Reference: Deliveroo Editions, Swiss Cottage
Project No: 1818025

Technical note

Deliveroo Swiss Cottage – Land to the rear of 115-119 Finchley Road, London, NW3 6HY

Introduction

Planning permission for the Deliveroo site at Swiss Cottage is subject to compliance with a number of planning conditions on consent 2020/2367/P. Planning consent 2020/2367/P is a temporary permission with an expiry date of 3rd December 2021; Deliveroo wish to seek to make their consent permanent.

Sharps Redmore (SR) provided Acoustic consultancy services to Deliveroo for the Planning Enforcement Inquiry that lead to the issuing of a temporary planning permission. SR prepared Proofs of Evidence relating to noise from the use of fixed plant equipment and the use of scooters, electric vehicles and bicycles. Subsequently SR also provided updated noise assessment reports in 2020 to accompany a further planning application seeking the permanent use of the site for Deliveroo Editions.

Fixed plant noise

Noise from fixed plant and equipment at the Swiss Cottage Deliveroo site is controlled by planning condition 9 of planning permission 2020/2367/P. Planning condition 9 states:

"9 The level of noise emitted from all fixed plant on the site shall not exceed a value which is 10 dB below the background noise level at 1 metre from the façade of any dwelling or premises used for residential purposes or an alternative representative location approved in writing by the local planning authority. Background noise level is 50 dB, LA90 during the day (between 0700 and 2300 hours) and is 45 dB, LA90 at night (between 2300 and 0700 hours). The assessment period shall be 1 hour during day time periods and 15 minutes during night time periods. If the plant hereby approved has a noise that has a distinguishable, discrete continuous note (whine, hiss, screech, hum) and/or if there are distinct impulses (bang, clicks, clatters, thumps) the level shall be 15 dB below the background noise level instead of 10 dB below.

Reason: To safeguard the amenities of neighbouring noise sensitive receptors in accordance with the requirements of policies A1 and A4 of the London Borough of Camden Local Plan 2017".

The Proof of Evidence "Assessment of noise from fixed plant equipment" SR reference 1818025, dated 5th July 2019 (appended to this technical note at Figure 1), objectively demonstrates that noise associated with the ventilation and refrigeration plant equipment would comply with the requirement of planning condition 9.

The noise assessment work relating to noise from fixed plant equipment was updated in May 2020 in the report "Assessment of noise from fixed plant equipment", SR reference 1818025, dated 13th May 2020 (appended to this note at Figure 2).

SR confirm that the findings of the plant noise assessments reflect the current position with regard to plant noise emissions from the site. Hence plant noise levels remain compliant with the requirements of planning condition 9.

Delivery activity noise

SR provided technical evidence in relation to noise from delivery activity from the site in the Proof of Evidence "Assessment of noise from Deliveroo Editions operations", SR reference 1818025, dated 9th July 2019 (appended to this technical note at Figure 3).

The noise assessment work relating to noise from Deliveroo operations was updated in May 2020 in the report "Assessment of noise from Deliveroo Editions operations", SR reference 1818025, dated 21st May 2020 (appended to this note at Figure 4)

Deliveries of food orders from the Swiss Cottage Deliveroo site are made by riders using two-wheeled electric vehicles, bicycles or on foot. To this end the noise associated with these forms of transport is negligible.

Planning condition 4 of planning permission 2020/2367/P states:

"4 Deliveries from the premises to customers shall be carried out by foot, bicycle or electric two wheeled vehicle only and not by any other mode of transport.

Reason: To safeguard the amenities of the adjoining premises and the area generally in accordance with the requirements of policies A1 and A4 of the London Borough of Camden Local Plan 2017."

Sharps Redmore confirm that the site continues to operate its delivery service using two-wheeled electric deliveries and bicycles, as such associated noise is considered to be negligible.

Keith Metcalfe

Director

28th September 2021

FIGURE 1

SHARPS REDMORE PROOF OF EVIDENCE "ASSESSMENT OF NOISE FROM FIXED PLANT EQUIPMENT", DATED 5TH JULY 2019

SHARPS REDMORE

ACOUSTIC CONSULTANTS • Established 1990

Proof of Evidence

Deliveroo Editions, Finchley Road, Swiss Cottage

PINS ref:
APP/X5210/C/18/3206954

Council ref: EN17/1005

Assessment of noise from fixed plant equipment

Prepared by
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Date 5th July 2019
Project No: 1818025

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Appendices

1.0 Qualifications and Experience

1.1 My name is Keith James Metcalfe, I am a Director and acoustic consultant with Sharps Redmore, a specialist acoustic consultancy based in Ipswich.

1.2 I hold a Bachelor of Science (Honours) degree in Environmental Studies and the Institute of Acoustics (IOA) Diploma in Acoustics and Noise Control. I am a Member of the Institute of Acoustics.

1.3 I have been employed in my current position since March 2004. Prior to this he worked as an acoustic consultant with Arup Acoustics. I have over 23 years' experience in acoustic consultancy.

1.4 I specialise in environmental noise and have undertaken assessments of proposals for industrial, distribution, residential and retail projects. I have presented evidence at planning inquiries, informal hearings and for written representation appeals.

1.5 Since joining Sharps Redmore in 2004, my main focus has been assessing noise associated with retail operations; I have personal experience of working on in excess of 500 retail projects. The noise characteristics associated with retail ventilation and refrigeration equipment are very similar to those associated with Deliveroo operations at this site.

1.6 The evidence which I have prepared and provide for this appeal reference APP/X5210/C/18/3206954 in this proof of evidence is true and has been prepared and is given in accordance with the guidance of The Institute of Acoustics and I confirm that the opinions expressed are my true and professional opinions.

2.0 Introduction

2.1 Sharps Redmore (SR) has been instructed to undertake a noise assessment of fixed plant equipment associated with the Deliveroo Editions site at Finchley Road, Swiss Cottage.

2.2 This noise assessment work is intended to provide evidence for an appeal (reference APP/X5210/C/18/3206954) against a planning enforcement notice served by the London Borough of Camden (LBC) on 1st June 2018 (reference EN17/1005) which has been followed by a further enforcement notice served on 23rd April 2019 (reference EN19/0359). Two of the reasons given for the service of enforcement action (the reasons identified in both enforcement notices are identical) relate to noise. They are:

"The high volume of vehicle deliveries serving the Property results in a significant noise nuisance and a harmful loss of amenity to adjacent occupiers contrary to Policy A1 of the Camden Local Plan 2017"

And

"A suitably comprehensive acoustic survey and a risk-based odour control and impact assessment demonstrating that all plant equipment, when operating at full capacity, would be capable of doing so without causing harm to local amenity has not been provided. As a result, the plant and equipment that have been installed at the Property are contrary to Policies A1 and A4 of the Camden Local Plan 2017"

2.3 This proof of evidence seeks to address noise associated with the second reason, above, relating to noise from fixed plant equipment. The evidence of my colleague Clive Bentley, is presented in a separate proof of evidence, which seeks to address the first reason for refusal relating to deliveries serving the site.

