

M L SHAW FABRICATIONS LTD.

M L SHAW FABRICATIONS LTD.
IKV (INTELLIGENT KITCHEN VENTILATION) SYSTEM
NATIONAL ENGINEERING SPECIFICATION

Revision 1

3rd March 2010

Contents

SPECIFICATION EXPERT - INTRODUCTION.....	3
C14 BUILDING SERVICES SURVEY	4
S32 NATURAL GAS.....	5
U19 VENTILATION (SELF CONTAINED SPECIFICATION)	5
Y51 TESTING AND COMMISSIONING OF MECHANICAL SERVICES	11
Y54 IDENTIFICATION - MECHANICAL.....	12
Y90 FIXING TO BUILDING FABRIC.....	13

SPECIFICATION EXPERT - INTRODUCTION

This document has been compiled using Specification Expert, which is copyright to National Engineering Specification Limited which is part of the AMTECH Group.

The content incorporates that of the National Engineering Specification (NES).

NOTES

Dependant on the nature of the works specified within this document, the specification shall contain some or all of the items below:-

SYSTEM SPECIFICATIONS

The system specifications are sub-divided into four parts:-

Part 1 System objectives:

The system objectives are clauses giving details of design information, system performance and description, together with lists of the system schematics and drawings.

Part 2 Selection schedules for the reference specifications:

These selection schedules specify items in the systems that are contained in the Reference Specifications (Y group). Required Y group clauses are invoked by reference.

Part 3 Clauses specific to the system:

These specification clauses are specific to the system concerned and in general make no reference to the Y group clauses.

Part 4 Reference Specifications (Clauses from the Y Group).

All the reference specifications relevant to all the systems for the job.

C14 BUILDING SERVICES SURVEY

PART 1 SYSTEM OBJECTIVES

100.010 PERFORMANCE OBJECTIVES

- Obtain and verify currency of proposed and or existing survey or building drawing information.
- Determine the location, nature and condition of the proposed and or existing survey or engineering drawing information.
- Include for all costs necessary to update the existing kitchen ventilation system / gas supply / kitchen equipment installation serving the kitchen to comply with current legislation and local authority requirements.

100.030 SYSTEM DESCRIPTION

- The mechanical services contractor shall visit site during the tender period and allow for all costs to co-ordinate with the building structure and existing building services.

S32 NATURAL GAS

PART 1 SYSTEM OBJECTIVES

100.010 PERFORMANCE OBJECTIVES

The mechanical services contractor will provide a new or modify the existing natural gas supply system serving the kitchen equipment which will be safety interlocked with the IKV kitchen ventilation system.

100.020 DESIGN PARAMETERS

The new or existing natural gas installation serving the kitchen shall comply with current legislation and local authority requirements.

100.030 SYSTEM DESCRIPTION

The mechanical service contractor will install an emergency gas solenoid valve at the outlet of the meter with a quarter turn isolating valve on each side of the solenoid valve. The emergency gas solenoid valve will be linked to 2No. gas knock off buttons located adjacent to each of the exit doors via the interlock panel and also the fire alarm system.

The gas installation will be interlocked with the IKV ventilation system to comply with BS 6173.

100.040 CONTROL REQUIREMENTS

The gas solenoid valve will be activated by 2No. Emergency knock off buttons located adjacent to the exit doors, and also on activation of the fire alarm system. The mechanical service contractor will include for all controls wiring from the IKV control panel to the solenoid valve and knock off buttons.

U19 VENTILATION (SELF CONTAINED SPECIFICATION)

100.000 SYSTEM DETAILS

To provide a mechanical supply and extract ventilation system to serve the kitchen which fully complies with current Building Regulations and HVCA specification DW172.

100.010 SYSTEM DESCRIPTION

M L Shaw will supply, install and commission an IKV supply and extract kitchen ventilation system including the canopy c/w supply and extract air spigot connections, two piece grease filters, lighting, double deflection grilles etc - supply AHU and extract fan and interconnecting ductwork.

The supply air will be taken from the roof mounted supply air handling unit, via sheet metal ductwork and onto the canopy supply spigot connection. The AHU will consist of inlet louvre, filters (panel or bag), LPHW heater battery and supply fan and silencer. The supply ductwork installation will be complete with melinex lined attenuation, or acoustic insulation.

