

NOISE ASSESSMENT

on behalf of

M.RAY LIMITED

for the site at

**39 – 45 HIGH STREET, PRESCOT, KNOWSLEY, L34
6HF**

REPORT DATE: **05/10/2023**

REPORT NUMBER: 103072

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Summary

A noise assessment was undertaken to predict the potential impact on a proposed development for a change of use of the first floor at 39 – 45 High Street, Prescot, Knowsley, L34 6HF, from a commercial space to two self-contained flats. This was requested by the Local Authority to support a full planning application for the development.

Measurements were made at various locations around the site, to identify the pre-development baseline noise levels. This data was subsequently used to predict the potential impact of noise from existing noise sources close to the proposed development when in use.

Attended monitoring to determine baseline levels for the existing bakery was undertaken during the period 07:30 – 09:30. This was to determine the noise levels both with and without the bakery operational.

The assessment of noise has shown that the site is suitable for residential development assuming care is taken in the final design of the site and appropriate mitigation is applied where appropriate.

Record of changes

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Reviewed By: Jo Lacy MIOA

Signed:



Signed:



Date:

05/10/2023

Date:

05/10/2023

Version	Date	Change	Initials
1	03/10/2023	Draft Issue	SC
2	04/10/2023	Final issue	JL
3	05/10/2023	Typo updates	JL

Contents

Summary	1
Contents	2
1 Introduction	3
2 Site Description	3
3 Proposed Development	3
4 Policy Context	4
4.1 Noise Policy Statement for England	4
4.2 National Planning Policy Framework	5
4.3 Planning Practice Guidance – Noise	6
5 Local Authority Policy	8
6 Acoustic Standards and Guidance	9
6.1 BS 8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings	9
6.2 World Health Organisation (WHO) Guidelines for Community Noise 1999	11
6.3 BS 4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound'	11
7 Noise Survey	13
7.1 Measurements of Existing Noise Sources	13
7.2 Monitoring Results	15
7.3 BS 4142:2014+A1:2019 Assessment	20
8 Consideration of Other Discipline Requirements	20
9 Conclusions	21
APPENDICES	22
Appendix 1: Site Location	23
Appendix 2a: Site Plan	24
Glossary of Terms	25

1 Introduction

- 1.1 Miller Goodall Ltd has, on behalf of M.Ray Limited, undertaken a noise assessment in respect of the impact of noise on a proposed change of use of the first floor at 39-45 High Street from commercial space to two self-contained flats.
- 1.2 The report provides an assessment of existing plant noise sources from the bakery below, on the first floor, that will have an impact on the amenity of the proposed residential units.

2 Site Description

- 2.1 The site is located in the town centre of Prescot, located in Merseyside and is one of the oldest former market towns in the area. It is located approximately 5 km from the town of St. Helens, and approximately 10 km from Liverpool.
- 2.2 The four Victorian shopfronts below the proposed development on High Street which were formally Ray's Bakery and Coffee Shop, have now been combined and leased to Chatwin's bakery. The proposed development space was used as flats and then converted for use as staff facilities. The bakery is located directly below the site, on the ground floor of the same building.
- 2.3 The proposed development is located on High Street. The site is an 'L' shape that wraps around the Moss Street council-run car park, but the proposed works only affect a small area of the overall site. The property to the left of the site is a Grade 2 Listed Building. The site is surrounded to the west, north and east by two-storey residential properties. A bus stop is located immediately outside the bakery shop entrance, with a fairly narrow pavement and there is a private car park to the rear of the site that allows for daily deliveries and bin store.
- 2.4 The site location is shown in Appendix 1.

3 Proposed Development

- 3.1 The proposal is to change the use of the site, from a commercial space, to form two self-contained flats on the first floor of the building. A bakery / café called Chatwins occupies the ground floor of the same building.
- 3.2 The site plan is shown in Appendix 2.

4 Policy Context

4.1 Noise Policy Statement for England

4.1.1 The Noise Policy Statement for England (NPSE¹), published in March 2010, sets out the long-term vision of *Government noise policy*. *The Noise Policy aims, as presented in this document, are:*

“Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- *avoid significant adverse effects on health and quality of life;*
- *mitigate and minimise adverse effects on health and quality of life; and*
- *where possible, contribute to the improvement of health and quality of life.”*

4.1.2 The NPSE makes reference to the concepts of NOEL (No Observed Effect Level) and LOAEL (Lowest Observed Adverse Effect Level) as used in toxicology but applied to noise impacts. It also introduces the concept of SOAEL (Significant Observed Adverse Effect Level) which is described as the level above which significant adverse effects on health and the quality of life occur.

4.1.3 The first aim of the NPSE is to avoid significant adverse effects, taking into account the guiding principles of sustainable development (as referenced in Section 1.8 of the Statement). The second aim seeks to provide guidance on the situation that exists when the potential noise impact falls between the LOAEL and the SOAEL, in which case:

“...all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also taking into account the guiding principles of sustainable development”.

4.1.4 Importantly, the NPSE goes on to state:

“This does not mean that such adverse effects cannot occur”.

¹ Noise Policy Statement for England, Defra, March 2010

4.1.5 The Statement does not provide a noise-based measure to define SOAEL, acknowledging that the SOAEL is likely to vary depending on the noise source, the receptor and the time in question. NPSE advises that:

“Not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available”

4.1.6 It is therefore likely that other guidance will need to be referenced when applying objective standards for the assessment of noise, particularly in reference to the SOAEL, whilst also taking into account the specific circumstances of a proposed development.

4.2 National Planning Policy Framework

4.2.1 The National Planning Policy Framework (NPPF²) initially published in March 2012, was updated in September 2023. One of the documents that the NPPF replaces is Planning Policy Guidance Note 24 (PPG 24) “Planning and Noise”³.

