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# IRIS CAFE, 43 WARWICK WAY, PIMLICO,

## NOISE IMPACT ASSESSMENT

Report 17249-NIA-01

Prepared on 13 December 2021

**Issued For:**

**Bryan Packman Marcel**

**31-33 Morton Street**

**London**

**SW1Y 2NZ**

## Executive Summary

This noise impact assessment has been undertaken in order to assess a proposed plant installation for commercial use at IRIS Café 43 Warwick Way, London

The proposed plant installation comprises a Soler & Palau CVAB2000/315 extract fan.

A background noise survey has been undertaken as detailed in the report, in order to determine an appropriate noise emission criterion, in accordance with the requirements of the City of Westminster.

Calculations were undertaken for the nearest identified receivers, identified as 25 Longmoore Street and 41 Warwick Way. It should be noted that if there are closer receivers that Clement Acoustics is not aware of, a reassessment will be necessary, and this should therefore be confirmed by the Client.

It has been demonstrated that compliance with the established criterion is feasible, dependant on the following material considerations:

- The proposed plant will be in use between the Café opening hours, which is between 08:00 and 23:00
- The noise emissions data for the proposed units as obtained from available manufacturer information
- Plant and receiver locations are as established in this report and marked on the attached site plan
- Mitigation is applied as recommended in this report, in the form of inline acoustic attenuator

If there is any deviation from the above, Clement Acoustics must be informed, in order to establish whether a reassessment is necessary.

Clement Acoustics has used all reasonable skill and professional judgement when preparing this report. The report relies on the information as provided to us at the time of writing and the assumptions as made in our assessment.

This report is designed to be suitable to discharge typical plant noise planning conditions, as per our original scope of work. The report should not be relied upon for further reasons, such as the detailed design of mitigation measures.

## Contents



## List of Attachments



| Document Revision | Date of Revision | Reasons for Revision | Revision By |
|---|---|---|---|
| 0 | 13/12/2021 | First Issue | Andy Thomas MIOA |

## 1.0 INTRODUCTION

Clement Acoustics has been commissioned by Bryan Packman Marcel to measure existing background noise levels at 43 Warwick Way, London. Measured noise levels have been used to determine noise emissions criteria for a proposed plant installation in agreement with the planning requirements of the City of Westminster.

This report presents the results of the environmental survey followed by noise impact calculations and outlines any necessary mitigation measures.

An acoustic terminology glossary is provided in Appendix A.

## 2.0 SITE DESCRIPTION

The site is a proposed café located on a road predominantly made up of ground floor commercial units with residential dwellings on the upper floors. It was noted during the site visit that neighbouring properties had items of plant serving the associated commercial units.

Current proposals are to install a Soler & Palau CVAB2000/315 extract fan system. It is understood the fan will be installed within the building envelope.

25 Longmoore Street and 41 Warwick Way have been identified as the nearest affected receivers. These nearest noise sensitive receivers were identified through observations on-site. If there are any receivers closer to that identified within this report then a further assessment will need to be carried out. Therefore, the closest noise sensitive receiver should be confirmed by the client before the plant is installed or any noise mitigation measures are implemented.

Locations are shown in attached site plan 17249-SP1.

## 3.0 ENVIRONMENTAL NOISE SURVEY

### 3.1 Unattended Noise Survey Procedure

Measurements were undertaken at one position as shown on indicative site drawing 17249-SP1. The choice of this position was based both on accessibility and on collecting representative noise data in relation to the nearest affected receiver.

The surroundings and position used for the monitoring location are described in Table 3.1.

| Position No. | Description |
|---|---|
| 1 | The microphone was mounted on a tripod within the rear basement garden of 43 Warwick Square. The position was at least 3.5 m away from any vertical reflective surfaces and therefore considered to be in freefield conditions. [1] |

**Table 3.1: Description of unattended monitoring locations**

**Note [1]: The position was considered to be free-field according to guidance found in BS 4142: 2014, and a correction for reflections has therefore not been applied.**

Continuous automated monitoring was undertaken for the duration of the survey between 11:00 on 02 December and 07:00 on 06 December 2021.

