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Noise and Vibration Consultants



# PROPOSED RESIDENTIAL DEVELOPMENT AT DINTING ROAD, DINTING, GLOSSOP

## RAILWAY NOISE IMPACT ASSESSMENT

Report No. 21630.01v1
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## RAILWAY NOISE IMPACT ASSESSMENT

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## 1.0 INTRODUCTION

1.1 Hepworth Acoustics Limited was instructed by Loxley Homes to assess the potential noise and impact from passing trains on a proposed residential development at Dinting Road, Dinting, Glossop.

1.2 The assessment of the potential noise impact has included:

i) Measurement of noise levels from passing trains at a position near to the site boundary with the railway (Location 1 as shown in Figure 1);

ii) Assessment of likely day and night-time noise impact on the proposed dwellings;

iii) Recommending an appropriate scheme of noise mitigation measures where necessary.

1.3 The Hadfield and Glossop railway line runs parallel to the eastern boundary of the development site, with trains running between Manchester and Glossop/Hadfield. The line is in a cutting and the topography of the development land is such that there will be no line of sight from the nearest proposed dwelling to the railway line. The weekday passenger trains traffic on the line is shown Table 1 and there are no freight movements on this line.

**Table 1 : Daily Number of Passing Trains (Total 2-way Flow)**

| **Daytime** (0700-2300 hrs) | **Night-time** (2300-0700 hrs) |
|---|---|
| 67 | 5 |

1.4 The various units and indices referred to in this report are described in Appendix I. All results in the text have been rounded to the nearest decibel, as fractions of decibels are imperceptible.

## 2.0 NOISE SURVEY AND ASSESSMENT

2.1 The dominant source of noise at the proposed development site is railway traffic on the adjacent rail line.

2.2 Trains run on the adjacent line between 06:06 and 23:54 hours. Therefore a noise measurement survey has been carried out. Noise levels were measured on the development site between 06:00-08:45 hours on Friday 16th November 2012 to cover the first trains of the day (i.e. at the end of the night-time period) and during a rush hour period when trains are most regular. During the survey, the weather conditions were mild, dry and generally calm (<5 m/s).

2.3 The noise monitoring was carried out using a Brüel & Kjær 2260 'Type 1' sound level meter (Serial numbers 2467016). The meter was mounted onto a tripod with a microphone height of approximately 1.5 metres above the ground. A windshield was fitted to the microphone during all noise measurements. All measurements were carried out in 'free-field' conditions. Calibration checks were carried out before and after the noise survey with no variance in levels observed.

2.4 The noise monitoring position was at the top of the slope near to the eastern boundary of the site with the railway line and representative of worst case noise levels outside the dwellings that will be most exposed to railway noise.

2.5 Noise levels were measured during the passage of each train in terms of the 'sound exposure level' (SEL) and the maximum sound pressure level, $L_{Amax}$.

2.6 The results of the railway noise survey are detailed in Appendix II and the data has been used in the analysis below.

**Calculation of Railway Noise Exposure**

2.7 Railway noise is evaluated in terms of the 'equivalent continuous noise level', $L_{Aeq}$. Period $L_{Aeq}$ values for the site have been calculated from the results of the noise survey using the formula:

$$L_{Aeq\,(T)} = SEL_{\,Average} + 10 \log N - 10 \log T$$

where $L_{Aeq\,(T)}$ = $L_{Aeq}$ over time period T
$SEL_{\,Average}$ = Average 'Sound Exposure Level'
N = Number of train passes in time period T
T = Time period in seconds

2.8 The railway noise calculations have been undertaken for the daytime and night-time periods using the average SEL value of 67dB(A). The results are shown in Table 2.

**Table 2 : Railway Noise Exposure Values**

| Location | Daytime $L_{Aeq}$ (0700-2300 hrs) | Night-time $L_{Aeq}$ (2300-0700 hrs) |
|---|---|---|
| Nearest Proposed Façade to Railway Line | 38 | 29 |

2.9 Table 2 shows that the daytime and night-time $L_{Aeq}$ railway noise exposure levels on the site are very low. Corresponding peaks of noise were in the range 51 – 63 dB $L_{Amax}$.

2.10 The National Planning Policy Framework (NPPF) 2012 provides some general guidance to local authorities on taking noise in to account in planning policies and decisions. This includes guidance that local authorities should '*aim to avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development*'. However, there is as yet no specific guidance on acoustic assessment/design criteria provided in the NPPF or the accompanying Technical Guidance document; therefore, established national guidance which carries the full weight of an adopted British Standard has been used to determine acceptable noise criteria, as described in Section 3.0.

