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FAÇADE NOISE EXPOSURE ASSESSMENT

50 DON STREET, PENISTONE, SHEFFIELD,
SOUTH YORKSHIRE S36 6HA



Our Ref HA/AA133/V1
Site Address 50 Don Street, Penistone, Sheffield, Yorkshire S36 6HA
For Nigel Pickstock
Client Address 51 Don Street, Penistone, Sheffield, Yorkshire S36 6HA
Date of Report 18 July 2018
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EXECUTIVE SUMMARY

- Mr Nigel Pickstock instructed Healthy Abode Ltd t/a as HA Acoustics to undertake a noise impact assessment for proposed residential premises to be located at 50 Don Street, Penistone, Sheffield, Yorkshire S36 6HA.
- HA Acoustics has undertaken an environmental noise survey at the site in order to determine prevailing ambient, background and maximum noise levels that are representative of the residential premises.
- A baseline environmental noise survey and assessment has been undertaken in line with the guidance contained in British Standard (BS) 8233:2014, measurements being taken over continuous 5-minute periods.
- An unattended survey was conducted between Monday 2nd July 2018 and Wednesday 4th July 2018 at two fixed secure monitoring positions deemed representative of the worst affected façades of the proposed site. Manual measurements were also undertaken on Monday 2nd July 2018.
- Existing noise levels at the site have been compared to relevant standards and guidance. The results of the noise survey are considered reasonable given the location of the measurement position and the existing noise sources in the local vicinity. The representative time-averaged ambient and night-time maximum noise levels have been calculated at 52dB L_{Aeq} daytime, 49dB L_{Aeq} night time, and 60dB L_{Amax,F}.
- The assessment has indicated that internal noise levels within the proposed development are likely to meet the guideline noise criteria contained in BS 8233:2014 through the use of appropriately specified glazing and ventilation; reference to BS 4142:2014 has been made.
- At the time of composing the report the exact specifications of the construction/build of the proposal have not been finalised. Recommendations provided in respect to sound insulation of the building have been proposed based on achieving the desired internal noise levels in BS 8233:2014.

TABLE OF CONTENTS

EXECUTIVE SUMMARY	2
TABLE OF CONTENTS	3
1. INTRODUCTION.....	4
2. SITE DESCRIPTION AND OBSERVATIONS	5
3. ENVIRONMENTAL NOISE SURVEY METHODOLOGY.....	6
4. NOISE SURVEY RESULTS.....	8
5. NOISE EMISSION CRITERIA.....	9
6. SITE SUITABILITY FOR RESIDENTIAL DEVELOPMENT	11
7. BUILDING FACADES SUITABILITY	12
8. EXTERNAL AMENITY SUITABILITY	15
9. NOISE IMPACT CALCULATIONS.....	16
10. CONCLUSION	19

Appendix A – Site Plan

Appendix B – Time Histories

Appendix C – Façade Exposure Glazing Calculations

Appendix D – Acoustic Calculations

1. INTRODUCTION

- 1.1. It is proposed to introduce new residential premises at 50 Don Street, Penistone, Sheffield, Yorkshire S36 6HA. The existing ambient noise climate could have the potential to affect the premises.
- 1.2. The purposes of this report are:
 - 1.2.1. To determine and assess prevailing ambient, background and maximum noise levels affecting the proposal due to nearby noise sources (e.g. air and road traffic);
 - 1.2.2. To present desired internal noise levels to be achieved within the residential premises in accordance with BS 8233:2014, and consideration to BS 4142:2014.
 - 1.2.3. To detail appropriate sound insulation requirements for the purposes of mitigating noise caused by prevailing and potential noise sources such that internal noise levels are achieved.
- 1.3. The site, surrounding land use and proposed noise mentoring methodology was discussed in advance with the local authority, Barnsley Metropolitan Borough Council. Environmental Health department.

2. SITE DESCRIPTION AND OBSERVATIONS

- 2.1. 50 Don Street, Penistone, Sheffield is hereafter referred to as 'the site'. The site is currently a privately owned residential premises with a large garden. The proposal is for outline planning consent to build three residential detached houses on the existing plot.
- 2.2. The site is located on the edge of a small market town, within a semi-rural area. The site fronts onto Don Street, with residential premises to the south-west. The site is located on the end of Don Street and is predominantly surrounded by woodland park and agricultural land to the north. The nature of the area means the site backs into woodland with Kirkland Beck running to the rear. Situated to the south of the site is Argo Feeds. Argo Feeds Manufacturers and distributed agricultural feed. See appendix A for the site plan.
- 2.3. The noise survey was unmanned; therefore, a subjective assessment of background and ambient noise sources could not be undertaken for the whole monitoring duration. However, during installation and collection of the monitoring equipment, the dominant noise source emanated from road traffic, nearby residential premises, construction (of a residential extension). During the manual assessment, noise could be heard to dominate from Argo Feeds, during certain time periods, with the blowing of feed from the trucks into the silo's. These noise sources are considered normal to the site location. No significant abnormal noise source(s) were identifiable.

