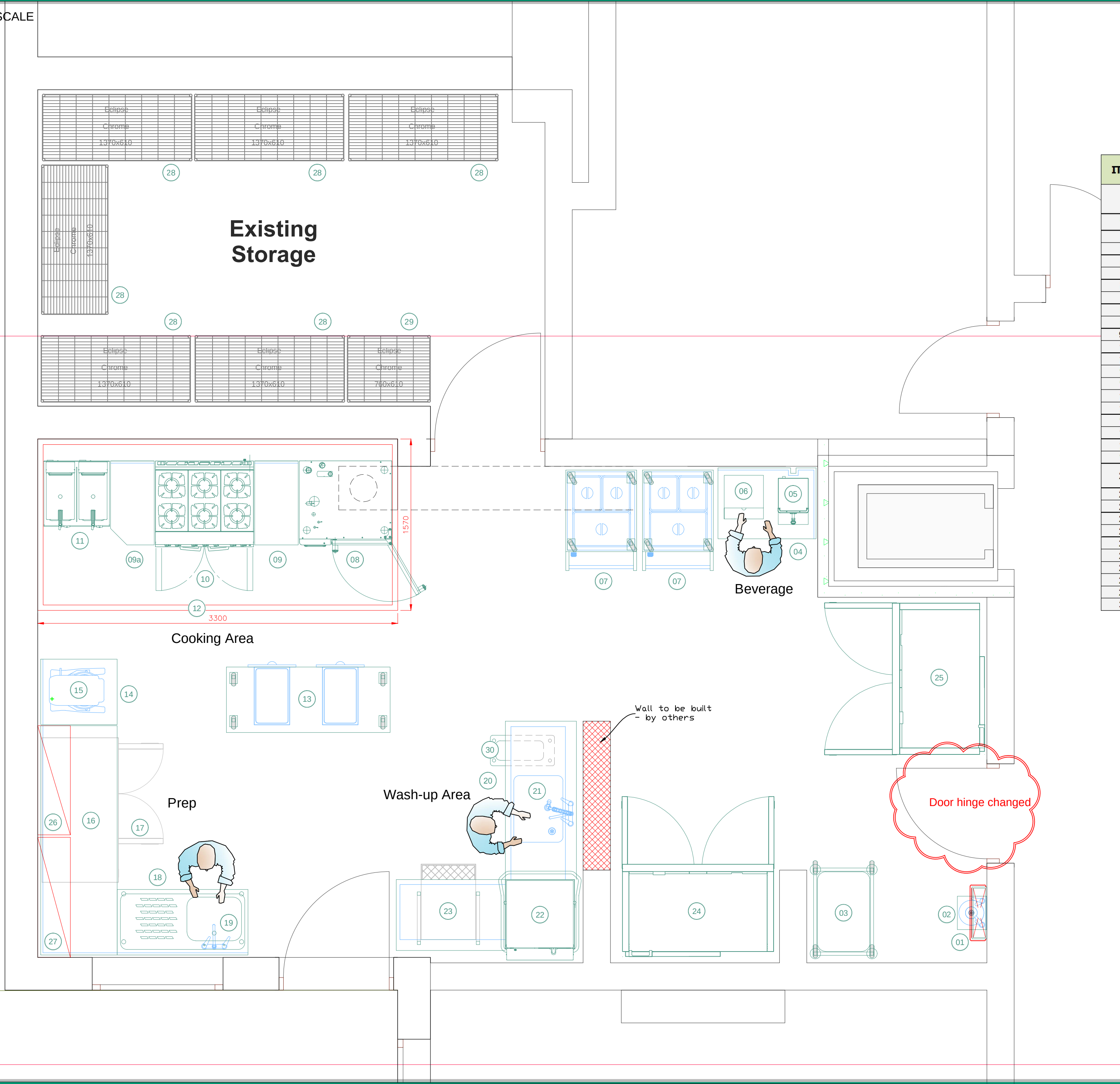


DO NOT SCALE



ITEM	DESCRIPTION	QTY
1	Fly killer	1
2	Wash hand basin	1
3	GP trolley	1
4	S/s corner bench c/w notch for services 900x650mm	1
5	Water boiler	1
6	Milk dispenser	1
7	Mobile dry well bain marie unit	2
8	10 grid combi set	1
9	S/s infill table 400x770mm	1
9a	S/s infill table c/w chamfer LHS 400x770mm	1
10	6 burner range oven	1
11	Double fry single tank twin basket	1
12	Ventilation canopy 3300x1570mm	1
13	S/s mobile centre bench c/w 2no. drawers 1500x600mm	1
14	S/s wall low level bench for mixer c/w reinforced top 600x700mm	1
15	Planetary mixer	1
16	S/s corner bench c/w part void under to suit item 17 2100x700mm	1
17	2 door counter refrigerator	1
18	S/s sink unit 1200x600mm	1
19	Mixer tap set	1
20	S/s dishwasher inlet table c/w inset sink bowl & part void under for bin 1450x650mm	1
21	Pre-rinse spray assembly	1
22	Pass-through dishwasher c/w integral softener	1
23	S/s dishwasher outlet table c/w basket runner under 1000x650mm	1
24	Double upright refrigerator	1
25	Double upright freezer	1
26	S/s wall shelf 1000x300mm	1
27	S/s wall shelf 1100x300mm	1
28	4 tier chrome wire rack 1370x610mm	6
29	4 tier chrome wire rack 760x610mm	1
30	Slim jim bin	1

DESIGN • INSTALLATION • SALES • SERVICE

Revision	Description	Date	Revised by

CLIENT: OAKLANDS CARE HOME

DRAWING TITLE: PROPOSED KITCHEN LAYOUT

DRAWING NO: J1393-01 REV: - SCALE: 1:25@A2 DATE: 17.11.14 DRAWN BY: MGM

DRAWING STATUS: ☒ PRELIMINARY ☐ INFORMATION ☐ FOR APPROVAL ☐ CONSTRUCTION

DRAWING APPROVAL:

Accepting Signature: _____ Date: _____

Print Name: _____

Company: _____

HCE
Foodservice Equipment

Integral Services Ltd t/a HCE
School Lane, Chandlers Ford Industrial Est
Eastleigh, Hampshire, SO53 4DG
Tel: +44 (0) 23 8027 1010
Fax: +44 (0) 23 8027 1818
Email: sales@hce-catering.co.uk
Web: www.hce-catering.co.uk

© Integral Services Ltd t/a HCE 2014.
Do not copy without written permission
from Integral Services Ltd t/a HCE.

This drawing must be read in conjunction with **HCE Terms of Installation**

To:
PWP Architects
Konstantinos Droutsas
61 South Street
Havant, Hampshire PO9 1BZ
02392482494 (Contact)

Project:
Oaklands Care Home

From:
HCE
Martin Pucci
School Lane
Chandlers Ford Industrial Estate,
Chandlers Ford
Eastleigh, Hampshire SO53 4DG
02380 271010
02380 258557 (Contact)

Job Reference Number: J1393

Item	Qty	Description	Sell	Sell Total
1	2 ea	FLY TRAP Pelsis Limited Model No. PZ30W Packed: ea PlusZap, ZE124, Commercial zapper flykiller. Dimensions 525x145x240. Coverage 80 Sq/M. White plastic finish.	£58.00	£116.00
2	2 ea	WASH HAND BASIN Mechline Developments Ltd Model No. WR-WS2-L Packed: ea BaSiX Hand Wash Station, WRAS 3" lever head tap, 305mm x 270mm x 140mm H; bowl 240x 110 x 135mm deep, basin, drain boss, 304 stainless steel	£68.00	£136.00
3	1 ea	GENERAL PURPOSE TROLLEY  TrakHupfer UK Model No. P087 Packed: ea General Purpose Trolley, 3-tier, removable aluminium shelves, grey powder coated finish framework, (4) 125mm castors (2 locking; 2 free), bumpers & positive fixing	£122.00	£122.00
4	1 ea	CORNER BENCH  Specialist Fabricator's Model No. BESPOKE Packed: ea Corner Bench, 1100mm x 650mm x 900mm, 1.5mm 304 stainless steel top with 430 stainless steel frame & under shelf, 50mm upstand, adjustable feet 1 ea Upstand on right end 1 ea Notched cutout around pipes or column	£208.00	£208.00
5	1 ea	WATER DISPENSER, HOT WATER BOILER  Lincat Ltd Model No. EB3F Packed: ea FilterFlow Water Boiler, electric, automatic fill, 9 litre capacity, 31 litre output per hour, built-in filtration, LCD display panel, tap dispense, drip tray, stainless steel construction	£353.00	£353.00
6	1 ea	DISPENSER, MILK, BAG OR BOX	£562.00	£562.00

