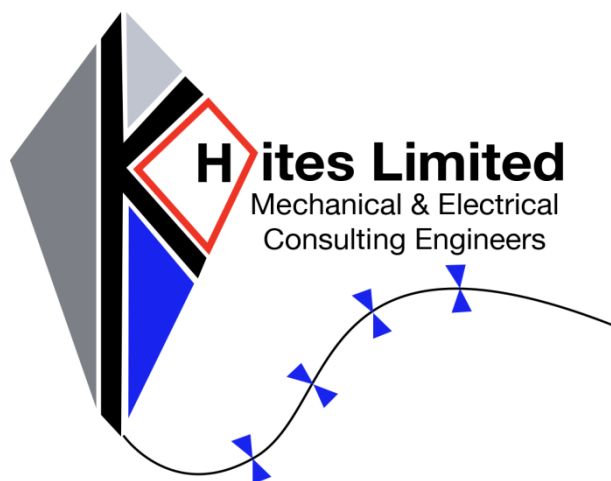


Mechanical Services Performance Specification

**Brunel University
Lecture Centre Coffee Shop**

Provision of Mechanical, Electrical, Public Health Engineering
Energy and Sustainability Consultancy
Project No. 136 Rev T0



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1.0 THE SITE

The existing building is a multi-storey concrete built Educational/Lecture Centre, with glazed front facia, on a large University site. The existing office area and tea making area is to be converted into a new coffee shop. There is to be no main cooking facilities within the new coffee shop.

We are advised that due care and attention is required as it is a listed building, and that service alterations/additions are to be kept to a minimum.

We are also advised by the client that certain areas, risers etc, have restricted access due to the possible presence of asbestos.

1.1 Site Location

The proposed development is situated at the ground floor Lecture Centre, Brunel University, Kingston Lane, Uxbridge, London. UB8 3PH.

1.2 The Scheme

The project consists of supply, installation and fit-out of a ground floor coffee bar area in the form of a single floor with new counter facilities, and includes the strip out/modification required within the existing office space, and tea making facility area.

The brand is to be developed which is proposed to be of a University fit out with particular emphasis from the CDS Wilman Interior designers.

This document should be read in conjunction with all CDS Wilman documents relevant to this project. In addition, to the supporting documentation provided by the design team, including but not limited to the following:-

- Brunel University – Client
- CDS Wilman – Developer/Main Contractor
- CDS Wilman – PM / Cost Consultants
- CDS Wilman Interior Designers

The contractor shall comply with requirements of the University's full M&E design brief V2 (Dec 15) and Standards and all the current relevant British Standards and Regulations.

1.3 Existing Mains / Services

It is proposed to re-use the existing incoming services to the site, including the existing water services. The proposal is to connect to a larger main within the riser on the 1st floor.

The new coffee shop will be fed from this location as shown on the layout drawings. A new 25mm connection will be made from the existing area within the riser on the 1st floor.

It should be noted that the contractor must confirm with the local utilities company/University that the existing water supply is suitable for re-use.

The contractor must fully liaise with the utilities provider/University, before carrying out and completing this work.

There will be no gas requirement for this facility.

1.4 Risks to Health and Safety

The nature and condition of the site and its associated electrical & mechanical services cannot be fully and certainly ascertained before the work commences on site.

The accuracy and sufficiency of information provided to CDS Wilman to date cannot be guaranteed.

It is the responsibility of the mechanical services contractor to ascertain for themselves any information he may require to ensure the safety of all persons whether associated with the works or not.

The mechanical services contractor must comply with the requirements of the CDM Regulations by compiling and issuing designers risk assessments and method statements as their works progress. Conditions 7 and 13 of the CDM Regulations shall apply throughout the duration of this contract.

The mechanical services contractor must provide such information with respect to any portion of their works which might affect the health or safety of any person.

The mechanical services contractor must provide appropriate input into the Pre-Construction Information (Construction Phase Plan) together with the development Health and Safety File.

1.5 Survey

As part of the tender requirements each prospective mechanical services contractor will be expected to visit site to assess the nature of the site and all local conditions and restrictions which are likely to affect the execution of the works.

2.0 DESCRIPTION OF THE WORKS

2.1 Extent of the Mechanical Services Works

The mechanical services contractor will be responsible for undertaking the detailed design, coordination, supply, installation, testing, commissioning and setting to work of the mechanical and electrical services installation.

The mechanical services contractor will be responsible for adopting and adapting the design principles as provided by CDS Wilman through the remaining design stages to completion together with such post completion works as is necessary. The successful mechanical services contractor will be fully responsible for the design and installation of the following mechanical services:-

Brunel University – Lecture Centre Coffee Shop

- Identification of location and routes associated with any existing or proposed MEP services serving and passing through all areas affected by the works.
- Provision of new Hot & Cold Water systems(s)
- Provision of new Above Ground Drainage(s)
- Provision of new Ventilation Systems(s)
- Provision of new Mechanical Wiring(s)

In addition, the mechanical services contractor will be responsible for undertaking and issuing such builders work drawings as may be required by other trades to provide such modifications to the building structure as may be necessary to facilitate the installation of the electrical services works.

