Hampshire County Council
Shepherds Spring
Noise Assessment

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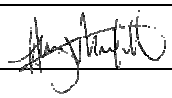
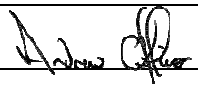
		Signature			
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1 Introduction

A previous Arup report[1] considered the suitability of the noise climate of an area of land at Shepherds Spring in Andover for residential development. The initial assessment was carried out in 2008 in accordance with the requirements of Planning Policy Guidance: Planning and Noise (PPG 24)[2]. The site was predominantly categorised as Noise Exposure Category (NEC) A and B with a small area adjacent to Newbury road categorised as NEC C. The purpose of this supplementary report is to predict noise levels at the proposed property locations and design noise mitigation to ensure that noise levels are such that all properties are within either NEC A or B.

For the previous report, Arup conducted a noise survey in accordance with PPG24 requirements for NEC assessment. Since no significant non-traffic noise sources have been introduced on or near to the site, it is not considered necessary to repeat the previous noise survey.

The site is currently as it was at the time of the previous report. The proposed development area is the existing school playing field situated to the north of Smannell Road and to the east of Newbury Road (A343). Newbury Road is a dual carriageway and forms the western boundary of the site. The land to the north and east of the site is residential and is served by small quiet roads.

2 Methodology

The noise exposure arising from roads associated with the proposed development can be calculated using the Calculation of Road Traffic Noise (CRTN)[3] method. The method creates a spatial model of the area between the road and the receiver position (or grid of receiver positions). The noise source levels generated by the road are based on the volume, average speed and composition of the traffic. The resulting noise levels across the site are then calculated taking into account the propagation distance, intervening screening and other effects. The WS Atkins RoadNoise proprietary software was used for this exercise.

Noise levels on the west side of the development site are dominated by traffic noise from Newbury Way. The road noise model was calibrated from noise level measurements taken by Arup during August 2008 and reported in Arup Report AAc/125730/R01. The model was created with geographical data obtained from Hampshire County Council.

Noise levels were assessed at the most sensitive receivers positioned at the facades of houses closest to Newbury Road. The assessment of NEC assumes free-field conditions hence no reflection correction from the proposed building facades was assumed in the calculations. Receivers were positioned at heights of 1.5m to represent downstairs rooms and 4m to represent upstairs rooms. It is understood that there would be no windows on the west facades of the proposed

[1] Arup Acoustics (2008), AAc/125730/R01 'Shepherds Spring Andover, Assessment of the Suitability of Noise Climate for Residential Development'
[2] Communities and Local Government (1994), Planning and Policy Guidance 24: Planning and Noise, HMSO
[3] Department of Transport Welsh Office (1988), Calculation of Road Traffic Noise, HMSO

houses, so noise levels were predicted only at the western end of north and south facades. Receiver positions are shown in Figures 1, 2 and 3.

2.1.1 Mitigation Options

The NEC levels specified in Planning Policy Guidance: Planning and Noise (PPG 24) are assumed to be at ground level, i.e. a height of 1.5m. Three strategies were considered to mitigate the noise from Newbury Road at residential properties such that the noise levels would be equivalent to that of an open site meeting NEC A or B. Option 1 gives a basic mitigation strategy to meet NEC B at downstairs rooms (ie assumed height of 1.5m) but not upstairs rooms. In order to provide this same noise climate at first floor level ,options 2 and 3 attempt to meet NEC B at both downstairs and upstairs rooms.

2.1.1.1 Option 1

Option 1 mitigation design consists of a 2m noise barrier on the western boundary of the development site. Figure 1 shows the option 1 mitigation design along with the receiver locations assumed on the north and west facades of the proposed properties.

2.1.1.2 Option 2

Option 2 mitigation design consists of a 4m noise barrier and 3.5m noise barrier on the western boundary of the development site. Limiting the barrier position to the site boundary allows sound leakage between the barriers where the path passes through and at the top north-west corner. Figure 2 shows the option 2 mitigation design.

