

Rowan Gate School Design Statement

Justification for the Scheme

By way of explanation, the Hot School Meal Plan is an NCC initiative to introduce into the Schools of Northamptonshire the opportunity to provide a hot school meal to all students/pupils in the county. There is an ambitious programme of works to target approx. 226 Schools over a 3 year programme that began in 2010. We are currently concentrating on Year 2 Schools in 2011, of which there are approx. 104 Schools being considered.

The internal kitchen refurbishment for this School consists of refurbishing the existing kitchen within the School. It is proposed to upgrade the current catering equipment and appliances, improve the overall working environment and ensure that the ventilation system for the Kitchen meets current legislation guidance.

Design

The proposed external AHU plant location will be positioned near the centre of the School complex directly above the Kitchen. It is unlikely that this AHU plant is to be seen by any residential property. The school's site boundary is shared with Highfield Nursery and Primary School.

The kitchen ventilation systems have been designed to comply with current Health and Safety legislation and Building Regulations Approved Document Part F requirements.

Current legislation requires the safe removal of fumes and other gases/vapours that may pose a health issue to the operatives or be harmful to the building and its contents with regards to moisture etc.

The size of the ventilation equipment is dependent on the equipment being used within the kitchen and is closely controlled.

Associated plant also has to comply with noise limitation for the operatives (Noise at Work Act) and the efficiencies of the plant have to comply with Approved Document Part L of the Building Regulations legislation to ensure that fan energy is optimised to reduce lifetime running costs.

The plant is weather proof where fitted externally and the normal finish is galvanised steel.

The units would sit on a Roof Pro support system. This support system allows the plant to sit above the roof and facilitates re-roofing without de-commissioning the air handling plant should it be required. The height required for this function is 450mm however;

If planning restrictions require a lower value, the Roof Pro can be fitted as low as 200mm above the roof. This would not allow work to be carried out on the roof and the air handling plant would need to be de-commissioned.

Relevant Planning Policies

The proposals for the external AHU plant feeding the new Kitchen ventilation comply with Local Planning Policy guidance and in particular with **Policy 13 of the Core Spatial Strategy Plan** for North Northamptonshire in the following ways:

- The AHU plant is situated at high level to deter vandalism and avoid noise and smells coming into contact with people.
- The units are specified as one of the most energy efficient and quieter models on the market. The data for the noise generation can be seen within section 10 of the Ventilation and Extract Statement document supplied. This is aimed to comply with **PPG24** to minimise the adverse impact of noise.
- Material finishes of the units are galvanised steel and powder coated grey to be sympathetic with the character of the building.
- The existing kitchen ventilation is non-compliant with current Regulations and the AHU plant has been designed and specified to meet these Regulations and improve the kitchen working environment for staff.

Smells

With regards to odours, we would assume that the catering loads in each instance have not altered and so odours leaving the kitchen should be no worse than previously experienced.

We would advise that the new plant will be more effective at removing the building up of fumes and odours and these will inevitably create a smell. The distance and prevailing wind will carry these to any adjacent location.

If necessary, we can fit raised exhaust ducts that will discharge the odours to a higher level. This obviously will have an impact on the aesthetics which is also a consideration.

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Building Services Design
Consulting Engineers

Ventilation & Extraction Statement

Refurbishment Kitchen

**Rowan Gate School, Finedon Road, Wellingborough
Northamptonshire, NN8 4NS**



Food for thought

A sustainable building starts with a healthy core

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Section 1 – Information on Premises

Number of meals per day: 50

Methods of preparation & cooking: The methods of cooking will be predominantly gas fired oven/hob and Steamer.

Types of meal served: The kitchen will be required to prepare fresh food for cooking or for cooking frozen pre-prepared meals

Proposed hours of operation: 1000 – 1400hrs

Section 2 – Plans & drawings

See attached for plans and elevations of proposed kitchen services.

Section 3 – Pre Filters

Not applicable to this site

Section 4 – Electrostatic Precipitators

Not applicable to this site

Section 5 – Carbon Filters

Not applicable to this site

Section 6 - Odour Counteractant or Neutralising System

Due to the nature of cooking, based on the equipment being installed, the occurrence of odours will be minimal. The velocity of the extracted air will be such that any odours that are produced will be dispersed and mixed into the surrounding air.

Section 7 – Cooker hood

A supply and extract cooker hood is proposed to extend over the full length of the equipment, overhanging by a minimum of 200mm. Dimensions of the hood are 3175x2900x490. The hood has the following:

Full length double sided triangulated grease filter housing to retain Superstream baffle type grease filter panels handling a total extract volume of $0.75\text{m}^3/\text{sec}$ against a resistance at the duct connection spigot of $110\text{N}/\text{m}^2$. The housing has integral grease collection system with removable drawers. The filter panels are suitable for cleaning within most commercial dishwashers.

