

# NOISE SURVEY LTD

## Noise Assessment Report

**Report Ref:** 220ALE  
**Client:** Read Ale & Wine  
**Site Location:** Read Ale & Wine  
116 Whalley Road  
Burnley  
BB12 7PN  
**Date of Issue:** 19<sup>th</sup> August 2017  
**Date of Assessment:** Friday 18<sup>th</sup> August 2017



Picture 1: Read Ale and Wine currently operates as bar.

### Executive Summary

Noise from use of the room as a customer seating area has been assessed at  $L_{Aeq(1hour)}$  of 80dB to account for uncertainty of  $\pm 5$  dB. The current standardized level difference of  $D_{nT,w} + C$  39dB is insufficient to reduce the likelihood of adverse impact from customer noise in the proposed seating area. A scheme of sound insulation is required for all the ceiling to the proposed development areas.

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A design showing the scheme of sound insulation to be applied to the ceiling of the proposed development has been included in the appendix of this report. Applying the scheme of sound insulation will increase the  $D_{nT,w} + C$  to 45dB and reduce the likelihood of adverse impact to the noise sensitive dwelling above the development.

**Uncertainty in the measurement is  $\pm 5$ dB**

**Objective:**

Read Ale and Wine operates on the ground floor of 116 Whalley Road. Presently customers can purchase alcohol from and sit at the front of the store. The rear of the premises is used for storage. Above Read Ale and Wine is a residential flat known as 116A Whalley Road. The client proposes to convert the rear storage area into a bar seating area. The proposed development is directly below the noise sensitive dwelling of 116A Whalley Road.



Picture 2: This is the main room to be converted into a bar seating area for Read Ale and Wine.



Picture 3: Above the proposed additional seating area is the living room of 116A Whalley Road, a residential flat.

The purpose of this noise assessment is to determine the level of noise likely to be generated inside the proposed seating area and to provide a recommendation for sound insulation that will reduce the noise impact from use of the proposed seating room that will satisfy the guidelines in BS8233:2014.

### **Source under Assessment**

Customers using the seating area will generate noise through conversation and interaction. The level of noise will not be constant and will vary depending on but not limited to;

- The number of customers in the room
- How loud they speak and interact
- Intensity and type of activity in the room
- The level of background music

Normal levels of speech range from  $L_{Aeq(1 \text{ hour})}$  35 – 60dB. Noise levels near a busy road are  $L_{Aeq(1 \text{ hour})}$  60 – 80dB(Watson & Downey, 2013).

The noise level to be mitigated against is  $L_{Aeq}$  (1 hour) 80dB to account for uncertainty of  $\pm 5$ dB. This level is based on the accepted speech level of 60dB plus variation of upto 15dB for number

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of customers in the room plus  $\pm 5\text{dB}$  for uncertainty. The measurement descriptor of LAeq(1 hour) has been selected because BS4142:2014 assess day time (07:00 – 23:00) commercial noise based on LAeq (1 hour).



Picture 4: The ground floor is occupied by Read Ale & Wine. The first floor is a residential dwelling.

## Methodology

Standardized level difference ( $D_{nT,w} + C$ ) was measured between the proposed seating room and the living room of 116A Whalley Road to determine the current standardized level difference. The current  $D_{nT,w}$  was compared against recommendations in BS8233:2014 to determine whether the sound insulation in the ceiling was adequate.



Picture 5: The room of the proposed seating area has incomplete plaster board. This accounted for its low sound insulation of  $DnT'W + C (c;ctr) 39 (-2,-7) \text{ dB}$ .

## Date and Time of Measurements

Friday 18th August 2017

## Result

The standardized level difference was measured as  $DnT'w + C 39\text{dB}$ . This is due to insufficient sound insulation. An  $L_{Aeq}$  (1 hour) 80dB in the seating area below would be measured as  $L_{Aeq}(1 \text{ hour}) 37\text{dB}$  in the noise sensitive residence above. A  $DnT,w + C$  of 45dB is required to reduce the noise level in the dwelling above to 35dB.

## BS8233:2014 Criteria

Table 1 below is taken from BS8233:2014. It shows the guide lines for internal ambient noise levels. The guidelines in BS8233:2014 are also advised by WHO (2009).

Activity	Location	Day (07:00 -23:00)	Night (23:00 – 07:00)
Resting	Living Room	35 $L_{Aeq}$ (16 hour)	-

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<b>Dining</b>	<b>Dining room/area</b>	<b>40</b> LAeq (16 hour)	-
<b>Sleeping(daytime resting)</b>	<b>Bedroom</b>	<b>35</b> LAeq (16 hour)	<b>30</b> LAeq (16 hour)

Table 1: BS8233:2014 noise level for internal habitable rooms.