2.4 The Deliveroo Editions site has been operating since November 2017; comprising of nine kitchen 'pods' with associated ventilation and refrigeration plant equipment.

2.5 A retrospective planning application was made for the Deliveroo plant equipment, which was accompanied by a plant noise assessment report prepared by Noise Solutions Limited (NSL) dated 4th August 2017 (see Appendix A). This assessment was reviewed by Camden Council's Environmental Health Officer (EHO) who made a number of comments in relation to the NSL report, as outlined in the Delegated Report (application 2017/4737/P – see Appendix B to this report).

2.6 With regard to the NSL assessment of plant noise the EHO made a number of observations. The first was to be critical of the duration of the baseline noise survey, which was undertaken over a 22 hour period. Concerns were expressed that the survey should have been carried out over a period sufficiently long to establish any variation in background noise level between weekday and weekend days. A second concern was raised that the NSL noise survey was dominated by plant room noise from the adjacent premises to the Deliveroo site and that this could vary at receptors closer to the Deliveroo unit. A third concern was also made that the noise assessment should consider noise from existing (non Deliveroo) plant equipment installed at roof level of the Deliveroo unit without planning permission.

2.7 The concerns detailed above have since been discussed with Mr Camilo Castro-Llach, Noise Officer at Camden Council. To address the first two concerns, it was agreed that a further baseline noise survey should be carried out; this is detailed in this assessment. With regard

to the third concern raised in the delegated report, this has been discussed and agreed that it is not one that Deliveroo should be addressing as part of an assessment of Deliveroo plant noise, rather one for planning enforcement to address, should concerns continue.

2.8 It is noted that the 2017 NSL plant noise assessment report only considered noise associated with the kitchen ventilation supply and extract systems. This updated assessment considers noise from both Deliveroo kitchen ventilation plant equipment, and that from the installed refrigeration equipment. Predicted Deliveroo plant noise levels are considered (section 5) in relation to agreed plant noise limits determined following a new background noise survey (section 4).

2.9 The closest residential properties to the proposed Deliveroo plant are in Dobson Close to the south and west.

2.10 This assessment is based on plant equipment information supplied by Chapman Ventilation Limited, Airedale Group, Leech Group Services and Deliveroo. The plant noise source level information used in this assessment is presented in Appendix C. A full topographical survey of the site has been carried out by Retail Design Solutions, with other technical drawings provided by LBF Architects (reproduced at Appendix D).

2.11 Section 3 of this report contains a review of the relevant planning policy and guidance.

2.12 Section 4 of this report sets out the findings of an environmental noise survey and section 5 presents an assessment of noise from the Deliveroo fixed plant equipment.

2.13 The assessment summary and conclusions are contained in section 6 of this report.

2.14 A guide to the acoustic terminology used in this report is shown in Appendix I.

3.0 Planning Policy and assessment methodology and criteria

National Planning Policy, Guidance and Standards

3.1 The National Planning Policy Framework (NPPF), February 2019, sets out the Government's planning policies for England and "these policies articulate the Government's vision of sustainable development." In respect of noise, Paragraph 180 of the NPPF states the following:

"Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;

b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; and

c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation".

3.2 The NPPF reinforces the March 2010 DEFRA publication, "Noise Policy Statement for England" (NPSE), which states three policy aims, as follows:

"Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- *avoid significant adverse impacts on health and quality of life;*
- *mitigate and minimise adverse impacts on health and quality of life; and*
- *where possible, contribute to the improvement of health and quality of life."*

3.3 Together, the first two aims require that no significant adverse impact should occur and that, where a noise level which falls between a level which represents the lowest observable adverse effect and a level which represents a significant observed adverse effect, then according to the explanatory notes in the statement:

"… all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life whilst also taking into consideration the guiding principles of sustainable development. This does not mean that such effects cannot occur."

3.4 Taking an overview of national policy aims and guidance it is clear that when considering the impact of noise, the fact noise can be heard and causes impact, is not a reason to refuse an application as consideration should also be given to the significance of the impact and the mitigation measures available.

3.5 It is normal and good practice to apply objective standards to the assessment of noise and the effect produced by the introduction of a certain noise source may be determined by several methods, as follows:

i) The effect may be determined by reference to guideline noise values, such as those contained in the World Health Organisation (WHO) "*Guidelines for Community Noise"*.

ii) Alternatively, the impact may be determined by considering the change in noise level that would result from the proposal, in an appropriate noise index for the characteristic of the noise in question. There are various criteria linking change in noise level to effect. This is the method that is suited to, for example, the assessment of noise from road traffic because it is capable of displaying impact to all properties adjacent to a road link irrespective of their distance from the road.

iii) Another method is described within BS 4142:2014 which focuses on determining the significance of sound impact from sources of industrial and/or commercial nature. The sources that the newly revised standard is intended to assess are sound from industrial and manufacturing processes, sound from fixed plant installations, sound from loading and unloading of goods at industrial and/or commercial premises and the sound from mobile plant and vehicles, such as forklift, train or ship movements.

3.6 The assessment of fixed plant noise is principally undertaken in accordance with the methodology in BS 4142:2014. The scope of this standard states that it is suitable for the assessment of:

"a) sound from industrial and manufacturing processes;

b) sound from fixed installations which comprise mechanical and electrical plant and equipment;

c) sound from the loading and unloading of goods and materials at industrial and/or commercial premises; and

d) sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes, such as that from forklift trucks, or that from train or ship movements on or around an industrial and/or commercial site."

3.7 The significance of sound impact is to be determined according, in summary, to the following process:

i) Determine the typical background sound levels, in terms of the index L_{A90}, at the receptor locations of interest.

ii) Determine the specific sound level of the source being assessed, in terms of its L_{AeqT} level (T = 1 hour for day or 15 minutes for night), at the receptor location of interest.

iii) Apply a rating level acoustic feature correction if the source sound has tonal, impulsive, intermittent, or other characteristics which attract attention.

iv) Compare the rating sound level with the background sound level; the greater the difference between the two, the higher the likelihood of adverse impact.

v) A difference (rating – background) of around +10 dB is an indication of significant adverse impact, depending on the context; a difference of +5 dB is an indication of an adverse impact, depending on the context. 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 upon context.

3.8 BS 4142:2014 introduces the concept of '*context'* to the process of identifying noise impact. Section 11 of BS 4142:2014 explains "*The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs* (our emphasis). A*n effective assessment cannot be conducted without an understanding of the reason(s) for the assessment and the context in which the sound occurs/will occur. When making assessments and arriving at decisions, therefore, it is essential to place the sound in context"* (our emphasis).