## 3.0 RECOMMENDED NOISE MITIGATION MEASURES

3.1 Guidance on acceptable noise design levels for proposed new dwellings is set out in British Standard 8233: 1999, "Sound insulation and noise reduction for buildings – Code of practice" and is summarised in Table 5.

**Table 4: BS 8233 Recommended Acoustic Design Criteria**

| Location | Noise Criteria |
|---|---|
| **Living Rooms** | Good Standard 30dB $L_{Aeq}$<br>Reasonable Standard 40dB $L_{Aeq}$ |
| **Bedrooms** | Good Standard 30dB $L_{Aeq}$<br>Reasonable Standard 35dB $L_{Aeq}$ |
| **Gardens** | Below 55dB $L_{Aeq}$ |

3.2 For this development we recommend the following noise criteria be adopted: daytime levels below 35 dB $L_{Aeq}$ inside living rooms; and night-time noise levels not exceeding 30 dB $L_{Aeq}$ and generally not exceeding 45 dB $L_{Amax}$ in bedrooms, with windows closed and trickle ventilation provided. Also, noise levels in private gardens should be controlled to no more than 55 dB $L_{Aeq,16hour}$ where feasible.

**Gardens**

3.3 Noise levels in all private gardens will be within the adopted 55 dB $L_{Aeq,16hour}$ criterion without any specific noise control measures.

**Sound Insulation**

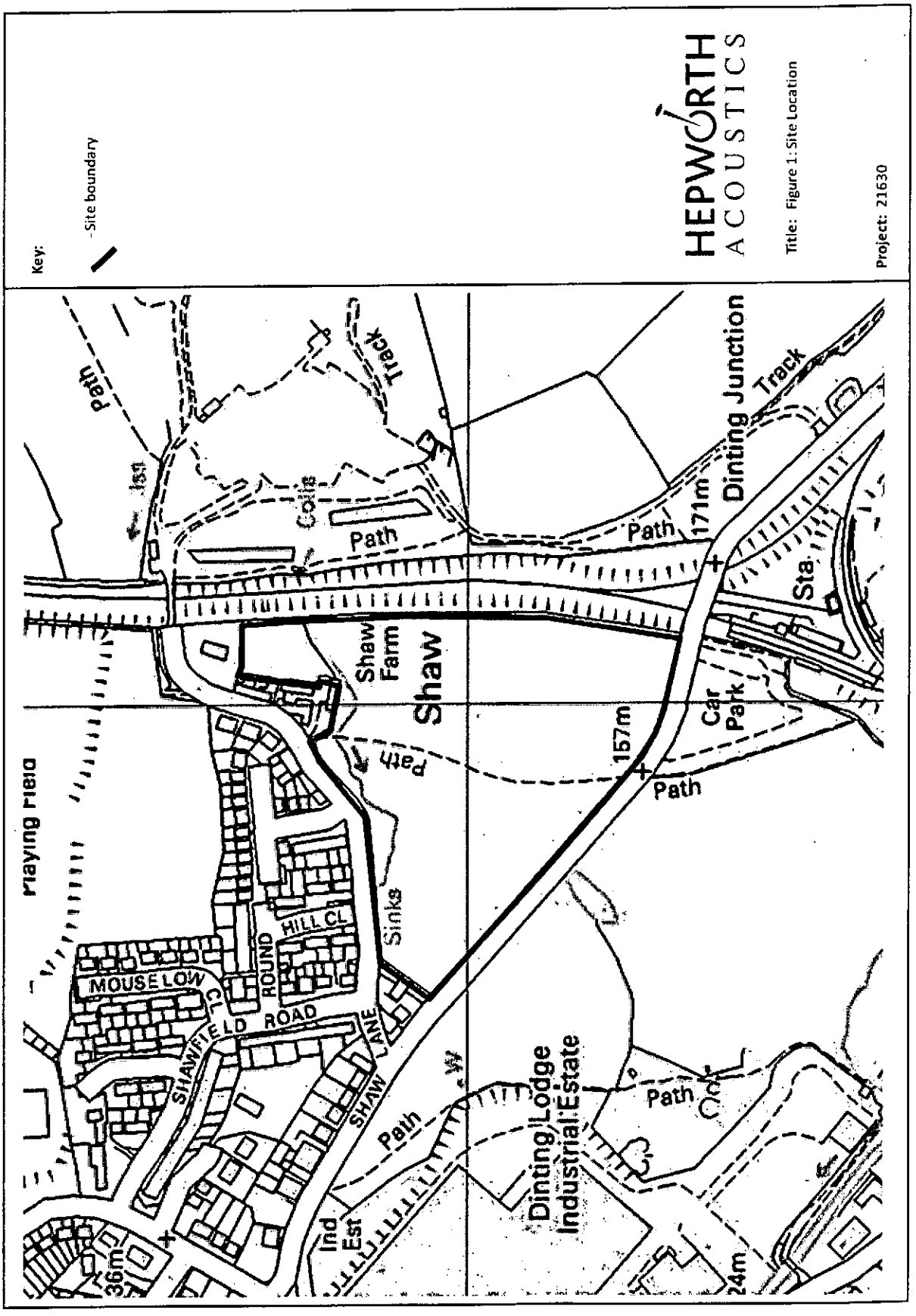
3.4 The low levels of noise from the railway line mean that no specific measures are required to meet the internal noise criteria. The adopted internal noise criteria will be achieved with the installation of well fitted standard thermal double glazing (i.e. 4mm glass – nominal cavity – 4mm glass) and standard in-frame trickle vents.

