Bickerdike
Allen
Partners
Architecture
Acoustics
Technology

KOJO HAMPSTEAD, 32 – 34 ROSSLYN HILL

LONDON, NW3 1NH

BS4142:2014 NOISE ASSESSMENT

APP 021/0101/P

Report to

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A11414_01_RP001_2.0
8th September 2021

Bickerdike Allen Partners LLP is an integrated practice of Architects, Acousticians, and Construction Technologists, celebrating over 50 years of continuous practice.

Architects: Design and project management services which cover all stages of design, from feasibility and planning through to construction on site and completion.

Acoustic Consultants: Expertise in planning and noise, the control of noise and vibration and the sound insulation and acoustic treatment of buildings.

Construction Technology Consultants: Expertise in building cladding, technical appraisals and defect investigation and provision of construction expert witness services.

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1.0 INTRODUCTION

Bickerdike Allen Partners LLP (BAP) have been instructed by DCUK to carry out a noise impact assessment in relation to a planning application at the Kojo restaurant in Hampstead, London.

Kojo is a new restaurant operator which has taken on an existing unit on the ground floor of the terraced properties at 32 – 34 Rosslyn Hill. The development has involved the installation of new mechanical plant and ductwork on the rear roof of the building, serving the restaurant floor and kitchen.

A retrospective planning application has been submitted to the local authority (London Borough of Camden) for "*Installation of roof lantern, replacement condenser units and duct on the roof of the rear ground floor extension. (Retrospective).*" The application number is 2021/0101/P. A noise assessment was submitted with this application by others. This did not meet the requirements of the local authority and BAP have been instructed to carry out an assessment of the above application.

The project falls under the planning and environmental health jurisdiction of the London Borough of Camden (hereafter abbreviated LBC). This report is intended for submission to LBC in support of a retrospective planning application for the development. The report is written with reference to that application and the relevant local and national planning policies on environmental noise.

Environmental noise measurements have been carried out at the site by BAP, to determine the prevailing environmental noise climate at the site over a 24 hour period and to determine the specific sound source levels from the plant items being assessed. The noise survey work is detailed in Section 4 of this report. The survey data forms the basis for the assessment of potential noise impact from the site as detailed in Section 5.

This report is necessarily technical and a glossary of acoustic terminology can be found in Appendix 1.

2.0 STATEMENT OF COMPETENCE

This report includes technical information relevant to the assessment of commercial noise in accordance with BS 4142:2014+A1:2019 and local authority requirements. That standard and LBC requires that a suitably qualified person is appointed to carry out acoustic assessments.

This report was prepared by:

- Tom Deering MSc (Environmental and Architectural Acoustics) MIOA who has six years of relevant experience and is a corporate member of the Institute of Acoustics.
- David Trew CEng BEng (Engineering Acoustics and Vibration) MIOA who has 21 years of relevant experience and is a corporate member of the Institute of Acoustics.

3.0 PLANNING CONTEXT

Kojo is a restaurant operating on the ground floor of the terraced properties at 32 – 34 Rosslyn Hill. This commercial unit was previously operated by the Carluccio's Restaurant chain. The site is highlighted on the OS Map in Figure 1 below.

Figure 1: Kojo Hampstead site location on OS Map

The surrounding land is a mix of residential and commercial use with buildings similar to the project site. The neighbouring buildings and streets are predominantly rows of Victorian

terraced houses along Rosslyn Hill featuring commercial (restaurant, café and shop) uses on the ground floor with dwellings and/or professional offices in the apartments above.

3.1 Planning Application

Kojo has submitted a retrospective planning application to LBC by Kojo as follows:

"for the insertion of a roof lantern, installation of replacement condenser units and ventilation duct."

The covering letter for the application states:

"The submission has been made following an enforcement investigation (EN20/1071) by Camden Council. This application seeks retrospective planning permission for the insertion of a roof lantern, replacement 3 x condenser units and ventilation pipe…

The size, scale and sitting of the condenser units are a direct match for that which they replaced. The units would remain fixed to the rear flat roof of No. 32 Rosslyn Hill.

A fresh air duct has been installed as part of the recent works. The duct replaces a recently removed ventilation duct which was located adjacent to the cement boarded roof which is show on image 1 above."

The noise assessment in this report relates to all of the mechanical plant items named in the application as above, namely:

- Modified kitchen supply ductwork
- Replacement air conditioning condenser units

It is noted that there have been four replacement air conditioning condenser units installed on the rear roof of 32 Rosslyn Hill, with 3 Samsung units serving the public restaurant space and one Danfoss unit serving the kitchen's walk-in fridge. All units are replacing previous plant in the same location. All four condenser units are assessed in this report.

The mechanical plant noise sources being assessed are indicated on the marked-up design drawing in Figure 2 below (this is the Proposed layout drawing that is submitted in full with the application and included in Appendix 3 to this report).

