



Fiona Bartholomew,
City Development,
Oxford City Council,
St Aldate's Chambers,
109-113, St Aldate's,
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OX1 1DS

29 April 2015

Dear Fiona,

**BICESTER TO OXFORD TRANSPORT AND WORKS ACT ORDER
(TWA/10/APP/01)) - DISCHARGE OF CONDITION 19 (VIBRATION
AND NOISE) AS IT RELATES TO SECTION H**

I write to you in response to your e-mail dated 16 April 2015, which sets out a number of points relating to the decision on both the Noise and Vibration Schemes of Assessment (SoA) for Section H and Oxford City Council's (OCC) intention to hold a Special Planning Committee meeting to determine these applications on 19 May 2015.

In particular, we wish to provide the Project's response to the queries set out in your e-mail dated 16 April 2015 relating to the imposition of speed restrictions and how the exceedance of the Scheme Vibration Dose Value (VDV) levels at 4 Bladon Close will be addressed to allow OCC to discharge Condition 19 (Vibration) as it relates to Section H.

**Why A Speed Limit Cannot Reasonably Be Imposed As A Condition On
The Discharge of Condition 19.**

You have requested that we provide OCC with the reasoning as to why a speed limit cannot be imposed as a Condition on the discharge of condition 19.

The matter of operational restrictions such as speed limits was explored thoroughly at the TWA Inquiry. Chiltern Railways' position, as summarised in its Closing Statement (CRCL/INQ/85), was that *"a speed limit in built up areas would adversely affect journey times and have a significantly deleterious effect on timetabling. Further, speed limits on the railway derive from the characteristics*

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of the railway track and its alignment. There is no expectation in Oxfordshire, England or Europe that trains because they are within an urban area should for that reason suffer inhibitions on speed' (paragraph 72). As noted in closing, 'The authorising Acts of Parliament did not and do not limit train numbers, type or speed' (paragraph 104).

Furthermore as part of the Inquiry process in a note to the Inspector on Train Service Timetable Planning (CRCL/INQ/28), it was clearly set out that in order to facilitate the envisaged services in the Franchise Agreement between Chiltern Railways and the Department for Transport (CD/2.13) it *'requires a 70mph speed limit between Peartree Junction and Woodstock Road and a 75 mph limit between Woodstock Road Junction and the approach to Oxford Station. A lower speed limit would thus result in a breach of the franchise agreement'* (paragraph 2.1).

With regard to the above the Inspector (and the Secretary of State) was satisfied that imposing speed limits for the purposes of reducing the noise and vibration impacts of the scheme in operation and the effects of trains on bats in Wolvercot Tunnel would be unnecessary (Inspector's Main Report to the Secretary of State for Transport and the Secretary of State for Communities and Local Government, July 2011, paragraph, 9.8.38 and SoS letter dated 17 October 2012, paragraph 20). The Inspector did not propose imposing speed restrictions, as advocated by numerous objectors, for the following reasons:

- a) 'No expert evidence was brought to support the views that any of the suggested speed limits would have the desired effect in the context of the Scheme, or that any one of them was necessary.*
- b) Such evidence as was brought about the relationship of train speed and resulting vibration was that the ground vibration spectra produced by passing railway trains depend strongly on factors other than train speed [6.19.10].*
- c) The planning conditions I propose would provide the surety I have described in respect of noise and in respect of vibration, without recourse to speed limits.*
- d) The suggested condition would therefore not be necessary'.*

In respect of Point (c), it should be noted that, apart from one location, at 4 Bladon Close, where there might be, under worst case assumptions, an exceedance of thresholds for vibration as set out in Andy Milne's letter of 2 April 2015, the thresholds set out in the *Noise and Vibration Mitigation Policy* (NVMP) as required to discharge Condition 19 can be shown to be capable of being met without recourse to any speed limit, other than the maximum line speed.

