

Environmental Noise Survey & Assessment

Prepared: 10th September 2018

Report No	16991-1-R2
Client	Rowlinson Construction
Site	Bowes Street Moss Side Manchester

1. Executive Summary

1.1.1. An environmental noise assessment has been carried out for a proposed residential development at Bowes Street, Moss Side. This report considers any relevant criteria to assess the impact of environmental noise on the development.

1.2. Measurement, assessment and evaluation

1.2.1. The survey was conducted to BS7445-1:2003¹ and BS7445-2:1991² which are covered under our UKAS Accreditation.

The interpretation of the data and the specification of suitable mitigation or treatment is outside the scope of our UKAS accreditation but is covered in our 17025 Quality Management System and reporting procedure.



1.3. Notes on revisions

Revision 1 (R1) dated 2nd November 2016

1.3.1. An updated layout has been integrated into the report. The new layout has resulted in slight changes in the required facade sound insulation. Additional National Planning Practice Guidance has also been included.

Revision 2 (R2) dated 10th September 2018

1.3.2. The glazing mark-up plan and glazing specifications have been amended to reflect the plans included in revision 1.

¹ BS7445-1:2003 "Description and measurement of environmental noise – Part 1: "Description of quantities and procedures"

² BS7445-2:1991 "Guide to the acquisition of data pertinent to land use"

2. Limitations

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4. Scope

- 4.1.1. This report covers all aspects of the assessment, including:
- An objective sound pressure level survey of the existing site
 - Analysis of data
 - Prediction of the internal sound pressure levels in internal areas
 - The design of any mitigation to meet the required internal noise criteria

5. Introduction

5.1. Proposed development

- 5.1.1. Rowlinson Construction is proposing a residential development at Bowes Street, Moss Side.
- 5.1.2. An image showing the proposed location and layout of the development is given in Figure 1.



Figure 1 - Plan showing the location of the proposed development

5.2. Noise climate

- 5.2.1. The noise climate on site was dominated by continuous road traffic noise from the A5103 Princess Road. The other roads surrounding the site were significantly quieter, residential roads.

6. Assessment criteria

6.1. National Planning Policy Framework

- 6.1.1. The National Planning Policy Framework (NPPF) was published in March 2012 and sets out the Government's planning policies for England and how these are expected to be applied. The framework states that the planning system should contribute to and enhance the natural and local environment by:

“preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability”.

- 6.1.2. The express inclusion of noise in the NPPF means that it is a material planning consideration for local planning decisions. It replaces the now revoked Planning Policy Guidance (PPG) Note 24. Paragraph 123 of the NPPF document states that planning policies and decisions should aim to:

- A. Avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;
- B. 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;
- C. 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
- D. 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.

6.2. Noise Policy Statement for England

- 6.2.1. The Noise Policy Statement for England (NPSE), published in March 2010, states the long-term vision of Government noise policy is to *“promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development”.*

- 6.2.2. This long-term vision is supported by the following aims; through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- Avoid significant adverse impacts on health and quality of life;
- Mitigate and minimise adverse impacts on health and quality of life;
- Where possible, contribute to the improvement of health and quality of life.

- 6.2.3. The intention is that the NPSE should apply to all types of noise apart from noise in the workplace (occupational noise).

6.3. National Planning Practice Guidance

- 6.3.1. The National Planning Practice Guidance (PPG) is a web-based resource, launched by the Department for Communities and Local Government (DCLG) in March 2014 to support the NPPF and make it more accessible.³
- 6.3.2. It advises on how planning can manage potential noise impacts in new development. The guidance is regularly reviewed and updated and noise is listed as a specific category. The guidance is for ad hoc developments, as major infrastructure is covered by overarching National Policy Statements.
- 6.3.3. A summary of the effects of noise exposure (in terms of health and quality of life) associated with both noise generating developments and noise sensitive developments is presented within the PPG and reproduced in Table 1.

