Chiltern Railways

Project 0172205
Chiltern Railways Condition 19: Appointment of Independent Expert (Noise and Vibration)

TWA/10/APP/01/Cherwell/ALL/C19 (IE)

April 2013

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REPORT

Chiltern Railway

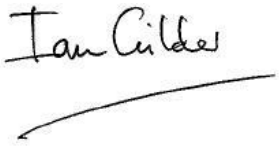
Condition 19: Appointment of Independent Expert (Noise and Vibration)

April 2013

Reference: TWA/10/APP/01/Cherwell/ALL/C19 (IE)

For and on behalf of
Environmental Resources Management

Approved by: Ian Gilder



Signed:

Position: Technical Director

Date: 15th April 2013

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1 INTRODUCTION

The Secretary of State has decided to make The Chiltern Railways (Bicester to Oxford Improvements) Order with modifications and directs that planning permission be deemed to be granted, subject to the conditions set out in Annex 1 to the letter from Martin Woods (Head of TWA Orders Unit) dated 17th October 2012 (ref TWA/10/APP/01).

The planning conditions relating to operational noise comprise 19(1) to 19(14) which require approval of Schemes of Assessment of the predicted noise and vibration impacts of Phase 1 and 2A and of Phase 2B by the Local Planning Authority (LPA). The relevant LPAs are Cherwell District Council and Oxford City Council. In order to inform the LPAs' decisions, a report (or series of reports), prepared by an independent expert who has been previously approved in writing by the Local Planning Authority, will be produced. The subject of the report which is produced will be the robustness of the noise and vibration-related elements of the Schemes of Assessment (as specified in conditions 19(9) and 19(10)). There is also a potential role in advising the LPA on the assessment methodology to be applied in condition 19(3) if required.

The planning conditions are contained an *Annex A* with the relevant inputs for the independent expert in bold type. This report sets out the proposed scope of work required from the appointed independent experts in order that they can provide the appropriate reports and advice to the LPAs to discharge the requirements of the conditions.

This scope of work has been prepared by the Chiltern Railway Company Limited (CRCL), who will be the applicant for the discharge of planning conditions. The content of the scope of work and the appointment of the selected independent experts has been agreed by both Local Planning Authorities, who have each nominated Lead Officers.

2 SCOPE OF WORK

2.1 KEY TASKS

2.1.1 Introduction

The key tasks for the independent expert listed in the planning conditions relate to conditions 19(3), 19(4), 19 (9) and 19(10). The Schemes of Assessment that are to be reported on will be provided by Chiltern Railways and its advisors and contractors to show how the standards of mitigation set out in the Policy will be achieved for noise 19(9) and for vibration 19(10).

Condition 19(3) relates to identifying measures that should be taken to ensure, insofar as reasonably practicable, that the noise caused by individual passing trains, using the railway, does not significantly impede voice communication over a distance of 30 metres within riding school areas at Wendlebury Gate Stables. Although the assessment will be part of the Scheme of Assessment which is reviewed by the independent expert there is a specific requirement, if personal communications or sound reinforcement systems are proposed, for the expert to approve the assessment methodology. This requirement will be reviewed and if necessary an independent expert with specific expertise in this field will be appointed.

Condition 19(4) specifies that the appropriate Scheme of Assessment will include 45 Lakeside, Oxford, and must identify measures that are to be taken to ensure that the noise caused by passing trains in the Studio at 45, Lakeside does not exceed 35dB $L_{Aeq, 30\ min}$ and 55dB $L_{A1, 30\ min}$, the standards to be met by music teaching rooms as defined in Building Bulletin 93, Acoustic Design of Schools (Table 1.1). A specific assessment will be provided for this dwelling and included in the Scheme of Assessment for review by the independent expert.

Route Sections will be defined and a separate Scheme of Assessment will be produced to cover each of the individual route sections. (Some of the individual route sections will be combined into single Schemes of Assessment.)

It is anticipated that an initial document which sets out the proposed methodology to be used in the Schemes of Assessment will be submitted to the independent expert via the LPAs without prejudice at an early stage of the process. The draft Scheme of Assessment will be also be submitted to the independent expert(s) via the LPAs (without prejudice) prior to finalising and formal submission.

2.1.2 Noise Assessment

The independent expert will be required to review the supporting calculations, or printouts of inputs and outputs from recognised computer

software, and to produce a report on the robustness of the noise-related elements of the Scheme of Assessment.