Actions to Deal with the Potential Exceedance of Vibration Dose Value at 4 Bladon Close

In order to secure approvals of the Vibration SoAs on 19 May, without recourse to speed limits, Network Rail is willing to agree not to install the proposed Switches and Crossing (S&C), which was proposed to be located in the vicinity of 4 Bladon Close (otherwise known as the Woodstock Road Crossover). The effect of this would be to bring the estimated Vibration Dose Values (VDVs) at 4 Bladon Close well within the Scheme limits during both day and night periods.

You had also asked us to review the predicted VDVs at 3 Bladon Close. We had already completed this before making the decision not to proceed with this S&C and can confirm that these were already below the limits.

The submitted Vibration SoA can therefore stand as an assessment of the 'worst case scenarios' and still provide a robust assessment to allow OCC to discharge Condition 19 (Vibration) as it relates to at Bladon Close and its neighbouring properties.

The Project now proposes to relocate the S&C to a position further north, but still within Section H, at Lakeside. The general layout of the proposed S&C is shown on Atkins drawing no 5114534-ATK-DRG-MD-790203 Rev P01 – chainage 125550, attached here as Annex 1. This location has been chosen in order to be well away from nearby residential (and commercial) properties.

Atkins has undertaken a further vibration assessment for the proposed relocation, attached here in full as Annex 2 (*East West Rail Phase 1: Vibration Assessment for Proposed Relocation of Switches and Crossings in Section H*). This assesses the potential vibration impacts on the nearest property to the S&C, which is identified as 8 Carey Close. This property is located approximately 87.5m and 100m south of the 2 relevant parts of the crossing.

The assessment shows that, based on both the typical transfer functions and the worst-case transfer functions, the estimated VDVs at 8 Carey Close are well within the Scheme vibration threshold limits.

The relocation of the S&C as outlined above will therefore address the potential exceedances at 4 Bladon Close, noted in Andy Milne's letter of 2 April 2015, and will not result in any adverse impacts at the new location, because of the much greater distances from the nearest residential property.

Assessment of Potential Noise Impacts of the relocation of Switches and Crossings

A consequential effect of removing the S&C will be also to reduce the predicted residual noise levels, to some extent, at 4 Bladon Close and other nearby properties.

Although this might be sufficient just to take one or two properties below the noise insulation thresholds, Network Rail is prepared to ignore this and keep the barrier design/location and the eligible properties for noise insulation the same as in the submitted Noise Scheme of Assessment at this location.

The submitted Noise SoA can therefore stand as an assessment of the 'worst case' and still provide a robust assessment at this location.

We have also modelled the noise effects around the proposed relocated S&C at Lakeside. This shows that the addition of the S&C here will make no significant difference to the predicted noise levels at the receptors shown in the NSoA. The initial noise contour mapping suggests that there are no other properties in the vicinity that would be adversely affected and that no changes to the barrier lengths/siting (or eligibility for noise insulation) will be necessary. We are verifying those results but will be able to provide new predictions for the named receptors and a revised extract of the noise contour mapping in the next day or so, to provide confirmation of our initial conclusions set out in this letter.

Post Construction Monitoring

The removal of the S&C and the Atkins Technical Note (*East West Rail Phase 1: Vibration Assessment for Proposed Relocation of Switches and Crossings in Section H*) shows that there is now no risk of exceedance of the vibration limits and therefore no necessity for post-construction vibration monitoring. If, however, the City Council considers that such monitoring is justified, Network Rail would be prepared to undertake monitoring using a methodology and at an appropriate location(s) to be agreed with the Council.

Operational noise monitoring will be undertaken as set out in the NVMP and amplified in the responses given to consultees.

Track Alignments

The horizontal and vertical track alignments that have been assessed in the Schemes of Assessment (as now amended) can be taken as being the 'final' designs that Network Rail intend to construct.

Conclusion

We trust that the proposed relocation of the S&Cs meets the particular concerns of the City Council and this letter provides the requisite information to show the benefits of the relocation of the S&Cs to address the potential vibration exceedance at 4 Bladon Close.

