

A303 Sparkford to Ilchester Dualling Scheme TR010036

9.18 Joint note setting out CRTN approach as to effect of wind direction and speed on noise effects

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**Joint note setting out CRTN approach as to the
effect of wind direction and speed on noise effects**

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1 Joint note setting out CRTN approach as to the effect of wind direction and speed on noise effects

1.1 Introduction

1.1.1 This document sets out the Applicant and Sparkford Hall's respective positions on the CRTN approach as to the effect of wind direction and speed on noise effects.

1.1.2 This joint note is in response to Action Point 25 (EV-007).

1.2 Sparkford Hall's Position

1.2.1 To provide a Note setting out the Calculation of Road Traffic Noise ('CRTN') approach as to the effect of wind direction and speed on noise affects.

The Guidance

1.2.2 The Design Manual for Roads and Bridges (DMRB) directs (at Vol 11, Section 3, Part 7, Para 3.43) that traffic noise modelling follows the method laid down in the CRTN, 1988.

1.2.3 CRTN has the following main contents:

- Introduction
- Definition and Interpretation
- Requirements for use with the Noise Insulation Regulations
- Section 1 – **The prediction method (general procedures)**
- Section 2 – **The prediction method (additional procedures)**
- Section 3 – **The measurement method**
- Appendices
- Procedural Charts
- Examples

CRTN Section 3 Paragraph 39. Physical Conditions for measurement

1.2.4 The only specific reference to the effect of wind is in Section 3, para 39 and in the Definition and Interpretation section, which states, at para 4; "The procedures assume typical traffic and noise propagation conditions which are consistent with moderately adverse wind velocities and directions during the specified periods (See para 39.2)...."

1.2.5 In Section 3 (The measurement method) Paragraph 39.2 describes those wind conditions in which measurements can – and cannot – be made. Other parts of Section 3 describe "the specified periods" in which measurement are made.

1.2.6 Section 1 (The prediction method (General Procedures)) describes the prediction method in 19 detailed paragraphs, supported by the Procedural Charts and Examples (contained in at the end of the document). There is no specific reference made to the effect of wind on traffic noise. If it were, it

would seem that such reference would be made at Section 1, paragraphs 17 or 18 "Propagation".

The Practice

- 1.2.7 Professional users of CRTN calculate source road noise (the 'Basic Noise Level') from traffic flow data, speed, % heavy vehicles, gradient, and road surface, before applying a further range of relevant corrections to arrive at a prediction of traffic noise at a receiving location. Each of the elements in the desktop calculation is based on findings in the CRTN literature.
- 1.2.8 It was discussed at the Hearing that currently there are no reliable algorithms to calculate the impact of wind on traffic noise over distance.
- 1.2.9 Currently the only factors considered in the CRTN are those that have a robust basis proved in repeatable experience based tests. The effect of wind does not yet have that pedigree, so is not included. However, just because a factor of a variable nature does not yet have an agreed algorithm does not mean it is not a significant factor. Wind should be considered a variable, and at certain locations which it is known regularly experience or are subject to the prevailing winds, the effect of wind on noise should be factored into calculations.
- 1.2.10 Due to the absence of a generally accepted method to quantify wind effect, an arbitrary correction of +2dBA could be awarded to ensure the noise assessment is more robust.

Consequences

- 1.2.11 At Sparkford Hall the prevailing wind is from the direction of the A303, and traffic can usually be heard as it climbs Camel Hill, a mile away. Due to the fact that the CRTN make no specific provision in which the effect of wind can be calculated. Mr March-Smith is disadvantaged because the method has no specific requirement to do so, and therefore it has not been taken into account in the scheme.
- 1.2.12 The noise assessment should take a robust approach and make provisions for the wind impact, making an arbitrary correction of +2dBA. Such a correction would result in the long term noise change at Sparkford Hall from +1.3dBA (classed in the DMRB as 'negligible') to +3.3dBA (classed in DMRB as a 'minor' impact).
- 1.2.13 Volume 11, Section 3, Part 7 of the DMRB guidance states at paragraph 4.2 that "*In the long-term, a 3 dB(A) change is considered perceptible. Such increases in noise should be mitigated if possible.*".

1.3 The Applicant's Position

The Guidance

- 1.3.1 DMRB HD213/11 sets out the methodology for the assessment of road traffic noise in the UK. Paragraph 3.43 of DMRB states "*For the prediction of road traffic noise the methodology given in the CRTN should be used.*"

CRTN

- 1.3.2 Paragraph A4.56 of DMRB states "In paragraph 4, CRTN contains the statement '...noise propagation conditions are consistent with moderately adverse wind velocities...'. This statement is often misinterpreted and an explanation of the background is given below. During the development of the algorithms used for CRTN, measurements were undertaken to develop the relationship between traffic flow and noise level. In order to provide a robust relationship these measurements were undertaken during adverse wind conditions (i.e. a wind from the source to the receiver)."
- 1.3.3 The whole of Paragraph 4 of CRTN states "The procedures assume typical traffic and noise propagation conditions which are consistent with moderately adverse wind velocities and directions during the specified periods (see para 39.2)." In turn Paragraph 39.2, referring to the impact of wind on measurements, states "Measurements should be made where: (i) the wind direction is such as to give a component from the nearest part of the road towards the reception point exceeding the component parallel to the road; (ii) the average wind speed at a height of 1.2 metres and mid-way between the road and the reception point is not more than 2 m/s in the direction from the road to the reception point; (iii) the wind speed at the microphone in any direction should not exceed 10 m/s. In all cases it is recommended that a wind shield be used on the microphone and that measurements should only be carried out when the peaks of wind noise at the microphone are 10 dB(A) or more below the measured value of L10 [the traffic noise index]"
- 1.3.4 The assessment is therefore carried out in accordance with DMRB, with CRTN used for the calculation of road traffic noise. The calculation procedures in CRTN are themselves consistent with moderate downwind conditions. The potential influence that wind can have on measurements is understood and conditions are imposed on such measurements.
- 1.3.5 It appears to be common ground that the CRTN procedures state that they are consistent with moderately adverse wind conditions. The challenge appears to be the extent to which CRTN adequately captures the effect of wind and whether an additional, arbitrary correction of 2dB should be applied. No evidence is offered to support the proposed 2dB correction. Conversely it is noted that the statement within DMRB that the CRTN algorithms used to predict noise levels are based on measurements "undertaken during adverse wind conditions (i.e. a wind from the source to the receiver)" confirms that adverse wind has already been taken into account.

Conclusion

- 1.3.6 The Applicant therefore rejects the introduction of additional factors to capture the effect of wind as these would not be based on any evidence and would be supplementary to the factors that are already within the established methodology for this effect.