



Shurgard Self Storage Facility Croydon, London

Mechanical & Public Health Services Performance Specification



Butler Consulting Ltd.
Oxford House,
71 Oxford Street,
Glasgow G5 9EP

Tel: 0141 370 3009
www.butler-consult.co.uk

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1.0 MECHANICAL & PUBLIC HEALTH SPECIFICATION

1.1 General

The works described herein are for the complete design, installation and commissioning of the Mechanical & Public Health Services for a Shurgard UK Ltd. Self-Storage Store based in Croydon London.

This specification describes the particular requirement for the Mechanical & Public Health Installation which shall be in accordance with Industry Standards for Specification of Workmanship and Materials including the CIBSE Guides.

The complete design, installation and commissioning must comply with the latest appropriate British Standard Specifications. All equipment that uses electricity shall be CE marked.

The contractor shall review the tender documents. If any discrepancies are found between the documents and drawings/Shurgard standards, it shall be the duty of the contractor to notify the design team for clarification prior to the tender being submitted. A site visit is recommended in order that the tenderers can be satisfied as to the nature of the site for the building construction.

1.2 Scope of Works

The works shall comprise the design, supply, delivery, off-loading, marking out, erection, testing, commissioning and setting to work, of the complete mechanical and public health installation as described and detailed in the following Clauses, Schedules and Drawings.

The Mechanical Services installation shall commence at the input to the building of the Supply Authority's equipment and shall comprise the following:

- Design and installation drawings.
- Heating, Ventilation & Air Condition as outline in the design intent information
- Local control of all the heating, ventilation and air conditioning
- Incoming water services connection from utility providers metered supply
- All internal water services installation
- All above ground drainage installation, including co-ordination with below ground connections
- Dry riser installation
- Testing and commissioning.
- Record documentation including O&M information.

The mechanical trade contract will be tendered on the basis of a Trade Contractors Design. This document should be used as a design intent/performance specification.

The following information is pertinent to the tenderer:

- Shurgard self-storage Building Requirements
- Shurgard store security and IS infrastructure requirements
- Specifications: Electrical and Mechanical/ Public Health Performance Specifications
- Tender Drawings: Electrical and Mechanical/ Public Health Services, Architect's and Structural Engineer's Drawings
- Project Programme

Tender drawings showing the design intent are included with the tender documents. The drawings are for illustrative purposes to define the scope and do not constitute a final design or final plant and equipment locations.

Unless otherwise stated in this Specification, the installations shall conform to the current requirements of the following:

- Latest relevant BS Standards and Codes of Practice
- Health and Safety at Work Act
- CDM regulations
- The Building Regulations Approved Documents
- The Approved Documents Part B (Fire Safety), Part F (Ventilation), Part G (Sanitation, Hot Water Safety and Water Efficiency), Part H (Drainage & Waste Disposal), Part J (Heat Producing Appliances), Part L (Conservation of Fuel and Power).
- Local Authority Regulations and By-laws.
- CIBSE Guides and Commissioning Codes
- Statutory Authorities/ Undertakers By-laws, Regulations and Recommendations.
- Offices, Shops and Railway Premises Act
- Factories Act
- All current CIBSE Technical Memoranda

1.3 Contractor's Design & Build Responsibility

The contractor shall undertake the detailed design, construction and supervision of the complete mechanical and public health installations. The Contractor's responsibility shall include the following:

- Detailed design of the installation including submission of installation drawings, technical submittals, all calculations, equipment specification, co-ordination drawings, and such details as are necessary to demonstrate the proposed design to the Employer's Agent.
- Attending design meetings, explaining to other members of the design team the proposed system/design and providing information to enable the design of the supporting structure to be completed.
- Submission of drawings and specifications where appropriate, to the Local Authority, Building Control Approved Inspector and Fire Officer for approval.
- Preparation of a programme of works covering all aspects of the sub-contract for co-ordination with the main contract programme.
- Preparation of builder's work drawings and schedules.
- Co-ordination of the access requirements to the mechanical and plumbing equipment to establish safe working access for future maintenance.
- Liaise, co-ordinate and co-operate with all other Contractors and sub-contractors employed for the works and the design team at all stages. The Contractor shall be charged with the lead management role for co-ordination and allowance shall be made for meetings and amendments to designs to provide a fully co-ordinated installation.
- Liaison with the utility provider to coordinate the requirements for the incoming water services to the building.
- Advise the Managing Contractor in writing and within 3 working days, of any cost implications to the Mechanical and Public Health Services scheme arising from changes to the project as a result of any written or verbal instructions issued by the Managing Contractor on site.

1.4 Information to Other Trades

The contractors shall provide all information relating to other trades through the Managing Contractor. The mechanical contractor shall request a Schedule of Mechanical requirements associated with the Mechanical and Public Health plant and equipment, through the Managing Contractor, for all plant requirements.

1.5 Co-ordination

The Contractor must ensure, via the Managing Contractor that they are in possession of all details relating to other trades that may have an effect on the Installation. The Contractor shall report to the Managing Contractor, during the production of their installation drawings, to identify any clash of services either physical or programming. The Contractor shall in conjunction with the Managing Contractor and other sub-contractors, co-ordinate the installation of services to avoid conflict of services within the available space.

The contractor shall provide installation drawings for approval before progressing with any stage of the installation works. The contractor will also provide dimensioned builder's work drawings, to the Managing Contractor. The drawings shall provide details of all required plant bases, holes, chasing, etc. required for the installation.

1.6 Drawings

The drawings issued with the Specification detail the design intent and main items of equipment as a guide to the tenderer. They do not show the full extent of the works described in this Specification.