3.9 There are many *context* points to consider when undertaking an assessment of sound impact including:

- The absolute level of sound;
- The character and level of the specific sound in the context of the existing noise climate; for example is the sound to occur in a location already characterised by similar activities as those proposed?
- The sensitivity of the receptors;
- The time and duration that the specific sound is to occur;
- The conclusions of assessments undertaken using alternative assessment methods, for example WHO guidelines noise values or change in noise level;

3.10 It is therefore entirely possible that whilst the numerical outcome of a BS 4142:2014 assessment is indicative of adverse or significant adverse impact, when the proposal is considered in *context* the significance of the impact is reduced to an acceptable level.

Local Planning Policy, Guidance and criteria

3.11 Policy 7.15 of the adopted London Plan (2016) states that planning proposals should:

"… seek to manage noise by:

a. avoiding significant adverse noise impacts on health and quality of life as a result of new development;
b. mitigating and minimising the existing and potential adverse impacts of noise on, from, within, as a result of, or in the vicinity of new development without placing unreasonable restrictions on development or adding unduly to the costs and administrative burdens on existing businesses;
c. improving and enhancing the acoustic environment and promoting appropriate soundscapes (including Quiet Areas and spaces of relative tranquillity);
d. separating new noise sensitive development from major noise sources (such as road, rail, air transport and some types of industrial development) through the use of distance, screening or internal layout – in preference to sole reliance on sound insulation;
e. where it is not possible to achieve separation of noise sensitive development and noise sources, without undue impact on other sustainable development objectives, then any potential adverse effects should be controlled and mitigated through the application of good acoustic design principles;
f. having particular regard to the impact of aviation noise on noise sensitive development;

g. promoting new technologies and improved practices to reduce noise at source, and on the transmission path from source to receiver."

3.12 The Mayor of London's draft New London Plan (2018) contains Policy D13, which with its suggested minor modifications, has the following relevant policy requirements:

"*In order to reduce, manage and mitigate noise to improve health and quality of life, residential and other non-aviation development proposals should manage noise by:*

- *avoiding significant adverse noise impacts on health and quality of life …*
- *mitigating and minimising the existing and potential adverse impacts of noise on, from, within, as a result of, or in the vicinity of new development without placing unreasonable restrictions on existing noise generating uses …"*

3.13 The Camden Local Plan (2017) contains Policy A4 which sets out policy for noise and vibration. This states:

"The Council will seek to ensure that noise and vibration is controlled and managed.

Development should have regard to Camden's Noise and Vibration Thresholds (Appendix 3). We will not grant planning permission for:

a. development likely to generate unacceptable noise and vibration impacts; or

b. development sensitive to noise in locations which experience high levels of noise, unless appropriate attenuation measures can be provided and will not harm the continued operation of existing uses.

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

We will also seek to minimise the impact on local amenity from deliveries and from the demolition and construction phases of development."

3.14 Appendix 3 of the Camden Local Plan 2017 contains noise thresholds for Industrial and Commercial Noise Sources.

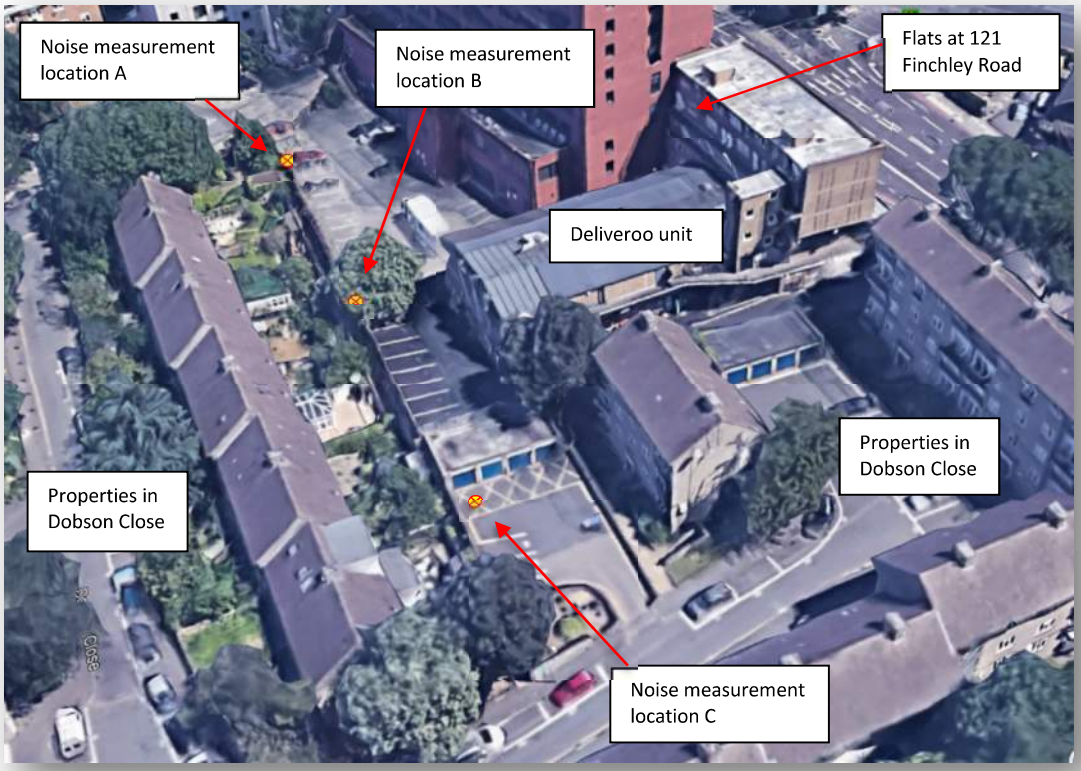
"A relevant standard or guidance document should be referenced when determining values for LOAEL and SOAEL for non-anonymous noise. Where appropriate and within the scope of the document it is expected that British Standard 4142:2014 'Methods for rating and assessing industrial and commercial sound' (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)."

3.15 The above thresholds have been discussed with Mr Camilo Castro-Llach. It is agreed that the design objective should be that noise from the Deliveroo fixed plant equipment does not exceed a level 10 dB below the existing typical daytime and night time background noise levels at the closest residential properties in Dobson Close.

4.0 Environmental noise survey details

4.1 An unattended baseline noise survey was undertaken between Thursday 21st March and Monday 25th March 2019, at two measurement locations to the rear of the properties in Dobson close, at the back of the Deliveroo unit (noise measurement locations A and B as shown on the map at Figure 1 below). A short attended survey undertaken on Tuesday 23rd April 2019 in the car park to the rear of the flats at 11 to 16 Dobson Close (noise measurement location C as shown on the map in Figure 1 below).

FIGURE 1: Noise measurement locations



4.2 The unattended baseline noise measurements (locations A and B) were carried using Cirrus Optimus sound level meters, with the attended short term survey (location C) carried out using a Norsonic 118 sound level meter. All sound level meters were calibrated at the start and end of the measurements and no variations in level observed.