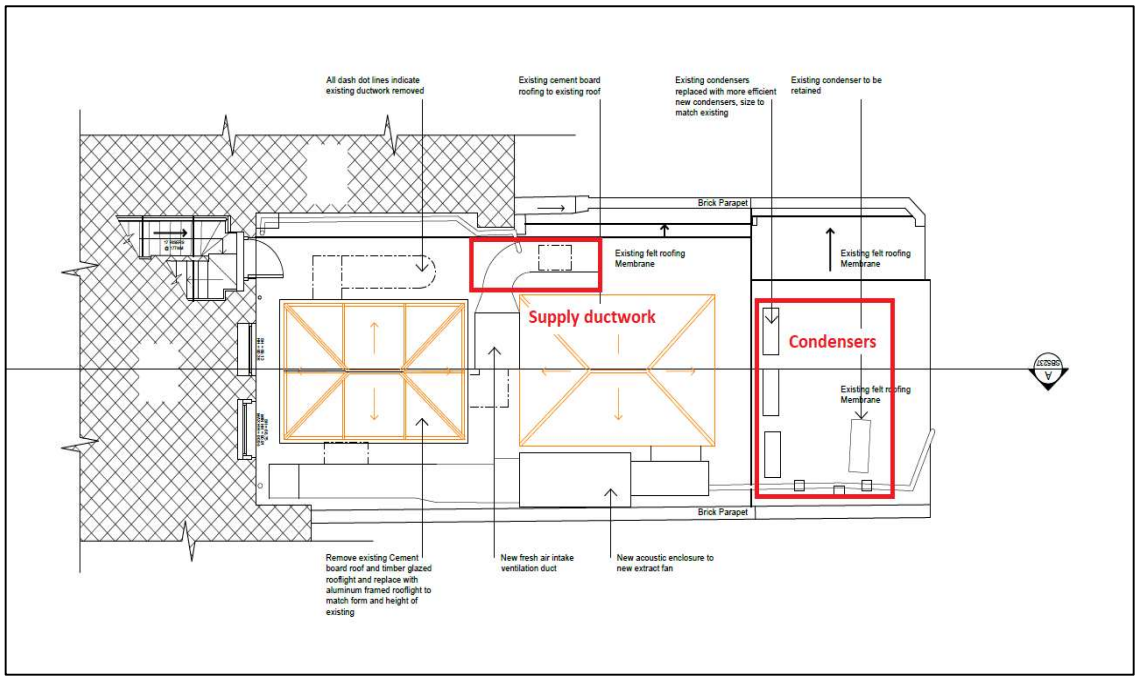


Figure 2: Mechanical plant layout drawing

The modified kitchen supply ductwork and replacement air conditioning condenser units are shown in the BAP photographs in Figure 3 and Figure 4 below.

Figure 3: Modified kitchen supply ductwork

Figure 4: Replacement air conditioning condenser units

3.2 Camden Local Plan 2017

Policy A4 Noise and vibration of the local plan states that

"*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."

Guidance on the Council's requirements for noise impact assessments is found in the Camden Local Plan (2017) *Appendix 3: Noise thresholds*. LBC replicates the National Planning Policy Framework in use of the OAEL (Observed Adverse Effect Level) concept and states the following regarding "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 (15 dB if tonal components are present) should be considered as the design criterion."

Table C of Appendix 3 of the Camden Local Plan details the noise levels applicable to setting OAELs for proposed industrial and commercial developments, including fixed mechanical plant. These are referred to in a traffic light system with Green (LOAEL), Amber (LOAEL to SOAEL), and Red (SOAEL) These noise levels are reproduced in Table 1 below.

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

*10 dB should be increased to 15 dB 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.

Table 1: from Table C, Appendix 3 of Camden Local Plan 2017: Noise levels applicable to proposed industrial and commercial developments (including plant and machinery).

It is also stated below the Table:

"The periods in Table C correspond to 0700 hours to 2300 hours for the day and 2300 hours to 0700 hours for the night. The Council will take into account the likely times of occupation for types of development and will be amended according to the times of operation of the establishment under consideration.

There are certain smaller pieces of equipment on commercial premises, such as extract ventilation, air conditioning units and condensers, where achievement of the rating levels (normally determined by a BS 4142 assessment) may not afford the necessary protection. In these cases, the Council will generally also require a NR curve specification of NR35 or below, dependant on the room (based upon measured or predicted Leq, 5mins noise levels in octave bands) 1 metre from the façade of affected premises, where the noise sensitive premise is located in a quiet background area.

3.3 British Standard (BS) 4142:2014+A1:2019

BS 4142:2014+A1:2019 *"Methods for rating and assessing industrial and commercial sound"* is the standard by which the environmental impact from industrial or commercial noise is normally assessed in the UK. The standard details a method for rating and assessing the noise emitted by an existing or proposed industrial or commercial sound source in order to determine the likelihood that the source is having, or will have, an adverse impact on sensitive receptors.

Section 11 of the standard describes the initial estimate of impact based on the difference between the rating level and the typical background sound level as follows:

"Typically, the greater this difference, the greater the magnitude of the impact

a) A difference of around + 10dB or more is likely to be an indication of a significant adverse impact, depending on the context.

b) A difference of around + 5dB is likely to be an indication of an adverse impact, depending on the context.

c) 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."

The resultant Rating Level is then considered in context of the assessment site and/or development (for example, consideration of the absolute level of the sound inside or outside a nearby dwelling or other sensitive receptor) to arrive at the conclusion regarding the potential impacts of the industrial or commercial sound.

3.4 BAP Commentary

The retrospective planning application at Kojo is for replacement (rather than new) air conditioning condensers and a change in ductwork layout for a supply fan.

It is clearly desirable that any replacement plant should be controlled to meet the 10 dB below background LOAEL performance standard. This however is not always reasonably practicable.

A noise rating standard of equal to background would be classified under BS4142:2014+A1:2019 as having a "*low impact"*. A noise rating standard of 5 dB above background or more would be rated by Camden as being the onset of a Significant Adverse Effect Level.

4.0 ENVIRONMENTAL NOISE SURVEY

4.1 Survey Methodology

BAP has carried out two noise surveys on the rear rooftop of the Kojo Hampstead restaurant, on 19th to 20th July and 16th August 2021.