The measurement procedure generally complied with BS 7445: 1991: '*Description and measurement of environmental noise, Part 2- Acquisition of data pertinent to land use*'.

## 3.2 Weather Conditions

At the time of set-up and collection of the monitoring equipment, the weather conditions were damp with light wind speeds. It is understood that the weather conditions during the unattended survey were generally below 5 m/s except for Sunday where the wind speed increased to above 5 m/s according to local weather stations. The microphone position was enclosed between two rows of terraced houses and therefore would be expected to be sheltered from high winds to some degree. Intermittent periods of rain were also noted on Saturday morning.

A review of the noise time history shows one period where the noise profile is atypical during a period where adverse weather was understood to be ongoing. This period has been excluded from the summary results in this report. Therefore, with the atypical period removed, it is considered that the weather conditions did not significantly adversely affect the measurements and the conditions were considered suitable for the measurement of environmental noise.

### 3.3 Equipment

The equipment calibration was verified, by means of a field verification check, before and after use and no abnormalities were observed.

The equipment used was as follows.

- 1 No. Svantek Type 957 Class 1 Sound Level Meter
- Rion Type NC-74 Class 1 Calibrator

## 4.0 RESULTS

### 4.1 Unattended Noise Survey Results

The $L_{Aeq: 5min}$, $L_{Amax: 5min}$, $L_{A10: 5min}$ and $L_{A90: 5min}$ acoustic parameters were measured at the location shown in site drawing 17249-SP1.

Measured noise levels are shown as a time history in Figure 17249-TH1, with average ambient and minimum background noise levels summarised in Table 4.1.

| Time Period | Average ambient noise level $L_{eq: T}$ | Minimum background noise level $L_{90: 5min}$ |
|---|---|---|
| Daytime (07:00 - 23:00) | 49 dB(A) | 39 dB(A) |
| Night-time (23:00 - 07:00) | 44 dB(A) | 32 dB(A) |
| Proposed Operating Hours (08:00 – 23:00) | 49 dB(A) | 39 dB(A) |

**Table 4.1: Average ambient and minimum background noise levels**

## 5.0 NOISE CRITERIA

### 5.1 Relevant Local Policy

The assessment and recommendations in this report have been undertaken in accordance with Policy D14 of the London Plan 2021, which contains the following relevant sections:

"*D14. 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:*

> *5) 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*".

The adopted Westminster City Plan 2019-2040 contains the following policy, which has been considered throughout this assessment:

"*33. C Development should prevent adverse effects of noise and vibration and improve the noise environment in compliance with the council's Noise Thresholds, with particular attention to:*

> *2. minimising noise from plant machinery and internal activities*".

The above policies from the adopted plan and adopted city plan have been considered when determining suitable criteria for noise emissions from plant.

### 5.2 Local Authority Criteria

The City of Westminster's general criteria for noise emissions depend on whether the existing ambient noise levels are below WHO recommended guideline levels or not. Measured ambient levels as shown in Table 3.1 are below the daytime guideline level of 55 dB(A) during daytime hours and night-time guideline level of 45 dB(A) during night-time hours.

In this instance, the City of Westminster's criteria for noise emissions are as follows:

> *"The 'A' weighted sound pressure level from the plant, when operating at its noisiest, shall not at any time exceed a value of 5 dB below the minimum external background noise, at a point 1 metre outside any window of any residential property."*

It is understood that the proposed plant unit will be for commercial use and therefore is expected to be in operation between 08:00 and 23:00.

Based on the results of the environmental noise survey and requirements of the City of Westminster, Table 5.1 presents the proposed plant noise emission criteria to be achieved at 1 m from the nearest noise sensitive receiver:

| Period | Plant Noise Emission Limit $L_{eq: T}$ |
|---|---|
| Proposed Operating Hours | 34 dB(A) |

**Table 5.1: Plant noise emission limits**

# 6.0 PLANT NOISE IMPACT ASSESSMENT

## 6.1 Proposed Installation

The proposed plant installation comprises a Soler & Palau CVAB2000/315 extract fan, which will be situated within the building envelope and ducted to atmosphere. Therefore the assessment will consider the noise emissions from the atmospheric duct terminus.

