KELSTONE LIMITED

CHANGE OF USE OF THE UPPER FLOORS OF 27 MARKET PLACE TO FORM FLATS, 27 MARKET PLACE, HUDDERSFIELD, HD1 2AD

NOISE ASSESSMENT

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SECTION 1 INTRODUCTION

1.1 RP Acoustics Ltd (RPA) has been commissioned by Kelstone Limited to undertake a noise assessment for the change of use of the upper floors to form flats at the former RBS building, 27 Market Place, Huddersfield, HD1 2AD (the application site). It is understood that the ground floor will remain in commercial use and will be dealt with under a separate application.

1.2 The application site is understood to be Grade II listed. In relation to noise impact, consideration has been given to (i) the potential impact of the external noise environment on the proposed residential units, and (ii) the sound insulation between the ground floor commercial unit and overlying residential units.

1.3 As such, the scope/objectives of the assessment were to:

i. Determine the ambient noise climate at the application site during representative periods of the daytime and night time.

ii. Assess the potential impact of the noise climate on the proposed residential units with reference to pertinent guidelines.

iii. Provide recommendations for a scheme of sound attenuation works, as necessary, such that that future occupants of the proposed residential units do not experience an unacceptable loss of amenity due to noise. Attenuation works include (i) glazing and ventilation specifications, and (ii) the acoustic specification for the separating floor between the ground floor commercial use and first floor residential use.

1.4 This report has been prepared to accompany the application submitted for the redevelopment of the upper floors of the site. It details the methodology and results of the assessment, together with recommendations for the control of noise.

1.5 This report has been prepared for Kelstone Limited and its agent, Philip Fletcher Architectural Design Services, for the sole purpose described above, with no extended duty of care to any third party implied or offered.

1.6 A glossary of acoustics terms used in the main body of the text is contained in Appendix 1.

SECTION 2 SITE SETTING AND DEVELOPMENT PROPOSALS

2.1 SITE SETTING

2.1.1 The application site is located in a mixed use environment in the centre of Huddersfield. An annotated aerial image of the site and its environs is contained in Appendix 2.1. The application site is bound by:

i. Market Place to the north.

ii. Retail units at ground floor level to the east and west.

iii. A small courtyard to the rear and the rear of buildings fronting on to New Street and Market Walk to the south.

2.1.2 During the course of the noise survey, the main noise sources were noted to consist of slow moving local traffic and people in the Market Place square. The rear of the application site was screened from local traffic, but very low level plant noise associated with the adjacent premises was audible (broadband in nature with, subjectively, no distinguishing characteristics).

2.2 DEVELOPMENT PROPOSALS

2.2.1 The development proposals consist of the conversion of the 1st and 2nd floors of the building to form flats. As part of the listed status of the building, the existing sash windows are to be made good and retained.

SECTION 3 ENVIRONMENTAL NOISE SURVEY

3.1 In order to assess the ambient noise climate at the site and obtain design data for a sound attenuation scheme, a baseline noise survey was undertaken between 11:40 hours on Tuesday 28th November and 11:00 hours on Wednesday 29th November 2023. For the purpose of the assessment, the following monitoring positions (MPs) were used (note: external measurements were undertaken by extending a boom through a window):

i. MP1 was located at 1 metre from the rear façade, at first floor level, in a reflective field environment.

ii. MP2 (long term) was located at 1 metre from the Market Place façade, at 1st floor level, in a reflective field environment.

iii. MP2A was located internally, in the centre of a 1st floor office room (carpeted but not furnished) on the Market Place façade, in a reverberant field environment (note: room volume circa. 25 m^3, mid-frequency reverberation time circa. 0.5 seconds).

3.2 The approximate location of the external monitoring positions is identified on the annotated aerial image contained in Appendix 2.1.

3.3 Noise measurements were undertaken using a NTi Audio XL2 Type 1 integrating sound level meter. A 90 mm windshield was fitted for all measurements. The measurement system calibration was

verified immediately before the commencement of the measurement sessions and again at the end. No drift in calibration level was noted. Weather conditions throughout the survey were appropriate for monitoring.

3.4 Measurements consisted of A–weighted broadband parameters, together with linear third octave band Leq levels, with a logging interval of 1 second. The long term survey at MP2 was predominantly unmanned, with full audio recording undertaken. Measurement data was post-processed using NTi Audio Data Explorer software.

3.5 The following table contains a summary of the noise measurement data, rounded to the nearest decibel. The tabulated external measurements have been corrected for façade enhancement and, as such, represent free field (incident) noise levels. Based on reverberation time measurements undertaken within the 1st floor office (reverberation time of circa. 0.5 seconds), the MP2A data is considered representative of a furnished habitable room within the proposed development.

