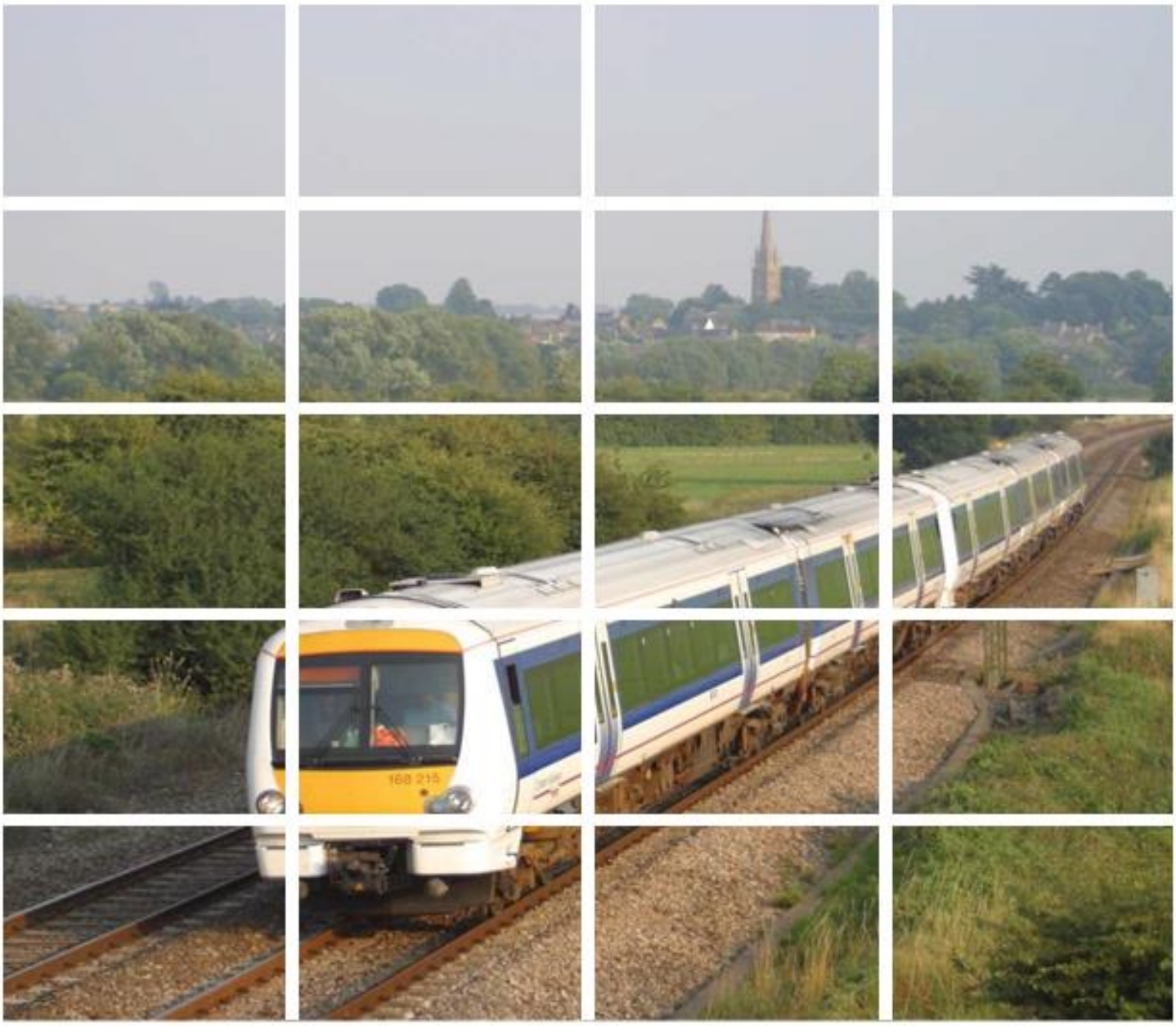

Chiltern Railways

NetworkRail

Supplementary Information to the NSoA for Route Section D, Relating to Amendments to the Noise Barrier at Oddington Crossing.