Item	Qty	Description	Sell	Sell Total
		Valera Model No. A10207 Packed: ea Autonumis Bag-In-Box Milk Dispenser, Countertop, chilled, 3 gallon (13.6 litres) box, dispense tap, removable drip tray, stainless steel finish, 13amp plug		
7	2 ea	SERVING COUNTER, HOT FOOD, ELECTRIC E & R Moffat Model No. 2FBM Packed: ea Medium Duty Hot Cupboard, mobile, 757 mm, dry bain marie well, base and centre rodded shelves, lift off sliding solid doors, handles, bright polished stainless steel interior, Merlin grey exterior finish, (4) swivel castors (2 with brakes), 2.0 kW	£579.00	£1,158.00
	2 ea	FTH1 Handles, at one end	£25.00	£50.00
	1 ea	RBD K923 St/Steel 1/1 Gastronorm Pan 100mm deep	£10.00	£10.00
	1 ea	RBD K926 St/Steel 1/1 Gastronorm Lid	£7.00	£7.00
	2 ea	RBD K928 St/Steel 1/2 Gastronorm Pan 100mm deep	£10.00	£20.00
	2 ea	RBD K931 St/Steel 1/2 Gastronorm Lid	£7.00	£14.00
ITEM TOTAL:				£1,259.00
8	1 ea	COMBI OVEN, ELECTRIC, 1/1 GN Rational Model No. SCC-WE 101 Packed: ea 5 Senses SelfCooking Centre, Electric, half-size, (10) 1/1 GN or (20) 1/2 GN capacity, (9) selfcooking controls, (3) combi-steamer modes, CareControl clean and care system, core temperature probe with 6-point measurement, retractable hand shower, USB interface, 18.6 kW	£7,417.00	£7,417.00
	1 ea	400V 3 NAC standard		
	1 ea	Door hinged on right std.		
	1 ea	60.30.328 UG II Stand, standard, (14) pairs support rails, side panels and top closed, rear panel open	£564.00	£564.00
	5 ea	Mechline BSX-GN1/1-2 BaSiX Gastronorm/Oven Grid, GN 1/1-2D5 20D2, durable, 304 stainless steel	£9.00	£45.00
ITEM TOTAL:				£8,026.00
9	1 ea	INFILL TABLE Specialist Fabricator's Model No. BESPOKE Packed: ea Infill Table, 400mm x 770mm x 900mm, 1.5mm 304 stainless steel top with 430 stainless steel frame & under shelf, 50mm upstand, adjustable feet	£144.00	£144.00
9a	1 ea	INFILL TABLE Specialist Fabricator's Model No. BESPOKE Packed: ea Infill Table, 400mm x 770mm x 900mm, 1.5mm 304 stainless steel top with 430 stainless steel frame & under shelf, 50mm upstand, adjustable feet	£161.00	£161.00
	1 ea	Corner chamfer (LHS) 100x100mm		
10	1 ea	RANGE, MEDIUM DUTY, GAS, 850-950MM Falcon Foodservice Model No. G3101 Packed: ea Dominator Medium Duty Range, gas, 900mm wide, 6 x hob burners, semi-sealed hob, flame failure device, standard oven, thermostatic control, 2 x shelves with 5 positions, 42.8 kW (146,000 btu/hr)	£1,281.00	£1,281.00

Item	Qty	Description	Sell	Sell Total
	1 ea	Gas type to be specified		
	1 ea	Twin Oven Doors, side hinged, standard		
	1 ea	CASTORS1 Castors, factory fitted, Dominator Series	£78.00	£78.00
ITEM TOTAL:				£1,359.00
11	1 ea	FRYER, FLOOR MODEL, GAS, DOUBLE WELL	£1,543.00	£1,543.00
		Lincat Ltd Model No. J10/N Packed: ea Silverlink 600 Fryer, natural gas, freestanding, 600 mm, (2) 12 litre capacity tanks, thermostatic control, (2) nickel plated wire basket, batter plate, stainless steel lid & construction, 74,000 BTU/hr, 21.7 kW		
12	1 ea	EXTRACTION CANOPY	£8,918.00	£8,918.00
		Specialist Ventilation Model No. BESPOKE Packed: ea St/Steel Wall Style Extract & Replacement Air Canopy, approx 3600 x 1570mm. Approx 5m extract ductwork, fan & controller. Approx 5m replacement air ductwork, fan & controller. Lighting pre-wired for connection to mains circuit by others. C/w cut out to rear R/H corner.		
	1 ea	Gas Interlock Control Panel and 2no air pressure switches. Connection to 2no fans, 2no speed controllers, field wiring (by others) and gas solenoid valve (by others)	£1,283.00	£1,283.00
	1 ea	15Kw 3ph thyristor-controlled electric heater battery to maintain temperature of incoming air above 10°C (Recommended)	£1,872.00	<Optional>
	1 ea	St/s Wall Cladding, approx 4870 x 2000mm (Recommended)	£949.00	<Optional>
	1 ea	St/Steel Infill Panels (to max 500mm)	£251.00	<Optional>
ITEM TOTAL:				£10,201.00
13	1 ea	CENTRE BENCH	£392.00	£392.00
		Specialist Fabricator's Model No. BESPOKE Packed: ea Mobile Centre Bench, 1500mm x 650mm x 900mm, 1.5mm 304 stainless steel top with 430 stainless steel frame & under shelf, adjustable feet		
	2 ea	Drawer, Gastronorm (includes container)		
	1 ea	Castors x 4 (2 braked)		
14	1 ea	WALL BENCH	£162.00	£162.00
		Specialist Fabricator's Model No. BESPOKE Packed: ea Low Level Wall Bench, 600mm x 700mm x 600mm, 1.5mm 304 stainless steel top with 430 stainless steel frame & under shelf, 50mm upstand, adjustable feet		
	2 ea	Reinforced top, per 300mm		
15	1 ea	FOOD MIXER	£1,783.00	£1,783.00
		Metcalfe Catering Equipment Ltd Model No. SP-200 Packed: ea Mixer, planetary, 20 litre (21 quart), bench mounted, heavy duty, 3 speed gear box, no-volt release, emergency stop button, overload and fully interlocked bowl guard and bowl lift, includes stainless steel bowl, whisk, dough hook, beater, and attachment hub, 13 amp plug, 1/2 hp, 220/240v/50/60/1-ph, CE Approved		
16	1 ea	CORNER BENCH	£292.00	£292.00

Item	Qty	Description	Sell	Sell Total
		Specialist Fabricator's Model No. BESPOKE Packed: ea Corner Bench, 2100mm x 700mm x 900mm, 1.5mm 304 stainless steel top with 430 stainless steel frame & under shelf, 50mm upstand, adjustable feet		
	1 ea	Upstand on left end		
	1 ea	Part void to underframe, u-shaped tie-bar		
17	1 ea	REFRIGERATED COUNTER, WORK TOP Foster Refrigerator Model No. 33/105-XR2H Packed: ea XR2H XTRA by Foster Refrigerated Counter, two-section, 1330 mm wide, stainless steel work top, solid hinged doors, (2) 1/1 GN shelves, microprocessor controls, +2° to +8°C temperature range, fan assisted, stainless steel exterior, aluminium interior, castors, side mount self-contained refrigeration, 230v/50/1-ph, 10.0 amps	£1,191.00	£1,191.00
18	1 ea	SINK, SINGLE BOWL Specialist Fabricator's Model No. BESPOKE Packed: ea Single Bowl Sink Unit, 1150mm x 600mm x 900mm, 304 stainless steel with 1.5mm top, 430 stainless steel underframe with undershelf, 50mm upstand, adjustable feet	£363.00	£363.00
	1 ea	Bowl size: 500x400x300mm deep		
	1 ea	Wipe down - Right Hand drainer		
19	1 ea	TAP, DOUBLE PEDESTAL First Choice Catering Spares Ltd Model No. 403115 Packed: ea Lever Action 1/2" Mixer Tap, chrome plated brass with 1/2" BSP inlets, WRAS approval no: 0902012	£39.00	£39.00
20	1 ea	DISHWASHING TABLE, PREWASH, SPECIFY Specialist Fabricator's Model No. BESPOKE Packed: ea Dishwash Inlet Table, 1450mm x 650mm, 304 stainless steel with 1.5mm top	£467.00	£467.00
	1 ea	Sink 610x450x300mm deep weld in bowl		
	2 ea	Leg set		
	1 ea	1450mm Valance		
	1 ea	Part void to underframe U-shaped tie-bar		
	1 ea	Splashback (bolt on) 1500mm		
21	1 ea	PRE-RINSE UNIT Mechline Developments Ltd Model No. AJ-PR-30-BF2 Packed: ea AquaJet Pre-Rinse Spray, 1200mm H, 300mm L wall brace, tap hole 2x25mm, (2) pedestal, (2) water feed, standard lever controls, standard rose head gun, deck mounted + plus 12-in bowl-filling faucet, WRAS	£202.00	£202.00
	1 ea	Lever handle control, standard		
	1 ea	AJ-PR-RS AquaJet Restraining Device to prevent the spray arm from being overstretched	£5.00	£5.00

