Sainsbury's Supermarkets Limited

CAMDEN ROAD NW1 9LJ

Acoustic Report

70085113
MAY 2021

PUBLIC

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Acoustic Report

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EXECUTIVE SUMMARY

WSP has been appointed by Sainsbury's Supermarkets Limited to undertake a noise assessment in support of the application to install new plant items on the central roof area of the Camden Road store.

As the store is located in a particularly busy area of London, it is considered highly likely that the existing background noise levels in the area surrounding the site are high. This is supported by noise survey data reported within an acoustic report prepared for a recent planning application to the west of the store.

The new plant items are proposed to be installed on the central roof area of the store. The construction of the store is such that this central roof area is well screened (by the frontage of the store itself overlooking Camden Road) from the nearby residential receptors opposite on Camden Road.

Plant noise emission criteria have been proposed based on both the survey data used for the nearby planning application, and fixed limits based on target internal noise levels. Noise levels have been predicted from the proposed plant items using a 3D noise model of the site and surrounding area. The predicted noise level from the proposed plant items was 26 dB (free-field level at 1m from the façade) at the Camden Road residential receptors which is well below both the plant noise emission criteria.

Given the above, it is considered that it is not necessary to undertake a noise survey to quantify the background noise levels representative of the nearby residential receptors as it can be demonstrated that noise levels from the proposed new plant items will be below any reasonable plant noise emission criterion.

It is therefore considered that this assessment appropriately demonstrates that noise levels from the proposed plant items are highly unlikely to cause a disturbance to nearby residents on Camden Road and from a noise perspective the proposals meet the aims of Camden Council planning policy.

In conclusion, noise from the proposed plant items should not present a constraint to these proposals gaining planning permission.

1 INTRODUCTION

1.1.1. WSP has been commissioned by Sainsbury's Supermarkets Limited to undertake a noise assessment for the proposal to install two external condenser units and an air source heat pump (ASHP) on the roof of Sainsbury's Camden Road store. The site is located within the jurisdiction of Camden Council (CC).

1.1.2. A noise assessment has been undertaken to determine the likelihood of adverse noise impacts resulting from the proposed plant items.

1.1.3. Given the distance from the proposed plant items and the screening afforded by the Sainsbury's store itself (the proposed plant will be completely screened from view at the Camden Road receptors) it was considered likely that the predicted noise levels from the plant would be very low at the receptors. A 3D noise model has been used to predict noise levels from the proposed plant at the nearby residential receptors. The results from the model indicate that noise levels from the proposed plant would be very low and highly unlikely to cause adverse impacts. Therefore, it is considered unnecessary to undertake a noise survey to support this application. This approach has been outlined in greater detail in the following sections of this report.

1.1.4. This report is necessarily technical in nature, a glossary of technical terms is presented in Appendix A.

2 SITE DESCRIPTION

2.1 THE SITE

2.1.1. The Sainsbury's Camden Road store is located in a busy area of Camden, London. The current proposal is to install two external condenser units and an ASHP on the central roof area of the store. The store is constructed such that the central roof area is considerably lower than the roof at the front and back of the store meaning that the plant will be well screened.

2.1.2. There are already a number of existing plant items located on the roof which service the Sainsbury's store.

2.1.3. Camden Road is a busy road within a mixed-use area of predominantly commercial and residential uses. It is likely that the noise climate in the area is dominated by road traffic noise. This section of Camden Road (including the residential receptors opposite the Sainsbury's store) is located within a noise important area (NIA). NIAs are areas identified as experiencing the highest 1% of noise levels in residential areas, based on strategic noise mapping undertaken by the Department for the Environment and Rural Affairs. This demonstrates that the existing noise levels at the Camden Road receptors will already be high.

2.1.4. The nearest noise sensitive receptors to the proposed new condensers are the residential receptors on the opposite side of Camden Road. The construction of the Sainsbury's store is such that the proposed plant items will be screened from view by the raised frontage of the store itself.

2.1.5. Figure 2-1 below shows an aerial view of the store and nearest receptors on Camden Road.

2.1.6. Figure 2-2 shows a screenshot of google satellite imagery which demonstrates the construction of the store, and the screening that will be provided by the store itself.

