Report

22 January 2021

TEMPLE
LEADERS IN ENVIRONMENT, PLANNING & SUSTAINABILITY.

Report for – Lifschutz Davidson Sandilands
Harrods Wharf Ferry Terminal
Desktop Noise Impact Assessment

Document version control

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Executive Summary

Temple Group (Temple) has been appointed by Lifschutz Davidson Sandilands to undertake a Desktop Noise Impact Assessment for the Harrods Wharf project on nearby noise sensitive receptors. The proposed redevelopment of Harrods Wharf, located on 6 Somerville Avenue, Barnes, London, SW13 8A.

London Borough of Richmond upon Thames has expressed their requirement for an assessment of the noise generated by the potential services and activities associated with the introduction of an operational wharf at the location.

This report presents criteria for plant noise emissions, the methodology and the findings of the desktop noise impact assessment, undertaken in lieu of a noise survey due to restrictions imposed by COVID-19. These have then been used to review predicted noise emission from passenger in the boarding area and air source heath pump to nearby sensitive receptors.

In summary, based on information available at the time of this assessment and the assumptions made it is predicted that noise emissions from the boarding area will need additional mitigation during operational hours.

Given that it has not been possible to determine the background noise levels through measurements at this time, it is recommended that a background noise survey be undertaken once COVID-19 restrictions are eased and travel/activity returns to more typical levels

1.0 Introduction

Temple Group Ltd (Temple) has been appointed by Lifschutz Davidson Sandilands to undertake a Desktop Noise Impact Assessment relating to the proposed use of Harrods Wharf, located in the London Borough of Richmond upon Thames (LBRuT) as a passenger ferry terminal to support local residents while Hammersmith Bridge is being repaired.

As well as allowing the ferry to operate, the Wharf is proposed to include a ticket office and a café with toilets to be serviced by air source heat pumps (ASHPs) and photovoltaic panels (PVs). The local authority, LBRuT, has requested that these be assessed along with behavioural/passenger noise.

The purpose of this report is to assess the likely noise impact on nearby noise sensitive receptors and, where noise levels are assessed to exceed recommended levels, provide in-principle recommendations as to how this could be mitigated.

While ordinarily a noise survey to establish the prevailing environmental noise levels in the area would be undertaken, due to restrictions and changes in activity due to COVID-19, a desktop assessment has been undertaken based on available information.

The acoustic terminology used in this report is explained in Appendix A.

2.0 Local Authority Discussion, Guidance and Standards

2.1 Local Authority Discussion

Dr Hedley Pugh, Senior Environmental Health Officer serving LBRuT was contacted to discuss and agree the proposed assessment methodology. A copy of the correspondence is presented in Appendix B.

London Borough of Richmond upon Thames Local Plan

The local plan[1] for London Borough of Richmond upon Thames was adopted by the Council on 3 July 2018. It sets out the Council's approach to the planning of the whole Borough up to 2033.

Policy LP 10 'Local Environmental Impacts, Pollution and Land Contamination' sets guidance for the use of developers. Noise and Vibration states:

"C. The Council encourages good acoustic design to ensure occupiers of new and existing noise sensitive buildings are protected. The following will be required, where necessary:

1. a noise assessment of any new plant and equipment and its impact upon both receptors and the general background noise levels;

2. mitigation measures where noise needs to be controlled and managed;

3. time limits and restrictions for activities where noise cannot be sufficiently mitigated;

4. promotion of good acoustic design and use of new technologies;

5. measures to protect the occupiers of new developments from existing sources."

Development Control for Noise Generating and Noise Sensitive Development

Supplementary Planning Document (SPD)[2] was adopted in September 2018 and is intended for use in conjunction with the Local Plan. Its aim is to provide a consistent approach to development where noise is an issue. The SPD is set on the following principles which must be applied in the planning process:

- *Encourage good acoustic design*
- *Improve living and working conditions where the acoustic environment already has a significant adverse effect on people's quality of life; and*
- *Improve and enhance the acoustic environment and promote soundscapes that are appropriate for the local context, including the promotion of a vibrant acoustic environment where this is appropriate and the protection of relative tranquillity and quietness where such features are valued.*
- *Mitigate and reduce to a minimum the adverse effects of noise within the context of sustainable development;*

[1] London Borough of Richmond upon Thames Local Plan, July 2018

[2] Development Control for Noise Generating and Noise Sensitive Development, September 2018

- *Avoid significant adverse effects of noise on people living and working in the*
- *Borough within the context of sustainable development;*
- *Prevent development which is unacceptable in terms of noise.*

It is expected from the applicant to demonstrate to the Local Planning Authority (LPA) the noise generated by a noise generating development *"has been mitigated and reduced to a minimum and that the principles of good acoustic design have been followed".*

Consideration must be given to the following:

"For schemes that may generate noise, developers must consider the cumulative noise impact from their proposed scheme and the existing acoustic environment; and where appropriate the future cumulative impact of any already permitted or proposed noise generating development in the vicinity.

There will be a general presumption against development which gives rise to significant adverse effects from noise unless it can be demonstrated that the economic and/or social and/or environmental benefits associated with the proposed development outweigh the adverse effects."

New Noise Generating Industrial and Commercial Developments should be assessed in accordance with BS4142:2014 Methods for Rating and Assessing Industrial and Commercial Sound. The SPD document adopted by London Borough of Richmond upon Thames sets noise significance risk in the and assessment outcome in Table 2.1.

Table 2.1 New Industrial and Commercial Development

Noise Significance Risk	BS4142 Outcome	Planning Advice
Minimal	$L_{A,Tr} - L_{A90,T} \leq -5$	Where the rating level of noise is below the background noise level by at least 5dB, this indicates that the proposed noise generating development is likely to be acceptable from a noise perspective. The Borough will seek this level of compliance in most noise sensitive areas and/or where there is a requirement to mitigate creeping background effects.
Low	$L_{A,Tr} - L_{A90,T}$ is > -5 & ≤ 0	Where the rating level of noise is equal to, or below the background noise level by up to 5dB, this indicates that the proposed noise generating development may be acceptable from a noise perspective but will be more context dependent, i.e. extent and effect on noise sensitive receivers (externally and internally). Compliance within this range is more applicable to less sensitive sites or where there is no requirement to mitigate creeping background effects.
Medium	$L_{A,Tr} - L_{A90,T}$ is > 0 & $\leq +5$	Where the rating level of noise is equal to, or above the background noise level by up to 5dB, this indicates that the proposed noise generating development is less likely to be acceptable from a noise perspective and will be context dependent, i.e. extent and effect on noise sensitive receivers (externally and internally). Compliance within this range is typically only applicable to non-sensitive sites or where there are overriding other reasons why development should be considered. It will typically be necessary for the applicant to confirm how adverse impacts from the noise generating development will be mitigated and minimised. It is less likely that planning consent will be granted.
High	$L_{A,Tr} - L_{A90,T} > +5$	Where the rating level of noise is above the background noise level by more than 5dB, this indicates that the proposed noise generating development is unlikely to be acceptable from a noise perspective and planning consent is likely to be refused on noise grounds.

Note: All terms as defined in BS4142

Point 6.3 Internal Noise Levels in Nearby Dwellings specifies that in some cases prediction of internal noise levels at the closest noise sensitive receptor might be required in order to demonstrate that suitable internal noise levels within noise sensitive rooms are not exceeded as set in BS8233.