³ <http://www.planningguidance.planningportal.gov.uk>

Perception	Examples of outcomes	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 (NOAEL)	No specific measures required
Lowest Observed Adverse Effect Level (LOAEL)			
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 (SOAEL)			
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 intrusive	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

Table 1 – Noise exposure hierarchy

6.4. Local planning authority (LPA) criteria

6.4.1. The LPA has published guidance for developers on noise affecting their developments.⁴ Manchester City Council has adopted the following internal noise limits for residential properties:

- Bedrooms (night time - 23.00 - 07.00) 30dB L_{Aeq} (individual noise events should not normally exceed 45 dB $L_{Amax,F}$ by more than 15 times)
- Living Rooms (daytime - 07.00 - 23.00) 35dB L_{Aeq}
- Gardens and terraces (daytime) 55 dB L_{Aeq}

⁴ Planning and Noise, Technical Guidance, December 2015, Manchester City Council

7. Survey

7.1. Measurement Locations

- 7.1.1. Fixed position monitoring took place at two locations to account for the likely dominant noise sources, i.e. the road traffic.
- 7.1.2. Monitoring equipment was mounted approximately 1.5m from the ground and 3m from the next nearest reflecting surface. The monitoring positions are illustrated in Figure 2.

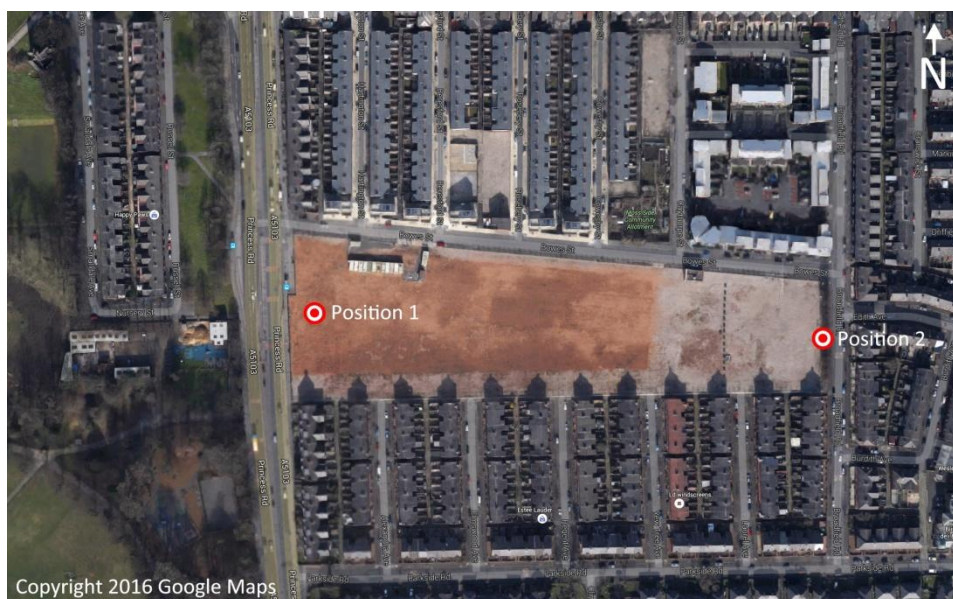


Figure 2 - Noise monitoring locations on site

7.2. Measurement instrumentation

- 7.2.1. The measurement instrumentation used during the survey is detailed in the appendix.
- 7.2.2. The acoustic equipment was calibrated to comply with Section 4.2 of BS7445-1:2003⁵ before and after the surveys. The calibration details are also detailed in the appendix.

⁵ B7445-1:2003 "Description and measurement of environmental noise – Part 1: Guide to quantities and procedures"

7.3. Measurement and timescale

7.3.1. Unattended noise monitoring took place over a typical weekday period on Friday 10th June 2016. The following quantities were measured:

$$L_{Aeq,5min}, L_{AFMAX,5min}$$

7.3.2. Sound pressure measurements were subsequently averaged into hourly, daytime and night-time periods.

7.3.3. The acoustic measurements and their interpretation shall be in accordance with BS 7445: Parts 1, and 2⁶. All sound pressure levels are in dB (referenced to 20µPa).

