential development comprises 57 residential units which are to be a mixture of detached and semi-detached houses.
- 1.2.3 The site location and proposed layout is included in **Figure 1-1**.

Figure 1-1: Site Location and Proposed Layout



2 LEGISLATION AND GUIDANCE

2.1 BS 8233:2014: GUIDANCE ON SOUND INSULATION AND NOISE REDUCTION FOR BUILDINGS (BS 8233)

2.1.1 BS 8233 provides guidance for the control of noise in and around buildings and recommends internal and external noise level criteria for residential dwellings.

2.1.2 The Standard states that it is desirable that internal ambient noise levels do not exceed the guideline values set out in **Table 2-1**.

Table 2-1: Internal Desirable Guideline Values from BS 8233

Activity	Location	Period	
		07:00 to 23:00 Hours, i.e. Daytime	23:00 to 07:00 Hours, i.e. Night-time
Resting	Living Room	35 dB L _{Aeq,16hour}	-
Dining	Dining Room/Area	40 dB L _{Aeq,16hour}	-
Sleeping (daytime resting)	Bedroom	35 dB L _{Aeq,16hour}	30 dB L _{Aeq,8hour}

2.1.3 BS 8233 does not provide specific criteria for one-off noise events (L_{AFmax}), however, it is common practice to adopt 45 dB L_{AFmax} as a criterion for typical events at night, based on the guidance from the World Health Organisation (WHO) *Guideline for Community Noise* 1999 and *Environmental Noise Guidelines for the European Region* 2018. Therefore, this criterion has been adopted for this assessment.

2.1.4 With respect to external amenity space such as gardens and patios, it is stated that it is desirable that the noise level does not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments.

2.2 BRITISH STANDARD 4142: 2014+A1:2019: METHODS FOR RATING AND ASSESSING INDUSTRIAL AND COMMERCIAL SOUND (BS 4142)

2.2.1 BS 4142 describes methods for rating and assessing the following:

- Sound from industrial and manufacturing processes;

- Sound from fixed installations which comprise mechanical and electrical plant and equipment;
- Sound from the loading and unloading of goods and materials at industrial and/or commercial premises; and
- Sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes, such as that from forklift trucks, or that from train movements on or around an industrial and/or commercial site.

2.2.2 The method uses outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident.

2.2.3 In accordance with the assessment methodology, the specific sound level (L_s) of the noise source being assessed is measured or predicted at a receptor location. A rating level ($L_{A,r,Tr}$) is then derived by adding a correction or penalty to the specific sound level for characteristic features, such as tonal qualities and/or distinct impulses, which make the source distinguishable against the residual noise climate. The British Standard effectively compares the difference between the rating level and the typical background sound level ($L_{A90,T}$) in the absence of the noise source being assessed.

2.2.4 It is advised that the time interval ('T') of the background sound measurement should be sufficient to obtain a representative or typical value of the background sound level at the time(s) when the noise source in question is likely to operate or is proposed to operate in the future.

2.2.5 Comparing the rating level with the background sound level, BS 4142 states:

"Typically, the greater this difference, the greater the magnitude of impact.

A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.

A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.

The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source 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, depending on the context."