For noise, these Schemes of Assessment will include:

- identification of further baseline measurement that is required;
- prediction of noise levels from the railway in accordance with the Policy and conditions;
- assessment of eligibility for noise mitigation under the Policy;
- review of proposed mitigation measures and their effectiveness;
- proposed mitigation measures for operational noise; and
- predicted residual noise levels with mitigation in place.

As discussed above, condition 19(3) would require the independent expert to review and approve a methodology if personal communications or sound reinforcement systems are proposed to mitigate noise at Wendlebury Gate Stables. However, it has not been determined at this stage, if this activity will need to be included in the scope of work for the independent expert.

2.1.3 Vibration Assessment

For vibration, the Schemes of Assessment will show how the standards of vibration mitigation set out in the Policy will be achieved, and will include supporting calculations or empirical data, or a combination of the two. The independent expert in 19(10) will be required to review these items and to produce a report on the robustness of the vibration-related elements of the Scheme of Assessment.

2.2 ADDITIONAL TASKS

Whilst the tasks above represent a reasonable estimate of the core desktop review work, additional fees or expenses could be incurred if additional meetings are required to discuss specific issues, or if site visits are required. Additional fees and expenses would need to be approved by Chiltern Railways, in advance of these being incurred, but the authorisation of reasonable fees for the purposes of discharging the planning conditions effectively, including independent communication with the LPAs would not be unreasonably withheld. It is anticipated that this cost would not exceed an additional 4 days of time in total (2 for noise and 2 for vibration).

In order to facilitate an efficient process for condition discharge the Local Planning Authorities have requested the following to which Chiltern Railways has agreed:

- provision for confidential communication between the independent expert and the lead officer for environmental health for each LPA;
- an single initial briefing meeting with both lead officers within 2 weeks of appointment; and

- the submission of draft reports from the independent expert to each LPA 2 weeks prior to a final version.

Responsibility for approving the Schemes of Assessment and confirming that the planning conditions have been discharged rests with each Local Planning Authority, separately, but the Local Planning Authorities have agreed that, as far as possible, they will adopt a single agreed approach to technical issues and approval of the Schemes of Assessment.

2.3 COMMUNICATION PROTOCOL

The contract(s) for the work to be undertaken by the independent expert(s) will be between the independent expert(s) and Chiltern Railways (CRCL). Correspondence regarding contractual matters will be undertaken directly between the contract holder at Chiltern Railways and the independent expert(s). However, at all times, the independent expert will be expected to act in a professional expert role, as the Courts understand that term, as adviser to the LPAs. In order to maintain independence and to promote transparency in the role, it has been agreed that:

- the applicant shall ensure that all non-contractual correspondence including the submission of reports to the independent expert(s) shall be sent via the Local Planning Authority Lead Officers;

- the independent expert(s) shall ensure that all non-contractual correspondence shall be sent via the Local Planning Authority Lead Officers; and

- communication between CRCL and the independent expert(s) regarding availability and timing of resources will follow the same route as technical correspondence (ie will be via the LPA Lead Officers).

The LPA Lead Officers have made arrangements to ensure that all correspondence will be forwarded appropriately within a target timescale of two working days. The Lead Officers will arrange a method of working whereby appropriate personnel are available to receive and forward communications in the target timescale.

It is understood that communication, in confidence if necessary, might be needed between the independent expert(s) and third parties, in particular the relevant Lead Officers of the Local Planning Authorities (LPAs). While CRCL would expect to be kept informed of any matters relevant to them, the contract allows for such independent communication to take place, in a confidential manner where necessary.

2.4 DETAILS OF EXPERTS APPOINTED

A number of consultants with the necessary experience in railway noise mitigation and vibration mitigation were considered for this role. Following

consultation with the Local Planning Authorities and in view of the specialist nature of railway noise and vibration, separate experts have been selected for each topic area. Brian Hemsworth and Dr Chris Jones have been commissioned to fulfil the independent expert role, in relation to noise and vibration respectively. The independent experts have been selected from a short list of railway specialists based on the depth of their experience in their subject areas, and their practical and theoretical experience of mitigating railway noise and vibration. Details of their qualifications and experience are listed in *Annex B.*

The need for a specialist in personal communications or sound reinforcement systems will be reviewed as the design of mitigation at Wendlebury Gate Stables progresses.