3. ENVIRONMENTAL NOISE SURVEY METHODOLOGY

- 3.1. An unmanned environmental noise survey was undertaken at two secure single measurement locations (see appendix A). The surveys were undertaken between 09:00 hours on 2 July 2018 and 10:00 on the 4 July 2018.
- 3.2. Ambient, background and maximum sound pressure level measurements (L_{Aeq} , L_{A90} and $L_{Amax,F}$ respectively) were measured throughout the noise survey with continuous recorded 5 minute periods. The measurement position is indicated in **orange** in Appendix A.
- 3.3. The sound level meter(s) (SLM) was positioned 3.5 metre from reflective surfaces (walls/fences) to the front and rear boundary of the proposed development. The SLM's were mounted approximately 1.5 metres above ground level. The position is considered to be in 'free-field' conditions so a façade correction has not been applied to the data. The positions were chosen to gain representative noise levels from any noise sources as well as for monitoring equipment security reasons.
- 3.4. The equipment used for the noise survey is summarised in Table 3.1.

Equipment	Description	Quantity	Serial Number
Svantek 977	Class 1 automated logging sound level meter	1	69506
ACO Pacific 7052E	Class 1 ½" microphone	1	68191
Svantek 977	Class 1 automated logging sound level meter	1	69297
ACO Pacific 7052E	Class 1 ½" microphone	1	69364
Larson Davis CAL200	Class 1 Calibrator	1	13530

Table 3.1 Description of Equipment used for Noise Survey

- 3.5. The noise survey and measurements were conducted, in accordance with BS7445-1:2003 '*Description and measurement of environmental noise. Guide to quantities and procedures*'. Measurements were made generally in accordance with ISO 1996-2:2007 '*Acoustics – Description, measurement and assessment of environmental noise – Part 2: Determination of environmental noise levels*'.
- 3.6. Weather conditions throughout the entire noise survey period were noted to be hot (approx. 26° to 30° Celsius), dry, with clear skies (0-10% cloud cover) and a light wind (<5m/s). These weather conditions were checked against and confirmed by the use of the Met Office mobile application

available on smart phone technology. These conditions were generally maintained throughout the whole survey period and are considered reasonable for undertaking environmental noise measurements.

- 3.7. The noise monitoring equipment used was calibrated before and after the noise survey period. No significant drift was recorded. Equipment calibration certificates can be provided upon request.

4. NOISE SURVEY RESULTS

4.1. The average-ambient and noise levels at the measurement position during the survey has been based on an analysis of the monitoring data and are summarised in Table 4.1. A full listing of the noise monitoring data recorded during the measurement survey is provided in Appendix B.

Monitoring Position	Period	Measured External Sound Pressure Level, dB
Position 1 (Front Façade)	Daytime (07:00 - 23:00)	46 dB $L_{Aeq,T}$
	Night-time (23:00 - 07:00)	43 dB $L_{Aeq,T}$
	Night-time (23:00 - 07:00)	*61 dB $L_{Amax,F}$
Position 2 (Rear Façade)	Daytime (07:00 - 23:00)	52 dB $L_{Aeq,T}$
	Night-time (23:00 - 07:00)	49 dB $L_{Aeq,T}$
	Night-time (23:00 - 07:00)	**60 dB $L_{Amax,F}$

*11th highest measured noise level

**10th highest measured noise level

Table 4.1 Noise Survey Results

4.2. BS 8233:2014 does not provide specific guidance on night time $L_{Amax,F}$ criteria therefore maximum levels are based on World Health Organisation 'Guideline for Community Noise' (2009) (WHO) guidance, BS8233:1999 guidance and ProPG:2017 guidance. It is stated that for suitable sleeping conditions, 45dB $L_{Amax,F}$ should not be exceeded by more than 10-15 times a night within a bedroom. For robustness, the $L_{Amax,F}$ noise levels presented above is the not normally exceeded (NNE) 10th and 11th highest measured between 23:00 and 07:00 hours. This $L_{Amax,F}$ noise level then needs to be reduced to 45dB internally to comply with the night time internal noise level.

5. NOISE EMISSION CRITERIA

5.1. Local Authority Requirements

5.2. BS8233: 2014

5.3. Local Authorities usually stipulate internal noise criteria for new build residential uses based on British Standard 8233:2014 'Guidance on Sound Insulation and Noise Reduction for Buildings'.

5.4. BS 8233:2014 provides references and guideline values for desirable indoor ambient noise levels for dwellings as shown in Table 5.1 below.

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

Table 5.1 BS 8233:2014 Desirable Internal Ambient Noise Levels for Dwellings

5.5. The table is noted to apply to external noise as it affects the internal acoustic environment from sources without a specific character. The above internal ambient noise levels are therefore considered appropriate within this assessment.

5.6. BS 8233:2014 states that 'for traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed an upper guideline value of 55dB L_{Aeq} , which would be acceptable in noisier environments. However, it is also recognized that these guideline values are not achievable in all circumstances...in higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited'.

5.7. BS4142: 2014

5.8. In relation to the noise produced by Argo Feeds Ltd, Argo Feeds is a commercial premises, such as vehicles moving and blowing of food from the truck into the silo feeds.