Noise emissions for the proposed fan, as provided by the manufacturer, are shown in Table 6.1. Loudest modes of operation have been used in order to present a robust worst-case assessment.

| Plant Unit | A weighted Sound Power Levels (dB) in each Frequency Band | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 63Hz | 125Hz | 250Hz | 500Hz | 1kHz | 2kHz | 4kHz | 8kHz | dB(A) |
| Soler & Palau CVAB2000/315 | 41 | 55 | 74 | 68 | 67 | 65 | 65 | 57 | 76 |

**Table 6.1: Manufacturer provided noise emissions levels**

The proposed plant location is on the rear façade of No. 43 Warwick Way which is shown on indicative site plan 17249-SP1.

## 6.2 Proposed Mitigation Measures

In order to meet the proposed criteria stated in Section 5.0, it is recommended that an inline attenuator is installed within the duct terminating to atmosphere. The attenuator should be installed close to the fan casing itself and must be within the building envelope. The attenuator should provide sufficient attenuation to achieve a maximum sound pressure level of 54 dB(A) when measured at 1 m in all directions.

Based on the information provided, an enclosure meeting the sound reduction indices as stated in Table 6.2 should be suitable to achieve this.

| Mitigation | *Insertion Losses (dB) in each Frequency Band* | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 63Hz | 125Hz | 250Hz | 500Hz | 1kHz | 2kHz | 4kHz | 8kHz |
| Attenuator | 4 | 9 | 14 | 29 | 34 | 28 | 17 | 11 |

**Table 6.2: Required attenuation from mitigation**

### 6.3 Noise Impact Assessment

The closest receivers have been identified as:

- No.25 Longmoore Street (min. 10 m from the plant with no screening offered)
- No.41 Warwick Way (min. 8 m from the plant with screening offered by the building envelope)

Taking into account all necessary acoustic corrections, the resulting noise level at the identified residential windows would be as shown in Table 6.3. Detailed calculations are shown in Appendix B.

| Receiver | Design Criterion | Noise Level at Receiver (due to proposed plant) |
|---|---|---|
| No.25 Longmoore Street | 34 dB(A) | 34 dB(A) |
| No.41 Warwick Way | | 24 dB(A) |

**Table 6.3: Noise levels and project criterion at noise sensitive receivers**

As presented in Table 6.3 and Appendix B, the proposed plant installation with the specified inline attenuator would be expected to meet the requirements of the proposed criteria.

### 6.4 British Standard Requirements

Further calculations have been undertaken to assess whether the noise emissions from the proposed plant unit would be expected to meet recognised British Standard recommendations, in order to further ensure the amenity of nearby noise sensitive receivers.

British Standard 8233: 2014 '*Guidance on sound insulation and noise reduction for buildings*' gives recommendations for acceptable internal noise levels in residential properties. Assuming worst case conditions, of the closest window being for a bedroom, BS 8233: 2014 recommends 35 dB(A) as being acceptable internal resting conditions during daytime.

With loudest external levels of 34 dB(A), acceptable internal conditions would be met without taking the attenuation of the window itself into consideration. According to BS 8233: 2014, a typical building facade with a partially open window offers 15 dB attenuation.

It can therefore be predicted that, in addition to meeting the requirements of the set criteria, the emissions from the proposed plant would be expected to meet the most stringent recommendations of the relevant British Standard, with neighbouring windows partially open. Predicted levels are shown in Table 6.4.

| Receiver | Recommended Target – *For resting conditions in a bedroom, in BS 8233: 2014* | Noise Level at Receiver (due to plant installation) |
|---|---|---|
| No.25 Longmoore Street | 35 dB(A) | 19 dB(A) |
| No.41 Warwick Way | | 9 dB(A) |

