

MECHANICAL SERVICES SPECIFICATION

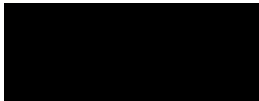
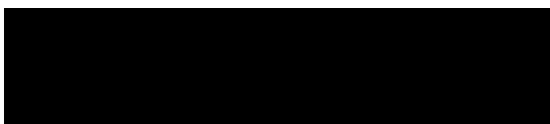
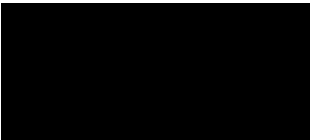
HEATON PARK FARM CENTRE

Manchester City Council

Document No. 27/206/MS/01/B

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GENERAL MECHANICAL SPECIFICATION

GENERAL

The Contractor shall note that this document does not include the ECS Consultants General Mechanical Services Specification.

This document is available for inspection at the offices of ECS Consultants Ltd or can be e-mailed upon request in PDF format.

The Contractor shall note that any claims resulting from not examining this document at tender stage shall not be entertained.

PARTICULAR MECHANICAL SPECIFICATION

GENERAL

The following specification relates to the supply, installation, testing and commissioning of mechanical installations within Heaton Park Farm Centre.

The Contractor shall note no claims shall be entertained for loss of potential earnings due to any sections of the tender summary being omitted from the contract.

The Contractor shall include to liaise with the Contract Administrator to ensure that the proposed installation will be harmonised with the methods of construction.

The Contractor shall include where applicable, to liaise with the principal and other sub-contractors to effect fully coordinated systems.

The Contractor shall include to cross-reference this specification with the appropriate drawings. In all situations, any discrepancies shall be resolved by the Contractor, including within the tender the worst-case scenario.

The particular mechanical specification shall comprise of the following sections:

1. GENERAL NOTES
2. CONTRACT ADMINISTRATION
3. SCOPE OF WORKS
4. REMOVAL OF EXISTING SERVICES
5. GAS SERVICES INSTALLATION
6. HEATING INSTALLATION
7. DESTRATIFICATION FANS
8. HOT & COLD WATER SERVICES INSTALLATION
9. TESTING, COMMISSIONING, AS FITTED DRAWINGS AND MAINTENANCE MANUALS
10. SYSTEM DEMONSTRATION
11. DRAINING DOWN AND VENTING THE SYSTEM
12. SYSTEM WARRANTY
13. INTERNAL AND EXTERNAL ELEVATIONS

1. GENERAL NOTES

The complete mechanical works, as detailed in this Particular Specification or shown on the associated mechanical drawings, shall be carried out to the satisfaction and in accordance with the rules, regulations and requirements of the supply authority, the fire officer concerned (if applicable), the appropriate British Standard Code of Practice. The works shall pass the survey of their respective inspectors. The final test and inspections for completion of the certificates as required shall be witnessed by the Contract Administrator. The Contractor shall serve all notices for testing, pay all fees in connection therewith and any additional charge for re-testing. Compliance with these requirements must be to the entire satisfaction of the contract administrator.

The Tenderer will be deemed to have visited the site and be fully aware of all conditions relevant to the installations. Any ambiguity on the drawings or specification must be clarified during the period of tendering. Arrangements to visit the site or clear any ambiguity may be made with the contract administrator.

Additional claims will not be entertained after receipt of the tenders due to lack of knowledge on the part of the Tenderer.

This section of the Specification shall be read in conjunction with the preliminary clauses, tender drawings, General Specification for Mechanical Engineering Services and Conditions of Contract. In the event of any discrepancy between the General Specification and the Particular Specification and tender drawings, the Particular Specification and tender drawings shall be followed. However, any ambiguity should be checked with ECS prior to any works being undertaken.

The installation shall comply with all relevant statutory instruments, standards, and regulations **current at the date of tender** and in particular with the following:

1.1. **Statutory Requirements**

- (i) The Health and Safety at Work Act
- (ii) The Management of Health and Safety at Work Regulations
- (iii) The Workplace (Health, Safety and Welfare) Regulations
- (iv) The Construction (Health, Safety and Welfare) Regulations
- (v) The Construction (Design and Management) Regulations
- (vi) The Building Regulations
- (vii) The Electricity at Work Regulations
- (viii) The Electricity Safety, Quality and Continuity Regulations
- (ix) Control of Substances Hazardous to Health
- (x) RIDDOR - Reporting of Injuries, Diseases and Dangerous Occurrences Regulations
- (xi) Control of Pollution Act 1974 – The Contractor shall employ the ‘best practical means’ as defined in the Control of Pollution Act 1974 to minimise noise and vibration resulting from his operations and shall have regard to BS5228
- (xii) HSC Approved Code of Practice – The Control of Legionella Bacteria in Water Systems
- (xiii) Water Regulations
- (xiv) Gas Safety Regulations
- (xv) Document L8, Prevention of Legionella in Water Systems
- (xvi) All relevant British and European Standards
- (xvii) Part G Building Regulations

1.2. **British and European Standards and Guidance Notes**

- (i) CIBSE Guides
- (ii) The Institute of Plumbing Guides
- (iii) IWCA Publications
- (iv) All relevant British and European Standards

Where Provisional Sums are included; details must be resolved early by application for details to the contract administrator, to avoid delay or disruption to the job programme. Such sums will or will not be expended at the discretion of the Contract Administrator.