Both of the sound level meters used during these survey visits are Class 1 under BS EN 61672-1:2013. The sound level meters were field calibrated at 1 kHz before and after each survey with no significant drift observed.

Weather conditions at the site during the unattended survey period (19th to 20th July) were warm to mild, with no precipitation and wind speeds under 5m/s. Cloud cover was 50%. These conditions are considered suitable for obtaining representative measurement results.

During the attended survey on 16th August, wind speed was 6 m/s. This was not thought to have impacted on measurements. Cloud cover during that visit was 10% and there was no precipitation.

Full details of the monitoring equipment used during the environmental noise survey, including serial numbers and calibration histories, can be found in Appendix 2 of this report.

4.1.1 Unattended background noise survey

An environmental noise survey was carried out at the project site between Monday 19th and Tuesday 20th July 2021. The purpose of the survey was to establish the prevailing background noise climate at the site in the hours before and after the Kojo restaurant operates. The noise monitoring position during this unattended survey was on the rear roof of the restaurant building, between the two skylights, as indicated ('MP') on the aerial photograph in Figure 5 below.

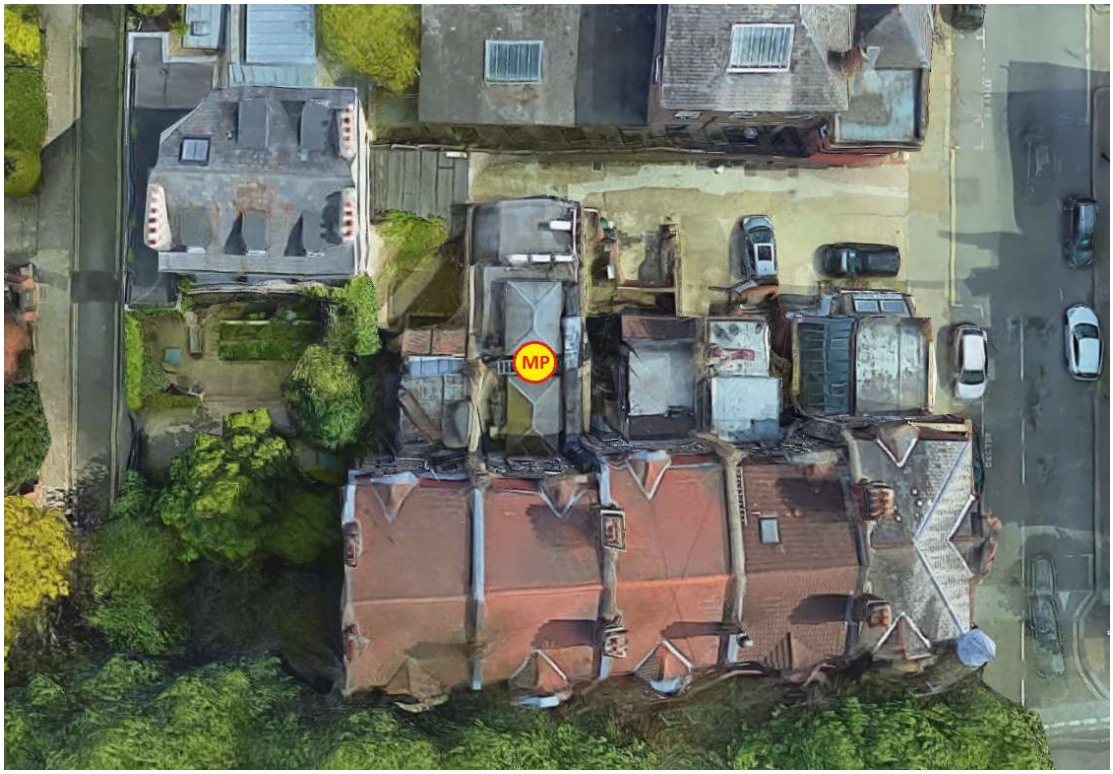


Figure 5: Replacement air conditioning condenser units

The unattended noise monitor was installed with the microphone fixed to a tripod at a height of 2.5 metres above the roof level. The sound level meter was set up to log measurements at 15 minute intervals and was used to collect data between 14:15 on 19th July and 15:15 on 20th July.