**Table 6.4: Noise levels and BS 8233: 2014 criteria inside nearest residential space**

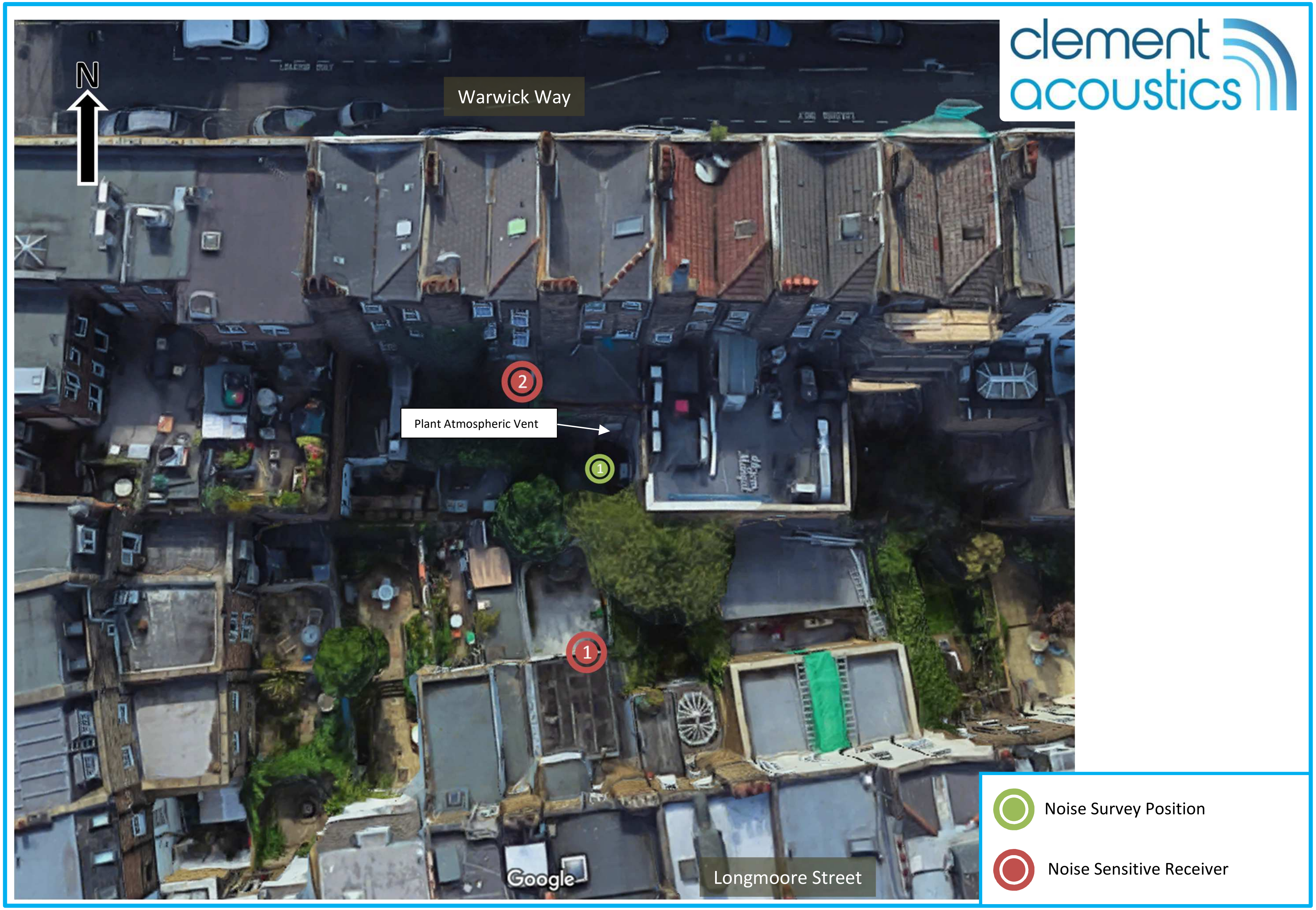
## 7.0 CONCLUSION

An environmental noise survey has been undertaken at IRIS Cafe, 43 Warwick Way, Pimlico. The results of the survey have enabled criteria to be set for noise emissions from the proposed plant in accordance with the requirements of the City of Westminster.