4.2.2 The revised NPPF advises that the planning system has three overarching objectives, which are interdependent and need to be pursued in mutually supportive ways (so that opportunities can be taken to secure net gains across each of the different objectives). One of these is an environmental objective which is described in par. 8 (c):

“to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.”

4.2.3 At par. 174 we are advised that:

“Planning policies and decisions should contribute to and enhance the natural and local environment by:

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local

² National Planning Policy Framework, Ministry of Housing, Communities and Local Government, September 2023

³ Planning Policy Guidance 24: Planning and Noise, DCLG, September 1994

environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans.”

4.2.4 Par. 185 goes on to state:

“Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;

b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.”

4.2.5 Par. 187 seeks to ensure that any development does not prejudice the legally permitted operations and activities of other, existing non-residential uses, stating:

“Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or ‘agent of change’) should be required to provide suitable mitigation before the development has been completed.”

4.2.6 The NPPF document does not refer to any other documents regarding noise other than NPSE.

4.3 Planning Practice Guidance – Noise

4.3.1 As of March 2014, a Planning Practice Guidance⁴ for noise was issued which provides additional guidance and elaboration on the NPPF, the guidance was updated in July 2019. It advises that when

⁴ Planning Practice Guidance – Noise, <https://www.gov.uk/guidance/noise--2> 22nd July 2019.

plan-making and decision-taking, the Local Planning Authority should consider the acoustic environment in relation to:

- Whether or not a significant adverse effect is occurring or likely to occur;
- Whether or not an adverse effect is occurring or likely to occur; and
- Whether or not a good standard of amenity can be achieved.

4.3.2 In line with the Explanatory Note of the NPSE, the PPG goes on to reference the LOAEL and SOAEL in relation to noise impact. It also provides examples of outcomes that could be expected for a given perception level of noise, plus actions that may be required to bring about a desired outcome. However, in line with the NPSE, no objective noise levels are provided for LOAEL or SOAEL although the PPG acknowledges that:

“...the subjective nature of noise means that there is not a simple relationship between noise levels and the impact on those affected. This will depend on how various factors combine in any particular situation”.

4.3.3 Examples of these factors include:

- The source and absolute noise level of the source along with the time of day that it occurs;
- Where the noise is non-continuous, the number of noise events and pattern of occurrence;
- The frequency content and acoustic characteristics of the noise;
- The effect of noise on wildlife;
- The acoustic environment of external amenity areas provided as an intrinsic part of the overall design;
- The impact of noise from certain commercial developments such as night clubs and pubs where activities are often at their peak during the evening and night.

4.3.4 The PPG also provides general advice on the typical options available for mitigating noise. It goes on to suggest that Local Plans may include noise standards applicable to proposed developments within the Local Authority's administrative boundary, although it states that:

“Care should be taken, however, to avoid these being implemented as fixed thresholds as specific circumstances may justify some variation being allowed”.

4.3.5 The PPG was amended in December 2014 to clarify guidance on the potential effect of noise from existing businesses on proposed new residential accommodation. Even if existing noise levels are

intermittent (for example, from a live music venue), noise will need to be carefully considered and appropriate mitigation measures employed to control noise at the proposed accommodation.

5 Local Authority Policy

5.1 In January 2016, Knowsley Metropolitan Borough Council adopted the 'Knowsley Local Plan':

5.2 Policy CS2: Development Principles (p. 50) gives the following guidelines in terms of noise:

"1) New development in Knowsley and the preparation of subsequent stages of the Local Plan will be expected to support the following development principles:

...

Principle 4: Recognise environmental limits, protect and enhance environmental assets, enhance local character and promote quality of place by:

- a) Understanding and respecting the character and distinctiveness of places and landscapes;*
- b) Protecting and enhancing the historic environment;*
- c) Promoting good quality design and ensuring that development respect its setting, taking into account relevant design requirements, and best practice;*
- d) Maximising opportunities for the regeneration of previously developed land, including derelict or unsightly areas to improve the image of Knowsley and use land resources efficiently;*
- e) Mitigating potential negative impacts of traffic growth and road traffic on highway safety, air quality, noise and health;*
- f) Supporting policies relating to green infrastructure and the greening of towns and cities*
- g) Maintaining or enhancing the tranquillity of open countryside and rural areas;*
- h) Maintaining or enhancing the quantity and quality of biodiversity and habitats, including potential impacts on nationally and internationally important sites for biodiversity;*
- i) Addressing any issues of unstable land, resulting from Knowsley's legacy of minerals extraction; and*
- j) Minimising the negative impact upon flood risk, air quality, water quality, land quality, soil quality, and noise or vibration levels and ensuring the negative impacts are appropriately mitigated.*

Development that will have an unacceptable impact upon any of the above will only be permitted where the benefits of the proposal clearly outweigh the harm."

Chapter 9: Promoting Quality of Place:

"9.6 Protecting Local Amenity

The design of new development should avoid unacceptable impacts which affect the amenity and living conditions of occupiers of buildings. Such effects can include generation of noise, light and air pollution and harmful overbearing and loss of privacy through overlooking."

6 Acoustic Standards and Guidance

6.1 BS 8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings

- 6.1.1 This standard carries the full weight of an adopted British Standard, provides recommended guideline acoustic design criteria for new dwellings and is supported by guidance contained within WHO GCN⁵. The guideline noise design criteria of BS 8233 apply to external noise "without a specific character" (previously and sometimes termed or referred to as "anonymous noise") such as that associated with road and rail traffic.

