ORBITAL INDUSTRIAL ESTATE

NOISE IMPACT ASSESSMENT

CARTERHATCH®
ARCHITECTURAL ACOUSTICS

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Summary of pages

This document comprises a front cover, pages 2 to 7 and a back cover.

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INTRODUCTION

01 Units 6 & 7 Orbital Industrial Estate, Horton Road, West Drayton, UB7 8JL have recently been occupied under Use Class B2 General Industrial. The units are currently vacant and it is proposed to expand the permitted use to include B2 as well as B8 Storage or Distribution and E(g)(iii) Industrial Processes.

02 It is understood that Hillingdon Council require an assessment of noise impacts due to the proposed expanded use of the units. This report presents the assessment of noise impacts on the nearest residential receptors to the industrial units. The aim is to identify and mitigate 'adverse impacts' and avoid 'significant adverse impacts', in-line with current national noise policy such as *Noise Policy Statement for England*, 2010 and *National Planning Policy Framework*, 2021.

ASSESSMENT CRITERIA

03 It is understood that Hillingdon Council have requested a desk-based noise assessment for Units 6 & 7 Orbital Industrial Estate. The assessment requirements are reproduced below.

"Noise Assessment

An assessment of the existing background noise/vibration level over at least a 24 hour period, comprising:

- *Predicted noise/vibration levels*
- *Identification of any acoustic mitigation required to meet the required levels or provide the necessary protection*
- *The report must be undertaken by a suitably qualified acoustician*
- *The assessment should demonstrate compliance and make reference to relevant British Standards and World Health Organisation (WHO) guidelines*
- *The identified mitigation to address noise and vibration concerns should be cross referenced within the remainder of the application."*

04 Vibration is mentioned in the Hillingdon Council assessment requirements. Vibration data given in BS 5228-2:2209 indicate that vibration from piling activities falls below the threshold of human perception (in residential buildings) with distances greater than 7 m. Industrial activities that fall under Use Classes B2, B8 and E(g)(iii) are highly unlikely to give rise to vibration levels that are equivalent to piling and the distance between the industrial units and the nearest residential properties is greater than 7 m. Therefore, it can be concluded that a vibration assessment is not necessary.

05 For this assessment, the most relevant British Standard is BS 4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial sound* (which also references the WHO guidelines: *Night noise guidelines for Europe* and *Guidelines for Community Noise*).

06 Section 11 of BS 4142 (Assessment of impacts) declares that the lower the rating level is relative to the background sound level, the less likely it is that the specific sound source will have an adverse impact or significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

Context

07 The context is an existing industrial premises that is currently permitted (and has been used) for the B2 Use Class. It is generally considered that Use Class E(g)(iii) would have the same source sound levels as B2. Furthermore, B8 use is likely to have lower source sound levels than B2 use. Therefore, it is likely that future source sound levels from the industrial units will not be significantly greater than the previous source sound levels regardless of whether the eventual use is B2, B8 or E(g)(iii). It is assumed that there were no noise complaints from residential properties near the industrial estate when Units 6 & 7 were occupied.

08 In light of this context, the requirement for a desk-based noise assessment is considered appropriate as the context indicates that the likelihood of adverse impacts should be low. Nonetheless, steps have been taken to reduce the level of uncertainty in the assessment calculations and predictions, as described in Appendix B.

EXISTING SOUND LEVELS

09 The nearest residential properties to the industrial units are on Aspen Close to the north. Figure 1 presents the locations of the industrial units and the residential properties.

10 The sound levels at the residential properties on Aspen Close have been predicted using the Strategic Noise Mapping dataset (Round 3) published by Defra. This data is intended to give a snapshot of the estimated noise from major road and rail sources across England. The data indicates that the annual average sound levels at Aspen Close are likely to be a minimum of 54 dB $L_{Aeq,16hr}$ during the daytime (07:00-23:00) and 50 dB $L_{Aeq,8hr}$ during the night-time (23:00-07:00). These estimated sound levels do not include noise from the existing industrial estates to the south of Aspen Close. Therefore, these can be considered minimum sound levels and are used in this report to assess the worst-case noise impacts.

11 The background sound level is the sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval. Therefore, the background sound levels for this assessment are taken to be 90% of the estimated ambient sound levels published by Defra. This results in background sound levels that are 5 dB lower than the ambient sound levels, which is a difference that is consistent with previous background sound surveys conducted in West London near sources of road, rail and industrial noise (for example, the Noise Impact Assessment for Unit 2 West Links, Alperton, Wembley conducted in April 2022).

12 The background sound levels used for this assessment are presented in Table A. Original noise mapping data is given in Appendix A.