ITEM TOTAL: £207.00

Item	Qty	Description	Sell	Sell Total
22	1 ea	DISHWASHER, HOOD TYPE, PASS-THRU Hobart Model No. BAR AID 900S-10N Packed: ea Bar Aid Dishwasher, hood type, single button electronic controls, automatic draindown & self flushing cycle, 440mm hood opening height allows double racking of crockery, 0.73Kw pump with separate upper & lower wash & rinse arms, built in softener, integral detergent & rinse aid pumps, class 'AA' air gap, choice of (3) cycles, 60, 90 or 120 seconds, (2) stage strainer with interlock for correct operation, up to 60 racks per hour (240 covers)	£3,952.00	£3,952.00
23	1 ea	OUTLET TABLE Specialist Fabricator's Model No. BESPOKE Packed: ea Dishwasher Outlet Table, 1000mm x 650mm, 304 stainless steel with 1.5mm top (leg sets not included)	£277.00	£277.00
	1 ea	Leg set		
	1 ea	Basket runners, bank of three		
24	1 ea	REFRIGERATOR, UPRIGHT (REACH-IN) Foster Refrigerator Model No. 33/103-XR1300H Packed: ea XR1300H XTRA by Foster Upright Refrigerator, reach-in, two-section, 1300 litre capacity, solid hinged doors with lock(s), (6) adjustable 2/1 GN shelves, fully-automatic, +2° to +8°C temperature range, fan assisted, stainless steel exterior, aluminium interior, castors, top mount self-contained refrigeration, 230v/50/1-ph, 10.0 amps	£1,494.00	£1,494.00
25	1 ea	FREEZER, UPRIGHT Foster Refrigerator Model No. 33/104-XR1300L Packed: ea XR1300L XTRA by Foster Upright Freezer, reach-in, two-section, 1300 litre capacity, solid hinged doors with lock(s), (6) adjustable 2/1 GN shelves, fully-automatic, -18° to -21°C temperature range, fan assisted, stainless steel exterior, aluminium interior, castors, top mount self-contained refrigeration, 230v/50/1-ph, 10.0 amps	£1,665.00	£1,665.00
26	1 ea	WALL SHELF Specialist Fabricator's Model No. BESPOKE Packed: ea Wall Shelf, 1000mm x 300mm, solid, 430 stainless steel 1.2mm top, box section brackets	£62.00	£62.00
27	1 ea	WALL SHELF Specialist Fabricator's Model No. BESPOKE Packed: ea Wall Shelf, 1100mm x 300mm, solid, 430 stainless steel 1.2mm top, box section brackets	£62.00	£62.00
28	6 ea	SHELVING UNIT, WIRE Shelfspan Ltd Model No. EC56 Packed: ea Eclipse Wire Shelving Unit, 610mmD x 1370mmW x 1625mmH, 4-tier, 4-post, chrome finish	£108.00	£648.00
29	1 ea	SHELVING UNIT, WIRE	£73.00	£73.00

Item	Qty	Description	Sell	Sell Total
				
		Shelfspan Ltd Model No. EC47 Packed: ea Eclipse Wire Shelving Unit, 610mmD x 760mmW x 1625mmH, 4-tier, 4-post, chrome finish		
30	1 ea	SLIM JIM BIN RB Distributors Model No. F603 Packed: ea Slim Jim Bin, 279 x 587 x 630mm high, 60 ltr capacity, grey	£33.00	£33.00
	1 ea	F634 Rubbermaid Slim Jim Container Interlocking Dolly. Reduces carrying and return trips. Temp range -34 C to 110 C (-20 F to 212 F).	£60.00	£60.00
ITEM TOTAL:				£93.00
INSTALLATION & PRELIMINARIES				
	1 ea	INSTALLATION & PRELIMINARIES HCE Model No. INSTALL & PRELIM Packed: ea Includes delivery, unwrapping, assembly, positioning and final connections to suitably terminated live and commissioned services in accordance with the positions shown on our services drawing. Please note we have allowed for installation and commissioning in one continuous visit. Return visits outside of HCE's control may incur an additional charge. Preparation of scaled services installation drawing based upon the agreed and signed off drawing at order stage issued in hard copy or electronic format. Coordinate and finalise delivery and install programme, H&S requirements including method statements and risk assessments, site safety. Upon completion, HCE will provide technical support information comprising O&M manuals and 'as installed' drawings.	£4,321.00	£4,321.00
Total				£41,733.00

Clarifications

Commercial

Prices quoted are strictly net of MCD, Retention, Liquidated Damages and VAT.

Our tender has been produced generally in accordance with the following documentation: Drawing J1393-01 Revision A E&OE

Local Democracy, Economic Development & Construction Act 2009 (New Act) and Scheme for Construction Contracts (England & Wales) Regulations (as amended) Revised Scheme

In accordance with the above Act and Regulations this quotation and all meetings, discussions and additional documentation relating to it, and that may arise from it, are deemed 'subject to contract' and will remain so until such time as a mutually agreed contract is signed by both parties.

Contract terms will be subject to our agreement at Tender Award stage and will be used in any Subcontract agreement.

Our quotation shall remain open for acceptance within 30 days and our price will remain fixed until 15th December 2014

Lead time will be 6-8 weeks from approval of drawings.

Prices are based on work being carried out during normal working hours (8am - 5pm Mon - Fri) and in one continuous visit unless specifically stated on our quotation. Unscheduled additional and or out of hours work incurred will be charged at the applicable hourly rate plus a 30% premium.

Payment Terms

Either approved net monthly credit account or cleared funds with your order.

Insurances

Employers Liability: £10,000,000.00

Public & Products Liability: £20,000,000.00

Professional Indemnity Insurance: £20,000,000.00

Contractors All Risks: £12,500,000.00

We are unable to reimburse for stock losses due to the failure of any Items of Refrigerated equipment included within our quotation. We strongly recommend that suitable insurance is considered for such circumstances.

Water Pipework

We have allowed for copper inlet pipework and plastic waste/drainage pipework (unless otherwise stated).

General Clarifications**Variations**

No alternative, variation, extra or omission from the quotation will be carried out unless confirmed in writing between our two companies and agreed by HCE as regards content and cost. Where site conditions or dimensions vary to those issued at tender stage any modification to the equipment that may be necessary will carry additional charges.

Warranty

Will be in line with the manufacturers' warranty conditions and shall commence from the date of installation (unless stated otherwise).

Abortive Installations and/or Deliveries

Charges will be incurred at the following rates for abortive installations and/or deliveries: Notification 10 working days or more prior to the agreed installation date - no penalty; 9 to 5 working days - 50% of our installation and/or delivery charge; 4 to 2 days before - 75% of our installation and/or delivery charge; less than 48 hours - 100% of our installation and/or delivery charge. These charges are not open to negotiation. If storage is required HCE storage costs are £15 ex VAT per day per storage bay required.

Delivery

We have allowed for delivery of the equipment to ground floor only. If following our initial site survey it is found that specialist lifting equipment or extra staff are necessary HCE will forward a separate quote. We have assumed a clear and uninhibited access route will be provided for the offloading and distribution of equipment to the required installation area. Please note that door widths up to approx 1200mm may be required for access. If for any reason the agreed delivery and/or installation date cannot be met then HCE reserve the right to apply for an off site valuation or to invoice in full for the goods delayed, in addition to applying the charges stated at **Abortive Installations and/or Deliveries** above.

Installation

In order to commence installation the following conditions are required:

- Rooms that require installation must be in a clean, prepared and finished state.
- Suitably terminated, isolated live and commissioned services installed in accordance with the HCE Services drawing.

Existing Equipment

We have assumed that any equipment included in our quotation for re-installation and/or commissioning is fit for purpose. No allowance has been made for cleaning or servicing this equipment unless stated otherwise. During these works if it is found that any additional labour or parts are required a separate quotation will be raised and an additional order will be required. HCE will not re-install and/or commission any existing equipment that is found to be not fit for purpose, or where the location and/or services for the equipment are not fit for purpose, and will issue a Warning Notice or condemn where necessary.

Disposal of Waste Electrical and Electronic Equipment (WEEE)

HCE do not manufacture any goods and thus far do not hold the necessary licenses to dispose of goods under the Waste Electrical and Electronic Equipment Regulations 2006 Act. We are therefore unable to accept, remove or dispose of any goods under WEEE

as a result of the acceptance of this quotation.

Chlorination

During testing chlorinated water must be not allowed to enter water connected catering equipment including combination ovens, dishwashers, ice makers and water boilers. These appliances should be disconnected from their water supply. In addition chlorinated water should be rinsed out and not be left laying in stainless steel sink bowls as corrosion may occur.

Should any damage occur to the equipment due to the above details being carried out incorrectly HCE will not take responsibility for any costs or damage caused. To aid in the chlorination process HCE will leave combinations ovens, dishwashers, ice makers and water boilers disconnected from the water supply until chlorination has been completed and the pipework flushed with clean water (by others).

Fabrication

Unless otherwise stated all fabrications are to our standard specification. All sink units are supplied complete with standpipes and waste kits. All fabricated drainers are wipe clean design and not self draining.