1.3. Site Visit

Tenderers are strongly recommended to visit the site during the tender period to assess the practical difficulties of the project and to include for same within their offer, as no variation of costs will be considered on the plea of insufficient information during the tender period.

Site visits should be made by prior arrangement with Tony Jones of who can be contacted on telephone number 0161 773 1085. The postal address of the site is M25 2SW.

1.4. Building Construction

The existing building comprises of a two-storey traditional masonry construction. The building comprises of a ground and first floor.

The ground floor comprises of a solid concrete floor. All further floors are of chamber construction with timber joist floorboards and plasterboard ceilings.

The internal works are a mixture of either brick or timber stud with plaster finish.

The roof construction comprises of various interconnecting pitches with a tiled roof and a plasterboard finish.

1.5. Asbestos

The Contractor shall note that it is understood to the best of our knowledge that asbestos is not present in any working areas of this contract. However, if any suspect materials are discovered all work in the area shall be suspended and the construction administrator informed immediately. The Contractor shall note the residual quantities of asbestos remain in the building. The Contractor shall consult the asbestos report.

The Contractor shall obtain a copy of the Asbestos Register from the Contract Administrator and include to review prior to the submitting of the tender.

If, during the project works, any suspect materials are discovered in the existing building, all work within the area shall be suspended and the contract administrator will be informed.

1.6. The Contractor

The Contractor shall be registered with Building Engineering Services Association (BESA) with Gas works executed by a Gas Safe IGEM Registered Organisation.

The Mechanical Contractor selected to execute the work will be required to carry out the complete mechanical building services Installation in accordance with the general technical specification; the relevant performance specification and the associated drawings.

The Contractor must co-ordinate the installation with all domestic sub contractors to ensure the design criteria outlined on the tender drawings and this specification are complied with.

The Contractor shall retain on site, during all working hours, a competent foreman who shall be a fully accredited representative with authority to accept and carry out formed and authorised instructions.

2. CONTRACT ADMINISTRATION

The following section shall be read in conjunction with the employers' requirements, all other contract documents, and the general conditions of contract.

2.1. General – Contractor as Principal Contractor

Where the Contractor is acting as the Principal Contractor, all following clauses relating to the 'Principal Contractor' shall be included for within their tender return.

Under the project and contract, the Contractor shall be the Principal Contractor. Items of liaison, costs and management within the following sections relate to specific actions to be undertaken by the Contractor.

2.2. Tender Drawings

The tender drawings issued in relation to the works show the general arrangement of works and are indicative. These are intended as a guide to the Contractor.

Drawing Number:

27/206/M/01 – Existing Ground Floor Mechanical Services Strip-out Layout

27/206/M/02 – Proposed Ground Floor Mechanical Services Layout

The approximate positions of plant, equipment, accessories, and all other equipment are shown on the drawings. The Contractor shall confirm all such positions with the contract administrator prior to proceeding with the work. The Contractor shall ascertain the mechanical installation will not foul any other trade or services and any work re-done due to negligence will be at his own expense.

The Contractor must be fully conversant with the Health and Safety at Work Act 1974, CDM Regulations and the Control of Asbestos Regulations (CAR) 2012 and will be held fully responsible for all actions by his employees which contravene the aforementioned Regulations. Copies may be obtained from H.M. Stationery Office.

The Contractor shall make no claims for lack of knowledge relating to sight of Architect's, Structural Engineers, and any other specialist drawings. All related drawings are held at the offices of ECS Consultants and are available for examination.

2.3. Working Drawings

Three weeks prior to the commencement of any works in a specific area, the Contractor shall submit to the contract administrator's representative, detailed working drawings of all pipe / duct routes and final locations of equipment.

These drawings shall also include sizes of pipework / ductwork systems.

Prior to submission the drawings shall be signed and dated by the Contractor's engineer/foreman.

The Contractor shall allow a period not exceeding five working days for approval. Any points of ambiguity shall be resolved within this period.

2.4. Coordination Drawings

During the production of the working drawings, The Contractor shall liaise with the other services Contractors to ensure that the drawings are fully co-ordinated.

If there are areas of the building where agreement cannot be reached, these matters shall be resolved during a meeting held at the offices of ECS Consultants Limited.

