

Takeaway Restaurant at 57 Basingstoke Road, Reading Kitchen Ventilation System

Noise and Odour Risk Assessment and Proposed Mitigation Measures

Note – Follows guidelines set out in Annex B of DEFRA “Guidance on the Control of Odour and Noise from Commercial Kitchen Exhaust Systems 2005”

(BWF ref: 18166)

1) Introduction

In support of a planning application for 57 Basingstoke Road, the following document assesses the potential for any noise or odour nuisance associated with operation of the kitchen ventilation system. It then describes the measures proposed to manage those risks identified to an acceptable level.

2) Information on Premises and Requirements for Kitchen Extraction

- Ref aerial photo below, the building is situated on Basingstoke Road which is a main route between the town centre and the M4. It is located in a short of run of mixed use shops and other takeaway restaurants. The kitchen area is located to the rear of the building.



- The kitchen will cook Indian type foods for takeaway
- Description of kitchen ventilation system proposed: (drawing 18166 refers, manufacturer specifications for equipment included in supporting information pack)
 - The extract air system will comprise of a 4600 x 1500 mm stainless steel extract canopy fitted with Longar Industries stainless steel baffle grease filters. It will be extracted from its rear to the outside via a Longar Industries high efficiency smoke and grease filter and Plasmaclean xtract 2100 ozone injection system. A Systemair MUB 042 450 E4 fan fitted with an acoustic jacket to reduce breakout noise is included. From there the duct will run up the side of the building via an attenuator to terminate at 1m above eaves height in a “rocket top” type cowl to generate an exhaust airspeed in excess of 10 m/sec.
 - The supply air system will compromise of an external birds-beak cowl to introduce air through a redundant window opening. From there it will run via an attenuator and fan to the kitchen area.
 - The system has been designed in accordance with the guidelines proposed by DW/172

3) Noise and Odour Risk Assessment

Noise

The attached Noise Impact Assessment Study and Report has been completed by Accon UK Environmental Consultants. The study recommends that in order to meet the requirement stipulated by Reading Borough Council that noise from the proposed plant should be 10dB(A) below the background level at the nearest sensitive receptor, noise from the proposed plant should be no more than 55dB(A).

See key extract from report below.

Table 5.1: BS 4142 Assessment - Daytime			
Results	Noise Level at the Nearest Noise Sensitive Receptor	Relevant Clauses of BS 4142:2014	Commentary
Typical Background Sound Level $L_{A90,T}$ (dB)	45	8.1, 8.2	A typical background sound level during the specific periods.
Maximum Specific Sound Level $L_{Aeq,1hr}$ (dB)	35	9.1	The specific sound level as identified in order to achieve RBC's requirement that the specific sound level should be at least 10 dB below the existing background sound level (L_{A90})
Maximum Sound Power Level (dB)	55	9.1, 9.2	The maximum possible sound power level in order to meet the requirements of RBC

The assessment of the existing noise levels at the proposed development in **Table 6.1**, identifies that in order for the assessment to give an indication of a low impact when assessed in line with the methodologies in BS 4142:2014, the proposed plant must have a maximum sound power level of 55 dBA.

In order to achieve the target noise levels, attenuation has been included to the atmosphere side of both fans as well as additional acoustic sleeving to the externally mounted extract fan. Noise estimates for the installation are included below. Manufacturer specifications for the fans proposed are also included in the supporting information pack included.

Noise Estimates - 57 Basingstoke Road, Reading

Extract System

Attenuator Type and size

2 D podded 500 diameter x 1000

Fan

Systemair MUB 042 450 E4

Length of duct

3 metres

Number of bends

0 bends

	Hz 63	Hz 125	Hz 250	Hz 500	Hz 1k	Hz 2k	Hz 4k	Hz 8k	dB(A) Av
Fan Lw at face of fan	64	66	70	72	71	68	63	56	75.1
Attenuation from 3m of duct	-2.1	-2.1	-0.9	-0.6	-0.6	-0.6	-0.6	-0.6	
Attenuation from 0 x square bends		0	0	0	0	0	0	0	
Insertion loss from attenuator	-4	-10	-15	-22	-29	-30	-29	-22	
Net	57.9	53.9	54.1	49.4	41.4	37.4	33.4	33.4	50.4

