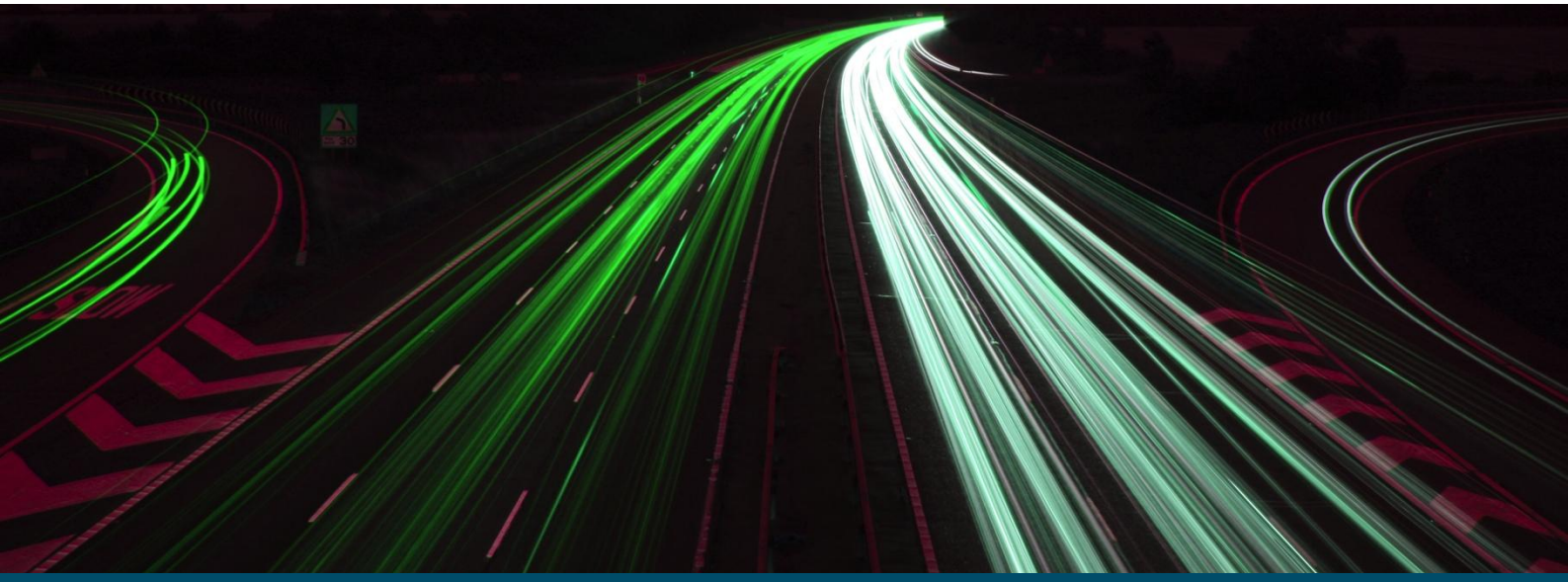

# Noise Assessment Report

## Report: 3204-R1 – Theobalds Road, Holborn, London, WC1X 8SP

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## 1. Table of Contents



| *Report Revisions* | *Date* | | |
|---|---|---|---|
| 3204-R1 | 05/12/2014 | Initial Report | |
| | | | |
| | | | |
| | | | |
| | *Produced by:* | *Checked by:* | *Authorised by:* |
| Name: | Steve Clow MIOA | Steve Mckeever AMIOA | Steve Clow MIOA |

*Steve Clow MIOA*, is a member of The Institute of Acoustics and has achieved the IOA Diploma in Acoustics and Noise Control. Steve Clow has over 15 years experience in an acoustic consultant capacity working on many assessments involving planning and regulatory services.

*Steve Mckeever AMIOA*, is an associate member of The Institute of Acoustics and has achieved the IOA Diploma in Acoustics and Noise Control. Steve Mckeever has 10 years experience working in acoustics and 5 years in an acoustic consultant capacity.




Clover Acoustics Ltd - The Old Vicarage - Barcroft Lane - Askern - Doncaster - DN6 0DS
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## 2. Introduction

Clover Acoustics Ltd has been appointed by Zohaib Khan to carry out a noise assessment on a proposed kitchen extract system to be installed at the rear of 37 Theobalds Road, Holborn, London, WC1 X8SP. The equipment will service a proposed restaurant located on the ground floor and basement of the building.

A baseline noise survey has been carried out over a period representative of the proposed operational hours of the restaurant in order to establish the existing background levels. The background noise survey was conducted at one monitoring location on Friday 28th November 2014 and Monday 1st December 2014.

The purpose of this report is to demonstrate that due consideration for noise affecting neighboring residential properties has been made and to assess the significance of any noise impact from the operation of the units.

## 3. Scope

**BS4142:2014 Methods for rating and assessing industrial and commercial sound.**

BS4142 gives a method for rating sound from industrial and commercial sources affecting people inside or outside dwellings or premises used for residential purposes. An initial estimate of the significance of the sound from the industrial/commercial nature can be assessed by subtracting the measured background noise level from the rating level (this is the specific sound level of the source with any corrections or penalties for distinctive acoustic characteristics). Typically, the greater the difference, the greater the magnitude of the impact.