5.9. It is understood that Argo Feeds Ltd is typically operable during daytime (07:00 – 23:00 hours). To determine the potential impact the mill may have upon the proposed residential site, the

levels taken from the manual measurement with delivery in operation will be compared to the typical daytime background (with delivery not in operation). Therefore, the comparable criteria is a maximum rating noise level of 46dB $L_{A90, \text{daytime}}$ measured at the NSR.

5.10. BS 4142:2014 “Methods for Rating and Assessing Industrial and Commercial Sound” presents a method for assessing the significance and possible adverse impact due to an industrial or commercial noise source upon the proposed residential. A comparison has been made of the source noise levels and the background noise levels, both of which are measured or predicted at the proposed noise sensitive receiver.

5.11. The specific noise level due to the source is determined, with a series of corrections for tonality, impulsivity, intermittency or any other unusual characteristic. This can result in a maximum total correction of +21dB being added if the new noise source demonstrates all the above characteristics. The rating level is then compared to the background noise level and the significance of the new noise source likelihood of any adverse impact is determined in accordance with the following advice:

“The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs. 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. SITE SUITABILITY FOR RESIDENTIAL DEVELOPMENT

- 6.1. With appropriate sound insulation measures and building construction as exemplified within this report the proposed site is more than capable of achieving the recommended internal noise levels in the premises. The façade construction is proposed to be of brick and block. All major building elements should be tested in accordance with BS EN ISO 140-3:1995.
- 6.2. Sound reduction performance calculations have been undertaken to determine the internal noise levels and performance of the glazed and non-glazed elements as outlined in Table 7.1. The specification has been adopted to achieve the night-time level (23:00 – 07:00 hours) for bedrooms, 30dB $L_{Aeq, 8\text{hour}}$ and for the daytime (07:00 – 23:00) for living rooms, 35dB $L_{Aeq, 16\text{hour}}$. Values of the night-time period have been also applied to the calculated sound reduction index of the glazed element to confirm the limit of 45 $L_{Amax, F}$, is also achieved for single events during the night.
- 6.3. Suggested glazing units and building element specifications other than those provided below may be suitable but should be checked before purchase or installation. The analysis is provided to demonstrate that a design solution is feasible at the site for the purposes of meeting the requirements of the Local Authority.

Facade	Period	Measured External Sound Pressure Level, dB	Internal Sound Pressure Level Requirement, dB
Position 1 Front Façade	Daytime (07:00 – 23:00)	46 dB $L_{Aeq, T}$	35 dB $L_{Aeq, T}$
	Night time (23:00 – 07:00)	43 dB $L_{Aeq, T}$	30 dB $L_{Aeq, T}$
	Night time (23:00 – 07:00)	61 dB $L_{Amax, F}^*$	45 dB $L_{Amax, F}$
Position 2 Rear Façade	Daytime (07:00 – 23:00)	52 dB $L_{Aeq, T}$	35 dB $L_{Aeq, T}$
	Night time (23:00 – 07:00)	49 dB $L_{Aeq, T}$	30 dB $L_{Aeq, T}$
	Night time (23:00 – 07:00)	60 dB $L_{Amax, F}^{**}$	45 dB $L_{Amax, F}$

Table 6.1 Required Sound Insulation Performance

*11th highest measured noise level **10th highest measured noise level

7. BUILDING FACADES SUITABILITY

7.1. Non-Glazed Elements

7.2. It is understood that the non-glazed elements of the building will be constructed from brick and block work and internally drylined. This construction would be anticipated to provide a sound reduction performance of at least the figures shown in Table 7.1 when tested in accordance with BS EN ISO, 140-3:1995.

Element	Octave band centre frequency SRI, dB					
	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz
Non-glazed element brick/block cavity wall SRI	41	43	48	50	55	55

Table 7.1 Non-glazed elements assumed sound reduction performance

7.3. The below example of construction provides guidance to a typical wall build which should attenuate external noise such that the internal noise levels are achieved.

- BS 8233 Table E.1A (50-54dB R_w sound insulation) (d) details construction of “Brick laid frogs up, wall nominal 200 mm thickness, weight (including plaster) not less than 380 kg/m². Plaster or dry-lined finish both sides. Brickwork joints well filled”.

7.4. Given the typical extensive build and construction of external walls in accordance with the Building Regulations it is predicted that this element would provide significant attenuation to achieve the internal noise levels.

7.5. Roofs

7.6. Roofs generally have a lower SRI than masonry façade walls but they are required to reduce noise from external sources. Typical construction and sound insulation values of roofs can be gained from BS 8233:2014, for example a traditional pitched roof with tiles on felt with 100mm mineral wool on plasterboard ceiling has an SRI of approximately 43dB R_w . It is predicted that the build of the roofs is likely to achieve and exceed this value of 43dB R_w and that these elements would provide significant attenuation to achieve the internal noise levels.

7.7. Given the typical extensive build and construction of roofs it is predicted that these elements would provide significant attenuation to achieve the internal noise levels.