January 2017

www.erm.com

The business of sustainability

ERM

Network Rail / Chiltern Railways

Supplementary Information to the NSoA for Route Section D, Relating to Amendments to the Noise Barrier at Oddington Crossing.

January 2017

Reference: 0221083/11/D11

Author: Jamie Hogg

Technical Reviewer: Mike Fraser

For and on behalf of
Environmental Resources Management

Approved by: Ian Gilder

Signed: [redacted]

Position: Head of Planning

Date: 17/01/2017

Environmental Resources Management Limited
Incorporated in the United Kingdom with registration number 1014622
Registered Office: 2nd Floor, Exchequer Crt, 33 St Mary Axe, London, EC3A 8AA

1 INTRODUCTION

The Chiltern Railways (Bicester to Oxford Improvements) Transport and Works Act Order 2012 authorises the construction and operation of an improved railway between Bicester and Oxford. The planning direction (or 'deemed planning permission') is subject to a number of conditions.

Planning condition 19(1) requires operational noise monitoring and mitigation to be carried out in accordance with the Noise and Vibration Mitigation Policy (NVMP).

Details of the proposed noise mitigation are set out in Noise Schemes of Assessment.

The Noise Scheme of Assessment for *Route Section D* (NSoA) was submitted to Cherwell District Council (CDC) in May 2015 and subsequently approved in July 2015 (14/00151/DISC).

The NSoA included two noise barriers, each intended to mitigate noise from the Order Scheme at a single property located close to the railway. At the request of the owner of one of the two properties, Oddington Crossing Station House, the barrier installed adjacent to this property is approximately 19 m shorter than the one presented in the NSoA (the height remains the same). The owner, Mr. North, does not wish the full length of barrier to be installed because of the loss of amenity from his garden and property that it would cause.

Network Rail (NR) has instructed ERM to carry out a review and provide supplementary information relating to the amended noise barrier, to enable CDC to consider approving this amendment and the associated noise insulation proposed within this report.

The approved NSoA provides full details regarding the assessment of noise mitigation that was carried out in accordance with the NVMP. This information has not been repeated here. However, the same approach has been followed in this assessment. This document should therefore be read in conjunction with the NSoA.

This document presents the results of an assessment of the unmitigated and residual (1) noise impacts from the Order Scheme at Oddington Crossing with the reduced length noise barrier that has now been installed at the request of the owner of Oddington Crossing Station House. A comparison of the predicted acoustic performance of the barrier with the barrier presented in the NSoA is also included.

As part of the assessment included in this report, L_{Amax} noise contours for the amended barrier at Oddington Crossing are compared with the contours for the NSoA barrier. Following the issue and approval of the NSoA for *Route Section D*, irregularities in the L_{Amax} noise contours presented in the NSoA for *Route Section H* were identified which were found to result from a computational feature of the version of SoundPlan that was being used (version 7.1). This had the small effect of artificially increasing predicted noise levels in some specific areas. Subsequently, the modelling was repeated for *Route Section H* using an updated version of SoundPlan (version 7.3), which does not exhibit this feature. The contours used in this assessment for the NSoA barrier have been taken directly from the NSoA and were therefore produced using SoundPLAN version 7.1. For the amended barrier, they were produced using SoundPLAN version 7.3.

As-built barrier drawings were obtained through surveys and provided to ERM by NR as CAD drawings, by e-mail on 25 August 2016. The drawings include the heights of the base of the barriers. Height data for the screening edge of the barriers was provided separately.

(1) Ie, the noise impact after the noise mitigating barriers have been taken into account.

Table 3.1 presents the locations of the NSoA barrier and amended barrier at Oddington Crossing. *Table 3.2* presents the predicted unmitigated and residual noise from the Order Scheme at Oddington Crossing for the NSoA and installed barriers.

