PROPOSED CHILTERN RAILWAYS (BICESTER TO OXFORD IMPROVEMENTS) ORDER

NOTE REGARDING THE DESIGN AND MAINTENANCE OF NOISE BARRIERS

1 Introduction

1.1 Chiltern Railways has produced a Noise and Vibration Mitigation Policy **[CD/1.29]** which sets out the standards at which mitigation which will be provided. This note aims to provide clarification regarding the design of barrier mitigation in the North Oxford area and the attenuation that may be expected from them.

1.2 The note also provides details on the typical design life and maintenance requirements for noise barriers.

2 Predicted Barrier Attenuation

2.1 Table 1 gives an overview of the predicted attenuation offered by a 2 m barrier (2 m high relative to top of rail height, separated from the nearest rail by 2 m) at the closest properties in the Wolvercote / Lakeside area. Predicted daytime train noise levels as a result of Phase 2 of the Scheme are shown before and after mitigation, as well as the expected attenuation.

Table 1: Expected Barrier Attenuation in North Oxford

	Predicted Train Noise Level (LAeq,16h)		
	Unmitigated, dB	**Residual, dB**	**Barrier Attenuation, dB**
Lakeside (1st Floor)	63	48	15
Quadrangle House			
1st Floor	65	58	7
2nd Floor	63	59	4
Blenheim Drive (1st Floor)	60	46	14

	Predicted Train Noise Level (LAeq,16h)		
5 First Turn (1st Floor)	57	51	6
Ulfgar Close (1st Floor)	57	47	10

3 Design of Mitigation

3.1 The final design of noise barriers including selection of material from which they are made will be subject to further detailed engineering work. Railway barriers based on a wooden noise barrier are shown on Figure 3.15 and 3.16 of page 33 of the Design and Access Statement **[CD/1.19]**.

3.2 The Calculation of Railway Noise (CRN) **[CD/5.12]** is the standard UK guidance procedure for calculating railway noise and predicting the insertion loss achieved by a barrier based on the amount by which noise is diffracted over the screening edges of the barrier (ie the top and ends). This method is specific for railway noise. This has been used in the assessment of the effectiveness of noise barriers in attenuating noise from the Scheme. This part of the procedure does not take into account the barrier is not acoustically reflective on the side facing the railway, and it assumes that sound is not able to pass through the barrier to any significant extent compared to the sound passing over the top/sides of the barrier.

3.3 In order to address potential reflected noise between the barrier and the trains, it is likely that the face of the barrier will need to be faced with acoustic absorbent material (as shown in the Design and Access Statement).

3.4 The issue of sound passing through the barrier is considered in Paragraph 24 of CRN which provides guidance on barrier screening. Footnote 7 in CRN provides a method for calculating the minimum superficial surface density required. The surface density needs to be high if the barrier is to achieve a high attenuation of noise over the top/sides of the barrier. It is noted in Footnote 7 that a timber barrier could be suitable if attenuation values up to 17 dB(A) are required. Since this is compatible with the attenuation values above in Table 1.1, it is likely that timber barriers will be considered.

3.5 If, during detailed design the standard surface mass calculations show that another material would be more appropriate, then this will be considered. Other concrete based materials are used on some schemes where particularly high values of barrier insertion loss are required, which is not the case in North Oxford. Whilst it is not necessary to design the barriers in detail at this stage, adequate solutions exist using standard technology.

3.6 It is noted that these acoustic barriers are supplied by specialist acoustic suppliers. An example of a company who build such timber barriers is given below:

Buffalo Structures
Ipsden
Wallingford
Oxfordshire
OX10 6BS

Tel 01491 838368
Fax 01491 825418
http://www.buffalo-fence.co.uk/

4 Maintenance of Noise Barriers

4.1 The design life of a well engineered wooden noise barrier of this type, with steel posts, is typically quoted as approximately 40 years. However, in practice, it is likely to be effective for much longer than this.

4.2 Barriers are not expected to require maintenance during their lifetime. The railway facing side will be acoustically absorbent. This absorbent layer will be covered by a protective membrane which is also expected to require no maintenance.

4.3 An example of wooden noise barriers installed 33 years ago on the M4 can be seen on the website of the barrier manufacturing company Buffalo Structures, mentioned above.

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16 December 2010