2.1.1.3 Option 3

Option 3 mitigation design consists of 3.5m noise barriers either side of the footpath on the western boundary of the development site. In addition the barrier extends a small way across the north side of the site at a height of 4m to mitigate noise at the north-west corner of the site. By closing this angle of view to the road at this corner of the site it is possible to achieve the NEC B target at receivers A and B with a slightly reduced barrier height on the western boundary. Figure 3 shows the option 3 mitigation design.

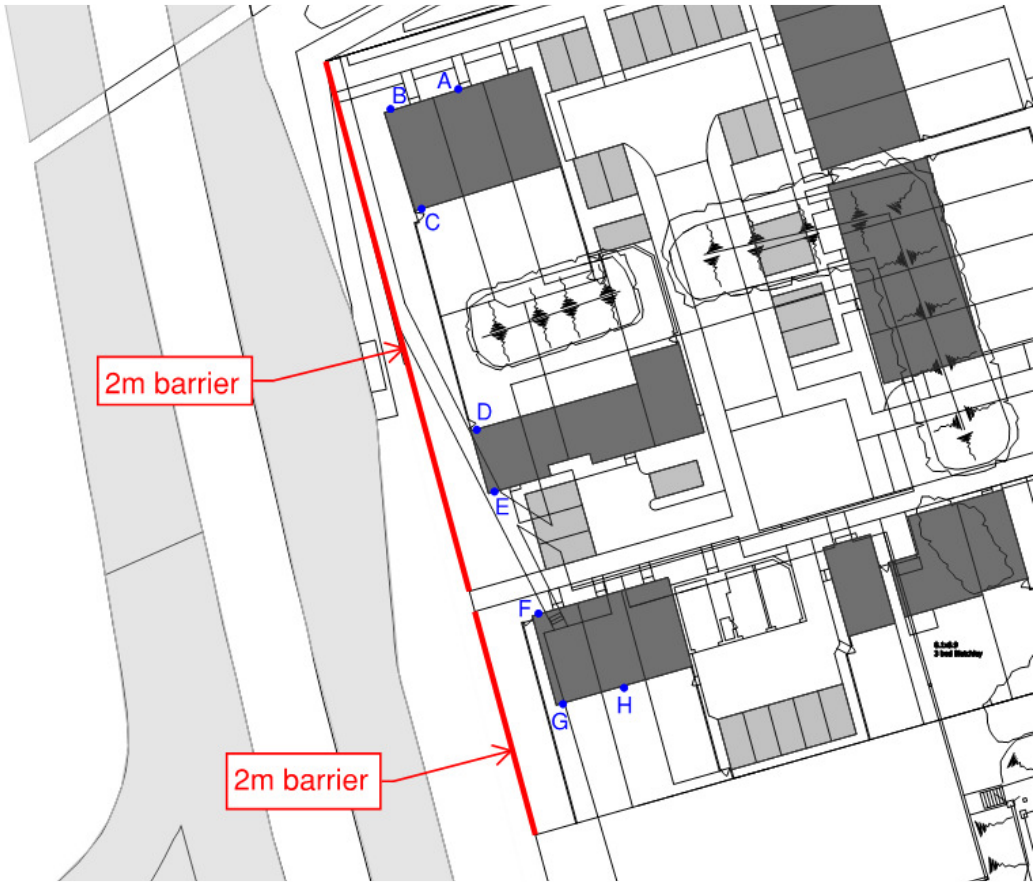

Figure 1 Option 1 mitigation design

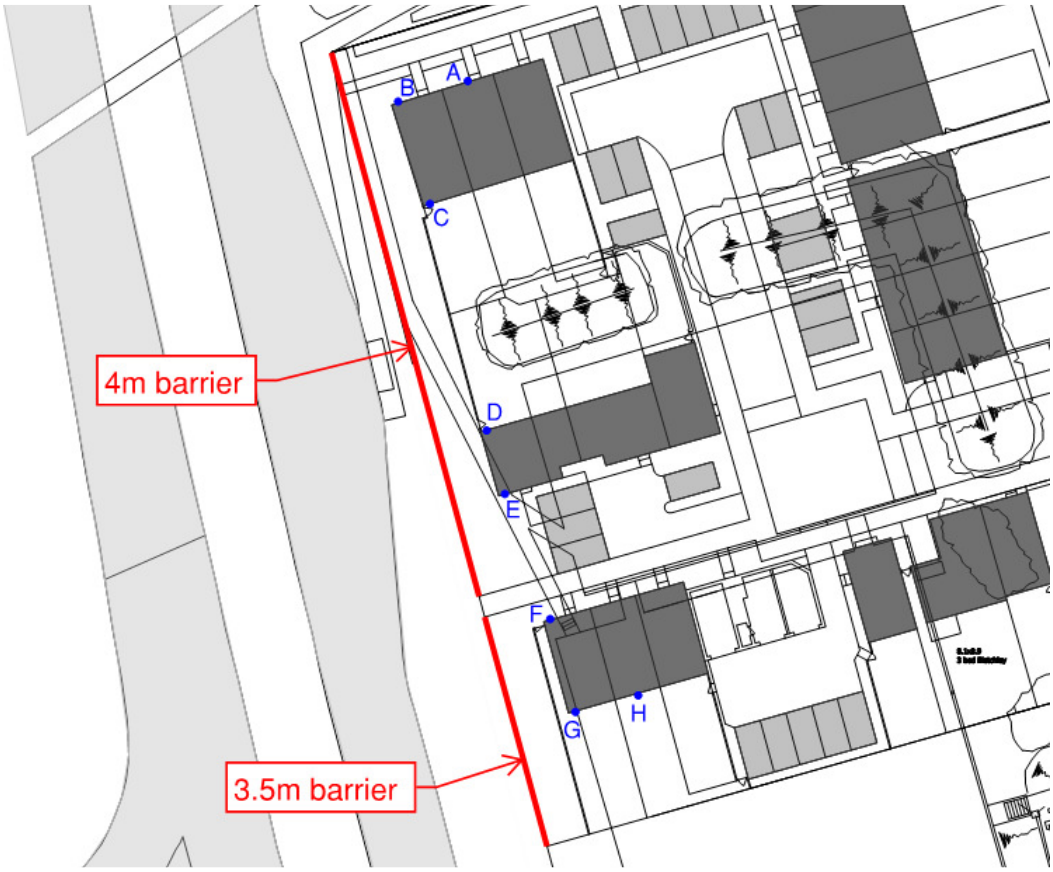

Figure 2 Option 2 mitigation design

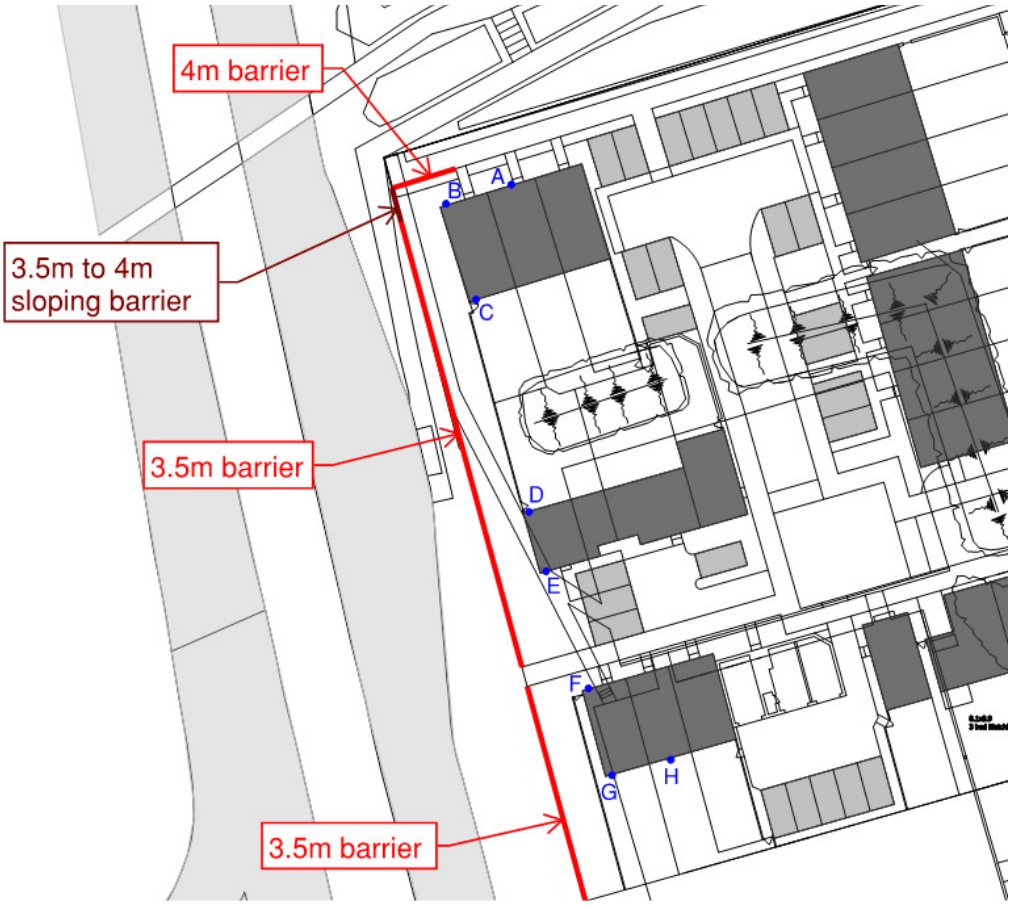

Figure 3 Option 3 mitigation design

3 Results

Table 1 gives calculated daytime noise level results at receivers positioned at ground floor (1.5m) for options 1, 2 and 3. All the calculated levels fall into NEC B (55-63dB) with the exception of some in option 2 and 3 which fall into NEC A (<55dB).