Figure 2-1 - Site plan

Figure 2-2 - Sainsbury's store and Camden Road receptors 3D view

Source: https://www.google.com/maps/@51.5412211,-0.1401454,29a,35y,191.86h,70.88t/data=!3m1!1e3

2.2 DEVELOPMENT PROPOSALS

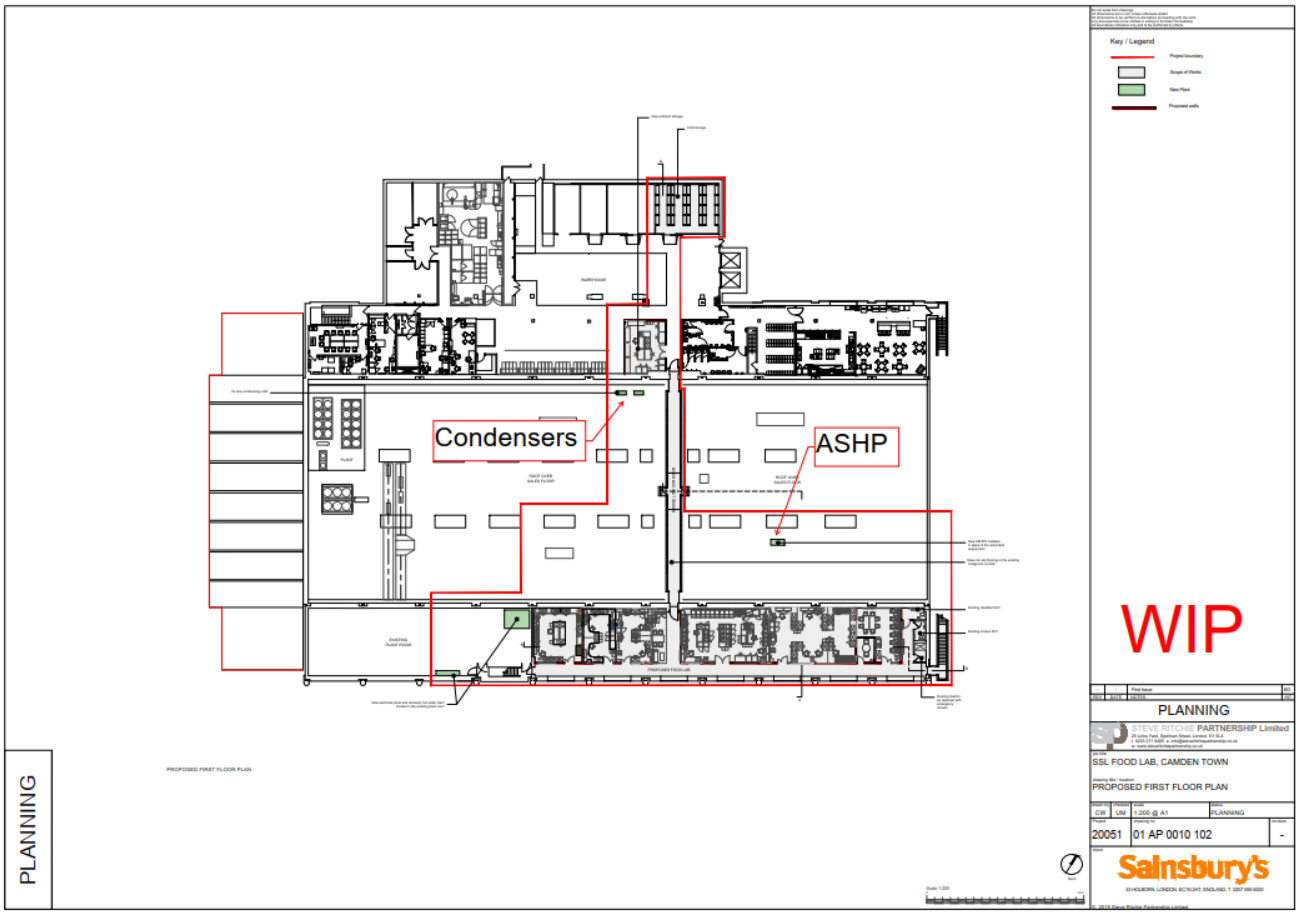
2.2.1. Two condenser units and one ASHP are proposed to be installed on the central roof area of the Sainsbury's store. Figure 2-3 below shows a marked-up drawing of the Sainsbury's store and marks the locations of the proposed units.