All equipment dimensions quoted are approximate and costs are subject to final site survey.

WRAS

Unless specified the quoted equipment may not have WRAS approval.

DTLR Building Regulations 2000

Drainage and waste disposal approved document 'H' states that all commercial establishments supplying 'Hot Food' are required to install a commercial grease separator complying with PREN1825-1 and PREN1825-2 (or other effective means of grease removal) to prevent the discharge of fats, oils and grease into the municipal sewerage systems. We have assumed these units are to be supplied by others unless stated otherwise.

Coldrooms/Walk In Freezers

Where coldrooms and/or walk in freezers are quoted we exclude in-fills and containment and/or cable trays unless otherwise stated. Where infills have been quoted they are to a 500mm maximum.

Heater Mats

Where quoted, heater mats are standard 25mm thickness

Ventilation Canopies

Our price is subject to a full site survey and specifically excludes, and is not limited to, all building works, electrical field wiring, odour control, noise attenuation, return air facility within canopy, in-fills, gas interlock, any building or planning permissions and local authority approval, unless stated otherwise. Where infills have been quoted these are to a maximum of 500mm.

Service Spines

Where service spines are quoted, they are priced to be installed in one continuous visit with the ventilation (unless stated otherwise)

Should any existing equipment which does not have a flame failure be installed, the gas supply must include a suitable gas pressure proving system provided by others.

Exclusions

Main contractors discount
Any retention whatsoever
Liquidated Damages
VAT
Design responsibility
Suitable isolated live commissioned services
Earth Bonding
Testing of M&E Services
Kitchen Ventilation Interlock System
Floor gulleys
Sealants
Pipe lagging
Ductwork lagging

Cable Trays or containment
In-fill panels (If infill panels have been quoted they are to a maximum of 500mm)
Specialist lifting equipment
Protection of equipment
Any damage to goods following delivery to site
Builders work (such as but not limited to):-

Holes, chases, ducts, diamond drilling, craneage, trenches, fire cladding/stopping, making good, up stands, bases, support steelwork, painting, plastering, shopfitting or support for wall fixed equipment.

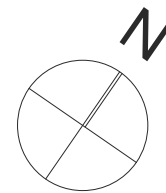
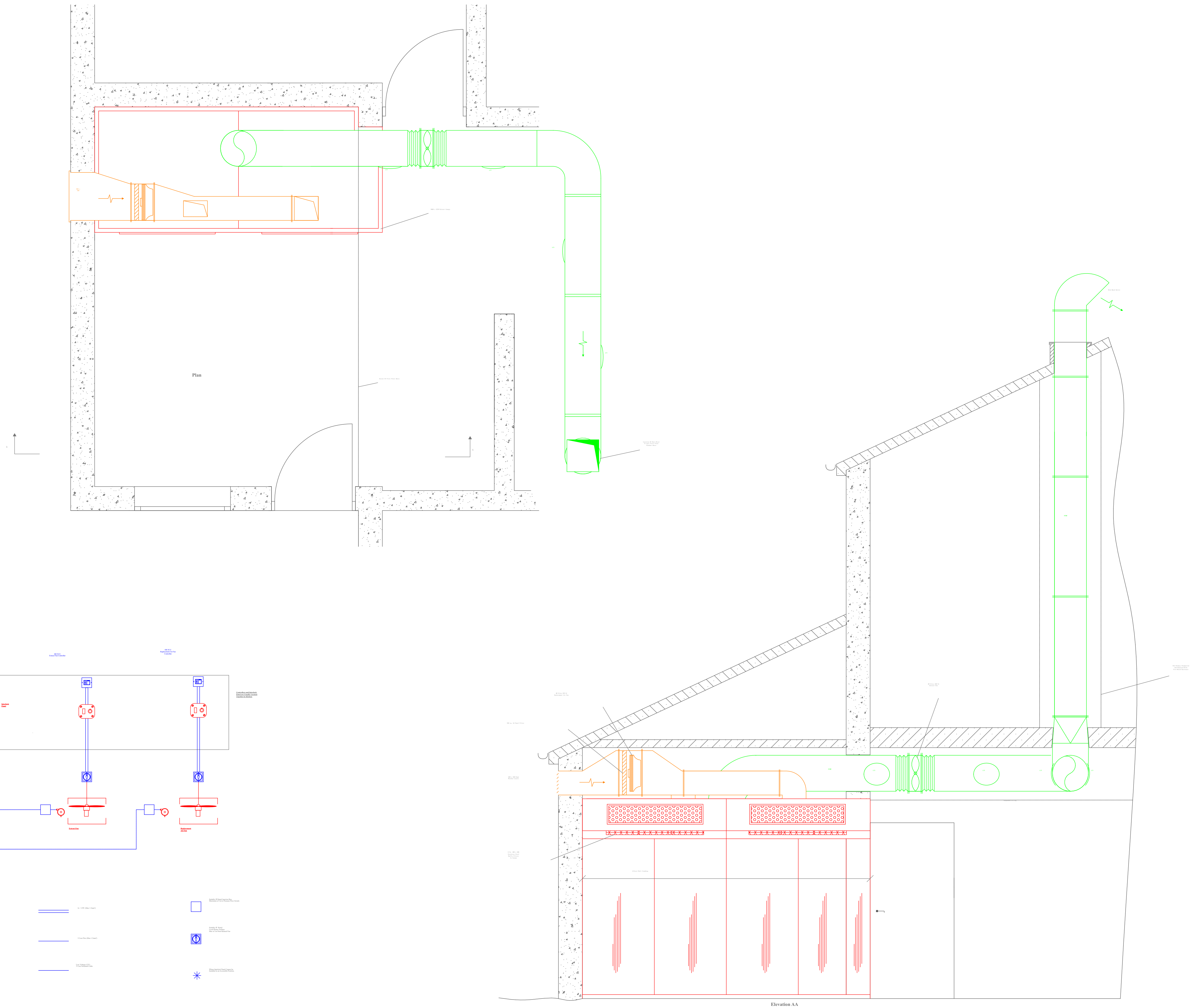
Cleaning down after leaving site
Skips [NB. We allow to remove rubbish to a central point only]
Scaffolding
Watching & Site security
Welfare facilities
Planning permissions and building applications

The contents of this document shall remain at all times strictly confidential and are disclosed strictly in confidence and subject to contract. All intellectual property rights including all copyrights and designs are owned by Integral Services Ltd t/a HCE.

Acceptance: _____ Date: _____

Printed Name: _____

Project Grand Total: £41,733.00



revisions & notes: A 27.03.2015 KD Issued for Planning

0 100mm @A1

Note: All dimensions to be checked on site by the contractor before fabrication and erection. Figured dimensions to be taken in preference to scaled dimensions. This drawing is the copyright of the architects and must not be reproduced or used without their express consent, except for the purposes of a planning application. Electronic issue of this drawing to be confirmed by paper hard copy only.

project: Mr T. M. Maloney
Care Home Extension
Oaklands, Stakes Hill Road,
Waterlooville
Proposed Kitchen
Extract Fan Design

drawing name:
status: For Planning
date: February 2015
scale: 1:25 @A1
drawn: KD

pwparchitects
61 South Street, Havant, Hampshire PO9 1BZ
t: 023 9248 2494
e: design@pwp-architects.com
f: 023 9248 1152
w: www.pwp-architects.com

Project No. **5011**

drawing No. **1210** rev **A**

Annex B: Information Required To Support Planning Application for a Commercial Kitchen.

Oaklands Care Home, Waterloooville (BWF ref: 14633)

1) Information on Premises

The residents are served five to six meals per day and the majority of food is either cooked in the oven or on casserole, while fried food is being kept to a minimum. The kitchen is open at all times although the ventilation system is operating between 7am and midnight. When the cook is not present, a senior member of staff will operate the kitchen in order to serve light meals such as sandwiches and beverages to the residents.

The number of residents following the proposed extension added rooms will be fifty.

- The kitchen is at ground floor level to the NE side of the building. The extract duct runs horizontally through the void above the kitchen ceiling to the base of a vertical riser through the first floor formed in the place of an old chimney. The duct rises into the roof void above the first floor and exits the building via a high level discharge cowl approximately 2 metres above the first floor eaves.
- Replacement air is introduced into the kitchen via a weatherlouvre below the ground floor eaves of the kitchen extension through dust filters, fan and duct below the kitchen ceiling before being distributed through the front of the 3600 x 1570mm kitchen canopy below.

2) Design Issues

- In order to address the potential noise nuisance the following actions are proposed:
 - To locate the extract fan within the building in the roof void above the kitchen ceiling.
 - To direct the extract outlet cowl away from sensitive neighbours
 - To maintain low airspeeds through the extract cowl and the replacement air weatherlouvre louvre terminations.
- An odour risk assessment following the methodology outlined in Annex C of Defra's Guidance on the Control of Odour and Noise from Commercial Kitchen Exhaust Systems (Jan 2005) is attached and suggests that a "Low" level of odour control is required.
- In order to address the potential odour nuisance the following actions are proposed:
 - To discharge the extracted air at as high a level as can be achieved without compromising the appearance of the building (1m above first floor eaves).
 - To direct the extract outlet away from the nearest sensitive receptors.

