

WIVELSFIELD VILLAGE HALL

EAST END EXTENSION

MECHANICAL SERVICES SPECIFICATION

VOLUME 2 -

PARTICULAR PRELIMINARY REQUIREMENTS

WIVELSFIELD VILLAGE HALL EAST END EXTENSION MECHANICAL SERVICES SPECIFICATION VOLUME 2 – MECHANICAL PARTICULAR PRELIMINARY REQUIREMENTS

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1.0 PREFACE

This document, together with the other volumes of this specification and drawings must be read in conjunction with the Contract Conditions.

In the interest of consistency and clarity, reference to the Contractor has been made throughout the documents in the male gender. This has been done without prejudice and where these references are made it should be interpreted equally for the female gender.

2.0 CONTRACT CONDITIONS

The successful Contractor will be appointed as the Main Contractor. A copy of the Main Contract Conditions is issued under separate cover.

3.0 MINIMUM REQUIREMENTS

The whole of the works covered by this contract shall be carried out in full compliance with the relevant sections of the following:

Current Parliamentary & Governmental Legislation including but not limited to:

Carry out the works incorporated within this Contract in compliance with the relevant sections of the following:

- CIBSE Guides
- BESA Guides
- IEE Regulations
- British and European Standards
- IEC EMC Design Guides
- Health and Safety Regulations
- Building Regulations
- Water Regulations
- Gas Regulations
- CDM Regulations

N.B: Should any of the foregoing standards, codes of practice or regulations change during the contract period, advise the Employers Agent accordingly requesting instructions on how to proceed.

4.0 DOCUMENTS AND DRAWINGS

The Contractor shall keep an up to date set of contract documents on site at all times.

Design Installation/Working Drawings, Schedules and Schematics

Produce a complete set of design/installation drawings. Indicate all conduit routes, draw-in boxes, pipe runs, equipment locations, fixing and supports details in sufficient detail to facilitate well managed and co-ordinated installation of the systems.

Produce a detailed schedule of installation working and builders work drawings indicating the drawing content, drawing size, scale, drawing status and issue date. Updated and reissued the schedule to the Main Contractor and all members of the professional team on a regular and frequent basis as the project progresses. Allow 5 days from first issue for the CA's first comment and further time at the Contractors discretion for incorporation of modifications that may arise from the CA's comment.

The CA's comment relates to the general principals of the scheme and shall not be taken as signifying that the drawing/detail has been fully checked or ratified by the CA. Irrespective of the CA's comment the Contractor remains responsible for the correctness and adequacy of his drawings.

Include on the detailed design/installation drawings, as a minimum, the following as applicable to the scope:

- a) 1:50 scale general arrangement drawings for each area indicating the following: -
- i. Heating Services
 - ii. Domestic Hot and Cold Water Services
 - iii. Ventilation Services
 - iv. Above Ground Drainage
 - v. Heating/domestic water schematics
 - vi. Auxiliary Services.
 - vii. All Plant and Equipment
 - viii. Detailed Requirements for Builders Work

Clearly indicate all cable trunking, conduit, pipework, ductwork co-ordinated with all other services and including working dimensions as required, but as a minimum including principle setting out dimensions for all major service routes.

b) Single line schematic diagrams for all installations illustrating: electrical distribution, wiring diagrams, control panels, control field wiring and equipment, ventilation, heating, and domestic services pipe work, gas distribution from incoming meter to final point of use etc, indicating cable/pipe/duct sizes and flow rates, complete with distribution board schedules, valve schedules and others, all equipment schedules, (these may be included in A4 format). Indicate the type and size of all pipework, cables and the arrangements and rating of all plant, switchgear, including pressure drops, flow rates, prospective short circuit ratings, external earth loop impedances and the connected load, etc.

c) Supplementary Detail sheets as required.

The Contractor may use design drawings produced for tender purposes as a basis for the working drawings at his own discretion. Disks will be available on request. However, it remains the Contractor's responsibility to ensure that there is sufficient information on the drawings to enable his staff to carry out the installation.

Ensure that an up-to-date set of working drawings is available on site for his operatives at all times throughout the contract. Ensure that within the schedule of quantified rates, a financial element is included to update the drawings from time to time as contract variations are issued.

Site and 'As-Installed' Drawings

Keep one set of drawings on site and mark onto these drawings all deletions, additions and revisions as the works proceed. If requested, present three at all site meetings.

Provide two sets of paper prints, together with four sets of CDs or memory sticks with the drawing prepared in AutoCAD release 2016 or higher, clearly indicating the installed services on completion of the works. Dimensioned from permanent, easily recognizable datum points.