The Contractor shall produce installation drawings detailing all elements of the proposed mechanical and public health services included in this specification. These drawings shall be the result of site surveys detail design, and co-ordination with the design team and other sub-contractors. Layout drawings must be produced on the latest Architect's plans and shall be to scale of 1:100 minimum GA.

Drawings provided by the Contractor shall show the following but not be limited to:

- Heating (electric)
- Mechanical Ventilation (front of house and storage areas)
- Air Conditioning including local controls
- Water Services (incoming connection and distribution)
- Hot Water Services
- Above Ground Drainage
- Dry Riser

Larger scale details shall be produced by the Contractor where required to coordinate services requirements with the Design and Construction Team to provide an integrated solution.

The contractor shall submit working drawings to the Design and Construction Team prior to commencing fabrication and works on site. Drawings shall be returned with comments within five working days of receipt. Distribution Board Schedules with design impedance values per circuit shall be provided with the working drawings submission. Calculations shall be requested for submission if any anomalies are identified.

Before completion of the Contract, the Contractor shall supply, for approval, a full set of "As Installed" drawings. The record drawings shall generally be based on the Contractor's progress drawings. The Contractor shall also produce and handover electronic copies of "As Installed" drawings in .dwg and .pdf format.

1.7 Design Information

The contractor shall submit detailed design information, to the M&E Services Consulting Engineer for comment and approved prior to proceeding with the works.

This information shall include but not be limited to the following:

- Steady state heating & cooling load calculations
- Supply/Extract systems static fan pressure calculation
- Water services pipework calculation/sizing

Calculations shall be submitted in typed form wherever possible and must be signed as having been checked by the Design Contractor. Where computer generated calculations have been used, a full listing of the input information shall be provided with the results, together with details of any calculation programmes used.

Upon approval of the Contractor's design and installation drawings by the professional team, the Contractor shall procure, install, balance, commission and set to work all services to the complete satisfaction of the Employer's Agent and in full compliance with the Performance Specification.

For mechanical contractor must co-ordinate their electrical connection requirements with the electrical design contractor.

1.8 Operation and Maintenance Manuals

The Sub Contractor shall provide three sets of Operation and Maintenance manuals. The O&M manual requirements will be as prescribed in the BSRIA BG 1-2007 Handover Guide.

The level of information and format to be provided shall comply with BS EN 82079-1. A cross referencing index shall comply with BS ISO 999 recommendation for preparing indexes. The manuals shall be consistent in format and presentation throughout.

1.9 Testing and Commissioning

All works shall be tested in accordance with commissioning codes published by CIBSE or as required by current regulations. On completion of the Contractor's testing and commissioning, the contractor shall demonstrate the functional operation of all systems to the satisfaction of the Employer's Agent (an allowance for comprehensive witness commissioning must be included by the contractor).

Testing and commissioning certificates shall be made available prior to practical completion of works.

1.10 Health and Safety File

A Health and Safety file shall be made available upon Practical Completion of works.

1.11 Instruction to Staff

Following completion and demonstration of functional operation of all systems to the Employer's Agent, the contractor shall provide instruction to the Employer's staff on the routine operation of the Mechanical and Public Health Installation and all associated systems.

This demonstration shall be in addition and separate to the Witness Commissioning demonstration to the Employer's Agent.

1.12 Maintenance Contract

In addition to the general requirements for the defects liability period, the Contractor shall provide any required routine servicing of the equipment during the first 12 months of operation to ensure its continued safe and efficient operation and to prevent deterioration throughout the defects liability period.

1.14 Builder's Work

The Managing Contractor shall carry out all builders' work, but the Contractor shall be responsible for providing all builders' work details to the satisfaction of the Employer's Agent. The builder's work shall include all the cable and duct requirements for the incoming water supply.

1.15 Mechanical Services Design Criteria

The following design criteria shall be used as the basis of the design for the mechanical services installations:

External Design Temperatures

Winter: -3.1°C ambient (saturated)
Summer: 31.4°C ambient (50% RH)

Internal Design Temperatures

Occupied Staff Areas: Heating only to 19°C db (RH not controlled)

WCs & Shower Room: Heating only to 18°C db (RH not controlled)

Circulation Areas: Heating only to 18°C db (RH not controlled)

Shop Unit: Store Open - Heating to 19°C db (RH not controlled)
Store Closed – Heating to 13°C db (RH not controlled)

IT Server Room: 18°C +/- 1oC (RH not controlled)

Warehouse No heating provided.

Infiltration Rate

As per appropriate building type stipulated within the CIBSE guides.

Internal Heat Gains

To be calculated in accordance with CIBSE guidelines.
No allowance shall be made for the heat gain from lighting, small power, occupants and equipment within the heating load calculations.

Maximum Noise Levels Generated by Building Services

Storage Warehouse NR40
Shop Unit NR40
WCs: NR40
External: As Planning Conditions

Ventilation Rates

Shop: 3 air changes/hour
WC: 10 air changes/hour
Cleaners Store: 10 air changes/hour
Storage Area: 4 air changes/24 hours
Staff Room: 3 air changes/hour

Maximum Design Velocities

Main Supply Ductwork	5.0 m/s
Main Extract Ductwork	5.0 m/s
Grille, Diffuser and Louvre Face Velocity	2.5 m/s

Design Pressure Drops

Maximum Supply Air Systems	1.0 Pa/m
Maximum Extract Air Systems	1.0 Pa/m

1.16 Mains Water Services (MCWS)

The building will be provided with a new water supply provided by the utility provider (Thames Water). The supply shall be metered with the meter located as outlined on drawing.

From the point of connection a new MCW service complete with additional internal and external BREEAM compliant check meter will enter the building with a double check valve, isolation valve and drain off cock upon the rising main, this will be distributed as shown on the drawings, to serve the water services outlets throughout the property. The statutory water meter is to be supplied complete with a pulsed output.