3) Plans and Drawings – Drawing 5011_1210A shows the proposed ventilation system. Additional information if required:

- the ductwork will be manufactured throughout in 22g galvanised steel,

- extract duct will include access hatches located in accordance with TR19 to facilitate regular cleaning
- a system is proposed to introduce replacement air to the kitchen including:
 - a 600x300 weather louvre in the kitchen wall below ground floor eaves
 - 1 no. 500mm sq G4 panel-type dust filters (specification attached)
 - a Systemair AW Sileo 350E4-41 intake fan located internally above the canopy

4) Grease-filters

6 no. 500x400x45mm polished stainless steel baffle filters

- Manufacturer: Jasun Filtration
- Product Code: GFBES 1620
- Dimensions: 500Wx400Hx45D
- Maintenance instructions: See BWF Operations Manual and Cleaning Frequencies table attached.

5) Pre-filters – none proposed

6) Carbon Filters – none proposed

7) UV/Ozone Odour Neutralising System – none proposed

8) Cooker Hood

- Dimensions: 3600 x 1570mm
- Extract Airflow: 0.82m³/sec (calculated according to HVCA DW172 method 1)
- Face velocity: 0.15m/s

9) Flue Design

- A high level 400mm sq swan neck cowl with bird mesh facing into the roof slope of Oaklands has been selected with low noise generating potential.
- Efflux velocity at design airflow will be 5.2m/sec.

10) Noise

- Back ground noise levels have not been measured.
- Extract and replacement air fans have been located inside the building to reduce noise breakout and low noise terminations have been selected.
- Extract fan: Systemair AR Sileo 450-41
- Replacement Air Fan: Systemair AW Sileo 350-41
- No attenuators are proposed.

11) 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.

Attachments:

- a) BW Fabrications Operation and Maintenance Manual (includes table of recommended cleaning frequencies)
- b) Jasun Filtration Data Sheets for:
 - G4 Panel Filters for replacement air
 - GFBE Baffle type Grease Filters
- c) BW Fabrications Drawing No 14633
- d) Odour Risk Assessment
- e) Fan Specifications:
 - Extract – Systemair AR Sileo 450-41
 - Supply – Systemair AW Sileo 350-41

BW FABRICATIONS March 2015

ODOUR RISK ASSESSMENT

USING DEFRA 2005 ANNEX C METHODOLOGY [from "Guidance on the Control of Odour and Noise from Commercial kitchen Exhaust Systems" published by DEFRA Jan 2005]

SITE: OAKLANDS CARE HOME, WATERLOOVILLE

BWF REF: 14633

<u>Criterion</u>	<u>Level Details</u>	<u>Score</u>	<u>Score</u>
Dispersion	~~Low level discharge~~ ~~Not low level but below eaves at below 10m/s~~ Discharging 1m above eaves at 10-15m/s ~~Discharging 1m above ridge at 15m/s~~	~~Very poor~~ ~~Poor~~ Moderate ~~Good~~	~~20~~ ~~15~~ 10 ~~5~~
Proximity of receptors	~~Closest sensitive receptor less than 20m~~ between 20 and 100m ~~More than 100m from kitchen discharge~~	~~Close~~ Medium ¹ ~~Far~~	~~10~~ 5 ~~1~~
Size of kitchen	~~More than 100 covers or large takeaway~~ 30 to 100 covers or medium sized takeaway ~~Less than 30 covers or small takeaway~~	~~Large~~ Medium ² ~~Small~~	~~5~~ 3 ~~1~~
Cooking Type	Most pubs, Italian, French, Pizza or steakhouse	Low ³	1
TOTAL			19

CONCLUSION: The site requires [delete as applicable]

"Low Level Odour Control" (total score less than 20)

~~"High Level Odour Control"~~ (total score ~~20-35~~)

~~"Very High Level Odour Control"~~ (total score ~~more than 35~~)

¹ Client to confirm

² Client to confirm

³ Care Home cooking generally has even lower odour potential than cooking types listed



**OPERATING &
MAINTENANCE
INSTRUCTIONS FOR
EXTRACTION SYSTEMS**

EXTRACTION SYSTEMS OPERATION AND MAINTENANCE

See table 1 (below) for cleaning frequencies.

1) EXTRACTION CANOPY CLEANING

Generally the extraction canopy will be manufactured from 430-Grade Dull Buff Stainless Steel or 304-Grade if specified.

To clean the stainless steel, we recommend a mild detergent with vinegar, which will remove light grease marks etc.

The grease collection trays at the bottom of the extraction plenum will collect any excess grease/oil. These cups will collect any waste material over a long period and should be checked at regular intervals (see table 1).

2) MESH TYPE AND BAFFLE TYPE GREASE FILTERS.

Both mesh and baffle type grease filters should be cleaned at regular intervals according to use (see table 1).

The filters will fit into a Commercial Dishwash Machine or alternatively can be placed in very hot water with a detergent overnight and washed out under a tap to clear grease. ***Do not use any caustic materials as this may damage the filters.***

3) FANS AND CONTROLS

Each extract / fresh air system fan is selected at design stage depending on the size of the canopy, the length and size of ductwork, the type of filtration system, and the type of cooking equipment being used.

Any speed controllers fitted MUST be set at full speed on every occasion before the extract and air supply fans are switched on (see figure 1). Failure to do this may result in the fan motor burning out and the invalidation of any warranty on the fans.



Fig 1 – Fan controls set at full speed (Typical speed controllers shown)

There is very little maintenance to fans and controllers required but fans should be checked periodically for cleanliness and heavy grease deposits which could, in time, increase system resistance and cause fans to fail. It is not possible to service a fan as they are sealed units but cleaning by a professional company if grease deposits build up will prolong fan life.

4) FRESH AIR INLET FILTERS

Dust filters (either in panel cartridge or bag form) are usually installed between the fresh air inlet and the supply fan. These should be inspected and cleaned or removed and replaced as necessary (See system drawing for filter location).

5) GAS INTERLOCK



Fig 2 – Typical Gas Interlock Control Panel

Before this system can be operated, any fans connected should be turned on and operational. Once power is running to the interlock control panel, the Red 'Power' LED will be illuminated.

Normal Operation

Insert the key into the key switch on the interlock control panel and turn to the 'ON' position. It can take up to Ten seconds for the Green 'Supply Fan' and 'Extract Fan' LEDs to illuminate. The Green 'Gas On' LED will then illuminate to signal that the Gas solenoid valve has opened, supplying gas to appliances. If any fans installed on the system are not functioning, the 'Fan Fault' LED will illuminate and the LED of the failed fan will flash.

Emergency Stop

If the Emergency Stop button is depressed the Amber 'EM Stop' button will illuminate, the gas solenoid valve will close and an audible alarm will be present. To silence the alarm tone, press the 'Mute' button on the front of the

interlock control panel. To reset the stop button, turn the key switch to the off position and repeat the normal operation procedure as detailed above.

Fan fault

Should any fan connected to the gas interlock system fail (or be turned off), the fan fault LED will illuminate, the relevant fan LED will flash and the gas solenoid valve will close and prevent gas cooking.

If a fault persists please contact BW Fabrications on the details below for Assistance.

6) EXTRACT DUCTWORK

It is not possible to provide a general rule for the frequency of ductwork cleaning required because of the variation in hours of usage and level of contamination in the system. We recommend that a regular inspection is made and a risk assessment is made to determine the ongoing cleaning frequency (See Table 1 below). Further guidance is available in TR/19: Guide to Good Practice – Internal Cleanliness of Ventilation Systems published by the HVCA (www.hvca.org.uk).

7) SERVICE DISTRIBUTION UNITS, CONDENSE CANOPIES AND WALL CLADDING.

These are normally made from 304-Grade stainless steel to customer's specific requirements. No maintenance is required apart from the need to keep clean by wiping over using a solution of hot water with a little mild detergent. ***Do not use any caustic solutions.***

8) GAS AND ELECTRICAL INSTALLATIONS

The inspection and testing of these should be included in the planned maintenance programme for the full catering facility to comply with the appropriate regulations.

FREQUENCY OF CLEANING.