## Recommendations

Music or entertainment noise should be kept at below LAeq (1hour) 70dB in the proposed development area of 116 Whalley Road.

## Ceilings

- Sound insulation for the ceilings in the ground floor area of the development should be increased to a minimum DnT,w of 45dB.

## Walls

- A small mid section of the ground floor will be partitioned to provide a kitchen area where noise levels will be below LAeq(1hour) 70dB. The partition will provide sound insulation from noise in the passage way. No other walls are shared with a residential dwelling. No additional sound insulation measures are required to the external walls.

A scheme of sound insulation to be applied to the ceiling of the proposed development is included to the appendix of this report. It will result in a Dnt'w + C of 45dB and reduce LAeq (1hour) of 80dB in the proposed seating area to LAeq(1 hour) 35dB in the dwelling of 116A Whalley Road.

Achieving the sound reduction as stated in this report will meet the standards for day time noise levels in the residence above.

## Context of the Noise Environment

- Read Ale & Wine occupy the ground floor and a residential dwelling exists on the first floor of the building.

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- The ground floor was historically used as a bakery and for the manufacturing of pies using noise emitting machinery.
- The properties are located in a mixed use area although it is predominantly a residential area.
- Road traffic noise is a feature of the noise environment from Whalley road.

## Uncertainty

Sound insulation measurements were conducted using a Cesva Type 1 sound level meter. The  $DnT,w + C$  of the proposed seating area was obtained by direct onsite measurements. Laboratory calibration uncertainty of the sound level meter is  $\pm 1$  dB

Uncertainty arises because the exact level of customer noise in the seating area is not known. Whilst conversational noise levels have been used  $L_{Aeq(1hour)}$  60dB together with the addition of noise from multiple conversations (+15dB), an uncertainty  $\pm 5$ dB has been added to the noise levels to account for variations that will occur from differences in number and level of customer conversations in the proposed development area.

The calibration of the sound level meter at the beginning and end of the readings showed a maximum drift of 0.2 dB at the start and end of the reading. This is considered normal.

$$u = \sqrt{a^2 + b^2 + c^2 \dots etc}$$

$$U = \sqrt{1 + 5^2}$$

$$U = \pm 5 \text{ dB}$$

**Uncertainty in the measurement is  $\pm 5$  dB**

## Conclusion

Noise from use of the room as a customer seating area has been assessed at  $L_{Aeq(1hour)}$  of 80dB to account for uncertainty of  $\pm 5$  dB. The current standardized level difference of  $DnT,w + C$  39dB is insufficient to reduce the likelihood of adverse impact from customer noise in the proposed seating area. A scheme of sound insulation is required for all the ceiling to the proposed development areas.

# NOISE SURVEY LTD

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## Uncertainty in the measurement is $\pm 5$ dB

Signed:

*Donald I Angir*

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Noise Survey Ltd

## BIBLIOGRAPHY

British Standards Institution (2014) BS EN 8233:2014 **Guidance on Sound Insulation and Noise Reduction for Buildings**. London. BSI

World Health Organization Europe (2009) **Night Noise Guidelines for Europe**. Copenhagen WHO

Department for Communities and Local Government (2012) **National Planning Policy Framework**. Crown London

Watson R and Downey O (2013) **The Little Red Book of Acoustics A Practical Guide Third Edition**. Blue Tree Acoustics UK

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## APPENDIX A

### Measuring Equipment & Calibration

The sound insulation test was conducted using the following instrumentation;

- Cesva SC310 Class 1 Sound Level Meter
- Casella Cel-110/1 Sound Level Meter Calibrator
- 2 loudspeakers operating simultaneously.
- A noise generator (Pink Noise)

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At the beginning and at the end of measurements the meters were calibrated with an acoustic calibrator before and after the measurements with negligible deviation ( $\leq 0.4\text{dB}$ ). The meter calibrated successfully before and after measurements.

## **Method for the Measurement of Standardized Level Difference ( $D_{nT,w}$ )**

### **Test Method (Airborne Sound Insulation)**

Airborne sound insulation tests were undertaken in accordance with the requirements of BS EN ISO 140-4: 1998 and the guidance in Annex B to Approved Document E.

All measurements were in  $1/3^{\text{rd}}$  octaves.

### **Reverberation Time**

Reverberation times in the receiver room were recorded using a single loudspeaker position, 3 measurement positions and 2 readings at each position in accordance with ISO 354:2003, all arithmetically averaged to derive third octave band T60 for the receiver room.