The cold water will route at high level through the ceiling void to serve the sanitary appliances in the break room services and disabled WC services as detailed on the water services layout drawings. The cold water supply will also feed the hot water heaters described below.

1.17 Hot Water Services (HWS)

The setting out of the rooms on this project means each outlet requires their own point of use water heaters.

Break Room

An inline point of use 30litre storage hot water cistern will be provided for the break room. The water heater shall be electric, self-regulating in all respects and provided with all necessary pressure and temperature safety devices. An HWS shall distribute to provide hot water to the sink and dishwasher.

Cleaners Store

An inline point of use 30litre storage will be provided for the cleaners cupboard. The cleaner's cupboard storage heater will be located adjacent to the sink and will be supply hot water to the cleaners sink.

Accessible WC

An inline point of use 5litre storage will be provided for the accessible WC cupboard. The accessible WC storage heater will be located adjacent to the sink and will be supply hot water to accessible WC wash hand basin.

Where necessary thermostatic mixing valves (TMV's) shall be provided to ensure a safe working temperature at the outlets. The contractor will ensure that the system is designed to minimise dead legs and in accordance with the ACOP L8 – Legionnaires Disease.

General Installation

Copper tubing will be used as the MCWS and Hot Water distribution pipework, it shall be to BS EN 1057 and BS EN 12449 and insulated to BS EN 5422. All pipework should be identified in accordance with BS 1710 with hydraulic pressure tests provided with a notice of 1 week and tested to two times the working pressure for 1 hour.

Corroded and damaged pipes shall not be used. Rising and dropping pipes shall be truly vertical. No joints shall be formed within the thickness of the structure, or in positions inaccessible after completion.

Support systems shall be of correct size and strength, and allow for anchoring of the piping systems. Full details of hangers and supports proposed for use shall be submitted. A proprietary support system may be used subject to prior agreement. Vertical drops shall be restrained and supported to prevent offset and sway. Brackets and supports shall allow sufficient safe access for adjustment, maintenance and removal of any item of equipment with the minimum of dismantling and without need for temporary supports. Supports for copper piping shall either be non-ferrous, or have a liner to prevent electrolytic action.

The installation should be in accordance with BS 8558, BS EN 806-2 and the HSE publication "The control of legionella bacteria in water systems: Approved Code of Practice and Guidance." Disinfection results should be presented to the consultant engineer for review.

Commissioning will be carried out in accordance with BSRIA 2/89.3 and CIBSE Commissioning Code W.

All new systems will be installed using WRAS/BS approved fittings suitable for potable water supplies. Upon completion of the system they will be flushed and sterilised to BS EN 806/ACOP L8.

All pipework will be insulated throughout, including valves with valves boxes being provided. The insulation must be a minimum of A or A+ rating in accordance with BRE Green Guide, with the minimum thermal conductivity of $0.025\text{W/m}^2\text{K}$.

1.18 Mechanical Ventilation

The contractor will design, procure, supply, install, test and commission the ventilation services in accordance within this specification and the Butler Consulting drawings and equipment schedules.

Storage Warehouse Installations

The fresh air requirement to the warehouse will be by dedicated fresh air supply and extract fans. Each floor is split into two zones, with a supply and extract system each. The supply and extract ductwork will distribute down the corridors at high level in galvanised ductwork on each floor.

The supply and extract fans will be efficient backward curved centrifugal design and will be supplied complete with a packaged control system incorporating fan speed control.

The contractor is to carry out pressure drop calculations to confirm the final duty required for each fan before ordering.

Shop Unit Installation

A supply and extract heat recovery ventilation system shall be provided for the occupied areas to the back of house as well as the shop unit. This heat recovery system shall incorporate an electric heater battery and fan speed control through a local packaged touch screen controller. The controller will be located within the break room.

Ductwork Fabrication and Installation

All ductwork should be manufactured and installed in accordance with HVCA DW/144, BS EN 1506 and BS EN12237. All volume control dampers should be in accordance with HVCA DW/144 with the material to match that of the ductwork within which it is being installed.

Ferrous ductwork shall be corrosion resistant galvanised steel spiral wound ducting, insulated throughout to BS 5422. All ductwork, excluding storage warehouse, will be insulated throughout, the insulation must be a minimum of A or A+ rating in accordance with BRE Green Guide, with the minimum thermal conductivity of 0.023 W/m² K.

Flexible aluminium & polyester ducting will be used for final grille connections only and will be strictly no longer than 450mm. Flexible connections must be correctly supported in order to prevent kinking within the installation.

The contractor will include all transformation pieces in order to minimise pressure drops between items of plant in accordance with the fittings identified within HVCA DW/144. The transformation pieces may be either circular or rectangular (manufacturer dependant) but in all instances must be corrosion resistance galvanised steel and complete with insulation.

Ductwork will be hung and supported as per HVCA DW/144, HVAC DW/154, HVAC DW/191 and BSRIA BG 10/2010 with strength requirements to BS EN 12236. No ductwork should be supported by the ceiling. The ductwork should contain access openings for inspection, cleaning and maintenance with sizes in accordance with HVCA DW/144 Appendix D and to BS EN 12097. Where it is deemed required by the consultant, ductwork should be fixed with double locking nuts for security.

Ductwork joints should be completed with self-adhesive foam strip or equivalent in order to reduce ductwork air leakage. The joint should be finished neatly with no sharp edges or protruding screws.

The ventilation ductwork should be tested for air leakage in accordance with Part L2B with the test pressure and standard to Ductwork Specification DW/144 (2016): tables 2.1 to 2.3 requirements for low pressure ductwork installations. The extent of testing should be random and cover 10% of the ductwork. Results for testing should be submitted electronically upon completion for review and sign-off and/or rectification instruction.