7.4. Meteorology

7.4.1. During the survey the weather information was noted. This is summarised in Table 2.

	Friday 10 th June 2016
Roads (Wet/Dry)	Dry
Wind Speed (ms ⁻¹)	2 S

Table 2 - Meteorological data noted during the survey

⁶ BS7445-2:1991 "Guide to the acquisition of data pertinent to land use"

8. Results

8.1. External measurements summary

8.1.1. The fixed position external measurement results are summarised in Table 3.

8.1.2. A bus stop is located on the A5103 Princess Road immediately in front of the proposed residential development; therefore, there is likely to be regular individual noise events. The 15th highest $L_{AFMAX,5min}$ sound pressure level at position 1 has been reported in line with the LPA guidance

Measurement Location	Sound Pressure Level, dB		
	0700-2300, $L_{Aeq,16hr}$	2300-0700, $L_{Aeq,8hr}$	2300-0700, L_{AFMAX}
1	62.5	60.6	76.9
2	54.6	52.6	

Table 3 - Summary of the external sound pressure levels measured

8.2. 3D noise model

8.2.1. The monitoring equipment was located 1.5m from the ground inside the site boundary, this may not be a representative sound pressure level across the development. SoundPLANTM has been used to model the situation using the CRTN calculation procedure. The measurement data has been used to calibrate the road sources affecting the development, these include:

- A5103 Princess Road
- Bowes Street
- Broadfield Road

8.2.2. Other, less influential local roads have not been included in the model.

8.2.3. The free-field sound pressure levels at each level of three key buildings have been summarised in Table 4. The difference between the modelled results and measurement results has been treated as an insertion loss to determine the L_{AFMAX} level at facades over looking A5103 Princess Road. Noise contour plots can be found in the appendix with the maximum sound pressure level (regardless of height) identified for each building facade that has been considered. Note that the levels reported in the contour plots are facade levels and are, therefore, 3dB higher than the levels in Table 4.

Assessment Location	Sound Pressure Level, dB		
	0700-2300, $L_{Aeq,16hr}$	2300-0700, $L_{Aeq,8hr}$	2300-0700, L_{AFMAX}
A5103	66.4	64.5	80.8
Bowes Street	57.2	51.0	
Broadfield Road	54.9	50.4	

Table 4 – Summary of external sound pressure levels predicted using the 3D noise model

9. Mitigation

9.1. Method

- 9.1.1. Based on the measurement data, the simple calculation method from BS8233:2014 has been used to determine the necessary sound reduction to meet the target criteria. Standard forms of construction are assumed such that the glazing is likely to be the lowest performing facade element.

9.2. Required mitigation

- 9.2.1. The single figure glazing performance requirements in order to achieve the internal design criteria are summarised in Table 5.

Assessment Location	Facade Sound Insulation, dB	
	Living Rooms	Bedrooms
A5103	32dB $R_w + C_{tr}$	36dB $R_w + C_{tr}$
Bowes Street	23dB $R_w + C_{tr}$	21dB $R_w + C_{tr}$
Broadfield Road	20dB $R_w + C_{tr}$	21dB $R_w + C_{tr}$

Table 5 - Required facade sound reduction provided by glazing

9.3. Glazing and ventilator specifications

- 9.3.1. The glazing and ventilator performance has been specified based on the performance data provided by Saint-Gobain and Greenwood Airvac. These are suggested configurations and any other glazing and vent combination can be used provided it achieves the minimum performance levels given in Table 5.
- 9.3.2. The recommended glazing specification is given in Table 6.

Building area	Recommended glazing configuration
Facades overlooking A5103 Princess Road	
Living Rooms	Saint-Gobain 4(10)10
Bedrooms	Saint-Gobain 6(27)10
All other facades	
Living Rooms	Saint-Gobain 4(12)4
Bedrooms	Saint-Gobain 4(12)4

Table 6 - Our recommended glazing configurations

- 9.3.3. Our recommended ventilator configurations, calculated to work in conjunction with the above glazing specifications, are summarised in Table 7. It should be checked by a suitably qualified person that this ventilator specification meets the requirements of Approved Document F.⁷

⁷ Approved Document F: Means of Ventilation (2010 Edition)

Building area	Recommended ventilator specification
Facades overlooking A5103 Princess Road	
Living Rooms	1x Greenwood 5000EA+AC2
Bedrooms	1x Greenwood 2500EA+AC2
All other facades	
Living Rooms	1x Greenwood 5000EA
Bedrooms	1x Greenwood 5000EA

Table 7 – Our recommended ventilator specification

- 9.3.4. Given the assumptions in this method the information in this section should be treated as general guidance only. The acoustic performance of third party products cannot be guaranteed by noise.co.uk.