3 BASELINE NOISE SURVEY

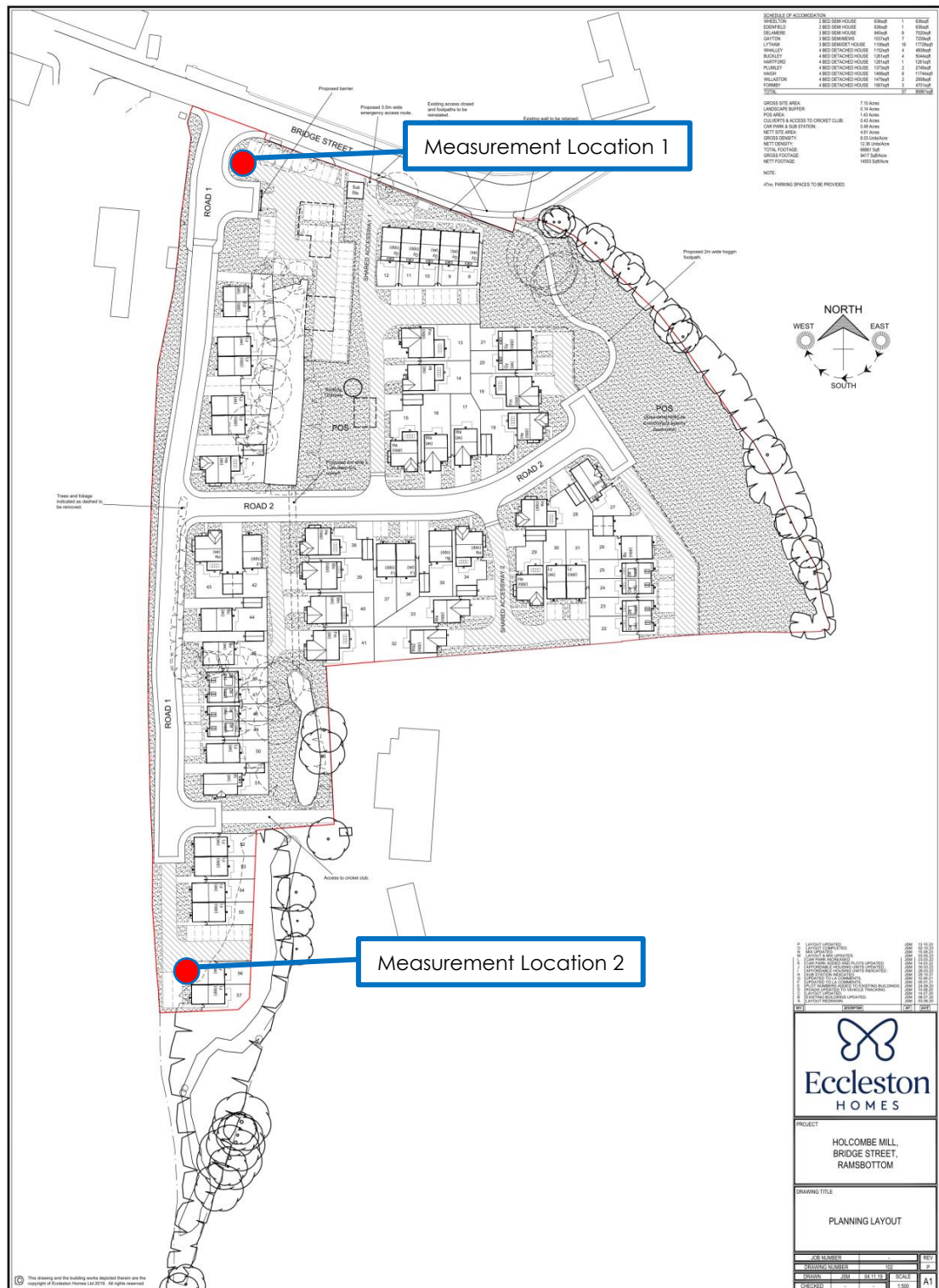
3.1 OVERVIEW

- 3.1.1 To inform the assessment, baseline noise surveys were undertaken on the site between 19:30 on Wednesday 4th January and 11:15 on Wednesday 5th January 2023 and between 09:45 on Sunday 22nd October and 07:00 on Tuesday 24th October 2023.

3.2 MEASUREMENT LOCATIONS

- 3.2.1 The measurement locations adopted during the baseline noise survey are shown on **Figure 3-1**.

Figure 3-1: Measurement Locations



3.2.2 Measurement Location 1 (ML1) was close to the northern site and western site boundaries at a distance of approximate 11 m from the nearside kerb edge of Bridge

Street and 20 m from the East Lancashire Railway line. Monitoring at ML1 was undertaken between 09:45 on Sunday 22nd October and 07:00 on Tuesday 24th October 2023. The microphone was at a height of 1.5 m above local ground in free-field conditions. The location was used to determine the noise levels generated by Bridge Street and the East Lancashire Railway Line.

- 3.2.3 Measurement Location 2 (ML2) was adjacent to the western site boundary at the location of the worst affected receptors in the vicinity of the Fedex site to the southwest of the site. Monitoring at ML2 was undertaken between 19:30 on Wednesday 4th January and 11:15 on Wednesday 5th January to capture noise levels from operations at the Fedex site. The microphone was at a height of 1.5 m above local ground in free-field conditions.