4.3 Both sound level meter microphones were positioned approximately 1.5 to 2 metres above the ground in free field conditions.

4.4 The weather conditions during the survey(s) were dry are not considered to have affected the noise measurements. The following weather conditions occurred during the survey as reported by the BBC weather forecast.

TABLE 1: Noise survey weather conditions

Date	Weather conditions
Thurs 21.3.19	Mostly cloudy, 11-14°C, light south westerly wind
Fri 22.3.19	Mostly cloudy, 9-15°C, light south westerly wind
Sat 23.3.19	Mostly cloudy, 7-12°C, light northerly wind
Sun 24.3.19	Partly cloudy, 4-12°C, light north to north westerly wind

Mon 25.3.19	Partly cloudy, 4-13°C, light westerly wind
Tues 23.4.19	Partly cloudy, 20°C, light easterly wind

4.5 Measurement location A was selected to seek to replicate the noise survey undertaken by NSL in their baseline noise survey. At this location, the noise climate was found to be dominated by noise from the office block plant room. The measured background noise levels correlated well to those measured by NSL to be typically 52 dB L_{A90} both daytime and night time (see Appendix E for full survey results and a summary of the noise climate at location A at Figure 2).

4.6 Measurement location B was located in the north west corner of the Deliveroo rear yard area, at the boundary with the rear gardens of the houses in Dobson Close. Whilst it was anticipated that the noise at this location would be dominated by noise from Deliveroo plant, the measured background noise levels were lower than those at location A. Noise at this location was affected by local road traffic sources, and intermittent Deliveroo plant noise. Typically the background noise climate at this location was found to be 50 dB L_{A90} daytime and 45 dB L_{A90} at night (see Appendix E for full survey results and a summary of the noise climate at location A at Figure 3).

4.7 Noise measurement location C was a short term attended location within the car park to the rear of the flats at 11 to 16 Dobson Close. The measured background noise levels in this location were between 46 to 48 dB L_{A90}, albeit they represent 15 minute samples over a relatively short period of time (see Appendix E for full survey results).

4.8 It has been agreed with Mr Camilo Castro-Llach that the noise levels measured at location B of 50 dB L_{A90} daytime and 45 dB L_{A90} night time are considered to be representative of the typical background noise climate at the properties in Dobson Close, and shall be used as the basis for setting plant noise limits.

FIGURE 2: Summary of measured noise levels measurement location A, to the rear of 1 Dobson Close

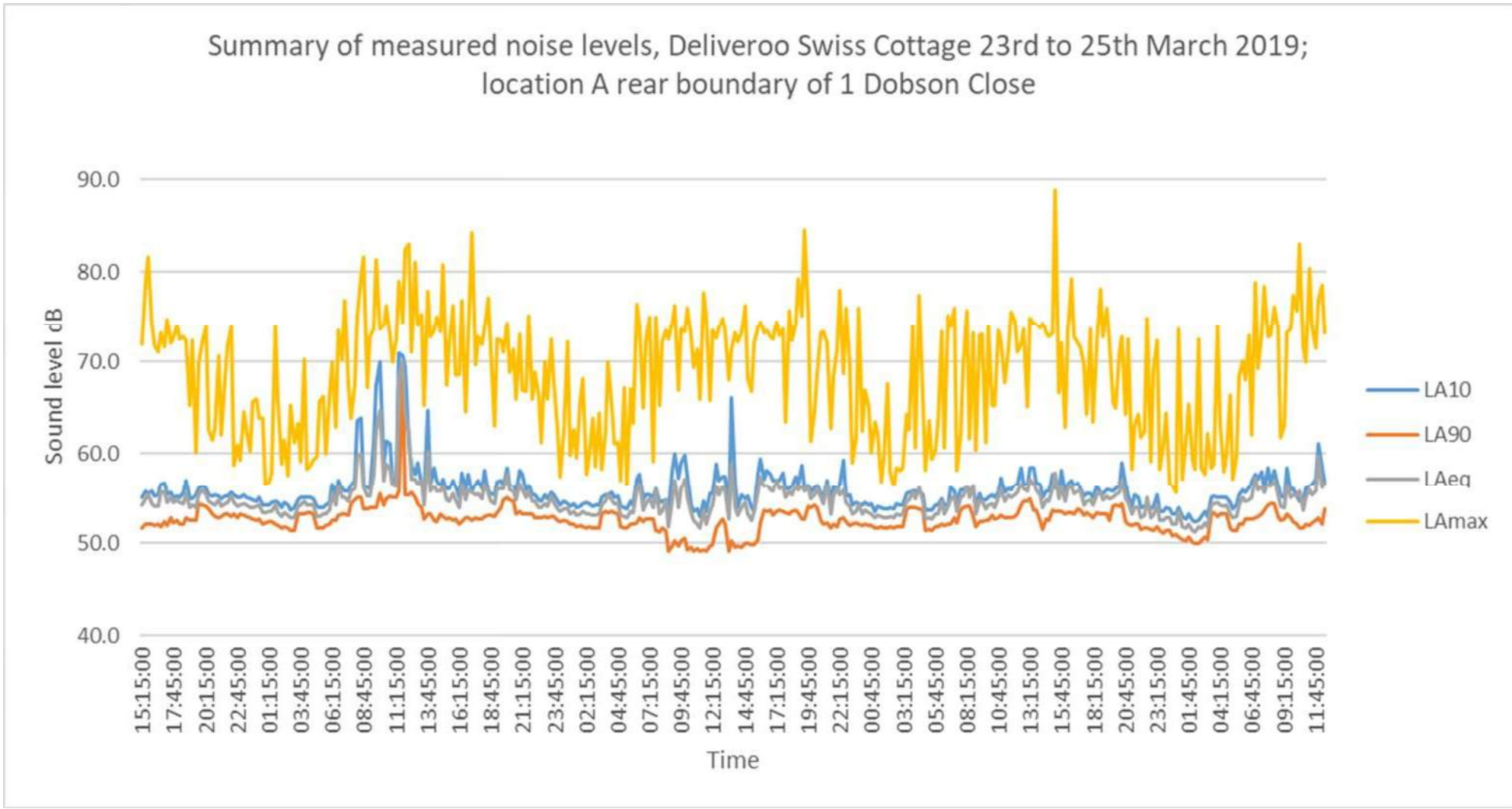
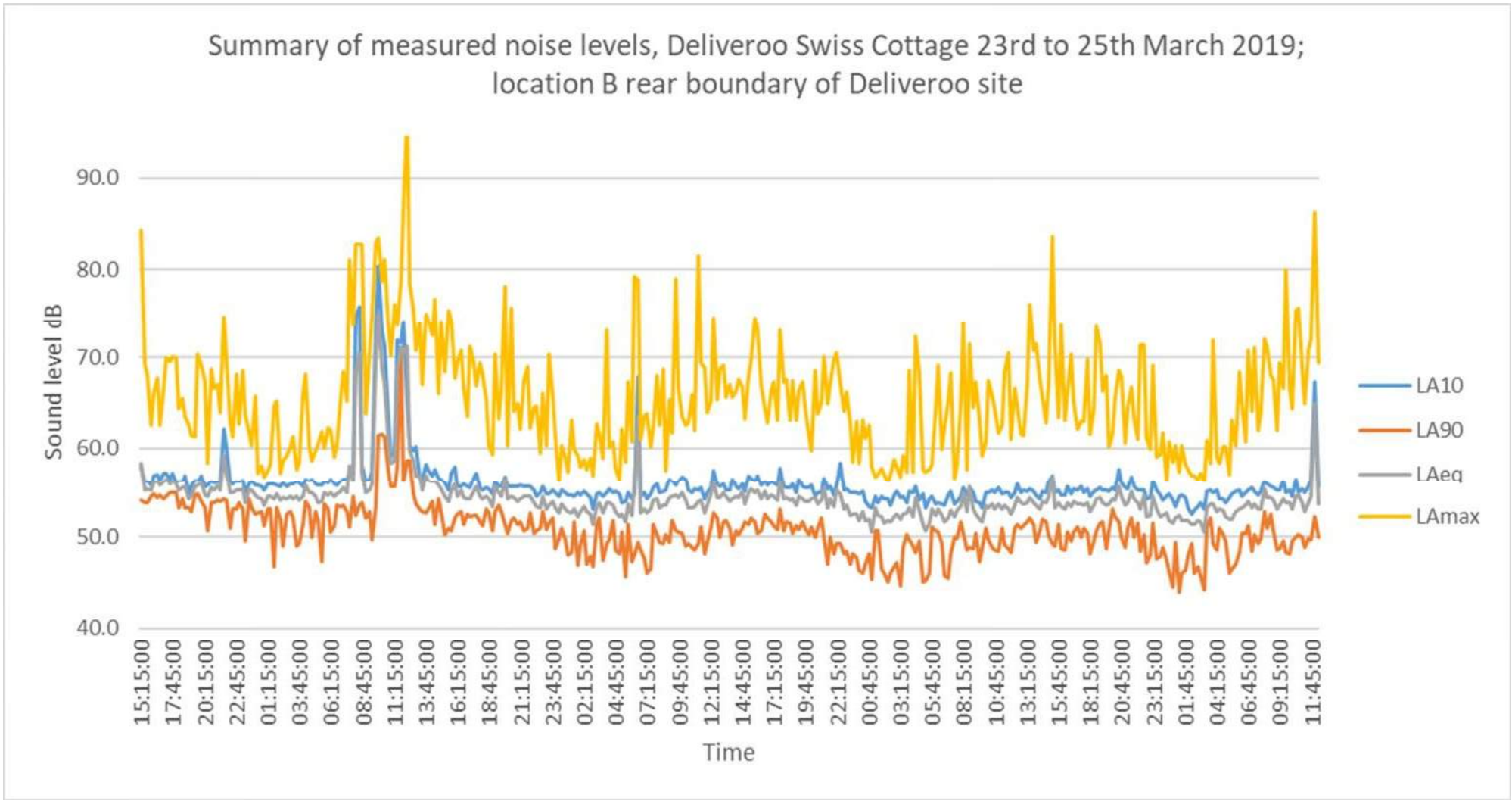