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

**Local Authority Requirements**

The proposed development is located in the London Borough of Camden. The planning guidance document DP28 from the Camden Local Authority offers the following guidance on noise level requirements:

**Table E: Noise levels from plant and machinery at which planning permission will not be granted**

| Noise description and location of measurement | Period | Time | Noise level |
|---|---|---|---|
| Noise at 1 metre external to a sensitive façade | Day, evening and night | 0000-2400 | 5dB(A) <LA90 |
| Noise that has a distinguishable discrete continuous note (whine, hiss, screech, hum) at 1 metre external to a sensitive façade. | Day, evening and night | 0000-2400 | 10dB(A) <LA90 |
| Noise that has distinct impulses (bangs, clicks, clatters, thumps) at 1 metre external to a sensitive façade. | Day, evening and night | 0000-2400 | 10dB(A) <LA90 |
| Noise at 1 metre external to sensitive façade where LA90>60dB | Day, evening and night | 0000-2400 | 55dB$_{LAeq}$ |

Figure 1 – Table E from Camden Planning Guidance Document DP28

# 4. Site Description

The proposed restaurant is to be located on the ground and basement level of 37 Theobalds Road, Holborn, London. The area is predominantly a mixed commercial and residential environment.

The ground floor area of the building being developed was previously part of a larger restaurant that spanned the neighbouring property which is also going through its own refurbishment. *The client advises that some items of plant from this neighbouring establishment is not currently running and therefore the assessment should be viewed as a "worst case" lowest background noise level.*
The remaining 3-floors above the proposed restaurant are residential dwellings.

The proposed restaurant kitchen is to be located within the basement. Kitchen extract equipment will be ducted through the building and exit at rear of the building between the ground and first floor. From this point it will be vertically ducted to the discharge point at 1meter above roof level.

The current application hours of operation are Mon-Fri 07:00-23:00 and Sat-Sun 11:00-23:30. The proposed extract system is to include a SMVW 560/4 extraction fan which is likely to run throughout the proposed operational hours.

It was observed at the rear of the development that there were other extract systems and air condensing units servicing neighbouring properties. The proposed development was previously a restaurant and the area is of mixed commercial and residential use. We would consider the proposed system as within context of the surrounding area. Subjectively whilst attending the site the background noise was dominated by road traffic noise from the surrounding area.

Figure 2 shows the site location plan and Figure 3 shows the proposed development layout.


Figure 2 – Site Location Plan


Figure 3 – Proposed Development Layout

# 5. Survey Information

**Measurement Instrumentation**

The measurement instrumentation used on the survey was as follows:

| Equipment | Manufacturer & Type | Serial Number | Calibration Certificate |
|---|---|---|---|
| Sound Level Meter | Norsonic 118 | 30559 | U16612 |
| Acoustic Calibrator | Norsonic 1251 | 32856 | U16611 |

The equipment was calibrated to comply with section 4.2 of BS7445:1-2003 before and after the surveys. The calibration was as follows:

| Meter | Serial | Before | | After | |
|---|---|---|---|---|---|
| Norsonic 118 | 30559 | 113.9 | -26.1 | 113.9 | -26.1 |

**Measurements & Timescales**

During the background survey 15-minute measurements were made over a typical daytime and night time period between Friday 28th November 2014 and Monday 1st December 2014 at a location representative of the residential dwellings to the rear of 37 Theobalds Road. The measurements were subsequently analysed into hourly periods.

The following measurements are reported: $L_{Aeq,T}$, $L_{A90,T}$, $L_{Amax,T}$

The measurements and their interpretation shall be in accordance with BS 7445: Parts 1 and 2. All sound pressure levels are in dB (re 20µPa).