7.8. Glazed Elements

7.9. Calculations (Appendix C) show that based on monitoring data, façade materials, room sizes and volumes, a minimum of 31dB R_w noise reduction is required for all glazed elements to be installed. The performance is specified for the whole window unit, including the frame and other design features such as the inclusion of trickle vents. Sole glass performance data would not demonstrate compliance with this specification. Glazing performance calculations have been based on the measured L_{Aeq} noise levels as recommended by BS 8233:2014.

7.10. Typical thermal double-glazing required by the Building Regulations provide approximately 31dB R_w sound insulation therefore this glazing specification would ensure that the internal noise levels are achieved. These specifications and their acoustic data on octave band frequencies are provided in Appendix C.

7.11. The glazing requirements are listed below in table 6.3. These specifications and their acoustic data on octave band frequencies are provided in Appendix C.

Glazing Type	Required Overall Sound Reduction Performance, R_w	Glazing and Ventilation Type – Indicative Only
Front Façade*	31 dB	R_w 31 dB Double Glazing System (4mm Glass – 12mm air gap – 4mm Glass)
		Standard Trickle Ventilator (23 $D_{n,e,w}$)
Rear Façade*	31 dB	R_w 31 dB Double Glazing System (4mm Glass – 12mm air gap – 4mm Glass)
		Standard Trickle Ventilator (23 $D_{n,e,w}$)

*based on approximate room sizes

Table 6.3 Required Glazing specifications.

7.12. Ventilation

7.13. In addition to the glazing requirements, internal noise levels should be considered in the context of room ventilation requirements. At the time of writing, full details regarding a ventilation strategy are not available. Table 6.3 details a suitable standard trickle ventilator, which provides a sound insulation performance of 23dB $D_{n,e,w}$, which would work in combination with the specified glazing spectral.

Element	Octave band centre frequency SRI, dB					
	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz
Standard Trickle Vent 23dB $D_{n,e,w}$	29	22	32	30	29	23

Table 6.4 Trickle ventilation minimum sound insulation performance

8. EXTERNAL AMENITY SUITABILITY

- 8.1. The recently released ProPG Planning and Noise Guidance, published 2017, states that: *“If external amenity spaces are an intrinsic part of the overall design, the acoustic environment of those spaces should be considered so that they can be enjoyed as intended”*.
- 8.2. Noise monitoring data confirms that the external amenity areas achieve BS8233:2014 and WHO (1999) guidance levels, therefore no mitigation levels are required. Should a further reduction be desired, then a basic standard fence will achieve a sound reduction of around 5dB(A), a good standard fence design will achieve around 10dB(A) noise reduction. Enabling external areas to achieve BS8233:2014 and WHO (1999) guidance levels.

9. NOISE IMPACT CALCULATIONS

9.1. The proposed site lies within the jurisdiction of the Local Authority, Barnsley Metropolitan Borough Council. An acoustic report is required to support a planning application as stipulated below:

“In addition the Environmental Health Officer has requested a noise impact assessment to be carried out as part of any application received. This is because the site is close to ARGO Feeds Ltd and we have received a number of recent complaints about noise arising from this site and would want to ensure any future occupants are not exposed to detrimental noise levels.”

9.2. A conversation with the Environmental Health Officer, Mr James Gardhan, explained that noise complaints had previously been received regarding Argo Feeds Ltd, when the trucks blow the feed into the silo. It is understood that this typically occurs on Monday, Tuesday and Thursday mornings. A manual measurement was undertaken on the Monday morning and a site visit on Tuesday and Wednesday mornings to witness the noise source. The EHO requested a noise impact assessment to be carried out as part of any application received.

9.3. The recently released ProPG Planning and Noise Guidance, published 2017, states that: *“If external amenity spaces are an intrinsic part of the overall design, the acoustic environment of those spaces should be considered so that they can be enjoyed as intended”*.

9.4. BS4142: 2014 can be used for the purpose of assessing sound at proposed new dwellings or premises used for residential purposes

9.5. Manual Measurement Results

9.6. Table 9.1 illustrates the noise survey results of the manual measurements, showing the typical background levels for the time measured.

	Ambient Noise Level L_{Aeq} , 1min	Typical Background Noise Level $L_{A90,5min}$
MM1 (09:50-13:15)	51 dB(A)	49dB(A)

Table 9.1 Noise Survey Results

9.7. Between 10:25-11:08 the food material could be heard moving, which caused a dominant fan like sound. This can be seen in MM1 as dominating the background. This time frame has been utilised to determine the potential impact on the proposed residential. Table 9.2 shows the ambient, background, residual and specific levels calculated from this section of the manual measurement.

Ambient Noise Level L_{Aeq}, 1min	Typical Background Noise Level L_{A90}, 5min	Residual Level	Specific Level
56dB (A)	46 dB(A)	46 dB(A)	56 dB(A)

Table 9.2 MM levels of food being blown.