9.4. Gardens and amenity areas

- 9.4.1. The noise contour plots in the appendix illustrate that the gardens of the proposed development are likely to have at least some areas that are equal to or less than 55dB $L_{Aeq,T}$ during the daytime. This is largely by virtue of the new buildings fronting the A5103 Princess Road providing a screen for the noise from the dominant noise source.

10. Conclusions

- 10.1.1. An environmental noise assessment has been carried out on a proposed residential development at Bowes Street, Moss Side to assess the potential impact of existing noise sources.
- 10.1.2. Table 5 in section 9.2 gives the required facade sound reduction by any glazing and ventilator combination to be compliant with the internal noise criteria from BS8233:2014. We have provided suggested glazing and ventilator configurations that would satisfy these requirements.
- 10.1.3. We strongly recommend that this report be passed to the LPA for approval before any works are carried out.

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Appendix

APPENDIX A: Summary Information

Required ISO Test Report Information (cross referenced where required)			
		Measurements carried out to:	Analysed to:
A	Standards	BS 7445-1: 2003 BS 7445-2: 1991	BS 8233:2014
B	Organisation performed the measurements	noise.co.uk Ltd, The Haybarn, Newnham Grounds, Kings Newnham Lane, Bretford, Coventry, CV23 0JU.	
C	Name of Client	Rowlinson Construction	
D	Full site address	Bowes Street, Moss Side	
E	Date of surveys	Survey Date: 10 th June 2016	
F	Description & identification of proposed development	It is proposed to develop the site for residential use.	
G	Brief Description of details of Procedure & equipment	See Section 7 of this report.	

APPENDIX B: Technical appendix

10.1.4. Measurements were made using the following equipment:

Monitoring Position	Sound Level Meter (Serial Number)	Calibrator (Serial Number)
1	Norsonic 118 (31477)	Norsonic 1251 (31013)
2	Norsonic 140 (1405558)	Norsonic 1251(33826)