Internal Amenity

- 6.1.2 The Standard states that for external noise without a specific character, such as road traffic, it is desirable that the internal ambient noise level does not exceed the guideline values shown in Table 1 below:

Table 1: BS 8233: 2014 guideline indoor ambient noise levels for dwellings

Location	Activity	07:00 to 23:00	23:00 to 07:00
Living Room	Resting	35 dB $L_{Aeq,16hr}$	–
Dining room/area	Dining	40 dB $L_{Aeq,16hr}$	–
Bedroom	Sleeping (daytime resting)	35 dB $L_{Aeq,16hr}$	30 dB $L_{Aeq,8hr}$

⁵ World Health Organisation Guidelines for Community Noise, 1999

6.1.3 Note 7 to Table 4 of BS 8233 states:

“Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved.”

6.1.4 Guidance on reasonable acoustic design criteria for individual noise events are also provided, and the Standard advises that:

“regular individual noise events...can cause sleep disturbance. A guideline value may be set in terms of SEL^6 or $L_{Amax,F}$ depending on the character and number of events per night. Sporadic noise events could require separate values”.

6.1.5 For Internal spaces, the Standard states that;

“..to avoid sleep disturbance, sound pressure levels at the outside facades of living spaces should not exceed 45 dB L_{Aeq} (taken as a façade level, and equating to a free-field external level of 42 dB L_{Aeq}) and 60 dB L_{AFmax} so that people may sleep with bedroom windows open.”

External Amenity

6.1.6 BS 8233:2014 adopts guideline external noise values provided in WHO for external amenity areas such as gardens, patios and private outdoor amenity spaces. BS 8233:2014 adopts guideline external noise level limits provided in WHO for external amenity areas such as gardens and patios. The standard states that it is “desirable” that the external noise does not exceed 50 dB $L_{Aeq,16hr}$ with an upper guideline value of 55 dB $L_{Aeq,16hr}$ whilst recognising in paragraph 7.7.3.2 that development in higher noise areas, such as urban areas or those close to the transport network, may require a compromise between elevated noise levels (i.e., above 55 dB $L_{Aeq,16hr}$) and other factors that determine if development in such areas is warranted. In such circumstances, the development should be designed to achieve the lowest practicable noise levels in external amenity areas, but should not be prohibited.

6.1.7 The standard also states:

“Other locations, such as balconies, roof gardens and terraces, are also important in residential buildings where normal external amenity space might be limited or not available,

⁶ Sound exposure level or L_{AE}

i.e. in flats, apartment blocks, etc. In these locations, specification of noise limits is not necessarily appropriate. Small balconies may be included for uses such as drying washing or growing pot plants, and noise limits should not be necessary for these uses. However, the general guidance on noise in amenity space is still appropriate for larger balconies, roof gardens and terraces, which might be intended to be used for relaxation. In high-noise areas, consideration should be given to protecting these areas by screening or building design to achieve the lowest practicable levels. Achieving levels of 55 dB $L_{Aeq,T}$ or less might not be possible at the outer edge of these areas, but should be achievable in some areas of the space."

6.2 World Health Organisation (WHO) Guidelines for Community Noise 1999

- 6.2.1 The WHO Guidelines 1999 recommends that to avoid sleep disturbance, indoor night-time guideline noise values of 30 dB L_{Aeq} for continuous noise and 45 dB L_{AFmax} for individual noise events should be applicable. It is to be noted that the WHO Night Noise Guidelines for Europe 2009⁷ makes reference to research that indicates sleep disturbance from noise events at indoor levels as low as 42 dB L_{AFmax} . The number of individual noise events should also be taken into account and the WHO guidelines suggest that indoor noise levels from such events should not exceed approximately 45 dB L_{AFmax} more than 10 – 15 times per night.
- 6.2.2 The WHO document recommends that steady, continuous noise levels should not exceed 55 dB L_{Aeq} on balconies, terraces and outdoor living areas. It goes on to state that to protect the majority of individuals from moderate annoyance, external noise levels should not exceed 50 dB L_{Aeq} .

6.3 BS 4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound'

- 6.3.1 BS 4142:2014+A1:2019⁸ provides guidance on the assessment of the likelihood of complaints relating to noise from industrial sources. It replaced the 1997 edition of the Standard in October 2014 and was amended in June 2019. The amended version corrected a number of printing errors and further clarified that the standard is used to assess external noise levels, and not internal noise levels

⁷ WHO Night Noise Guidelines for Europe 2009

⁸ BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound

(although this can form part of the discussion regarding context). The key aspects of the Standard are summarised below.

6.3.2 The standard presents a method of assessing potential noise impact by comparing the noise level due to industrial sources (the Rating Level) with that of the existing background noise level at the nearest noise sensitive receiver in the absence of the source (the Background Sound Level).

6.3.3 The Specific Noise Level – the noise level produced by the source in question at the assessment location – is determined and a correction applied for certain undesirable acoustic features such as tonality, impulsivity or intermittency. The corrected Specific Noise Level is referred to as the Rating Level.

6.3.4 In order to assess the noise impact, the Background Sound Level is arithmetically subtracted from the Rating Level. The standard states the following:

- *Typically, the greater this difference, the greater the magnitude of the 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.*

6.3.5 In addition to the margin by which the Rating Level of the specific sound source exceeds the Background Sound Level, the 2014+A1:2019 edition places emphasis upon an appreciation of the context, as follows:

An effective assessment cannot be conducted without an understanding of the reason(s) for the assessment and the context in which the sound occurs/will occur. When making assessments and arriving at decisions, therefore, it is essential to place the sound in context.

6.3.6 The 2014 edition of BS 4142 also introduced a requirement to consider and report the uncertainty in the data and associated calculations and to take reasonably practicable steps to reduce the level of uncertainty.