This schedule shall be submitted for approval prior to the commencement of any works.

The Contractor shall ascertain the electrical installation will not foul any other trade or service. Any work required to be re-done due to lack of coordination shall be carried out by The Contractor at their own expense.

2.5. Site Meetings

The programming of meetings shall be decided by the contract administrator and Principal Contractor to the mutual convenience of all parties.

2.6. Approval of Materials

Prior to the procurement of any materials, the Contractor shall submit a schedule of all accessories, equipment, complete with relevant manufacturers for final comment.

2.7. Product Samples

Prior to the procurement of any plant, emitters, or accessories, the Contractor shall include to provide product samples for final Client comment.

All samples shall be presented within three weeks of the contract being awarded.

2.8. Quotations

Whilst every endeavour has been made to ensure the accuracy of quotations from suppliers where produced for numbered schedules, ECS Consultants cannot guarantee their accuracy. It is the responsibility of the Contractor to ensure the accuracy of part references, quantities, etc, and make due allowance within the tender.

2.9. Final Positions

Prior to setting out the position of any accessory the Contractor shall obtain confirmation in writing from the Principal Contractor / Contract Administrator that the details they are working to are correct and current and where confirmation is to be sought shall obtain same prior to installation.

Any claim for lack of information due to incorrect setting out or any other reason whatsoever will not be considered.

The Contractor shall note the position of all accessories, as detailed on the appropriate drawings. The final locations shall be determined by a site walk around with the Contract Administrator, Project Architect and Client.

The Contractor shall note that any deviations from the ECS drawings up to 2000mm either side horizontally/vertically of the accessory position shall be carried out at the Contractor's own expense.

2.10. Approval of Sub-Contractors

The Contractor shall compile a complete schedule of all sub-Contractors they propose to employ the services of during the contract.

This schedule shall be submitted for comment prior to the commencement of any works.

2.11. Programme of Works / Access Arrangements

The Contractor shall include to issue a detailed programme of works inclusive of all agreed key date to the Principal Contractor / Contract Administrator.

2.12. Special Restrictions of Work

2.12.1 General Installation

Generally, works shall be carried out as agreed with the Principal Contractor and Contract Administrator.

2.12.2 Key Dates and Contract Conditions

The Contractor shall note that the installation key dates shall be determined by the Contract Administrator in line with their project programme.

The Contractor shall include to liaise with the Contract Administrator during the tender period to ascertain their Contract Terms.

The Contractor shall include within their tender all associated costs with complying with the Contract Administrator's Contract Terms.

The Contractor shall include to liaise with the Contract Administrator during the tender period to determine start and completion dates.

2.12.3 Instructions

The Contractor is reminded that instructions must only be accepted in keeping with Contract procedures.

Instructions or directions shall not be accepted from unauthorised parties and if in doubt shall be verified by the Principal Contractor. Any work carried out at the request of an unauthorised source will be at risk.

2.12.4 Project Management Report

The Contractor shall include to provide a two-weekly report to the Contract Administrator during the first fix/second fix/commissioning phase of the project. This shall be typewritten and not longer than two sides of A4 paper. This shall comprise of: -

- (i) Progress
- (ii) H & S incidents
- (iii) Client liaison
- (iv) Sub-Contract Issues
- (v) Technical Queries

Each report shall be complete with a minimum of ten colour photographs of the current area being worked upon.

3. SCOPE OF WORKS

3.1. General

The mechanical contracts shall be in accordance with the drawings and specifications and shall consist of the following works:

1. Gas Boiler Heating System and Distribution Pipework/Radiator Removal
2. Gas Pipework Strip Out Works
3. Electric Heat Emitters Installation
4. Electric Hot Water Cylinder Installation
5. Destratification Fan Installation

The contractor shall note that in all circumstances the installation shall be installed flush. The contractor shall note that in particular circumstances, exposed services shall be considered. This shall be in areas such as the engine room, plant rooms and where exposed services are a part of the aesthetic.

The Contractor shall include to have read at tender stage, all information relating to the architectural, structural, and electrical services proposals and to be fully aware of the extent of the works required.

All materials and items of equipment are to be of the same manufacturer of their various types in order to standardise and simplify maintenance and replacement.

Tenders are to be submitted strictly in accordance with the requirements detailed on the drawings and as contained in the specification and qualifications by the Contractor will be recognised.

The whole of the works shall be carried out in a workmanlike manner to the satisfaction of the Contract Administrator. All materials are to be adequately protected and stored and the tender price is to include for the provision of all necessary cabins required for this purpose and welfare facilities for the Contractor's operatives.

No variations or additions to the contract are to be undertaken without the prior approval of ECS Consultants.

The tenderer shall note that the premises are to be left in a clean and tidy manner at the cessation of work on each working day.