Point 6.4 from the SPD specifies defines the possibility of a desktop assessment only to be submitted, omitting the need to submit a fill acoustic report.

"…a desktop noise assessment may be submitted where the applicant can demonstrate that the plant will achieve the set criteria below... Information supporting the application will need to include:

1. The location of the nearest residential window that may be affected by noise from the proposed plant.

2. Indicate the distance of the window from the source in metres and any natural barrier or shielding to the noise path.

3. The proposed operational hours of the plant.

4. Maximum noise emission criteria of 45dB(A) LAeq,1hour daytime (07.00-23.00) and 35dB(A) LAeq,15minute night time.

5. Manufacturers' noise specifications of plant: Sound Power/Sound Pressure Level, octave band spectral levels.

6. Calculations for the predicted noise level 1 metre from the window of the nearest residential property. Include any proposed attenuation measures."

2.2 Technical standards and Guidance

British Standard 4142 Methods for rating and assessing industrial and commercial sound

The latest edition of British Standard 4142 (BS 4142:2014+A1:2019)3 distinguishes between the uses of the words "sound and "noise". Sound can be measured by a sound level meter or other measuring system. Noise is related to a human response and is routinely described as unwanted sound, or sound that is considered undesirable or disruptive.

The methods described in this standard use outdoor sound levels to assess the likely effects of sound of an industrial and/or commercial nature on people who might be inside or outside a dwelling or premises used for residential purposes upon which the sound is incident. The standard is not intended to be applied to the derivation of indoor sound levels arising from sound levels outside, or the assessment of indoor sound levels.

In the case of where a new noise-sensitive receptor is introduced and there is extant industrial and/or commercial sound, it ought to be recognised that the industrial and/or commercial sound forms a component of the acoustic environment. In such circumstances other guidance and criteria in addition to or alternative to this standard can also inform the appropriateness of both introducing a new noise-sensitive receptor and the extent of required noise mitigation.

The standard requires determination of the following:

[3] BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound

• Rating level - $L_{Aeq,Tr}$ sound level produced by the specific sound source at the assessment location with any adjustment for the characteristic features of the sound which could be added to the specific sound level if a tone, impulse or other characteristic occurs, or is expected to be present.

• Background sound level – $L_{A90,T}$ - A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T.

• Tr is the reference time interval over which the specific sound level is determined. This is 1-hour for daytime (07:00-23:00 h) and 15-minutes for night-time (23:00-07:00 h).

The assessment methodology considers the Specific Sound Level, as measured or calculated at a potential noise sensitive receptor, due to the source under investigation. A correction factor is added to this level to account for the acoustic character of the sound as follows:

- **Tonality** – A correction of up to 6 dB depending on the prominence of tones;
- **Impulsivity** - A correction of up to 9 dB depending on the prominence of impulsivity;
- **Other sound characteristics** - A 3 dB correction may be applied where a distinctive acoustic character is present that is neither tonal nor impulsive;
- **Intermittency** - A 3 dB correction may be applied where the specific sound has identifiable on/off conditions.

An estimate of the impact of the specific sound generated can be obtained by subtracting the measured background sound level from the rating level, and the following is considered:

a) Typically, the greater this difference, the greater the magnitude of the impact.
b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
c) A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.
d) The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a 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.

All pertinent factors should be taken into consideration when assessing the impact, including the following:

- Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night;
- The character and level of the residual sound compared to the character and level of the specific sound; and
- The sensitivity of the receptor.

Guidance for Noise Impact Assessment

When considering environmental impact, the impact is typically considered in terms of changes to the existing ambient (L_{Aeq}) noise climate due to the additional noise resulting from the new sources. The basis of this form of assessment can be found in the consultation draft ‘Guidelines for Noise Impact Assessment’ written by the Institute of Environmental Management and Assessment and the Institute of Acoustics.

The document does not state any limitations regarding types of noise source that can be assessed in this manner.

Taking account of these factors the table below relates to the changes in overall sound levels to the normal human auditory response.

Table 2.2 – Impact from the change in sound level

Noise Change, dB(A)	Subjective Impression	Magnitude of Effect
0	No change	No Change
0.1 – 2.9	Imperceptible change in loudness	Negligible
3 – 4.9	Perceptible change in loudness	Minor
5 – 9.9	Up to doubling or halving of loudness	Moderate
10+	More than doubling or halving of loudness	Major

3.0 Development Proposals and Surrounding Area

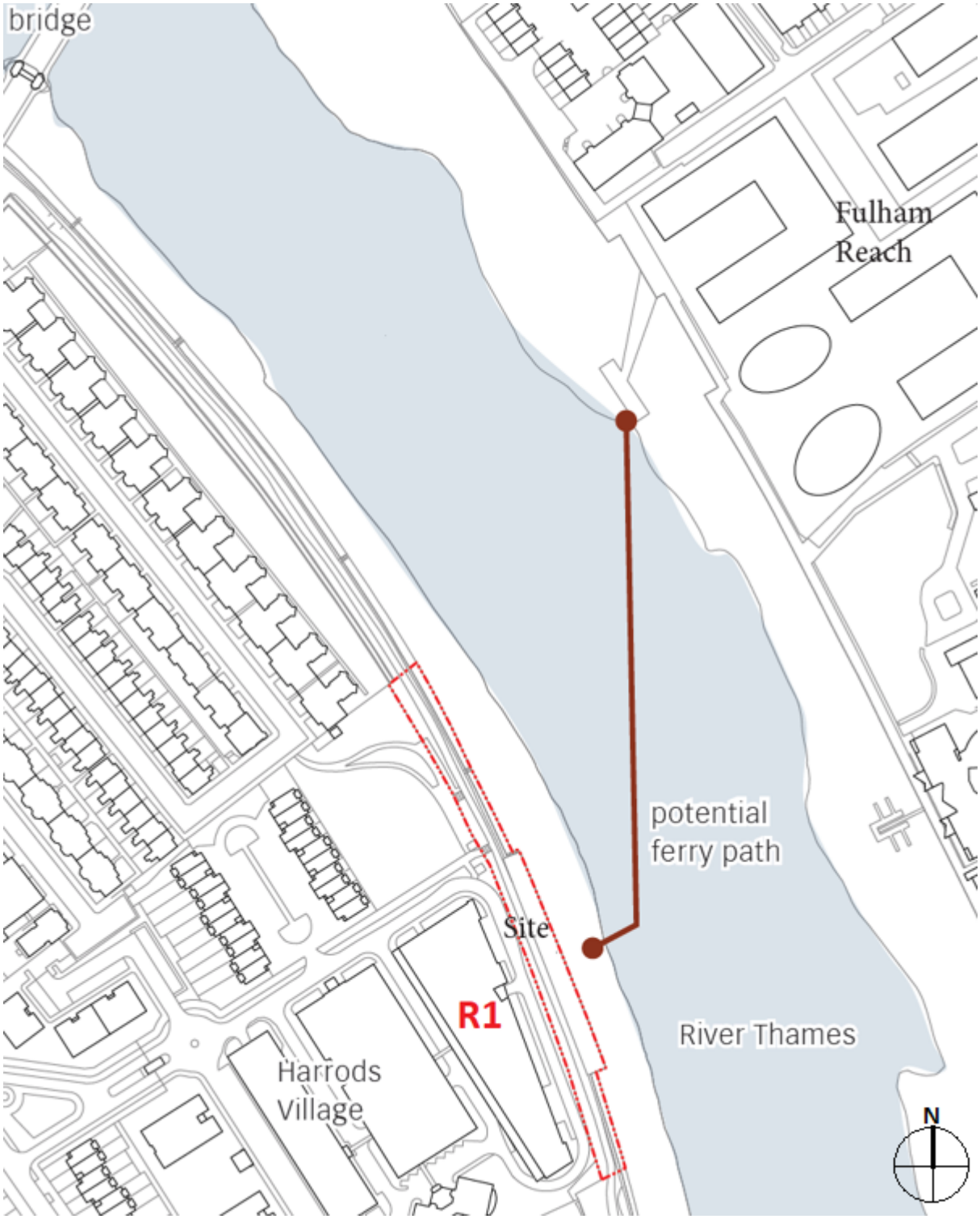
The development proposed is to be located at 6 Somerville Avenue, Barnes, London, SW13 8AD. The existing Harrods Wharf will be redeveloped to allow a ferry service to operate across the River Thames. Two single storey pavilions connected by a covered area will be constructed on the Wharf. It is understood that a ticket office and staff facilities will be accommodated by one pavilion to the north and a café with customer WCs accommodated in a second pavilion to the south. Two ASHPs and PVs are proposed to service the pavilions but specifications of the plant is not known at this time.