FIGURE 3: Summary of measured noise levels measurement location A, to the rear of 5 Dobson Close (boundary with Deliveroo unit)



5.0 Fixed plant noise assessment

5.1 It is standard practice that the objective assessment of plant sound sources in commercial premises is undertaken in accordance with British Standard 4142:2014. This Standard enables the resultant sound levels from new plant equipment to be compared against the existing typical background sound level (L_{A90}) of an area to establish the significance of the sound impact.

5.2 The agreed typical measured background sound levels were 50 dB L_{A90} during the daytime and 45 dB L_{A90} at night to the rear of 5 Dobson Close.

5.3 In terms of seeking to set appropriate plant rating sound limits, the advice in BS 4142:2014 is that *"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 of having a low impact, depending on the context*" (clause 11, note 'd').

5.4 However, as discussed at paragraph 3.14 the plant noise limit required by Camden Council (CC) are more stringent than those suggested by BS 4142. CC policy is for plant rating noise level to not exceed a level 10 dB below the background noise climate. The following plant noise limits have been adopted.

TABLE 2: Adopted plant noise limits

Time period	Plant rating noise level limits dB
Daytime (0700 to 2300 hours)	40 (50-10)
Night time (2300 to 0700 hours)	35 (45-10)

5.5 Previous noise modelling has established that the original Deliveroo plant equipment scheme had been operating at noise levels above local authority threshold limits. Deliveroo has recently instigated number of operational changes aimed at improving the way the site operates. This has involved removal of an external refrigeration condenser unit, with reliance on an internal freezer storage solution, and the installation of atmospheric side attenuators to two previously unattenuated extract fan systems (which has no effect on the external appearance of the Deliveroo unit).

5.6 This assessment objectively demonstrates that the Deliveroo ventilation and refrigeration plant equipment operates in accordance with the noise limits agreed with the local authority.

5.7 The following table summarises the mechanical services plant equipment source noise levels.

TABLE 3: Plant schedule source noise levels

Description	Octave band (Hz) sound power levels dB L_W							
	63	125	250	500	1K	2K	4K	8K
Kitchen extract fans EF1 & EF2*	79	73	84	80	80	75	73	70
Kitchen extract fans EF3*	80	74	85	81	81	76	74	71
Kitchen extract EF1 & EF2 duct breakout**	69	58	63	48	41	30	26	29
Kitchen extract EF3 duct breakout**	70	59	64	49	42	31	27	30
Kitchen supply fan SF1*	76	82	80	77	72	69	66	64
Kitchen supply fan SF2*	77	83	81	78	73	70	67	65
Kitchen supply fan SF3*	80	96	84	81	76	73	70	68
Chefs room extract fan EF4	49 dBA at 10 metres							
Rider room extract fan EF5	49 dBA at 10 metres							
Toshiba AC unit (x3)	47 dBA measured at 1 metre (each unit)							
Optyma condenser unit fridge room	38 dBA at 10 metres							

Notes:
*Fan noise levels corrected for fan speed (see Appendix F);
**Kitchen extract fan duct breakout source noise level calculations see Appendix G.

5.8 The extract and supply systems have been fitted with atmospheric side attenuators with the following insertion loss performance.