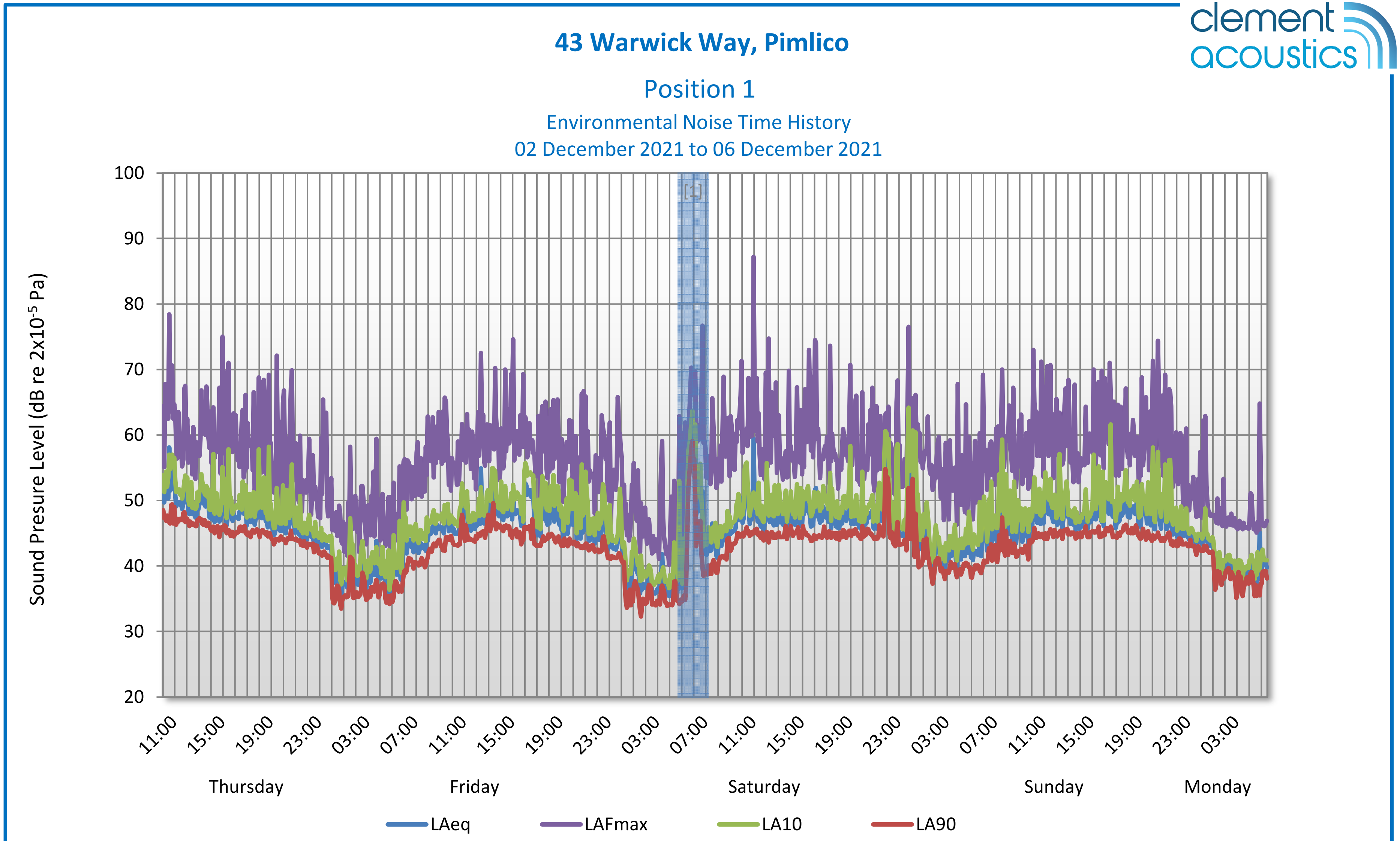
A noise impact assessment has then been undertaken using manufacturer noise data to predict the noise levels, due to the proposed plant, at the nearby noise sensitive receivers.