3.3 EQUIPMENT

- 3.3.1 The baseline noise survey was undertaken using the Class 1 specification noise measurement equipment detailed in **Table 3-1**. The measurement equipment was calibrated using a portable calibrator immediately before and after the measurements with no significant drift in calibration observed. The sound level meter, pre-amplifier and microphone were calibrated to traceable standards within 24 months prior to the measurements. The portable calibrator was calibrated within 12 months prior to the measurements.

Table 3-1: Equipment Details

Location	Item	Make & Model	Serial Number	Calibration Due
1	Sound Level Meter	SVAN 971	80344	26/05/2024
	Microphone	ACO 7052E	69566	
	Pre-amp	SV18	71577	
2	Sound Level Meter	SVAN 971	60745	23/08/2023
	Microphone	ACO 7052E	64535	
	Preamp	SV18	66815	
All	Calibrator	01dB-Stell Cal 21	34675335	06/09/2024 for ML1 14/02/2023 for ML2

3.4 WEATHER CONDITIONS

- 3.4.1 Weather conditions during the survey were generally conducive to environmental noise monitoring, it being mainly dry with low wind speeds ($<5 \text{ ms}^{-1}$).

3.5 RESULTS

- 3.5.1 A summary of the measured noise levels at ML1 is included in **Table 3-2**, the results for ML2 are shown in the assessment section. Full survey results for ML1 are included in **Appendix B**. The measurements on 22nd October 2023 at ML1 included movements on the East Lancashire Railway line.

Table 3-2: Measured Sound Pressure Levels at Measurement Location 1, Free-field

Start Date and Time	Period	dB L _A F _{max}	dB L _A eq,T	dB L _A 90,T
22/10/2023 09:45	Daytime (09:45 to 23:00)	-	64	53 ¹
22/10/2023 23:00	Night-time (23:00 to 07:00)	73 ²	55	49 ¹
23/10/2023 09:45	Daytime (07:00 to 23:00)	-	61	55 ¹
23/10/2023 23:00	Night-time (23:00 to 07:00)	72 ²	56	48 ¹
¹ Taken to be the mean of measured L _A 90,15min values during period.				
² 10 th Highest L _A F _{max,1min} value during the night-time				

4 ASSESSMENT

4.1 NOISE MODEL

4.1.1 A detailed computer based acoustic model of the site was generated to predict the daytime and night-time noise propagation across the site. The noise model was generated applying the following methodology:

- The model was generated using the PC based CadnaA® noise modelling package.
- The noise model was set to apply the prediction methodology from the Department of Transport document *Calculation of Road Traffic Noise (CRTN)* 1988 for road traffic noise sources (L_{Aeq}).
- The noise model was set to apply the prediction methodology from the department of transport document *Calculation of Railway Noise (CRN)* 1995 for railway noise sources (L_{Aeq}).
- The noise levels generated by the East Lancashire Railway and Bridge Street were calibrated based on the noise levels measured at ML1;
- To reflect local ground cover, ground absorption was set to $G=0$ (100% reflective ground).
- The development, surrounding existing buildings and proposed walls/barriers were incorporated into the noise model in order to account for acoustic screening.
- The model included topographical data for the site and surrounding area.
- The noise model was set to apply the prediction methodology from ISO 9613-2: *Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation* for L_{AFmax} noise levels.

4.2 EXTERNAL NOISE LEVELS, ROAD AND RAIL NOISE

4.2.1 **Figure 4-1** shows the noise levels predicted by the noise model at 1.5 m height across the site from road and rail traffic noise during the daytime.

The image is a detailed site plan for a residential development, likely a school or community center. It shows building footprints, parking lots, roads (Road 1, Road 2), and landscaped areas. The plan includes a color-coded noise or sound level overlay, with a legend on the right side. The legend shows color ranges from 0 to 60, with corresponding sound level ranges. The plan also includes various annotations and a scale bar.

Legend:

- 0 < ... <= 40
- 40 < ... <= 45
- 45 < ... <= 50
- 50 < ... <= 55
- 55 < ... <= 60
- 60 < ...

Annotations:

- ROAD 1
- ROAD 2
- ROAD 3
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4.2.2 It can be seen from **Figure 4-1** that in all rear gardens the 50 dB(A) desirable guideline value from BS 8233 is predicted to be achieved, indicated in pink, blue and green.