Figure 3.1 presents noise contours for the installed barrier. This figure presents the same key noise predictions as those presented in *Figure 5.1* of the NSoA. The noise contours are presented at a height of 5 m above ground, 1st floor window height. The following noise contours are included:

- Contour showing predicted (free field) noise level, $L_{Aeq,8h}$ of 45dB(A), for the night time period 23.00 – 07.00. Significant impacts are not expected at properties which fall outside this contour.

- Contour showing predicted (free field) noise level, $L_{Aeq,8h}$ of 55dB(A), for the night time period 23.00 – 07.00. Properties within this contour may be eligible for further noise mitigation, likely to be in the form of a noise insulation package, except where the change in baseline noise levels as a result of the Order Scheme is predicted to be less than 10 dB(A).

- Contour for a maximum (free field) night time noise level $L_{Amax,s}$ of 82dB(A). Properties within this contour may be eligible for further noise mitigation, likely to be in the form of a noise insulation package.

- Contour showing predicted relevant (façade) noise level (as defined in the NIR), $L_{Aeq,6h}$ of 63dB(A), for the night time period 00.00 – 06.00. Properties within this contour may qualify for statutory noise insulation.

Figure 3.2 presents the contour for a noise level, L_{Aeq}, of 55 dB(A) at night and compares it with the contour for the same noise level predicted with the barrier presented in the NSoA. Properties within this contour may be eligible for further noise mitigation, likely to be in the form of a noise insulation package, except where the change in baseline noise levels as a result of the Order Scheme is predicted to be less than 10 dB(A).

Figure 3.3 presents noise contours showing the difference in predicted residual average noise levels between the NSoA and installed barriers.

Figure 3.4 presents the contours for a night time maximum noise level of 82 dB(A) for the installed and NSoA barriers. Note that, as described in *Section 2*, a different version of the noise modelling software was used to produce the two maximum noise level contours used in the comparison.

Table 3.1 Location of Oddington Crossing Noise Barriers

Noise Barrier	Up / Down Line [1]	Start Chainage (m) [2]	End Chainage (m) [2]
NSoA Noise Barrier	Down	118310	118360
Amended Noise Barrier	Down	118320	118350

1) The Order Scheme (Phase 1, 2A and 2B) includes double track throughout Route Sections A to H. The tracks are identified as an 'Up' line (which carries trains running from Bicester to Oxford) and a 'Down' line (which carries trains running from Oxford to Bicester). As trains drive on the left, the Up line lies to the southeast of the Down line.
2) Project chainage for the Bletchley Line.

Table 3.2 ***Results of the Noise Modelling at Oddington Crossing Station House (Free-field, at 1st Floor Level). Results are the Same for Both the NSoA and Installed Barriers*** [1]

	Results Without Mitigation [1]		**Results With Noise Barrier** [1]	
	Day ($L_{Aeq,16h}$)	**Night ($L_{Aeq,8h}$)**	**Day ($L_{Aeq,16h}$)**	**Night ($L_{Aeq,8h}$)**
Predicted Train Noise / Exceedence of Threshold [2], dB	67 / **12**	65 / **20**	64 / **9**	61 / **16**
Baseline Noise Level (Without Baseline Trains / With Baseline Trains) [3], dB	37 / 52	31 / 49	37 / 52	31 / 49
Resulting Total Noise Level / Change in Noise Level [3], dB	67 [6] / **15**	65 [6] / **16**	64 [6] / **12**	61 [6] / **12**
Predicted Impact [4] , dB	**12**	**16**	**9**	**12**
Maximum Noise Level ($L_{Amax,night}$), dB	- [5]	94	- [5]	92
Noise Insulation (statutory [7] or non-statutory [8])			Yes (statutory and non-statutory)	

1) The predicted results at this assessment location (which is the same location that was used in the NSoA), are the same for both the NSoA barrier and the amended barrier. This is discussed later in this section.