Calculations show that noise emissions from the proposed units should meet the requirements of the City of Westminster with the recommended mitigation installed as stated herein.

| | | | |
|---|---|---|---|
| **Reviewed** | **Andrew Thomas**<br>Senior Consultant<br>BSc (Hons) MIOA | | 13 December 2021 |
| **Author** | **Kenny Macleod**<br>Consultant<br>BSc (Hons) MIOA | | 13 December 2021 |
| **Approved** | **John Smethurst**<br>Director<br>BSc (Hons) MIOA | | 13 December 2021 |




**17249-SP1** Indicative site plan indicating noise monitoring position and nearest noise sensitive receiver **Date:** 13 December 2021




*Note 1: The identified period was removed from results due to atypical noise profile during adverse weather*

**17249-TH1**

# APPENDIX A

## GLOSSARY OF ACOUSTIC TERMINOLOGY

### dB(A)

The human ear is less sensitive to low (below 125Hz) and high (above 16kHz) frequency sounds. A sound level meter duplicates the ear's variable sensitivity to sound of different frequencies. This is achieved by building a filter into the instrument with a similar frequency response to that of the ear. This is called an A-weighting filter. Measurements of sound made with this filter are called A-weighted sound level measurements and the unit is dB(A).

**$L_{eq}$**

The sound from noise sources often fluctuates widely during a given period of time. An average value can be measured, the equivalent sound pressure level $L_{eq}$. The $L_{eq}$ is the equivalent sound level which would deliver the same sound energy as the actual fluctuating sound measured in the same time period.

**$L_{10}$**

This is the level exceeded for not more than 10% of the time. This parameter is often used as a "not to exceed" criterion for noise

**$L_{90}$**

This is the level exceeded for not more than 90% of the time. This parameter is often used as a descriptor of "background noise" for environmental impact studies.

**$L_{max}$**

This is the maximum sound pressure level that has been measured over a period.

### Octave Bands

In order to completely determine the composition of a sound it is necessary to determine the sound level at each frequency individually. Usually, values are stated in octave bands. The audible frequency region is divided into 10 such octave bands whose centre frequencies are defined in accordance with international standards.

### Addition of noise from several sources

Noise from different sound sources combines to produce a sound level higher than that from any individual source. Two equally intense sound sources operating together produce a sound level which is 3dB higher than one alone and 10 sources produce a 10 dB higher sound level.

### Attenuation by distance

Sound which propagates from a point source in free air attenuates by 6dB for each doubling of distance from the noise source. Sound energy from line sources (e.g. stream of cars) drops off by 3 dB for each doubling of distance.

### Subjective impression of noise

Sound intensity is not perceived directly at the ear; rather it is transferred by the complex hearing mechanism to the brain where acoustic sensations can be interpreted as loudness. This makes hearing perception highly individualised. Sensitivity to noise also depends on frequency content, time of occurrence, duration of sound and psychological factors such as emotion and expectations. The following table is a reasonable guide to help explain increases or decreases in sound levels for many acoustic scenarios.

| Change in sound level (dB) | Change in perceived loudness |
|---|---|
| 1 | Imperceptible |
| 3 | Just barely perceptible |
| 6 | Clearly noticeable |
| 10 | About twice as loud |
| 20 | About 4 times as loud |

### Barriers

Outdoor barriers can be used to reduce environmental noises, such as traffic noise. The effectiveness of barriers is dependent on factors such as its distance from the noise source and the receiver, its height and its construction.

### Reverberation control

When sound falls on the surfaces of a room, part of its energy is absorbed and part is reflected back into the room. The amount of reflected sound defines the reverberation of a room, a characteristic that is critical for spaces of different uses as it can affect the quality of audio signals such as speech or music. Excess reverberation in a room can be controlled by the effective use of sound-absorbing treatment on the surfaces, such as fibrous ceiling boards, curtains and carpets.

# APPENDIX B1

## 17249

## Iris Café, 43 Warwick Way, Pimlico

### EXTERNAL PLANT NOISE EMISSIONS CALCULATION

**Receiver 1: No.25 Longmoore Street**
Source: Fan System

| | A weighted Sound Power Levels per frequency band, Hz | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | *63* | *125* | *250* | *500* | *1k* | *2k* | *4k* | *8k* | *dB(A)* |
| **Manufacturer provided A weighted Sound Power Levels** | | | | | | | | | |
| Soler & Palau CVAB2000/315 | 41 | 53 | 65 | 59 | 67 | 66 | 64 | 57 | 72 |
| Installation Effects, dB | 3 | 6 | 7 | 8 | 8 | 6 | 5 | 3 | |
| Grille End Reflections, dB | -14 | -9 | -5 | -2 | 0 | 0 | 0 | 0 | |
| Attenuation from Proposed Attenuator, dB | -4 | -9 | -14 | -29 | -34 | -28 | -17 | -11 | |
| Radiation Corrections, dB | -8 | -8 | -8 | -8 | -8 | -8 | -8 | -8 | |
| Directivity Correction, dB | 1 | 2 | 3 | 4 | 5 | 6 | 6 | 6 | |
| Distance correction to receiver, dB (10 m) [1] | -20 | -20 | -20 | -20 | -20 | -20 | -20 | -20 | |
| **Sound pressure level at receiver** | **-1** | **15** | **28** | **12** | **18** | **22** | **30** | **27** | **34** |