2.2.2. The proposed units and their respective noise levels (based on manufacturer data) are:

- Two Rivacold CN030M145X0211 condensers (sound power level of 64 dB for each unit).
- One Mitsubishi PURY-P550 ASHP (sound pressure level of 64 dB measured at one metre).

2.2.3. As a worst-case it is assumed that the plant will operate throughout the daytime and night-time periods. There is the potential that during the night-time the ASHP will operate on a reduced set-back mode during the night and produce lower noise levels. However, as this is not yet guaranteed, and in order to provide a worst-case assessment, it has been assumed that plant will operate at standard capacity throughout the night-time.

Figure 2-3 - Marked-up drawing showing the proposed plant locations



3 POLICY, GUIDANCE AND ASSESSMENT CRITERIA

3.1 CONSULTATION

3.1.1. On Friday 14 May 2021 an email was sent to the environmental health officer (EHO) responsible for noise at CC outlining the proposed approach for this assessment. Whilst some of the details have changed since this email, the assessment approach has remained the same. WSP have not received a response to this email other than acknowledgement that it had been forwarded to technical and planning officers for review. WSP were not able to engage with the relevant EHO over the phone regarding this assessment.

3.2 POLICY

CAMDEN LOCAL PLAN, 2017

3.2.1. The Camden Local Plan is the key strategic document in Camden's development plan, setting out the vision for shaping the future of the Borough.

3.2.2. The document contains policies for guiding planning decisions. Pertinent to this application is Policy A4 which addresses noise and states:

"We will only grant permission for noise generating development, including any plant or machinery, if it can be operated without causing harm to amenity."

3.2.3. With regard to noise from industrial and commercial sources, Appendix 3: Noise thresholds within the Camden Local Plan states:

"A relevant standard or guidance document should be referenced when determining values for LOAEL and SOAEL for non-anonymous noise. Where appropriate and within the scope of the document it is expected that British Standard 4142:2014 'Methods for rating and assessing industrial and commercial sound' (BS 4142) will be used. For such cases a 'Rating Level' of 10 dB below background (15dB if tonal components are present) should be considered as the design criterion)."

3.2.4. Table C within Appendix 3 (which has been reproduced below) aligns industrial and commercial noise to the lowest observed adverse effect level (LOAEL) and significant observed adverse effect level (SOAEL) thresholds. The LOAEL threshold is aligned with a rating level from industrial or commercial noise of 10 dB below the background level. As the LOAEL is (as set out within the Noise Policy Statement for England, 2010) the level above which adverse effects on health and quality of life can be detected, below this threshold it is considered that adverse effects would not occur.

Table 3-1 - Appendix 3, Table C of Camden's Local Plan: *Noise levels applicable to proposed industrial and commercial developments (including plant and machinery)*

Assessment Location	Design Period	LOAEL (Green)	LOAEL to SOAEL (Amber)	SOAEL (Red)
Garden used for main amenity (free-field) and Outside living or dining or bedroom window (façade)	Day	'Rating level' 10 dB[1] below background	'Rating level' between 9 dB below and 5 dB above background	'Rating level' greater than 5 dB above background
Outside bedroom window (façade)	Night	'Rating level' 10 dB[1] below background and no events exceeding 57 dB L_{Amax}	'Rating level' between 9 dB below and 5 dB above background or noise events between 57 dB and 88 dB L_{Amax}	'Rating level' between 9 dB below and 5 dB above background and/or events between exceeding 88 dB L_{Amax}

CAMDEN PLANNING GUIDANCE AMENITY, 2021

3.2.5. Camden Planning Guidance (CPG) Amenity, January 2021 includes a checklist of items which should be included within an acoustic report to support a planning application. This checklist has been reproduced in Section 5 of this report, along with a description of where the relevant items are included in this report, or why they are not required for this assessment.