4.3 ENVIRONMENTAL NOISE BREAK-IN, ROAD AND RAIL NOISE

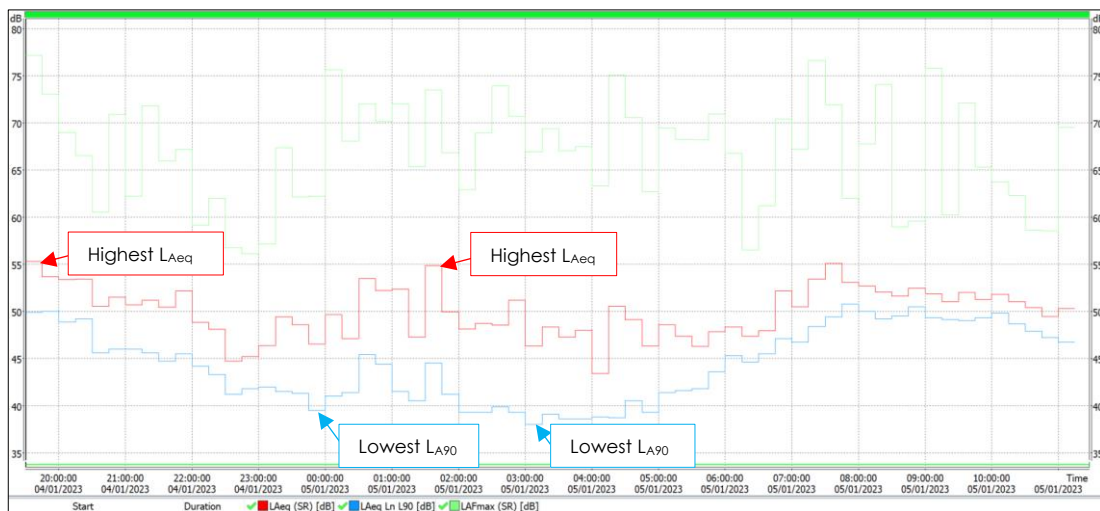
- 4.3.1 The highest predicted noise levels at the worst affected façades across the development were 63 dB $L_{Aeq,16h}$ during the daytime and 56 dB $L_{Aeq,8h}$ /73 dB L_{AFmax} at night.
- 4.3.2 In accordance with the 'Simple Calculation' from Section G.1 of BS 8233 internal noise levels can be estimated, assuming closed windows, by subtracting the weighted sound reduction index (R_w) performance of the proposed glazing, from the external free-field level incident on the façade.
- 4.3.3 Thermally proficient double glazing with a configuration similar to 6 mm glass/ 12 mm air gap/ 6 mm glass typically achieves a sound insulation performance of circa 33 dB R_w . Standard (i.e. non-acoustic) window mounted trickle ventilators typically achieve a sound insulation performance of circa 32 dB $D_{n,e,w}$ in the open position.
- 4.3.4 Based on the above performances and prediction methodology, the predicted internal noise levels with windows closed and ventilators open for the worst affected facades would be 30 dB $L_{Aeq,16h}$ during the daytime and 23 dB $L_{Aeq,8h}$ / 40 dB L_{AFmax} during the night-time. Therefore, all adopted assessment criteria would be predicted to be achieved with closed standard thermal double glazing and open trickle ventilators.
- 4.3.5 The following is stated in BS 8233 regarding predictions made using the simple calculation method:
- "Where the estimate is within 5 dBA of the target noise level, a more rigorous calculation needs to be carried out using octave bands, as explained in G.2."*
- 4.3.6 As the predicted levels are at least 5 dB below relevant criteria, more rigorous calculations are not required.
- 4.3.7 The above assessment demonstrates that suitable internal noise levels are achievable in principle, as is appropriate at planning stage. Detailed noise break-in calculations should, however, be undertaken during detailed design, once the internal layouts, finishes and glazing unit selections have been finalised. The sound insulation performance values for windows and ventilators presented in this report are indicative only, and should be reviewed in detail as the scheme design progresses to ensure the

final scheme design is suitable for controlling environmental noise break-in. Careful consideration should be given to the number of trickle ventilator units required to achieve the minimum airflow requirements from the relevant Building Regulations guidance document.

5 INDUSTRIAL AND COMMERCIAL NOISE

5.1.1 **Figure 4-2** details the measured 15-minute L_{Aeq} , L_{A90} and L_{AFmax} noise levels measured throughout the survey at ML2.

