MILLER GOODALL
ACOUSTICS - AIR QUALITY - LIGHTING

Technical Memorandum

on behalf of

READ DESIGN LTD

for the site at

OLD ROW, WHALLEY ROAD, BARROW, BB7 9AZ

DATE: 20/09/2024

REF NUMBER: 103226

Miller Goodall Ltd
Ground Floor
Ashworth House
Deakins Business Park
Blackburn Road
Egerton
Bolton
Lancashire
BL7 9RP

Tel: 01204 596166

www.millergoodall.co.uk

Company registration number5201673

Record of changes

Prepared By: Jo Lacy MIOA **Reviewed By:** Will Wright MIOA

Signed: [redacted] **Signed:** [redacted]

Date: 20/09/2024 **Date:** 20/09/2024

Version	Date	Change	Initials
1	20/09/2024	First issue	JL

1 Introduction

1.1 Miller Goodall Ltd has on behalf of Read Design Ltd, undertaken a desktop-based sound insulation assessment in respect of the proposed redevelopment of the former public house occupying 23 – 25 Old Row, Whalley Road, Barrow, BB7 9AZ.

1.2 It is proposed to redevelop the building to provide a new village hall and community area, with meeting rooms at the first floor level. Planning permission has been granted for these works, with one condition pertaining to noise as follows:

> *"Prior to the commencement of development, save for any demolition works hereby approved, a detailed scheme for the sound insulation to prevent undue noise disturbance or nosie transference between the proposed Village Hall and the following nearby residential dwellings 2-19 Cockerill terrace, 20-21 Old Row and 1 Trafford Gardens Barrow, shall be submitted to and agreed in writing by the Local Planning Authority.*
>
> *"The scheme shall demonstrate that there is sufficient acoustic insulation of the premises to ensure internally generated noise from the village hall will not impact those in the adjoining premises. For the avoidance of dought the sound insulation works shall be engineered so the dB levels within residential buildings adhere to BS8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings. The agreed details shall be implemented prior to commencement of first use.*
>
> *"Reason: To safeguard the living conditions of residents particularly with regard to the effects of noise."*

1.3 The BS 8233:2014 criteria mentioned in this planning condition are reproduced below in **Table 1**:

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 $L_{Aeq,8hr}$

1.4 This technical memorandum lays out an assessment undertaken for the site with recommendations made for appropriate mitigation measures to see that noise criteria are achieved in all nearby dwellings under "normal use" conditions. This includes commentary on detailing of junctions, and airborne sound transmission to non-adjacent properties.

2 Internal Acoustics

2.1 Noise levels

2.1.1 As a village hall, it is assumed that live music performance may happen periodically, and this is likely to be the loudest noise-generating activitiy within the space. Recorded noise levels from live music in a large church hall have been used to provide an indicative noise spectrum for the purposes of assessment. This included audience noise singing along with the band, and was averaged over 3 minutes.

Table 2: Indicative noise spectra

Source	Sound Pressure Level (SPL), dB at Octave Band Centre Frequency, Hz								SPL (dB)
	63	125	250	500	1k	2k	4k	8k	
Live Music @ 15 m	87.9	88.4	87.5	85.6	80.4	74.6	76	70	86.8

2.1.2 While it is possible that noise levels could exceed those above, it would not be "typical" for them to be at, or above this level for extended durations of time.

2.2 Sound Insulation

2.2.1 The assessment period is chosen as daytime for the purposes of assessment as the hall is anticipated to only be in "noisy" use during the daytime (07:00 – 23:00). Furthermore, it is only connected at ground floor level (i.e. adjacent to living rooms), so noise transfer to bedrooms would have to take an alternative path (rather than direct through the partition) which would be subject to additional acoustic losses.

2.2.2 The construction of the existing wall separating the development site from the residence at 21 Old Row is not known, but it is reasonable to assume that as a minimum, it comprises plastered brickwork of approx. 100 mm total thickness. Twin-leaf masonry or any stud partition already in

existance in addition to the brickwork will enhance the acoustic performance, but for the purpose of a worst-case assessment, this is not assumed.

