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**Residential Noise Survey**

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Chatburn  
Lancashire  
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Job Reference: 382AJ

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Date: 08/07/15

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**Quality Assurance**

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Date:	<b>08/07/15</b>
Document Reference:	<b>382AJ</b>

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## 1. Introduction

NOVA Acoustics Ltd has been commissioned by Mr A Jackson to provide a noise assessment to assess the suitability of the site Land near 9 Downham Road, Chatburn, BB7 4AU for the development of two new build dwellings in accordance with the National Planning Policy Framework published on 27<sup>th</sup> March 2012 (replacing Planning Policy 24).

This report presents the results of the environmental noise survey undertaken in order to measure the prevailing ambient noise levels and outlines any necessary mitigation measures.

## 2. Background

The proposed development shall be located on land behind 9 Downham Road, Chatburn BB7 4AU and will consist of two new build dwelling-houses. The development site is located in a small village with the surrounding properties being primarily residential.

To the north of the property runs Downham Road which has very light road traffic. To the west and east of the proposed site there are residential properties.

Along the south - south east perimeter of the proposed site runs the Ribble Valley railway line which only runs through the summer, starting on the 17/5/2015 to 6/9/2015. There is no further evidence that this line has regular passenger or freight trains. The affect of rail traffic on the local noise environment is low as there is only one train a week on a Sunday through the summer period.

The noise profile of the area is low, there are no dominant sources of noise within the area.

## 3. Legislation, Policy and Guidelines

### 3.1 NPPF (National Planning Policy Framework) and NPSE

The NPPF is the over-arching planning and policy document that applies to all new developments in England. The guidance and assessment criteria given (or referred to) in this document can therefore be applied to all standards in terms of assessing the suitability of granting planning permission with respect to noise impact.

The NPPF states that planning policies and decisions should aim to:

- Avoid noise giving rise to significant adverse impact on health and quality of life as a result of a new development;
- Mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from new developments, 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 placed upon 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.

With specific reference to noise impact, the NPPF document refers to the noise policy statement for England (NPSE). The NPSE provides guidance which enables decisions to be made regarding the acceptable noise burden to place on society, using three key phrases – the No Observed Effect Level (NOEL), the Lowest Observed Adverse Effect Level (LOAEL) and the Significant Observed Adverse Effect Level (SOAEL).

In order to provide a consistent frame of reference (and to allow a view to be taken on the suitability of the application with reference to the relevant planning guidance), the levels criteria given in other relevant documents used in assessment will be re-framed in terms of the following:

**NOEL:** The level of noise impact below which no effect can be detected, and there would be no discernible negative effect on health or quality of life.

**LOEL:** The lowest level of noise impact which adverse effect on health or quality of life can be detected. Designing noise impacts to be less than or equal to LOAEL should see that any adverse effects on health or quality of life are negligible.

**SOAEL:** The level above which significant adverse effect to health and quality of life occur. Designs should always seek to avoid a noise impact, which would be categorised as SOAEL.

### 3.2 BS 8233-2014 - Sound insulation and noise reduction for buildings code of practice

The BS8233-2014 "Sound insulation and noise reduction for buildings code of practice"; gives absolute noise limits for steady state anonymous noise (such as road traffic) inside residential properties. Table 3.2 outlines these target limits.

BS8233-2014 Target limits			
Activity	Location	07:00 – 23:00	23:00 – 07:00
Resting	Living Rooms	35dB LAeq,16Hour	-
Dining	Dining Room	40dB LAeq,16Hour	-
Sleeping	Bedroom	-	35dB LAeq,8Hour

Table 3.2

BS8233 also provides guidelines for noise levels in residential gardens. LAeq 50dB represents a desirable standard, with LAeq 55dB an upper limit. These guidelines are in keeping with "Guidelines for Community Noise" published by the World Health Organisation, 1999.

### 3.3 WHO Guidelines on Community Noise, 1999

This document provides useful criteria, which, together with BS 8233-2014 is widely used to assess the effect of nearby sound sources of different types, such as roads, motorways and

commercial premises on residential dwellings. In particular, the criterion for noise levels at external spaces of dwelling houses has been used. Table 3.3 outlines these target limits.

WHO 1999 Target limits		
Activity	Critical health effect	Noise Level
Outdoor Living	Serious annoyance, daytime and evening	55dB L <sub>Aeq,16Hour</sub>
	Moderate annoyance, daytime and evening	50dB L <sub>Aeq,16Hour</sub>
Dwelling Indoors	Speech intelligibility and moderate annoyance, daytime and evening	35dB L <sub>Aeq,16Hour</sub>

**Table 3.3**

#### 4. Environmental Noise Survey

##### 4.1. Objectives

The purpose of this report is to:

- Determine the existing noise climate at the proposed dwelling locations due to rail noise.
- Determine the existing noise climate at the external areas, i.e. the gardens of the dwellings.
- Detail the proposed attenuation/design necessary to protect the amenity of the occupants of the new residences (including ventilation).