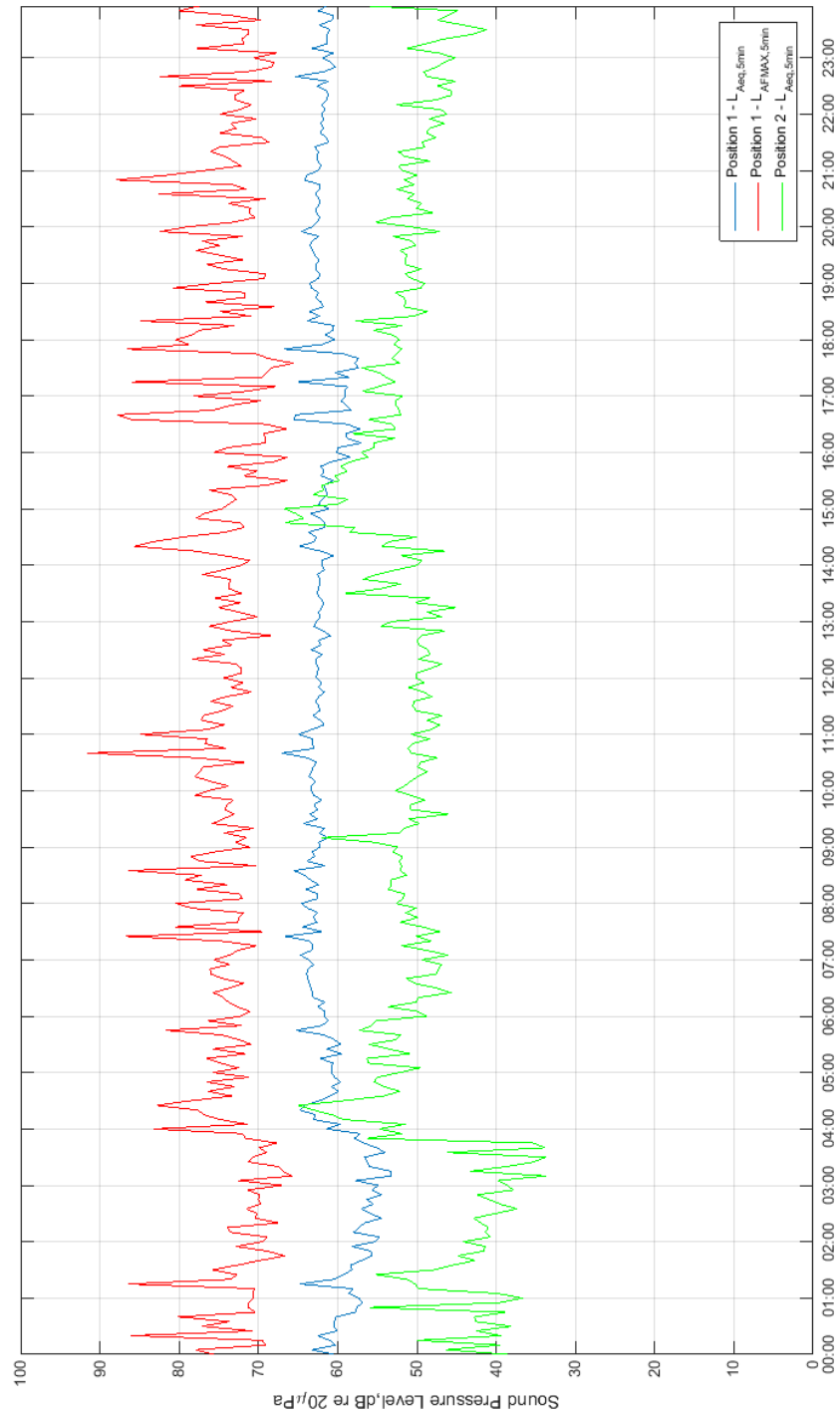
10.1.5. The equipment has traceable calibration.

10.1.6. The sound level meter was calibrated immediately prior to and immediately after the measurements were carried out.

Sound Level Meter	Before	After
Norsonic 118 (31477)	114.0 dB	114.0 dB
Norsonic 140 (1405558)	114.0 dB	114.0 dB