2) As described in the Noise and Vibration Mitigation Policy (The Policy) and in *Section 2.3* of the NSoA, the noise impact threshold levels are 55 dB, $L_{Aeq\ (07.00 - 23.00\ hours)}$ during the day and 45 dB, $L_{Aeq\ (23.00 - 07.00\ hours)}$ at night

3) Noise from existing train movements was removed from measured baseline noise levels. The 'Resulting Total Noise Level' combines predicted train noise from the Order Scheme with existing baseline noise (without existing train noise as this will be replaced by the Order Scheme). The 'Change in Noise Level as a Result of the Order Scheme' compares the 'Resulting Total Noise Level' with existing baseline noise levels. Predicted train noise from existing railway traffic has been added to these baseline noise levels (from which existing train movements were removed) to represent the existing baseline noise situation for a 16h day and an 8h night. However, at Oddington Crossing, existing train movements are minimal and are not expected to have a significant effect on existing noise levels.

4) The predicted impact is calculated as the lower of:
   - the amount by which train noise levels are predicted to exceed the threshold criteria. As described in the Noise and Vibration Mitigation Policy and in *Section 2.3* of the NSoA, the noise impact threshold levels are 55 dB, $L_{Aeq\ (07.00 - 23.00\ hours)}$ during the day and 45 dB, $L_{Aeq\ (23.00 - 07.00\ hours)}$ at night; and
   - the change in noise level as a result of the Order Scheme (compared to the baseline noise level including trains).

5) The Policy requires the consideration of maximum noise levels in relation to the provision of non-statutory noise insulation. The Policy states: If maximum pass-by free-field noise (L_{Amax}, the instantaneous 'peak' as the train passes) regularly exceeds 82 dB (free-field) at night, this is considered to be a significant impact, based on guidance on the prevention of sleep disturbance. Therefore only predicted maximum noise levels at night are presented here. The highest predicted maximum noise level from freight and passenger trains has been reported.

6) Train noise is predicted to be the dominant noise source at the majority of the nearest NSRs. Where this is the case, baseline noise levels do not significantly influence the resulting total noise level and so this level will be the same as the predicted train noise.

7) The process for determining statutory noise insulation is described in paragraph 2.5 of The Policy.

8) The process for determining non-statutory noise insulation is described in paragraph 2.6 of The Policy.

Table 3.2 presents the predicted unmitigated noise from the Order Scheme and mitigated noise level with the installed barrier. The predictions have been carried out at the assessment location that was used in the NSoA, which represents the window likely to be most affected by noise from the Order Scheme. As this window is situated towards the middle of the noise barrier there are no significant differences in predicted noise as a result of the reduced barrier length.

KEY:

- Baseline noise monitoring locations
- Noise Receptors
- Rail centreline
- Buildings
- Noise Barrier
- Contour showing predicted (free field) noise level, $L_{Aeq,8h}$ of 55dB(A), for the night time period 23.00 – 07.00. Properties within this contour may be eligible for further noise mitigation, likely to be in the form of a noise insulation package, except where the change in baseline noise levels as a result of theOrder Scheme is predicted to be less than 10 dB(A)
- Contour showing predicted (free field) noise level, $L_{Aeq,8h}$ of 45dB(A), for the night time period 23.00 – 07.00. Significant impacts are not expected at properties which fall outside this contour
- Contour for a maximum (free field) noise level $L_{Amax,s}$ of 82dB(A). Properties within this contour may be eligible for further noise mitigation, likely to be in the form of a noise insulation package
- Contour showing predicted Relevant (façade) noise level (as defined in the NIR), $L_{Aeq,6h}$ of 63dB(A), for the night time period 00.00 – 06.00. Properties within this contour may qualify for statutory noise insulation

ES 8

NML(ES)5

0 2 4 6 8
Meters

N

SCALE: See Scale Bar	VERSION: A01
SIZE: A3	DRAWN: AZ
PROJECT: 0172205	CHECKED: MF
DATE: 06/01/2017	APPROVED: KB

Figure 3.1 Location of Noise Barrier, Noise Contours showing extent of Noise Insulation and Residual Noise Levels from the Order Scheme

ERM

CLIENT: NetworkRail

PROJECTION: British National Grid

Path: P:\Projects\0221083ChilternsRailwayGIS_JL_AD\0172205ChilternGIS_AZ_SG\MAPS\NOISE\SectionD\Figure 3_1 - Location of Noise Contours from the Order Scheme.mxd