Test holes should be provided throughout each of the ductwork systems where necessary in order to allow for commissioning. These holes should be in accordance with CIBSE Commissioning Code, Series A and HVCA DW/144. Results should be submitted in a timely manner upon completion of commissioning for review and sign-off and/or rectification instruction. Upon the contact being commenced, a commissioning programme should be provided detailing dates and commissioning activities being carried out. All commissioning results should be formatted and reported in accordance with CIBSE and BSRIA codes.

Upon completion the ductwork should be cleaned to HVCA TR/19 for client handover.

The supply fan should be inspected for cleanliness before commissioning is carried out and the filter replaced with a new unit after final commissioning. Three spare filters should be provided to the client upon handover.

Ventilation grilles will be of the louvre-faced and linear slot types. All pressure drops through grilles should be kept as low as possible in order to maintain low Specific Fan Powers and will have an upper limit as stated within the mechanical equipment schedules. It should be noted that the dampers on the grilles will not be the main source of air flow balancing; this will be done via duct mounted volume control dampers. The plenum boxes should be installed in accordance with HVCA DW/144 with holing drilled within the non-active sections of the plenum.

All volume control dampers used throughout the building should be tested in accordance with BS EN 1751:1999 – “Ventilation for Buildings – Air Terminal Devices – Aerodynamic Testing of Dampers and Valves”.

1.19 Electric Panel Radiators

A low surface temperature electric panel radiator shall be installed in the accessible WC in accordance with the Butler Consulting drawings and equipment schedules. This radiator will be supplied complete with integral thermostat and time-clock.

1.20 Comfort Cooling

Break Room & Shop Cooling

The break room and shop will be provided with a ‘mini VRF’ heating and cooling installation to maintain internal conditions to meet those described under design criteria within this specification. The shop unit will be heated and cooled by concealed ceiling fan coil units connected to a single outdoor unit.

The shop and break room system shall be controlled by a wall mounted programmable controller incorporating the following control facilities as a minimum:

- fan speed
- mode selection (heating/cooling/automatic/fan only)
- set point temperature adjustment
- 7 day time clock control.

The 2No fan coil units within the shop shall be controlled by a dedicated wall mounted controller behind the reception desk. The fan coil units shall be controlled on a duty/standby basis. The single fan coil unit within the break room shall be controlled by a dedicated wall mounted controller adjacent to the light switch.

The associated outdoor unit will be mounted externally at floor level and shall be provided complete with a secure cage for protection. Refer to Butler Consulting Engineers drawings for the location of the unit, this is to be confirmed with the Main Contractor prior to installation.

General

Refrigerant pipework should be carried out by an Approved Refrigerant Engineer (F-Gas), and in accordance with BS EN 378:2000 and the manufacturer's design and installation instructions.

All pipework (gas and liquid lines) to be insulated with slip-on, close cell elastomeric pipe insulation (as manufactured by Armaflex or equal and approved) with a fire performance of class 'O' and having a wall thickness of not less than 13mm. All refrigerant pipework shall be insulated with nitrile rubber where externally routed.

Pipework to be properly fixed and supported at a minimum of 1.5 metre centres and where required should be run on galvanised trays.

Joints in copper pipe shall be brazed. Brazing shall be carried out to the requirements of the HVCA Code of Practice – Brazing and Bronze Welding of Copper Pipe and Sheet.

1.21 Drainage

A new drainage system, including all above slab soil and waste drainage, connecting to an under slab drainage installed by others shall be installed. The system will be ventilated by AAVs located at high level as indicated on the drawings. The installation shall be carried out in UPVC/MUPVC pipe and fittings in accordance with BS5572 and Local Authority Building Control.

Drainage shall be provided to each fan coil unit and heat recovery condensate drainage. Drainage shall also be provided to all safety valves on the electric hot water heaters to minimise scald risk. Foul waste shall be provided to the accessible toilet and cleaners cupboard adjacent.

Waste connections shall also be provided to the dishwasher and sink within the break room.

1.21 Sprinkler System

A dedicated sprinkler system is being installed in the Croydon facility. These works will be carried out by a specialist contractor, however, the mechanical contractor is to allow for co-ordination exercises to be undertaken between all parties to ensure a planned out services installation.

1.23 Inspection, Testing, Commissioning & Performance Testing

Inspect, test, commission and performance test the Building Services Works at works and on site, to demonstrate compliance with the Building Services Documents/associated BSRIA and CIBSE Guides and Codes and the requirements of Approved Documents (Building Regulations).

Where the performance of the Building Services Works fails to meet the requirements of the Building Services Documents, submit a method statement for the proposed remedial works including measures to be taken to prevent any delay to the programme for the Works.

Rectify any defects that become apparent during inspection, testing, commissioning and performance testing. Retest defective parts of the Building Services Works, and any associated interdependent systems, and demonstrate that the Building Services Works operate in accordance with the Building Services Documents.

Submit without delay any record that indicates that any part of the Building Services Works inspected or tested does not comply with the Building Services Documents along with a proposal for rectification.

Maintain records and certificates of inspections, testing, commissioning and performance testing undertaken demonstrating compliance with the Building Services Documents and other recognised standards including those carried out by third party testing agencies, and manufacturers.

Certify that the Building Services Works have been tested to recognised standards and the requirements of the Statutory Authorities, the Statutory Undertakings/Utility Suppliers, and service providers.

1.24 Training

The contractor shall provide training sessions, on the various systems installed within the building, these training sessions shall be for the staff responsible for the operational management of the building.