### **Background Levels**

Measurements were taken at each one of 3 sound level meter positions using broadband pink noise. A total of 3 measurements were taken and logarithmically averaged to produce a single set of  $1/3^{\text{rd}}$  octave  $L_{\text{eq},T}$  readings.

### **Noise in the Source and Receiving Room**

Five positions were used in each room. Readings were taken at each of the 5 positions in the receiving and source room. The measured levels were then logarithmically averaged to obtain third octave band  $L_{\text{eq},T}$  levels for each room.

The noise level measurements from the receiver room were corrected using the receiver room reverberation time measurements to determine the standardised level difference  $D_{nT}$  and compared with the reference curves to provide a  $D_{nT,w}$  as stipulated in Annex B of Approved Document E and weighted in accordance with ISO 717-1:1997. A  $C_{tr}$  correction was applied to the sound spectrum in compliance with the approved documents.

### **Schedule of Tests**

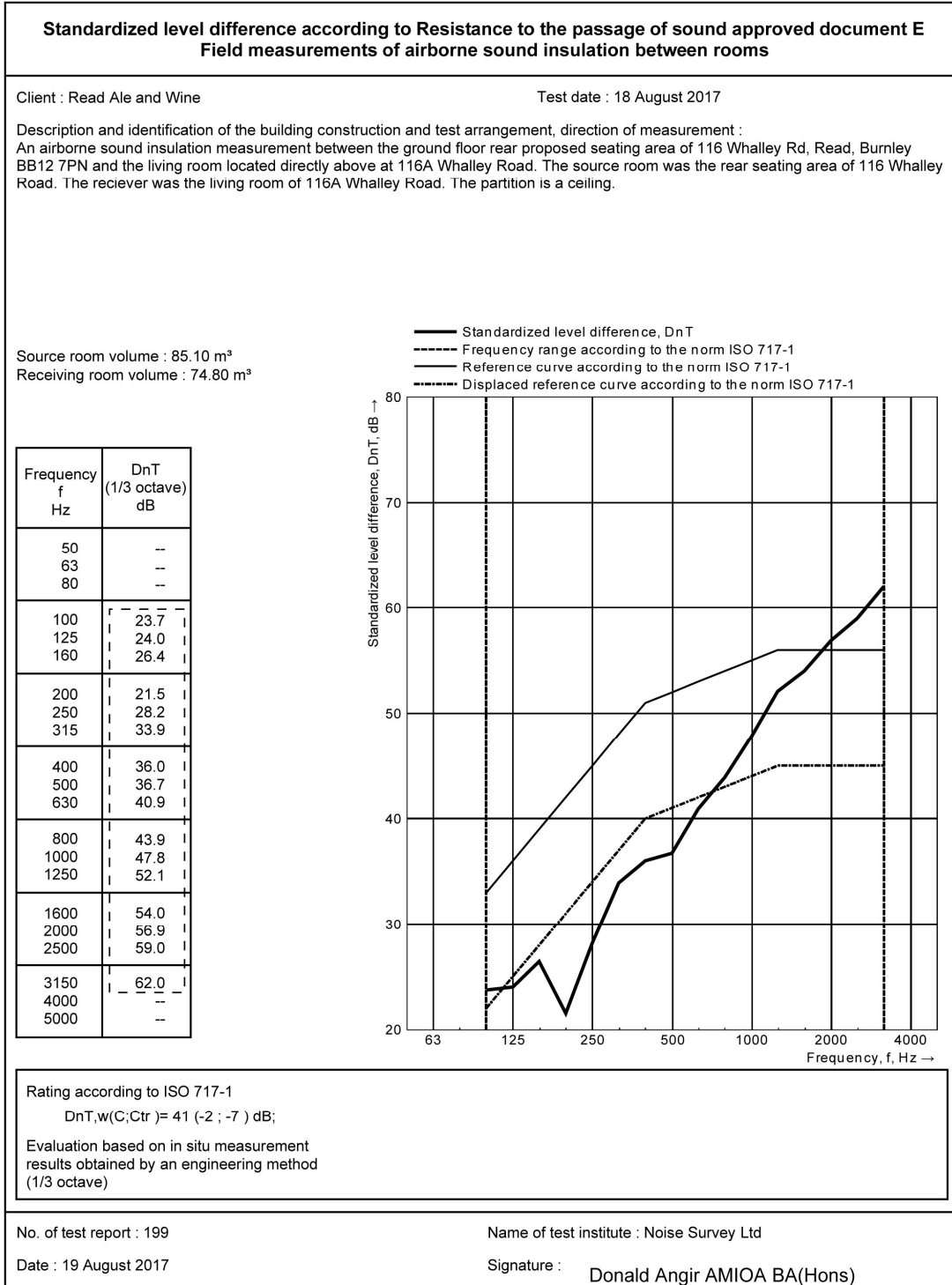
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Details of the test and the relevant requirements of Approved Document E are provided in the attached table T1.