The mechanical services contractor will provide suitable sized heavy weight steel LPHW F&R connections or a suitably sized three phase power supply to the heating coil on the AHU. The mechanical services contractor will provide and install a 3-port valve arrangement and associated controls to serve the LPHW coil, as the M L Shaw IKV detail.

The extract air shall be taken in sheet metal ductwork from the canopy; the vitiated air will be discharge via a roof mounted extract fan with vertical discharge. The extract ductwork will be wrapped with acoustic insulation. ML Shaw will provide all necessary upstands and weather proofing as required to facilitate the installation.

M L Shaw will provide all necessary supports for the ventilation system. Heating pipework supports will be provided by the Mechanical Services Contractor.

100.030 CONTROL REQUIREMENTS

M L Shaw will supply, install and commission and IKV automatically controlled energy saving kitchen ventilation system to comply with BS 6173 and HVCA specification DW172. The kitchen ventilation system will be complete with speed controllers. The locations of the control panels will be agreed on site with the M Shaw project engineer.

The mechanical services contractor will include for installing the gas interlock system and all wiring to the IKV control panel.

M L Shaw will provide all stats, and pressure switches for the operation and automatic control of the supply and extract units, all field wiring from the control panel to the sensors and switches will be carried out by the mechanical services contractor.

100.040 SYSTEM DRAWINGS

As indicated on the IKV drawings.

200.000 PLANT AND EQUIPMENT

200.001 PRESSURE EQUIPMENT DIRECTIVE/PRESSURE EQUIPMENT REGULATIONS:

All equipment and assemblies which fall within the scope of the Pressure Equipment Directive (PED) 97/23/EC, implemented in the UK through the Pressure Equipment Regulations 1999, must be tested by the manufacturers, and be certified as compliant with the Directive. Such compliance shall be evidenced by displaying the appropriate CE Mark on the equipment and assemblies. Only relevant equipment and assemblies certified as compliant will be permitted under this specification, and any substitution put forward must also be compliant with the Directive.

200.010 AIR HANDLING UNITS:

- Type A
- Application Kitchen supply air handling unit.
- Manufacturer and reference to be provided by M L Shaw c/w speed controller
- Duty
 - Location Roof mounted designed to shed water.
 - Air volume
 - Supply (m^3/s) to be provided by M L Shaw based on number and type of cooking appliances
 - External air resistance (Pa) as calculated by the M L Shaw
 - Sound Power Level
 - Select fan, motor, drive and speed control system not to exceed
 - typical fan noise level spectra as given in CIBSE Guide.
- Double skin unit.
- Panel material
 - Manufacturer's standard.
- Casing Finish
 - Manufacturer's standard.
- Air handling unit construction
 - General construction
 - Construct unit to withstand maximum fan static pressure without deformation.
 - Casing Insulation
 - Insulation complies with BS 476-6 and BS 476-7.
 - Insulation is fixed securely to panel, and protected to prevent migration of fibre into air flow.
 - Insulation to provide
 - thermal treatment.
 - acoustic treatment.
 - Insulation material

Provide insulation that is inorganic, vermin proof and non-hygroscopic.

- Framework
 - Framework is rigid enough to prevent distortion during transportation and after final assembly on site.
 - 30mm pentapost
- Base
 - Continuous channel base
- Air handling unit access
 - Access openings and covers complete with opening devices, and sealed to prevent air leakage.
 - Seals are designed for normal maintenance operations for a minimum of 10 years.
- External air handling units
 - Air handling units for external use will be provided with weatherproof isolators.
 - M L Shaw will provide and install all necessary supports to facilitate the installation of the supply and extract systems.
- Fan
 - Centrifugal, double inlet double width
 - Backward curve.
- Motor
 - Electrical supply to BS 7697
 - Three phase.
- Fan section
 - Frame for motor and fans shall comply with fire regulations.
 - Frame is isolated from casing.
 - Mount motor
 - Internally.
- Panel filter
 - Filter media is retained in frame.
 - Filter Media
 - Canfill panel and Bag
 - Filter frames
 - Aluminum.
- Filter panel EU4 and Bag filter EU7
- Heating coil
 - Duty
 - Rating (kW) to be agreed AIR ON COIL TEMP -3°C OFF COIL +20°C.
 - Water temperature
 - Flow (°C) 82
 - Return (°C) 71
 - Heating coil complete with 3-port valve arrangement. 3-port valve and associated controls and flow and return pipework will be provided and installed by Mechanical Contractor.
 - Draining and venting
 - Coil complete with venting and draining devices.
 - Pipe connections
 - Threaded to BS 21 and BS EN 10226-1.