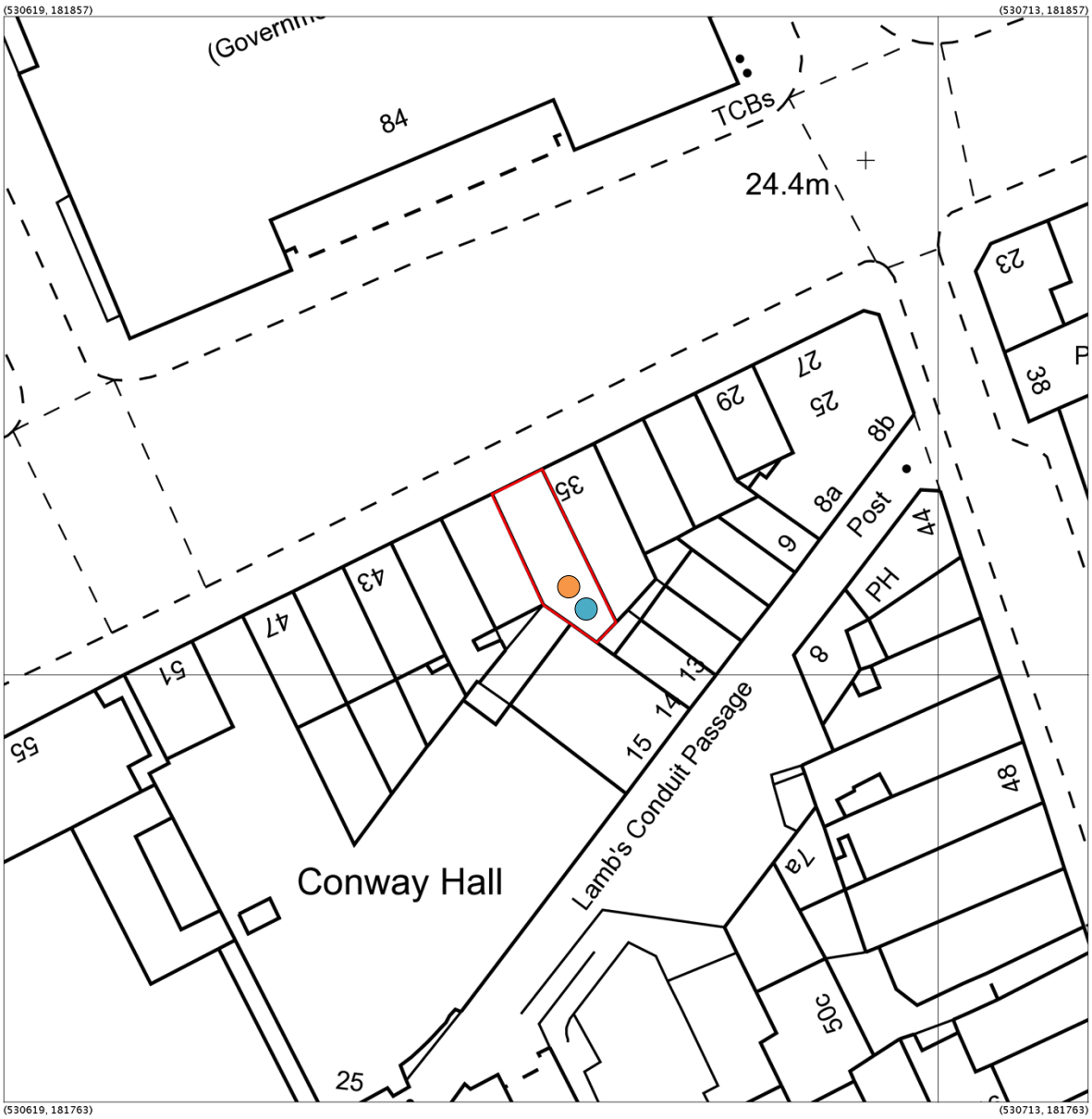
**Meteorology**

Wind speed measurements were logged during the background survey close to the noise monitoring location. The monitoring location was shielded from wind by the surrounding buildings, throughout the assessment period Sunday 30th November 2014, wind speed measurements were below 5m/s$^{-1}$.

Local weather station data indicates temperatures ranged between 6°C and 10°C and there was no precipitation during the assessment period.

**Position of Monitoring Equipment**

The equipment was mounted free field 1.5m from the flat roof at a location representative of the nearest receivers. Figure 2 shows the site location plan with the location of the proposed unit and background monitoring location.






Metres
0 4 8 12 16 20
1:500

N

37, Theobalds Rd
London
WC1 X8SP

Supplied by: Stanfords 26 Nov 2014
Stanfords Ordnance Survey Partner Licence: 100035409
Reference: OI787625
Centre coordinates: 530666 181810

| Background Monitoring Location | Proposed Extract Equipment |
|---|---|

Figure 4 – Site Location Plan Showing Monitoring Location

# 6. Survey Results

**Background Noise Summary**

The background monitoring from Sunday 30th November 2014 has been selected as the representative background period for the assessment. The collated data is indicative that background levels were slightly lower during this Sunday period and it is presumed that this is due to neighbouring properties being inactive throughout the period.

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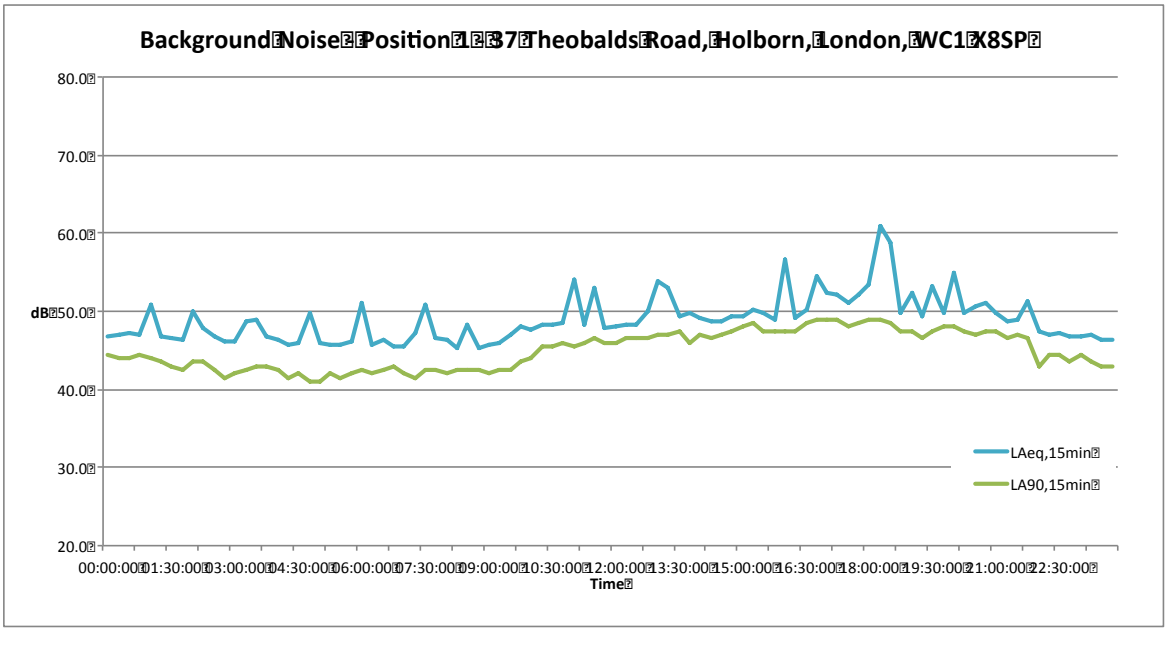
Site: Position 1 - 37 Theobalds Road, Holborn, London, WC1 X8SP
Table: 1 Summary — Start Date: 30/11/2014
Report: 3204-R1 — End Date: 30/11/2014