Figure 4-2: Measured Sound Pressure Levels during Baseline Noise Survey at ML2



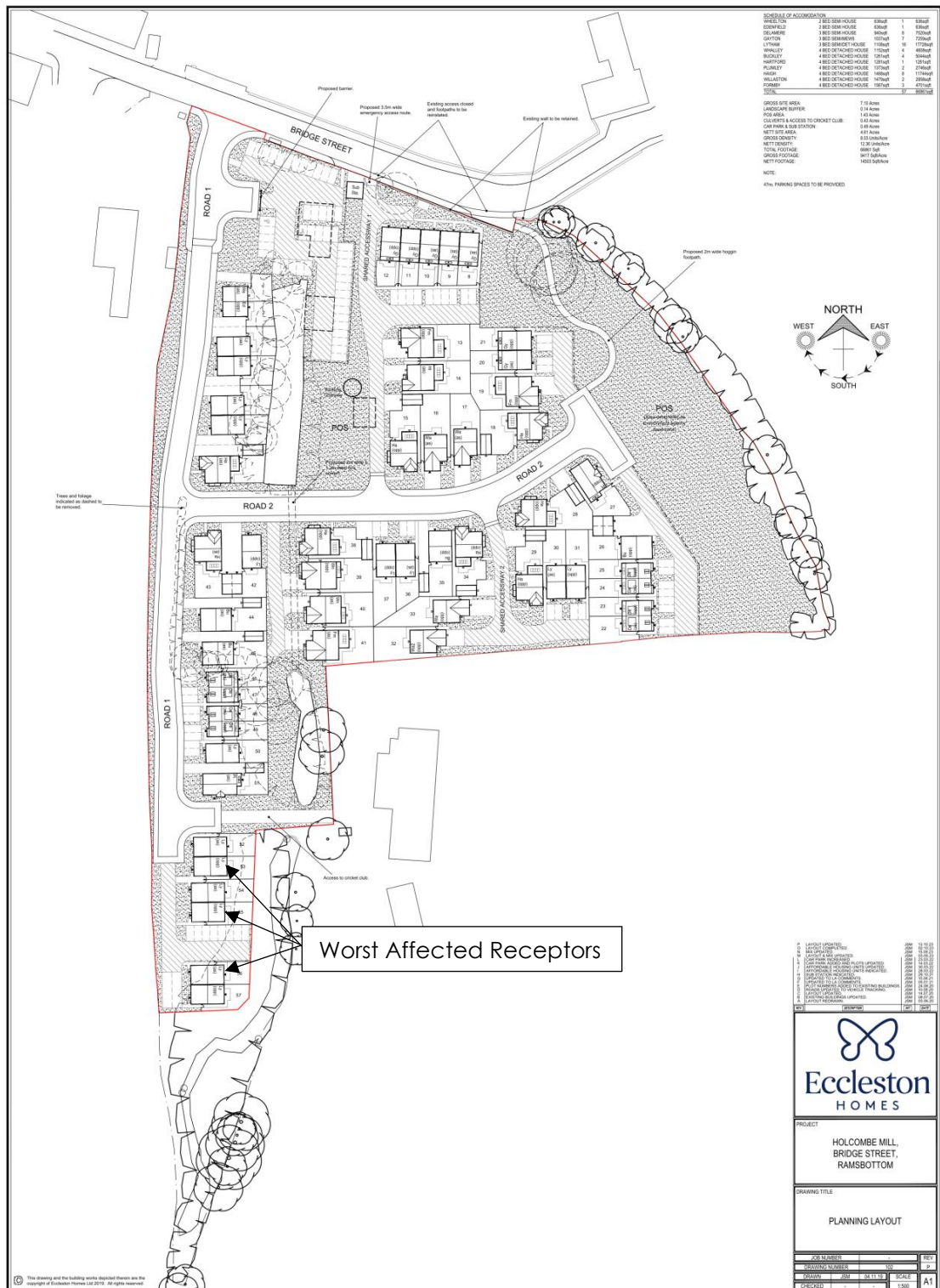
5.1.2 The measured noise levels from **Figure 4-2** have been assessed in accordance with BS 4142.