Table 3.1: Summary of Noise Measurement Data

MP	Date	Time	$L_{Aeq,T}$ (dB)	L_{AFmax} (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)	Comments
MP1	28/11/23	11:40-12:40	43	52	44	42	Low level plant noise. Broadband in nature with no distinguishing characteristics.
MP2 Daytime:							
MP2	28&29/11/23	12:57-23:00 07:00-11:00	56	78	59	49	Local traffic and people in the square. Note: extensive church bell noise between 19:40 and 21:10 hours has been excluded as not considered representative of a typical day.
MP2 Night time:							
MP2	28-29/11/23	23:00-07:00	53	72*	54	41	Local traffic and people in the square. Street cleaner audible circa. 05:00 hours.
MP2A	28/11/23	12:42-12:47	31	43	33	28	Internal measurement. Window closed. L_{AFmax} associated with loud voices in Market Place.
MP2A	28/11/23	12:48-12:53	42	55	45	37	Internal measurement. Window open (circa 50 mm). L_{AFmax} associated with loud voices in Market Place.

* Based on 10th highest L_{AFmax}

3.6 Slow moving local road traffic and people noise in the Market Place square were the main noise sources on the Market Place frontage of the building (note: extensive church bell noise between 19:40 and 21:10 hours has been excluded as not considered representative of a typical day). At the rear of the building, the main noise source was very low level plant noise associated with the adjacent premises (broadband in nature with, subjectively, no distinguishing characteristics).

SECTION 4 ASSESSMENT CRITERIA

4.1 NATIONAL PLANNING POLICY FRAMEWORK

4.1.1 The National Planning Policy Framework (NPPF) is a material consideration in planning decisions. At the heart of the NPPF is a presumption in favour of sustainable development, and the policies in Paragraphs 18 to 219 of the NPPF, taken as a whole, constitute the Government's view on what sustainable development in England means in practice for the planning system.

4.1.2 The NPPF states that there are three dimensions to sustainable development, which include an economic role (contributing to building a strong, responsive and competitive economy), a social role (providing the supply of housing required to meet the needs of present and future generations) and an environmental role (which includes minimising waste and pollution).

4.1.3 The main policy statement in relation to noise is Paragraph 123 of the NPPF, which states:

Planning policies and decisions should aim to:

- *Avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;*
- *Mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions;*
- *Recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established; and*
- *Identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.*

4.1.4 In relation to 'adverse impacts', the NPPF refers to the Explanatory Note to the Noise Policy Statement for England (NPSE) for guidance.

4.1.5 The Noise Policy Statement for England (NPSE) and associated Explanatory Note were published by DEFRA in 2010 and set out the Government's noise management strategy to enable noise management decisions to be made within the wider context (i.e. guiding principles of sustainable development), in a cost-effective manner and in a timely fashion.

4.1.6 Fundamental to this approach is 'there is a need to integrate consideration of the economic and social benefit of the activity or policy under examination with proper consideration of the adverse environmental effects, including the impact of noise on health and quality of life. This should avoid noise being treated in isolation in any particular situation, i.e. not focussing solely on the noise impact without taking into account other related factors'.

4.1.7 The noise policy aims of NPSE are to (i) avoid significant adverse impact on health and quality of life, (ii) mitigate and minimise adverse impacts on health and quality of life, and (iii) where possible,

contribute to the improvement of health and quality of life. The policy aims are always to be considered within the context of the Government's policy on sustainable development.

4.1.8 In relation to the mitigation and minimisation of adverse impacts, NPSE considers that *'in reality, although not always stated, the aim has tended to be to minimise noise 'as far as is reasonably practical'*. This is reinforced in Paragraph 2.24 of the Explanatory Note, which requires that '*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. This does not mean that such adverse effects cannot occur'*.

4.1.9 In relation to explaining the 'significant adverse' and 'adverse' effects quoted in the NPPF, NPSE uses the two established concepts from toxicology that are currently being applied to noise impacts, for example by the World Health Organisation (WHO), these are:

- NOEL – No Observed Effect Level. This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to noise.
- LOAEL – Lowest Observed Adverse Effect Level. This is the level above which adverse effects on health and quality of life can be detected.

4.1.10 The NPSE then extends these concepts to lead to a SOAEL – Significant Observed Adverse Effect Level. This is the level above which significant adverse effects on health and quality of life occur.