Hourly Summary

| Hour End | LAeq,1Hour | Min LA90,15min | Max LAMax, 15min |
|---|---|---|---|
| 00:00 | 44.9 | 43.0 | 54.2 |
| 01:00 | 45.3 | 44.0 | 61.3 |
| 02:00 | 46.3 | 42.5 | 70.2 |
| 03:00 | 46.3 | 41.5 | 75.0 |
| 04:00 | 46.1 | 42.0 | 70.9 |
| 05:00 | 45.6 | 41.0 | 69.4 |
| 06:00 | 44.1 | 41.0 | 60.6 |
| 07:00 | 46.1 | 42.0 | 70.0 |
| 08:00 | 46.3 | 41.5 | 77.6 |
| 09:00 | 44.7 | 42.0 | 65.9 |
| 10:00 | 45.0 | 42.0 | 69.6 |
| 11:00 | 46.4 | 44.0 | 67.0 |
| 12:00 | 49.9 | 45.5 | 78.2 |
| 13:00 | 46.9 | 46.0 | 67.3 |
| 14:00 | 50.2 | 46.0 | 71.6 |
| 15:00 | 47.3 | 46.5 | 62.6 |
| 16:00 | 47.8 | 47.5 | 62.2 |
| 17:00 | 51.9 | 47.5 | 77.2 |
| 18:00 | 50.2 | 48.0 | 70.2 |
| 19:00 | 55.9 | 47.5 | 81.3 |
| 20:00 | 49.7 | 46.5 | 73.1 |
| 21:00 | 50.4 | 47.0 | 75.3 |
| 22:00 | 48.1 | 46.5 | 67.1 |
| 23:00 | 45.4 | 43.0 | 65.4 |



# 7. Noise Assessment

**BS4142:2014 – Methods for rating and assessing industrial and commercial sound**

The proposed kitchen extract specification includes a Helios SMVW 560/4 Extractor Fan with a published sound output level of 61dB(A) at 1m. The proposed development layout identifies the fan unit would be installed on the flat roof level adjacent the residential receiver windows. Substantial attenuation would be required to attenuate the fan case breakout to a level to avoid a significant adverse impact on the nearby receivers. We would strongly recommend installing the fan unit internally to avoid substantial attenuation requirements to the fan unit.

Noise will be generated within the ductwork by the fan unit. This noise may become apparent at the receiver via noise breakout from the external ductwork wall and discharge point.

The proposed hours of operation are Mon-Fri 07:00-23:00 and Sat-Sun 11:00-23:30. The lowest background noise level monitored during the proposed operational hours was 43dB $L_{A90,15min}$.

Based on the manufacturers' published information using prediction methods from CIBSE Guide B and other appropriate calculation methods[1] the specific noise impacting on the receiver has been calculated for both duct wall breakout and discharge point aspects of the system before any mitigation has been applied as follows:

| Kitchen Extract System | |
|---|---|
| **Extract** | **Noise Level at receiver dB(A)** |
| Duct Breakout | 64 |
| Discharge Point | 59 |
| Fan Case (Installed Internally) | - |
| Total | 65 |

The total system noise level has been predicted as 65dB(A) at the receiver. The lowest operational background noise level recorded was 43dB$L_{A90.}$ A BS4142 Assessment based on the proposed untreated system would result in a specific level of 22dB above background at the receiver. According to BS4142, "A difference of around +10dB or more is likely to be an indication of a significant adverse impact".

The local authority requirement is to achieve a specific noise level that is 10dB below the background LA90 (where the source contains a whine hiss screech or hum). To achieve the local authority requirements, additional attenuation for the extract system of 32dB is required which would result in a combined noise rating level 10dB below the lowest operational hours background of 43dB $L_{A90}$. Each contributing element therefore needs to be attenuated to achieve no more than 30dB at the receiver.

[1] Calculations are presented in the Appendix

**Kitchen Extract System:**

Insertion loss requirements have been calculated as follows:

| Table 2: Insertion Loss Requirement | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |
|---|---|---|---|---|---|---|---|
| Discharge point | 13 | 19 | 41 | 55 | 55 | 45 | 31 |
| Duct wall breakout | 24 | 33 | 59 | 75 | 78 | 68 | 56 |

To achieve the required insertion loss for the discharge point the suggested treatment would be to adopt an in-line silencer solution. The clients' kitchen extraction designer has included information on a range of Helios silencers. Based on the insertion loss requirements this could be achieved by installing 2x off KSD 600 silencers.

To achieve the required insertion loss for the duct-wall breakout the suggested treatment would be to adopt the in-line silencers as above and in addition lag the external ductwork. A typical product used for this purpose would be Muftilag Tap-Wrap 6F/5kg (http://www.tapacoustic.com/).

*Noise Assessment*

Adopting further treatment to the system and achieving the required insertion loss values for the system would predict a noise rating level of 33dB(A) at the receiver[1]. This would give a predicted level of 10db below the lowest operational hours background level. This is line with the local authority requirement to achieve a specific noise level that is 10dB below the background LA90 (where the source contains a whine hiss screech or hum) at 1m external to a sensitive facade.

| Local Authority Assessment – Extract System with mitigation. | dB(A) |
|---|---|
| Combined specific level at Receiver | 33 |
| Lowest Operational Hours Level $L_{A90}$ | 43 |
| Rating Above/ Below Background | -10dB |

| BS4142 Assessment – Extract System with mitigation. | dB(A) |
|---|---|
| Combined specific level at Receiver | 33 |
| Acoustic Feature Correction | +5 |
| Rating Level | 38 |
| Lowest Operational Hours Level $L_{A90}$ | 43 |
| Rating Above/ Below Background | -5dB |

BS4142 advises, "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 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".

## 8. Recommendations

The current proposed system would predict a noise rating above the existing background noise level and indicate a significant adverse impact on the neighbouring properties. To avoid this and achieve the local authority requirements of a specific noise level that is 10dB below the background LA90 (where the source contains a whine hiss screech or hum) further treatment would be required.

The suggested treatment options would be to install the fan unit internally. If the fan unit were to be installed externally, significant attenuation would be required.