Internal sloping skin on two sides forming insulated supply air plenum chambers with Britannia stainless steel diffuser panels to deliver $0.64\text{m}^3/\text{sec}$ externally at low velocity. The diffusers are fitted with synthetic dust filter media and the panels are easily removed for maintenance.

Section 8 – System Operation

Extract rate: $0.75\text{m}^3/\text{s}$

Supply: $0.64\text{m}^3/\text{s}$

The velocity of the extracted air leaving the system is $7.58\text{m}/\text{s}$.

Section 9 - Flue Design

The kitchen exhaust is located on the roof in a similar location to the existing extract fans. The final discharge is horizontal with a 45° louver.

Section 10 – Noise

Extract Fan

Sound Data

| Fan Power | Fan Speed RPM | Sound Spectrum dB re 10 ⁻¹² w PWL Centre Frequency Hz | | | | | | | | Sound Pressure Level dBA @ 3 metres from outlet |
|-----------|---------------|--|-----|-----|-----|----|----|----|----|---|
| | | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | |
| 230Vac | 1390 | 66 | 70 | 73 | 73 | 69 | 65 | 60 | 56 | 60 |
| 50Hz | 1430 | 66 | 70 | 73 | 73 | 69 | 65 | 60 | 56 | 60 |
| 45Hz | 1287 | 64 | 67 | 71 | 70 | 66 | 62 | 58 | 53 | 58 |
| 40Hz | 1144 | 61 | 65 | 68 | 68 | 63 | 59 | 55 | 50 | 55 |
| 35Hz | 1001 | 58 | 62 | 65 | 65 | 60 | 56 | 52 | 47 | 52 |
| 30Hz | 858 | 55 | 59 | 62 | 62 | 57 | 53 | 49 | 44 | 49 |

Insertion Loss Table

| | Sound Spectrum dB re 10 ⁻¹² w PWL Centre Frequency Hz | | | | | | | |
|---------------------|--|-----|-----|-----|----|----|----|----|
| | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k |
| Case Insertion Loss | 9 | 14 | 21 | 27 | 32 | 37 | 43 | 42 |

Supply fan

Sensaire Noise Data

| Sensaire Model | Sound Power Level Spectrum dB re 10 ⁻¹² w PWL | | | | | | | |
|----------------|--|-----|-----|-----|----|----|----|----|
| | Centre Frequency - Hz | | | | | | | |
| | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k |
| 1 | 67 | 66 | 76 | 75 | 71 | 64 | 58 | 53 |
| 2 | 59 | 69 | 64 | 59 | 54 | 49 | 45 | 39 |
| 3 | 64 | 74 | 69 | 64 | 59 | 54 | 50 | 44 |
| 4 | 75 | 78 | 77 | 71 | 65 | 62 | 60 | 59 |
| 5 | 69 | 79 | 80 | 69 | 67 | 62 | 59 | 57 |

Note: The above figures are for 1 phase units which are slightly noisier than 3 phase fans.

Noise Breakout

| Sensaire Model | Distance from unit - metres | Sound Pressure Level - dB | | | | | | | | | |
|----------------|-----------------------------|---------------------------|-----|-----------------------|-----|-----|-----|----|----|----|----|
| | | NR level | dBA | Centre Frequency - Hz | | | | | | | |
| | | | | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k |
| 1 | 1 | 45 | 47 | 34 | 41 | 46 | 44 | 43 | 39 | 31 | 21 |
| | 3 | 40 | 42 | 30 | 39 | 41 | 39 | 39 | 36 | 26 | 20 |
| 2 | 1 | 35 | 36 | 28 | 42 | 35 | 31 | 30 | 30 | 30 | 23 |
| | 3 | 30 | 32 | 24 | 39 | 31 | 26 | 24 | 24 | 24 | 20 |
| 3 | 1 | 40 | 41 | 33 | 47 | 40 | 36 | 35 | 35 | 35 | 28 |
| | 3 | 35 | 37 | 29 | 44 | 36 | 31 | 29 | 29 | 29 | 23 |
| 4 | 1 | 45 | 49 | 43 | 52 | 48 | 42 | 40 | 42 | 40 | 38 |
| | 3 | 40 | 43 | 39 | 48 | 44 | 37 | 34 | 36 | 34 | 34 |
| 5 | 1 | 45 | 48 | 37 | 53 | 51 | 40 | 42 | 42 | 39 | 37 |
| | 3 | 40 | 44 | 33 | 49 | 47 | 35 | 36 | 36 | 33 | 32 |

NB: Noise breakout can be further reduced if heavy weight infill is fitted within the double skinned case.

Section 11 – Maintenance

Filters for the AHU and kitchen canopy will be cleaned/replaced in accordance with the manufacturers' recommendations.

Section 12 – Additional Information

The make up air for the kitchen will be supplied via a roof mounted AHU. This will be directly supplied to the kitchen canopy.