Installation

Air is straightened as it leaves unit discharge.

Ductwork connection is long enough to maintain the aerodynamic performance of the fan.

Seal panels around electrical cable and pipework service entry points to prevent air leakage.

Provide flexible cables between fan motor and local isolator.

200.050 EXTRACT UNITS:

- Type B
- Application Kitchen extract fan
- Manufacturer and reference to be provided by M L Shaw
 - Select roof extract units from Quality Assured firms registered under CAME scheme.
 - Extract (m^3/s) to be provided by M L Shaw based on number and type of cooking appliances
 - External air resistance (Pa) as calculated by the M L Shaw
- Double skin unit.
 - Or approved equivalent
 - Sound Power Level

Select fan, motor, drive and speed control system not to exceed

- typical fan noise level spectra as given in CIBSE Guide.
- Operation
 - Single.
 - Horizontal discharge.
- Fan
 - Centrifugal.
- Materials
 - to suit external application
- Electrical safety to BS EN 60335-2-80.
- Motor
 - Electrical supply to BS 7697
 - Three phase.
- Accessories
 - Speed controller - Provide speed controller to match fan.
- Testing
 - Where fans approved under CAME scheme are used provide certified data for type.
 - the extract fan will be complete with speed control and interlocked with the supply air system and gas supply system.

200.090 PLANT AND EQUIPMENT WORKMANSHIP:

Install all plant and equipment in accordance with manufacturer's instructions.

200.100 ELECTRICAL SUPPLY:

- Application Power wiring to supply and extract fans, and control panel
- Incoming power to BS 7697
 - Three phase.
- Electrical installation to be carried out by
 - Electrical contractor
- Requirements
 - As Work Section V90 Electrical installation.
 - Carry out electrical installation in accordance with BS 7671.

300.000 DUCTLINES AND ANCILLARIES

300.010 DUCTWORK FABRICATION:

M L Shaw will prepare fabrication drawings and carry out fabrication of ductwork in accordance with DW 144 and DW 154 as appropriate.

300.020 DUCTWORK DIMENSIONS:

Sizes of ductwork are internal dimensions. Where applicable make allowance for any internal lining.

300.030 INSTALLER SELECTION:

- Use a member of the HVCA specialising in the trade of manufacturing and installing ductwork.

300.040 DUCTWORK AND FITTINGS:

- Type A
 - Application Kitchen supply ductwork
- Design Information
 - Supply ductwork in accordance with classification in DW144 Table 1.
 - Ductwork Classification and Air Leakage limits
 - Low pressure - Class A - Positive.
- Ductwork air leakage testing
 - Carry out ductwork air leakage testing on high pressure ductwork in accordance with DW 144 as procedures set out in DW 143.
 - Test medium pressure ductwork in accordance with DW144, A5.
 - Testing plant items, DW 144, Part 8, A.8.
- Plant connections.
 - Make connection between air handling assembly and ductwork system in accordance with DW 144.

- Flanged connections.
Provide bolted flanged joints for connecting ductwork to flanged items of plant, builder's work frames and where removable sections of ductwork are required.

300.080 ACCESSORIES - METAL DUCTWORK:

- Flexible Joints
 - Position
 - To make connections to air conditioning units.
- Access openings
 - Provide access openings in accordance with DW 144 Part 7 Section 20.
 - Provide access for cleaning in accordance with DW 144 Part 7, paragraph 20.8 and
 - Appendix M Table 25 Level 2.
- Provide hangers and supports throughout in accordance with DW 144 Part 6.
- Regulating dampers
Provide regulating dampers in accordance with DW 144 Part 7 Section 21.
 - Function
 - Balancing damper.
- Fit bird screens of 13mm square mesh wire on all intake and extract louvres to atmosphere. Wire gauge to be not less than 1mm.

300.100 DUCTWORK WORKMANSHIP:

Install ductwork in accordance with DW 144, and DW 154 as appropriate. Ensure that there are no sharp edges or corners on cut edges on ductwork, flanges and supports. Arrange ductwork to drain any entrained moisture and ensure the lapping of joints minimises moisture leakage.

Connection to builder's work. Comply with DW 144 Part 7 Section 28.

Space supports in accordance with DW 144 Part 6 or DW 154 Part 5 as appropriate.