7 Noise Survey

7.1 Measurements of Existing Noise Sources

7.1.1 Noise measurements were undertaken at a location consistent with the proposed development in accordance with BS 7445-1: 2003⁹ by Sarah Cook of Miller Goodall Ltd. The calibration of the sound level meter was checked before and after measurements with negligible deviation (≤ 0.1 dB). Details of the equipment used are shown in Table 2, below:

Table 2: Noise monitoring equipment

Equipment Description	Type Number	Manufacturer	Serial No.	Date Calibrated	Calibration Certification Number
Class 1 Calibrator ¹⁰	CAL 200	Larson Davies	14154	10/10/2022	05964/1
Class 1 ^{11,12} Integrating Real Time 1/3 Octave Sound Analyser	NTi XL2-TA	NTi Audio	A2A-15860-E0	27/02/2023	05145/1
Microphone	NTi MC230A	NTi Audio	A16445	27/02/2023	05145/1

7.1.2 Specific, background and ambient noise monitoring was undertaken at the times specified in Table 3, below. Weather conditions were determined both at the start and on completion of the survey. It is considered that meteorological conditions were appropriate for environmental noise measurements. Measurement locations are shown in Appendix 2.

⁹ BS 7445-1: 2003 Description and measurement of environmental noise – Part 1: Guide to quantities and procedures

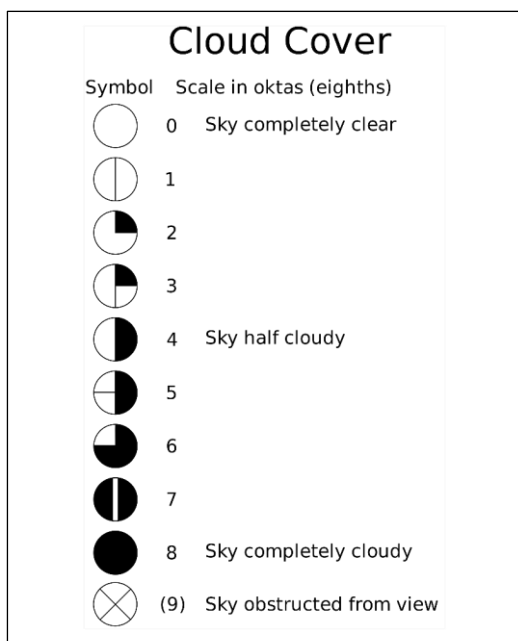
¹⁰ IEC 60942 (2003) Electroacoustics – Sound calibrators

¹¹ IEC 61672-1 (2002) Electroacoustics – Sound level meters Part 1: Specifications

¹² IEC 61260 (1995) Electroacoustics – Octave-band and fractional-octave-band filters

Table 3: Dates, times and weather conditions during noise measurements

Measurement Locations	Date/Time	Weather conditions		
		Description	At Start of Survey	On Completion
MPI	29/09/2023, 07:30 to 29/09/2023, 09:00	Temperature:	12 °C	13 °C
		Precipitation:	Dry	Dry
		Cloud cover (oktas – see opposite):	2	2
		Any fog/snow/ice?	No	No
		Any damp roads/wet ground?	No	No
		Wind speed:	5 m/s	5 m/s
		Wind direction:	East	
		Any conditions that may cause temp. inversion (e.g. calm nights with no cloud):	No	No



7.1.3 Measurements were made at times considered to be representative of the periods during which the proposed residential accommodation would be subject to the highest levels of ambient noise. This was during the morning rush-hour period after the bakery had opened (understood 08:00 – 17:00 daily), and when plant would be expected to be operational. Measurements were made under free-field conditions at a height of 1.5 m above the ground / floor level.

7.1.4 The noise sources within the vicinity of the measurement locations are summarised in Table 4, below:

Table 4: Description of noise sources affecting the site

Measurement Location	Description of Measurement Location and Condition	Noise Sources
P1	4 m from rear ground floor wall, behind flat 2	Distant traffic. Extract fan (operational but not audible)
P2	7 m from rear ground floor wall	Distant traffic, birdsong
P3	Inside flat 1. In room labelled 'office /storage'. 2 m from external wall with window open	Distant traffic and faint music from shop below audible through floor
P4	Inside flat 2. In room labelled 'office/storage'. 1 m from external wall with window open.	Distant traffic and faint music from shop below audible through floor

7.1.5 The plant items identified at the site have been highlighted in **BLUE** in Appendix 2 and are labelled as follows:

- C1 – Condenser unit at ground level near base of stairs to Flat 1.
- C2 – Condenser unit mounted at first floor level on the roof adjacent to the bathroom window of Flat 2
- EF – Extract fan for ground floor commercial unit, approx. 2.5 m above ground level in rear façade of building facing north

7.1.6 Only the extract fan was in operation during the survey period – the condenser units remained inactive. It is therefore not possible to quantify the potential noise impact from the condenser units.

7.2 Monitoring Results

7.2.1 A summary of the broadband measurement data recorded externally is provided in Chart 1 overleaf. All data are sound pressure levels in dB re 20 µPa.