3.3 GUIDANCE

BS 4142:2014+A1:2019 METHODS FOR RATING AND ASSESSING INDUSTRIAL AND COMMERCIAL SOUND

3.3.1. BS 4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial sound* (BS 4142) provides typical guidance for assessing noise emissions from new items of building services plant against the existing background noise level at the nearest noise sensitive receptors.

3.3.2. The standard provides guidance as to how to derive the noise rating level for a source based on the character of the noise produced. The character of noise is rated using the penalties below:

- Tonality up to 6 dB
- Impulsivity up to 9 dB
- Other sound characteristics 3 dB
- Intermittency 3 dB

3.3.3. On the determination of a background sound level, BS 4142 states that the goal is to present a background sound level, over a suitable time period, which is representative of the typical noise environment, and considers the context of the noise sources effecting that environment. The statistical analysis provided as an example in BS 4142 presents the lowest most commonly occurring $L_{A90,15m}$ value as the typical background sound level.

3.3.4. It suggests that if the noise rating level is greater than or equal to 10 dB higher than the existing background noise level (L_{A90} dB), it provides a likely indication of a significant adverse impact. If the level is 5 dB above the existing background noise level, it provides a likely indication of an adverse impact. Where the level doesn't exceed the background noise level it is an indication of having low impact.

4 ASSESSMENT

4.1.1. This section provides an assessment of the predicted noise levels resulting from the proposed plant items at the nearby receptors. In order to provide some context a discussion of potential plant noise emission limits based on a nearby recent planning application and fixed noise emission limits based on target internal noise levels has been presented first.

4.2 GRAND UNION HOUSE PLANNING APPLICATION

4.2.1. In March 2021 an application was made for planning consent for a site to the west of the Sainsbury's store (application reference 2021/0911/P), as shown approximately on Figure 2-1 above. An acoustic report ('Grand Union House' dated 19/02/21) accompanied this application and presented noise survey data from measurements undertaken in 2017.

4.2.2. The report also includes a discussion of why it considered that noise measurements undertaken in 2017 remain appropriate at this time.

4.2.3. Noise measurements were undertaken at two locations (which are shown on a plan in Appendix D of the Grand Union House report which has been reproduced in Figure 4-1 below), both of which would be considered fairly representative of the background noise levels over a wider area, including the site of this application. However, in reality it is likely that the receptors overlooking Camden Road will experience higher background noise levels given their proximity to Camden Road which is likely to be a busier road than Kentish Town Road (along which the west measurement position from the Grand Union House site was located) and also a busy bus route.

Figure 4-1 - Appendix D Site Plan and Monitoring Locations - reproduced from Grand Union House Acoustic Report

Source: Grand Union House, Acoustic Report, application reference 2021/0911/P, available at: http://camdocs.camden.gov.uk/HPRMWebDrawer/Record/8791882/file/document?inline

4.2.4. Table 4-1 within the Grand Union House report presents the noise survey data (corrected so that free-field results are presented).

4.2.5. As discussed above, as it is assumed that the proposed plant may operate over the full daytime and night-time periods and as the daytime background levels are higher than the night-time, this assessment is focussed on night-time noise levels as a worst-case.

4.2.6. The typical background sound levels reported during the night-time period (23:00 – 07:00 hours) as presented within the Grand Union House report are as follows:

- MP1 (West) – 47 dB $L_{AF90,\ 15min}$
- MP2 (East) – 49 dB $L_{AF90,\ 15min}$

4.2.7. As a worst-case, the lower of these two values (47 dB $L_{AF90,\ 15min}$) will be used for this assessment in the derivation of a plant noise emission criterion.

4.3 ASSESSMENT CRITERIA

ASSESSMENT CRITERIA BASED ON GRAND UNION HOUSE MEASUREMENTS

4.3.1. As discussed above, the CC policy relating to plant noise is that the rating level from proposed plant should not exceed 10 dB below the background level. This aligns with the LOAEL threshold as set out within the Camden Local Plan.

4.3.2. Therefore, based on the noise measurement data captured for the Grand Union House application, the plant noise emission criterion during the night-time would be 37 dB $L_{AF90,\ 15min}$.