4. REMOVAL OF EXISTING SERVICES

The Contractor shall include during tender stage to undertake a comprehensive site survey to ascertain the full scope of the removal disposal and adaptation works. No claims shall be entertained in relation to lack of knowledge in relation to existing systems.

4.1. **General**

The Contractor shall include to disconnect, cut back, remove, and dispose of existing redundant mechanical services as detailed below and on the appropriate drawing. This shall include the existing: -

INTERNAL REMOVAL

- (i) Heating System and Associated Emitters
- (ii) Gas Pipework (Serving Plantroom Only)
- (iii) Domestic Hot Water Cylinder
- (v) Boiler Flues
- (vi) Control Panel

EXTERNAL REMOVAL

- (i) Boiler Flues

The Contractor shall note that the boiler flues terminate through the roof of the building. The Contractor shall ensure that once the flues are removed, the Contractor shall repair the roof with slates to match the existing installations. The Contractor shall ensure that these slates match the existing in every aspect.

The Contractor shall note that pipework systems have not been fully identified and a degree of tracing will be required to ascertain the extent of removal works.

The Contractor shall note all hot and cold water services shall be retained. The Contractor shall include to carry out an investigation to cut back any dead legs within the demise.

The Contractor shall note that there are various drawings concerning this element of the work including extensive notes. This shall be read in conjunction with this specification.

The Contractor shall note that the heating system, domestic hot water and cold-water systems shall be locally isolated and drained down prior to any removal works.

4.2. **Internal Removal Works**

4.2.1 **Heating**

The Contractor shall note the existing heating system plant is located in the ground floor plantroom. The heating plant comprises of a wall mounted boiler with flues penetrating through the wall. The system comprises of steel pipework, steel panel radiators and pipe coils

The Contractor shall include to isolate, remove, and dispose of the complete installation, within the demise. All plant shall be removed and all penetrations are to be made good. The making good of penetrations shall be the responsibility of the Principal Contractor.

The Contractor shall note that the boiler flues terminate through the roof of the building. The Contractor shall ensure that once the flue are removed, the Contractor shall repair the roof with slates to match the existing installations. The Contractor shall ensure that these slates match the existing in every aspect.

4.2.2 **Hot and Cold Water Services**

The Contractor shall note the existing hot and cold water services shall be retained.

The Contractor shall note all hot and cold water services shall be retained. The Contractor shall include to carry out an investigation to cut back any dead legs within the demise.

4.2.3 Gas Pipework

The Contractor shall include to strip back the existing gas pipework serving the plantroom to the meter. The Contractor shall include to trace, strip back and remove all exposed gas pipework serving the plantroom, and shall cap the gas meter.

4.2.4 Control Panel

The Contractor shall include to isolate and remove the existing BMS that is serving the existing gas fired heating system.

5. GAS SERVICES INSTALLATION

5.1. Incoming Gas Service

5.1.1 Existing Income Retained

The Contractor shall note that the existing Kitchen gas meter and pipework shall be retained.

The Contractor shall note that the gas pipework serving the plantroom shall be stripped back to the meter and the meter shall be capped.

The Contractor shall include to cap off and purge any gas pipework within the floor regarding the plantroom gas strip-out.

6. HEATING INSTALLATION

6.1. General

This section comprises the supply and installation of the new heating installation including all heating plant heat emitters and distribution systems.

This shall form a complete installation in all respects to the details shown on the drawing and this specification.

6.2. Heat Emitters

6.2.1 Electric Radiant Panels

The Contractor shall include to design, supply, install, test, and commission the suspended electric radiant heating panels installation within the WC areas as detailed on the appropriate drawing.

The Contractor shall liaise with the Contract Administrator regarding the colour and finish of these electric radiant panels.

The Contractor shall note the electric radiant panels shall be controlled via PIR sensors. The Contractor shall include to free issue the PIR controllers complete with adjustable override between 20 seconds and 20 minutes.

The Contractor shall note that the proposed electric radiant panels shall be suspended via threaded rod systems, which shall be fixed to the ceiling. The Contractor shall note that four hangers are required for each heating panel.

6.2.2 Electric Storage Heaters

The Contractor shall install new electric storage heaters as indicated on the drawings. These heaters are specified within the schedule of equipment section of this document. The Contractor shall include to provide samples to the Contract Administrator for their sign off prior to order.

The Contractor shall include to supply and install the storage heaters in the positions indicated on the appropriate layout. All electrical connections and testing of the systems shall be undertaken by the Electrical Contractor. The Mechanical Contractor shall include to liaise with the Electrical Contractor to ensure adequate electrical supplies are provided to each heater location.

The Contractor shall be responsible for checking all storage heaters dimensions against the building prior to placing order. The storage heaters shall be complete with appropriate wall fittings to ensure the heaters are firmly fixed to the back wall.

