



Dale Thomas
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Report on duties required for the Bakery concept at Whalley

Site Name	Bakery
Address	King Street, Whalley
Client	Northcote & GastroNorth
Required works	Investigate, Extract and supply flow rates, Discharge and Odor control
Canopy Type	2 x wall canopies open to one side
Slab height	TBC
Equipment list	Supplied by Gastronorth
Duct route	Through ground floor and to eaves level at the rear of the building

We have been asked by Northcote to look at the floor rates, Duct sizes and potential Odor control requirements for a proposed new concept on King Street in Whalley.

Our findings are based on information available and might be subject to change.

Equipment list and duties required on flow rates

Any calculation's carried out by BACSL are done so based on coefficients given in BESA DW172 2018 edition using the Thermal Convection method.

This is the only method that should be used as stated in **section 3, fig 3.2 on page 11.**

[**3.2 The 'Thermal Convection Method' of calculation should be the only method used.**](#)

The equipment from both Canopies C1 and C2 have been grouped together to allow for one main duct on both Extraction and Supply. This would mean that the Odor control would have less on-going maintenance costs and take up less space within the demise.



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Based on the equipment list supplied from Gastronorth we carried the below calculation to ascertain what duties would be required.

DW172 COMPLIANCE CALCULATIONS

Job No.
Site Name. Bakery Whalley - C1 + C2
Site Address.
Rev. A

HVCA	DW/172	SPECIFICATIONS FOR EXTRACTION CANOPY UNIT						
DWG REF	ITEM	SOURCE	PLAN SIZE		AREA M ²	COEFFICIENT	FLOW RATE M ³ /S	SURFACE TEMP °C
			Length (mm)	Width (mm)				
1	6 Grid /10 Grid (Stacked)	Electric	850	800	0.680	0.6	0.408	
2	Benches, Spreaders, Worktops	N/A	200	800	0.160	0.03	0.005	0.03
3	Hob (Induction)	Electric	800	800	0.640	0.2	0.128	
4	Plancha	Electric	400	800	0.320	0.4	0.128	
5	Convection Oven - Fan Assisted	Electric	800	800	0.640	0.3	0.192	
6	Benches, Spreaders, Worktops	N/A	400	800	0.320	0.03	0.010	0.03
7	6 / 7 / 8 / 9 Grid (Stacked Combinations of)	Electric	850	800	0.680	0.6	0.408	#N/A
8	Grill - Salamander	Electric	600	400	0.240	0.55	0.132	
9	Benches, Spreaders, Worktops	N/A	200	800	0.160	0.03	0.005	#N/A
10	Benches, Spreaders, Worktops	N/A	400	800	0.320	0.03	0.010	#N/A
11	Range/Oven (Solid Top)	Electric	800	800	0.640	0.51	0.326	
12	Griddle - Induction	Electric	400	800	0.320	0.27	0.086	
13	Deep Fat Fryer	Electric	400	800	0.320	0.45	0.144	
14	Benches, Spreaders, Worktops	N/A	200	800	0.160	0.03	0.005	#N/A
Theoretical Extract volume required							2.22	m ³ /s
Canopy Type							Island Single Open End	1.250
							SPECIFIC EXTRACT FLOW RATE REQUIRED	2.775 m ³ /s
							SPECIFIC SUPPLY FLOW RATE REQUIRED	2.359 m ³ /s

As you can see on the Calculations above the extraction flow rate required for both Canopy's C1 & C2 is **2.775M³/s**

We have based the Supply flow rate on reintroducing 80% (of the extract flow rate) fresh air back into the space.

As you can see on the Calculations above the Supply flow rate required for both Canopy's C1 & C2 is **2.359M³/s**

Even though the equipment is all electric and there is no danger from Co₂ or Co Gases the system still has to Balance. This is done by replacing the dirty air that is being extracted above the cooking equipment with filtered fresh air maintaining a negative pressure.