TfL are expecting the ferry service to operate as a minimum between 06:00hr and 22:00hr with potential reduced hours on weekends. Peak hours of operation are expected to be 06:00hr to 10:00hr and 15:00hr to 19:00hr weekdays only. The ferry service is expected to be capable of safely accommodating usage by 800 passengers per hour in both directions, reducing to 400 for off-peak hours. A minimum service frequency has not been specified.

The closest noise sensitive receptor to the Wharf has been identified as the former Harrods Furniture Depository (R1) to the west which is now residential accommodation. Figure 3.1 shows the current site plan with sensitive receptor. There is an existing buffer of trees and hedges between the proposed development and the noise sensitive receptor.

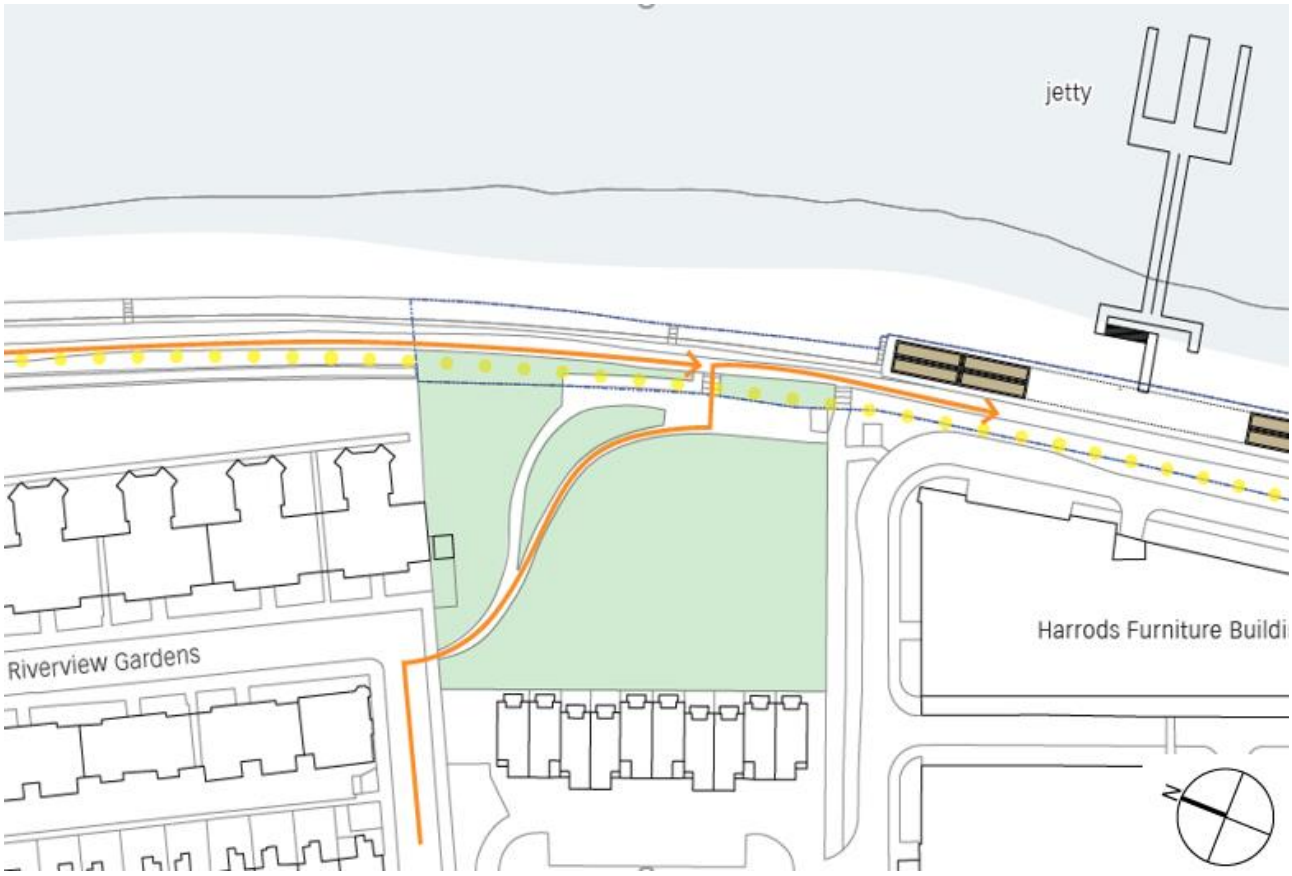
Figure 3.2 shows the access paths in orange arrows for passengers to reach Harrods Wharf.

Figure 3.1 – Site plan and sensitive receptor



Source: Design and Access Statement 06/11/20

Figure 3.2 – Passenger entrance/exit



Source: Design and Access Statement 06/11/20

4.0 Desktop Assessment of Baseline Noise Levels

4.1 Introduction

In lieu of a noise measurement survey to determine the baseline noise levels, a review has been undertaken of publicly available noise data to establish the likely noise levels in the area.

4.2 Joint Guidance on the Impact of COVID-19 on the Practicality and Reliability of Baseline Sound Level Surveying and the Provisions of Sound and Noise Impact Assessment

The Institute of Acoustics (IOA) and Association of Noise Consultants (ANC) have issued a guidance document in response to the imposed restrictions due to COVID-19. Government guidance has significantly reduced the number of journeys made across the country whereby travel is only permitted when necessary. As such, the accuracy and reliability of baseline noise surveys in areas dominated by transportation noise during this period has been questioned due to a reduction in typical road, rail and air travel usage.

The guidance recognises that there is a required change in the ways that acoustic assessment and reporting is carried out and recommends changes in working practices in the production of such reports. Alternative methods of characterising baseline conditions are set out in the document and include using existing data (for example from previous local surveys and noise maps) and undertaking baseline noise predictions based on transport data.