2.2.3 Sound Reduction Index (SRI) performance of plastered brickwork, and plastered brickwork with an independent stud wall are provided in **Table 3** below:

Table 3: Predicted Partition Sound Insulation Performance

Partition	Sound Reduction Index (SRI), dB at Octave Band Centre Frequency, Hz								R_w + C_{tr} (dB)
	63	125	250	500	1k	2k	4k	8k	
Plastered Brickwork 102.5 mm	35	38	34	38	46	54	59	54	41
Plastered Brickwork with stud partition	29	48	58	76	81	92	91	86	62

2.2.4 Assuming plain plastered brickwork, noise levels within the adjacent residence would be expected, in the short-term, to exceed BS 8233 criteria for the daytime period. Therefore, an independent stud is suggested to increase the performance of the partition.

2.2.5 The introduction of a new indpenedent stud wall with a 90 mm void containing ≥ 25 mm mineral wool (or equivalent, achieving at least 10 kg/m³ density), with a plasterboard lining achieving a total surface mass of at least 16.0 kg/m² (e.g. 2 x 12.5 Gyproc WallBoard @ 8.0 kg/m² per board) will dramatically increase the acoustic performance of the partition. This can be seen from the second result in **Table 3** above.

2.2.6 With the addition of this independent stud wall with two layers plasterboard, noise levels within the adjacent dwelling would be expected to be below 35 dB $L_{Aeq,T}$. With noise levels in the community hall expected to be generally lower than the 87 dB quoted in **Table 2** earlier in this memorandum, the resultant noise levels will be even lower. Compliance with the Condition is therefore demonstrated for direct noise transfer to the adjacent property.