BESA DW172 2018 edition states that any duties above 0.9M³/s requires mechanical fresh air at between 75-95%



On Extract we have to make sure that the Velocity(speed)of the air through each spigot is between **5-7 M/s**

Canopy C1 would have 2 Extraction spigots@ 300 x 300mm giving a velocity through each spigot of **6.5M/s**

On Supply we have to make sure that the Velocity(speed)of the air through each spigot is between **3-5M/s**

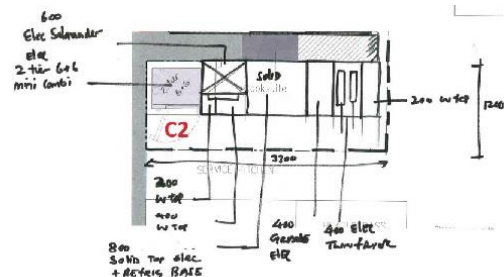
Canopy C1 would have 2 supply spigots@ 350 x 350mm giving a velocity through each spigot of **4.1M/s**

Canopy C2

DW172 COMPLIANCE CALCULATIONS

Job No. _____
Site Name. Bakery Whalley - C2
Site Address. _____
Rev. A

DWG REF	ITEM	SOURCE	PLAN SIZE		AREA	COEFFICIENT	FLOW RATE	
			Length (mm)	Width (mm)			M ³ /S	TEMP °C
7	6/7/8/9 Grid (Stacked Combinations)	Electric	650	800	0.680	0.8	0.408	
8	Grill - Salamander	Electric	600	400	0.240	0.55	0.132	
9	Benches, Spreaders, Worktops	N/A	200	800	0.160	0.03	0.005	0.03
10	Benches, Spreaders, Worktops	N/A	400	800	0.320	0.03	0.010	0.03
11	Range/Oven (Solid Top)	Electric	800	800	0.640	0.51	0.326	
12	Griddle - Induction	Electric	400	800	0.320	0.27	0.086	
13	Deep Fat Fryer	Electric	400	800	0.320	0.45	0.144	
14	Benches, Spreaders, Worktops	N/A	200	800	0.160	0.03	0.005	0.03
Theoretical Extract volume required							1.25	m ³ /s
Overhead Wall Single Open End							1.200	m ³ /s
SPECIFIC EXTRACT FLOW RATE REQUIRED							1.497	m ³ /s
SPECIFIC SUPPLY FLOW RATE REQUIRED							1.272	m ³ /s



As you can see above Canopy C2 has an extract flow rated of **1.497M³/s**
And a supply flow rate of **1.272M³/s**

On Extract we have to make sure that the Velocity(speed)of the air through each spigot is between **5-7 M/s**

Canopy C2 would have 2 Extraction spigots@ 350 x 350mm giving a velocity through each spigot of **6.1M/s**

On Supply we have to make sure that the Velocity(speed)of the air through each spigot is between **3-5M/s**

Canopy C2 would have 2 supply spigots@ 400 x 400mm giving a velocity through each spigot of **3.7M/s**



Odour and Grease Management

*It is presumed that Ribble Valley Borough Council will ask for Odour control on the system.
With this in mind and to pre-empt this I would recommend the following.*

*For Canopy C1 with an Extract Duty of **1.167M³/s** I would recommend an out of air
Stream UVO-500 to negate 99% of Odours*

The UVO-500 can deal with up to between 1.0M³/s - 1.5M³/s depending on the style of cooking



UV-O 500
220-240 _V 50HZ
120 _W
1.5 _{M³/SEC (UP TO)}
W 605 H 630 D 200
10.5 _{KG (APPROX)}

*For Canopy C2 with an Extract Duty of **1.497M³/s** I would recommend an out of air
Stream UVO-1000 to negate 99% of Odours due to the style of cooking and it being so close to
the limitations of the UVO-500*



UV-O 1000
220-240 _V 50HZ
700 _W
2.5 _{M³/SEC (UP TO)}
W 1568 H 350 D 363
50 _{KG (APPROX)}



*For Grease Management I would recommend using the ESP6000E on the main duct run
This could be subject to change depending on available space taking in to account the space required for maintaining the ESP units*



ESP 6000

220-240 V 50HZ

50 W

2.8 M³/SEC (UP TO)

W 1800

H 630

D 640

153 KG

Fans and silencers

It is difficult to give accurate details on a fan spec with a confirmed Duct route, Design and pressure loss but I would recommend the MUB630-EC for both Extract and supply.

This Fan is insulated, Quiet and can handle good pressure, It is also easy to clean without removing fan from its location

Spec

Hydraulic data

Required air flow 4.70 m³/s

Required static pressure 500 Pa

Working air flow 4.70 m³/s

Working static pressure 500 Pa

Air density 1.204 kg/m³

Power 4,341.1 W

Fan control - RPM 1,642 rpm

Current 6.47 A

SFP 0.924 kW/m³/s

Control voltage 9.8 V

Supply voltage 400 V





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Silencers should be used in conjunction with the MUB fan but can only be selected once any DB figures are given by the local authority that need to be achieved

Should you require any further information please don't hesitate in contacting me

Kind Regards

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