4.1.2 Attended mechanical plant noise measurements

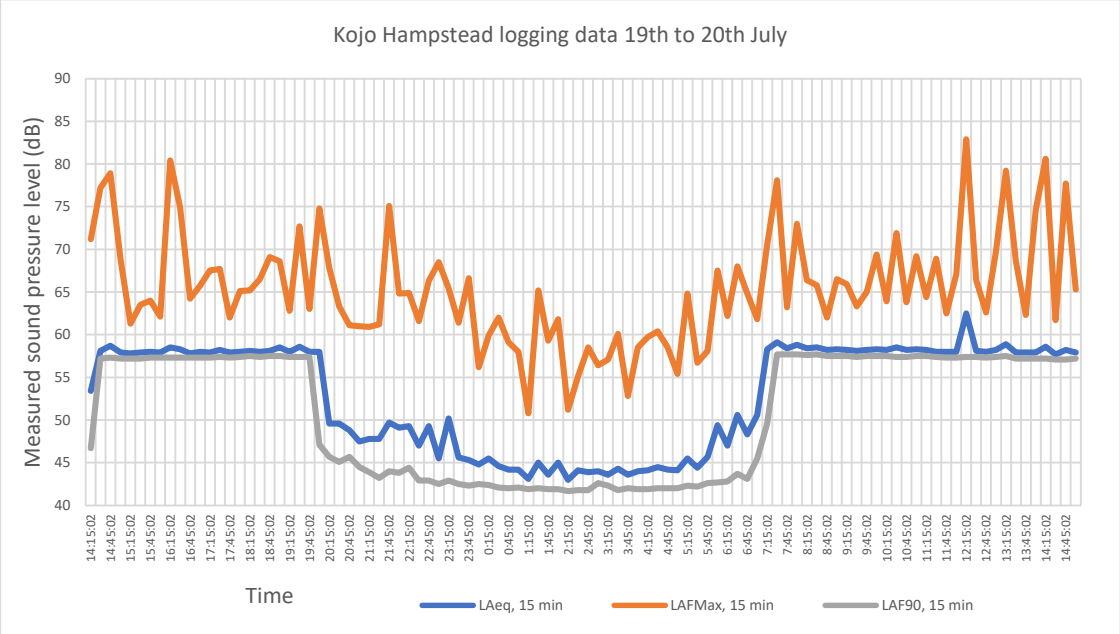
Further noise measurements were taken at the site between 06:00 and 07:30 on 16th August 2021. The purpose of these attended measurements was to gather data on specific sound sources (i.e. for each item of mechanical plant under assessment, on the roof of the Kojo restaurant building). The specific sound sources under assessment are shown on the layout drawing in Appendix 3.

During this attended survey, a series of sound level measurements were taken at a distance of 1 and 3 metres from each item of mechanical plant whilst the source was on and in the absence of any other mechanical plant noise source (i.e. each mechanical plant source was measured individually).

BAP understand that three of the four condenser units on the roof (the three new Samsung units serving the restaurant) have an electronic limiter set so they cannot run at the maximum duty specified by the manufacturer. BAP understand that this limiter does not change and that the measurements taken on 16th August are representative of the highest duty the units will run at. The kitchen supply fan was operating at typical duty.

4.2 Survey results

The logging data from the unattended survey is presented as a time history below. Table 2 presents a summary of the typical background and ambient noise levels measured during two time periods when the Kojo restaurant fixed mechanical plant was not operating: 20:00 to 21:00 on 19th July and 06:15 to 07:15 on 20th July. Background noise data from these two hours have been used in the assessment of potential noise impact from the project as these levels are the most representative of the typical background at the site in the absence of Kojo restaurant plant noise.



Time period	Ambient noise level (dB $L_{Aeq, 15\ min}$)	Background noise level (dB $L_{AF90, 15\ min}$)
20:00 to 21:00 (19/07/21)	54	46
06:15 to 07:15 (20/07/21)	49	44

Table 2: Representative noise data outside of Kojo operating hours

Table 3 presents sound level data measured for each item of mechanical plant being assessed. All of the data presented is for sound pressure level measured at 1 metre from the source.

Source	Sound level (dB)								
	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	dBA
Kitchen Supply Duct	62	59	51	46	41	37	27	22	49
Condenser 1	55	58	59	48	43	37	33	41	53
Condenser 2	56	56	50	45	40	34	30	27	48
Condenser 3	56	55	48	44	42	37	32	28	47
Condenser 4	68	63	54	56	49	46	44	43	57

Table 3: Specific noise source data measured at Kojo

Note: the noise level from the kitchen supply duct has been corrected for background noise in accordance with the method in BS 4142. It was observed that at 1 metre, noise from the kitchen supply duct is inaudible above the background noise level. However the background corrected measurement shows a low frequency component present in the sound source which has been included in the following assessment.

5.0 NOISE IMPACT ASSESSMENT

5.1 Assessment Details

The nearest noise-sensitive receptors (hereafter abbreviated NSRs) to the Kojo mechanical plant installation are residential windows on the rear façade of 32 Rosslyn Hill (NSR 1) and at 2A Pilgrims Lane (NSR 2). In each case the residential windows are overlooking the rear roof of Kojo and as such have a direct line of sight to mechanical plant items installed there. The NSRs are indicated in red (with the nearest window and assessment location circled) in Figure 6 below.

Figure 6: NSRs at Kojo Hampstead

It was not possible to confirm whether the South East-facing window of 2A Pilgrim's Lane, which directly looks on to the roof of Kojo, is occupied (i.e. a bedroom or living room). This assessment location therefore represents a worst-case for that property in terms of noise impact from the development, as all other windows of that property would benefit from screening effects (i.e. they do not have a direct line of sight to the noise sources). For NSR 1 the top-storey window has been used to again represent a worst-case in terms of noise impact to residences at 32 Rosslyn Hill.

The approximate distances between Kojo mechanical plant items and the NSRs are presented in Table 4 below.

Source	Distance to NSR 1 (32 Rosslyn Hill rear façade) (m)	Distance to NSR 2 (2A Pilgrim's Lane SE façade) (m)
Kitchen Supply Ductwork	12	14
Condenser 1	12	12
Condenser 2	12	13
Condenser 3	13	14
Condenser 4	14	14

Table 4: Source to receiver distances

5.2 Noise predictions

The noise level generated by each item of mechanical plant at the distances presented in Table 4 has been predicted, assuming hemispherical radiation from a point source over hard ground. The predicted noise levels from the Kojo mechanical plant items being assessed, at NSRs 1 and 2, are presented in Table 5 below, for each individual source and as a cumulative level.