- 9.8. During the manual measurement undertaken between on the Monday July 2018, the noise from Argo Feeds was audible. The most dominant noise was caused by the moving of material off the trucks into the silo's. The occasional reversing beepers of forklift trucks and Lorries could also be heard. Apart from the feed delivery/movement, the noise emitting from Argo feeds was noted to be limited. Road traffic noise was also heard from the nearby network, along with residential activity and construction from a nearby house extension. A site visit was also undertaken between 9:30-12:30 on Tuesday July 2018. A similar noise climate was heard during this visit.
- 9.9. It is understood that the delivery of the feed lasts for approximately 40minutes within a day. The exposure level of this operation has therefore been calculated over the 16hour day.
- 9.10. A 'penalty' addition has been added to the noise source for intermittency and tonality as the operation is considered to be such that it could attract attention at the NSR. A penalty addition has not been applied for impulsivity or any other unusual characteristics.
- 9.11. Calculations can be seen in Appendix D of the predicted impact Argo Feeds Ltd could have upon the proposed residential receiver.
- 9.12. **Potential Impact**
- 9.13. Detailed calculations to predict the noise level from the nearby Argo Feeds Ltd at 1metre from the proposed site location are provided in Appendix D. The rating noise level at 1m from the NSR is 53dB and 7dB(A) above the assessed background noise level (46dB LA90,T). In accordance with BS 4142:2014 guidance, the rating noise "is an indication of the specific sound source having an adverse (but not significantly adverse) impact". The predicted noise level at the external amenity of the proposed residential dwellings are below the WHO noise criteria for external amenity.
- 9.14. British Standard 8233:2014 '*Sound insulation and noise reduction for buildings – Code of Practice*' gives recommendations for acceptable internal noise levels in residential properties.

Assuming worst case conditions, of the closest window being for a bedroom, BS8233:2014 recommends 35B(A) as being acceptable internal resting/sleeping conditions during daytime. According to BS8233:2014, the façade of a residential dwelling; with a window partially open for ventilation offers 15 dB attenuation. Therefore, taking into account this reduction for a partially open window the internal noise level with the source(s) operating would be 33dB (A) which is lower than the acceptable internal noise level as seen under BS8233: 2014; and significantly lower than the background. Therefore, complaints are extremely unlikely.

10. CONCLUSION

- 10.1. A new residential development is proposed at 50 Don Street, Penistone, Sheffield, Yorkshire S36 6HA.
- 10.2. A noise survey and assessment has been undertaken for the proposed development. Existing noise levels at the site have been measured and compared to relevant standards and guidance.
- 10.3. In accordance with BS 4142:2014 guidance, the rating noise “is an indication of the specific sound source having an adverse, but not significant adverse impact”. The lower the rating level is relative to the measured background level, the less likely it is that the specific sound source will have an adverse impact.
- 10.4. A minimum of 31dB R_w noise reduction is required for all glazed elements to be installed into the proposed building. Glazing calculations have been carried out and the requirements identified. Example specifications are provided. Passive vents to provide ventilation are available that meet or exceed the sound reduction required by the glazing elements and can be constructed into the proposal accordingly.
- 10.5. With appropriate sound insulation glazing measures and building construction as exemplified within this report the proposed residential premises is more than capable of achieving the guideline internal noise criteria contained in BS 8233:2014.

Appendix A – Site Plan 1 (SP1)



- Key:
- Noise Monitoring Position ●
 - Manual Noise Measurement ●
 - Location of Noise Source →
 - Site Boundary []

Appendix A – Site Plan 2 (SP2)

Proposed plan - Architectural Drawings

Date: Apr 18

Notes:

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Revision List:

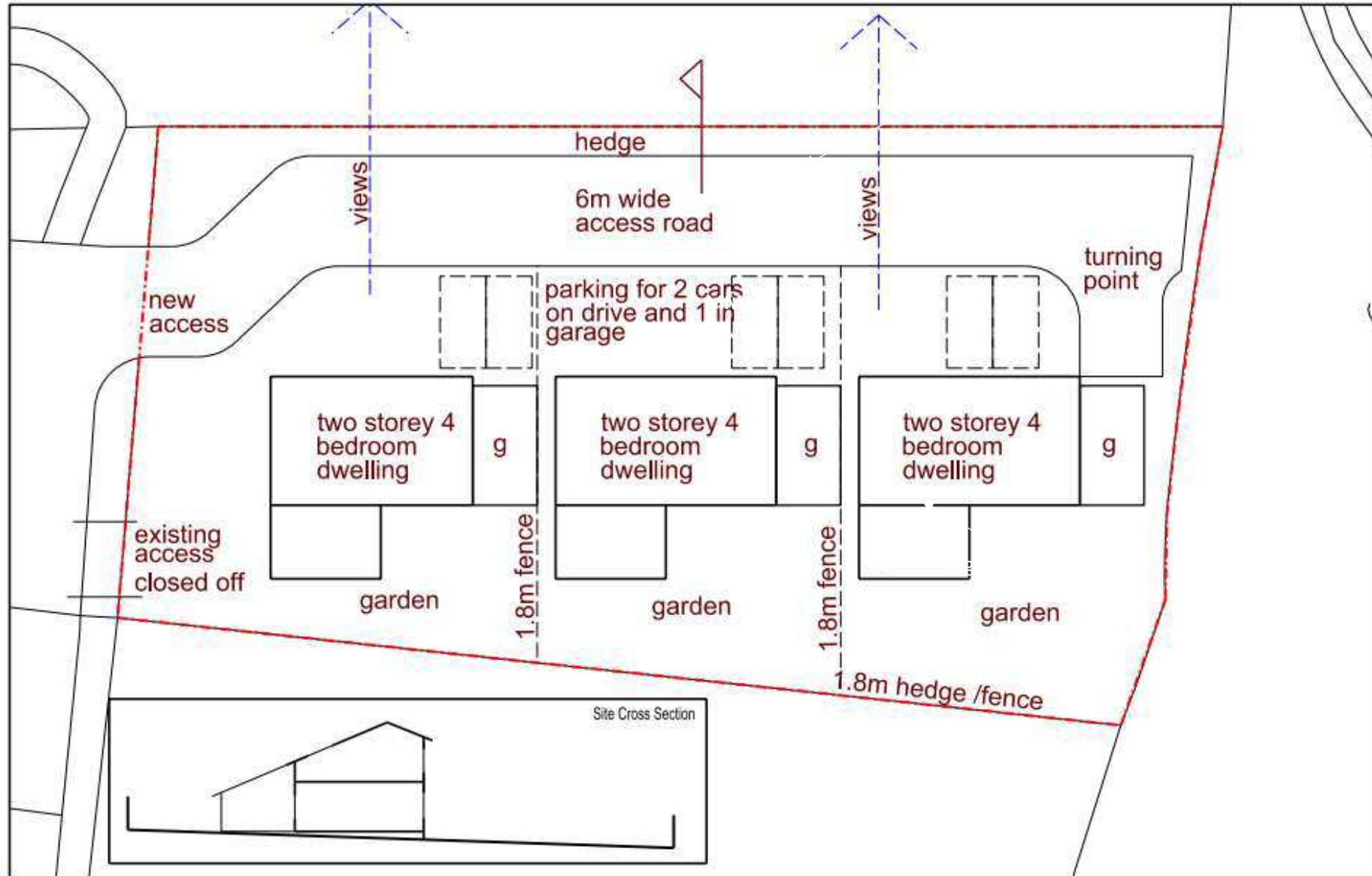
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Project/ Client: 50 Don Street