Appendices

Appendix A	Heat Recovery Unit
Appendix B	Electric Panel Heater
Appendix C	Electric Water Heaters
Appendix D	VRF Schedule
Appendix E	External Louvre Schedule
Appendix F	Extract Grilles Schedule
Appendix G	Supply Grilles Schedule
Appendix H	Storage Area Fans Schedule

Appendix A Heat Recovery Unit

PROJECT :	Shurgard Croydon
Project Number :	G1262
Date :	28/11/19
Revision:	Rev 01

EQUIPMENT SCHEDULE - HEAT RECOVERY VENTILATION UNIT

Reference	HRU/01
Location	Shop / Entrance
System	Supply & Extract Heat Recovery Unit
Number of units	01
Air Volume Flow Rate (l/s)	151 l/s Supply, 219 l/s Extract
Static Pressure (Pa)	116 Pa Supply, 150 Pa Extract
Specific Fan Power (W/l/s)	1.9
Fan Type	Internal Duct Mounted Heat Recovery Unit
Weight (kg)	242 kg
Number of Fans	2
Unit Size (L x W x H (mm))	1700 x 1150 x 340
Sound Power at 3m (dBA)	20
Electrical Details	
Electrical Power Input (kW)	6.4 (Includes 4.5Kw Electric Heater Battery)
FLC / SC (A)	19.4/19.4
Electrical Supply (V,Ø,HZ)	230/1/50
Supplier Details	
Manufacturer	NUAIRE - XBOXER XBC RANGE
Model Reference	XBC25-H-EES
Acoustic Treatment	The unit shall have asymmetric high mass double skinned wall construction (patented) with integral acoustic barrier mat.
Controls / Accessories	Ceiling void mounted HRU to be fitted using four drop rods and to be secured using standard unistruct channel to the steelwork. HRU to be provided with integral control panel to provide On/Off/Speed Control / Background Ventilation and Temperature Sensor integration or to allow BMS integration. 4.5kW Electric Supply and Extract Roomside Silencers (2 No XBC25-HS-MS10. Supply) and (2 No XBC25-HE-MS10 Extract) to be provided. HRU supplied with G4 Supply and Extract Filters plus Plate Heat Exchanger. HRU 01 to be locally controlled Ecosmart Wall Controller including temperature control.

Notes

- As Manufactured by Nuaire or equal and approved.
- The contractor shall be responsible for changing the fan pressure to compensate for any changes to the ductwork layout (types/quantities of bends etc.) from those indicated on the Tender drawings.
- Quoted fan duties include the following commissioning allowances : -10% on Flow Rate, 10% on Pressure.
- Specific Fan Power (SFP) at 25% of design flow rate to be no greater than that achieved at 100% design flow rate.
- Access for Maintenance shall be via hinged panels, allowing access for cleaning or removal of internal components
- Panel filters shall be replaced with new, after commissioning and before the SFP (Specific Fan Power) is checked for Building Regulations Compliance.

Appendix B Electric Panel Heater

PROJECT : SHURGARD Croydon

Project Number : G1262
Date : 21/11/19
Revision: Rev 01

EQUIPMENT SCHEDULE

Electric Panel Heaters

Ref	Floor	Room	Manufacturer	Type	Product Reference	Dimensions (mm)	Electrical Load (kW)	Notes
EH-01	Ground Floor	WC	Dimplex	Wall Mounted Low Surface Heater (LST)	LST050	688(h)x430(w)x105(d)	0.5	Unit to be supplied with built-in frost protection and 7day programmable time clock controller.

Notes:

1. As manufactured by Dimplex or equal and approved.
2. Units to be installed as per manufacturers requirements

Appendix C Electric Water Heaters

PROJECT : SHURGARD Croydon

Project Number :

G1262

Date :

21/11/19

Revision:

Rev 01

EQUIPMENT SCHEDULE

Electric Water Heaters

Ref	Floor	Room	Manufacturer	Type	Product Reference	Storage (litres)	Dimensions (mm)	Electrical Load (kW)	Weight (kg full)	Water Tank Material	Notes
WH/01	Ground Floor	Break Room	Hyco	Powerflow Unvented Multipoint Water Heater	PF30LC-1	30	630(h)x380(w)x295(d)	3.0	39	Stainless Steel	Unit to be supplied with manufacturers unvented accessory kit and expansion vessel
WH/02	Ground Floor	WC	Hyco	Speedflow Unvented Water Heater	SF05K	5	320(h)x280(w)x245(d)	3.0	10.5	Stainless Steel	Unit to be supplied with manufacturers unvented accessory kit and expansion vessel
WH/03	Ground Floor	Cleaners Cupboard	Hyco	Powerflow Unvented Multipoint Water Heater	PF30LC-1	30	630(h)x380(w)x295(d)	3.0	39	Stainless Steel	Unit to be supplied with manufacturers unvented accessory kit and expansion vessel

Notes:

1. As manufactured by Hyco or equal and approved.
2. Units to be installed as per manufacturers requirements

Appendix D VRF Schedule

Project : Shurgard Croydon

Project Number : G1262

Date : 21/11/19

Revision : Rev 01

EQUIPMENT SCHEDULE

Air Conditioning Units

Ref	Room	Indoor Unit				Cooling Mode	Heating Mode	Outdoor Condenser Unit						Supplier Details								
		No. of Indoor Units	Cooling Output (Total) per unit (kW)	Nominal Heating Output per unit (kW)	Unit Type			Air Volume Flow Rate (l/s)	Sound Power dBA	Room Temperature Setpoint (°C)	Room Temperature Setpoint (°C)	Location	System	Minimum Ambient Temperature (dB°C)	Design Ambient Temperature (°C)	Maximum Ambient Temperature (dB°C)	Refrigerant Type	Manufacturer	Indoor Unit Model / Reference	Electrical Power Input (Running Current - Amps Heating/Cooling)	Outdoor Condenser Unit Model / Reference	Electrical Power Input (kW)
FCU 001	Shop/Entrance	1	4.500	5.000	Leiling Mounted (4way cassette)	125/150/183	28/33/39	19°C	19°C	Ground	System 1	-3.6	10°C	31.4°C	R410A	Mitsubishi Electric	PLFY-P40VFM-E	0.23/0.28	PUMY-P125VKM4	4.94 (heating)/1.94 (cooling)	Starting current - 14 Running Current 16.51 (heating)/15.27 (cooling)	Fixed with BC controller to allow simultaneous heating/cooling mode. Each room to be supplied with PAR-33MAA wall mounted controller, plus any additional interface units required.
FCU 002	Shop/Entrance	1	4.500	5.000	Leiling Mounted (4way cassette)	125/150/183	28/33/39	19°C	19°C	Ground	System 1	-3.6	10°C	31.4°C	R410A	Mitsubishi Electric	PLFY-P40VFM-E	0.23/0.28				
FCU 003	Break Room	1	1.480	1.800	Leiling Mounted (4way cassette)	108/125/133	26/28/30	19°C	19°C	Ground	System 1	-3.6	10°C	31.4°C	R410A	Mitsubishi Electric	PLFY-P15VFM-E	0.14/0.19				

Notes

1. Ensure manufacturer's rating comply with BS 4856.
2. Units shall incorporate fixing lugs.
3. It is the responsibility of the contractor to ensure the final fan coil units selected
4. All units to be provided with high-lift condensate drain pump - contractor to utilise direct drain connection between unit and condensate drainage pipework wherever possible.
5. The contractor shall allow for all testing and commissioning of all areas of the fan coil unit installation.
6. As manufactured by Mitsubishi Electric or equal and approved.

Appendix E External Louvre Schedule

PROJECT: Shurgard Croydon

Project Number : G1262

Date : 21/11/19

Revision: Rev 01

EQUIPMENT SCHEDULE

External Louvres

Ref	Location	System	Air Volume Flow Rate Total (l/s)	No. of Louvres	Louvre Area (m2)	Pressure Drop (Pa)	Noise Level (DbA)	Width (mm)	Height (mm)	Manufacturer / Model	Notes
EL/01	Ground Floor	SF 01 Extract Fan	180	1	1.150	20 Pa	14	625 mm	525 mm	Solid Air /BMXN	To be fitted with bird and insect mesh, RAL colour to be confirmed by project architect
EL/02	Ground Floor	EF 01 Supply Fan	180	1	1.150	20 Pa	14	625 mm	525 mm	Solid Air/BMXN	
EL/03	Ground Floor	SF 02 Supply Fan	180	1	1.150	20 Pa	14	625 mm	525 mm	Solid Air /BMXN	
EL/04	Ground Floor	EF 02 Extract Fan	180	1	1.150	20 Pa	14	625 mm	525 mm	Solid Air/BMXN	
EL/05	1st Floor	SF 03 Supply Fan	198	1	1.150	20 Pa	14	625 mm	525 mm	Solid Air/BMXN	
EL/06	1st Floor	EF 03 Extract Fan	198	1	1.150	20 Pa	14	625 mm	525 mm	Solid Air/BMXN	
EL/07	1st Floor	SF04 Supply Fan	198	1	1.150	20 Pa	14	625 mm	525 mm	Solid Air/BMXN	
EL/08	1st Floor	EF04 Extract Fan	198	1	1.150	20 Pa	14	625 mm	525 mm	Solid Air/BMXN	
EL/09	2nd Floor	SF 05 Supply Fan	196	1	1.150	20 Pa	14	625 mm	525 mm	Solid Air/BMXN	
EL/10	2nd Floor	EF 05 Extract Fan	198	1	1.150	20 Pa	14	625 mm	525 mm	Solid Air/BMXN	
EL/11	2nd Floor	SF 06 Supply Fan	196	1	1.150	20 Pa	14	625 mm	525 mm	Solid Air/BMXN	
EL/12	2nd Floor	EF 06 Extract Fan	196	1	1.150	20 Pa	14	625 mm	525 mm	Solid Air/BMXN	
EL/13	3rd Floor	SF 07 Supply Fan	236	1	1.150	20 Pa	14	625 mm	525 mm	Solid Air/BMXN	