The need for specialist cleaning of extraction systems will depend on the level of usage of the cooking equipment, types and quantity of cooking and other risk factors such as vulnerability of the system to ignition and of the building and its occupant / users to system fire, hygiene, vermin and mechanical hazards. Typical cleaning intervals are shown below

Table 1: Typical Cleaning Frequencies for Extraction System Components at Different Usage Levels

SYSTEM COMPONENT	LIGHT USAGE 2–6 Hours/day	MEDIUM USAGE 6–12 Hours per day	HEAVY USAGE 12–16 Hours per day
CANOPY (clean accessible internal and external surfaces, check collection trays)	Every 2–3 weeks	Weekly	Twice weekly
GREASE FILTERS (clean)	Weekly	Twice Weekly	Daily
CARBON FILTER ODOUR CONTROL SYSTEMS* (check and replace as necessary) Carbon blocks Pre-Filters	12 monthly 4 monthly	6 monthly 2 monthly	3 Monthly Monthly
FANS (check and clean as necessary)	12 monthly	6 monthly	3 Monthly
FRESH AIR FILTERS (check and clean as necessary)	6 monthly	4 monthly	3 Monthly
EXTRACT DUCTWORK (check and clean as necessary)	12 monthly	8 monthly	6 Monthly

* Refer to manufacturers' guidance for UV/ESP/Ozone Systems

Systems with heavy usage of chargrills, salamander grills and chinese cookers may need to be cleaned even more frequently. Please refer to TR/19: Guide to Good Practice – Internal Cleanliness of Ventilation Systems (HVCA www.hvca.org.uk) for more information.

AR SILEO 450E4 AXIAL FAN

Item no. **34471**

Version: 50 Hz

Document type: **Product card**
 Document date: **2014-01-22**
 Generated by: **Systemair Online Catalogue**

Description

- speed controllable by voltage reduction
- inlet protection guard
- safe and maintenance free operation
- can be installed in any mounting position
- electric connection via terminal box mounted on the casing
- supplied with capacitor

Axial fans of the AR sileo range do have a bionic shape of the fan blade, and are driven by external rotor motors. The AR range is mounted in a round casing according Eurovent 1/2 made from galvanized steel, has a protection guard at the inlet side and is completely painted in black (RAL9005). The axial impeller is manufactured from pressure die cast aluminum and is painted in black. The impeller is balanced dynamically in two levels in accordance with DIN ISO 1940 part 1, quality G6.3. The motors are equipped with thermal contacts for motor protection, with leads to be connected to a motor protection unit, for example Systemair unit S-ET.

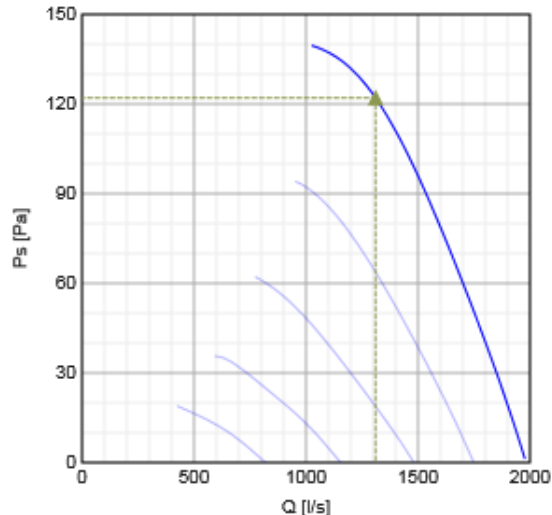


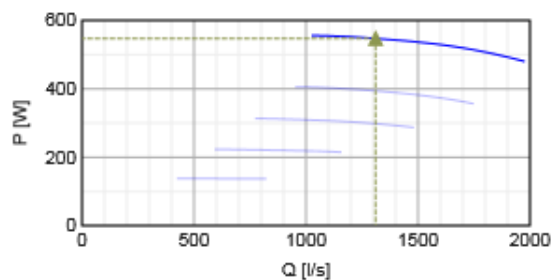
Technical parameters

Voltage	230	V
Frequency	50	Hz
Phase	1	~
Power	550	W
Current	2.5	A
Max. airflow	1977	l/s
R.p.m.	1320	r.p.m.
Max. temperature of transported air	70	°C
Max. temperature of transported air when speed-controlled	70	°C
Sound pressure level at 1 m	66	dB(A)
Weight	17	kg
Insulation class, motor	F	
Enclosure class, motor	54	IP
Capacitor	14	µF

Diagrams

Diagrams





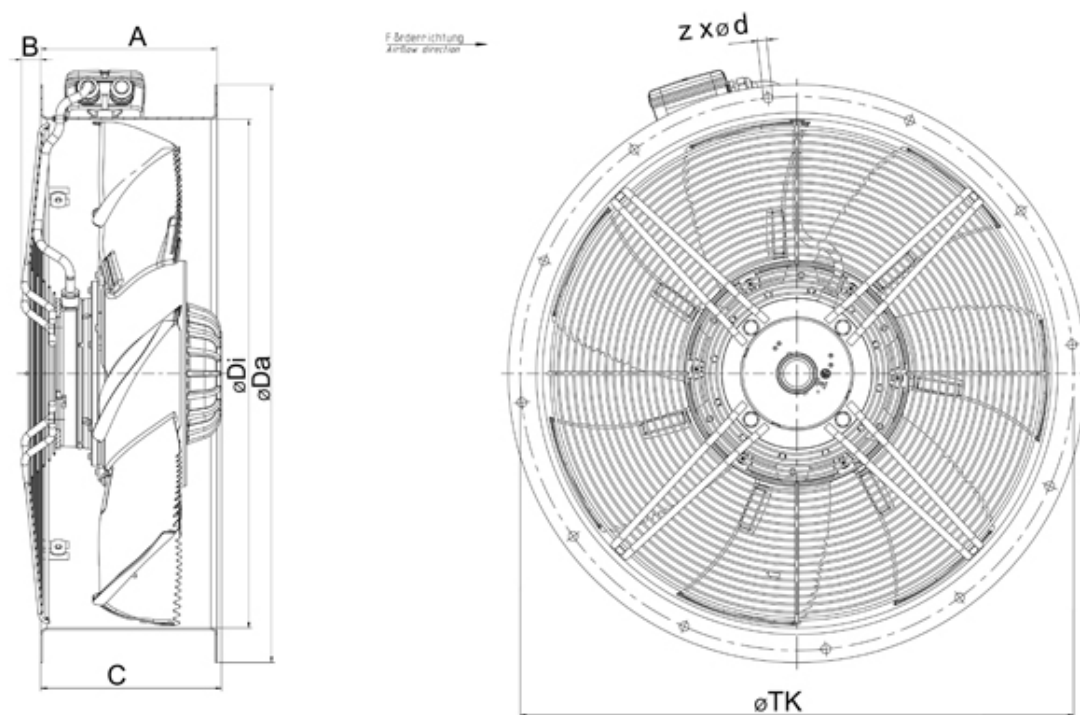
Hydraulic data

	Working point						
	Q [l/s]	Ps [Pa]	P [W]	n [r.p.m.]	I [A]	SFP [kW/m³/s]	U [V]
Max efficiency	▲ 1310	▲ 122	▲ 547	1330	2.44	0.418	230

Acoustic data

Sound power level		63	125	250	500	1k	2k	4k	8k	Tot
Inlet	dB(A)	42	53	63	61	64	64	60	52	70
Outlet	dB(A)	46	54	62	62	63	63	59	51	69

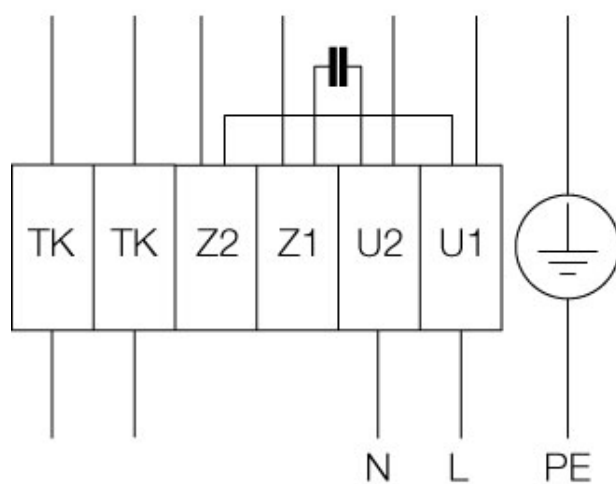
Dimensions



	A	B	C	ØDi	ØDa	z x Ød	ØTK
AR sileo 450E4	160	18	177	451	530	8 x Ø12	500
AR sileo 450DV	160	18	157	451	530	8 x Ø12	500

Wiring

Linkslauf
Counter Clockwise rotation
Rotation à gauche



AW SILEO 350E4 AXIAL FAN

Item no. 34123

Document type: **Product card**
 Document date: **2013-09-03**
 Generated by: **Systemair Online Catalogue**

Description

- speed controllable by voltage reduction
- inlet protection guard
- safe and maintenance free operation
- can be installed in any mounting position
- electric connection via terminal box mounted on the motor
- single phase fans are supplied with capacitor



Axial fans of the AW sileo range do have a bionic shape of the fan blade, and are driven by external rotor motors. The AW range is equipped with a square wall plate, galvanized steel and powder coated in black (RAL9005). The protection guard at the inlet side is powder coated in black. The axial impeller is manufactured from black high efficiency composite material. The impeller is balanced dynamically in two levels in accordance with DIN ISO 1940 part 1, quality G6.3.