4.1.11 No specific criteria are presented in the NPSE, to provide the necessary policy flexibility until further evidence and suitable guidance is available. In lieu of specific criteria, for this assessment, RPA makes reference to existing guideline documents, which are summarised in the following paragraph(s).

4.2 NATIONAL PLANNING PRACTICE GUIDANCE: NOISE

4.2.1 Guidance provided in the National Planning Practice Guidance (NPPG) for noise, presents a table of noise exposure hierarchy, which relates the NOEL, LOAEL and SOAEL levels to the subjective perception of noise and examples of outcomes (reproduced in Table 4.1 below).

4.2.2 When considering the factors that influence whether noise could be a concern, the NPPG considers that 'the subjective nature of noise means that there is not a simple relationship between noise levels and the impact on those affected'. This includes factors such as the source and absolute level of the noise, the time of day it occurs, the number of noise events and the frequency and pattern of occurrence.

Table 4.1: Summary of Noise Exposure Hierarchy (from NPPG, Noise)

Perception	Examples of Outcomes	Increasing Effect Level	Action
Not Noticeable	No Effect	No Observed Effect	No specific measures required
Noticeable and not intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No specific measures required
		Lowest Observed Adverse Effect Level	
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
		Significant Observed Adverse Effect Level	
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

4.3 BS 8233:2014

4.3.1 BS 8233:2014 'Guidance on sound insulation and noise reduction for buildings' (BS 8233) sets guideline indoor ambient noise levels for dwellings, for steady external noise sources, which it is desirable are not exceeded. These levels are reproduced in Table 4.2 and are based on guidelines issued by the World Health Organisation (WHO). The Standard also states that 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.

4.3.2 The Standard considers that for regular individual noise events, a guideline value may be set in terms of SEL or L_{AFmax} depending on the character and number of events per night. The WHO Guidelines on Community Noise, 1999 (WHO Guidelines) considers that if negative effects on sleep are to be avoided, noise events exceeding 45 dB L_{Amax} should be limited. ProPG: Planning & Noise (Note 4 to Figure 2) considers '*Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or $L_{Amax,F}$, depending on the character and number of events per night. Sporadic noise events could require*

separate values. In most circumstances in noise-sensitive rooms at night (e.g. bedrooms) good acoustic design can be used so that individual noise events do not normally exceed 45 dB $L_{Amax,F}$ more than 10 times a night.'

4.3.3 Note 5 to Figure 2 of ProPG: Planning & Noise states '….*Where it is not possible to meet internal target levels with windows open, internal noise levels can be assessed with windows closed, however, any façade openings used to provide whole dwelling ventilation (e.g. trickle ventilators) should be assessed in the "open" position and, in this scenario, the internal L_{Aeq} target levels should not normally be exceeded,….*'

Table 4.2: Indoor Ambient Noise Levels in Dwellings (as recommended in BS 8233:2014)

Activity	**Location**	**07:00 – 23:00**	**23:00 – 07:00**
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 $L_{Aeq,8hour}$

* BS 8233 states that internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved

4.3.4 With reference to the above guidelines, by definition, 'reasonable internal conditions' cannot represent a significant adverse impact (the prevention of which is the 1st aim of NPSE). With cognisance to the 2nd aim of NPSE (to minimise noise impact), the internal ambient noise levels detailed in Table 4.2 are considered appropriate.

4.3.5 On the basis of the above, the following design criteria are considered to be in keeping with the aims of the NPPF and the conservation balance required given the Grade II listed status of the building:

i. Living rooms and bedrooms: design range of 35-40 dB $L_{Aeq\ (07:00–23:00)}$

ii. Bedrooms: design range of 30-35 dB $L_{Aeq\ (23:00–07:00)}$

iii. Bedrooms: design range of 45-50 dB L_{AFmax} not normally exceeded in bedrooms at night (based on the 10th highest discrete event maxima).

SECTION 5 SOUND ATTENUATION SCHEME PROPOSALS – ENVIRONMENTAL NOISE

5.1 INTRODUCTION

5.1.1 The sound attenuation scheme proposals are based on the design criteria detailed in Para. 4.3.5 above.

5.1.2 The ventilation recommendations relate to the sound insulation scheme only and the developer should ensure compliance with the ventilation requirements of the Building Regulations.

5.2 HABITABLE ROOMS ON THE NORTHERN (MARKET PLACE) FAÇADE

5.2.1 The existing windows to habitable rooms on the Market Place façade consist of timber sash frames, which are to be retained due to the listed status of the building.