Figure 3.2 ***Comparison of the Contour for a Mitigated Noise Level, L_{Aeq}, of 55 dB(A) at Night Predicted with the Installed Barrier and the Barrier Presented in the NSoA (at 1st Floor Height)***

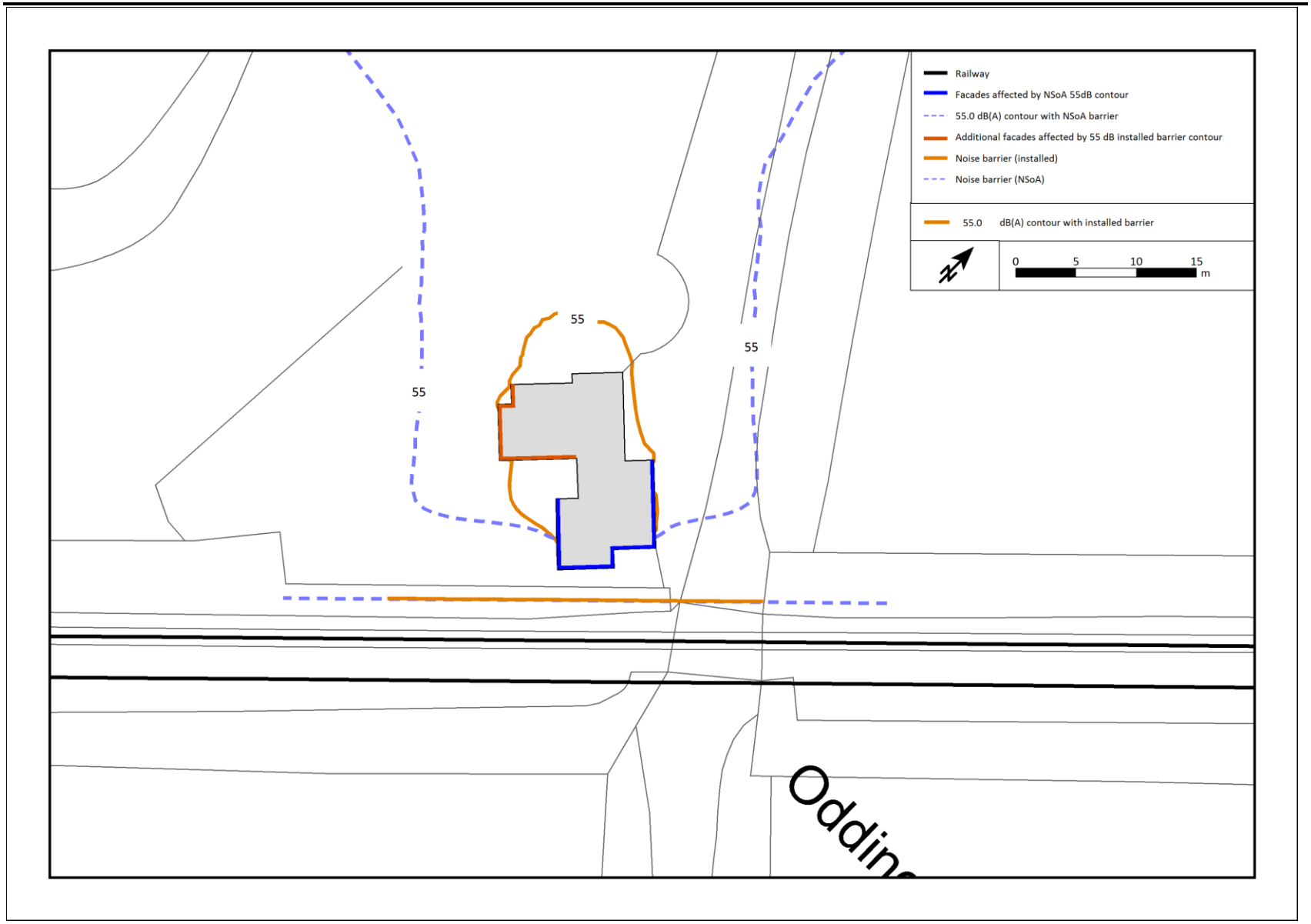

Figure 3.2 presents the contour for a noise level, L_{Aeq}, of 55 dB(A) at night and compares it with the contour for the same noise level predicted with the barrier presented in the NSoA. A noise level, L_{Aeq}, of 55 dB(A) at night exceeds the night-time Noise Threshold Level set out in the NVMP, of 45 dB(A), by 10 dB. As baseline noise levels here are not sufficient to affect the assessment of impacts, these contours represent one of the threshold levels for consideration of non-statutory noise insulation. The other threshold level, which is in terms of train maximum noise levels, is discussed below. The figure highlights the additional facades of the property which are now predicted to trigger consideration of non-statutory noise insulation. An offer will be made by NR to provide noise insulation to windows on these facades to mitigate noise from the Order Scheme.

Figure 3.3 ***Contours Showing the Difference in Predicted Acoustic Performance at Night, in Terms of Average Noise Levels, L_{Aeq}, From the Order Scheme, Between the Installed Barrier and the Barrier Presented in the NSoA (at 1st Floor Height)***