The current version of this guidance can be viewed here: https://www.association-of-noise-consultants.co.uk/wp-content/uploads/2021/01/Joint-Guidance-On-the-Impact-of-Covid.IOA-ANC-V6.pdf

4.3 Strategic Noise Mapping Data (Road and Rail)

The Government's strategic noise mapping covers noise from major road and rail corridors within large urban agglomerations and was designed to provide a global view of noise exposure in line with the requirements of the Environmental Noise Directive. It does not include all possible noise sources but does provide an initial screening for sites in the vicinity of the mapped sources. Maps can be viewed here: www.extrium.co.uk/noiseviewer.htm

Examination of the available maps for road noise indicates predicted noise levels of less than 55 dB $L_{Aeq,16hr}$ daytime and less than 50 dB $L_{Aeq,8hr}$ night-time (see Appendix C for further details). This said, the only local road to have been mapped appears to be Hammersmith Bridge and hence noise from other local roads has not been included due to their volumes of traffic. As such, it is likely that noise from other, more local roads would contribute to the noise climate in the area.

Noise from rail in the area is insignificant since no rail lines close to the site.

4.4 Heathrow Noise Mapping Data (Aircraft)

Heathrow Airport publishes noise contours for the aircraft serving the airport. The latest of these available are presented in Heathrow Airport 2018 Summer Noise Contours and Noise Action Plans ERCD Report 1901.

Examination of the 2018 contours indicates that the site sits just outside the 55 dB $L_{Aeq,12hr}$ daytime contour, outside the 55 dB $L_{Aeq,4hr}$ evening contour and outside the 50 dB $L_{Aeq,8hr}$ night-time contour (see Appendix C for further details).

4.5 Assessment of Baseline Noise Levels

Based on the above information and our experience of similar London locations, it is anticipated that the daytime and night-time noise levels are likely to be in the order of 50-55 dB $L_{Aeq,16hr}$ and 40-50 dB $L_{Aeq,8hr}$ respectively.

While there is no direct correlation between $L_{Aeq,T}$ and L_{AF90} levels, that latter used for the assessment of plant noise emission in line with BS 4142:2014+A1:2019, it is considered that L_{AF90} levels being 10 dB below $L_{Aeq,T}$ levels would be a conservative estimate. As such it is proposed that daytime and night-time background noise levels of 40 and 30 dB L_{AF90} respectively be assumed at present.

It is recommended that a comprehensive baseline noise survey be undertaken once COVID-19 restrictions are eased and travel/activity returns to more typical levels.

5.0 Passenger Noise

Neither the local or national planning policy contains specific technical guidance designed for use assessing passenger noise. We have therefore considered various different assessment methods and criteria which may be suitable and are included in section 2.0.

It is worth noting that a BS 4142 assessment is not applicable to this situation as that covers sound of an industrial and/or commercial nature.

To assess the noise impact, the proposed redevelopment of Harrods Wharf has been modelled using CadnaA noise modelling software which is common tool for the prediction of environmental noise.

5.1.1 Assumptions

The assessment has been carried out to the east façade of the former Harrods Furniture Depository.

The source data for the activity noise has been derived from Building Bulleting 93 'Acoustic of Schools: a design guide' (BB93). The sound pressure levels given within BB93 are listed as below:

Table 5.1 – Speech spectra Sound Pressure Levels at 1m in front of the speaker's lips in the free-field SPL (dB)

Vocal effort	Octave band centre frequency (Hz)							dBA
	125	250	500	1k	2k	4k	8k	Total
Normal voice effort	46.9	57.2	59.8	53.5	48.8	43.8	38.6	59.5
Raised voice effort	51.0	61.5	65.6	62.3	56.8	51.3	42.6	66.5

The expected number of passengers passing through Harrods Wharf is 800 per hour at peak times and 400 per hour at off peak times for both directions. For the assessment, it is assumed the service will operate at a frequency of 15 minutes.

It has therefore been assumed during Covid-19 restrictions that internal amenities will not be accessible to passengers and 200 people will pass through the terminal at peak time and 100 for off peak periods within a 15-minute period. For the future scenario when Covid-19 restrictions are relaxed, passengers will have access to the internal/café seating area of Pavilion 1 which can accommodate up to 25 people and hence this number of passengers can be subtracted from the calculations.

As a worst case scenario, it is assumed that half of the people at any one time are speaking with raised voices. From this, the spectral source data used for the activity noise has been converted into sound power levels, L_w, and is shown in Table 5.2.

Table 5.2 – Source Sound Power Levels, L_w (dB)

Vocal effort	Octave band centre frequency (Hz)							dBA
	125	250	500	1k	2k	4k	8k	Total
L_w for peak hours (100 passengers talking simultaneously)	79.0	89.5	93.6	90.3	84.8	79.3	70.6	96.8
L_w for off-peak hours (50 passengers talking simultaneously)	76.0	86.5	90.6	87.3	81.8	76.3	67.6	93.8
L_w for peak hours Post Covid-19 (87 passengers talking simultaneously)	78.4	88.9	93.0	89.7	84.2	78.7	70.0	96.2

L_w for off-peak hours Post Covid-19 (44 passengers talking simultaneously)	75.4	85.9	90.0	86.7	81.2	75.7	67.0	93.2

The following assumptions have been made to model the passenger noise at Harrods Wharf:

- The calculation procedures outlined in ISO 9613 part 2 have been applied;
- The source has been modelled as an area source in a steady-state (i.e. continuous through the assessment period);
- A metal framed canopy has been modelled to cover the area between Pavilion 1 and Pavilion 2;
- Ground absorption has been set to 0.75;
- There are no other existing noise sources in the area; and
- All noise predictions at the former Harrods Furniture Depository have been made at a point 1 metre in front of the most exposed window.

5.1.2 Results

Table 5.3 shows the summarised output of the model for a worst case scenario during peak and off peak hours of operation both during Covid-19 restrictions and after they are relaxed.

Table 5.3 – Noise model predictions

Scenario	Predicted noise level from passenger noise at most affected sensitive receptor $L_{Aeq,\ 15min}$ dB
Peak time periods Covid-19	56.3
Off-peak time periods Covid-19	53.3
Peak time periods post Covid-19	55.7
Off-peak time periods post Covid-19	52.7

5.1.3 Assessment

The assessment is based on predicted noise levels from the passenger noise and the prevailing ambient noise determined by the desktop assessment. Proposed operation of Harrods Wharf is from 06:00hr to 22:00hr with peak hours of 06:00hr to 10:00hr and 15:00hr to 19:00hr, and off-peak at all other times. Based on the baseline desktop assessment 50-55 dB $L_{Aeq,16hr}$ covers the daytime period 07:00hr to 23:00hr and 40-50 dB $L_{Aeq,8hr}$ covers the night-time period 23:00hr to 07:00hr.

Taking into consideration the above and the results from Table 5.3, for the period from 06:00hr to 07:00hr, total noise levels (passenger noise plus prevailing noise) of between 6.7 and 16.4 dB above the prevailing ambient noise level is anticipated. This said, it is expected that the ambient noise for this this period will be towards the higher end of the range (i.e. towards 50 dB) making the difference in noise level smaller; as such the impact level will most likely be “moderate”. It should also be noted that this scenario is limited to 1 hour from 16 hours of operation.

For operation during the peak periods during the daytime (i.e. 07:00hr to 10:00hr and 15:00hr to 19:00hr), an impact level ranging from “minor” to “moderate” is anticipated (both with and without Covid-19 restrictions).

For off-peak operational hours during the daytime, a “negligible” to “moderate” impact is predicted when internal amenities of Pavilion 1 are not accessible due to Covid-19 restrictions. The “moderate” impact level will be reduced to “minor” when internal amenities are accessible.

Results are summarised in Table 5.4, showing results with and without restrictions imposed due to Covid-19.