Supply System

Fan

Systemair AR Sileo 450

Attenuator Type and size

1 D podded 500 diameter x 500

Length of duct

3 metres

Number of bends

1 bends

	Hz 63	Hz 125	Hz 250	Hz 500	Hz 1k	Hz 2k	Hz 4k	Hz 8k	dB(A) Av
Fan Lw at face of fan	20	42	53	64	68	68	65	58	73.0
Attenuation from 3m of duct	-2.1	-2.1	-0.9	-0.6	-0.6	-0.6	-0.6	-0.6	
Attenuation from 1 x square bends	-3	-3	-3	-3	-3	-3	-3	-3	
Insertion loss from attenuator	-2	-7	-9	-17	-24	-24	-20	-16	
Net	12.9	29.9	40.1	43.4	40.4	40.4	41.4	38.4	47.8

Odour

Odour risk assessment and proposed mitigation are in line with, DEFRA Guidance on the Control of Odour and Noise from Commercial Kitchen Exhaust Systems - January 2005.

Applying the scoring matrix set out in annex C (copy attached), the odour risk has been assessed as;

High

In order to manage the risk, it is proposed to pass the extracted air through stainless steel baffles to remove grease, Longar Industries high efficiency filters to remove further grease/smoke particles as well as to treat the air with ozone before exhausting it at 1m above eaves level at in excess of 10 m/sec.

4) Ventilation System Component Specification

Extract Air

- **Extraction Canopy**
Dimensions: 4525 x 1500 x 500mm
Extract Airflow: 1.13 m³/sec (calculated according to HVCA DW172 method 1 for the proposed cookline)
- **Grease-filters**
 - 6 no. 500x400mm polished stainless steel baffle filters
 - Manufacturer: Longar Industries Type 2, Premium Baffle Filters
 - Dimensions (nominal): 500Wx400Hx45D
 - Maintenance instructions: See BWF Operations Manual and Cleaning Frequencies table attached.
- **Extract Fan**
 - Systemair MUB 042 450 E4
- **Pre-filters**
 - Longar Industries, Type 2 Medium and High Efficiency, F6 filters sized at 600 x 600
 - Supplier: Longar Industries
 - Dimensions: 595 x 595 x 100mm
 - Data sheet attached
 - Alternatives of equivalent specification may be used in final design

- **Ozone**
 - Plasmaclean Xtract 2100 system
 - Supplier: Plasmaclean
 - Designed for maximum airflow of 1.5 m3.
- **Attenuator**
 - 2D podded silencer sized at 1000 long x 500 diameter to generate the insertion losses as specified
- **Flue Design**
 - Ductwork constructed from galvanised steel at 600 x 300mm square initially then transforming to 400 diameter for riser. Fitted with regular access hatches to allow future maintenance to achieve a design speed of approx. 8 m/sec in duct.
 - Vertical discharge from a cowl
 - Outlet located above eaves
 - Efflux velocity at design airflow will be in excess of 10 m/sec.

Supply Air

- **Supply air fan**
 - Systemair AR 450 E4 sileo axial fan
- **Supply air filters** – to prevent duct particles entering the supply air system
 - Longar Industries, Type 2 Medium and High Efficiency, F6 filters sized at 600 x 500
 - Supplier: Longar Industries
 - Dimensions: 595 x 495 x 300mm
 - Data sheet attached
 - Alternatives of equivalent specification may be used in final design
- **Attenuator**
 - 2D un-podded silencer sized at 450 x 900 to generate the insertion losses as specified

5) Maintenance

- Cleaning and maintenance access panels will be provided throughout the extract system
- A recommended cleaning schedule produced by BWF (extraction system suppliers) and based upon HVCA TR/19 is attached in BWF's O&M Manual.

Attachments:

- Drawing ref: 18166
- Reading Borough Council – Pre app report
- A3433 – Noise Impact Assessment
- Systemair AR 450 E4 Sileo – supply fan specification
- Longar Industries Type 2, Premium Baffle Filters specification
- Longar Industries, Type 2 Medium and High Efficiency, F6 filters specification
- Systemair MUB-042-450E4- Sileo-Multibox fan specification
- Noise estimates for plant as proposed
- BWF O&M Manual with cleaning specification
- Odour Risk Assessment
- Plasmaclean Xtract 2100 specification