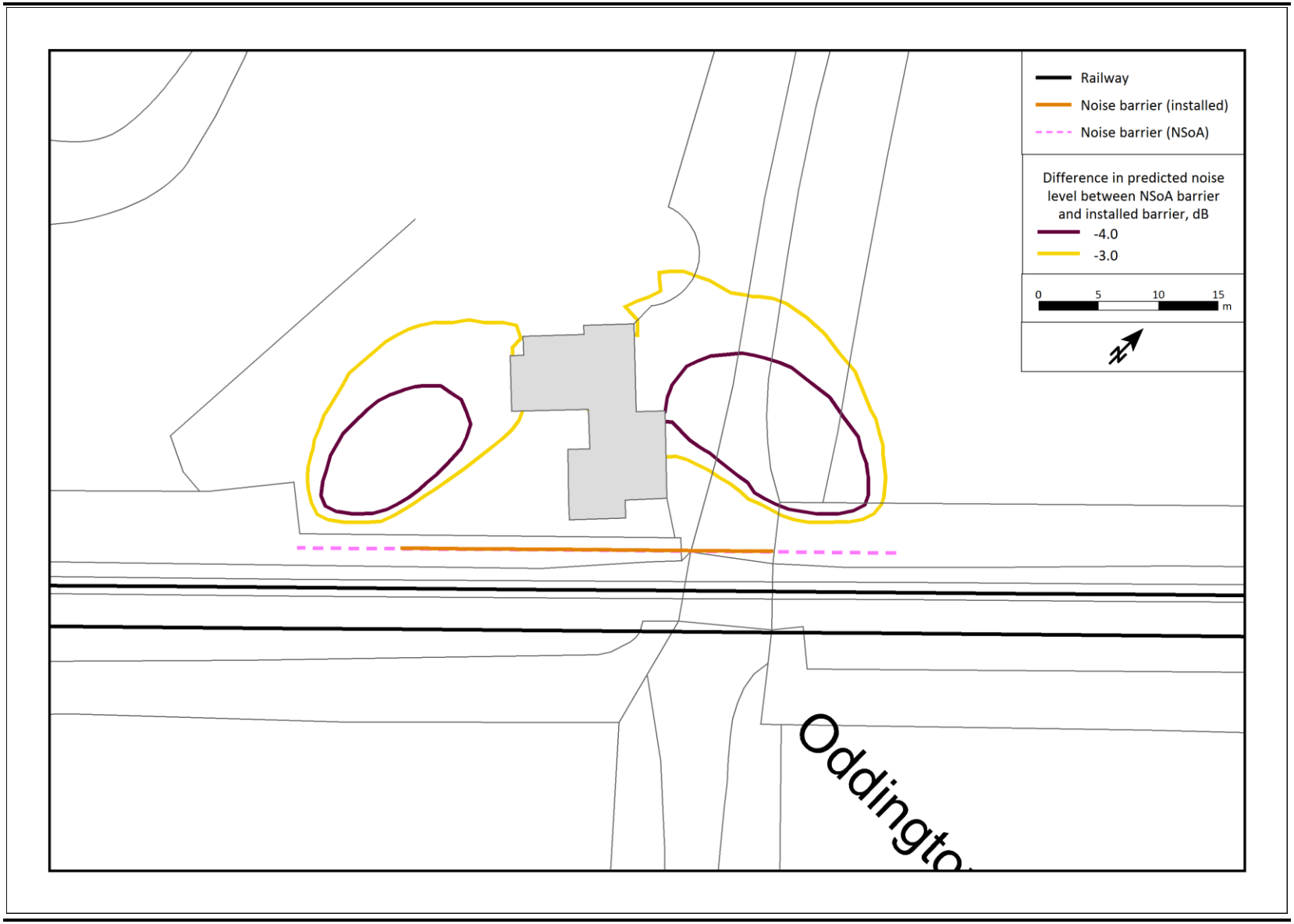

Figure 3.3 shows the predicted reduction in acoustic performance, in terms of average noise from the Order Scheme, between the NSoA and installed barriers, at 1st floor level.

The installed barrier is approximately 19 m shorter than the barrier presented in the NSoA. As a result, reductions in acoustic performance of approximately 3 dB are predicted at the windows to the front and rear of the property, most of which will qualify for non-statutory noise insulation. No reductions in performance are predicted at the side façade facing the railway, where the highest unmitigated train noise levels would be expected.

Figure 3.4 ***Contours Showing the Difference in Predicted Acoustic Performance, in Terms of Maximum Noise Levels, $L_{Amax,night}$, From the Order Scheme, Between the Installed Barrier and the Barrier Presented in the NSoA (at 1st Floor Height)***