Source	Predicted noise level at NSR 1 (dB $L_{Aeq, T}$)	Predicted noise level at NSR 2 (dB $L_{Aeq, T}$)
Kitchen Supply Ductwork	19	19
Condenser 1	42	42
Condenser 2	37	36
Condenser 3	36	36
Condenser 4	45	45
Cumulative noise level from Kojo plant	47	47
Background sound level	44	44

Table 5: Noise level predictions from each source

5.3 Noise Impact Assessment

Table 2 of this report presents the typical background noise levels measured in the hours before and after the restaurant operates. These levels were 46 dB $L_{AF90, 15\ min}$ and 44 dB $L_{AF90, 15\ min}$. Adopting the lower of the two as a 'worst-case', a typical background noise level 44 dB $L_{AF90\ 15\ min}$ is considered a representative background noise level for the assessment of potential noise impact from the restaurant plant.

This typical background noise level should then be considered in the context of LBC's 'Green', 'Amber' and 'Red' OAEL levels as summarised in Table 6 below.

'Green' LOAEL (10 dB or more below background)	'Amber' LOAEL -SOAEL (9 dB below to 5 dB above background)	'Red' SOAEL (5 dB or more above background)
≤ 34 dB	35 – 49 dB	≥ 49 dB

Table 6: LBC Green, Amber, Red OAELs at Kojo Hampstead

- *"Green – where noise is considered to be at an acceptable level.*
- *Amber – where noise is observed to have an adverse effect level, but which may be considered acceptable when assessed in the context of other merits of the development.*

- *Red – where noise is observed to have a significant adverse effect."*

The noise sources being assessed are characterized by broadband air movement noise with no acoustic characteristics (impulsivity, intermittency, tonality) which would require a penalty to be applied under BS 4142. The predicted noise levels at each receptor presented in Table 5 should therefore be considered the BS 4142 Rating level.

The predicted noise levels from the installation are compared with the 'Green' and 'Amber' target levels in Table 7 below to provide a summary of the noise impact assessment results:

Assessment Item	NSR 1	NSR 2
Cumulative noise level from Kojo plant (dB L_{AR})	47	47
LBC Green noise level (dB L_{AR})	34	34
LBC Amber noise level (dB L_{AR})	49	49
Assessment result	Amber (3 dB above background)	Amber (3 dB above background)

Table 7: Kojo Noise Impact Assessment

5.4 Recommendations

Table 7 shows that the predicted noise level from the Kojo mechanical plant installation is designated as 'Amber' when assessed using the LBC framework (this is also by definition in accordance with the BS 4142 methodology).

The kitchen supply ductwork has been shown in the noise predictions (Table 5) to have a negligible impact on the cumulative noise level (at 19 dB, noise from this source is 25 dB below the typical background and inaudible at the NSRs).

The predicted noise level from the four air conditioning condenser units is 47 dB L_{AR}. This is 3 dB above the worst-case background noise level measured at the site. During the daytime when the background noise level is likely to be higher, this would be rated as "low impact" under BS4142.

Calculations indicate that additional noise control measures would be required to meet this standard. A sound absorbing screen around the condensers is unlikely to achieve the LOAEL performance standard. A bespoke acoustic enclosure around the condensers would be required.

BAP consider that as the air conditioning condenser units are replacement rather than new units it would be unreasonable to expect these to meet the stringent LOAEL standard of 10 dB below background.

There is an existing kitchen extract fan used for the restaurant. Casing radiated sound levels from this fan were relatively low at around 60-62 dB(A) at 1m from the fan. Measurements at the fan termination at roof level could not be made. Manufacturer's sound power data was not provided to BAP on either of the fans.

6.0 SUMMARY

In this report, BAP have detailed the context, methodology and results of a BS4142 plant noise assessment in relation to a retrospective planning application submitted to London Borough of Camden (LBC) by the Kojo restaurant at 32 – 34 Rosslyn Hill.

The planning application relates to the installation of four condensers on the rear roof of the building and the modification of the kitchen supply fan ductwork.

The plant noise levels at each nearest sensitive receptor (NSR) has been predicted and assessed with regard to the LBC planning framework. The assessment has been carried out in accordance with the methodology found in BS 4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound'.

The results of the assessment show that the Kojo mechanical plant installation, without any mitigation, generates a noise level at the surrounding residential receptors that falls into the 'Amber' rating in the LBC assessment framework. Specifically, noise from the kitchen supply ductwork is negligible, whilst noise from the four air conditioning condenser units is 3 dB above the worst case background noise level at the receptors. LBC guidance rates this level of noise as "*where noise is observed to have an adverse effect level, but which may be considered acceptable when assessed in the context of other merits of the development".*

Tom Deering

for Bickerdike Allen Partners LLP

David Trew

Partner

APPENDIX 1
GLOSSARY OF ACOUSTIC TERMINOLOGY

The Decibel, dB

The unit used to describe the magnitude of sound is the decibel (dB) and the quantity measured is the sound pressure level. The decibel scale is logarithmic and it ascribes equal values to proportional changes in sound pressure, which is a characteristic of the ear. Use of a logarithmic scale has the added advantage that it compresses the very wide range of sound pressures to which the ear may typically be exposed to a more manageable range of numbers. The threshold of hearing occurs at approximately 0 dB (which corresponds to a reference sound pressure of 2 x 10^{-5} Pascals) and the threshold of pain is around 120 dB.

The sound energy radiated by a source can also be expressed in decibels. The sound power is a measure of the total sound energy radiated by a source per second, in watts. The sound power level, L_w is expressed in decibels, referenced to 10^{-12} watts.