The Contractor shall include for all storage heaters to be moved 2000mm either side of the drawing location in order to suit final layouts.

Following the initial installation, testing, and commissioning of the heating system, the Contractor shall allow for the removal and reinstatement of storage heaters to allow for decoration.

The Contractor shall refer to the drawing to ascertain numbers and locations of all storage heaters.

The electrical storage heaters shall be controlled via local built in thermostats with seven-day programmable timers.

The Contractor shall include to liaise with the Electrical Contractor regarding all electrical installation works associated with the storage heaters.

The Contractor shall note that all fixing of electrical heaters shall be made into mortar blocks, rather than into the masonry brick/block, in order to maintain the historic masonry.

7. DESTRATIFICATION FANS

The Contractor shall include to supply and install a new destratification fan within the Cafe area.

The Contractor shall include to liaise with the Electrical Contractor regarding wiring for the destratification fan operation.

The destratification fan shall operate via destratification speed controller. The destratification fan shall be located at high level within the Cafe area.

The Contractor shall include for appropriate method of fixing fans and include for all necessary scaffolding. The Contractor shall include to liaise with the Structural Engineer and Architect and provide all weight loadings to ensure all equipment can be suitably fixed.

8. HOT & COLD WATER SERVICES INSTALLATION

8.1. General

This section comprises the supply and installation of the complete hot and cold water services installation.

This shall form a complete installation in all aspects to the details shown on the drawings, this specification, BSEN 806, HSE L8 and the Water Regulations.

8.1.1 Cold Water Service (Existing Income)

The Contractor shall include to supply and install a complete water installation to facilitate the proposed domestic hot water cylinder system. The Contractor shall note that the existing building benefits from an existing mains cold water supply.

All water pipework shall be installed in copper pipework complete with soldered joints.

Following completion of the cold water services the complete system shall be chlorinated, tested, and commissioned.

All pipework and associated equipment shall be installed in compliance with document L8, Prevention of Legionnaires Disease.

8.2. Hot Water Services

8.2.1 Electric Hot Water Cylinder (Direct)

In the position shown on the drawings and in strict accordance with the manufacturer's installation instruction, the Contractor shall supply and install one electric hot water cylinder.

The cylinder shall be set up, commissioned, and put into operation by the manufacturer/ approved specialist.

The Contractor shall supply and install direct on mains 'unvented supply kit' to suit the new cylinder.

The Contractor shall include to test and commission the complete hot water cylinder and hot water pipework systems following the works.

The electric water cylinder shall be capable of achieving a supply temperature of 60°C and shall have an electrical supply of 16A main supply cable at 230 Volts, 1 phase, 50Hz.

8.3. DHW Return Pump

The Contractor shall supply and install a hot water return pump serving the hot water circuit.

The pump details can be found in the mechanical Schedules of Equipment.

Isolation valves, non-return valves, flexible connections and gauges shall be provided for each pump set/pump as detailed in the general specification and drawings.

The Contractor shall include to supply a spare DHW return pump within the plant room to enable pump changeover should the pump fail. This pump shall be hung on the wall within the plant room, location to be agreed with the Contract Administrator.

8.4. Pipework Material

8.4.1 Copper Pipework (soldered joints)

The Contractor shall include to carry out the minor pipework adaptations to connect the new electric hot water cylinder into the existing hot water services.

All pipework for hot and cold service shall be copper tube to BS EN 1057 and as detailed in the General Specification with fittings in accordance with the same.

8.5. Pipework Routing

8.6. Insulation

8.6.1 Metal Clad Insulation

The Contractor is to allow for insulating the following services using Kingspan Kooltherm Foil Faced Phenolic Foam pipe insulation with Metal Clad covering throughout.

1. The new hot and cold water pipework (minor adaptations) within the plant room.
2. The insulation is to have a thermal conductivity of 0.035W/mk with wall thickness for each service being as detailed on the following lists.
3. All pipework within the plant room to be metal clad insulated with valve bags fitted to all valves, flanges, unions, and low loss headers in all locations with metal clad covering.

All preparation works and installation procedures are to be carried out to the Manufacturer's recommendations.

This system shall be complete with identification bands and valve insulation bags.

All other requirements for insulation works are laid down in the General Specification.

8.6.2 General – Insulation Thickness

The pipework shall be covered by insulation to the following thicknesses:

Domestic Hot Water Pipework

Domestic Cold-Water Pipework - Frost Protection

Nominal Bore (mm)	Minimum Thickness of Insulation (mm)
15	25
22	19
28	19
35	19

Domestic Hot and Cold-Water Pipework

Nominal Bore (15mm)	Minimal Thickness of Insulation (mm)	
	Hot	Cold
15	20	20
22	25	20
28	25	20
35	25	20
42	30	25

50	30	25
65	30	25
80	30	25

8.7. Testing and Commissioning

The Contractor shall include to re-chlorinate the existing hot and cold water services in line with the programme.

