



AES

Acoustic Engineering Services (UK) Ltd

The Redwood Suite
Guardian House
Borough Road
Godalming
Surrey
GU7 2AE
01483 495 963
info@aesuk.co.uk
www.aesuk.co.uk

EMAIL TRANSMISSION

| | | | |
|----------------------|------------------------------|-------------------|---|
| Email: | Graham.Jupp@Kentex-Group.com | Page: | 1 of 4 |
| Company: | KENTEX | Date: | 15/08/2018 |
| Attention of: | GRAHAM JUPP | From: | MARK STAGG |
| Project: | WE WORK SHAFTESBURY AVENUE | Our Ref.: | 185366 Kitchen / Served Extract Technical |
| | | Your Ref.: | |

Dear Graham,

Further to our various emails and conversations I am now able to confirm the details of the proposed atmosphere side attenuators and fan casing enclosures for the kitchen and survey extract fans.

Using the Arup correspondence dated 13th August 2018 my understanding is that it is necessary to incorporate extra attenuation in addition to the attenuators already selected as follows-

- i) Served Extract fan outlet

| | | |
|--|-------|------|
| Actual plant sound power level (page 2) | 101dB | |
| Required plant sound power level (page 4) | 85dB | |
| Additional attenuation required: 101dB-85dB= | | 16dB |
| Previously selected attenuator loss- 20dB | | |
| Total attenuation of new attenuator 20dB+16dB= | | 36dB |

- ii) Served Extract fan casing

| | | |
|--|------|------|
| Actual plant sound power level (page 2) | 85dB | |
| Required plant sound power level | 64dB | |
| Additional attenuation required: 85dB-64dB | | 21dB |

Our Ref: 185366 Kitchen and Servery Extract technical

15th August 2018

| | | |
|------|--|-------|
| iii) | Kitchen Extract fan outlet | |
| | Actual plant sound power level (page 2) | 102dB |
| | Required plant sound power level (page 4) | 85dB |
| | Additional attenuation required: 102dB-85dB= | 17dB |
| | Previously selected attenuator loss- 18dB | |
| | Total attenuation of new attenuator 18dB+17dB= | 35dB |
| iv) | Kitchen Extract fan casing | |
| | Actual plant sound power level (page 2) | 89dB |
| | Required plant sound power level | 67dB |
| | Additional attenuation required: 89dB-67dB | 22dB |

Casing Radiated Noise – Both Fans

The only means of achieving the casing radiated noise reductions would be to form a full acoustic enclosure around the fans using solid acoustic panels, which we propose to be 100mm thick.

Panels would comprise of a solid galvanised steel sheet outer face with a perforated galvanised steel inner retaining a heavy density mineral fibre infill.

The relevant acoustic performance is as follows –

| | | | | | | | | | |
|-----------------------|----|-----|-----|-----|-----|-----|-----|-----|-----|
| Frequency | Hz | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k |
| Sound reduction index | dB | 24 | 19 | 25 | 38 | 47 | 52 | 58 | 57 |
| Absorption | α | 0.1 | 0.7 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |

Based on the breakout figures provided and allowing for the additional radiating surface this should comfortably meet with the requirement.

As it is a requirement to provide ambient airflow to and from the fan motor it will be necessary to incorporate air inlet and outlet attenuators into the design.

Our Ref: 185366 Kitchen and Servery Extract technical

15th August 2018

Our selection would be a 20% free area attenuator sized for the specific airflow and with a length of 1500mm providing the following insertion losses –

| | | | | | | | | | |
|----------------|----|----|-----|-----|-----|-----|-----|-----|-----|
| Frequency | Hz | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k |
| Insertion loss | dB | -9 | -17 | -30 | -38 | -45 | -41 | -32 | -24 |

Based on the breakout figures provided these should comfortably achieve the requirement.

Exhaust Attenuators

To achieve the required attenuator losses will mean replacing the existing selections with much higher performance units, resulting in an increase in cross section and length.

Due to the significant adverse effect of Melinex lining on the acoustic performance it would be preferable to omit this from the specification.

The attenuator performance figures shown below do not include Melinex.

Our proposed selections are as follows-

Servery Extract Exhaust – 3.55m³/s

1250mm wide x 1250mm high x 2400mm long

Exit airflow velocity – 12m/s

Resistance approximately 65Pa

| | | | | | | | | | |
|--------------------------|----|-----|-----|-----|-----|-----|-----|-----|-----|
| Frequency | Hz | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k |
| Open outlet Lw- 101dB(A) | dB | 99 | 98 | 103 | 99 | 95 | 91 | 86 | 83 |
| Attenuator loss | dB | -15 | -28 | -46 | -50 | -50 | -50 | -45 | -35 |

Overall loss – 41dB

Our Ref: 185366 Kitchen and Servery Extract technical

15th August 2018

Kitchen Extract Exhaust – 7.62m³/s

1750mm wide x 1750mm high x 2400mm long

Exit airflow velocity – 12m/s

Resistance approximately 65Pa

| | | | | | | | | | |
|--------------------------|----|-----|-----|-----|-----|-----|-----|-----|-----|
| Frequency | Hz | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k |
| Open outlet Lw- 102dB(A) | dB | 104 | 106 | 105 | 100 | 95 | 90 | 84 | 77 |
| Attenuator loss | dB | -15 | -28 | -46 | -50 | -50 | -50 | -45 | -35 |

Overall loss – 36dB

Overall performance is demonstrated against the Arup figures in their latest email.

It will be necessary to allow for suitable duct transformation pieces and adequate space either side of the attenuators to maintain appropriate airflow conditions.

I trust this is in line with your requirements.

Please let me know if you have any queries or require any more information.

Best regards,

Mark

Mark Stagg
ACOUSTIC ENGINEERING
SERVICES (UK) LIMITED
mark.stagg@aesuk.co.uk