Annex A

Operational Noise and Vibration Conditions

The conditions are shown below, and the requirements for approval by the local planning authorities and involvement by an independent expert are highlighted in bold.

1. Operational noise and vibration monitoring and mitigation shall be carried out in accordance with the Noise and Vibration Mitigation Policy, January 2011 (Inquiry document CD/1.29/2.1, referred to in this condition as "the Policy") and this condition. In the event of any conflict between the two, this condition shall prevail.

2. Development shall not commence within each Individual Section, until a detailed scheme of assessment of predicted noise impacts during operation of Phase 1 and 2A of the railway works, predicted vibration effects of the railway with Phases 1, 2A and 2B and details of proposed monitoring and mitigation measures, has been submitted to and ***approved in writing by the local planning authority****.*

3. The schemes of assessment of the predicted noise impacts of Phase 1 and 2A and of Phase 2B on the Individual Section or Sections that abut Wendlebury Gate Stables shall also identify measures that should be taken to ensure, insofar as reasonably practicable, that the noise caused by individual passing trains, using the railway, does not significantly impede voice communication over a distance of 30 metres within either the "large riding school" or the "small riding school" at those Stables, or within the paddock opposite Bramlow. For direct voice communications (i.e. without electro- acoustic assistance), the term "not significantly impede" shall be taken to mean that the speech intelligibility shall be at least "fair" at an increased (i.e. "loud") vocal effort as defined in BS EN ISO 9921:2003 Ergonomics Assessment of Speech Communications. The assessment method used shall be the Speech Interference Level as described in Annex E to that Standard. The assessment shall be based on a native female speaker facing the rider under instruction and the standard to be achieved will be for alert situations where short known words are used and the wind speed is less than 5 metres per second. A correction factor of -5dB shall be used to convert the standard for male voices to female voices. ***If personal communications or sound reinforcement systems are proposed, the assessment methodology shall be subject to the approval of the independent expert appointed in accordance with Condition 19.9.*** *This part of the condition shall not apply if, at the time of assessment, the Stables are no longer a licensed riding establishment under the Riding Establishments Act 1964.*

4. The schemes of assessment of the predicted noise impacts of Phase 1 and 2A and of Phase 2B on the Individual Section or Sections that abut 45 Lakeside shall also identify measures that shall be taken to ensure that the noise caused by passing trains in the Studio at 45, Lakeside does not exceed 35dB $L_{Aeq,\ 30\ min}$ and 55dB $L_{A1,\ 30\ min}$, the standards to be met by music teaching rooms as defined in Building Bulletin 93, Acoustic Design of Schools (Table 1.1).

5. Where vibration mitigation measures required for Phase 2B can be installed cost-effectively during the Phase 1 and 2A works, this shall be done. All mitigation measures, including those prescribed in the Noise Insulation (Railways and Other

Guided Transport Systems) Regulations 1996, required for Phase 1 and 2A shall be installed as soon as possible after commencement of the works and no later than the date on which a passenger rail service is resumed on that section of railway.

6. Any monitoring of noise and vibration shall be undertaken in accordance with the approved scheme of assessment and the Policy.

7. Before the commencement of the laying of the second track between the MoD Depot at Bicester and Islip, a detailed scheme of assessment of the predicted noise impacts arising from the works and from the additional services assessed as likely to operate under Phase 2B in the Environmental Statement and details of proposed mitigation measures, which achieve the standards for noise and vibration attenuation set out in the Policy, shall be submitted to and ***approved in writing by the local planning authority.***

8. Any vibration mitigation measures not already installed during the Phase 1 and 2A works necessary for Phase 2B shall be installed during the Phase 2B works. All mitigation measures, including those prescribed in the Noise Insulation Regulations (Railways and Other Guided Transport Systems) 1996, required for Phase 2B shall be undertaken as soon as possible after commencement of the works and completed no later than the date on which the second track is brought into use.