##### 4.2. Measurement Procedure

A long term automated environmental measurement was undertaken at one position, at the rear of 9 Downham road 7m away from the Ribble Valley railway line, as shown in Appendix A. This location was chosen in order to collect data representative of the ambient noise levels and noise generated by rail traffic.

Continuous monitoring was undertaken for the duration of the survey from 09:04 on the 30<sup>th</sup> June 2015 to 06:42 on the 2nd July 2015.

The noise levels at the measurement position 1 were low and there were not any apparent noise sources. Weather conditions were generally dry with light winds and therefore suitable for the measurement of environmental noise. The measurement procedure generally complied with BS7445:1991 "Description and measurement of environmental noise, Part 2 - Acquisition of data pertinent to land use"

##### 4.3. Equipment

The equipment was calibrated before and after use and no abnormalities were observed.

The equipment used was as follows:

- Class 1 Svantek 977 Sound Level Meter
- Class 1 SV31 Calibrator

Traceable calibration certificates can be provided on request.

## 5. Results

### 5.1. Environmental Noise Survey

The  $L_{Aeq,t}$ ,  $L_{Amax,t}$ ,  $L_{A10,t}$  and  $L_{A90,t}$  acoustic parameters were measured through the duration of the survey. The measured noise levels are shown as a time history in Appendix B. A summary is presented in Table 5.1.

	$L_{Aeq,t}$	$L_{Amax,t}$	$L_{A10,t}$	$L_{A90,t}$
Day 1 (09:04 - 22:59)	50.1dB	85.9dB	48.6dB	39dB
Night 1 (23:00 - 06:42)	45.6dB	63.5dB	46.6dB	28.5dB

Table 5.1

The noise levels shown in table 5.1 indicate that the average noise levels are low and do not exceed typical values of residential areas. Provided adequate mitigation measures are implemented during the design and construction phase of the development the internal noise levels within BS8233:2014 and the Local Authority can be achieved. Outline mitigation measures are described in Section 8.0 to ensure the amenity of residents is not affected.

## 6. Noise Criteria

### 6.1. Internal Noise Criteria

The internal noise criterion has been as taken from BS8233:2014 and WHO Guidelines on community noise these are shown in table 6.1.

Activity	Location	07:00 - 23:00	23:00 - 07:00
Resting	Living Rooms	35dB $L_{Aeq,16Hour}$	--
Dining	Dining Room	40dB $L_{Aeq,16Hour}$	--
Sleeping	Bedroom	35dB $L_{Aeq,16Hour}$	30dB $L_{Aeq,8Hour}$

Table 6.1

## 7. Noise Impact Assessment

### 7.1. Internal Noise Impact

The table below compares the measured noise levels on site with the target limits within the dwelling, thus allowing the composite sound reduction index to be calculated for the façade.

Measurement Position	Area	Period	Noise Levels Measured	Level to be achieved	Composite SRI Required
MP	Living Room	Day time	50.1 dB $L_{Aeq,16Hour}$	35 dB $L_{Aeq,16Hour}$	15.1 dB
	Dining Room	Day time	50.1 dB $L_{Aeq,16Hour}$	40 dB $L_{Aeq,16Hour}$	10.1 dB

	Bedroom	Night time	45.6 dB $L_{Aeq,8Hour}$	30 dB $L_{Aeq,8Hour}$	15.6 dB
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Table 7.1

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## 7.2. External Noise Impact

Table 7.2 compares the noise levels in the external areas against the maximum levels set in the WHO Guidelines on Community Noise.

Measurement position	Area	Period	Noise Levels Measured	Level to be achieved	Attenuation Required
MP	Garden	Day time	50.1 $L_{Aeq,16hour}$	55 dB	0

Table 7.2

## 8. Recommendations

### 8.1. Façade Specification

The noise levels within the proposed dwellings will be dictated by the configuration, materials and elements of the façade.

The non-glazed elements of the facade will contribute significantly to the reduction of ambient noise levels in combination with a good quality appropriate glazing specification. The prediction of the performance of the façade is based upon a construction of 200mm brick and is calculated within INSUL software, the expected performance is shown in table 6.1.