Table 5.4 Predicted change in noise level

Time	Assumed Typical Ambient $L_{Aeq,T}$ dB	Total Noise level and increase in ambient level $L_{Aeq, 15min}$ dB	Impact Level
06:00 - 07:00	40-50	56.4 – 57.2 (7.2 – 16.4)	Moderate – Major
06:00 - 07:00 Post Covid-19	50-55	55.8 – 56.7 (6.7 – 15.8)	Moderate – Major
07:00 - 10:00/15:00 – 19:00	50-55	57.2 – 58.7 (3.7 – 7.2)	Minor – Moderate
07:00 - 10:00/15:00 – 19:00 Post Covid-19	50-55	56.7 – 58.4 (3.4 – 6.7)	Minor – Moderate
10:00 - 15:00/19:00 – 22:00	50-55	55.0 – 57.2 (2.2 – 5.0)	Negligible – Moderate
10:00 - 15:00/19:00 – 22:00 Post Covid-19	50-55	54.6 – 57.0 (2.0 – 4.6)	Negligible – Minor

Since the predicted noise levels generated by passengers are above the assumed prevailing ambient noise level they may require further mitigation depending on the outcome of an environmental noise survey. As the assessment carried out features a worst case scenario involving the maximum number of passengers talking with raised voices at a steady state, it is likely there will be a “moderate” impact level at worst in accordance with the IEMA methodology.

A more pragmatic assessment of the activity noise where only a quarter of the passengers commuting in are having conversation (i.e. one eighth of the passengers are speaking at any one time with raised voices) would reduce the activity noise by 6 dB meaning it is likely that in practice there will be “negligible” to “minor” impact during the daytime. The results from this more realistic scenario are presented in Table 5.5.

Table 5.5 Predicted change in noise level when quarter of the passengers having conversation

Time	Assumed Typical Ambient $L_{Aeq,T}$ dB	Total Noise level and increase in ambient level $L_{Aeq, 15min}$ dB	Impact Level
06:00 - 07:00	40-50	50.7 – 53.2 (3.2 – 10.7)	Minor – Major
06:00 - 07:00 Post Covid-19	50-55	50.1 – 52.9 (2.9 – 10.1)	Negligible – Major
07:00 - 10:00/15:00 – 19:00	50-55	53.2 – 56.3 (1.3 – 3.2)	Negligible – Minor
07:00 - 10:00/15:00 – 19:00 Post Covid-19	50-55	52.9 – 56.1 (1.1 – 2.9)	Negligible
10:00 - 15:00/19:00 – 22:00	50-55	51.9 – 55.7 (0.7 – 1.9)	Negligible
10:00 - 15:00/19:00 – 22:00 Post Covid-19	50-55	51.7 – 55.6 (0.6 – 1.7)	Negligible

It must be noted that the assessment takes into consideration only passenger noise from the proposed boarding area between the café and ticket office. Noise from the passengers arriving and leaving Harrods Wharf has not been assessed at this time.

5.1.4 Additional Mitigation

Should additional mitigation be required following completion of a comprehensive baseline noise survey undertaken (once COVID-19 restrictions are eased and travel/activity returns to more typical levels), it is envisaged that this may include the introduction of physical screening between the proposed boarding area and the former Harrods Furniture Depository.

6.0 Plant Noise Emission

At this stage, the building services systems and requirements have not been finalised and therefore there is no plant noise emission data available. For this assessment, it is considered appropriate to propose preliminary noise limits applicable to future plant associated with the development (e.g. two ASHPs). In line with LBRuT's Development Control for Noise Generating and Noise Sensitive Development SPD, it is proposed that a plant noise rating level limit of 5 dB below the background noise level be adopted to target a "Noise Significance Risk" of "Minimal".

Based on the estimated background noise levels determined in Section 4.5, it is proposed that preliminary plant noise rating level limits of 35 dB and 25 dB during the daytime (07:00hr-23:00hr) and night-time (23:00hr-07:00hr) be assumed at present when assessed at 1m from any noise sensitive receptor.

It should be recognised that the above limits are likely to be onerous to achieve but it is anticipated that these limits can be relaxed on completion of a comprehensive baseline noise survey. As such, it is recommended that this item be dealt with by a suitably worded condition relative to the prevailing background noise levels to be measured in due course.

7.0 Summary and Conclusions

Temple Group Ltd (Temple) has been appointed by Lifschutz Davidson Sandilands to undertake a Desktop Noise Impact Assessment relating to the proposed use of Harrods Wharf, located in the London Borough of Richmond upon Thames (LBRuT) as a passenger ferry terminal to support local residents while Hammersmith Bridge is being repaired.

The purpose of the noise assessment is to identify any potential noise impacts arising from the proposed re-development introducing commercial plant and passenger noise.

Details of the assessment methodology used, together with the calculation of the assessment are presented within the report.

It is predicted that the noise levels generated from passengers arriving and departing at the boarding area may require mitigation measures to reduce impacts on the residents located within Harrods Furniture Depository (subject to the outcome of a comprehensive noise survey; see below).

It is recommended that a comprehensive baseline noise survey be undertaken once COVID-19 restrictions are eased and travel/activity returns to more typical levels. As such, it is recommended that noise be dealt with by suitably worded conditions relative to the prevailing noise levels to be measured in due course.

Appendix A **Glossary of Acoustic Terminology**

Many words have more specific meanings when used in acoustics than in every-day language.	
decibels dB	The decibel is not a true measurement unit nor is it exclusive to acoustics. The decibel is a logarithmic ratio of two values of a variable. Decibels are used because they can represent very wide ranges of ratios (from trillionths and billionths to billions and trillions) with a small range of decibel values. Decibels can be used to represent measured values by using a known reference value in the ratio. When using decibels to measure something it is therefore important to specify what variable is actually being measured and what reference level has been used. This is done by adding a reference value statement in the form "dB re x units", where the units indicate the variable being measured and x is the reference value. Decibels are used in acoustics because the human ear responds to sound in a logarithmic way and the quantities measured in acoustics vary over wide ranges. However, decibels are used in acoustics to measure several different things which it is important not to confuse with each other. To avoid confusion there is a notation system that identifies what a decibel value is for. The notations take the form of an italic capital letter and some subscript characters. The capital identifies the general type of value and the subscripts give specific details of what is being represented. L_{xxx} denotes a level (ie a value measured in dB by comparison with a reference value); D_{xxx} denotes a difference between two levels; R_{xxx} denotes a rating (or index), which is measure of the generalised acoustic performance of a material or construction based on a difference between two levels; C_{xxx} denotes a correction (or constant) Of these only those with *L* notations require a reference value statement. Those with *D* or *R* notations are effectively ratios of two measured values not one measured value and a reference value and those with *C* notations are not based on reference values at all. A reference value statement therefore has no meaning when describing *D*, *R* and *C* decibels. Because decibels are logarithmic they have to be added, subtracted, multiplied, divided and averaged using different techniques from normal numbers.