9. The submitted schemes of assessment shall show how the standards of noise mitigation set out in the Policy will be achieved. Supporting calculations, or printouts of inputs and outputs from recognised computer software, shall be provided. ***Each scheme shall be accompanied by a report, prepared by an independent expert previously approved in writing by the local planning authority, on the robustness of the noise-related elements of the scheme of assessment.*** *Noise mitigation measures shall be permanently installed as approved.*

10. The submitted schemes of assessment shall show how the standards of vibration mitigation set out in the Policy will be achieved. Supporting calculations or empirical data, or a combination of the two, shall be provided. ***Each scheme shall be accompanied by a report, prepared by an independent expert previously approved in writing by the local planning authority, on the robustness of the vibration-related elements of the scheme of assessment.*** *Vibration mitigation measures shall be permanently installed as approved.*

11. The submitted schemes of assessment shall include a list of properties assessed and the results of the assessment at each. By the times that the mitigation measures are due to be brought into use, notice shall be served on the local planning authority of the mitigation measures that have been installed for each property assessed.

12. The situation may arise in which Chiltern finds "not reasonably practicable" the provision of mitigation measures that otherwise would be required by the Policy. In such circumstances, the mitigation measure or an equally effective substitute previously approved in writing by the local planning authority shall be installed in the timescale set out in item 1.10 of the Policy, unless the ***local planning authority has confirmed, in writing, its agreement*** *that the mitigation in question is not reasonably practicable and that there is no suitable substitute.*

13. Where noise barriers are promoted in an approved scheme of assessment, they shall be installed only once the ***local planning authority has given written approval of their size, appearance and location****. Noise barriers shall be maintained in their approved form and may be removed only with the written approval of the local planning authority.*

14. Development shall be in accordance with the approved schemes and this condition.

Annex B

Details of Experts

B1 DETAILS OF EXPERTS PROPOSED

B1.1 BRIAN HEMSWORTH BSC, CENG, FIOA. - NOISE

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Brian was a member of the Acoustics Unit of British Rail Research, Derby from 1972 to 1997 responsible for research into environmental noise from railways and providing consultancy support for British Rail projects including Channel Tunnel Rail Link. This included presentation of evidence to Parliamentary Select Committees and Public Inquires. He was the Head of Acoustics from 1990 to 1996.

He formed Brian Hemsworth Noise Consultant in 1996. In this capacity he acted as external consultant to European Rail Research Institute, Utrecht, Netherlands (1997 – 2004) as the Manager of Noise and Vibration Unit. He was the coordinator of EU funded projects Silent Freight, Silent Track and STAIRRS. Other roles were as follows:

- Manager of UIC projects RENVIB(Environmental Vibration).
- Scientific Coordinator of EU Project Imagine for DeltaRail bv, Utrecht, 2005 -2007.
- Project Consultant and advisor for Heggies (located in Sydney) 2008 and 2009 on NSW Rail Projects North West Rail Link, Sydney Metro and North Sydney Freight Corridor.

He is currently an Associate with Temple working on HS2.

Brian was a member of UK Department of Transport Working Group that prepared Noise Insulation Regulations for Railways in 1996 and technical group that prepared “Calculation of Railway Noise 1995", to accompany the Noise Insulation Regulations.

He is a Chartered Engineer, Fellow of the Institute of Acoustics, and was awarded the Institute's Engineering Medal 2006.

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B1.2 DR CHRIS JONES - VIBRATION

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Dr Chris Jones worked at BR Research from 1986 to 1997 mostly in the Noise and Vibration Team where he was responsible for the development and application of computer models for rolling noise and especially ground vibration. He moved to the Institute of Sound and Vibration Research at the University of Southampton in 1997.

Starting as a Senior Research Fellow and ending as a Reader in 2011, he worked on a number of European Union and UK Research Council funded research projects in railway noise and vibration. This included the Silent Freight and Silent Track projects on railway rolling noise, STAIRRS (measurement techniques), Silence (application of quiet technologies to urban railways), Innotrack (low noise and vibration track developments) and the start of RIVAS on railway-induced ground vibration.

More academic research focussed on the development of numerical modelling techniques especially applicable to ground vibration from railways (boundary element methods for 2 and '2.5' dimensional elastodynamics etc.) Throughout his time at the ISVR Chris was engaged in consultancy work as the means by which his post was funded. Examples of consultancy were work on the vibration assessment and design of the Croydon Tramlink system, bridge noise for Thameslink, vibration prediction for the Thessaloniki Metro and advising on track requirements for Crossrail.

Since becoming a freelance consultant based in north Derbyshire, Chris has edited of the second edition of the Association of Noise Consultants Guidelines for the Measurement and Assessment of Ground Vibration and has worked with Balfour Beatty on track issues and with URS on a number of environmental vibration cases. He is currently a member of the Environmental Oversight Consultants group for the HS2 route on the subject of ground vibration.

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