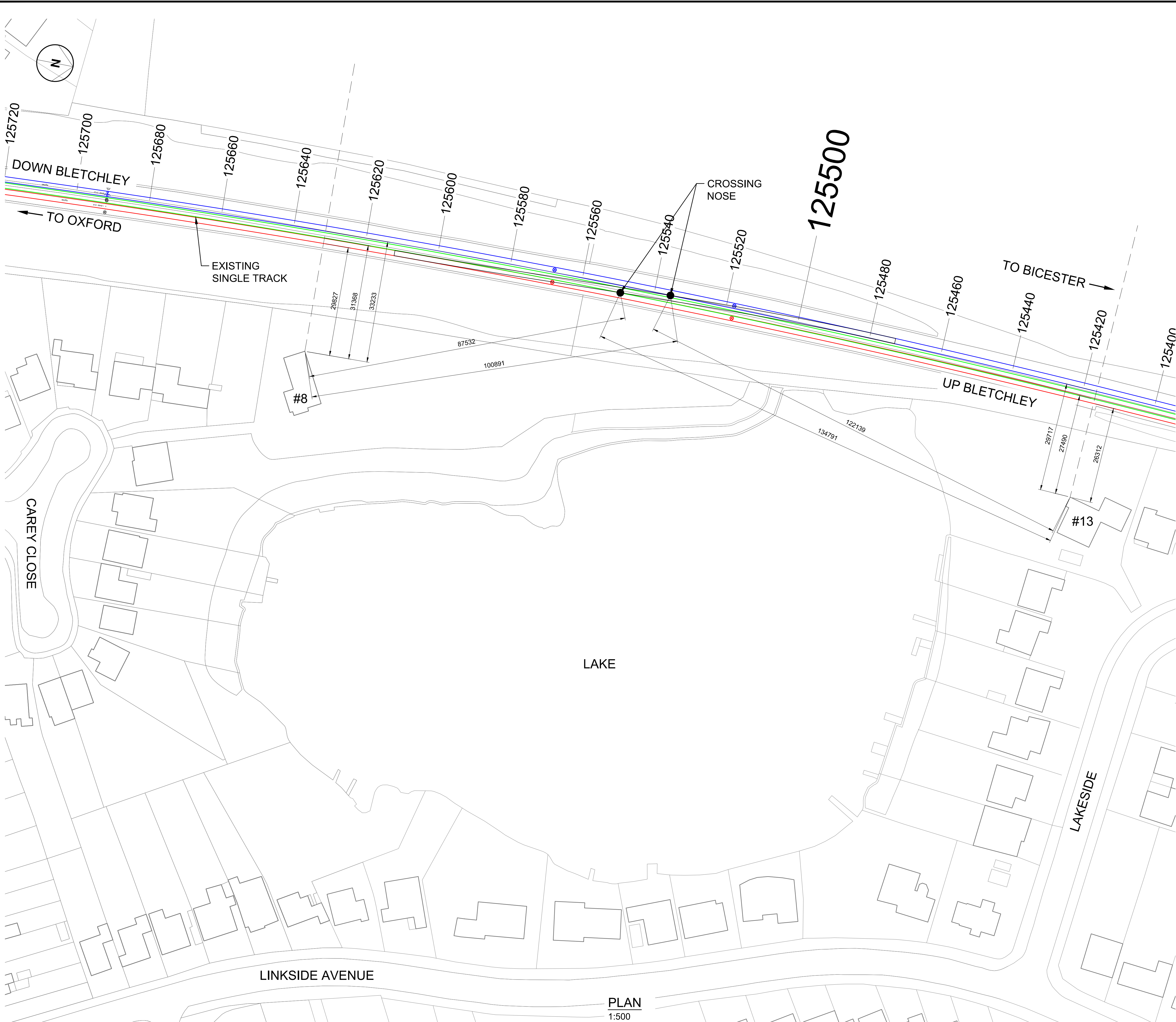
If there are any aspects of this letter that you wish to discuss, please talk to me or to Ian Gilder, the ERM Project Director. If there is further information you need to complete your reports on either the Vibration SoAs or the Noise SoA for Section H, not noted above, please let me know and we will do our best to provide it to allow approvals to be recommended on 19 May 2015.