Table A Background Sound Levels

Period	Background Sound Level, $L_{A90,T}$
Daytime (07:00-23:00)	49 dB
Night-time (23:00-07:00)	45 dB

Figure 1 Location Plan

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13 It is understood that no external building services plant are proposed for the industrial units. Therefore, only internal noise from industrial operations are considered in this assessment. The internal noise levels are not known. However, a worst-case noise level for a workshop/small-scale manufacturing unit in which power tools, air compressors, extraction equipment etc. are used has been estimated, based on library data for a mechanical equipment room (from Arup's Strutt v5 database, reference Egan p34). The estimated industrial sound level is presented in Table B.

Table B Estimated Internal Sound Level

Location	Specific Sound Level, $L_{Aeq,T}$
Units 6 & 7 Orbital Industrial Estate	88 dB

14 The existing external construction build-up of the industrial units is not known. However, the units appear to be constructed from a thermally insulated metal wall and roof system, which are the typical construction materials for industrial units. The sound reduction performance of these systems can range from 37 to 47 dB R_w. For this assessment it is assumed that the sound reduction performance of the external wall and roof system is 37 dB R_w (an example system is the JI Shield 120 mm Built-up System by Joris Ide Ltd).

15 The likely industrial noise level at the residential properties on Aspen Close have been predicted and a summary is presented in Table C. The predictions use the assumed internal noise level, surface area of the industrial unit walls and roof (312 m^2) and their assumed sound reduction performance to calculate the level of noise transfer (inside to outside) with a distance of 83 m between Units 6 & 7 and 2 – 28 Aspen Close. Corrections have also been applied for possible acoustic features (impulsivity and intermittency).

Table C Predicted Industrial Sound at Aspen Close

Description	Sound Level
Units 6 & 7 (internal sound)	88 dB $L_{Aeq,T}$
Resultant sound level at Aspen Close (due to noise transfer)	27 dB $L_{Aeq,T}$
Correction for impulsivity (clearly perceptible)	+6 dB
Correction for intermittency (readily distinctive)	+3 dB
Rating level	**36 dB $L_{Ar,Tr}$**

16 Comparisons between the predicted rating level and the background sound levels are presented in Table D.

Table D Assessment of Impacts at Aspen Close

Period	Background Sound Level, $L_{A90,T}$	Rating Level, $L_{Ar,Tr}$	Excess of Rating Level over Background Level
Daytime (07:00-23:00)	49 dB	36 dB	-13 dB
Night-time (23:00-07:00)	45 dB		-9 dB

17 It can be seen, from Table D, that the rating level is predicted to be 13 dB below the background sound level during the day and 9 dB below the background sound level at night. These assessment results indicate that industrial noise has a very low risk of causing adverse impacts. Therefore, no noise mitigation measures are proposed for Units 6 & 7 Orbital Industrial Estate.

CONCLUSION

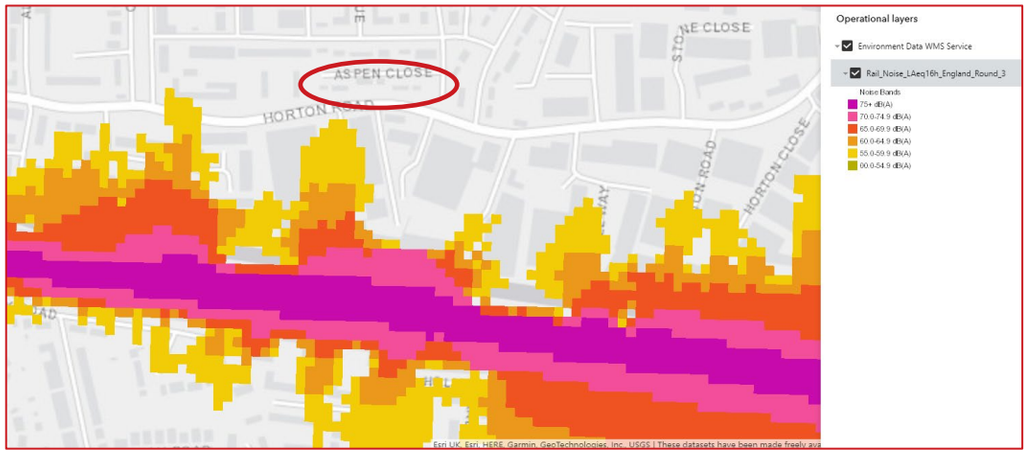
18 An assessment of the potential industrial noise impacts at the nearest residential properties to Units 6 & 7 Orbital Industrial Estate has been carried out.

19 The existing background sound levels at the residential properties have been predicted using the Strategic Noise Mapping dataset (Round 3) published by Defra.