5.1.3 The measured specific noise level (L_{Aeq}) during the survey was 55 dB at ML2 and the lowest / representative measured background noise levels (L_{A90}) were 41 dB during the daytime and 38 dB during the night-time. When determining a rating level in accordance with the methodology outlined in BS 4142, it is considered appropriate to apply a penalty of 6 dB to account for tonality (in the case of reversing alarms) or impulsivity (in the case of trailer connection/disconnection). The rating level (L_{Ar}) would therefore be 61 dB, which is 20 dB above the lowest measured background noise level during the daytime and 23 dB above the lowest background noise level during the night-time.

- 5.1.4 In accordance with BS 4142 the above noise levels would indicate a 'significant adverse impact'. It should be noted however that BS 4142 states the following regarding introducing new noise sensitive receptors to an area with extant industrial/commercial noise sources:

"Where a new noise-sensitive receptor is introduced and there is extant industrial and/or commercial sound, it should be recognized that the industrial and/or commercial sound forms a component of the acoustic environment. In such circumstances other guidance and criteria in addition to or alternative to this standard can also inform the appropriateness of both introducing a new noise-sensitive receptor and the extent of required noise mitigation."

- 5.1.5 Therefore, consideration has been given to absolute noise levels to determine the extent of required noise mitigation.
- 5.1.6 As such, it is considered appropriate to give consideration to the desirable guideline values from BS 8233 to determine the performance of suitable mitigation measures.
- 5.1.7 The worst affected proposed dwellings are the dwellings in the southern section of the site adjacent to the boundary with the FedEx site, as shown in **Figure 4-3**.

Figure 4-3: Worst Affected Receptors

- 5.1.8 The highest measured L_{Aeq} noise level at the worst affected dwellings was 55 dB(A) during the daytime, therefore the limit value of 55 dB L_{Aeq} from BS 8233 is predicted to be achieved in the worst affected garden areas before accounting for the screening afforded by the proposed dwellings. Accounting for the screening afforded by the proposed dwellings noise levels in the rear gardens would be expected to be circa 10 dB lower i.e. 45 dB(A). Therefore, the 50 dB(A) desirable guideline value from BS 8233 would be predicted to be achieved in the worst affected gardens.
- 5.1.9 The internal desirable guideline values from BS 8233 are 35 dB L_{Aeq} in living rooms / bedrooms during the daytime and 30 dB L_{Aeq} in bedrooms at night. Internal noise levels can be estimated from external free-field noise levels in accordance with the simple calculation method from BS 8233 by subtracting the sound insulation performance (R_w) of the glazing from external free-field noise levels. As noise emissions from the FedEx site include engine noise from HGVs manoeuvring, it is considered more appropriate to use the R_w+C_{tr} performance of the glazing in this instance.
- 5.1.10 It would be recommended that glazing with a sound insulation performance of 30 dB R_w+C_{tr} be installed for living rooms and glazing with a sound insulation performance of 35 dB R_w+C_{tr} be installed in bedrooms to appropriately mitigate noise from the FedEx site for the worst affected dwellings. Glazing with an arrangement similar to 6 mm glass/12 mm air gap/ 6 mm glass can achieve 30 dB R_w+C_{tr} . Glazing with an arrangement similar to 8 mm glass/12 mm air gap/ 8.4 mm acoustic laminated glass can achieve 35 dB R_w+C_{tr} .
- 5.1.11 The measured external free-field noise level at ML2 was 55 dB $L_{Aeq,15min}$ therefore, accounting for the 30 dB R_w+C_{tr} glazing to living rooms, the predicted internal noise level would be 25 dB $L_{Aeq,15min}$. Accounting for the 35 dB R_w+C_{tr} glazing performance to bedrooms the predicted internal noise level would be 20 dB $L_{Aeq,15min}$.
- 5.1.12 It is noted in BS 8233 that the simple calculation method can underestimate internal noise levels by up to 5 dB, therefore the maximum internal noise level would be expected to be 30 dB $L_{Aeq,15min}$ in living rooms, and 25 dB $L_{Aeq,15min}$ in bedrooms. These predicted noise levels are 5 dB below the desirable guideline values from BS 8233 and are therefore considered to afford sufficient protection to future residents.