- Internal cleanliness
 - Provide the level of cleanliness and protection as defined in HVCA document DW/TM2.
 - Basic.
- Weatherproofing
 - Fit ductwork with trimming angle and weather cravat, skirt, flashing plate and cowl where ductwork passes through or terminates in roof, to ensure a weatherproof seal to building structure
- Enclose ducts passing through building elements, (walls, floors, partitions, etc.) within purpose made sleeves. Cut sleeves of the same material as the duct and pack with mineral fibre or similar non-flammable and fire resistant material to form a fire/smoke stop of adequate rating and to prevent air movement and noise transmission between duct and sleeve.
- Provide test holes in ductwork system to allow complete testing and balancing of system in accordance with CIBSE Commissioning Code Series A.
- Site drill test holes on site in accordance with DW144 Part 7 Section 20.6.
- Provide holes in metal ductwork, in accordance with DW144 Part 7, paragraph 20.7, to accommodate control sensors in positions and sizes indicated on drawings.
- Fit sensors, damper motors and other control equipment as indicated on drawings.
- Provide instrument connections where indicated on drawings.

500.000 THERMAL INSULATION**500.010 THERMAL INSULATION - MATERIALS:**

- Type A
- Application LPHW F&R pipework to be insulated with CFC free Koolphen phenolic foam insulation with a foil face finish and taped to provide seal.

Standards

Comply in general with BS 5422 and the British Standards publications referred to therein. Also comply with BS 5970. Description of terms as BS 3533.

Thermal conductivity

Ensure values are in accordance with BS 874 and BS 2972.

Fire rating

Employ materials that comply with BS 476-4, non-combustibility test, or obtain a Class 'O' fire rating to Building Regulations.

When finished, comply with BS 476-7.

- Class 1 spread of flame

500.020 THERMAL INSULATION WORKMANSHIP:

Carry out thermal insulation work using one of the scheduled firms employing skilled craftsmen conversant with class of work.

Do not apply thermal insulation until installation has been fully tested and all joints proved sound.

Ensure all materials are kept dry.

Insulate each unit separately. Do not enclose adjacent units together.

Apply insulants, facings, coatings and protection strictly in accordance with manufacturer's instructions.

Neatly finish joints, corners, edges and overlaps and, where possible, arrange overlaps to fall on blind side.

Ensure overlaps are neat and even and parallel to circumferential and longitudinal joints.

600.000 COMMISSIONING

600.010 COMMISSIONING REQUIREMENTS:

- Type A
M L Shaw will test and commission the supply and extract air systems serving the new canopy.
- Clean ductwork before plant is first run, using access openings in ductwork.
- Put system to work and demonstrate that specified duties are attained plus or minus:
 - 10%
- Carry out commissioning of installations in accordance with the procedures, checks and tolerances given in the BSRIA Application Guide for air systems to achieve the standards set in the CIBSE Commissioning Codes.
- Carry out checks and procedures as detailed in CIBSE Commissioning Code A, Section A1.
- Set to work and regulate air distribution systems in accordance with CIBSE Commissioning Code A, Section A2.
- Ensure that the control system functions in accordance with the requirements specified in clause 100.030.
- Keep a systematic record of commissioning results.

700.000 CONTROLS

700.010 CONTROL COMPONENTS:

- Type A
- Application Heater battery 3-port control valve provided by the Mechanical Contractor. Kitchen supply and extract fan speed controllers provided by M L Shaw, together with ventilation interlock panel. These shall be located in the kitchen in a position to be agreed on site with the Client and
- Provide and fix control components to meet the requirements specified in clause 100.030.
- Provide wiring to the control system to meet the requirements of BS 7671 (the IEE Wiring Regulations).

Y51 TESTING AND COMMISSIONING OF MECHANICAL SERVICES

Y51.2010 PRESSURE TESTING - GENERAL:

Comply with procedures given in HVCA Guide to Good Practice for Site Pressure Testing of

Y51.3020 COMMISSIONING CODES:

Carry out commissioning of installations in accordance with the procedures, checks and tolerances given in the BSRIA Application Guides for water systems and air systems to achieve the standards set in the CIBSE Commissioning Codes.

Y51.3055 COMMISSIONING OF GAS PLANT AND SYSTEMS:

Commission gas fired plant on industrial and commercial premises in accordance with IGE/UP/4.
Commission gas supply systems in accordance with BS EN 12327.