## 2.0 AIRBORNE MEASUREMENT RESULTS

Source	Volume m <sup>3</sup>	Receiving Room	Volume m <sup>3</sup>	Structure	Test Date	Ref	D <sub>nt,w</sub> + C (dB) Achieved	D <sub>nt,w</sub> + C <sub>tr</sub> (dB) Required	Pass / Fail
Proposed Seating room on the ground floor	85	Living room of 116A Whalley Rd ( first floor)	74	Ceiling	18 <sup>th</sup> August 2017	199	39	≥ 45	<b>fail</b>

Table T1.



Graph 1: Sound insulation measurement. A correction of -2 dB is applied to the results because the noise source is similar to that of a pub or club.

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## Scheme of Sound Insulation to be Applied to all Ceilings in the Proposed Development Area



Picture 6: Resilient bar ceiling. In the recommended design below, the original joists are insulated and the resilient bar is fixed on hangers as opposed to directly onto the wooden joists. Source:

<http://www.roomsmadeformyou.british-gypsum.com/solutions/sound-solutions/existing-project/copy-of-sound-solutions-silent-floor.aspx> Date 21/08/2017 Time: 08:00



Picture 7: Resilient bar hung from joists. Source: <http://www.gyproc.ae/systems/ceiling-systems/gyproc-mf-ceiling> Date 21/08/2017 Time: 08:00

1. The existing wooden floor joists should be insulated with 100mm thick mineral wool with a minimum mass per unit area of 10Kg/m<sup>2</sup>.
2. A space of 100mm between the bottom of the original wooden joists and the top of the mineral wool underneath.

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3. Gypframe resilient bar ceiling fixed 200mm below the original wooden floor joists. The gypframe should be filled with 100mm thick mineral wool with a minimum mass per unit area of 10Kg/m<sup>2</sup>. This should maintain the 100mm gap between the top of the mineral wool and the bottom of the original floor joists.
4. Two staggered layers of 15mm Gyproc sound bloc
5. Plaster and paint to suit.

I have attached a PDF from British Gypsum on how to build the resilient floor. There is also a link to a video. The system is the same as described here except that we have added insulation in between the existing joists and require a 100mm gap between the mineral wool and the bottom of the original joists.

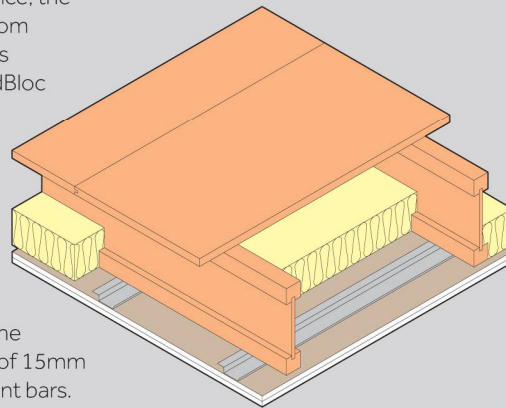
## SILENT FLOOR

### Building a Gypframe Resilient Bar and Gyproc SoundBloc ceiling

To achieve higher levels of performance, the ceiling structure can be decoupled from the floor joists. Silent Floor comprises of two layers of 15mm Gyproc SoundBloc boards, 100mm Isover acoustic insulation and Gypframe RB1 Resilient Bars.

#### Installation

Gypframe RB1 Resilient Bars fixed to the underside of the joist at 450mm centres, 100mm Isover acoustic insulation placed between the joists and then two staggered layers of 15mm Gyproc SoundBloc fixed to the resilient bars.



15mm Gyproc SoundBloc  
Gypframe RB1 Resilient Bars  
100mm Isover APR acoustic insulation

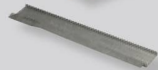
View our 'How to' video at [british-gypsum.com/how-to-videos](http://british-gypsum.com/how-to-videos)

#### Components needed for Silent Floor



#### 100m Isover Spacesaver Ready-Cut

For improved acoustic performance



#### Gypframe RB1 Resilient Bar

Acoustic engineered channel



#### 15mm Gyproc SoundBloc

Plasterboard with a high density core for enhanced acoustic performance



#### British Gypsum Drywall Screws

For fixing boards to Gypframe Resilient Bar and fixing Gypframe Resilient Bar to timber joists



#### Gyproc Sealant

Sealing air paths for optimum sound insulation



Picture 8: Resilient bar ceiling