TABLE 4: As installed insertion loss performance

Equipment name/reference	Insertion loss – Mid frequency octave bands (Hz)							
	63	125	250	500	1K	2K	4K	8K
Kitchen extract fans EF1, EF2 & EF3	4	6	9	17	22	20	16	10
Kitchen supply fan SF1 & SF3	5	7	11	19	25	22	18	12
Kitchen supply fan SF2	6	13	26	36	40	36	30	21
Extract fans EF4 and EF5	2	5	8	12	14	16	15	10

5.9 All of the plant equipment operates during the daytime; with only the Optyma condenser unit (for the chilled room) operating throughout the day and night time. The ventilation equipment only operates during the daytime when the kitchens are in use, and the Toshiba AC units are on timer switches to ensure daytime only use.

Noise modelling

5.10 SR uses an environmental noise modelling software package called 'NoysPlot'. This software enables coordinates to be entered for the relative positions of noise sources, receivers and barriers to calculate a resultant noise level at a given noise receptor. The software carries out 'text book' atmospheric side calculations with regard to distance and screening attenuation by referencing relative source and receiver positions.

5.11 The schedule of source noise data produced by the noise model is presented in Appendix H1.

5.12 The height coordinates ('z') used in the 'NoysPlot' model have been taken from the Retail Design Solutions topographical survey drawings and from site observations. The horizontal coordinates are referenced from an arbitrary 'x', 'y' position on a grid system.

5.13 NoysPlot uses operating time information to calculate noise levels for daytime and night time operation. The time period that the equipment is assumed to be operating is denoted by 'D' to indicate daytime only operation; 'N' to denote night time usage and 'A' to indicate that the equipment runs all the time. As explained, all of the plant equipment operates during the daytime; with only the Optyma condenser unit (for the chilled room) operating throughout the day and night time. In the context of the existing noise climate none of the ventilation or refrigeration equipment is considered to attract a BS 4142 rating level correction for noticeable acoustic characteristic.

5.14 NoysPlot has the capability to accept input noise data in a number of formats. Where available, the ventilation plant manufacturer's sound power level data (designated by the letter W in the L_p/L_w column of the input schedule) is used. Where the sound power level data is not available the manufacturer's un-weighted octave band sound pressure levels at a stated distance are used (designated P but with an N in the dBA column of the schedule to indicate un-weighted). Alternatively, measured or manufacturer's A-weighted, single figure, averaged level at the stated distance is used (designated 'P' with 'Y' in the dBA column of the schedule). For this assessment, single figure A-weighted noise level data and octave band sound power levels have been used.

5.15 The surface directivity is also assessed for all cases – this depends on the number of adjacent reflective surfaces – the number can be seen in the column headed Q in the input schedule.

5.16 Summaries of the atmospheric noise calculations for daytime and night time are displayed in Appendices H3 and H4. Calculations for each source to receiver can be made available upon request. These calculations take into account the attenuation afforded by distance, outlet reflection, angular and surface directivity and acoustic screening. The software maintains a logarithmic summation for each receiver position and ranks the individual noise sources in order of contribution to the overall noise level (highest at the top of the list). This assists with the identification of those noise sources requiring additional noise control.

5.17 The input data defining the locations of the noise sources, the receivers and screening are shown in Appendix H2. The NoysPlot noise model principally considers two noise barrier types; the barrier descriptor 'R' is used in the schedule to denote a ring type whereby only noise transmitted over the top of the barrier is considered; whilst noise barriers denoted

'F' for finite consider noise transmitted over the top and around the ends of the barrier. The Deliveroo building has been modelled as a ring barrier.

5.18 The NoysPlot calculations (see Appendices H3 and H4) show the following resultant plant noise levels:

TABLE 5: Predicted plant rating noise levels

Noise sensitive receptor	Predicted plant rating noise level dB(A)	
	Daytime	Night time
7 Dobson Close	35	32
3 Dobson Close	36	28
1 Dobson Close	35	26
5 Dobson Close	36	31
11 to 16 Dobson Close (ground floor)	37	25
11 to 16 Dobson Close (1st floor)	37	25
11 to 16 Dobson Close (2nd floor)	37	25
17 to 24 Dobson Close	32	10
121 Finchley Road above shops	37	8

5.19 The predicted rating noise levels show compliance with the local authority criteria for plant rating noise levels not to exceed 40 dB daytime and 35 dB at night. BS 4142 describes this situation, where plant rating noise levels do not exceed the background sound level, as being indicative of low impact, depending upon context. The above predicted rating levels are 10 dB or more below the background noise climate.

6.0 Assessment summary and conclusions

6.1 This proof of evidence considers noise associated with the fixed plant equipment at the Deliveroo Editions site at Finchley Road, Swiss Cottage.

6.2 The plant noise assessment at section 5 of this proof of evidence demonstrates that the predicted rating noise levels from the operation of the Deliveroo fixed plant equipment comply with Camden Council's requirement for plant rating noise levels to be 10 dB below the existing background noise climate.

6.3 The principal noise reduction measures at this site are the use of atmospheric side attenuators to the extract and supply fan systems, and the selection of intrinsically quiet refrigeration plant equipment.

6.4 This assessment objectively demonstrates that the predicted rating noise levels meet the local authority noise level requirements, and in doing so would comply with the requirements of the NPPF to avoid significant adverse impact.

APPENDIX A

NOISE SOLUTIONS LIMITED – PLANT NOISE ASSESSMENT DATED 4TH AUGUST 2017

NSL
Noise Solutions Ltd

Deliveroo

115 to 121 Finchley Road
Swiss Cottage
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NW3 6HY

Plant Noise Impact Assessment

On behalf of

deliveroo

Project Reference: 86967 | Revision: 03 | Date: 4 August 2017

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Document Information

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For and on behalf of Noise Solutions Ltd				

Revision	Date	Description	Prepared	Reviewed/ Approved
1	1/12/2017	Update reference to Camden London Borough policies	AM	NAC
2	31 Jan 2018	Clarification of operating hours	NAC	JS
3	5 Feb 2018	Amended for Certificate of Lawfulness Application	NAC	JS

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Contents

Appendices

1.0 Introduction

1.1. A Deliveroo kitchen is located within an existing building along Finchley Road in Swiss Cottage, London. Noise Solutions Ltd (NSL) has been commissioned to undertake a noise impact assessment in relation to the plant noise emissions from the building services plant serving the kitchen.

1.2. Noise emission levels for the installed plant have been predicted at the nearest noise sensitive receptors to the site and assessed against the relevant local and national guidance.

1.3. Appendix A contains a guide to common acoustic terminology.

2.0 Details of development proposals

2.1. A Deliveroo kitchen is located on the ground floor of an existing building located on the western side of Finchley Road in Swiss Cottage, London. There are currently eight kitchens on the site, with the potential to add a further kitchen in the future.

2.2. The installed ventilation plant comprises three supply Air Handling Units (AHU) and three kitchen extract fans. All plant is located inside the building with external intake and discharge vents. Appendix D contains the noise output data for the proposed plant.