10.1.7. There was no adverse deviation.

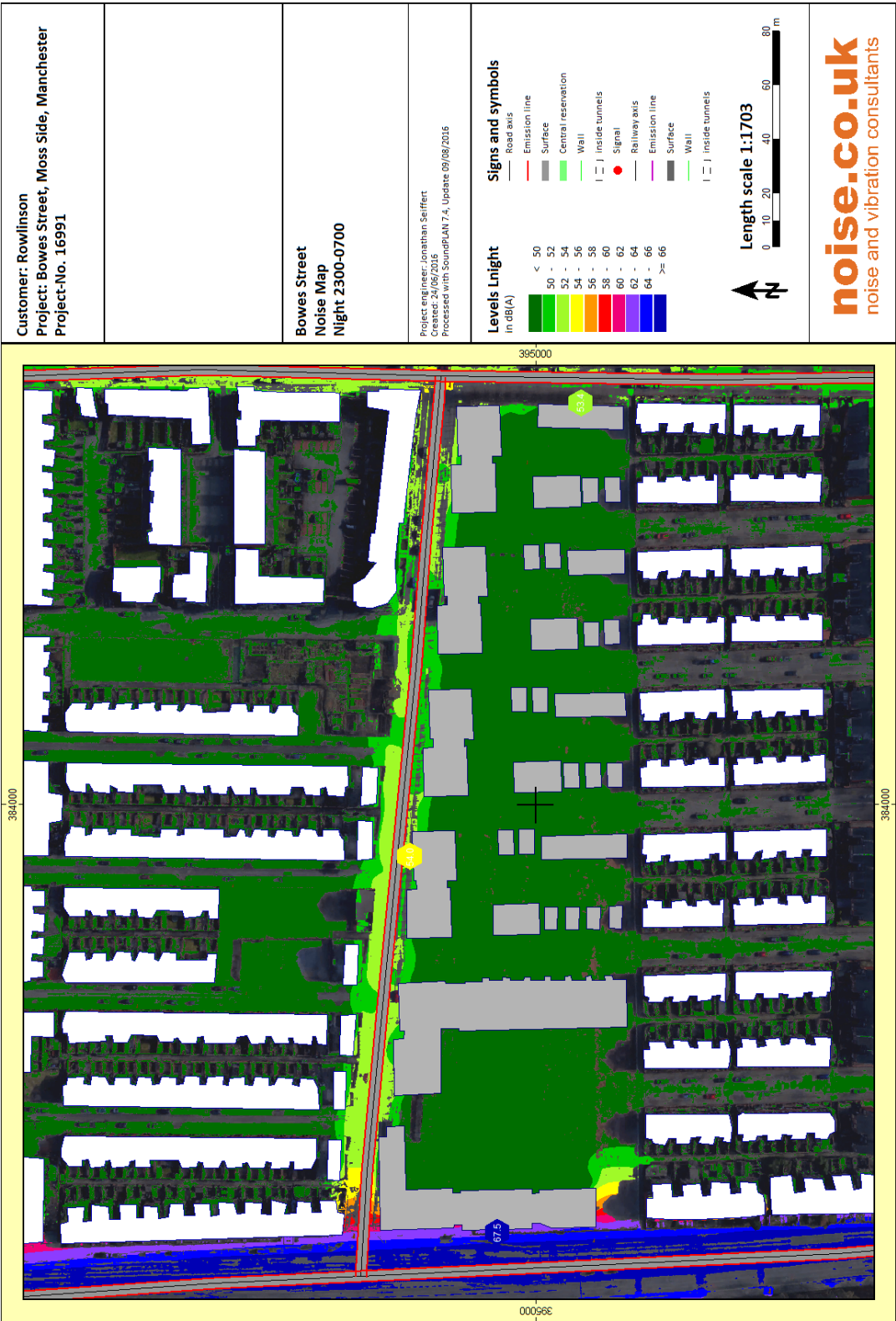
APPENDIX C: Recorded raw data



APPENDIX D: Average hourly levels

Date	Time (Hour Starting)	Sound Pressure Level, dB L _{Aeq,1-hour} re 20µPa	
		Position 1	Position 2
10/06/16	00:00	60.4	47.3
10/06/16	01:00	59.3	48.5
10/06/16	02:00	56.1	41.2
10/06/16	03:00	56.0	47.5
10/06/16	04:00	62.0	59.1
10/06/16	05:00	61.6	54.5
10/06/16	06:00	63.0	49.6
10/06/16	07:00	63.8	49.9
10/06/16	08:00	63.5	52.4
10/06/16	09:00	62.6	54.1
10/06/16	10:00	63.7	50.3
10/06/16	11:00	62.7	49.4
10/06/16	12:00	62.4	49.9
10/06/16	13:00	62.3	53.6
10/06/16	14:00	62.6	60.3
10/06/16	15:00	61.4	61.3
10/06/16	16:00	60.9	54.7
10/06/16	17:00	61.3	54.1
10/06/16	18:00	62.2	52.9
10/06/16	19:00	63.0	50.9
10/06/16	20:00	62.8	51.5
10/06/16	21:00	62.2	50.0
10/06/16	22:00	62.0	48.0
10/06/16	23:00	61.6	48.9

APPENDIX E: Noise contour plots



APPENDIX F: Glazing mark-up plan



Building area	Recommended glazing configuration
Specification 1	
Living Rooms	Saint-Gobain 4(10)10
Bedrooms	Saint-Gobain 6(27)10
Specification 2	
Living Rooms	Saint-Gobain 4(12)4
Bedrooms	Saint-Gobain 4(12)4

Building area	Ventilator Specification
Specification 1	
Living Rooms	1x Greenwood 5000EA+AC2
Bedrooms	1x Greenwood 2500EA+AC2
Specification 2	
Living Rooms	Greenwood 5000EA
Bedrooms	Greenwood 5000EA