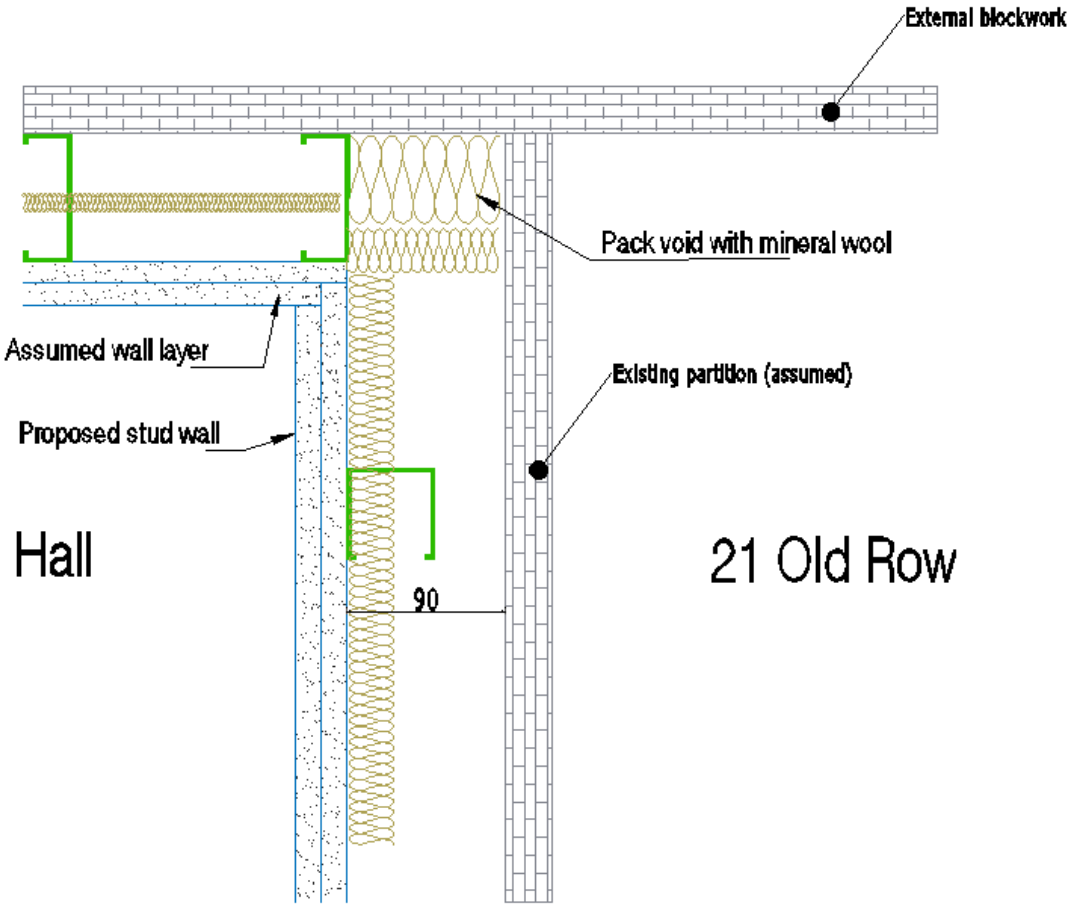
2.3 Acoustic Detailing

2.3.1 To ensure the maximum performance possible is achieved by the proposed independent stud wall, it will be necessary to ensure it is appropriately detailed at junctions. Typical causes of flanking sound losses are set out below, together with information on suggested mitigation:

- Wall junction with linings on façade – Where separating walls form a junction with external wall linings, it is necessary to ensure that the junction is well sealed and that the wall lining is not continuous behind the partition.
- Junctions with ceilings – Separating walls must extend from slab to slab and not terminate at the underside of ceilings.
- Plasterboard linings should be dovetailed at junctions/corners and sealed. Where it is not possible to dovetail joints e.g. for fire safety reasons, butt joints may be used but these must be well sealed with non-hardening acoustic mastic.

2.3.2 An indicative detail based on the assumptions laid out above is shown below in **Figure 1**:

Figure 1: Indicative partition detailing



3 Noise to non-adjacent properties

3.1 Noise levels within the hall have been assumed (as a worst case) within the hall as described in the previous section, with noise levels detailed in **Table 2**. It is generally accepted that through a partially open window, noise levels will be reduced by approximately 12 dB (broadband), and this is applicable both for noise leaving the hall and entering the dwelling being assessed to.

3.2 Assuming no screening or losses except for radiation (quarterspherical, - 5 dB), distance to 16 Cockerill Terrage (point source at 15 m, - 23 dB) and losses through partially open windows (- 12 dB per window), noise levels in the worst-affected dwelling are not expect to exceed 34 dB $L_{Aeq,T}$ in the worst-case scenario. Any other dwellings benefit from additional screening and/or distance losses. Additionally, as noted in the previous section, average noise levels over any given 1-hour period are expected to be below those assessed, resulting in correspondingly lower internal noise levels at the receptors.

3.3 For external amenity areas associated with nearby dwellings, the noise levels are not expected to exceed a level of 46 dB $L_{Aeq,T}$, which is below the lower guideline criteria for noise in external amenity areas. Compliance is therefore demonstrated with the Planning Condition with respect to noise break-out from the building to nearby dwellings i.e. 2-19 Cockerill Terrace, and 1 Trafford Gardens.

4 Conclusions

4.1 With the addition of an independent stud wall (described in Section **2.2** of this memorandum), noise criteria in the adjacent property at 21 Old Row will be achieved in a worst-case scenario, and compliance with the Planning Condition demonstrated.

4.2 Assuming partially open windows in the Village Hall and the worst-affected receptor, noise levels are anticipated to be compliant with the Planning Condition without any additional mitigation measures.

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.

$L_{Aeq,T}$ 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.

R_w Single number rating used to describe the sound insulation of building elements and is defined in BS EN ISO 10140-2: 2010 (formerly BSEN ISO 140-3:1995). It is derived by measurement under laboratory conditions and does not take into account the effects of flanking transmissions.

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 717-1:20-13.


MILLER
GOODALL
ACOUSTICS - AIR QUALITY - LIGHTING