7.2.2 Octave band frequency data was obtained during surveying, and this source data is provided in the tables below.

Table 5: Octave band noise level spectra at P1

Measurement Descriptor	Sound Pressure Level, dB at Octave Band Centre Frequency, Hz								dB(A)
	63	125	250	500	1k	2k	4k	8k	
Extraction fan off, before 8 am	29	44	51	52	56	53	50	45	60
Extraction fan on, after 8 am	37	43	52	52	56	52	49	45	59

Chart 1: Broadband noise data at P2

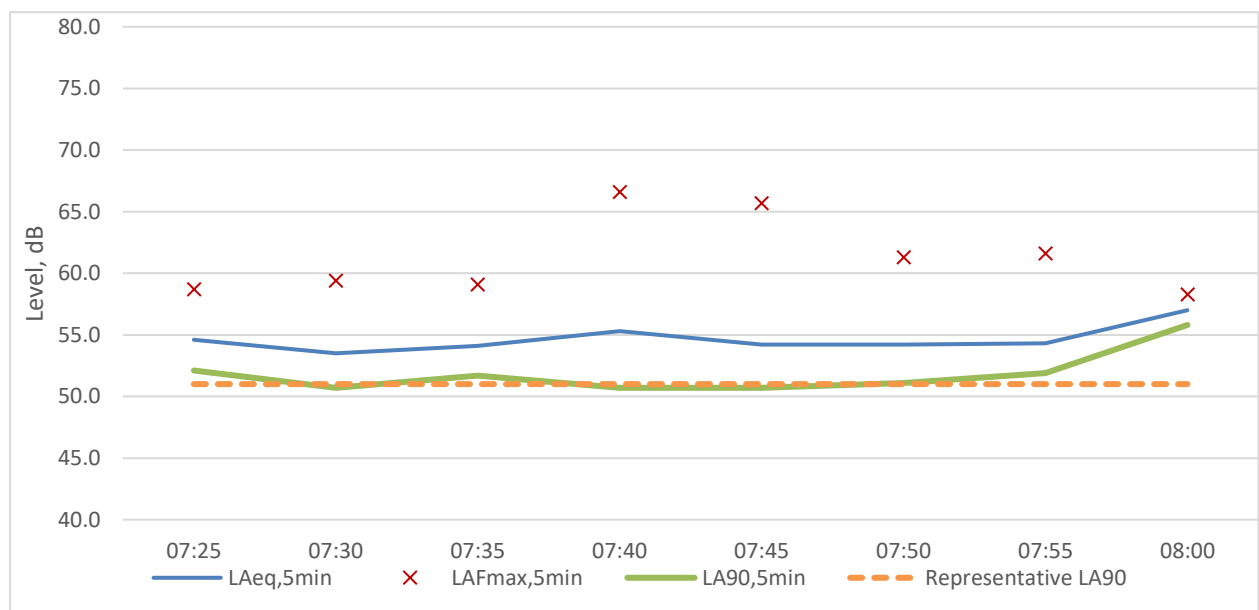


Table 6: Octave band noise level spectra at P2

Measurement Descriptor	Sound Pressure Level, dB at Octave Band Centre Frequency, Hz								dB(A)
	63	125	250	500	1k	2k	4k	8k	
Background	34	37	42	45	51	47	43	40	54

Chart 2: Broadband noise data at P3

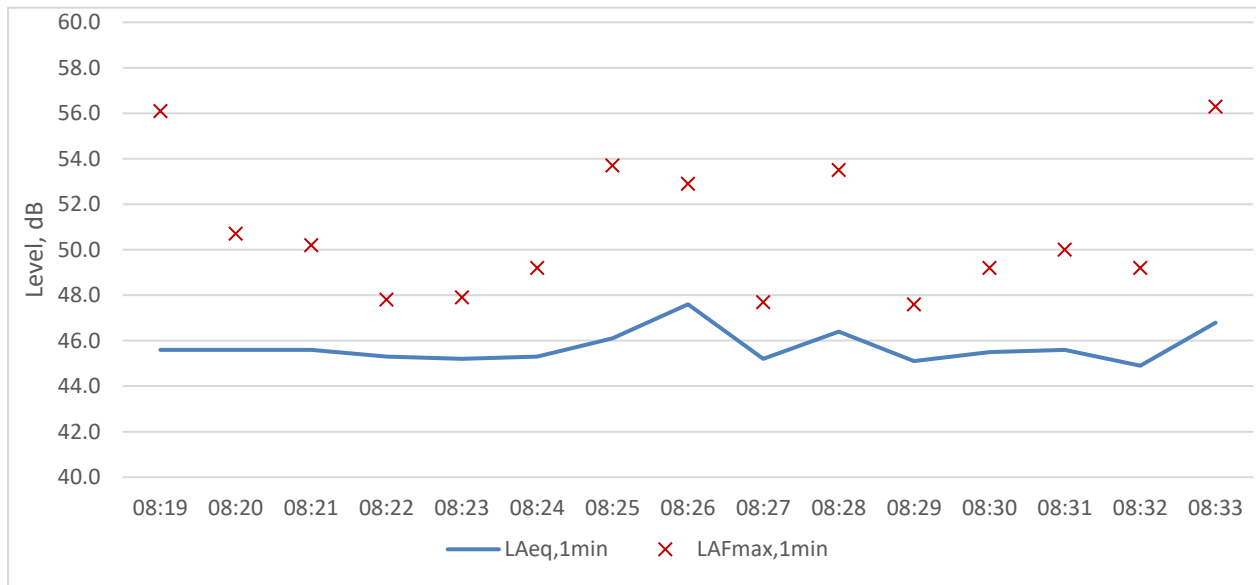


Table 7: Octave band noise level spectra at P3

Measurement Descriptor	Sound Pressure Level, dB at Octave Band Centre Frequency, Hz								dB(A)
	63	125	250	500	1k	2k	4k	8k	
Ambient Noise - Flat 1	22	26	33	38	40	37	37	37	45