To attenuate noise from the extraction system discharge point and duct-wall breakout, install in-line silencers with the minimum insertion loss values from table 2. This could be achieved by installing 2x off KSD 600 silencers in combination with Muftilag Tap-Wrap 6F/5kg lagging of the external ductwork.

It is understood that anti vibration mountings have been specific in line with good practice and detail is included in the appendix.

Clover Acoustics Ltd can only advise on noise issues in this regard, and it is recommended that professional advice be sought from others in respect of non acoustic issues such as air flow, ventilation to the equipment, any visual aspects and structural support issues.

## 9. Conclusion

A noise assessment has been carried out at the 37 Theobalds Road, Holborn, London, WC1 X8SP to assess the impact of a proposed kitchen extraction system at the rear of the building. A background noise survey was conducted between Friday 28th November 2014 and Monday 1st December 2014 at a location representative of the nearest sensitive receivers.

An assessment has been made in accordance with Local Authority and BS4142 which has shown that with attenuation applied a predicted specific noise level of 10dB below the proposed operational operation background hours can be achieved. This specific noise level would achieve the Local Authority of a specific noise level that is 10dB below the background LA90 (where the source contains a whine hiss screech or hum).

Further, according to BS4142, “Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact”

**Steve Clow** MIOA
Acoustic Consultant

# 10. Appendix

## Glossary of Terms

***Specific Noise Source***

The noise source under investigation for assessing the likelihood of complaints.

***Specific Noise Level, $L_{Aeq,T}$***

The equivalent continuous A-weighted sound pressure level at the assessment position produced by the specific noise source over a given reference time interval.

***Rating Level, $L_{A,T}$***

The specific noise level plus any adjustment for the characteristic features of the noise.

***Background Noise Level, $L_{A90,T}$***

The A-weighted sound pressure level of the residual noise at the assessment position that is exceeded for 90 % of a given time interval, T.

***Residual Noise***

The ambient noise remaining at a given position in a given situation when the specific noise source is suppressed to a degree such that it does not contribute to the ambient noise.

***Ambient Noise***

Totally encompassing sound in a given situation at a given time usually composed of sound from many sources near and far.

***Reference Time Interval, T***

The specified interval over which an equivalent continuous A-weighted sound pressure level is determined.

***$L_{Aeq,T}$***

The A-weighted equivalent continuous sound level – the sound level of a notionally steady sound having the same energy as the fluctuating sound over a specified measurement period, T.

***$L_{A10,T}$***

The A-weighted sound level exceeded for 10% of the specified measurement period, T.

***$L_{Amax}$***

The highest short duration A-weighted sound level recorded during a noise event.

***A-Weighting***

The 'A' weighting is a correction term applied to the frequency range in order to approximate to the sensitivity of the human ear to noise. It is generally used to obtain an overall noise level from octave or third octave band frequencies.

***Octave Band***

A frequency band in which the upper limit of the band is twice the frequency of the lower limit.

***One-third-octave Band***

A frequency band in which the upper limit of the band is 1/3 times the frequency of the lower limit.