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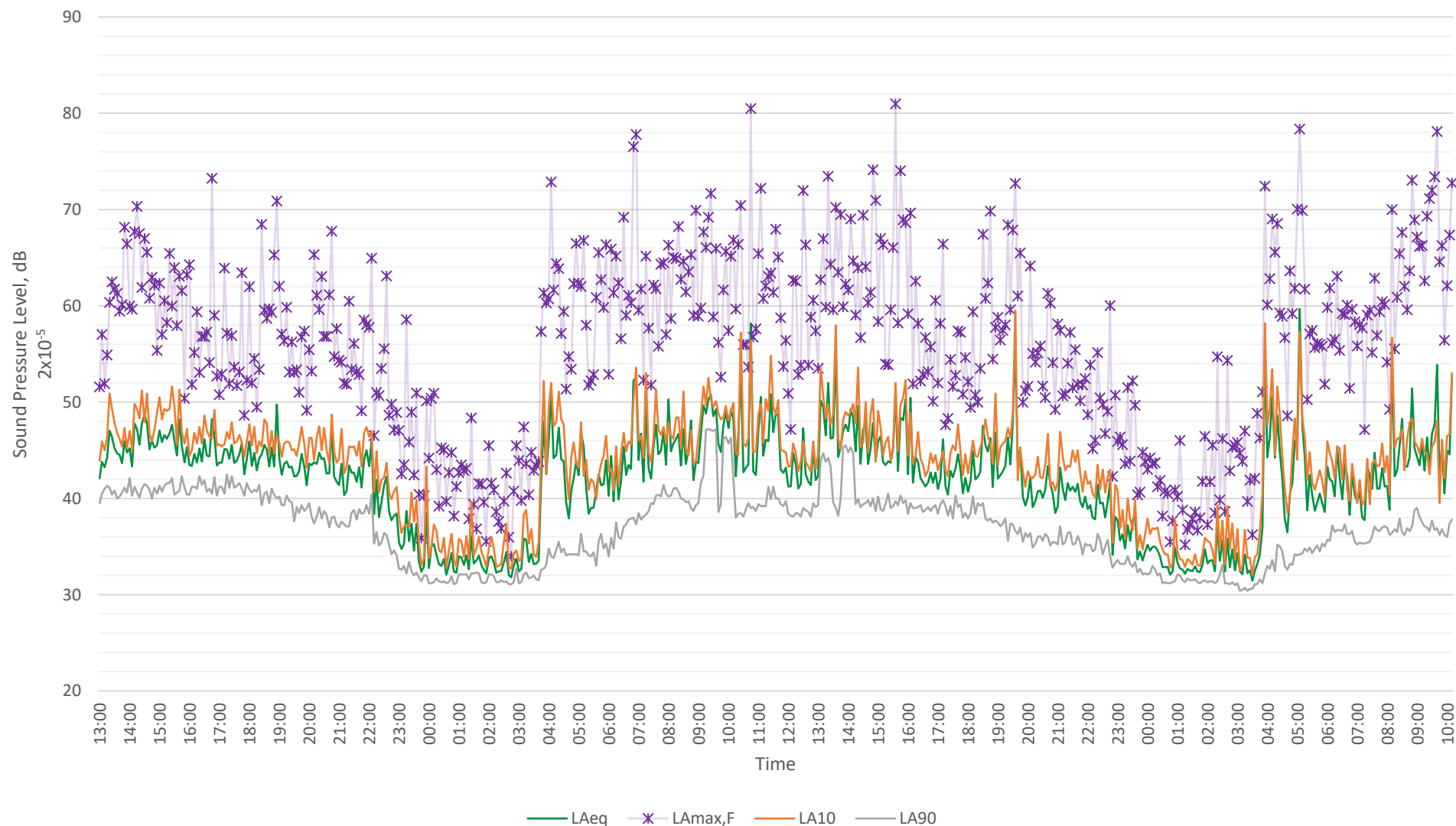
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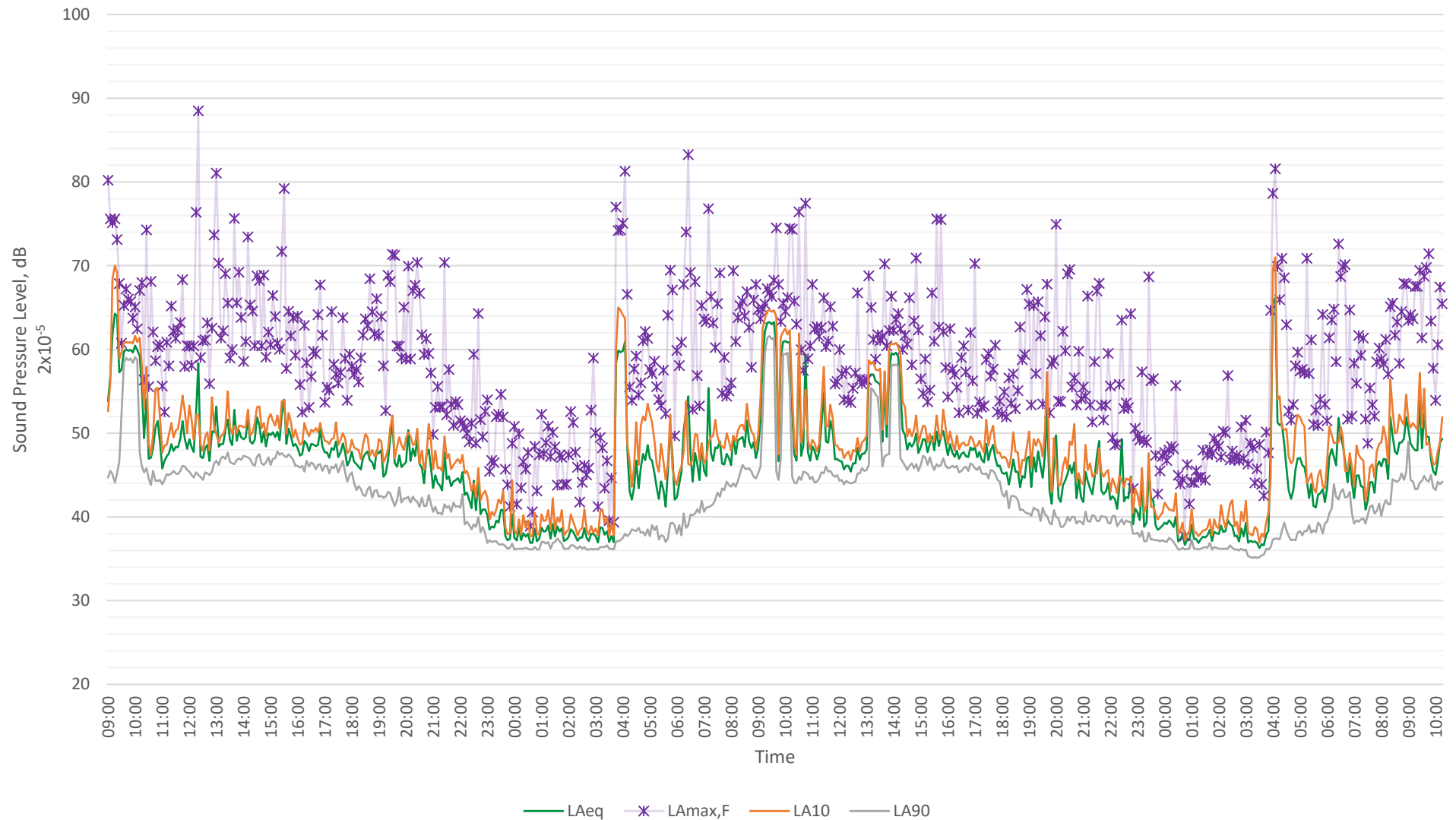
Appendix B - Time History 1 (TH1)

50 Don Street, Springvale, Penistone
Monday 2 July 2018 - Wednesday 4 July 2018
Position 1



Appendix B - Time History 2 (TH2)