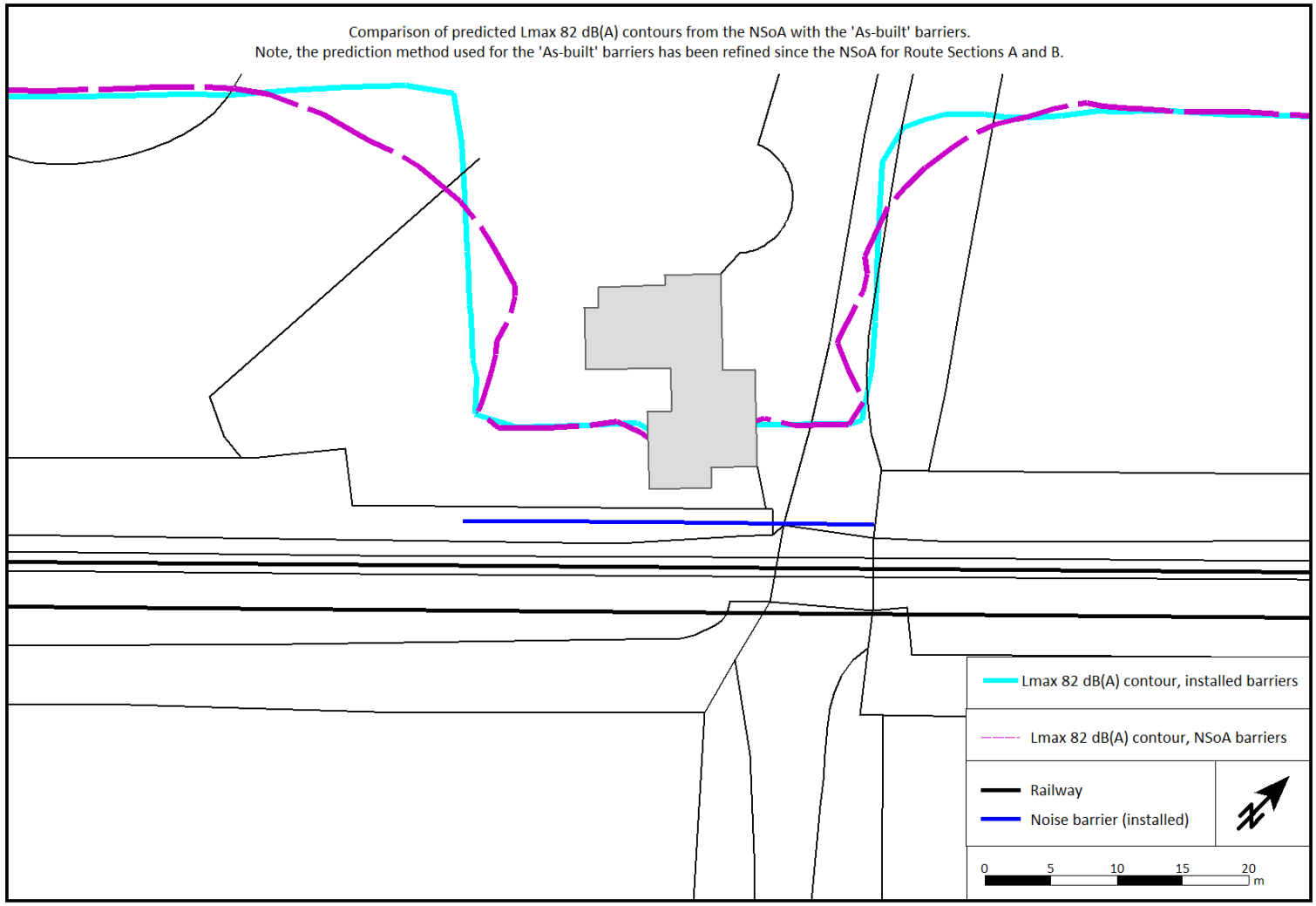

Figure 3.4 presents the contours for a night time maximum noise level of 82 dB(A) for the installed and NSoA barriers. Regular exceedance of this noise level at night would trigger consideration of non-statutory noise insulation. Comparing the two contours, it can be seen that the contour for the installed barrier includes no additional windows than the contour extracted from the NSoA.

At the request of the owner of Oddington Crossing Station House, the barrier installed at Oddington Crossing is approximately 19 m shorter than the one presented in the NSoA (the height remains the same). The owner, Mr. North, does not wish the full length of barrier to be installed because of the loss of amenity from his garden and property that it would cause.

As a result of the shorter barrier, reductions in acoustic performance in terms of average noise levels of approximately 3 dB are predicted at windows to the front and rear of the property (see *Figure 3.3*). Those to the rear qualify for non-statutory noise insulation (as shown in *Figure 3.2*). To the front of the property, only the first floor bedroom and ground floor study (situated to the north, away from the railway), are noise sensitive. These, however, fall outside the contour