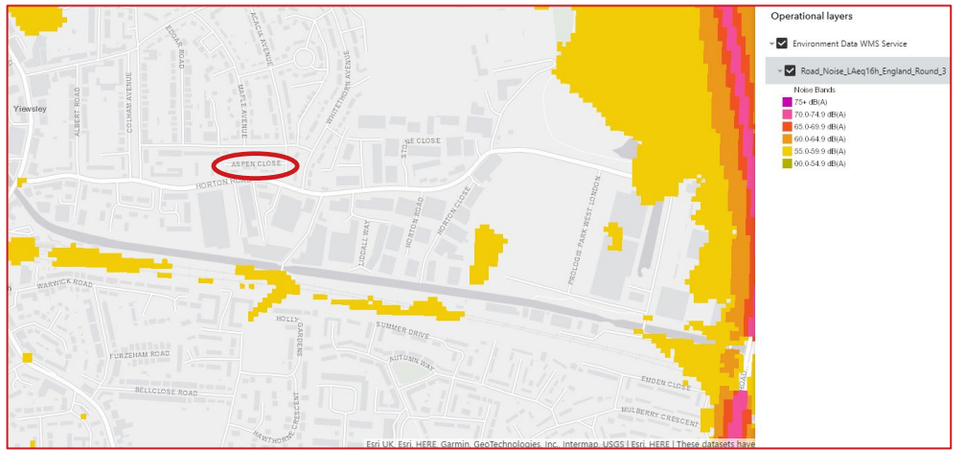
20 The level of industrial sound form Units 6 & 7 have been predicted at the location of the nearest residential properties. The rating level is below the background sound level, which indicates that adverse impacts due to noise are unlikely to occur. It can be concluded that no noise mitigation measures are needed.

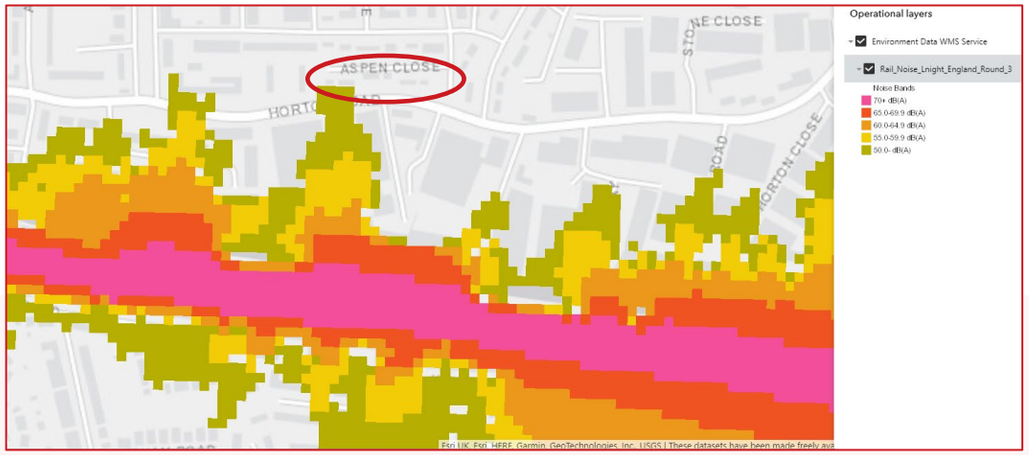
APPENDIX A

Strategic noise mapping. Contains public sector information licensed under the Open Government Licence v3.0.



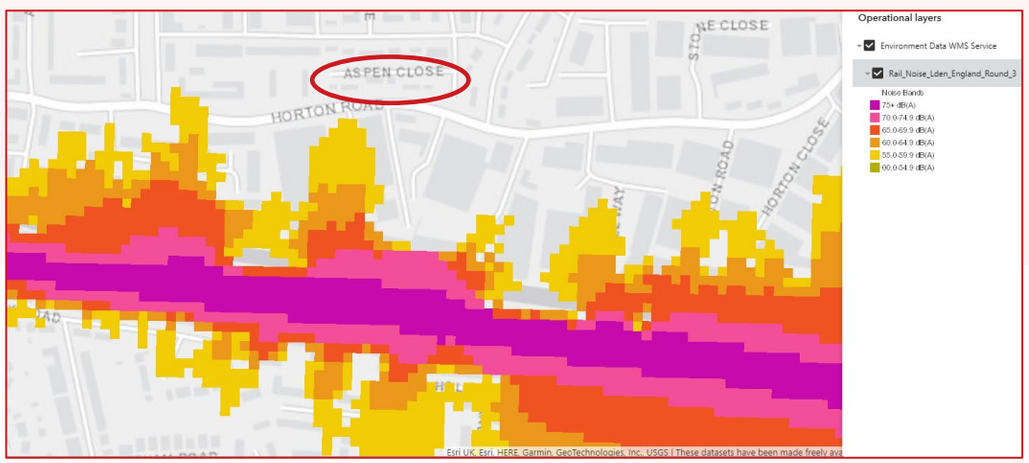
Rail Noise $L_{Aeq,16hr}$ England Round 3