Sound Pressure Level L_p obsolete – SPL	This is the basic measure of how much sound there is at a given location. It is a measure of the size of the pressure fluctuations in the air that we perceive as sound. Sound Pressure Level is expressed in decibels with a reference level of 20 μPa (L_p in dB re 20 μPa)
Sound Power Level L_W obsolete – SWL	This is the total amount of sound produced by a source. It cannot be measured directly but it can be calculated from Sound Pressure Level measurements in known conditions. It can be used to predict the Sound Pressure Level at any point. Sound Power Level is expressed in decibels with a reference level of 1 pW (L_W in dB re 1 pW). In the US a reference of 100 fW is sometimes used
A-weighting L_A or L_{pA}, L_{WA}, obsolete – dBA, dB(A) similar – C-weighting L_C or L_{pC}, L_{WC}	The human ear does not sense all frequencies of sound equally. Our sensitivity is at a maximum at around 2 kHz and steadily decreases above and below. Below 20 Hz and above about 20 kHz we can't hear at all. Within its operating limits a precision measurement microphone measures all frequencies the same so the output it produces does not reflect what we would actually hear. The A-weighting is an electronic filter that matches the response of a sound level meter to that of the human ear. When A-weighted the Sound Pressure Level L_p becomes L_{pA} (or L_A) and the Sound Power Level L_W becomes L_{WA}. It used to be common to identify that a level was A-weighted by writing dB(A) or dBA instead of dB. These terms are now obsolete and should not be used as they conflict with other, non-acoustic, uses of decibels The response of the human ear varies depending on how loud the sound is. A-weighting matches the response of a sound level meter to human hearing at low levels (~ 40-90 dB). For higher levels there are other weightings the most common of which is the C-weighting.

Different types of decibels commonly used in acoustics

L_{max} L_{Amax} L_{AFmax}	*The maximum instantaneous sound pressure level* (L_{max}), *The A-weighted maximum instantaneous sound pressure level* (L_{Amax}) *The A-weighted maximum instantaneous sound pressure level with a FAST time constant* (L_{AFmax}). This is the highest instantaneous sound pressure level reached during a measurement period.
L_{min} , L_{Fmin}	The opposite of the L_{max} is the *minimum instantaneous sound pressure level* or L_{min} etc. It is good practice to include the letter which identifies the time constant used as this can make a significant difference to the value.

$L_{N,T}$ $L_{AN,T}$ $L_{AFN,T}$ $_N$ = %age value, 0-100 $_T$ = measurement time eg. L_{A90}, L_{A10}, $L_{AF90,\ 5\ min}$	*The percentage exceedence sound pressure level ($L_{N,T}$),* *The A-weighted percentage exceedence sound pressure level ($L_{AN,T}$), the A-weighted percentage exceedence sound pressure level with a FAST time constant ($L_{AFN,T}$).* This is the sound pressure level exceeded for *N*% of time period *T*. eg. If an A-weighted level of x dB is exceeded for a total of 6 minutes within one hour, the level will have been above x dB for 10% of the measurement period. This is written as $L_{A10,1hr}$ = x dB. L_{A0} (the level exceeded for 0 % of the time) is equivalent to the L_{Amax} and L_{A100} (the level exceeded for 100 % of the time) is equivalent to the L_{Amin}. It is good practice to include the letter which identifies the time constant used as this can make a significant difference to the value.
$L_{eq,T}$ $L_{Aeq,T}$ $_T$ = measurement time eg. $L_{Aeq,5min}$	The *equivalent continuous sound pressure level over period T ($L_{eq,T}$),* *The A-weighted equivalent continuous sound pressure level over period T ($L_{Aeq,T}$).* This is effectively the average sound pressure level over a given period. As the decibel is a logarithmic quantity the L_{eq} is not a simple arithmetic mean value. The L_{eq} is calculated from the raw sound pressure data. It is not appropriate to include a reference to the FAST and SLOW time constants in the notation

Appendix B **Correspondence with Local Authority**

From: Nigel Burton

Sent: 15 December 2020 18:14

Hi Hedley

With regard to our proposed scope for the noise impact assessment, due to restrictions and changes in activity due to COVID-19, and the associated potential for changes in noise levels at this time, our proposal is to undertake a desktop assessment approach. As such, in lieu of an external noise survey, we propose an assessment potentially based on historic external noise levels measured in the area, published government noise maps, etc. Based on available information on the proposed activities to be provided by the client (e.g. details of ferry operation, associated activities (café), pedestrian traffic, etc), we propose to undertake an assessment of the likely impact on nearby noise sensitive receptors (e.g. residential). Where noise levels are assessed to exceed recommended levels, we will provide in principle recommendations as to how this could be mitigated.

We would welcome your thoughts on our approach and happy to discuss on the phone or a Teams call if that would be of assistance. In addition, any details of recent noise surveys in the area would be greatly appreciated.

All the best and look forward to hearing from you.

Nigel

From: Hedley Pugh

Sent: Wed 16 December 2020 08:56

Good morning Nigel,

Thank you for your email and I confirm the proposed methodology is acceptable.

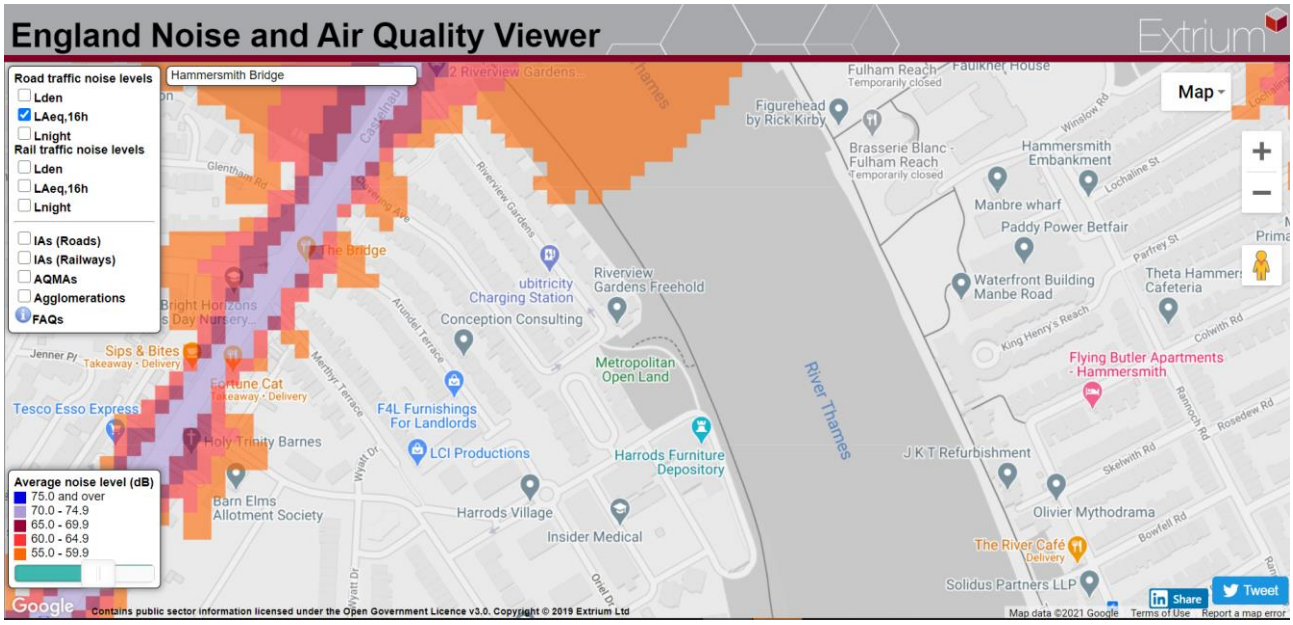
In respect of potential sources of data I am not aware of any planning applications in the immediate local which could assist but you would need to confirm. I would therefore suggest data from the DEFRA strategic noise mapping may be suitable but happy to discuss.