Receiver	Calculated Daytime L_{Aeq} (dB)		
	Option 1	Option 2	Option 3
A	57.6	56.9	57.9
B	61.7	60.3	57.9
C	58.6	53.1	54.3
D	58.8	54	53.9
E	59.1	56.2	56.8
F	61.2	58.3	58.6
G	61.8	58.8	58.7
H	58.9	57.7	57.7

Table 1 Ground floor receiver noise levels

Table 2 gives the calculated noise level results at receivers positioned at first floor level (4m). Many of the levels calculated for option 1 are above 63dB and fall into NEC C (63-72). Receiver results for option 3 all fall into NEC B. All results for option 2 fall into NEC B except at receiver B where the maximum level of 63dB is exceeded by just 0.2dB. Given that a 3dB is regarded to be the smallest noticeable increase in noise level, a 0.2dB exceedance is considered to be insignificant.

Receiver	Calculated Daytime L_{Aeq} (dB)		
	Option 1	Option 2	Option 3
A	61.1	60.1	60.9
B	66.2	63.2	61.1
C	65.2	57.8	59.9
D	65.3	58.5	60
E	64.7	59.9	60.9
F	66.5	61.9	62.4
G	65.8	62.2	62.2
H	61.4	59.8	59.8

Table 2 First floor receiver noise levels

3.1 NEC contours

Figure 4 gives the first floor (4m) NEC contours for option 3 which proved to be the most effective according to receiver calculation results. It should be noted that this version of the noise model assumes no building structures on the site which were included in the individual receiver calculations reported in Tables 1 and 2, By locating windows on properties so they do not directly face the road it may possible, with careful design, for properties to be located within the NEC C contour shown in Figure 4 but still meet PPG24 requirements for NEC B at the sensitive facades. This is because the presence of the buildings would limit the

angle of view towards the road hence reducing the noise levels on these facades perpendicular to the road.