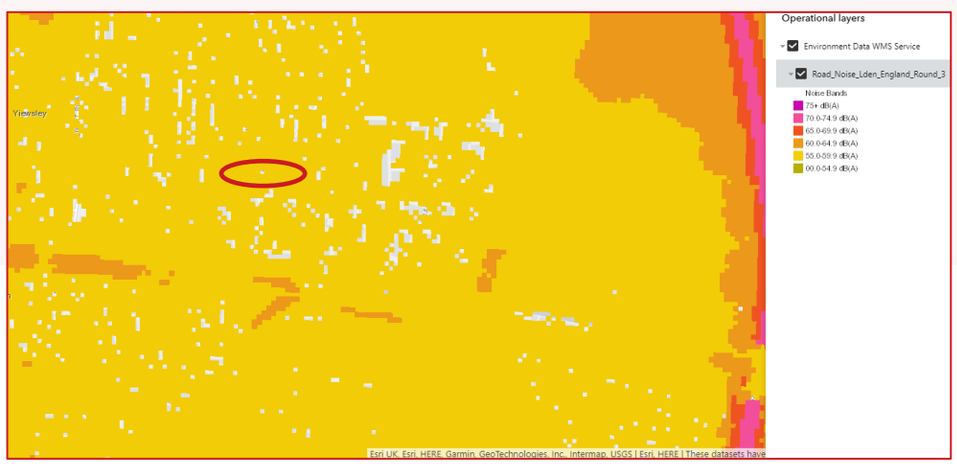


Rail Noise L_{night} England Round 3

Road Noise L_{night} England Round 3



Rail Noise L_{den} England Round 3



Road Noise L_{den} England Round 3

APPENDIX B

Industrial Source Sound Levels

Octave Band Centre Frequency Sound Pressure Level, dB								
63 Hz	**125 Hz**	**250 Hz**	**500 Hz**	**1 kHz**	**2 kHz**	**4 kHz**	**8 kHz**	**L_{pA}**
87	86	85	84	83	82	80	87	88 dB

External Wall and Roof System Sound Reduction Performance

The assumed sound reduction performance of the industrial units.

Octave Band Centre Frequency Sound Reduction Index, dB R								
63 Hz	**125 Hz**	**250 Hz**	**500 Hz**	**1 kHz**	**2 kHz**	**4 kHz**	**8 kHz**	**R_w**
18	22	28	35	37	40	46	48	37 dB

Suitably Qualified Acoustician

This assessment was conducted by Ismail Alli-Balogun, who:

- Holds a degree in **Acoustics BSc (Hons)** from the University of Salford;
- Has 14 years of experience in conducting acoustic assessments and advising developers on noise mitigation measures; and
- Has been a full member of the Institute of Acoustics (MIOA) since 2012.

Ismail Alli-Balogun is a director at Carterhatch Architectural Acoustics Ltd, which is a member of the Association of Noise Consultants (ANC) and a company partner of the Chartered Association of Building Engineers (CABE).

Uncertainty

There is an inherent (and inevitable) level of uncertainty in the assessment predictions and conclusions. However, guidance is given in BS 4142:2014+A1:2019 on measures to reduce uncertainty and its effect on the assessment conclusions.

The practical steps taken to reduce uncertainty in this assessment include:

- Selecting a high industrial source sound level;
- Assuming a low sound reduction performance of the industrial unit wall and roof system;
- Using only information for road and rail sound sources for the background sound levels and not attempting to include existing industrial sound sources;
- Using a conservative estimate of the distance between the industrial units and the nearest residential properties; and
- Using standardised calculation methods e.g. ISO 9613-2.

Due to the number of assumptions made for this assessment, the inherent uncertainty cannot be completely eliminated and may have some influence on the assessment outcome. However, the excess of the rating level over the background sound level is deemed large enough to give confidence that the risk of an adverse impact is low.

Sound from the loading and unloading of goods and materials at the industrial units has not been included in this assessment because there is no information available about future deliveries to and from the units. An indicative estimate of delivery noise suggests that the predicted rating level (Table D) is unlikely to increase if there are no more than two deliveries per hour during the daytime and one delivery per hour during the night-time. This is based on Carterhatch Architectural Acoustics' library data for delivery noise from light goods vehicles, corrections for possible impulsivity (+6 dB, clearly perceptible), the reference time interval given in BS 4142 (1 hour during the day and 15 minutes during the night) and a distance of 83 m.