ASSESSMENT CRITERIA BASED ON FIXED LIMITS

4.3.3. It is acknowledged that the background levels at the Camden Road receptors may be slightly different to those measured on the Grand Union House site. In reality it is likely that, given their proximity to the busy Camden Road, noise levels may actually be higher than those measured at the Grand Union House site, therefore leading to a higher plant noise emission criterion. Indeed, as discussed above, this section of Camden Road is located within an NIA meaning that high noise levels have been predicted in this area (based on DEFRA strategic noise mapping).

4.3.4. In the unlikely event that the background noise levels at the receptors on Camden Road are lower than anticipated, we may propose fixed building services noise emission limits as follows.

4.3.5. Where background noise levels are low, we would generally advise that plant noise emission criteria should be set at a level no lower than 35 dB $L_{Ar,T}$ and 30 dB $L_{Ar,T}$ during the daytime and night-time periods respectively.

4.3.6. This is based on an open window providing a sound reduction of 15 dB (as set out within BS 8233:2014 Guidance on sound insulation and noise reduction for buildings), which would result in internal noise levels of 20 dB and 15 dB from building services plant. These resultant levels are both 15 dB below the indoor ambient noise criteria within BS 8233, of 35 dB $L_{Aeq,\ 16hr}$ during the day and 30 dB $L_{Aeq,\ 8hr}$ during the night and align with the LOAEL criteria within Table B of Appendix 3 within the Camden Local Plan.

4.4 ADOPTED ASSESSMENT CRITERIA

4.4.1. In line with the above, for the purpose of this assessment it will be demonstrated that the proposed new plant items will meet both the plant noise emission criterion based on the Grand Union House survey data and BS 4142 (37 dB $L_{Ar,T}$) and the lower criterion based on target internal noise levels (30 dB $L_{Ar,T}$) during the night-time.

4.5 ASSESSMENT OF NOISE LEVELS FROM PROPOSED PLANT

4.5.1. In order to predict noise levels from the proposed plant items a 3D noise model using the CadnaA noise modelling software was constructed of the site and the surrounding area. The model included both the Sainsbury's store and Camden Road residential properties. Point sources were used for the proposed plant items and the propagation methodology outlined in ISO 9613 Attenuation of sound during propagation outdoors was used.

4.5.2. The noise model assumed a ground absorption coefficient of 0 (i.e. acoustically reflective) and all buildings were set to be acoustically reflective (with four orders of reflection calculated).

4.5.3. The results of the noise model indicated that top floor windows of the Camden Road receptors would experience the highest noise levels from the proposed plant.

4.5.4. The highest predicted noise level at the Camden Road receptors was 26 dB (free-field noise level at 1m from the façade). As the plant has been assumed to be operating during both the daytime and night-time, this level is considered indicative of daytime and night-time noise levels.

4.5.5. Given this low level, it is likely that for the majority of the time the plant will not be audible at the Camden Road receptors. It is therefore not considered that the plant will have particular characteristics that would mean that noise character corrections should be applied in line with BS 4142. Therefore, the predicted rating level from the proposed plant is 26 dB $L_{Ar,T.}$

4.5.6. Clearly, this level is significantly lower than the 37 dB $L_{Ar,T}$ criterion based on the Grand Union House measurements. It is also comfortably lower than the worst-case (and likely overly stringent) fixed criterion of 30 dB $L_{Ar,T}$.

4.5.7. It is therefore considered that the proposed new plant items would be highly unlikely to cause a disturbance or harm amenity and thus will meet the following aim from Policy A4 within the Camden Local Plan:

"We will only grant permission for noise generating development, including any plant or machinery, if it can be operated without causing harm to amenity."

4.6 SUMMARY

4.6.1. Given the distance from the proposed plant items and the screening afforded by the Sainsbury's store itself (the proposed plant will be completely screened from view at the Camden Road receptors) it was considered likely that the predicted noise levels from the plant would be very low at the receptors.

4.6.2. A noise model has been constructed to calculate the predicted noise levels at the worst-affected façade of the Camden Road receptors. The predicted noise rating level (as a free-field level at 1m from the façade) from the three proposed plant items at the Camden Road receptors is 26 dB $L_{Ar,T}$ during the daytime and night-time.

4.6.3. Based on noise level data for Grand Union House, and CC policy a plant noise emission criteria of 37 dB $L_{Ar,T}$ during the worst-case night-time period has been identified.