Chart 3: Broadband noise data at P4

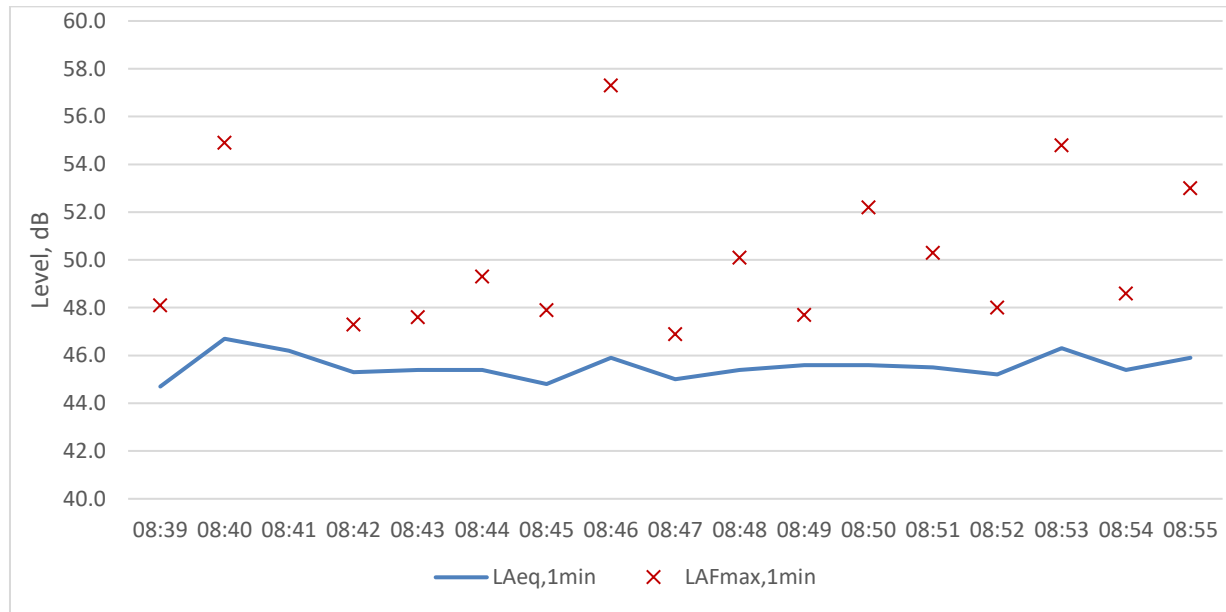


Table 8: Octave band noise level spectra at P4

Measurement Descriptor	Sound Pressure Level, dB at Octave Band Centre Frequency, Hz								dB(A)
	63	125	250	500	1k	2k	4k	8k	
Ambient Noise - Flat 2	25	29	38	35	39	36	37	37	45

- 7.2.3 Each measurement period consisted of sequential 1-minute samples which therefore allowed the variation in noise level over time to be assessed. As can be seen from the measurement results in Table 5, the noise levels do not significantly change when the fan turns on. This suggests the plant would not be audible, which was concerned on site.
- 7.2.4 The results of the noise monitoring have been assessed against the BS 8233 criteria to determine the potential effect of noise on the proposed site without mitigation measures. As the levels measured internally exceeded the internal ambient noise levels with windows open, it is necessary to consider alternate means of ventilating the internal spaces.
- 7.2.5 With open windows, the measured internal L_{Aeq} for both flats was 45 dB. Therefore, to achieve appropriate internal noise levels, it is recommended that the windows on the northern façade are fitted with trickle vents. The vent units should achieve a minimum element normalised sound level difference of 35 dB $D_{n,e,w} + C_{tr}$.

7.2.6 Contextual Argument

- 7.2.7 While the measured internal ambient noise levels exceed the internal criteria for residential spaces with windows open, context must also be taken into consideration.
- 7.2.8 When the attended survey was undertaken, the flats were mid-construction. Therefore, there was no floor finish within the flats and several windows across the flats had not been sealed. The extract fan (EF) and condenser unit (C2) are close to the façade of Flat 2, but there are no habitable spaces on this façade – living / dining and bedrooms are fully screened from these sources.
- 7.2.9 Condenser unit C1 is fully screened by the ground floor of the building from both flats and also benefits from increased distance from the façade when compared with the other plant items. This is therefore also unlikely to make any significant contribution to the noise levels within the residences.
- 7.2.10 Following the completion of sealing around the windows, we would anticipate that noise from external mechanical services will not be intrusive or have any significant adverse impact.

7.2.11 Floor Construction

- 7.2.12 Additionally, it must be noted that when onsite, there was some music noise from the radio in the ground floor commercial premises that was just audible. This was primarily audible through the floor of the residential spaces. This would suggest that the floor / ceiling construction separating the ground floor commercial premises from the first-floor residences is not achieving the minimum sound insulation performance requirements laid out in Approved Document E of the Building Regulations.
- 7.2.13 It is understood that the ceiling in the ground floor space is suspended plasterboard with services penetrations. However, without dismantling sections of the ceiling / flooring, it is not possible to confirm at this stage if this is a single or double layer of plasterboard, the void depth or if there is mineral wool in the void.
- 7.2.14 The easiest way to achieve the required acoustic performance is to use floor treatment 2 described in Approved Document E of the Building Regulations i.e. a floating floor. The mass of the ceiling in the ground floor should be determined to verify a minimum mass of 20 kg/m², which should be achieved by two layers of plasterboard. Additional to this, there should be 25 mm mineral wool or equivalent installed in the void between the ceiling joists with a full floating floor above.

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- 7.2.15 The floating floor should be installed in all habitable rooms to ensure that the criteria for all habitable rooms is achieved. If the ceiling / floor construction is different to the assumptions made above, it may be possible to adjust the advice but this should be confirmed at a later stage.
- 7.2.16 This is a matter which should be discussed at a later stage with Building Control and could be subject to a suitably worded planning condition, but should not prevent planning permission being granted on noise grounds. Assessing and determining a floor build up to achieve Building Regulations compliance is beyond the scope of this report.