Yours sincerely,



Andrew Deacon
Consultant
ERM

Annex 1 - Atkins Drawing No 5114534-ATK-DRG-MD-790203 Rev P01



- Legend/Notes
1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
 2. THIS DRAWING IS BASED ON OS TILES.
 3. TWA DRAWING INFORMATION IS AS SUPPLIED BY ARDENT AND IS FOR INFORMATION ONLY. FOR SPECIFIC QUERIES REGARDING TWA/LAND BOUNDARIES CONTACT ARDENT.

Rev	Date	Description of Revisions	Drawn	Chkd	Appr
P01	28/04/15	FOR INFORMATION	MB	IE	PH

FOR INFORMATION



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Project

EAST WEST RAIL PHASE 1

Drawing Title

WOLVERCOTE AREA
S&C GEOMETRY
CH 125473 TO CH 125607

Designed	VARIOUS	Signed	Date
Drawn	M BUDD	Signed	28/04/2015
Checked	I EKICI	Signed	28/04/2015
Approved	P HAMPSHIRE	Signed	28/04/2015
Scale(s)	AS SHOWN	ELR & Mileage	Date

Alternative Reference	Sheet	of	Revision
Drawing Number	5114534-ATK-DRG-MD-790203	P01	

**Annex 2 - (East West Rail Phase 1: Vibration Assessment for Proposed
Relocation of Switches and Crossings in Section H)**

Technical note

East West Rail Phase 1: Vibration Assessment for Proposed Relocation of Switches and Crossings in Section H

28 April 2015

Proposed New Location for the Switches and Crossings Previously Proposed adjacent to Bladon Close

The Project is proposing to relocate the S&C previously proposed adjacent to Bladon Close to a position further north at Lakeside, which is further away from nearby residential (and commercial) properties. The general layout of the proposed S&C is shown on the map extract below:



The nearest property is identified as 8 Carey Close and is approximately 87.5m and 100m from the 2 crossing points.

Assumptions

The calculations take into account the distance between the crossing points and the nearest property and use the service level assumptions made in Noise Scheme of Assessment (NSoA). A summary of the main differences in assumptions between VSoA and NSoA are summarised below:

Technical note

Table 1: Summary of Frequency Based Transfer Functions

Item	Original assumptions in VSoA	Revised assumptions in line with NSoA
No. of day-time passenger trains	79/79 in Up/Down directions	63/62 in Up/Down directions
No. of night-time passenger trains	14/14 in Up/Down directions	11/10 in Up/Down directions
Stone train speed (day-time only)	60mph	50mph/20mph in Up/Down directions
Passenger and conventional freight speeds in Down direction	60mph	70mph
Distribution of stone train	1 loaded stone train on each track	2 loaded trains in Down direction and no loaded trains in Up direction

The following frequency based transfer functions derived previously at a single family residence are used in the calculations to estimate the vibration transfer between outside and inside of the property:

Table 2: Summary of Frequency-Based Transfer Functions

Dwelling Type	Transfer Function	
	Typical values	Reasonable worst case
Single family residence	1.85	3

Assessment

Using the transfer functions and the assumptions above, the internal vibration levels from the S&C are estimated as follows:

Table 3: Summary – Internal VDV's using Frequency-Based Transfer Functions

Property	Time Period	Avg VSoA Calculated External VDV's (open ground)	Internal vibration Levels, VDV, m.s-1.75		
			Calculated based on Typical transfer functions	Calculated based on Reasonable worst case transfer functions	Project Limits
8 Carey Close	Day-time	<0.01	<0.01	0.02	0.4
	Night-time	<0.01	<0.01	0.01	0.2

The assessments for S&C amplifications apply conservative assumptions in line with the rest of the assessments. It should be noted that the updated assumptions above do not take into account a reduction in amplification factors which would be expected at speeds lower than 60mph.

Technical note

Conclusions

The calculations show that based on both the typical transfer functions and the worst-case transfer functions, the estimated VDV's at the property nearest to the proposed new S&C location in Section H are well within Scheme limits.

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