The Contractor shall obtain the services of a suitably qualified water hygiene specialist to carry out water treatment and chlorination of the complete system.

All works shall be carried out to BSEN806.

The system shall then be flushed to remove all traces of chlorine.

Bacteriological samples shall then be taken and sent to a public analyst for examination.

All results shall be presented to the Contract Administrator for comments as part of the whole commissioning procedure.

9. TESTING, COMMISSIONING, AS FITTED DRAWINGS AND MAINTENANCE MANUALS

9.1. Operation and Maintenance Manual

The Contractor shall include to obtain the services of a suitable qualified Consultant to supply one final paper copy document and two CDs / USB memory sticks for the complete project.

The CD's/USB memory sticks shall be in PDF format with Adobe Acrobat Reader.

The CD's / USB memory sticks shall contain the following files:

- (i) PDF word document as described below
- (ii) PDF files of all manufacturers literature
- (iii) Acrobat Reader

The Operation and Maintenance manual shall comprise of fourteen sections enclosed within separate divided sections. These sections shall detail:

1. Introduction and Project Overview
2. Description of Systems
3. Safety and Statutory Requirements
4. Construction of installation components and equipment
5. Operation and Maintenance by the building user
6. General Maintenance and Fault Finding by Maintenance Personnel
7. System Maintenance Planned and Preventative
8. Emergency Procedures
9. Installation Testing, Inspection, Commissioning and Tabulated Results
10. Schedule of Manufacturers and Spares
11. As Fitted Drawings

All sections shall be typed throughout and where applicable contain tables, A4 CAD drawings and coloured photographs to supplement written descriptions.

Six weeks prior to practical completion the Contractor shall submit details of any deviations from the original specifications and all manufacturers' literature. A draft copy of the proposed Operation and Maintenance manual will then be issued to the Contractor for comment four weeks prior to practical completion.

The final copies shall be enclosed within an A4 sized four ring binder complete with external clear PVC inserts. These copies shall be complete with title covers and spine indication.

At handover the Contractor shall include to insert the following information:

1. Test Certificates
2. Calibration Certificates
3. Specialist System Certificates

The final copies shall be submitted to the Principal Designer (If CDM applicable) and client at practical completion.

Following submission after practical completion, if any further amendments are still required. The client's planning supervisor shall include to indicate these in black pen and fax the appropriate sheets to the above specialist.

The Electrical Contractor shall to produce As Fitted Drawings using AutoCAD software 2017 or newer.

The Contractor shall include to clearly mark up the installation drawing with the appropriate changes. These drawings shall be submitted with the comments on the draft manual two weeks prior to practical completion.

All final copy As Fitted Drawings shall be included within the Operation and Maintenance manual.

The Electrical contractor shall obtain a further full set of As Fitted Drawings.

The Contractor shall note that under no circumstances shall Practical Completion be issued if the following documentation is not handed over for the completion date.

- i **O & M Manuals**
- ii **As Fitted Drawings**
- iii **Test Certificates**
- iv **Health and Safety Information**

9.2. Testing and Commissioning

Items of equipment not capable of withstanding test pressures shall be isolated.
Where necessary sectional tests shall be carried out to suit the programme of work.

On completion of the pressure tests a heat regulation test shall be carried out to ensure that all new and existing circuits are in balance. The settings of the regulation valves shall be noted and copies given to the Client and final copies contained within the Operation and Maintenance Manuals.

Where fixed orifice valves are installed, the Contractor shall demonstrate that mass flow rates are proportionally correct. These demonstrations are to be witnessed by the Client's representative.

Where applicable all automatic controls, time switches, thermostats, etc., shall be set to details furnished by the Client.

It will be necessary to liaise with the Engineer and the Client's representative to check during the commissioning process.

The Contractor is also to permit the Engineer to have access to the control panel for function checks and attend on him during these times to rectify and modify the system to meet design parameters.

Note: Any changes to wiring or panels are to be carried out by the Contractor to maintain the warranty during the defect's liability period.

The Contractor is to allow for two-stage control commissioning on all systems as follows:

- (i) Manufacturers are to commission all plant and controls and the outstation and mains panel after interconnecting wiring is complete.
- (ii) The systems shall be demonstrated to the Engineer and representatives of the Client with control manufacturers in attendance.

The Contractor will be responsible for calling this meeting and 'proving' the system to the satisfaction of the Engineer and the Client's representative.

Test certificates for all services shall be prepared and signed by the Contractor and countersigned by the Engineer or the Client's representative after test witness. The certificate is then to be submitted for record purposes and contained within the operation and maintenance manuals.