Submit for comment to the CA and incorporate comments on the drawings prior to the final issue.

Clearly mark each drawing 'As Installed'.

Provide copies of plant schematics, valve charts and plant room general arrangement drawings mounted on a hard back with frame and clear plastic fascia for each plant room. Fix framed schematics to the wall in the plant room. Provide for each mechanical services control panel a complete wiring diagram secured inside the panel. The preceding plant room and control panel drawings are additional to those provided in the O & M Manual itself.

Builders work Drawings

Produce a complete set of builder's work drawings and details, fully noted and dimensioned, identifying all elements of the services installation builders work. Include all builders work being undertaken by the Main Contractor, in sufficient detail for construction.

Operating and Maintenance Manuals

Produce 2 complete copies of the service manuals for the whole of the works. The service manual for each discipline, i.e. electrical, mechanical, etc. will comprise twelve sections prepared by the Contractor.

Submit the whole of the information to the C.A. correlated and indexed in relevant sections for his comments prior to the anticipated handover. Discuss the presentation, script and content before preparation of the draft manuals.

Ensure that the whole of the service manual is available for use throughout the final commissioning period. It is appreciated that Section 11 for each manual will not be finalised until the commissioning period is completed since it is used to record data taken during that period. Provide this section complete to the C.A. prior to handover. Make available Section 11 complete with the results of pre-commissioning tests for verification by the C.A. at final commissioning.

If due to the size and nature of the works it is not possible to contain all the relevant information in one binder, allow for each or part sections of the service manual to be produced in volumes. Each volume arranged to cover main sections of works such as LV switchgear, air handling units and fire alarm systems etc., until each item of the works is adequately documented.

Include the following sections in the service manuals for each discipline, i.e. electrical, mechanical, etc. shall comprise the following sections:

<u>Section No.</u>	<u>Title</u>
One	Introduction
Two	System Descriptions
Three	Operating Instruction
Four	Safety Information
Five	Plant/Equipment Inventory
Six	Lubricating Instructions
Seven	Repair and Maintenance Instructions
Eight	Spare Parts and Stores
Nine	General Information
Ten	Training and Demonstration Log

Eleven
Twelve

Test and Commissioning Results
Record Drawings

Prepare all sections in A4 size loose-leaf ring binders, with full content pages and front cover.

A description of the contents and the form of presentation required are detailed below:

Section 1 - Introduction

- a) Index and Contents of the complete Manual.
- b) Purpose of the O & M Manual.
- c) Overview description of the project.
- d) Name of the parties involved.
- e) Schedule of Record Drawings. (Also repeated in Section 12.0 of the Manual)

Section 2 - Systems Description

- a) A full and detailed description of each principal system/installation, including general constructional details, functions and locations.
- b) Details of design criteria and equipment/system set points.

Section 3 - Operating Instructions

- a) Name / title / description of equipment to which it applies.
- b) Procedures for starting up, shutting down, operating and testing of the equipment and controls operational philosophy.
- c) Regular operation instruction
- d) Emergency procedures.
- e) Safety measures to be taken.

Include schematic line diagrams of the works, sketches and drawings, which also emphasize all safety aspects.

Section 4 - Safety Information

- a) Description and relevant details of:

- i) Uses that have been made in the services works of dangerous, flammable, noxious materials, e.g. glass fibre, certain plastics, mercury etc. in relation to COSHH Regulations.
- ii) Provisions made for prevention of electric shock and safety in switching electricity supplies.
- iii) Any provisions for the prevention of injury to operatives and maintenance not contained in the operating instructions in the first section of the manual.

- b) Copies of all safety notices supplied, giving their locations.
- c) Description and illustrated document detailing the position and operation of main isolation devices both mechanical and electrical for the closure of any and all systems contained within the contract in the event of any emergency.

Section 5 - Plant/Equipment Inventory

- a) Schedules of all equipment, fittings, plant etc.
- b) Including name, address, telephone number and manufacturer.
- c) Reference codes matched to the record drawings.
- d) All equipment data, duty, size, type colour etc.

Sections 6 - 11

The requirements for these sections of the manual are considered self explanatory.

Building User Guide

The main contractor will produce the building user guide however, the mechanical sub-contractor shall assist in the process.

The list below indicates the type of information that should be included to meet the needs of the Facilities Management (FM) Team/Building Manager and the general users (staff).

1. Building Services Information

a. General User

Information on heating, cooling and ventilation in the building and how these can be adjusted, e.g. thermostat location and use, implications of covering heating outlets with files, bags etc., and use of lifts and security systems.