Appendix F External Grille Schedule

PROJECT : SHURGARD Croydon

Project Number : G1262

Date : 21/11/19

Revision: Rev 01

EQUIPMENT SCHEDULE

Extract Air Grilles

Ref	Floor	Room	Grille Air Volume (m ³ /s)	Type	Noise Rating (NR)	Max Pressure Drop (Pa)	Manufacturer/Model Grille Size	Type	Neck Size mm	Notes
EG 1/1	Ground	Storage Area	0.0360	Lourve Face Type Diffuser	35	20	Solid Air LRVD 250	4way	125	
EG 1/2	Ground	Storage Area	0.0360	Lourve Face Type Diffuser	35	20	Solid Air LRVD 250	4way	125	
EG 1/3	Ground	Storage Area	0.0360	Lourve Face Type Diffuser	35	20	Solid Air LRVD 250	4way	125	
EG 1/4	Ground	Storage Area	0.0360	Lourve Face Type Diffuser	35	20	Solid Air LRVD 250	4way	125	
EG 1/5	Ground	Storage Area	0.0360	Lourve Face Type Diffuser	35	20	Solid Air LRVD 250	4way	125	
EG 2/1	Ground	Storage Area	0.0600	Lourve Face Type Diffuser	35	20	Solid Air LRVD 325	4way	200	
EG 2/2	Ground	Storage Area	0.0600	Lourve Face Type Diffuser	35	20	Solid Air LRVD 325	4way	200	
EG 2/3	Ground	Storage Area	0.0600	Lourve Face Type Diffuser	35	20	Solid Air LRVD 325	4way	200	
EG 3/1	First	Storage Area	0.066	Lourve Face Type Diffuser	35	20	Solid Air LRVD 325	4way	200	
EG 3/2	First	Storage Area	0.066	Lourve Face Type Diffuser	35	20	Solid Air LRVD 325	4way	200	
EG 3/3	First	Storage Area	0.066	Lourve Face Type Diffuser	35	20	Solid Air LRVD 325	4way	200	
EG 4/1	First	Storage Area	0.099	Lourve Face Type Diffuser	35	20	Solid Air LRVD 325	4way	200	
EG 4/2	First	Storage Area	0.099	Lourve Face Type Diffuser	35	20	Solid Air LRVD 325	4way	200	
EG 5/1	Second	Storage Area	0.066	Lourve Face Type Diffuser	35	20	Solid Air LRVD 325	4way	200	
EG 5/2	Second	Storage Area	0.066	Lourve Face Type Diffuser	35	20	Solid Air LRVD 325	4way	200	
EG 5/3	Second	Storage Area	0.066	Lourve Face Type Diffuser	35	20	Solid Air LRVD 325	4way	200	
EG 6/1	Second	Storage Area	0.049	Lourve Face Type Diffuser	35	20	Solid Air LRVD 250	4way	125	
EG 6/2	Second	Storage Area	0.049	Lourve Face Type Diffuser	35	20	Solid Air LRVD 250	4way	125	
EG 6/3	Second	Storage Area	0.049	Lourve Face Type Diffuser	35	20	Solid Air LRVD 250	4way	125	
EG 6/4	Second	Storage Area	0.049	Lourve Face Type Diffuser	35	20	Solid Air LRVD 250	4way	125	
EG 7/1	Third	Storage Area	0.079	Lourve Face Type Diffuser	35	20	Solid Air LRVD 325	4way	200	
EG 7/2	Third	Storage Area	0.079	Lourve Face Type Diffuser	35	20	Solid Air LRVD 325	4way	200	
EG 7/3	Third	Storage Area	0.079	Lourve Face Type Diffuser	35	20	Solid Air LRVD 325	4way	200	
EG 8/1	Third	Storage Area	0.059	Lourve Face Type Diffuser	35	20	Solid Air LRVD 325	4way	200	
EG 8/2	Third	Storage Area	0.059	Lourve Face Type Diffuser	35	20	Solid Air LRVD 325	4way	200	
EG 8/3	Third	Storage Area	0.059	Lourve Face Type Diffuser	35	20	Solid Air LRVD 325	4way	200	
EG 8/4	Third	Storage Area	0.059	Lourve Face Type Diffuser	35	20	Solid Air LRVD 325	4way	200	
EG 9/1	Ground	Incoming Services	0.039	Lourve Face Type Diffuser	35	20	Solid Air LRVD 250	4way	125	
EG 9/2	Ground	Shop	0.122	Lourve Face Type Diffuser	35	20	Solid Air LRVD 400	4way	250	
EG 9/3	Ground	Break Room	0.028	Lourve Face Type Diffuser	35	20	Solid Air LRVD 250	4way	125	
EG 9/4	Ground	Cleaners	0.013	Lourve Face Type Diffuser	35	20	Solid Air LRVD 250	4way	125	
EG 9/5	Ground	WC	0.017	Lourve Face Type Diffuser	35	20	Solid Air LRVD 250	4way	125	

Notes:

- As manufactured by Solid Air or equal and approved.
- All Supply diffusers to be provided complete with side entry plenum boxes unless noted otherwise.
- The Contractor shall ensure that plenum boxes/spigot sizes are selected to meet the air volume and room noise criteria.
- Supply diffusers to be complete with base frame and removable front panel
- Static pressure and sound pressure levels not to exceed stated values.
- Unless noted otherwise, all grilles and diffusers shall be fitted with opposed blade dampers, this shall be fitted either to the grille or fitted to the plenum box spigot.
- All grilles shall be supported independently of the ceiling grid or plasterboard sidewall.
- Finish: powder coat to an RAL colour as confirmed by project architect