Frequency, Hz

Frequency is analogous to musical pitch. It depends upon the rate of vibration of the air molecules that transmit the sound and is measure as the number of cycles per second or Hertz (Hz). The human ear is sensitive to sound in the range 20 Hz to 20,000 Hz (20 kHz). For acoustic engineering purposes, the frequency range is normally divided up into discrete bands. The most commonly used bands are octave bands, in which the upper limiting frequency for any band is twice the lower limiting frequency, and one-third octave bands, in which each octave band is divided into three. The bands are described by their centre frequency value and the ranges which are typically used for building acoustics purposes are 63 Hz to 4 kHz (octave bands) and 100 Hz to 3150 Hz (one-third octave bands).

A-weighting

The sensitivity of the ear is frequency dependent. Sound level meters are fitted with a weighting network which approximates to this response and allows sound levels to be expressed as an overall single figure value, in dB(A).

Environmental Noise Descriptors

Where noise levels vary with time, it is necessary to express the results of a measurement over a period of time in statistical terms. Some commonly used descriptors follow.

Statistical Term	Description
$L_{Aeq, T}$	The most widely applicable unit is the equivalent continuous A-weighted sound pressure level (LAeq, T). It is an energy average and is defined as the level of a notional sound which (over a defined period of time, T) would deliver the same A-weighted sound energy as the actual fluctuating sound.
L_{A90}	The level exceeded for 90% of the time is normally used to describe background noise.
$L_{Amax,T}$	The maximum A-weighted sound pressure level, normally associated with a time weighting, F (fast), or S (slow)

APPENDIX 2
NOISE SURVEY DETAILS

Survey equipment

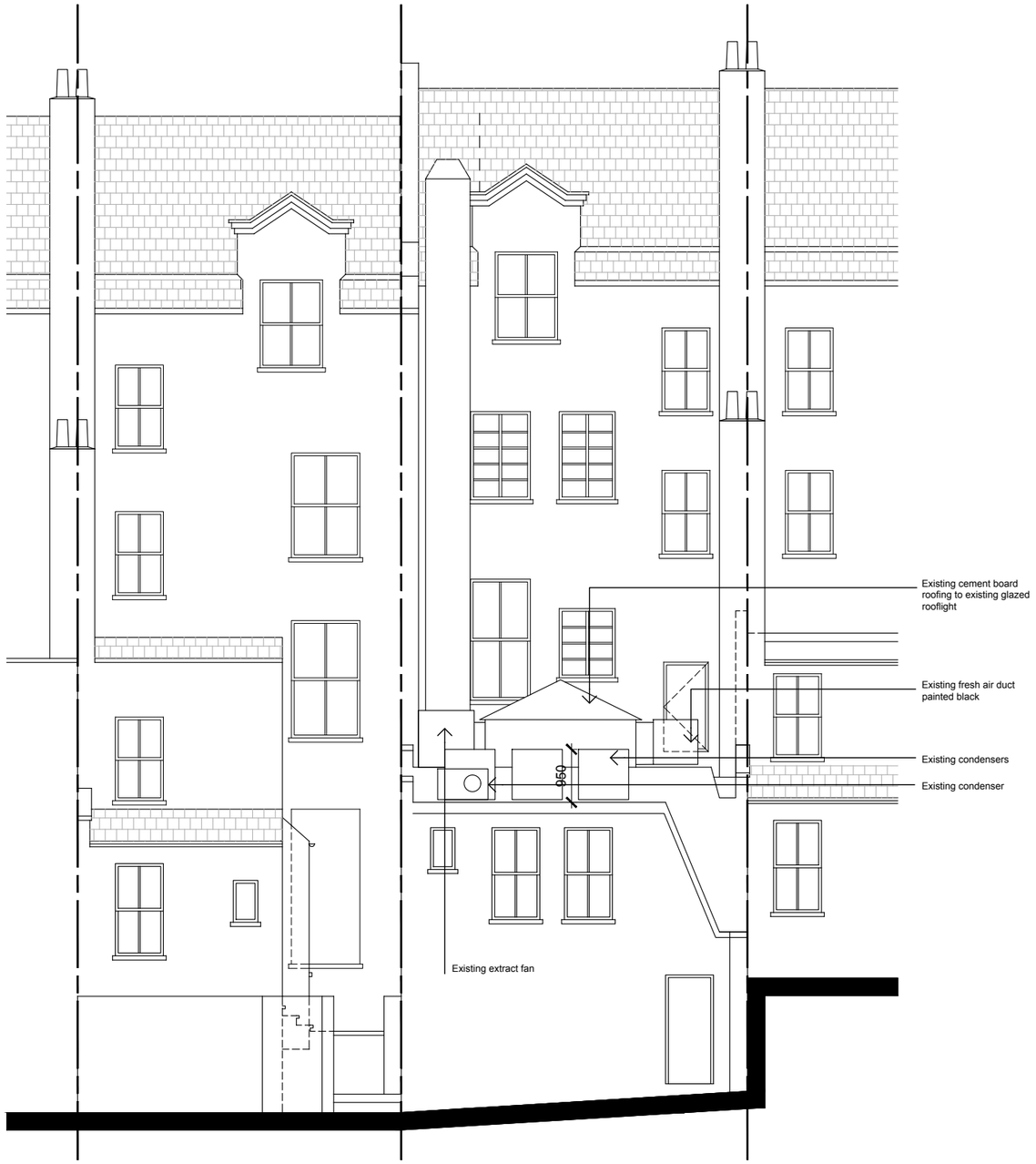
The environmental noise survey measurements were conducted using the equipment shown in Table A2.1. During the unattended survey, the sound level meter was located in an environmental case with the microphone connected to the meter via an extension cable. The microphone was fitted with a windshield and bird spike.