5.2.2 Based on the BS 8233 simplified calculation method and the internal and external measurements as detailed in Table 3.1 (note: the free field external level at MP2 was measured at 57 dB $L_{Aeq,5min}$ immediately after the internal measurements), the average sound reduction index (R_{av}) of the existing sash windows is calculated at 29 dB R_{av}. This is consistent with a 4 mm single glazed pane.

5.2.3 On the basis of the above and with reference to the daytime and night time data contained in Table 3.1., the predicted internal noise levels in habitable rooms on the Market Place façade with windows closed are circa. 30 dB $L_{Aeq\ (07:00–23:00),}$ 27 dB $L_{Aeq\ (23:00–07:00)}$ and 46 dB $L_{AFmax(night\ time)}$.

5.2.4 On this basis and with cognisance to the conservation balance, it is considered that retention of the existing glazing on the Market Place façade is appropriate.

5.2.5 With the window of the test room open by circa 50 mm (bottom sash), the internal noise level during the daytime period was 42 dB $L_{Aeq,5min}$ (note: the free field external level at MP2 was measured at 57 dB $L_{Aeq,5min}$ immediately after the internal measurements). This indicates a reduction from outside to inside of 15 dB for a partially open window, which is consisted with the WHO Guidelines.

5.2.6 On this basis, some form mechanical ventilation is recommended in order to give the occupiers the option to close windows to maintain BS 8233 internal noise criteria.

5.3 HABITABLE ROOMS ON THE REAR FAÇADE

5.3.1 The existing windows to habitable rooms on the rear façade consist of timber sash frames, which are to be retained due to the listed status of the building.

5.3.2 As stated in Para. 5.2.5, the reduction from outside to inside for a partially open window is 15 dB. The free field external level at MP1 was measured at 43 dB $L_{Aeq,1\ hour}$, which equates to an internal level of 28 dB $L_{Aeq,1\ hour}$.

5.3.3 On this basis and with cognisance to the conservation balance, it is considered that retention of the existing glazing on the rear façade is appropriate. Additionally, no form of mechanical ventilation is required as internal target criteria can be achieved with a partially open window.

5.4 VENTILATION REQUIREMENTS

5.4.1 In order to supplement the retention of the existing sash windows on the Market Place façade, some form of mechanical ventilation is considered appropriate.

5.4.2 The recommended solution is to install a mechanical extract ventilation (MEV) system with boost facility in each flat with glazed habitable rooms on the Market Place façade. The recommended product is the Vent-Axia MVDC-MS MEV unit (or equivalent). The MVDC-MS is Building Regulations ADF compliant and provides constant extraction from wet areas, with normal, boost and purge settings. The unit produces low levels of self noise and can be mounted in a cupboard in the flat lobby to ensure compliance with BS 8233 internal levels.

5.4.3 With cognisance to the conservation balance of the development, the exhaust spigots of the units (one per unit) can be ducted to the rear façade of the building or to a low profile roof tile vent. Make up air for the units can be provided by the natural leakage of the building envelope (i.e. trickle vents are not required).

SECTION 6 SOUND ATTENUATION SCHEME PROPOSALS – SEPARATING FLOOR BETWEEN THE GROUND FLOOR COMMERCIAL UNIT AND 1ST FLOOR FLATS

6.1 In relation to the sound insulation performance of separating elements between spaces used for normal domestic purposes and non-domestic purposes, Approved Document E 2003 (as amended) (ADE 2003) to the Building Regulations states '*a higher standard of sound insulation may be required between spaces used for normal domestic purposes and communal or non-domestic purposes. In these situations the appropriate level of sound insulation will depend on the noise generated in the communal or non-domestic space. Specialist advice may be needed to establish if a higher standard of sound insulation is required, and if so, to determine the appropriate level*.' In this respect, RPA is a specialist acoustic consultancy.

6.2 Notwithstanding the above, ADE 2003 states '*in the case of some historic buildings undergoing a material change of use, it may not be practical to improve the sound insulation to the standards set out in Tables 1a and 1b. The need to conserve the special characteristics of such historic buildings needs to be recognised, and in such work, the aim should be to improve sound insulation to the extent that it is practically possible, always provided that the work does not prejudice the character of the historic building…….In such cases it will be reasonable to improve the sound insulation as much as is practical, and to affix a notice showing the sound insulation value(s) obtained by testing in accordance with Regulation 41 or 20(1) and (5), in a conspicuous place inside the building.*'

6.3 In order to assess the airborne sound insulation of the existing separating floor between the ground floor commercial use and 1st floor residential use, a sound insulation test (SIT) was undertaken on 28th November 2023. The existing separating construction is not known, but is understood to be a timber joist base floor with ornate ceiling at ground floor level. The test was undertaken between the commercial space at ground floor (source room) and an existing 1st floor office (receiver room).