2.3. Operating hours are 08:30 to midnight, with cooking and deliveries out 17:00 - 23:00 Monday to Wednesday and 12:00 – 23:00 Thursday to Saturday. The period between 23.00 and midnight is used for cooling off and cleaning up.

3.0 Nearest noise sensitive receptors

3.1. The area surrounding the site contains mixed residential and commercial properties. The nearest residential dwellings are above the shops adjoining the proposed kitchen (Reference R1) at a distance of approximately 2m from the closest ventilation grille. There are further residential properties (Reference R2) behind the kitchen along Dobson Close at a distance of approximately 20m from the closest proposed plant item.

3.2. Appendix B contains an aerial photograph showing the site and surrounding area.

4.0 Existing noise climate

4.1. An environmental noise survey was undertaken to establish the typical background sound levels at a location representative of the noise climate outside the façades of the nearest noise sensitive receptors to the plant area, during the quietest times at which the plant will operate.

4.2. The results of the environmental sound survey are summarised in Table 1 below. The full set of measurement results and details of the survey methodology are presented in Appendix C.

Table 1: Summary of survey results

Measurement period	Range of recorded sound pressure levels (dB)			
	$L_{Aeq(15min)}$	$L_{Amax(15min)}$	$L_{A10(15min)}$	$L_{A90(15min)}$
Daytime (07.00 - 23.00 hours)	55-69	65-92	57-75	54-59
Operating hours (08.30 – 24.00)	55-69	65-92	56-75	54-59
Night-time (23.00 - 07.00 hours)	53-60	57-91	54-59	52-58

4.3. The noise climate at the nearest residential flat overlooking the site was dominated by noise from existing plant serving other premises in the area. In order to be robust, the lowest $L_{A90,15min}$ background levels are therefore deemed to be representative.

4.4. It should be noted that BS 4142:2014 *'Methods for rating and assessing industrial and commercial sound'* states the following with regard to the measurement of background noise levels;

> *Since the intention is to determine a background sound level in the absence of the specific sound that is under consideration, it is necessary to understand that the background sound level can in some circumstances legitimately include industrial and/or commercial sounds that are present as separate to the specific sound.*

5.0 Plant noise design criteria

National Planning Policy Framework

5.1. The National Planning Policy Framework (NPPF) was introduced in March 2012. The document sets out the Government's planning policies for England and how these are expected to be applied.

5.2. *Paragraph 123* of the *NPPF* states that planning policies and decisions should aim to:

- *avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;*
- *mitigate and reduce to a minimum other adverse impacts on quality of life arising from noise from new development, including through the use of conditions;*

- *recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established [subject to the provisions of the Environmental Protection Act 1990 and other relevant law]; and*

- *identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.*

5.3. Furthermore the NPPF gives weight to the requirements of the local authority as it states the following:

> *11. Planning law requires that applications for planning permission must be determined in accordance with the development plan unless material considerations indicate otherwise.*
>
> *12. This National Planning Policy Framework does not change the statutory status of the development plan as the starting point for decision making. Proposed development that accords with an up-to-date Local Plan should be approved, and proposed development that conflicts should be refused unless other material considerations indicate otherwise. It is highly desirable that local planning authorities should have an up-to-date plan in place.*
>
> *13. The National Planning Policy Framework constitutes guidance for local planning authorities and decision-takers both in drawing up plans and as a material consideration in determining applications.*

Planning Practice Guidance – Noise

5.4. As of March 2014, a Planning Practice Guidance (PPG) for noise was issued which provides additional guidance and elaboration on the aims of Paragraph 123 in the NPPF. The PPG advises that when plan-making and decision-taking, the Local Planning Authority should consider the acoustic environment in relation to:

- Whether or not a significant adverse effect is occurring or likely to occur;

- Whether or not an adverse effect is occurring or likely to occur; and

- Whether or not a good standard of amenity can be achieved.

5.5. This guidance introduced the concepts of NOAEL (No Observed Adverse Effect Level), and UAEL (Unacceptable Adverse Effect Level). NOAEL differs from NOEL in that it represents a situation where the acoustic character of an area can be slightly affected (but not such that there is a perceived change in the quality of life). UAEL represents a situation where noise is 'noticeable',

'very disruptive' and should be 'prevented' (as opposed to SOAEL, which represents a situation where noise is 'noticeable' and 'disruptive', and should be 'avoided').

5.6. As exposure increases above the LOAEL, the noise begins to have an adverse effect and consideration needs to be given to mitigating and minimising those effects, taking account of the economic and social benefits being derived from the activity causing the noise. As the noise exposure increases, it will then at some point cross the SOAEL boundary.

5.7. The LOAEL is described in PPG as the level above which "noise starts to cause small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life."

5.8. PPG identifies the SOAEL as the level above which "noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area."

5.9. In line with the Explanatory Note of the NPSE, the PPG goes on to reference the LOAEL and SOAEL in relation to the noise impact. It also provides examples of outcomes that could be expected for a given perception level of noise, plus actions that may be required to bring about a desired outcome. However, in line with the NPSE, no objective noise levels are provided for LOAEL or SOAEL although the PPG acknowledges that: *"...the subjective nature of noise means that there is not a simple relationship between noise levels and the impact on those affected. This will depend on how various factors combine in any particular situation."*

5.10. The relevant guidance in the PPG in relation to the adverse effect levels is summarized in Table 2.

Table 2: Summary of Effect Levels

Perception	Examples of Outcomes	Increasing Effect Level	Action
Not Noticeable	No Effect	No Observed Effect	No specific measures required
Noticeable and not Intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Noticeable and Intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Noticeable and Disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Noticeable and very Disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

5.11. This assessment will assess the impact of scooter deliveries from the kitchen in line with the NPPF. As the NPPF does not provide explicit objective assessment methodologies, various guidance documents and standards will be taken into account as summarized in the following section.

Camden London Borough Council

5.12. The Camden Local Policy document dated 2017 states in Policy A1 *'Managing the impact of development'* that for noise and vibration:

> *"Noise and vibration can have a major effect on amenity. The World Health Organisation (WHO) for example states that excessive noise can seriously harm human health, disturb sleep and have cardiovascular and behavioural effects. Camden's high density and mixed-use nature means that disturbance from noise and vibration is a particularly important issue in the borough.*
>
> *Where uses sensitive to noise are proposed close to an existing source of noise or when development that is likely to generate noise is proposed, the Council will require an acoustic report to accompany the application. Further detail can be found in Policy A4 -*

Noise and Vibration and our supplementary planning document Camden Planning Guidance 6: Amenity."

5.13. Policy A4 *'Noise and Vibration'* states under the section titled *'Plant and other noise generating equipment'* that:

"Planning conditions will be imposed to require that plant and equipment which may be a source of noise is kept working efficiently and within the required noise limits and time restrictions. Air conditioning will only be permitted where it is demonstrated that there is a clear need for it after other measures have been considered (Policy CC2 Adapting to climate change). Conditions may also be imposed to ensure that attenuation measures are kept in place and are effective throughout the life of the development."