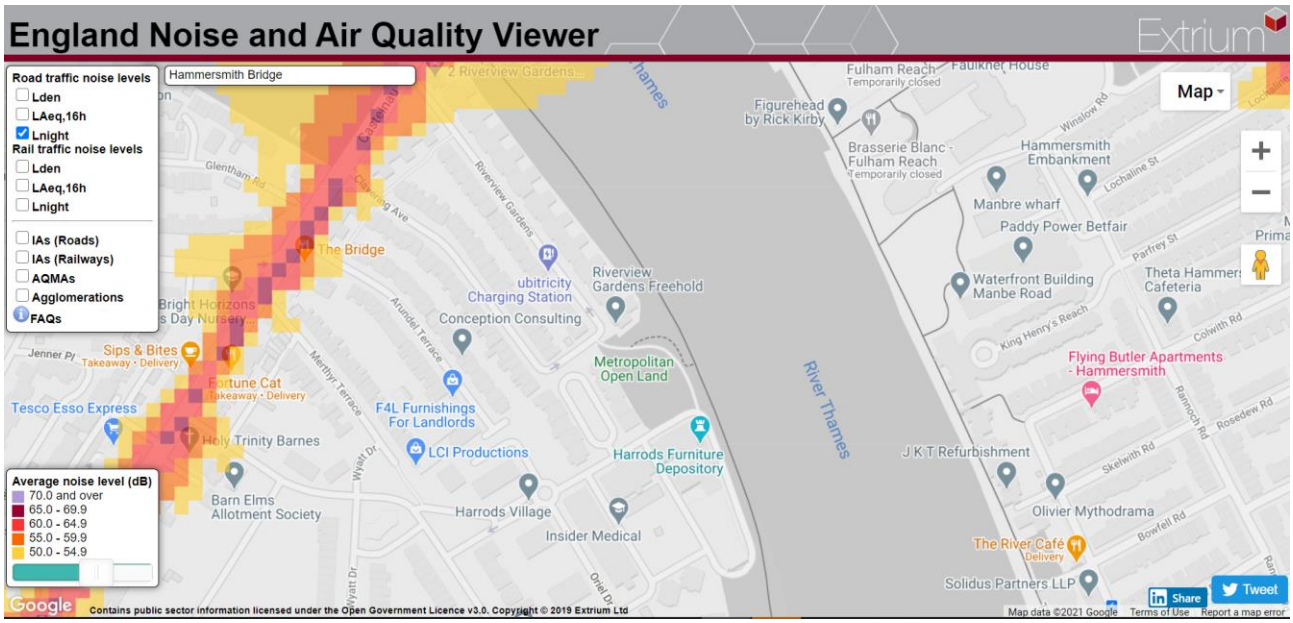
Regards

Hedley

Appendix C **Noise Map Imagery**

C.1 Road Noise Maps (Daytime and Night-time)





C.2 Aircraft Noise Contours (Daytime, Evening and Night-time)