50 Don Street, Springvale, Penistone
Monday 2 July 2018 - Wednesday 4 July 2018
Position 2



50 Don Street, Penistone Position 2

BS EN 12354-3 Calculation to determine glazing specification

Habitable room data variables

Type of habitable room	Bedroom
Volume	32 cubic metres
Total area - external façade(s)	11 square metres
Total area - window(s)	3 square metres
L(k)	3
Lmax (K)	3
Trickle Ventilator(s)	5
Solid Façade (exc. windows)	8 square metres
Reverberation Time	0.5 seconds

**Based on approximate measured room sizes*

External noise level

	1:1 Octave Bands Centre Frequency (Hz)							dB(A)
	63	125	250	500	1000	2000	4000	
Logged Log average daytime Leq	57	56	50	49	48	44	42	53
Logged Log average night-time Leq	44	42	38	38	36	46	44	49
Logged Lmax for duration of survey	46	45	44	47	42	56	56	60

Sound reduction of building fabric

	1:1 Octave Band Centre Frequency (Hz)							Rw / Dn,e,W
	63	125	250	500	1000	2000	4000	
31 Rw - Pilk 4/12/4mm	22	24	20	25	35	38	35	31
**Standard Masonry from Template R	39	41	43	48	50	55	55	
23 Dn,e,w - Airflow FB600 Hit & Miss 24000 open - Standard trickle	27	29	22	32	30	29	23	23

	1:1 Octave Band Centre Frequency (Hz)						
	63	125	250	500	1000	2000	4000
Reduction from façade	-22.4	-24.4	-19.1	-26.0	-29.2	-29.1	-23.4
Addition for Ctr	5.0	5.0	5.0	5.0	5.0	5.0	5.0

Resultant internal noise level

	1:1 Octave Band Centre Frequency (Hz)							dB(A)
	63	125	250	500	1000	2000	4000	
Daytime internal Leq	39	37	35	28	24	20	23	32
Night-time internal Leq	27	22	24	17	12	21	25	28
Night-time internal Lmax	24	21	25	21	13	27	33	35

Based on BS8233:2014 - Design Criterion: LAeq 30
Based on BS8233: 1999 Lmax levels LAmx 45

50 Don Street, Penistone Position 1

BS EN 12354-3 Calculation to determine glazing specification

Habitable room data variables

Type of habitable room	Bedroom
Volume	32 cubic metres
Total area - external façade(s)	11 square metres
Total area - window(s)	3 square metres
L(k)	3
Lmax (K)	3
Trickle Ventilator(s)	5
Solid Façade (exc. windows)	8 square metres
Reverberation Time	0.5 seconds

**Based on approximate measured room sizes*

External noise level

	1:1 Octave Bands Centre Frequency (Hz)							dB(A)
	63	125	250	500	1000	2000	4000	
Logged Log average daytime Leq	51	50	45	41	41	37	36	46
Logged Log average night-time Leq	42	39	36	34	34	38	36	43
Logged Lmax for duration of survey	59	54	50	50	54	58	57	63

Sound reduction of building fabric

	1:1 Octave Band Centre Frequency (Hz)							Rw / Dn,e,W
	63	125	250	500	1000	2000	4000	
31 Rw - Pilk 4/12/4mm	22	24	20	25	35	38	35	31
**Standard Masonry from Template R	39	41	43	48	50	55	55	
23 Dn,e,w - Airflow FB600 Hit & Miss 24000 open - Standard trickle	27	29	22	32	30	29	23	23

	1:1 Octave Band Centre Frequency (Hz)						
	63	125	250	500	1000	2000	4000
Reduction from façade	-22.4	-24.4	-19.1	-26.0	-29.2	-29.1	-23.4
Addition for Ctr	5.0	5.0	5.0	5.0	5.0	5.0	5.0

Resultant internal noise level

	1:1 Octave Band Centre Frequency (Hz)							dB(A)
	63	125	250	500	1000	2000	4000	
Daytime internal Leq	34	30	31	20	17	13	18	26
Night-time internal Leq	25	19	22	13	10	14	18	22
Night-time internal Lmax	37	29	31	24	25	29	34	37

Based on BS8233:2014 - Design Criterion: LAeq 30
Based on BS8233: 1999 Lmax levels LAmx 45

Appendix D - Acoustic Calculations

Noise Sensitive Receiver 1

Source: 1x Argo Feeds Ltd

	dB(A)
Background Level	46
Specific Sound Pressure Level	56
LEPd, 16 hour day*	48
BS412 Penalty for Intermittancy	3
BS4142 Penalty for tonality	2
Calculated level at Receiver 1	53

**Laeq, activities of events of time on and off, (delivery approx 40min in 16 hour day).*

Noise Background	46
Calculated noise level	53
BS4142	Indication of an adverse impact

BS8233: Internal Day Time Levels

	dB(A)
Calculated level at NSR	48
Partially Open Window Attenuation	-15
Calculated level in Internal Receiver	33

Appendix E - Manual Measurement 1 (MM1)

50 Don Street, Springvale, Penistone,
Monday 2 July 2017
Position 3 (MM1)