63Hz	125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz	Rw
41	44	42	47	55	63	68	53

Table 8.1

### 8.2. Ceiling/Roof Specifications

The ceilings on the top floor should consist at least of 100mm Rockwool 45kg/m<sup>2</sup> fitted tightly between the 200mm roof joists and 2no. 15mm soundbloc plasterboard fixed to resilient bars to achieve a uniform sound reduction. The expected performance as predicted within INSUL software is shown in table 8.2. Any configuration capable of providing the same attenuation would be suitable.

63Hz	125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz	Rw
33	45	52	57	60	57	61	58

Table 8.2



### 8.3. Specification of Glazing Units

Windows can be considered the weakest point of a façade in terms of noise reduction from external noise. In order to ensure that the internal noise levels according to BS8233:2014 will be achieved, the highest noise levels have been considered.

Glazed elements installed in the façade require a minimum sound reduction index ( $R_w$ ) value of 15.6 dB. The glazing unit shown in table 8.2 would provide a suitable sound reduction. Any other window capable of providing an attenuation of 15.6 dB will be suitable. The performance is specified for the whole window unit, including frame and other design features.

Glazing Type	Sound Reduction ( $R_w$ )
4mm glass/12mm cavity/ 4mm glass	29dB

Table 8.3

The glazing system above will protect the amenity of the occupants of the dwelling houses against any extraneous noise.

### 8.4. Specification of Ventilation

Considering windows open in the noise impact assessment providing a sound attenuation of 12dB, this would lead to internal noise levels as shown in Tables 8.3.

Area	Period	Noise Levels Measured	Open window	Internal noise levels	Noise Criteria	Level above criteria
Living Room	Day time	50.1 dB	- 12	38.1	35dB $L_{Aeq,16Hour}$	3.1 dB
Dining Room	Day time	50.1 dB	- 12	38.1	40dB $L_{Aeq,16Hour}$	0 dB
Bedroom	Night time	45.6 dB	- 12	33.6	30dB $L_{Aeq,8Hour}$	3.6 dB

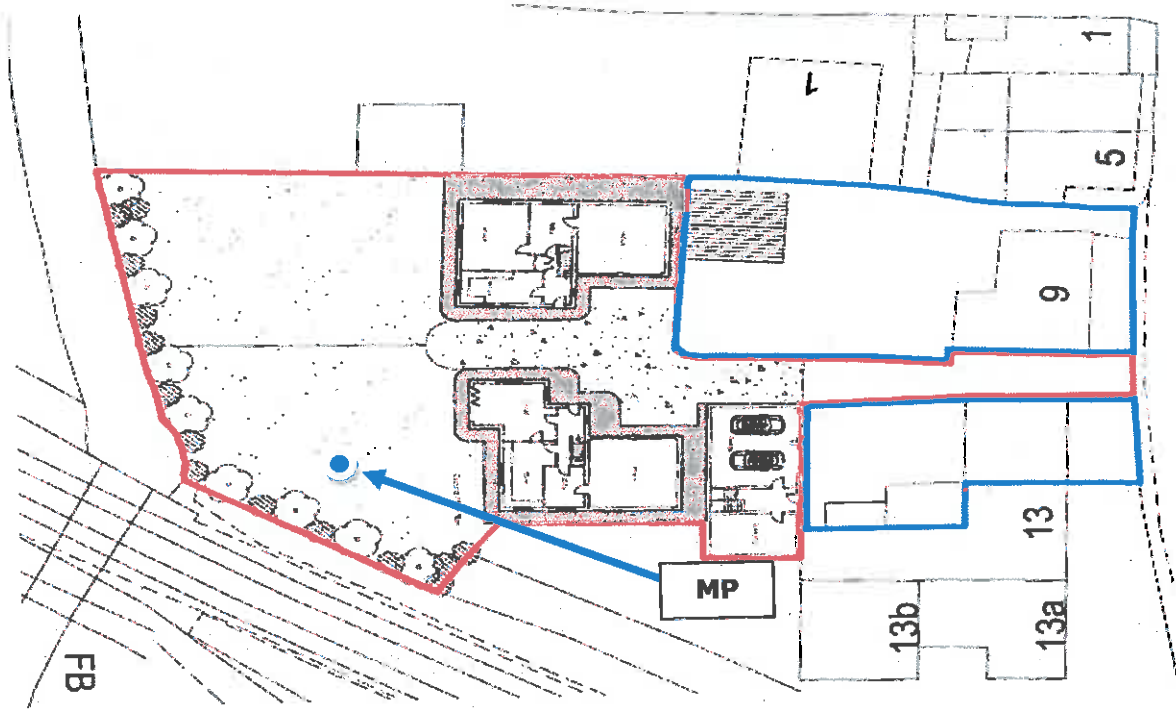
Table 8.4

The levels within the rooms with windows open are expected to be only 3.6 dB above the criteria. For such a small amount no ventilation system is required in terms of acoustic insulation. Essentially, any ventilation system in the market provides a sound attenuation of more than 3.6 dB, therefore whatever system is installed for air quality purposes will be suitable in terms of acoustic performance.