A simple form instruction guide should be provided for each item on a single side of A4, with easy to understand step by step instructions with pictures as necessary.

b. FM

As above, plus a non-technical summary of the operation and maintenance of the building systems (including BMS if installed) and an overview of controls.

2. Emergency Information

a. General User

Include information on the location of fire alarm systems, disabled refuse alarm systems, disabled call systems

b. FM –

As above, plus a non-technical summary of the operation and maintenance

3. Energy & Environmental Strategy

This should give owners and occupiers information on energy-efficient features and strategies relating to the building, and also provide an overview of the reasons for their use, e.g. economic and environmental savings. Information could include:

a. General User

Information on the operation of innovative features such as automatic blinds, lighting systems etc., and guidance on the impacts of strategies covering window opening and the use of blinds, lighting and heating controls

A simple form instruction guide should be provided for each item on a single side of A4, with easy to understand step by step instructions with pictures as necessary.

b. FM

As above, plus information on air tightness and solar gain (e.g. the impact of leaving windows/doors open in an air conditioned office, or use of blinds in winter with respect to solar gain); energy targets and benchmarks for the building type, information on monitoring such as the metering and sub-metering strategy, and how to read, record and present meter readings.

4. Water Use

a. General User

Details of water saving features and their use and benefits, e.g. aerating taps, low flush toilets, leak detection, metering etc.

b. FM

As above, plus details of main components (including controls) and operation.

Recommendations for system maintenance and its importance, e.g. risk of *Legionella*.

5. Training

Details of the proposed content and suggested suppliers of any training and/or demonstrations in the use of the building's services, features and facilities that will be needed. This could include:

a. General User

Training in the use of any innovative/energy saving features.

b. FM

As above, plus training in emergency procedures and setting up, adjusting, and fine-tuning, the systems in the building.

Planned Preventative Maintenance Schedule

The contractor shall provide a complete PPM schedule for the electrical services plant, equipment and systems. The schedule shall identify each item of equipment, the maintenance required and the time frequency.

5.0 DESIGN INFORMATION TO BE SUPPLIED BY THE CONTRACTOR

The Contractor shall submit details to the CA of all calculations.

All calculation shall be carried out using industry recognised calculation software.

In addition to the above, copies of all design and working drawings shall be provided. All information provided must be submitted in sufficient time to allow for the details to be checked and for time to allow for any amendments to be incorporated prior to the actual installation works being put in hand.

The Contractor is to submit one hard copy of all calculations and working drawings prepared for the works together with a complete list of names and addresses of manufacturers, together with details of the items of equipment that he proposes to use, in sufficient time to allow for any amendments to be incorporated prior to the work being put in hand. The minimum time span for comments/approval shall be 1 week.

The Contractor is to provide drawings, literature, samples of 'mock-ups' as necessary to fully illustrate the proposals.

6.0 DESIGN AND CO-ORDINATION OF SERVICES

The contractor shall undertake the full detailed co-ordination for the complete services installation. The systems and provisions indicated on the tender drawings are indicative and conceptual only. The contractor shall design and deliver complete working and commissioned systems to meet legislative and client requirements identified herein.

Include for all liaison with and payment of public authorities, building controls and the like.

Gain all consents, approvals and meet all planning requirements for the scheme.

Undertake detailed co-ordination of the installations and the production of working drawings.

Include for coordinating/liasing with all other trades and building professionals and be aware of the extent of works being installed within the contract area by other trades.

7.0 ROUTING OF CABLE TRAYS, TRUNKINGS & CONDUITS, PIPES, DUCTS ETC.

The drawings indicate the approximate services together with the approximate location of equipment, sufficient to indicate the design intent.

Not all sets, rises and falls are indicated. Include within the tender costs for all such sets, rises falls and detailed connection pipe arrangements etc as may be required for the final installation. Establish exact locations and routing in preparation of the scheme working drawings.

8.0 TESTING, COMMISSIONING, PROVING & DEMONSTRATION

Fully commission and test all aspects of the services installations, in accordance with the requirements of the appropriate British standard and CIBSE commissioning codes. Notify the CA in writing when, the works or parts thereof are ready for commissioning and testing.

Issue the CA with list of remedial items to be completed. Make all specified tests to the satisfaction of the CA.

Should the tests fail to demonstrate that the plant and equipment are properly installed and functioning correctly, investigate the cause of the failure. Should this be due to incorrect or faulty work by the Contractor, or his suppliers, then without delay carry out such remedial measure and adjustments as may be necessary and repeat the commissioning and testing procedure to the satisfaction of the CA.