6.4 The test result was a $D_{nT,w}$ of 61 dB and a $D_{nT,w} + C_{tr}$ of 54 dB. This level of performance is 11 dB greater than the minimum requirement of 43 dB $D_{nT,w} + C_{tr}$ contained in ADE 2003 for normal domestic use.

6.5 As a reference, typically, local planning authorities require that the sound insulation provided between places of entertainment with "non-discotheque" music levels and adjoining residential use should be a minimum of 60 dB $D_{nT,w}$. This is a single figure measure of the airborne sound insulation performance of the as-built separating elements, and is also considered appropriate for a restaurant environment. This requirement is also consistent with the performance requirements of a number of hotel chains, with, for example, the "Premier Inn Generic Specification for a Turnkey Development", requiring an airborne sound insulation performance of ≥ 60 dB $D_{nT,w}$ between a restaurant/bar/kitchen and bedrooms.

6.6 On the basis of the above, the airborne sound insulation of the existing separating floor is significantly above the minimum ADE 2003 requirement and, without upgrading, is considered appropriate to accommodate a range of relatively noise intensive uses at ground floor level (e.g. bar, café, restaurant, amusement arcade etc.)

SECTION 7 CONCLUSIONS

7.1 An assessment has been undertaken of the potential impact of noise on the change of use of the upper floors at the former RBS building, 27 Market Place, Huddersfield, to form flats.

7.2 In the context of the Grade II listed status of the building, the assessment has considered (i) glazing and ventilation specifications in the residential units to control environmental noise, and (ii) the acoustic specification for the separating floor between the 1st floor residential use and a proposed ground floor commercial use (to be dealt with under a separate application).

7.3 It is concluded that the retention of the existing sash windows is appropriate, albeit a mechanical ventilation system is required for residential units with habitable rooms on the Market Street façade.

7.4 It is also concluded that the airborne sound insulation of the existing separating floor between the ground and 1st floor areas is significantly above the minimum ADE 2003 requirement and, without upgrading, is considered appropriate to accommodate a range of relatively noise intensive uses at ground floor level (e.g. bar, café, restaurant, amusement arcade etc.)

7.5 On the basis of assessment detailed in this report, noise is not considered to represent a constraint to the proposed change of use.

APPENDIX 1

- Glossary of acoustic terms

Appendix 1
Glossary of Acoustic Terms

Sound Pressure Level (L_p)

The basic unit of sound measurement is the sound pressure level. As the pressures to which the human ear responds can range from 20 µPa to 200 Pa, a linear measurement of sound levels would involve many orders of magnitude. Consequently, the pressures are converted to a logarithmic scale and expressed in decibels (dB) as follows:

$L_p = 20 \log_{10}(p/p_0)$

Where L_p = sound pressure level in dB; p = rms sound pressure in Pa; and p_0 = reference sound pressure (20 µPa).

A-weighting Network

A frequency filtering system in a sound level meter, which approximates under defined conditions the frequency response of the human ear. The A-weighted sound pressure level, expressed in dB(A), has been shown to correlate well with subjective response to noise.

Equivalent continuous A-weighted sound pressure level, $L_{Aeq, T}$

The value of the A-weighted sound pressure level in decibels of continuous steady sound that within a specified time interval, T, has the same mean-square sound pressure as a sound that varies with time. $L_{Aeq, 16h}$ (07:00 to 23:00 hours) and $L_{Aeq, 8h}$ (23:00 to 07:00 hours) are used to qualify daytime and night time noise levels.

$L_{A10, T}$

The A-weighted sound pressure level in decibels exceeded for 10% of the measurement period, T. $L_{A10, 18h}$ is the arithmetic mean of the 18 hourly values from 06:00 to 24:00 hours.

$L_{A90, T}$

The A-weighted sound pressure level of the residual noise in decibels exceeded 90% of a given time interval, T. L_{A90} is typically taken as representative of background noise.

$L_{AF\ max}$

The maximum A-weighted noise level recorded during the measurement period. The subscript 'F' denotes fast time weighting, slow time weighting 'S' is also used.

Sound Exposure Level (SEL or L_{AE})

The energy produced by a discrete noise event averaged over one second, no matter how long the event actually took. This allows for comparison between different noise events which occur over different lengths of time.

APPENDIX 2

- Annotated aerial site image

Appendix 2.1: Annotated Aerial Image