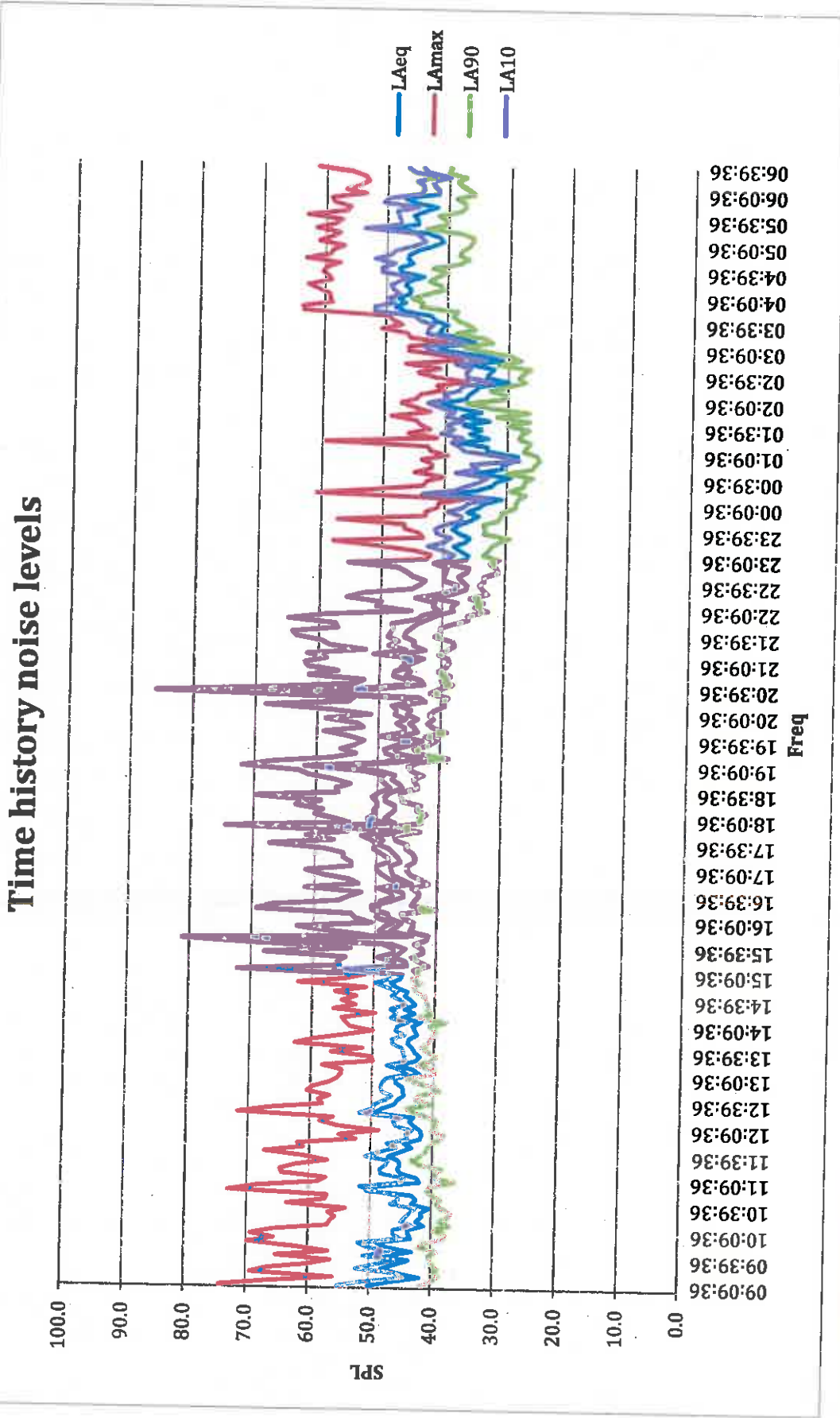
## 9. Conclusion

An environmental noise survey has been undertaken at 9 Downhan Road, Chatburn BB7 4AU in order to measure the ambient noise levels in the development area. The measured noise levels have allowed an assessment of the level of impact from noise that the proposed development site will receive. Outline mitigation measures have been recommended in section 8.0, including glazing and ventilation. These recommendations should be sufficient to achieve the internal and external noise levels for the proposed development according to BS8233:2014 noise criteria.

**APPENDIX A - Plan view and measurement position**



APPENDIX B - Time History



**Appendix C – Measurement Position**