7.3 **BS 4142:2014+A1:2019 Assessment**

- 7.3.1 The fan at the rear of the building was measured when it was turned off and then also when it was operational. It was not audible over the dominant traffic noise at the measurement position and the measurement data corroborates this. Therefore, we would not expect that this item of mechanical services plant will have any impact at the residential receptors.
- 7.3.2 The extract fan (EF) and condenser unit (C2) are close to the façade of Flat 2, but there are no habitable spaces on this façade – living / dining and bedrooms are fully screened from these sources.
- 7.3.3 Condenser unit C1 is fully screened by the ground floor of the building from both flats and also benefits from increased distance from the façade when compared with the other plant items. This is therefore also unlikely to make any significant contribution to the noise levels within the residences.
- 7.3.4 Provided the windows on the northern façade are fitted with trickle vents which achieve a minimum element normalised sound level difference of 35 dB $D_{n,e,w} + C_{tr}$, we would expect no significant adverse impact due to the operation of any items of mechanical services plant associated with the ground floor commercial unit.
- 7.3.5 A full BS 4142 assessment is therefore not considered necessary for this site.

8 **Consideration of Other Discipline Requirements**

- 8.1 It is recommended that you confirm the suitability of all recommended noise mitigation measures with your architects, structural engineers, building contractors, fire consultants and material manufacturers prior to procurement and field application so that when the recommended noise

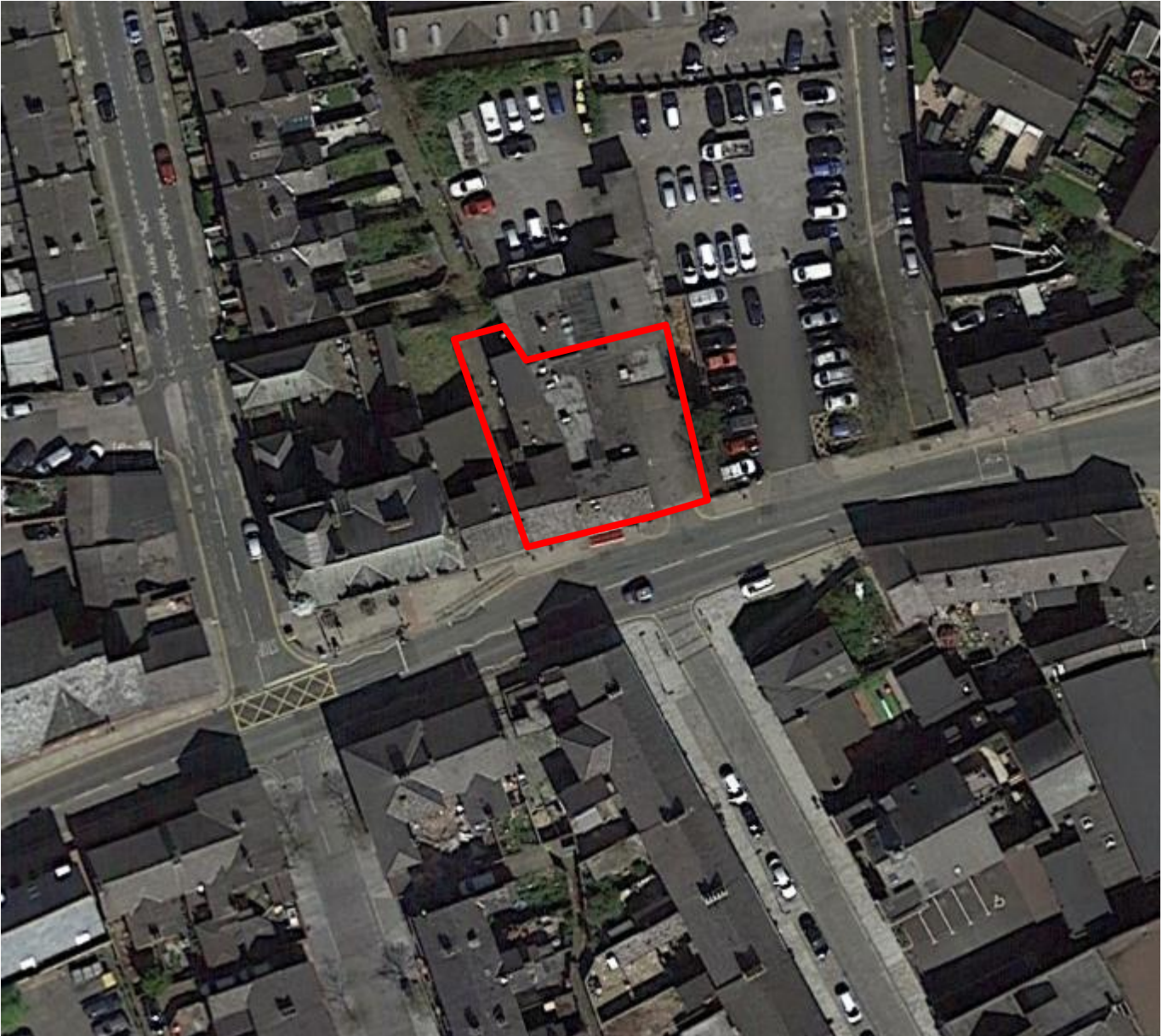
control measures are implemented on site, they will satisfy the requirements of all disciplines, therefore, should not cause any health and safety issues.