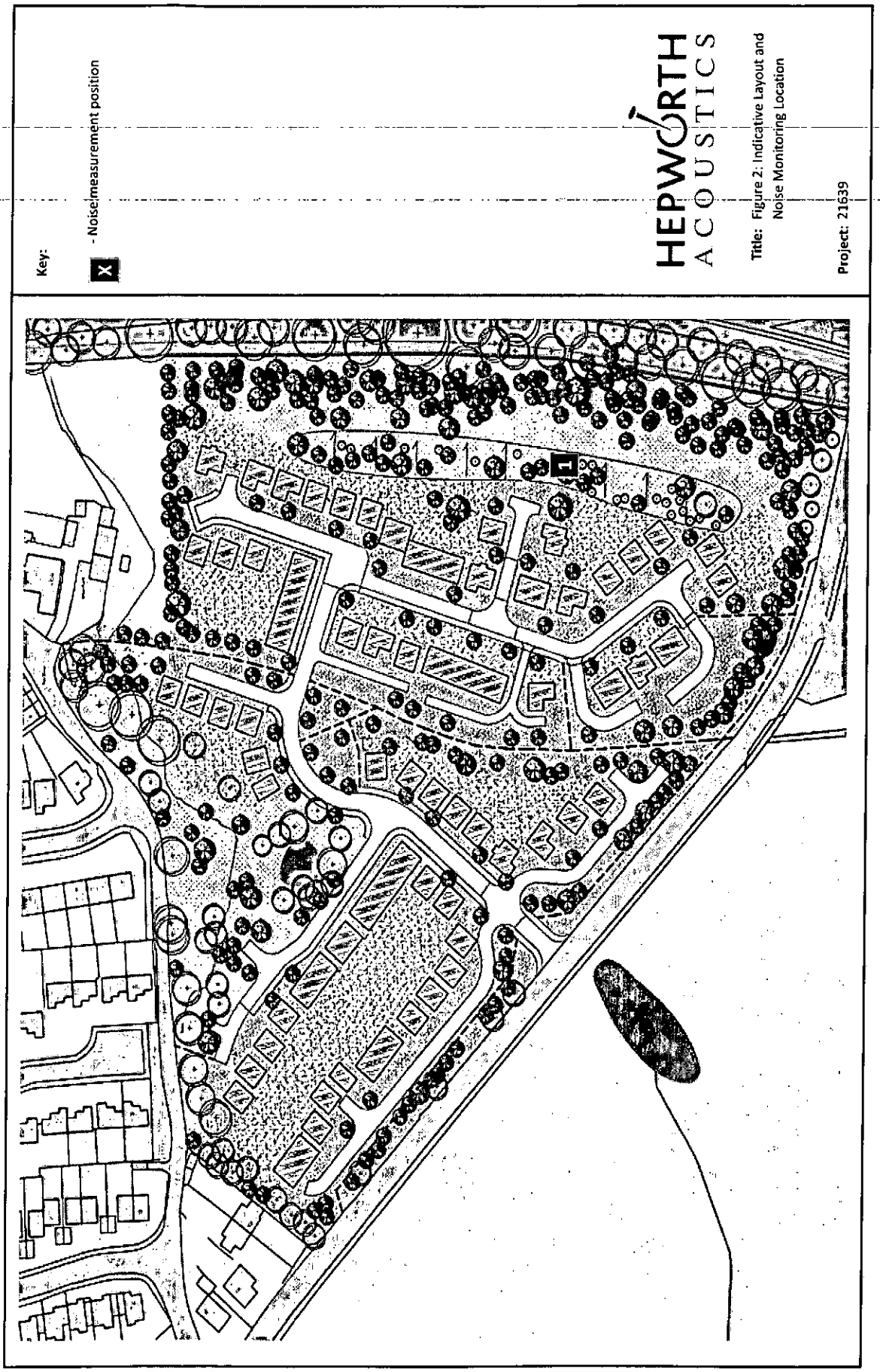
## 4.0 SUMMARY AND CONCLUSIONS

4.1 A noise assessment has been carried out for a proposed residential development on land at Dinting Road, Dinting, Glossop.