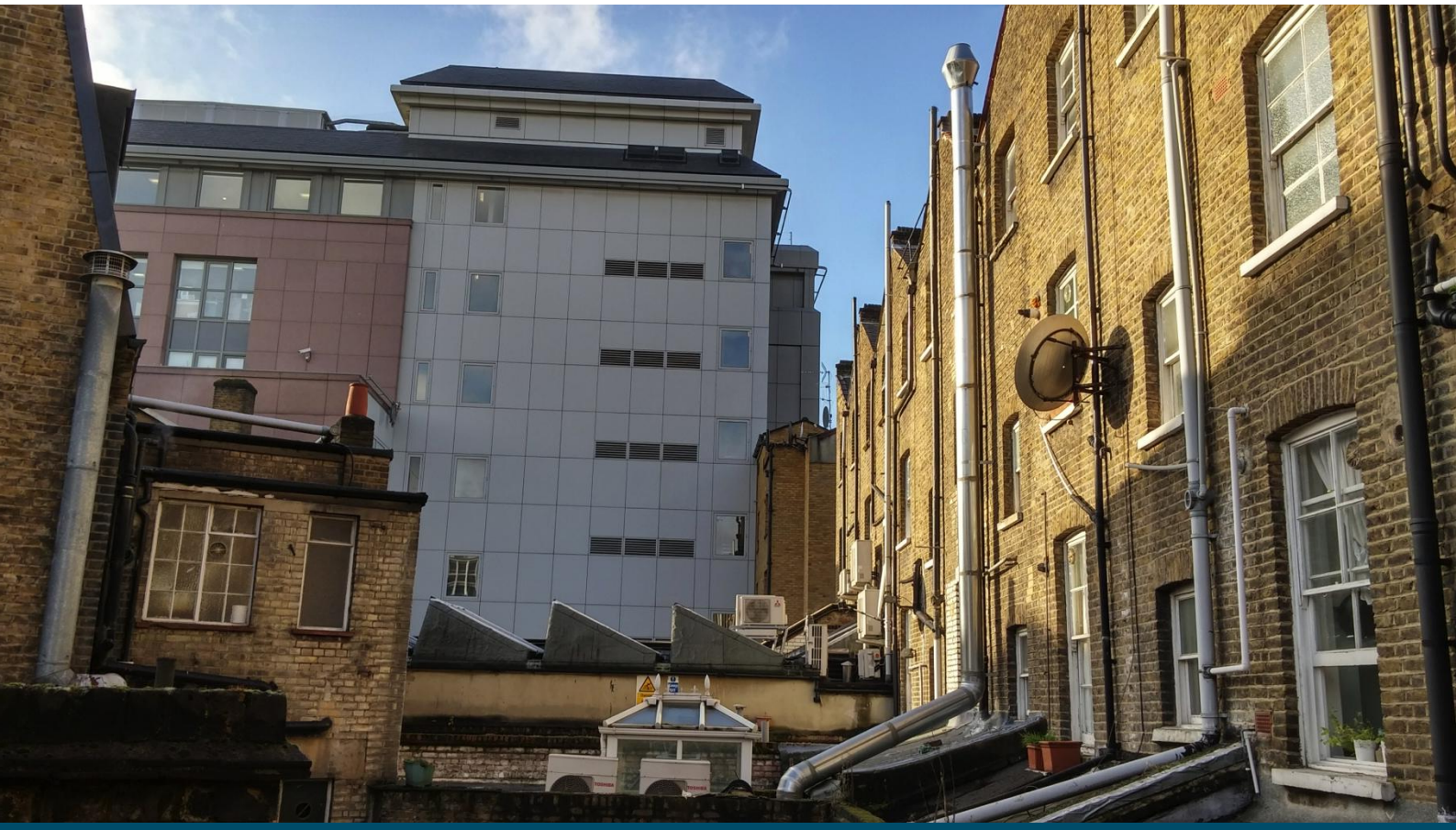


Figure 5 – View West Along Neighbouring Properties


Figure 6 – View East Along Neighbouring Properties

Figure 7 – View of existing neighbouring extract formally used by 37 Theobalds Road.

Figure 8 – View of proposed ductwork location on rear of 37 Theobalds Road.

# Noise Impact Calculations (Including Proposed Mitigation)

clover acoustics

Site: 37 Theobalds Road, Holborn, London, WC1X 8SP
Table: Kitchen Extract Discharge point noise
Report: 3204-R1

| Discharge Point Noise | | | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | dBA |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Unit Sound Power Level | | | | 64.0 | 69.0 | 73.0 | 77.0 | 73.0 | 65.0 | 57.0 | 80 |
| **Straight Ducts** | | | | | | | | | | | |
| Width x Height (mm) | Length (m) | Lined | | | | | | | | | |
| 500 x 500 | 10 | No | | 4.0 | 3.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | |
| **Bends / Take Offs** | | | | | | | | | | | |
| Width x Height (mm) | Type | Lined | | | | | | | | | |
| **Other Attenuation** | | | | | | | | | | | |
| Silencer 1 | Helios KSD 500 | | | 7 | 10 | 21 | 28 | 28 | 23 | 16 | |
| Silencer 2 | Helios KSD 500 | | | 7 | 10 | 21 | 28 | 28 | 23 | 16 | |
| **Discharge Point Noise** | | | | | | | | | | | |
| Sound Power Level at Discharge Point | | | | 46.0 | 46.0 | 30.0 | 20.0 | 16.0 | 18.0 | 24.0 | |
| Distance Exhaust to Receiver 4m | | | | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | |
| Sound Pressure Level at Receiver | | | | 26.0 | 26.0 | 10.0 | 0.0 | -4.0 | -2.0 | 4.0 | 29 |

clover acoustics

Site: 37 Theobalds Road, Holborn, London, WC1X 8SP
Table: Kitchen Extract Duct breakout noise
Report: 3204-R1

| Duct Noise Breakout | | | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | dBA |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Unit Sound Power Level | | | | 64.0 | 69.0 | 73.0 | 77.0 | 73.0 | 65.0 | 57.0 | 80 |
| **Straight Ducts** | | | | | | | | | | | |
| Width x Height (mm) | Length (m) | Lined | | | | | | | | | |
| 500 x 500 | 10 | No | | 4.0 | 3.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | |
| **Bends / Take Offs** | | | | | | | | | | | |
| Width x Height (mm) | Type | Lined | | | | | | | | | |
| **Other Attenuation** | | | | | | | | | | | |
| Silencer 1 | Helios KSD 500 | | | 7 | 10 | 21 | 28 | 28 | 23 | 16 | |
| Silencer 2 | Helios KSD 500 | | | 7 | 10 | 21 | 28 | 28 | 23 | 16 | |
| Lagging | Tap-Wrap 5F/5KG | | | 12.5 | 15.8 | 19 | 21.4 | 24.1 | 24.6 | 26 | |
| **Duct Noise Breakout** | | | | | | | | | | | |
| Sound Power Level at Duct Breakout Location | | | | 37.1 | 32.9 | 11.9 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Sound Reduction R of Duct Wall (22 gauge) | | | | 8.0 | 14.0 | 20.0 | 23.0 | 26.0 | 27.0 | | |
| Sound Power Level at Duct Wall | | | | 34.1 | 29.9 | 5.7 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Distance Duct to Receiver 1m | | | | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | |
| Sound Pressure Level at Receiver | | | | 26.1 | 21.9 | -2.3 | -8.0 | -8.0 | -8.0 | -8.0 | 28 |

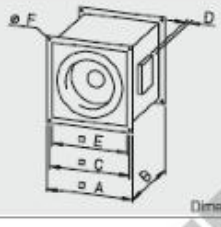
**Proposed Extract System Information**

# ARDA METAL WORKS LTD.

Unit 6 • 20 Kynoch Road Edmonton • London • N18 3BD
020 8807 78 78 • activems@ymail.com

## 450 - 630 MM Diameter Square Mix Flow Fan Extraction Motor Unit Details

SMV




Dimensions in mm see table

| Unit dimensions in mm | | | | | | |
|---|---|---|---|---|---|---|
| Type | A | B | C | D | E | ø F |
| SMV.. 450 | 492 | 400 | 470 | 65 | 447 | 10 |
| SMV.. 500 | 547 | 450 | 520 | 65 | 502 | 10 |
| SMV.. 560 | 595 | 485 | 573 | 65 | 550 | 10 |
| SMV.. 630 | 707 | 510 | 690 | 65 | 661 | 10 |

**Applications / use**
- For medium airflow volumes against high resistances.
- Square flanges for quick connection onto ducting.