Y51.3080 COMMISSIONING PLANT ITEMS:

Comply with the manufacturer's recommendations for setting to work.

Y51.3090A INSTRUMENTS AND GAUGES:

Ensure instruments are correctly calibrated. Record details of instruments on record sheets.
Submit evidence of correct calibration of instruments to be used in connection with commissioning and testing.

Y54 IDENTIFICATION - MECHANICAL

Y54.2030A PLANT AND EQUIPMENT IDENTIFICATION, ENGRAVED PLATES:

Standards

Identify each item of equipment by name and, where appropriate, by agreed reference characters.
Provide colour identification as called for in work sections and, in all cases, colour fire fighting equipment red.

Identification Colours

Use primary and secondary identification colours of associated system.

Plates

Use rectangular metal or laminated plastic, securely fixed to each item of equipment.

Lettering

Engraved plates filled with paint.

Legends

Engrave plates with an approved text. Incorporate operating duty of equipment where this is not incorporated in other labeling.

Y54.2040 VALVE AND COCK IDENTIFICATION:

Standards

Identify each valve, cock, stop valve, air vent, drain cock etc. with disc engraved with numerical reference. Except where exposed in occupied areas.

Identification Colours

Use primary and secondary identification colours of associated system for painted or self colour discs.

Discs

Securely attach metal or laminated plastic discs, minimum diameter 35mm, to each item.

Legends

Engrave discs with permanent characters, minimum height 6mm.

Incorporate in operating instructions relating to regulating valves and flow measuring equipment, details of flow rate, pressure differential and setting, as appropriate.

Y54.2090 DANGER AND WARNING NOTICES:

Hazardous Systems

Colour code and label hazardous systems and equipment to requirements of Health and Safety Executive Guidance Notes.

Y54.2100C SYSTEM IDENTIFICATION INSTALLATION CHARTS, PLASTIC ENCAPSULATED:

System Schematics

Supply and fix a referenced schematic diagram (or diagrams) of all systems as installed, including equipment and ancillary schedules. Show scheduled information on diagram. Identify all items by appropriate reference characters.

Control Schematics

Supply and fix a referenced schematic diagram (or diagrams) of all control systems as installed, including equipment and ancillary schedules. Show scheduled information on diagram. Identify all items by appropriate reference characters.

Location

Fix in each boiler house, calorifier room, plant room or equipment room.

Finish

Plastic encapsulated chart.

Y90 FIXING TO BUILDING FABRIC

Y90.2010 STANDARDS:

Ensure that fixings such as expanding anchors are tested for tensile loading in accordance with BS 5080-1.

Y90.2020 PLUGS:

Use plugs of suitable size and length for fixings. Use plastic, fibrous or soft metal non-deteriorating plugs to suit application. Do not use wood plugs.

Ensure that when screw is in place, threaded length is in plug. Ensure plugs used for screw fixing are set-in to correct depth prior to final tightening.

Y90.2030 SCREWS:

Use screws to BS 1210. Generally use sherardized steel wood screws for fixing to concrete, brickwork or blockwork.

In damp or exposed situations use greased brass wood screws.

Y90.3010 DRILLING:

Drill holes squarely. Use drills of requisite size and depth, and appropriate to fabric. Do not flame-cut holes in metal work.

Y90.3020 PROPRIETARY FIXINGS:

Comply with manufacturer's instructions for all fixings.

Y90.3040 FIXING TO BRICKWORK:

Do not fix to unsound material or mortar between brickwork courses.

Y90.3050 FIXING TO TIMBER RAILS:

Fix equipment, brackets and supports by drilling hole through timber rail and fixing with bolt, back plate, washer and loose nut.

Y90.3070A FIXING TO CONCRETE, BRICKWORK OR BLOCKWORK:

Fix equipment, brackets and supports using wood screws in plugs.

Drill holes and fix using steel bolts of grouted bolt type or expanding bolt type fixing.

Y90.3080A FIXING TO METALWORK:

Fix equipment, brackets and supports by drilling holes and fixing using set screws or bolts complete with washers, shakeproof washers and loose nuts.

Y90.3090A FIXING TO STRUCTURAL STEELWORK AND CONCRETE STRUCTURES:

Provide manufacturer's information on recommended fixing. Obtain approval for any fixing to structure steel work and concrete structures.

Generally use proprietary fixings to structural steelwork and concrete structures.

Obtain approval to cut holes in structural steelwork or concrete structures or weld to structural steelwork.