Furthermore, the Contractor shall include returning to site for seasonal testing and commissioning provisions for summer and winter operation during the defect's liability period.

10. SYSTEM DEMONSTRATION

The Mechanical Contractor shall allow a half day attendance for demonstrating the full scope of the mechanical installation. The purpose of the demonstration is to teach the Client and his representatives how to operate the various systems.

The demonstration shall be presented and structured in the following format:

- 1) Description / Operation of the Heating System including Controls
- 2) Description / Operation of the Hot Water Services

During the Demonstration / Teaching session the Operation and Maintenance Manual shall be handed over to the Client.

The Contractor shall include employing a specialist to film all demonstrations and providing the Client with two DVD copies.

11. DRAINING DOWN AND VENTING THE SYSTEM

The Contractor shall include all suitable keys to drain, refill and vent the system.

Following the completion of the new works, the system shall be filled, all air expelled and a suitable chemical inhibitor added.

Following the filling and operation of the system the Contractor shall include to return to site on two further occasions during the defects period, to expel further air from the total heating system. This shall include areas not within the construction area but forming part of an existing system that has been drained down.

12. SYSTEM WARRANTY

The Contractor shall include to provide a post practical completion two-year manufacturer's parts and labour warranty on key items of equipment.

13. INTERNAL AND EXTERNAL ELEVATIONS



External South Elevation



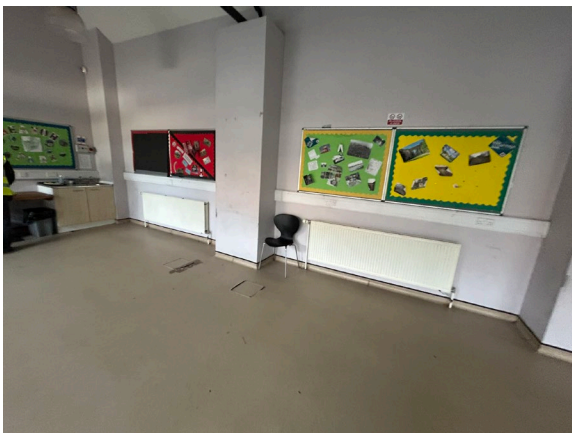
External East Elevation



Boiler Flues Penetrating Roof



Example of WC Ceiling



Activity Classroom Elevation



Café Elevation

PRICED SECTION

SCHEDULE OF WORKS**MECHANICAL WORKS**

		Quant	Unit	Rate	£	p
1	Removal of Existing Services		Item			
2	Gas Services Removal		Item			
3	Heating Installation		Item			
4	Destratification Fan		Item			
5	Hot and Cold-Water Services Installation		Item			
6	Testing, Commissioning, As Fitted Drawings and Maintenance Manuals		Item			
7	System Demonstration		Item			
8	Draining Down and Venting the system		Item			
9	System Warranty		Item			
10	Internal and External Elevations		Item			

DESIGNER RISK ASSESSMENTS

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THE CONSTRUCTION (DESIGN & MANAGEMENT) REGULATIONS 2015
DESIGNERS RISK ASSESSMENT SHEET

PROJECT: Heaton Park Farm Centre

PROJECT No: 27/206

ENGINEER: B.Donnellan

DATE: July 2025

20ACTIVITY	HAZARD	RISK ASSESSMENT			ACTION
		1	2	3	
<u>1. CONFINED SPACES</u> Access to and working within the Plantroom.	a) Inadequate lighting or ventilation. b) Injury or damage through falling through ceiling or falling off ladders. c) Working in confined spaces d) Exposure to dust and fibres			✓	i) Temporary lighting. ii) Comply with Control of Substances Hazardous to Health (Amendment) Regulations 2004.
<u>2. LIFTING AND LOADING</u> Moving, unloading and mounting, boilers and ductwork etc. Installation of high-level ventilation system and flue installation.	a) Injury to operatives		✓		i) Comply with Manual Handling Regulations 1992, (Amended 2005). ii) Consider 'Team Handling' for equipment above 20Kg iii) Craneage required for Air handling and Air Conditioning Plant. iv) Cordon off area, provide method statement and co-ordinate with Highways Department.
<u>3. WORKING FROM HEIGHTS</u> Installation of electric radiant panels and destratification fan at high level.	a) Falls from height of persons, materials and tools.			✓	i) Comply with provision and Use of Work Equipment Regulations 1998. ii) Post warning notices and restrict access to the working area where there is a possibility others may be below the work.