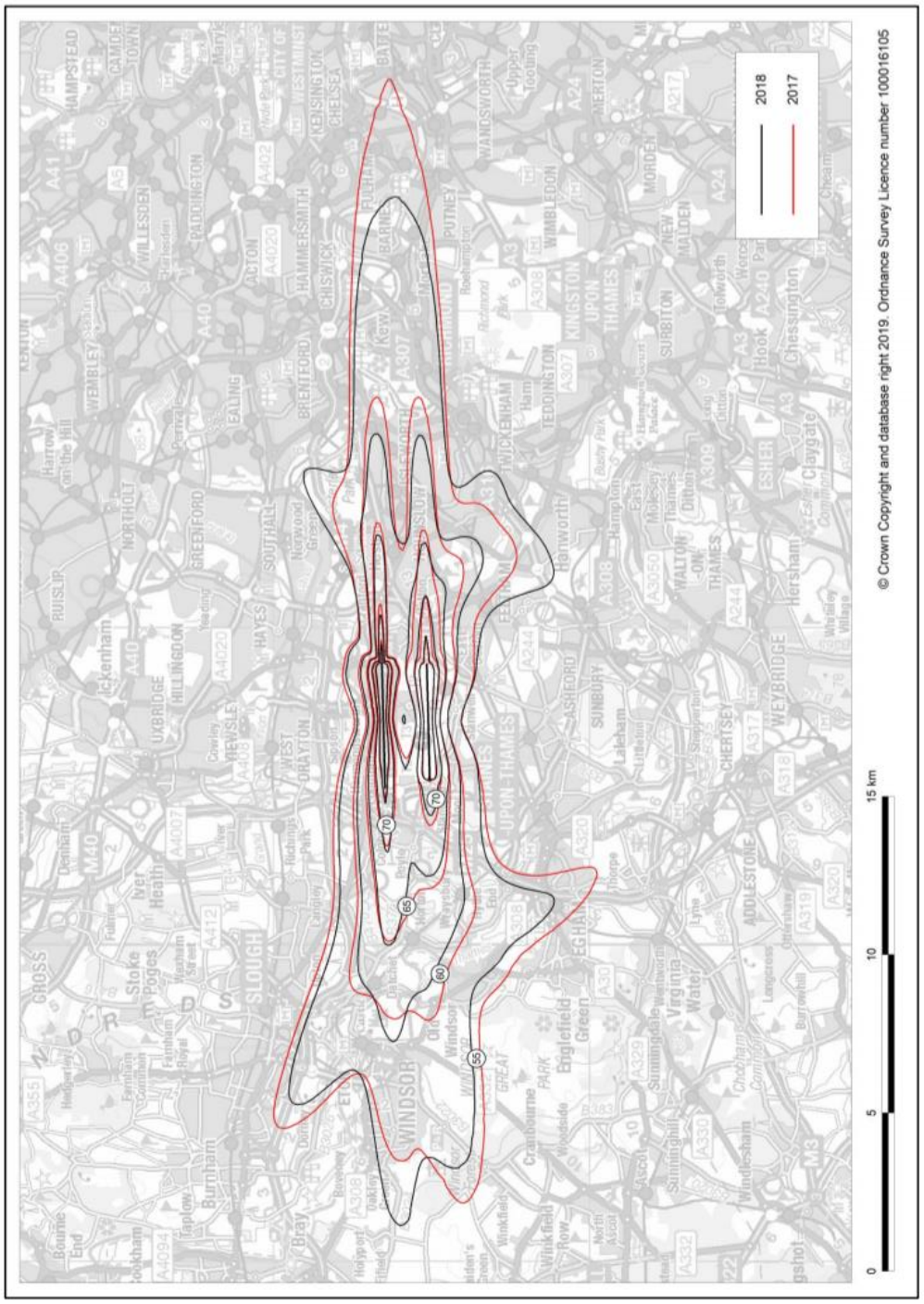


Figure B14 Heathrow 2018 and 2017 L_{day} noise contours

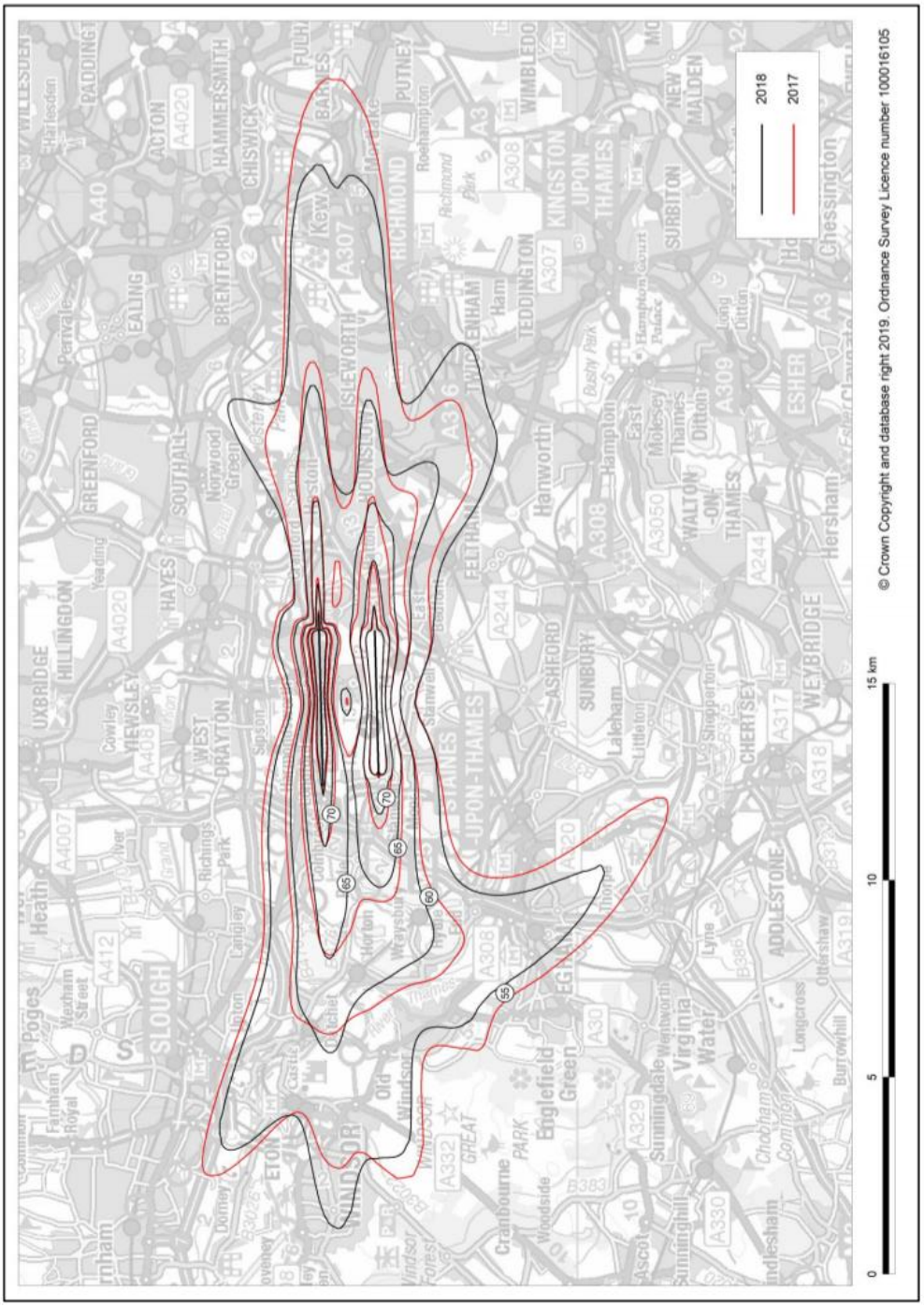


Figure B15 Heathrow 2018 and 2017 $L_{evening}$ noise contours

Note: 2017 $L_{evening}$ modal split was 81% W / 19% E; 2018 $L_{evening}$ modal split was 65% W / 35% E.

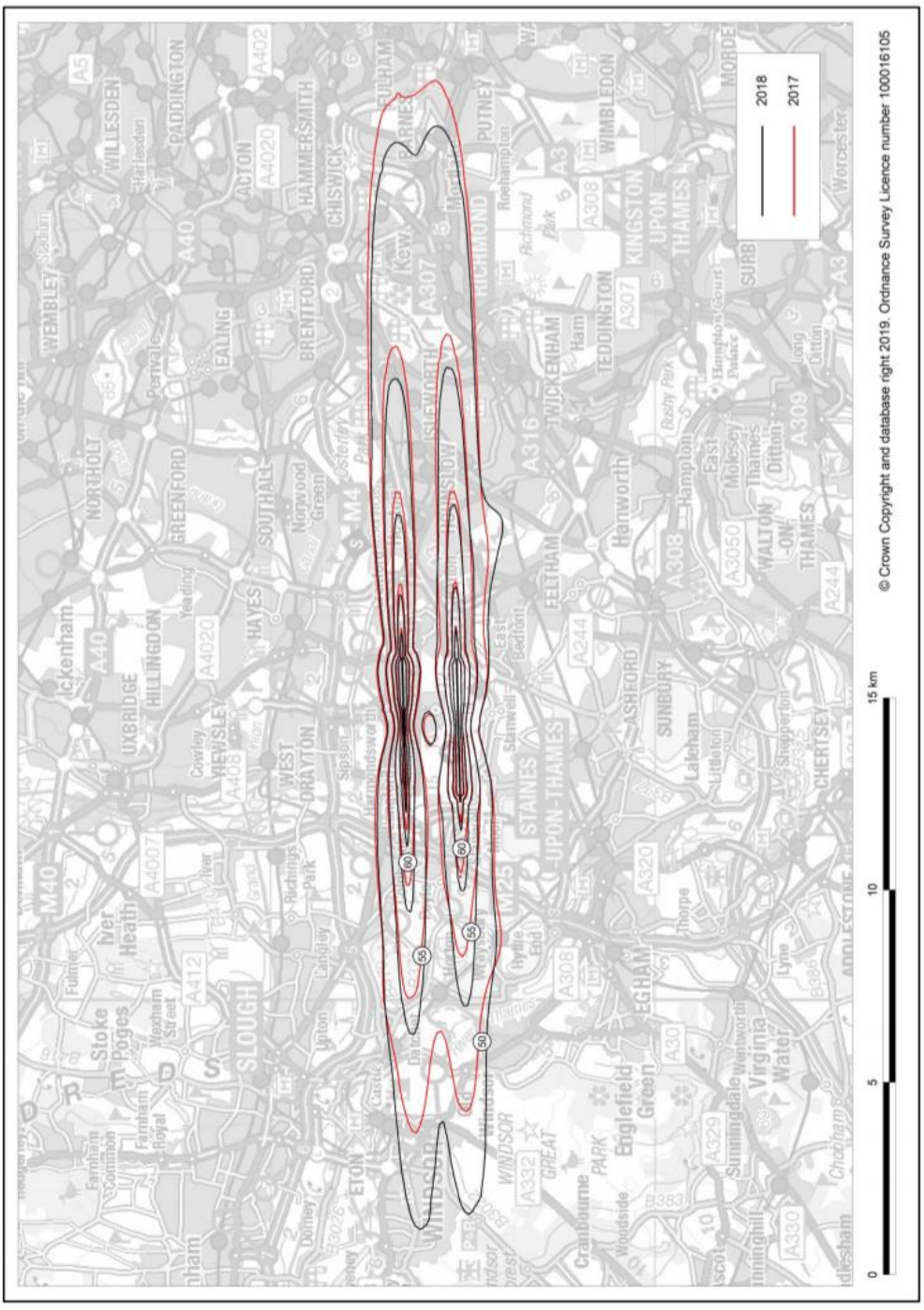


Figure B16 Heathrow 2018 and 2017 L_{night} noise contours

Note: 2017 L_{night} modal split was 80% W / 20% E; 2018 L_{night} modal split was 64% W / 36% E.