In the event of commissioning tests and inspections failing to meet the required standards, pay all abortive costs so arising incurred by the CA, or other parties. These shall be in accordance with the appropriate Professional Fee Scale.

Where portions of the work are commissioned and tested separately, upon final completion demonstrate to the CA that all the several portions are capable of proper simultaneous operation in accordance with the requirements of the Contract.

For the purposes of commissioning and testing of the installation provide all necessary skilled and unskilled labour and all necessary instruments and testing equipment.

Include for returning to site six months after completion in order to undertake recalibration of set points and re-commissioning of air and water systems, to new values as may be the client's preference as a result of experience in actual use of the building.

9.0 STAFF INSTRUCTION AND DEMONSTRATION

Allow for all necessary visits to site by equipment manufacturers representatives to ensure satisfactory completion and handover of the works.

Include for all necessary visits to carry out the following separate functions:

- a) The initial setting to work and witnessing by the Contractors Commissioning Engineers (Pre-Commissioning).
- b) The commissioning tests and examinations.
- c) Special separate visits as necessary to train and instruct the employer's staff on the maintenance of equipment.
- d) Special separate visits as necessary to train and instruct the employer's staff on the operation of the equipment.

Include for one full day return visit for each system 4 – 6 weeks after handover to undertake further training of the client's personnel on elements of the system that the initial period of occupation highlights as requiring further instruction.

No additional payment will be given to the Contractor for any abortive visits that may be caused due to any failure in the programme.

10.0 MEMBERSHIP OF RECOGNISED TRADE BODIES

It is a requirement that the Contractor belong to a recognised trade association before consideration of this tender return. The tenderer may be required to provide proof of membership at the discretion of the C.A.

The following associations as a minimum apply to each discipline: -

Electrical: ECA and NICEIC
Mechanical: BESA and Gas Safe

The tenderer may be required to provide proof of membership at the discretion of the C.A.

11.0 SCHEDULE OF RATES

Provide with the tender offer a quantified schedule of rates used in the preparation of the tender. The schedule shall be comprehensive.

Divide the schedule of rates into sections appertaining and summing to the separate costs indicated on the Form of Tender. The schedule of rates will be used in the valuation of any variations to the Contract and in the assessment of payments due to the Contractor.

If such schedule of rates details are not provided then the Employers Agent will have the authority under this contract to impose reasonable industry rates for the calculation of variation costs.

12.0 PLANT AND EQUIPMENT

Make and Type of Equipment

Within this specification and on the drawings, references are made to specific makes of equipment, which are deemed suitable to satisfy the design performance. Include in the tender for the makes and types of equipment and materials as specified or equal and to be approved by the Employers Agent.

Where the Contractor proposed to utilise equipment/manufacturer other than those stated in this specification, schedule these at tender stage for the approval of the CA.

Any alternative equipment and plant proposed by the Contractor must be capable of being accommodated in the space provided with all consequential additional costs and implications associated with the alternative proposals over the specified installation included by the Contractor when formulating any alternative equipment proposals.

The above applies to all alternative equipment/manufacturers irrespective of whether they are included on the scheduled of preferred manufacturers. Where a manufacturer or suppliers name is included in the specification for a particular item and the Contractor proposes alternatives, it is the intention that such equipment be of a single manufacture and not a combination of various makes.

Pump and Fan Duties

The specified pump and fan duties detailed within this Specification are approximate and for tendering purposes only. The Contractor from his working drawings prior to ordering shall confirm all duties. The selected pump or fan shall be supplied with a full set of performance curves indicating the design characteristics and maximum duty characteristics.

The Contractor is responsible for verifying fan or pump performance data and providing fans or pump capable of delivering the required air/water volume when operating against the actual installed total system resistance. The Contractor must make his final fan selections allowing for leakage from air handling ductwork in accordance with DW 144.

13.0 SITE ACCOMODATION

The contractor will be allowed to use Platform building 6, rooms G.4, G.LB01, G.3 and G.2 for their site accommodation. The contractor will be required to provide their own furniture, IT equipment and catering equipment eg kettle and microwave. The building has WC and wash facilities for contractors use.

Parking and space for storage container(s) is provided for the contractor along side Platform building 6. The contractor will be required to provide Heras fencing to cordon off their compound.

14.0 BUILDERS WORK

The contractor is responsible for all builder's work, chases and holes etc and, to identify them on drawings and mark up on site all holes required.