**Features**
- The Square Mixed flow vent range offers excellent fan performance in nominal duct dimensions of 450 to 660 mm square.
- Compact design to minimise space and cost.
- Square quick fix flanges offer fast and effective installation.
- 100 % speed controllable.
- Extensive range of accessories including starters, speed controllers, flexible connectors, silencers and filters.
- Units can be mounted in any position.
- Simple electrical connection via a terminal box on the casing.
- Robust corrosion resistant casing, designed for duct connection. Suitable for internal or external installation.

**Specification**

**Motor**
Maintenance free, external rotor motor with sealed for life ball bearings. Protection to IP 54, insulation-class B for 1 phase and class F for 3 phase motors.

**Motor protection**
All models are fitted with thermal contacts which should be connected to a motor protection device.

**Casing**
Made from galvanised sheet steel with fitted quick fix flanges.

**Impeller**
Mixed-flow impeller made from galvanised steel.

**Speed control**
All models are fully speed controllable.
Suitable controllers, electronic and auto-transformers, are available as accessories.

**Terminal box**
The external terminal box for electrical connection is IP 55.

**Electrical connection**
The connection of the electrical supply must be carried out in accordance with all relevant regulations.
Connection is via the terminal box on the casing.

**Installation**
Installation at any angle.

**Safety notice**
Protection against accidental contact to DIN EN 294 must be provided by the installer.

**Noise levels**
The data table below gives the sound pressure level (air noise) in dB(A) at 1 metre under freefield conditions. The total sound power levels shown on the performance curves are for intake, extract and case break-out.

**Performances**
All performances are at an air density of 1.20 kg/m³.

| Other accessories | Pages |
|---|---|
| Adaption plate for circular ducts, flexible connectors, attenuators, filters, heaters and speed controllers | 210 |

| Type | Ref. No. | R.P.M. | Air flow volume FID | Sound press. level at 1 m | Power | Max. air flow temp. | Current AMPS | Wiring diagram | Nominal weight | 5 step transformer controller | | 5 step transformer controller with full motor protection | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | m³h⁻¹ | m³/s | dB(A) | kW | +°C | FLC | No. | kg | Type | Ref. No. | Type | Ref. No. |
| **Single phase, 230 V / 1 ph. / 50 Hz, capacitor start motor, protection to IP 54** | | | | | | | | | | | | | |
| SMVW 450/4 | 7822 | 1385 | 1.00 | 54 | 0.33 | 50 | 1.55 | SS-434 | 26.0 | TSW 3.0 | 1496 | MVS 3 | 1948 |
| SMVW 500/4 | 7823 | 1330 | 1.45 | 62 | 0.51 | 45 | 2.27 | SS-434 | 41.0 | TSW 3.0 | 1496 | MVS 3 | 1948 |
| SMVW 560/4 | 7824 | 1280 | 1.94 | 61 | 0.86 | 45 | 4.10 | SS-434 | 42.0 | TSW 3.0 | 1497 | MVS 3 | 1949 |
| SMVW 630/4 | 7825 | 1315 | 3.10 | 69 | 1.50 | 40 | 6.60 | SS-434 | 57.0 | TSW 7.5 | 1596 | MVS 7.5 | 1950 |
| **Three phase, 400 V / 3 ph. / 50 Hz motor, protection to IP 54** | | | | | | | | | | | | | |
| SMVD 500/4 | 7826 | 1400 | 1.46 | 57 | 0.55 | 70 | 1.46 | SS-469 | 32.0 | TSD 3.0 | 1502 | RDS 2 | 1315 |
| SMVD 560/4 | 7827 | 1315 | 1.87 | 62 | 0.79 | 50 | 1.51 | SS-469 | 40.0 | TSD 3.0 | 1502 | RDS 2 | 1315 |
| SMVD 630/4 | 7828 | 1305 | 2.90 | 63 | 1.25 | 50 | 2.24 | SS-469 | 52.0 | TSD 3.0 | 1502 | RDS 4 | 1316 |

# ARDA METAL WORKS LTD.

Unit 6 • 20 Kynoch Road Edmonton • London • N18 3BD
020 8807 78 78 • activems@ymail.com

## 450 - 630 MM Diameter Square Mix Flow Fan Silencer Details

**Rectangular attenuator KSD**

**Specification – Installation**

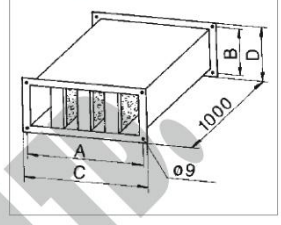
Casing made from galvanised steel with flanges to fit the fan's dimensions. To be installed in-line with ducting on inlet or exhaust. To reduce vibration transmission from the fan, a flexible connector (accessories VS or VS… Ex) should be installed between fan/attenuator and ducting.

**Pressure drop**

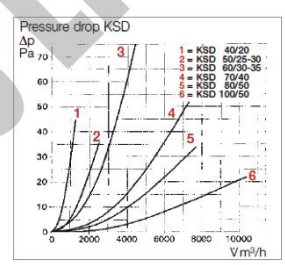
The attenuator will add an additional resistance to the duct system (see chart), which must be considered when selecting a fan. The figures shown refer to an equal inlet into the attenuator. Turbulences from the fan's exhaust can be reduced if 1 metre of straight ducting is fitted between fan and attenuator. Otherwise allow for a higher resistance.