4.6.4. As a worst-case, even if noise levels at the Camden Road receptors are lower than those at Grand Union House (which is considered unlikely), it is considered that plant noise emission criteria should be set no lower than 30 dB $L_{Ar,T}$ during the night-time period.

4.6.5. Therefore, it is clear that the proposed plant items will comply with both criteria. As such, it is considered highly unlikely that noise levels from the proposed plant items will cause adverse noise impacts at the residential receptors on Camden Road.

5 CPG CHECKLIST

5.1.1. As discussed above the CPG Amenity document includes a checklist of items which should be included within an acoustic report to support a planning application. This checklist has been reproduced in Table 5-1 below with a reference to where the relevant information is provided within this report or where it is discussed why certain information is not necessary for this application.

Table 5-1 – Camden Council Amenity CPG Checklist

Checklist Item	Evidence
Description of the proposal	Section 2
Description of the site and surroundings, a site map showing noise and vibration sources and measurement locations	Section 2 (measurement locations not required)
Background noise levels measured over a minimum of 24 hours	Section 4 explains why a noise survey is not required
Details of instruments and methodology used for noise measurements (including reasons for settings and descriptors used, calibration details);	Section 4 explains why a noise survey is not required
Details of the plant or other source of noise and vibration both on plan and elevations and manufacturers specifications;	Section 2
Noise or vibration output from proposed plant or other source of noise and vibration, including: - noise or vibration levels; - frequency of the output; and - length of time of the output.	Noise level predictions are provided in Section 4
Features of the noise or vibration e.g. impulses, distinguishable continuous tone, irregular bursts;	Discussed in Section 4
Specification of the plant, supporting structure, fixtures and finishes;	Plant specifications are provided in Section 2
Location of noise sensitive uses and neighbouring windows;	Section 2
Details of measures to mitigate noise and vibration;	No mitigation is required
Details of any associated work including acoustic enclosures and/or screening;	No mitigation is required
Cumulative noise levels; and;	No cumulative assessment is required
Hours/days of operation	Section 2

6 CONCLUSIONS

6.1.1. WSP has been commissioned by Sainsbury's Supermarkets Limited to undertake a noise assessment for the proposal to install two external condenser units and an ASHP on the roof of Sainsbury's Camden Road store. The site is located within the jurisdiction of CC.

6.1.2. A 3D noise model has been constructed and noise levels from the proposed plant items predicted at the nearby Camden Road receptors. The predicted noise rating level (as a free-field level at 1m from the façade) from the three proposed plant items at the Camden Road receptors is 26 dB $L_{Ar,T}$ during the daytime and night-time.

6.1.3. This level is significantly lower than the 37 dB $L_{Ar,T}$ criterion based on the Grand Union House measurements. It is also comfortably lower than the worst-case (and likely overly stringent) fixed criterion of 30 dB $L_{Ar,T}$.

6.1.4. It is therefore considered that this assessment has appropriately demonstrated that given the particularly low predicted noise level from the plant items, a noise survey is not required for this application.

6.1.5. Based on this assessment, the proposed plant items will be highly unlikely to cause a noise disturbance and will therefore meet the aims of the Camden Local Plan from a noise perspective.

6.1.6. In conclusion, noise from the proposed plant items should not present a constraint to these proposals gaining planning permission.

6.1.7. The limitations of this report are presented in Appendix B.

Appendix A

TECHNICAL GLOSSARY

TECHNICAL GLOSSARY

A-Weighting: The human ear is not equally sensitive to all frequencies of sound. It is relatively much less sensitive to very low frequencies such as 'mains hum', and to very high frequencies such as the call of a bat, than to the 'mid-frequencies' important for human voice communication. In order to make sound level meters, which would otherwise be indiscriminate in registering sound pressures, respond in a way which reflects human perception of sound, they usually are fitted with a set of filters to progressively filter out the high and low frequency energy. The filters are made to an internationally standardised specification and the filtered noise level is said to be 'A-weighted'. Sometimes A-weighted decibel levels are denoted 'dB(A)', but the correct, internationally standardised format for reporting requires the 'A' to be appended to the noise descriptor e.g. $L_{Aeq,T}$, L_{Amax}, etc.