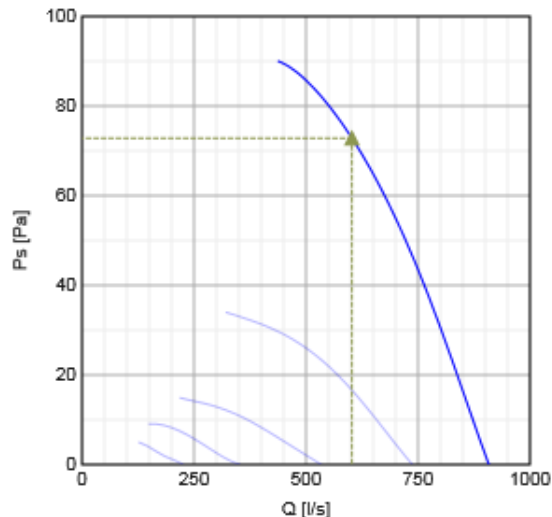
The motors are equipped with thermal contacts for motor protection, with leads to be connected to a motor protection unit, for example Systemair unit S-ET.

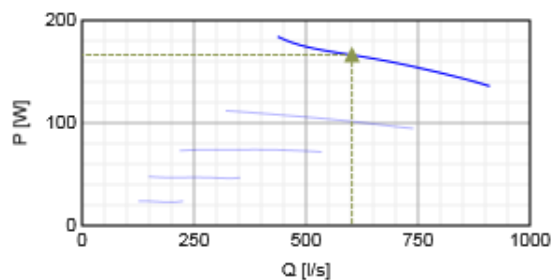
Technical parameters

Voltage	230	V
Frequency	50	Hz
Phase	1	~
Power	170	W
Current	0.75	A
Max. airflow	910	l/s
R.p.m.	1260	r.p.m.
Max. temperature of transported air	60	°C
Max. temperature of transported air when speed-controlled	60	°C
Sound pressure level at 1 m	62	dB(A)
Weight	7.5	kg
Insulation class, motor	F	
Enclosure class, motor	44	IP
Capacitor	5	µF

Diagrams

Diagrams





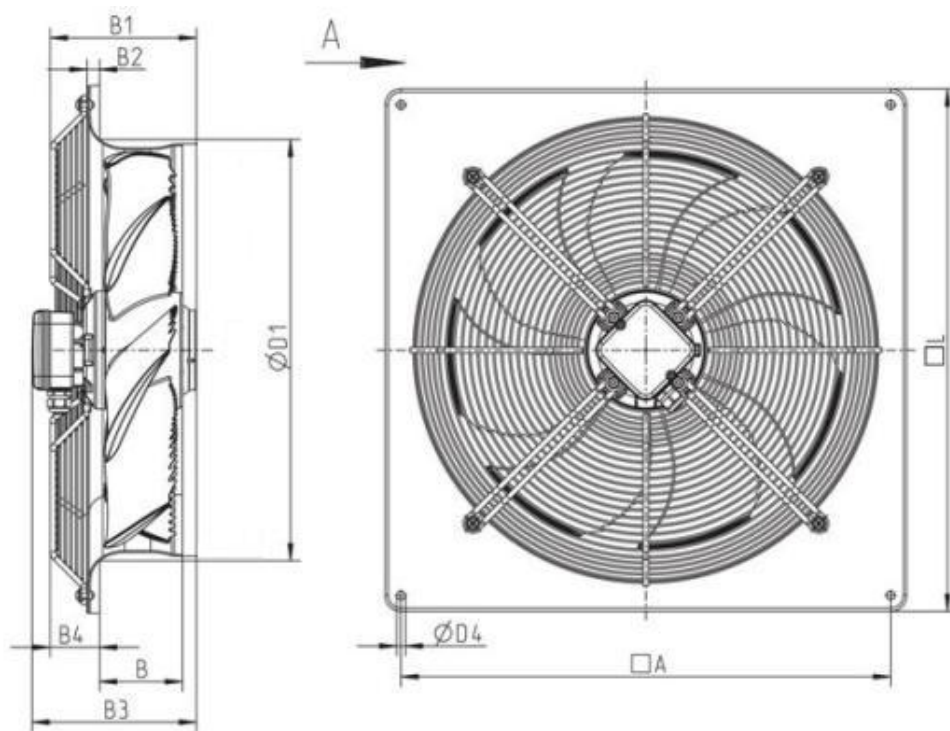
Hydraulic data

	Working point						
	Q [l/s]	Ps [Pa]	P [W]	n [r.p.m.]	I [A]	SFP [kW/m³/s]	U [V]
Max efficiency	602	72.8	166	1294	0.731	0.276	230

Acoustic data

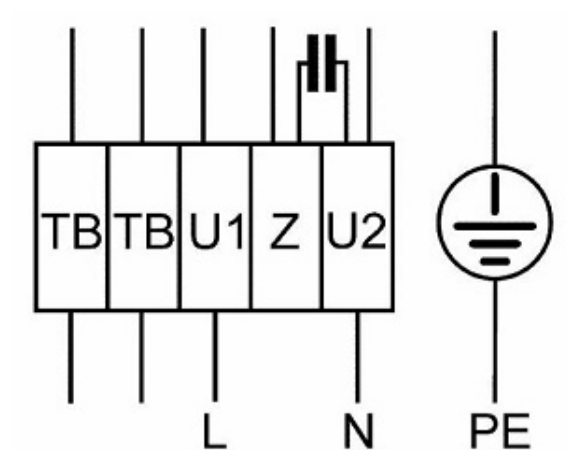
Sound power level		63	125	250	500	1k	2k	4k	8k	Tot
Inlet	dB(A)	40	54	53	60	58	61	55	46	65
Outlet	dB(A)	39	53	55	58	58	61	54	45	65

Dimensions



	□A	B	B1	B2	B3	B4	ØD1	ØD4	□L
AW 350DV	435	68	119	12	182	22	388	9	485
AW 350E4	435	68	132	12	173	49	390	9	485

Wiring



Specification text

Model GFBE

Economy Baffle Grease Filters



GENERAL DESCRIPTION

These filters are designed for use in commercial kitchens and ventilation from food preparation areas where their primary function is to prevent flame from travelling from the cooking area up into the extract duct.

Construction

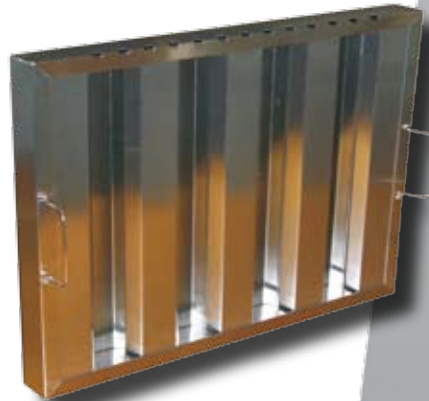
These filters are made from rolled channel frames, with safety edges. Each blade overlaps the opposite one to provide a tortuous path for the grease laden air. The grease drains down the blades and through the drain holes provided into a collection tray provided in the kitchen canopy.

These Filters are available in the finishes below

Stainless Steel



Brushed Stainless Steel



Galvanised Steel



ENVIRONMENT



EMS 81914
BS EN ISO 14001:2004

QUALITY



FM 29257
BS EN ISO 9001:2000

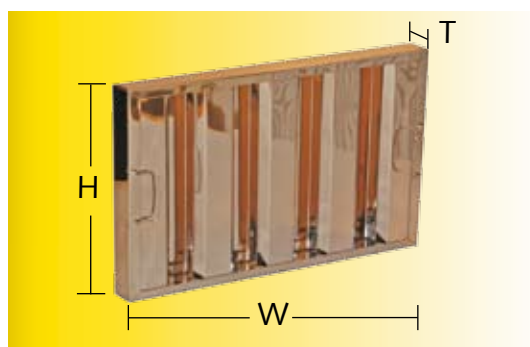
Jasun Filtration Plc
Riverside House, Parrett Way
Bridgwater, Somerset.
TA6 5LB
United Kingdom

Tel.: +44 (0) 1278 452277
Fax: +44 (0) 1278 450873
info@jfilters.com
<http://www.jfilters.com>

GFBE Baffle Grease Filters

STANDARD SIZES

Jasun Filtration always specify filters as Height (H) x Width (W)x Thickness (T) This is particularly important with baffle filters because the handles will always go on the H side, the blades will always run along the H side, and the drain holes will always be in the W side