- 5.1.13 Typical L_{AFmax} noise levels during the night-time were circa 75 dB at ML1. Accounting for 35 dB R_w+C_{tr} glazing to bedrooms, internal noise levels would be predicted to be 40 dB L_{AFmax} . Therefore, the 45 dB L_{AFmax} criterion associated with sleep disturbance from the World Health Organisation *Guidelines for Community Noise* 1999 would be predicted to be achieved, even when accounting for a 5 dB allowance.
- 5.1.14 For living rooms within the worst affected dwellings, any passive ventilators installed in the building façade should achieve a minimum sound insulation performance of 35 dB $D_{n,e,w}+C_{tr}$, to ensure that the performance of the glazing is not undermined. This would be achievable with acoustically rated trickle ventilators. For bedrooms within the worst affected dwellings, ventilators with a performance of 40 dB $D_{n,e,w}+C_{tr}$ would be recommended, to ensure that the performance of the glazing is not undermined. This would be achievable with high performing acoustically rated trickle ventilators.
- 5.1.15 The residential dwellings located further into the site, to the north of the worst affected dwellings, would be subject to noise levels from the Fedex site at least 9 dB lower than those detailed within the preceding paragraphs, assuming point source distance attenuation from the nearest area of operation within the FedEx service yard. For these dwellings, standard thermally proficient double glazing with a performance of 27 dB R_w+C_{tr} and standard trickle ventilators with a performance of 32 dB $D_{n,e,w}+C_{tr}$ would be appropriate to control internal noise levels from the FedEx site for all noise sensitive spaces.
- 5.1.16 Provided the mitigation measures detailed within this report are implemented, the residents of the proposed dwellings will be suitably protected from noise generated by the FedEx site.

6 CONCLUSION

- 6.1.1 JPM Acoustics Ltd has been appointed by Eccleston Homes to undertake a noise impact assessment to support a planning application for a proposed residential development at the Holcombe Mill site in Ramsbottom.
- 6.1.2 This report presents an assessment of the suitability of the site for the proposed development with regard to noise and draws on the results of a baseline noise survey on the site. The assessment has been undertaken with due consideration to relevant British Standards and current guidance relating to noise.
- 6.1.3 The assessment of external noise levels from road and rail traffic indicated that external noise levels would be below the 50 dB(A) desirable guideline value from BS 8233.
- 6.1.4 The assessment of internal noise levels identified that environmental noise break-in to noise sensitive spaces would require windows to be closed to achieve the internal desirable guideline values from BS 8233. It was identified that, provided appropriate glazing and ventilation units are selected, the desirable guideline values can be achieved.
- 6.1.5 An assessment of commercial/industrial noise sources identified that provided suitable glazing and ventilation units are selected suitable internal noise levels can be achieved. Suitable external noise levels in rear gardens will be achieved with the current scheme layout.
- 6.1.6 Given the results of the assessment, it is considered that noise need not be a determining factor in granting planning consent for the proposed development.

APPENDIX A: TECHNICAL GLOSSARY

Term	Descriptions
Sound Pressure	Sound, or sound pressure, is a fluctuation in air pressure over the static ambient pressure.
Sound Pressure Level (Sound Level)	The sound level is the sound pressure relative to a standard reference pressure of 20 μPa (20×10^{-6} Pascals) on a decibel scale.
Decibel (dB)	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds S_1 and S_2 is given by $20 \log_{10} (S_1 / S_2)$. The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is 20 μPa .
A-weighting, dB(A)	The unit of sound level, weighted according to the A-scale, which takes into account the increased sensitivity of the human ear at some frequencies.
Noise Level Indices	Noise levels usually fluctuate over time, so it is often necessary to consider an average or statistical noise level. This can be done in several ways, so a number of different noise indices have been defined, according to how the averaging or statistics are carried out.
$L_{eq,T}$	A noise level index called the equivalent continuous noise level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.
$L_{max,T}$	A noise level index defined as the maximum noise level during the period T. L_{max} is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall L_{eq} noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
$L_{90,T}$	A noise level index. The noise level exceeded for 90% of the time over the period T. L_{90} can be considered to be the "average minimum" noise level and is often used to describe the background noise.
Free-Field	Far from the presence of sound reflecting objects (except the ground), usually taken to mean at least 3.5 m.
Façade	At a distance of 1 m in front of a large sound reflecting object such as a building façade.
Fast/Slow Time Weighting	Averaging times used in sound level metres.
Octave Band	A range of frequencies whose upper limit is twice the frequency of the lower limit.

APPENDIX B: FULL SURVEY RESULTS

Figure B-1: Results from Measurement Location 1