The sound level meters were checked for correct calibration prior to and on completion of the survey with no significant fluctuations recorded. The check was performed with the extension cable where relevant. Laboratory calibration certificates are available upon request.

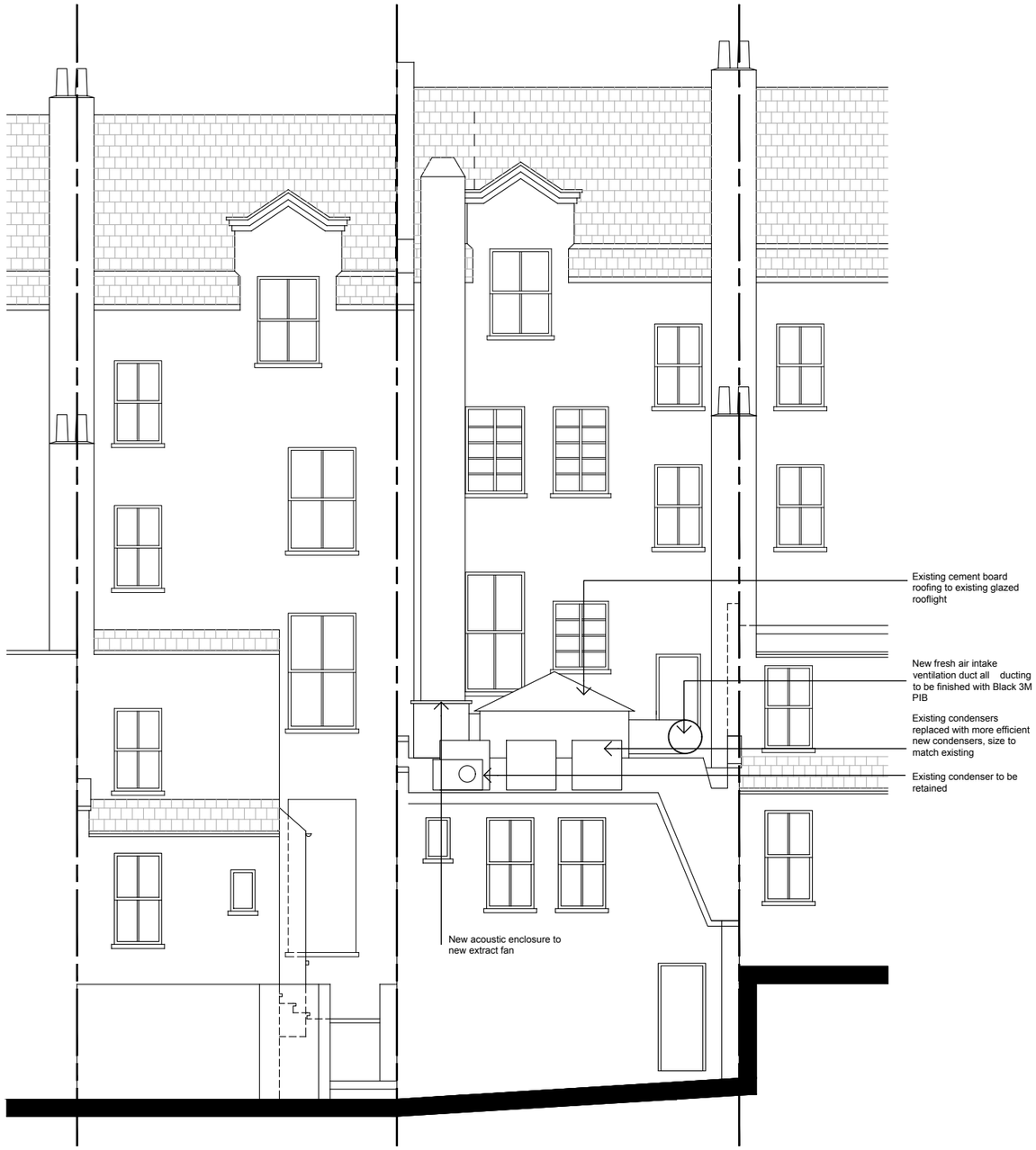
Survey	BAP Reference	Description	Serial Number	Calibration Date	Certificate number	Calibration Due
Attended (16/08/21)	Nor 140-1	Norsonic Type 140 Investigator	1403409	11/06/2021	U38140	10/06/2023
		Norsonic Type 1209 Preamplifier	14359	11/06/2021	U38140	10/06/2023
		GRAS-40AF Microphone	207309	11/06/2021	U38140	10/06/2023
		Norsonic Type 1251 Calibrator	32200	18/11/2020	U36343	17/11/2021
Unattended (19/07/21 – 20/07/21)	Nor140-2	Norsonic Type 140 Investigator	1405622	16/10/2019	U33112	15/10/2021
		Norsonic Type 1209 Preamplifier	12722	16/10/2019	U33112	15/10/2021
		GRAS-40AF Microphone	285511	16/10/2019	U33112	15/10/2021
		Norsonic Type 1251 Calibrator	33846	23/10/2020	U36118	22/10/2021