5.14. The policy document goes on to describe noise thresholds in Appendix 2 and states in the *'Industrial and Commercial Noise Sources'* section:

"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)."

5.15. Table C of the appendix states the criteria at which development related noise levels will be acceptable:

Table C: Noise levels applicable to proposed industrial and commercial development (including plant and machinery)

Existing Noise sensitive receptor	Assessment Location	Design Period	LOAEL (green)	LOAEL to SOAEL (Amber)	SOAL (Red)
Dwellings**	Garden used for main amenity (free field) and Outside living or dining or bedroom window (façade)	Day	'Rating level' 10dB* below background	'Rating level' between 9dB below and 5dB above background	'Rating level' greater than 5dB above background
Dwellings**	Outside bedroom window (façade)	Night	'Rating level' 10dB* below background and no events exceeding 57dBL_{Amax}	'Rating level' between 9dB below and 5dB above background or noise events between 57dB and 88dBL_{Amax}	'Rating level' greater than 5dB above background and/or events exceeding 88dBL_{Amax}

**10dB should be increased to 15dB if the noise contains audible tonal elements. (day and night). However, if it can be demonstrated that there is no significant difference in the character of the residual background noise and the specific noise from the proposed development then this reduction may not be required. In addition, a frequency analysis (to include, the use of Noise Rating (NR) curves or other criteria curves) for the assessment of tonal or low frequency noise may be required.*

***levels given are for dwellings, however, levels are use specific and different levels will apply dependent on the use of the premises.*

BS 4142:2014

5.16. BS 4142:2014 *'Methods for rating and assessing industrial and commercial sound'* is intended to be used to assess the likely effects of sound on people residing in nearby dwellings. The scope of BS 4142:2014 includes *"sound from the loading and unloading of goods and materials and industrial and/or commercial premises"*. The standard has been referenced as appropriate for the assessment of noise from deliveries made to or from commercial premises.

5.17. The procedure contained in BS 4142:2014 provides an assessment of the likely effects of sound on people when comparing the specific noise levels from the source with representative background noise levels. Where the noise contains *"a tone, impulse or other characteristic"* then various corrections can be added to the specific (source) noise level to obtain the *"rating level"*. Specifically, "Where the specific sound features characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied."

5.18. The likely effects of sound on people are assessed by subtracting the background noise level from the rating level. BS 4142:2014 states the following:

- *Typically, the greater this difference, the greater the magnitude of the impact.*
- *A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context;*
- *A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context;*
- *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.*

Plant noise criteria

5.19. The lowest background sound level measured during the kitchen operating hours was 54dB $L_{A90,15min}$. Based on the guidance above and given that noise from plant serving adjacent units is presently influencing the prevailing background, it is recommended that the cumulative noise level for the proposed plant should not exceed a level 10dB lower than the representative L_{A90} background level at the nearest noise sensitive receptors. The following noise limit therefore applies:

Table 3: Plant noise emissions limits at nearest receptors

Period	Cumulative plant noise rating level, dB(A)
Operating hours (08.30 – midnight)	44

6.0 Noise assessment

6.1. The London Borough of Camden plant noise criterion requires that noise from the plant must be significantly below the existing background sound levels, at the nearest noise-sensitive receptors. This precludes the demonstration of compliance with the criterion by measurement of plant noise on site. It is therefore necessary to show, by calculation, that the plant noise emissions meet the criterion.

6.2. Cumulative noise emissions from the installed plant have been predicted at the nearest properties to the site based on the manufacturer noise data presented in Appendix D.

6.3. Noise levels for the proposed extract and supply systems have been predicted taking into account ductwork system losses, aperture size, directivity of sound propagation and distance attenuation. Predictions are inclusive of the following atmospheric-side attenuation fitted to the ventilation systems.

Table 4: Proposed atmospheric-side attenuator selections

Attenuator	Insertion loss (dB) at Octave Band Centre Frequencies (Hz)							
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
Kitchen extract 1	4	6	9	17	22	20	16	10
Kitchen extract 2	4	6	9	17	22	20	16	10
Kitchen extract 3	4	6	9	17	22	20	16	10
AHU 1	5	7	11	19	25	22	18	12
AHU 2	6	13	26	36	40	36	30	21
AHU 3	5	7	11	19	25	22	18	12

6.4. It should be noted that the plant is high-quality, inverter driven equipment which will minimise the presence of any specific acoustic characteristics (i.e. bangs, clicks, tonal components, impulsive nature, etc.). In order to be robust, however, Camden Council's most stringent plant noise emissions criteria have been applied.

6.5. Predicted noise levels during the operating hours (08.30 to midnight) are based upon all plant operating simultaneously at maximum capacity (i.e with the existing eight kitchens and the potential future ninth kitchen operating). All the plant will be switched off outside those hours.

6.6. Table 5, below, summarises the assessment of predicted noise levels. The full set of calculations are presented in Appendix E.

Table 5 Assessment of predicted noise levels at the nearest noise sensitive receptors

Receptor	Period	Predicted noise level at receptor, L_{Aeq} (dB)	Design criterion (dB)	Difference (dB)
Receptor R1	All plant operating (08.30 - midnight)	44	44	0
Receptor R2		41	44	-3

6.7. The plant noise impact assessment has demonstrated that cumulative noise emissions from the plant comply with appropriate design criteria (as established in Table 3) at the nearest residential premises, inclusive of suitable atmospheric-side attenuation fitted to the kitchen

extract and supply systems. In addition, plant noise will be in the "No Observed Effect" category in the PPG table given above.

6.8. In addition, all plant and associated ductwork/pipework is fitted with suitable anti-vibration isolation in order to ensure structure-borne transmission to the adjoined residential properties is appropriately mitigated.

7.0 Summary

7.1. Noise Solutions Ltd (NSL) has been commissioned by Chapman Ventilation Ltd to undertake a noise assessment for new plant at a proposed Deliveroo kitchen along Finchley Road in Swiss Cottage.

7.2. The noise impact from the proposed plant has been predicted at the nearest noise sensitive receptors to the site and assessed against the typical requirements of the local authority (and in accordance with national policy on noise).

7.3. The predictions demonstrate that cumulative noise from the proposed plant should be acceptable to Camden Council at all nearby receptors and all times, inclusive of the atmospheric-side attenuators detailed in Table 4 being fitted to the fresh air supply and kitchen extract systems.

7.4. In addition, all plant and associated ductwork/pipework is fitted with suitable anti-vibration isolation in order to ensure structure-borne transmission to the adjoined residential properties is appropriately mitigated.

7.5. Therefore, noise from the plant proposals should not be a reason for refusal to issue a Certificate of Lawfulness.