Appendix G Supply Grilles Schedule

EQUIPMENT SCHEDULE	Supply Air Grilles
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Ref	Floor	Room	Grille Air Volume (m³/s)	Type	Noise Rating (NR)	Max Pressure Drop (Pa)	Manufacturer/Model Grille Size	Type	Neck Size mm	Notes
SG 1/1	Ground	Storage	0.0360	Jetflow Diffuser	35	20	JTGA 160 - 2 elements	JTG-AO	310x198	Connection to ductwork to include volume control damper.
SG 1/2	Ground	Storage	0.0360	Jetflow Diffuser	35	20	JTGA 160 - 2 elements	JTG-AO	310x198	Connection to ductwork to include volume control damper.
SG 1/3	Ground	Storage	0.0360	Jetflow Diffuser	35	20	JTGA 160 - 2 elements	JTG-AO	310x198	Connection to ductwork to include volume control damper.
SG 1/4	Ground	Storage	0.0360	Jetflow Diffuser	35	20	JTGA 160 - 2 elements	JTG-AO	310x198	Connection to ductwork to include volume control damper.
SG 1/5	Ground	Storage	0.0360	Jetflow Diffuser	35	20	JTGA 160 - 2 elements	JTG-AO	310x198	Connection to ductwork to include volume control damper.
SG 2/1	Ground	Storage	0.0600	Jetflow Diffuser	35	20	JTGA 160 - 2 elements	JTG-AO	310x198	Connection to ductwork to include volume control damper.
SG 2/2	Ground	Storage	0.0600	Jetflow Diffuser	35	20	JTGA 160 - 2 elements	JTG-AO	310x198	Connection to ductwork to include volume control damper.
SG 2/3	Ground	Storage	0.0600	Jetflow Diffuser	35	20	JTGA 160 - 2 elements	JTG-AO	310x198	Connection to ductwork to include volume control damper.
SG 3/1	First	Storage	0.0495	Jetflow Diffuser	35	20	JTGA 160 - 2 elements	JTG-AO	310x198	Connection to ductwork to include volume control damper.
SG 3/2	First	Storage	0.0495	Jetflow Diffuser	35	20	JTGA 160 - 2 elements	JTG-AO	310x198	Connection to ductwork to include volume control damper.
SG 3/3	First	Storage	0.0495	Jetflow Diffuser	35	20	JTGA 160 - 2 elements	JTG-AO	310x198	Connection to ductwork to include volume control damper.
SG 3/4	First	Storage	0.0495	Jetflow Diffuser	35	20	JTGA 160 - 2 elements	JTG-AO	310x198	Connection to ductwork to include volume control damper.
SG 4/1	First	Storage	0.0660	Jetflow Diffuser	35	20	JTGA 160 - 2 elements	JTG-AO	310x198	Connection to ductwork to include volume control damper.
SG 4/2	First	Storage	0.0660	Jetflow Diffuser	35	20	JTGA 160 - 2 elements	JTG-AO	310x198	Connection to ductwork to include volume control damper.
SG 4/3	First	Storage	0.0660	Jetflow Diffuser	35	20	JTGA 160 - 2 elements	JTG-AO	310x198	Connection to ductwork to include volume control damper.
SG 5/1	Second	Storage	0.0490	Jetflow Diffuser	35	20	JTGA 160 - 2 elements	JTG-AO	310x198	Connection to ductwork to include volume control damper.
SG 5/2	Second	Storage	0.0490	Jetflow Diffuser	35	20	JTGA 160 - 2 elements	JTG-AO	310x198	Connection to ductwork to include volume control damper.
SG 5/3	Second	Storage	0.0490	Jetflow Diffuser	35	20	JTGA 160 - 2 elements	JTG-AO	310x198	Connection to ductwork to include volume control damper.
SG 5/4	Second	Storage	0.0490	Jetflow Diffuser	35	20	JTGA 160 - 2 elements	JTG-AO	310x198	Connection to ductwork to include volume control damper.
SG 6/1	Second	Storage	0.0490	Jetflow Diffuser	35	20	JTGA 160 - 2 elements	JTG-AO	310x198	Connection to ductwork to include volume control damper.
SG 6/2	Second	Storage	0.0490	Jetflow Diffuser	35	20	JTGA 160 - 2 elements	JTG-AO	310x198	Connection to ductwork to include volume control damper.
SG 6/3	Second	Storage	0.0490	Jetflow Diffuser	35	20	JTGA 160 - 2 elements	JTG-AO	310x198	Connection to ductwork to include volume control damper.
SG 6/4	Second	Storage	0.0490	Jetflow Diffuser	35	20	JTGA 160 - 2 elements	JTG-AO	310x198	Connection to ductwork to include volume control damper.
SG 7/1	Third	Storage	0.0590	Jetflow Diffuser	35	20	JTGA 160 - 2 elements	JTG-AO	310x198	Connection to ductwork to include volume control damper.
SG 7/2	Third	Storage	0.0590	Jetflow Diffuser	35	20	JTGA 160 - 2 elements	JTG-AO	310x198	Connection to ductwork to include volume control damper.
SG 7/3	Third	Storage	0.0590	Jetflow Diffuser	35	20	JTGA 160 - 2 elements	JTG-AO	310x198	Connection to ductwork to include volume control damper.
SG 7/4	Third	Storage	0.0590	Jetflow Diffuser	35	20	JTGA 160 - 2 elements	JTG-AO	310x198	Connection to ductwork to include volume control damper.
SG 8/1	Third	Storage	0.0590	Jetflow Diffuser	35	20	JTGA 160 - 2 elements	JTG-AO	310x198	Connection to ductwork to include volume control damper.
SG 8/2	Third	Storage	0.0590	Jetflow Diffuser	35	20	JTGA 160 - 2 elements	JTG-AO	310x198	Connection to ductwork to include volume control damper.
SG 8/3	Third	Storage	0.0590	Jetflow Diffuser	35	20	JTGA 160 - 2 elements	JTG-AO	310x198	Connection to ductwork to include volume control damper.
SG 8/4	Third	Storage	0.0590	Jetflow Diffuser	35	20	JTGA 160 - 2 elements	JTG-AO	310x198	Connection to ductwork to include volume control damper.
SG 9/1	Ground	Shop	0.0390	4 Way Diffuser	35	20	LRVD 250		125	
SG 9/2	Ground	Break room	0.0280	4 Way Diffuser	35	20	LRVD 250		125	
SG 9/3	Ground	Shop	0.0610	4 Way Diffuser	35	20	LRVD 325		200	

- Notes:
1. As manufactured by Solid Air or equal and approved.
 2. All Supply diffusers to be provided complete with side entry plenum boxes unless noted otherwise.
 3. The Contractor shall ensure that plenum boxes/spigot sizes are selected to meet the air volume and room noise criteria.
 4. Supply diffusers to be complete with base frame and removable front panel
 5. Static pressure and sound pressure levels not to exceed stated values.
 6. Unless noted otherwise, all grilles and diffusers shall be fitted with opposed blade dampers, this shall be fitted either to the grille or fitted to the plenum box spigot.
 7. All grilles shall be supported independently of the ceiling grid or plasterboard sidewall.
 8. Finish: powder coat to an RAL colour as confirmed by project architect

Appendix H Storage Area Fans Schedule