Table A2.1: Details of noise monitoring equipment used

APPENDIX 3
PROJECT DESIGN DRAWINGS



1 Existing Rear Roof Elevation
1:100



2 Proposed Rear Roof Elevation
1:100

0 1 2 5M 10M

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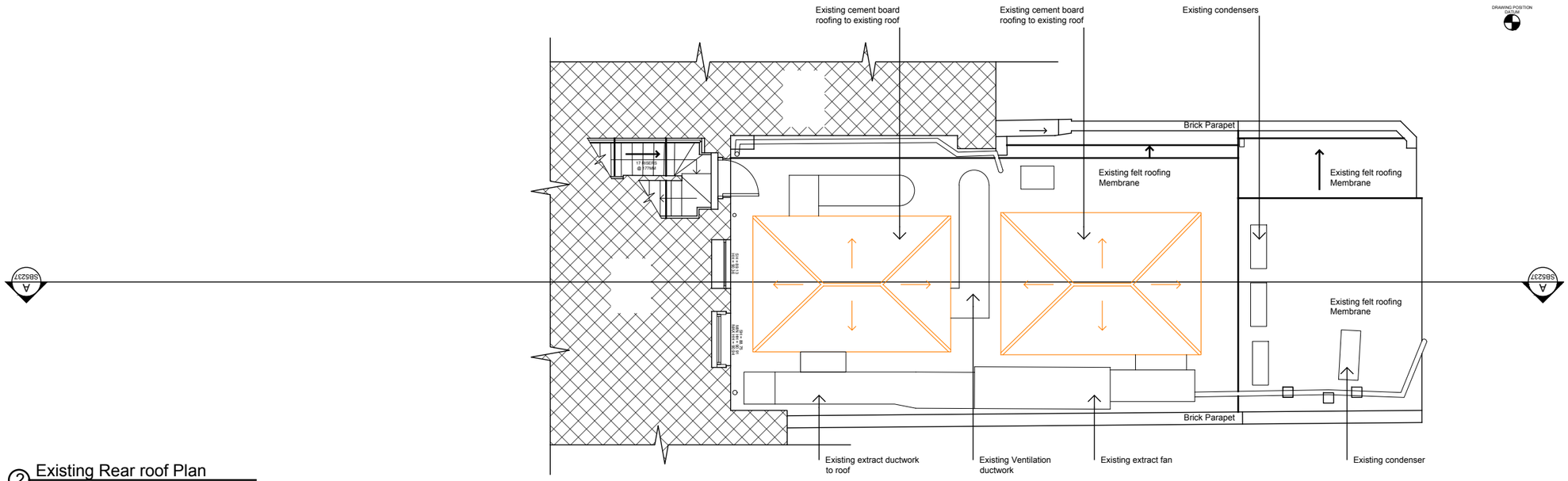
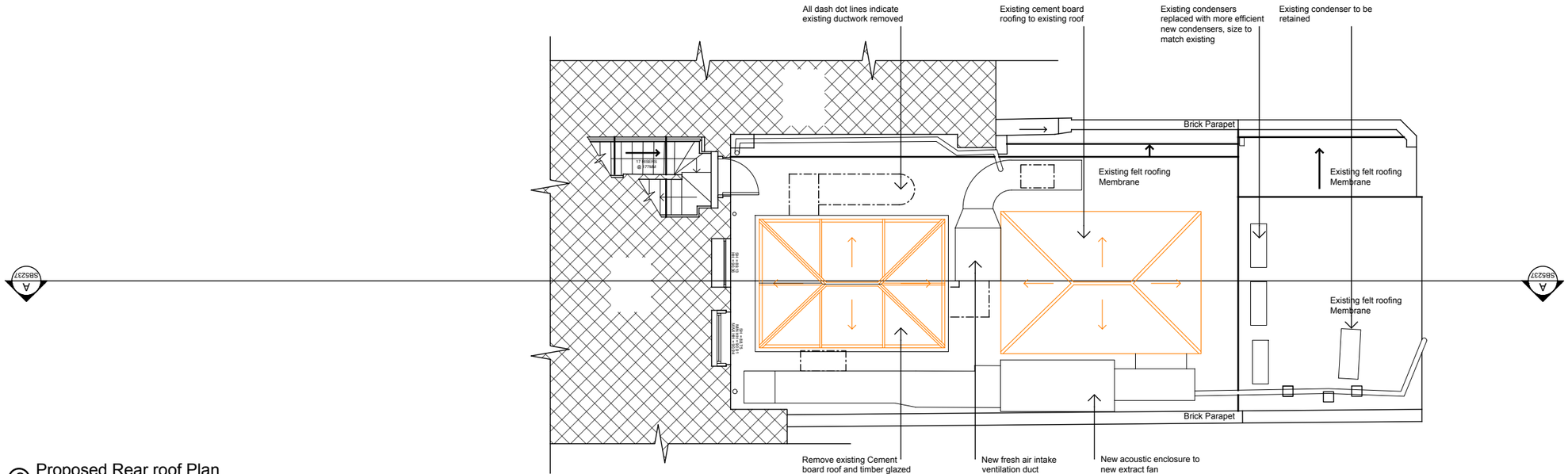
Revision			Revision			Project	Scale	Date	Drawing number	Revision
10/07/20	Rev. A	Proposed Typical Section A-A				KOJO London	1 : 100	December 2020	KOJO_P_02	A
Date	Issue	Notes	Date	Issue	Notes		Drawing name: Existing and Proposed Rear Roof Elevations			



② Existing Rear roof Plan
1:100

0 1 2 5M 10M



② Proposed Rear roof Plan
1:100

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Revision			Revision			Project	Scale	Date	Drawing number	Revision
10/07/20	Rev. A	Proposed Typical Section A-A				KOJO London	1 : 100	December 2020	KOJO_P_01	A
Date	Issue	Notes	Date	Issue	Notes		Drawing name: Existing and Proposed Rear Roof Plan			