KSD

Dimensions in mm see table




Pressure drop KSD




| Type | Ref. No. | Duct size in mm | Dimensions in mm A | B | C | D | Nominal weight kg | Attenuation $D_B$ dB 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | Average attenuation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| KSD 400/200 | 8728 | 400/200 | 420 | 220 | 443 | 240 | 13 | 8 | 11 | 23 | 31 | 31 | 26 | 18 | 17 |
| KSD 500/250.. | 8729 | 500/250-300 | 520 | 270/320 | 540 | 340 | 16.5 | 6 | 9 | 19 | 25 | 25 | 20 | 15 | 14 |
| KSD 600/300.. | 8730 | 600/300-350 | 620 | 320/370 | 640 | 390 | 20 | 7 | 10 | 21 | 28 | 28 | 23 | 16 | 12 |
| KSD 700/400 | 8731 | 700/400 | 720 | 420 | 740 | 440 | 25 | 6 | 8 | 18 | 24 | 24 | 20 | 14 | 12 |
| KSD 800/500 | 8732 | 800/500 | 820 | 520 | 840 | 540 | 31 | 7 | 9 | 19 | 26 | 26 | 21 | 15 | 14 |
| KSD 1000/500 | 8733 | 1000/500 | 1020 | 520 | 1040 | 540 | 35 | 5 | 7 | 16 | 21 | 21 | 17 | 12 | 11 |

## 450 - 630 MM Diameter Square Mix Flow Fan Speed Controller

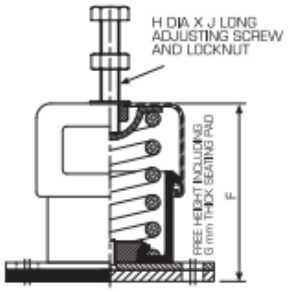
TSW / TSD

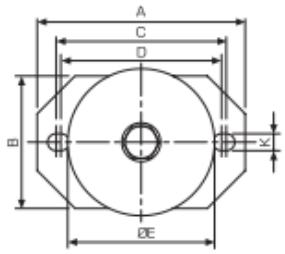
| Type | Ref. No. | I max. A | Dims. in mm W | H | D |
|---|---|---|---|---|---|
| For 1 ph. / 230 V | | | | | |
| TSW 3.0 | 1496 | 3.0 | 154 | 200 | 148 |
| TSW 5.0 | 1497 | 5.0 | 200 | 254 | 98 |
| TSW 7.5 | 1596 | 7.5 | 200 | 254 | 167 |
| For 3 ph. / 400 V | | | | | |
| TSD 3.0 | 1502 | 3.0 | 200 | 254 | 167 |

**5 step transformer controller TSW / TSD**

Robust ISO casing, of impact resitant polymers colour light grey. Protection IP 54. Bulit in 5 step switch providing on/off and 5 speed settings. Available for 220/240 V 1 ph. and 400/440 V, 3 ph. supply.

## Enclosed Spring Vibration Isolators

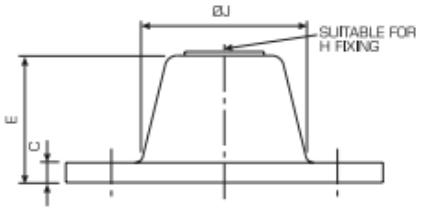


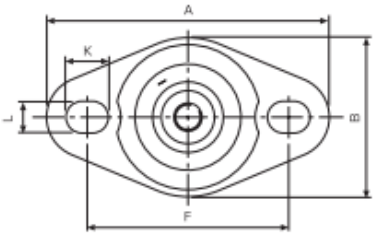




| Type | Load range per mounting (kg) | Product Number | A | B | C | D | E | F | G | H | J | K |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ES20/10/ZSB Purple | 10 | 503008 | 76 | 38 | 60 | 54 | 48 | 66 | 3 | M8 | 40 | 6.5 |
| ES20/15/ZSB Yellow | 15 | 503009 | 76 | 38 | 60 | 54 | 48 | 66 | 3 | M8 | 40 | 6.5 |
| ES20/20/ZSB Grey | 20 | 503010 | 76 | 38 | 60 | 54 | 48 | 66 | 3 | M8 | 40 | 6.5 |
| ES25/60/ZSB Green | 60 | 503015 | 110 | 70 | 90 | 85 | 78 | 94 | 6 | M10 | 60 | 9 |
| ES25/100/ZSB Blue | 100 | 503016 | 110 | 70 | 90 | 85 | 78 | 94 | 6 | M10 | 60 | 9 |

All dimensions shown in mm

## Rubber in Shear Vibration Isolators




Note: These vibration isolators are not suitable for use with JM Aerofoil HT category 300/1 and 400/2 series smoke venting fans - please use spring isolators.

| Type | Load range per mounting (kg) | Product Number | A | B | C | E | F | H | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 63.105.40 | 0-4 | 267321 | 64 | 43 | 2 | 20 | 50 | M6 | - | - | - |
| 63.105.60 | 0-6 | 267322 | 64 | 43 | 2 | 20 | 50 | M6 | - | - | - |
| 19.100.Yellow | 5-28 | 267336 | 80 | 45 | 5 | 32 | 57 | M8 | 41 | 12 | 9 |
| 19.100.Blue | 8-50 | 267337 | 80 | 45 | 5 | 32 | 57 | M8 | 41 | 12 | 9 |
| 19.101.Blue | 23-180 | 267345 | 95 | 60 | 5 | 45 | 71 | M10 | 56 | 14 | 9 |
| 19.101.Red | 35-280 | 267346 | 95 | 60 | 5 | 45 | 71 | M10 | 56 | 14 | 9 |
| 19.102.Red | 48-400 | 267352 | 150 | 86 | 6 | 70 | 115 | M12 | 82 | 22 | 11 |

All dimensions shown in mm

**Bold text denotes next day delivery available if ordered by 4pm.**