4.2 A noise measurement survey has been carried out on the site and the daytime and night-time road railway noise exposure values have been evaluated. Railway noise levels at the site are very low.

4.3 As such, no specific noise mitigation or sound insulation measures are necessary in order to meet the adopted acoustic design criteria.


Key:
Site boundary
HEPWORTH ACOUSTICS
Title: Figure 1: Site Location
Project: 21630
Path
Track
Path
Path
Track
Dinting Junction
171m
Sta.
Car Park
Shaw Farm
Shaw
Path
157m
Path
Path
Sinks
Playing Field
MOUSELOW CL
ROUND HILL CL
SHAWFIELD ROAD
SHAW LANE
Path
Path
Dinting Lodge Industrial Estate
Ind Est
36m
24m


Key:
- Noise/measurement position
HEPWORTH ACOUSTICS
Title: Figure 2: Indicative Layout and Noise Monitoring Location
Project: 21639

## Appendix I – Noise Units and Indices

a) Description of Noise Characteristics

Sound Pressure Level and the decibel (dB)

A sound wave is a small fluctuation of atmospheric pressure. The human ear responds to these variations in pressure, producing the sensation of hearing. The ear can detect a very wide range of pressure variations. In order to cope with this wide range of pressure variations, a logarithmic scale is used to convert the values into manageable numbers. The dB (decibel) is the logarithmic unit used to describe sound (or noise) levels. The usual range of sound pressure levels is from 0 dB (threshold of hearing) to 120 dB (threshold of pain).

The ear is less sensitive to sound at low and very high frequencies, compared with the frequencies in between. Therefore, when measuring a sound made up of different frequencies, it is often useful to 'weight' each frequency appropriately, so that the measurement correlates better with what a person would actually hear. Noise levels measured using the 'A' weighting are denoted dB(A) or dB $L_A$.

**b) Description of Noise Indices**

When a noise level is constant and does not fluctuate over time, it can be described adequately by measuring the dB(A) level. However, when the noise level varies with time, the measured dB(A) level will vary as well. In this case it is therefore not possible to represent the noise climate with a simple dB(A) value. In order to describe noise where the level is continuously varying, a number of other indices, including statistical parameters, are used. The indices used in this report are described below.

$L_{Aeq}$ This is the A-weighted 'equivalent continuous noise level' which is an average of the total sound energy measured over a specified time period.

$L_{Amax}$ This is the maximum A-weighted noise level that was recorded during the monitoring period.

SEL This is the 'sound exposure level', which is an average of the total sound energy of a single noise event, 'compressed' into 1 second. SEL is thus the level of a continuous noise lasting 1 second, which has the same total (A-weighted) energy as the entire real fluctuating noise event. It is usually used to measure short duration single events, such as trains passing by.

**Appendix II – Results of Railway Noise Survey:**

Date: Friday 16th November 2012
Weather: Dry, mild, light winds (<5 m/s)
Equipment: Brüel & Kjær 2260 'Type 1' Integrating Sound Level Meter (Serial Number: 2467016),
Results: All noise levels shown are in dB(A)

## Location 1- Nearest proposed façade to the railway line

| Time | Train Type | Direction | $L_{Amax,}$ | SEL |
|---|---|---|---|---|
| 06:17 | 3-car Passenger | N | 58.9 | 63.6 |
| 06:27 | 3-car Passenger | S | 52.9 | 62.0 |
| 06:44 | 3-car Passenger | N | 56.9 | 64.2 |
| 06:57 | 3-car Passenger | S | 51.0 | 61.4 |
| 07:11 | 3-car Passenger | N | 62.1 | 67.2 |
| 07:18 | 3-car Passenger | S | 51.9 | 62.7 |
| 07:32 | 3-car Passenger | N | 62.8 | 68.9 |
| 07:38 | 3-car Passenger | S | 55.0 | 62.8 |
| 07:51 | 3-car Passenger | N | 62.1 | 66.9 |
| 08:16 | 3-car Passenger | N | 62.2 | 67.6 |
| 08:23 | 3-car Passenger | S | 53.5 | 63.6 |
| 08:37 | 3-car Passenger | N | 62.4 | 66.7 |

(Log) Average SEL = 65.5