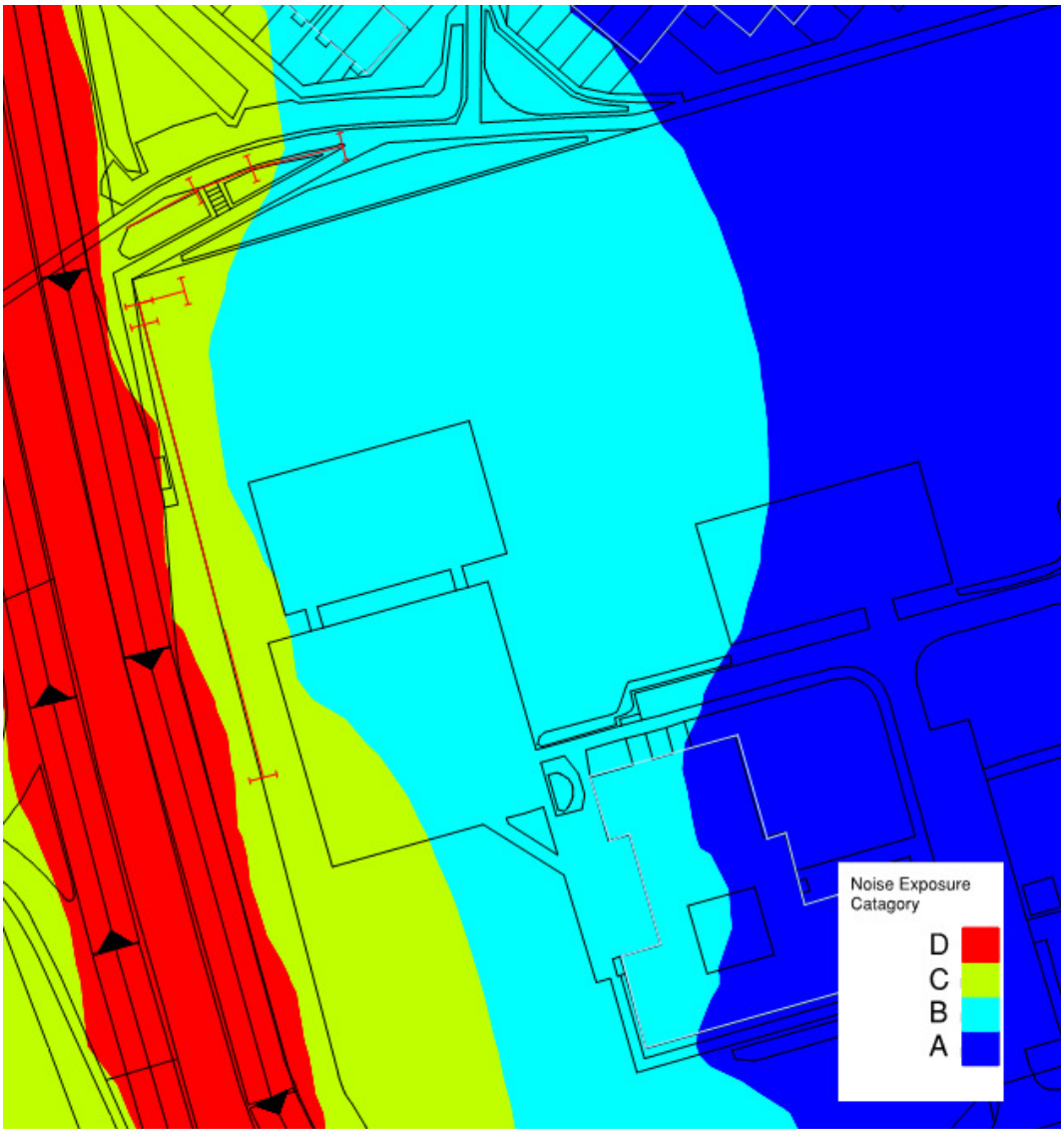

Figure 4 Noise Exposure Category (NEC) contours for option 3

4 Conclusion

Arup have been commissioned by Hampshire County Council to predict noise levels at facades of proposed properties at the Shepherds Spring residential development and to design noise mitigation measures to ensure all properties are within PPG 24 Noise Exposure Category (NEC) A or B.

A noise model of the development has been constructed according to the methods described in the Calculation of Road Traffic Noise (CRTN). The dominant noise source at the development is Newbury Road (A343). A number of the proposed properties close to Newbury Road would be classified as NEC C without mitigation. Three mitigation options have been designed to attempt to mitigate the proposed properties to within categories NEC A or B.

Option 1 is designed with minimum barrier heights so that NEC B is only met at ground floor of properties. Noise levels at first floor are not low enough to be within NEC B however the design meets PPG24 NEC B requirements in that the required noise levels are achieved at 1.5m height.

Options 2 and 3 consist of higher barriers and are designed to meet NEC B levels at both ground and first floor heights.