9 Conclusions

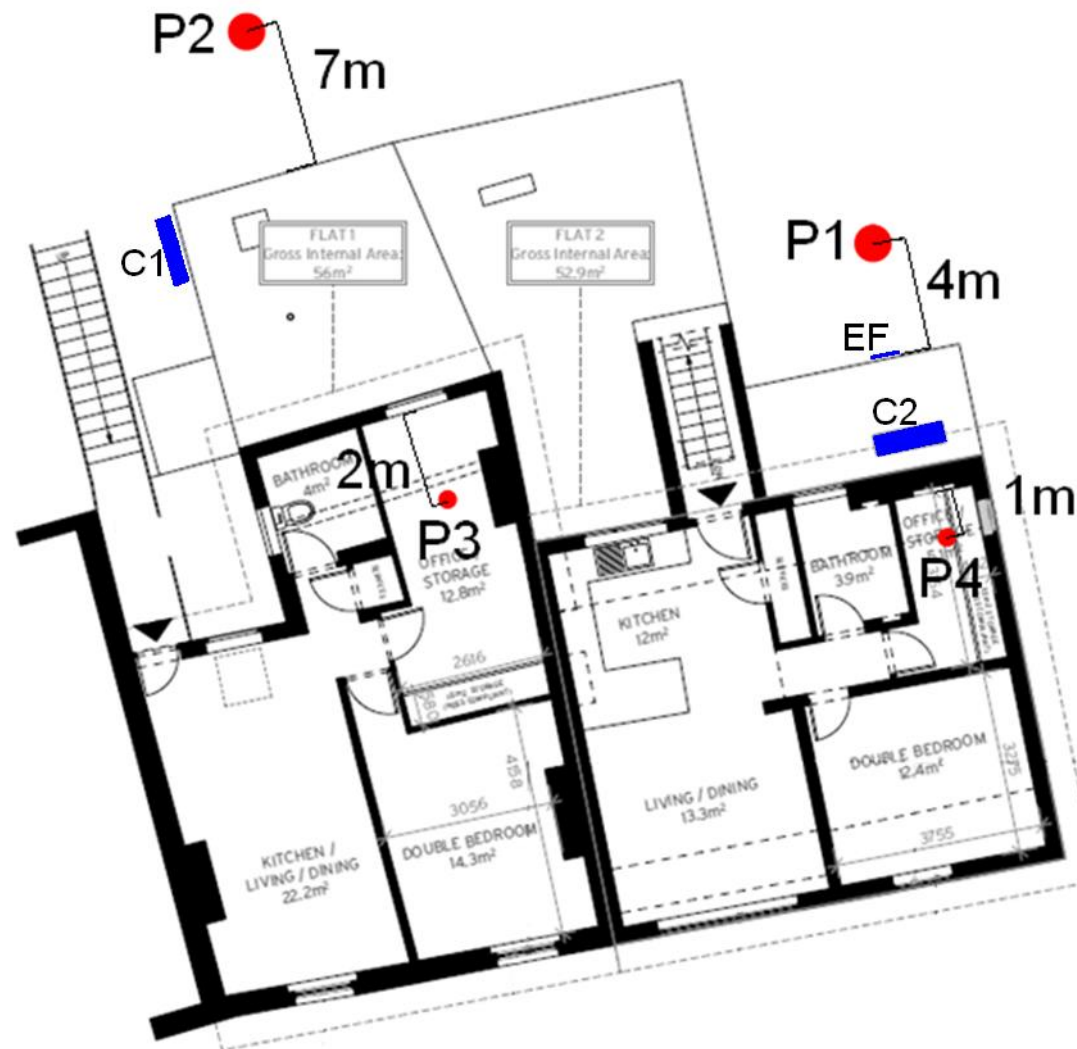
- 9.1 A noise assessment has been undertaken to predict the potential impact on a proposed development for a change of use of the first floor at 39 – 45 High Street, Prescott, Knowsley, L34 6HF, from a commercial space to two self-contained flats.
- 9.2 Measurements have been made to determine the ambient noise levels affecting the proposed flats. A recommended ventilation specification has been provided to enable the recommended internal noise limits to be achieved within the properties.
- 9.3 With the implementation of these recommendations, it is considered that a suitable and commensurate level of protection against noise will be provided to the occupants of the proposed dwellings and the site is suitable for development.

APPENDICES

Appendix 1: Site Location



Appendix 2a: Site Plan



Glossary of Terms

Decibel (dB) The unit used to quantify sound pressure levels; it is derived from the logarithm of the ratio between the value of a quantity and a reference value. It is used to describe the level of many different quantities. For sound pressure level the reference quantity is 20 μPa , the threshold of normal hearing is in the region of 0 dB, and 140 dB is the threshold of pain. A change of 1 dB is usually only perceptible under controlled conditions.

dB L_A Decibels measured on a sound level meter incorporating a frequency weighting (A weighting) which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB L_A broadly agree with an individual's assessment of loudness. A change of 3 dB L_A is the minimum perceptible under normal conditions, and a change of 10 dB L_A corresponds roughly to halving or doubling the loudness of a sound. The background noise level in a living room may be about 30 dB L_A ; normal conversation about 60 dB L_A at 1 meter; heavy road traffic about 80 dB L_A at 10 meters; the level near a pneumatic drill about 100 dB L_A .

$L_{A90,T}$ The A weighted noise level exceeded for 90% of the specified measurement period (T). In BS 4142: 2014+A1:2019 it is used to define background noise level.

$L_{Aeq,T}$ The equivalent continuous sound level. The sound level of a notionally steady sound having the same energy as a fluctuating sound over a specified measurement period (T). $L_{Aeq,T}$ is used to describe many types of noise and can be measured directly with an integrating sound level meter.

$D_{ne,w}$ The weighted element-normalized level difference is a single figure rating used to describe the sound insulation of small elements within a larger construction and is defined in BS EN ISO 10140-2:2010 (BSEN ISO 140-10:1991). It is most often used to rate the sound insulation performance of ventilator units e.g. trickle vents.

C_{tr} A single-number spectrum adaptation term used to characterise the sound insulation rating with respect to urban traffic. It is defined in ISO 717-1:2013.