for a noise level of 55 dB(A), L_{eq}, and so do not qualify. No reductions in performance are predicted at the façade facing the railway, where the highest unmitigated train noise levels would be expected.

Figure 3.2 presents the additional facades of the property which are now predicted to trigger consideration of non-statutory noise insulation. An offer will be made by NR to provide noise insulation to windows on these facades to mitigate noise from the Order Scheme.

A comparison of the performance of the installed and NSoA barriers in terms of maximum noise levels was carried out. The results show that the contour for the installed barrier includes no additional windows than the contour extracted for the NSoA barrier.

ERM has over 100 offices
Across the following
countries worldwide

Argentina	New Zealand
Australia	Panama
Belgium	Peru
Brazil	Poland
Canada	Portugal
China	Puerto Rico
Colombia	Romania
France	Russia
Germany	Singapore
Hong Kong	South Africa
Hungary	Spain
India	Sweden
Indonesia	Taiwan
Ireland	Thailand
Italy	The Netherlands
Japan	United Arab Emirates
Kazakhstan	United Kingdom
Korea	United States
Malaysia	Vietnam
Mexico	

ERM's Oxford Office

Eaton House, Wallbrook Court
North Hinksey Lane
Oxford
OX2 0QS

T: 01865 384800
F: 01865 384848

www.erm.com