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ACTIVITY	HAZARD	RISK ASSESSMENT			ACTION
		1	2	3	
<u>4. NOISE</u> Work involving use of hammers, percussion drills, core drilling, concrete and brickwork drilling.	a) Noise levels that are in excess of the 'second action level' of 90db(A)			✓	i) Comply with the Noise at Work Regulations 2006 and the Personal Protective Equipment at Work Regulations 1992.
<u>5. FIRE</u> Using propane torch for soldered joints. Oxyacetylene welding equipment	a) Fumes, fire and burns b) Explosions		✓		i) Consider hot work permit system to ensure that only the proper use of equipment by trained and competent personnel is permitted. ii) Protect combustible materials in the vicinity of the work. iii) Check that nothing is left smouldering at end of work. iv) Check cavities, eaves and other voids at the end of work. v) Comply with the Personal Protective Equipment at Work Regulations 1992.

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ACTIVITY	HAZARD	RISK ASSESSMENT			ACTION
		1	2	3	
6. ELECTRICITY Working on or near low voltage equipment (up to 415 volts) during the removal of existing supplies and during the installation of new supplies. Portable equipment.	a) Electric shock, fires. Burns and physical injury (fall from ladders etc.) b) Electric shock, fires. Burns and physical injury. c) Tripping over trailing leads, faulty flexible cables.			✓	i) Comply with the following: - Electricity at Work Regulations 1989. Low Voltage Electrical Equipment (Safety) Regulations 1994. Institution of Engineering & Technology Regulation for Electrical Installations (IET Wiring Regs.) and the related Codes of Practice published by the British Standards Institution. These documents contain the requirements pertaining to safety from electrical shock, fire, burns and physical injury in prescribed circumstances.
6. ELECTRICITY (Contd.) Electrical testing and test equipment	d) Electricians need to work on or near live conductors, danger of electrocution, shock and burns, chemical burns if batteries are used, fall from ladders etc. caused by reaction to non-lethal electric shocks from voltages including those below 50 volts.			✓	Only NICEIC Electrical Contractors are to be employed. Approved Contractors are required to carry out their work with materials of good quality, installed by competent electricians who are adequately supervised. Partially completed electrical work shall during erection and/or on completion <u>before being put into service</u> , be inspected, and tested to verify, so far as is reasonably practical, that the requirements of the Regulations have been met (the Contractor to provide a method statement on how this is to be achieved.)

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ACTIVITY	HAZARD	RISK ASSESSMENT			ACTION
		1	2	3	
<u>7. ASBESTOS REMOVAL</u> Existing asbestos materials shall be removed by Principal Contractor. Check client safety documentation with regard to this. The Contractor is to consult the Asbestos Register.	a) Inhalation of the dust can cause respiratory disease and cancer.			✓	i) Identify presence and type of asbestos materials. ii) Removal work to comply with Control of Asbestos at Work Regulations 2006 as amended. iii) Only Licensed Operatives to be employed to comply with the Control of Asbestos Regulations (CAR) 2012.
<u>8. GAS</u> Work associated with the gas service adaptations.	a) Explosion of fire resulting from gas leak.	✓			i) Comply with the Gas Safety (Installation and Use) Regulations 1998. ii) Only operatives who are registered with ACOPS can carry out work on LPG gas installations. iii) Contractors to be Gas Safe registered.
<u>9. HAZARDOUS MATERIALS</u> Soldering compounds for the jointing of pipework.	a) Inhalation or skin contact with chemicals.			✓	i) Inhibitor chosen must be nontoxic and non-irritant. ii) Avoid contact with skin or eyes

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ACTIVITY	HAZARD	RISK ASSESSMENT			ACTION
		1	2	3	
<u>10. DUST AND DIRT</u> General dust and dirt associated with the construction process. Power Tools Core Drilling Hammer or percussion tools.	a) Risk to health of operatives and public b) Trailing cables and flexible water pipes c) Slip and dust inhalation d) Vibration damage to operatives e) Refer to item 4.			✓	i) Use of powered cutters and grinders to have inbuilt powered dust extraction. ii) Comply with the Control of Substances Hazardous to Health Regulations 2004. iii) Comply with Personal Protective Equipment at Work Regulations 1998. iv) Use specialist providers for core drilling. v) Clean up working area. vi) Refresh hand damage training and monitor operatives'; working times vii) Comply with the Control of Substances Hazardous to Health (Amendment) Regulations 2004. viii) Comply with Personal Protective Equipment at Work Regulations 1992.

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RISK ASSESSMENT TABLE

LIKELIHOOD

H	3	1	1
M	3	2	1
L	3	3	2
	L	M	H

SEVERITY

SEVERITY

H- Fatality, major injury causing long term disability
M- Injury or illness causing short-term disability
L-Other injury or illness

LIKELIHOOD

H- Certain or near certain
M- Reasonably likely
L-Very seldom or never

ACTION

1. High Risk: Action required
2. Medium Risk: Action required unless good reason
3. Low Risk: No action required, but review for high severity category.