**[1] Distance loss caluculated assuming Point Source attenuation (*typically used where distance is more than 3x the largest source dimension* )**

| | |
|---|---|
| **Design Criterion** | **34** |

### BS 8233 ASSESSMENT CALCULATION

**Receiver: Inside Nearest Residential Window**
Source: Proposed plant installation

| | Frequency, Hz | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | *63* | *125* | *250* | *500* | *1k* | *2k* | *4k* | *8k* | *dB(A)* |
| Sound pressure level outside window | -1 | 15 | 28 | 12 | 18 | 22 | 30 | 27 | 34 |
| Minimum attenuation from partially open window, dB | -15 | -15 | -15 | -15 | -15 | -15 | -15 | -15 | |
| **Sound pressure level inside nearest noise sensitive premises** | **-16** | **0** | **13** | **-3** | **3** | **7** | **15** | **12** | **19** |

| | |
|---|---|
| **Design Criterion** | **35** |

# APPENDIX B2

## 17249

## Iris Café, 43 Warwick Way, Pimlico

### EXTERNAL PLANT NOISE EMISSIONS CALCULATION

**Receiver 2: No.41 Warwick Way**
Source: Fan System

| | *A weighted Sound Power Levels per frequency band, Hz* | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | *63* | *125* | *250* | *500* | *1k* | *2k* | *4k* | *8k* | *dB(A)* |
| **Manufacturer provided A weighted Sound Power Levels** | | | | | | | | | |
| Soler & Palau CVAB2000/315 | 41 | 53 | 65 | 59 | 67 | 66 | 64 | 57 | 72 |
| Installation Effects, dB | 3 | 6 | 7 | 8 | 8 | 6 | 5 | 3 | |
| Grille End Reflections, dB | -14 | -9 | -5 | -2 | 0 | 0 | 0 | 0 | |
| Attenuation from Proposed Attenuator, dB | -4 | -9 | -14 | -29 | -34 | -28 | -17 | -11 | |
| Radiation Corrections, dB | -8 | -8 | -8 | -8 | -8 | -8 | -8 | -8 | |
| Directivity Correction, dB | 1 | 2 | 3 | 4 | 5 | 6 | 6 | 6 | |
| Distance correction to receiver, dB (8 m) [1] | -18 | -18 | -18 | -18 | -18 | -18 | -18 | -18 | |
| Screening Correction, dB | -4 | -5 | -7 | -9 | -12 | -16 | -21 | -22 | |
| **Sound pressure level at receiver** | **-3** | **12** | **23** | **5** | **8** | **8** | **11** | **7** | **24** |

**[1] Distance loss caluculated assuming Point Source attenuation (*typically used where distance is more than 3x the largest source dimension*)**

| | |
|---|---|
| **Design Criterion** | **34** |

### BS 8233 ASSESSMENT CALCULATION

**Receiver: Inside Nearest Residential Window**
Source: Proposed plant installation

| | *Frequency, Hz* | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | *63* | *125* | *250* | *500* | *1k* | *2k* | *4k* | *8k* | *dB(A)* |
| Sound pressure level outside window | -3 | 12 | 23 | 5 | 8 | 8 | 11 | 7 | 24 |
| Minimum attenuation from partially open window, dB | -15 | -15 | -15 | -15 | -15 | -15 | -15 | -15 | |
| **Sound pressure level inside nearest noise sensitive premises** | **-18** | **-3** | **8** | **-10** | **-7** | **-7** | **-4** | **-8** | **9** |

| | |
|---|---|
| **Design Criterion** | **35** |