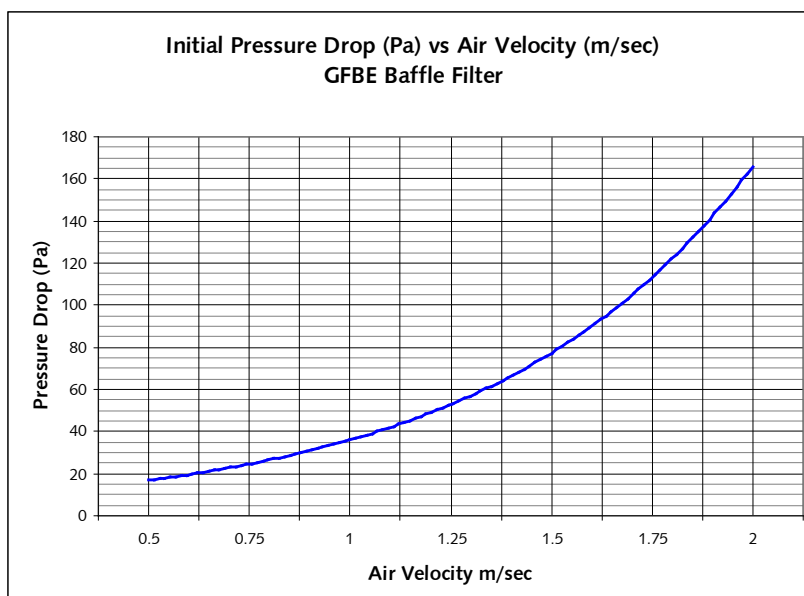


No.	Nominal Size Inches	Height (mm)	Width (mm)	Depth (mm)	Rated Airflow m ³ /hr.
GFBEEx-1020	10 x 20 x 2	241	495	45	644
GFBEEx-1212	12 x 12 x 2	292	292	45	460
GFBEEx-1216	12 x 16 x 2	292	394	45	621
GFBEEx-1224	12 x 24 x 2	292	594	45	937
GFBEEx-1616	16 x 16 x 2	394	394	45	838
GFBEEx-1620	16 x 20 x 2	394	495	45	1053
GFBEEx-1625	16 x 25 x 2	394	622	45	1323
GFBEEx-1818	18 x 18 x 2	445	445	45	1069
GFBEEx-2010	20 x 10 x 2	495	241	45	644
GFBEEx-2016	20 x 16 x 2	495	394	45	1053
GFBEEx-2020	20 x 20 x 2	495	495	45	1323
GFBEEx-2025	20 x 25 x 2	495	622	45	1663
GFBEEx-2424	24 x 24 x 2	597	597	45	1925

To Specify the Grease Filters material

In the Part Numbers above replace the x with

S for Stainless Steel
R for Brushed Stainless Steel
G for Galvanised Steel





V Line Pleated Panel Filter

GENERAL DESCRIPTION

The V Line pleated Panel filter is a standard capacity disposable product offering a better than basic level of filtration, or pre-filtration in HEVAC applications. This product is made using patented Kimberly Clark media which delivers a constant level of filtration over its life.

Construction

This product is constructed by bonding a pleat pack of Intrepid V Line media into a water repellent Aqua-Kote card fram

Features

The Frame is made from AquaKote card which has

- superior tear resistance when wet
- great dry tear resistance and
- is made from a renewable source.

The Patented Kimberley Clark Intrepid media

- Has a Graduated Density for even dirt loading
- Hydrophobic – so will not load with moisture in the air
- Has a constant efficiency due to its extra electrostatic charge
- Superior Efficiency V's Particle size (see table)
- Has a low pressure drop
- Is made form continuous fibres so will not shed

Efficiency Performance data G4 to EN779

Test Comparing Filtration efficiency V's different sized particles. Intrepid Media V's Cotton Polyester Filters

Particle Size Rang(mm)	Initial Fractional Efficiency(%)	
	Intrepid M8	The "best" Cotton Poly Alternative
0.3-0.4	7	2
0.4-0.55	15	6
0.55-0.7	28	11
0.7-1.0	41	19
1.0-1.3	52	24
1.3-1.6	58	28
1.6-2.2	63	32
2.2-3.0	67	36
3.0-4.0	70	37
4.0-5.5	71	38
5.5-7.0	72	38
7.0-10.0	73	39

Hi Magnification photo showing the cross section of the Intrepid media



Coarse
↓ Airflow
Fine



ENVIRONMENT



EMS 81914
BS EN ISO 14001:2004

QUALITY



FM 29257
BS EN ISO 9001:2000

Jasun Filtration Plc
Riverside House, Parrett Way
Bridgwater, Somerset.
TA6 5LB
United Kingdom

Tel: +44 (0) 1278 450873
Fax: +44 (0) 1278 452277
info@jfilters.com
<http://www.jfilters.com>

V Line Pleated Panel Filter

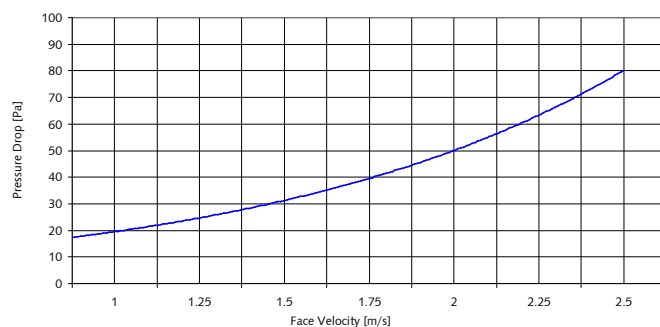
STANDARD SIZES

No.	Nominal Size Inches	Height (mm)	Width (mm)	Depth (mm)	Rated Airflow m³/hr
VL4-1010	10x10x4	241	241	95	544
VL4-1020	10x20x4	241	495	95	1117
VL4-1212	12x12x4	292	292	95	798
VL4-1224	12x24x4	292	594	95	1623
VL4-1515	15x15x4	368	368	95	1268
VL4-1520	15x20x4	368	495	95	1705
VL4-1616	16x16x4	394	394	95	1453
VL4-1620	16x20x4	394	495	95	1825
VL4-1625	16x25x4	394	622	95	2294
VL4-1818	18x18x4	445	445	95	1854
VL4-1831	18x31x4	445	775	95	3228
VL4-2020	20x20x4	495	495	95	2293
VL4-2024	20x24x4	495	594	95	2752
VL4-2025	20x25x4	495	622	95	2882
VL4-2424	24x24x4	594	594	95	3303

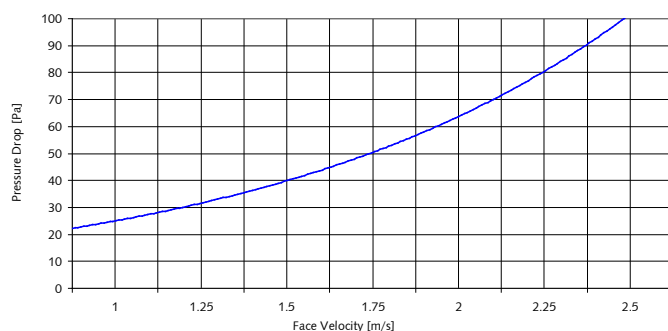
No.	Nominal Size Inches	Height (mm)	Width (mm)	Depth (mm)	Rated Airflow m³/hr
VL2-1010	10x10x2	241	241	45	418
VL2-1020	10x20x2	241	495	45	859
VL2-1212	12x12x2	292	292	45	614
VL2-1224	12x24x2	292	594	45	1249
VL2-1515	15x15x2	368	368	45	975
VL2-1520	15x20x2	368	495	45	1312
VL2-1619	16x19x2	394	470	45	1333
VL2-1620	16x20x2	394	495	45	1404
VL2-1624	16x24x2	394	594	45	1685
VL2-1625	16x25x2	394	622	45	1764
VL2-1818	18x18x2	445	445	45	1426
VL2-1820	18x20x2	445	495	45	1586
VL2-1824	18x24x2	445	594	45	1903
VL2-2020	20x20x2	495	495	45	1764
VL2-2024	20x24x2	495	594	45	2117
VL2-2025	20x25x2	495	622	45	2217
VL2-2424	24x24x2	594	594	45	2540

No.	Nominal Size Inches	Height (mm)	Width (mm)	Depth (mm)	Rated Airflow m³/hr
VL1-1010	10x10x2	241	241	45	314
VL1-1020	10x20x2	241	495	45	644
VL1-1212	12x12x2	292	292	45	460
VL1-1224	12x24x2	292	594	45	937
VL1-1515	15x15x2	368	368	45	731
VL1-1520	15x20x2	368	495	45	984
VL1-1619	16x19x2	394	470	45	1000
VL1-1620	16x20x2	394	495	45	1053
VL1-1624	16x24x2	394	594	45	1264
VL1-1625	16x25x2	394	622	45	1323
VL1-1818	18x18x2	445	445	45	1069
VL1-1820	18x20x2	445	495	45	1189
VL1-1824	18x24x2	445	594	45	1427
VL1-2020	20x20x2	495	495	45	1323
VL1-2024	20x24x2	495	594	45	1588
VL1-2025	20x25x2	495	622	45	1663
VL1-2424	24x24x2	594	594	45	1905

Pressure Drop vs/ Face Velocity
V Line VL4 Panel Filter 95mm Thick



Pressure Drop vs/ Face Velocity
V Line VL2 Panel Filter 45mm Thick



Pressure Drop vs/ Face Velocity
Vline VL1 Panel Filter 20mm Thick