Airborne Sound: Sound transmitted through the air rather than through the structure of a building or the ground.

Ambient Noise: This is the totally encompassing sound at the measurement position over a specified time interval and usually comprises sound from many different sources both near and far. Usually this is measured as an $L_{Aeq,T}$ where T is the time interval.

Attenuation: A general term used to indicate the reduction of noise or vibration, or the amount (in decibels) by which it is reduced.

Averaging: In the absence of a dominant steady source, the sound level at a point, indoors or outdoors, varies continuously. For example, the variation may be over a few dB about an average value in a quiet room, or over 10 dB or more in a noisy outdoor environment. In order to define a level to represent the noisiness of the space it is necessary to define that average value. The most common averaging methods are energy averaging (L_{Aeq}) and statistical averaging (L_{AN} where N is a percentage between 1 and 100).

Background Noise Level, $L_{A90,T}$: Background noise level is a term used to describe that level to which the noise falls during quiet spells, when there is a lull in passing traffic for example. It is quantified by the $L_{A90,T}$ which is the noise level that is exceeded for 90% of the measurement time interval, T. It is typically measured using the fast time weighting (see below), whereby the levels is denoted $L_{AF90,T}$ or $L_{A90,T,fast}$.

Decibels: Noise conventionally is measured in decibels (dB). The decibel is a logarithmic unit and decibel levels do not add and subtract arithmetically. An increase or decrease of 3 dB in the level of a steady noise is about the smallest that is noticeable. It represents a doubling or halving of noise energy. An increase or decrease of 10 dB represents a ten-fold change in noise energy, and is perceived as a doubling or halving of loudness.

The threshold of hearing for a typical young, healthy adult is 0 dB A-weighted sound pressure level. A noise level of 140 dB(A) can cause physical pain. Most people listen to their televisions at about 60 dB(A) to 65 dB(A). Alongside a busy main road the ambient noise level may be in the 70 dB(A) to 80 dB(A) range; on a quiet day in the country it might be as low as 30 dB(A), in town 40 dB(A) to 50 dB(A).

Decibel Addition: If two similar noise sources operate together their combined noise level at an observer's position some distance away is 3 dB higher than the noise level generated by just one of

them. If two further machines are switched on the noise level generated by all four at the observer's position is 3 dB higher than the level generated by the two. If the number of machines is again doubled, to eight, the noise level increases by another 3 dB, and so on.

Equivalent Continuous A-Weighted Sound Pressure Level, $L_{Aeq,T}$: The 'equivalent continuous A-weighted sound pressure level' is an average of the fluctuating sound energy in a space. It is the value of the A-weighted sound pressure level of a continuous, steady sound that, over the specified time period, *T* seconds, has the same root mean square sound pressure as the varying sound. It can be likened to the mean petrol consumption of a car over a specific journey during which the instantaneous consumption peaked during periods of acceleration and fell during periods of coasting or braking.

Façade Sound Level: Road and railway traffic noise levels often are specified in terms of the sound level at a position 1m in front of the most exposed façade of potentially noise sensitive premises. Such levels are assumed to be 3 dB(A) higher than sound levels measured at an equivalent position away from the reflections from the building and any other surfaces (excluding the ground).

Fast Time Weighting: An averaging time used in sound level meters, corresponding to a 125 ms time constant.

Free-field Sound Level: The free-field refers to sound level measurement positions in an open area well away from any buildings or other sound reflecting surfaces other than the ground. Generally the minimum distance from building façades for free-field measurements is taken to be 3.5 m.

Maximum Sound Level, L_{Amax}: This is the maximum instantaneous sound level occurring during the measurement period. It is typically measured using the fast time weighting (see above), whereby the levels is denoted L_{AFmax} or $L_{Amax,fast}$.

Appendix B

LIMITATIONS OF THIS REPORT

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The findings and opinions expressed are relevant to the dates of the site works and should not be relied upon to represent conditions at substantially later dates. Opinions included therein are based on information gathered during the study and our experience. If additional information becomes available which may affect our comments, conclusions or recommendations WSP UK Limited reserve the right to review the information, reassess any new potential concerns and modify our opinions accordingly.

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