The Contractor shall provide all such mechanical services and equipment as required to create a suitable environment within the Lecture Centre Coffee Shop.

Other Relevant Documents

Additional documents the Mechanical Contractor shall refer to are as follows:-

- Electrical Services Specification & Drawings
- CDS Wilman Layout Drawings
- CDS Wilman Section Drawings
- University's full M&E design brief V2 (Dec 15)
- University's Site Handbook

2.2 Work by Others and Co-ordination of Trades

The mechanical services contractor shall allow for co-ordinating the works with other trades and installations which may be on site during the period of the contract.

The mechanical contractor shall ensure that all parts of the mechanical services installation are fully co-ordinated in respect of providing the necessary labour and materials as and when required by the Main Contractor's programme. The mechanical contractor shall further ensure that the location of all items such as plant, ductwork, pipework, containment, drains and drops are fully co-ordinated with the fabric structure of the building and all other services installed, as advised by the client and developer/main contractor, and in full co-ordination with other services including, electrical, structural, civil, public health, and interior design.

2.3 Plant Operating Conditions

The mechanical services contractor shall ensure all plant items are suitable for operation in the environment in which they are to be located.

2.4 Working Drawings

The scope of the mechanical services sub-contract works shall be as Section 5 – and also as follows:

- (a) The production of installation drawings to be submitted for comment prior to Commencement of the site works. Floor layout drawings shall be provided at a scale of 1:100 and typical sections at 1:50, plantroom layouts at 1:20.
- (b) The production of builderswork drawings associated with the mechanical contract services installation.
- (c) The supply and installation of all materials and equipment necessary to provide full working systems in accordance with this specification and the finalised installation drawings.
- (d) The mechanical services contractor shall also include for all secondary steelwork and brackets required to support his services installations from the building structure and fabric.
- (e) The testing and commissioning of the completed installations in accordance with the agreed programme.
- (f) The production of operating and maintenance manuals and record drawings of the installations; draft copies are required 14 days prior to the completion date. However, changes to the design occurring 6 weeks prior to the documents being produced are to be included in the final copy only. The operating and maintenance manuals shall be provided in accordance with guidance document BISRIA 87/1.

Also, all drawings shall be supplied on cd in AutoCAD format Auto CAD 2007. Manufacturers information should be issued on CD-ROM or pen drive.

All plant schedules shall be provided on cd in Microsoft (Office 2007) Word format.

- (g) Twelve months parts and labour warranty from the date of main contract practical completion.

The mechanical services contractor shall ensure that all parts of the contract/sub-contract installations are fully co-ordinated in respect of providing the necessary labour and materials as and when required by the contract programme. The mechanical services contractor shall further ensure that all parts of his installation are fully co-ordinated with the fabric and structure of the building and all other services installed. It shall be the mechanical services contractor's responsibility to obtain and interpret the necessary information to co-ordinate the works. No costs will be accepted for any claims resulting from lack of performance in this respect.

The mechanical services contractor will be required to provide a fully competent site team, able to control the contract works and co-operate, co-ordinate and liaise fully with the Main Contractor's site management and the Engineer, attend site meetings and generally ensure the smooth running of the contract works in accordance with the programme.

The mechanical services contractor shall check all current issue drawings and available information prior to installation. Any change required through lack of compliance with this item shall be at the expense of the mechanical services contractor.

2.5 Programme

The close co-ordination and monitoring of the sequence and progress of all activities is paramount to the success of the project as a whole.

The mechanical services contractor shall liaise closely with the Main Contractor/Developer/Client to ensure that all the requirements of the programme are included and fully understood.

The sequence of operations on site will need to be co-ordinated with essential programme constraints.

The mechanical services contractor shall also be responsible for preparing a programme of works for his own installation, to be agreed and incorporated into the Main Contractors programme so that all site trades are co-ordinated.

The contractor should allow for all costs associated with phased works. It is likely that the project will have to be programmed in phases, including the separate disconnections and reconnections to the 1st floor, and adjacent amusement arcade.

It is anticipated that the date of:

- Commencement will be : Refer to main programme
- Completion will be : Refer to main programme

Throughout the contract the preparation and submission for approval of the Contractors drawings, the placing of orders for materials and their subsequent progressing and the retention on site of an adequate labour force, shall all be done in sufficient time to comply with the requirements of the programme.

The Contractor's attention is drawn to the fact that in order to comply with the programme it may be necessary to work in buildings, ducts, trenches, external areas or wherever, which may not at the time be covered in and weatherproof. The Contractor should allow in his tender for such sums he considers necessary to compensate for any additional expense that may be incurred due to any such compliance.

3.0 GENERAL SCOPE & CONDITIONS OF CONTRACT

The general scope of the works is as indicated below and as contained in any other drawing or document as may be issued with the ITT (Invitation to Tender).

The mechanical services contractor will fully comply with all statutory and regulatory requirements as well as all associated British, European, International standards together with those which form the University's requirements.

The contract will be in the form (TBC).

The systems described in this document form the outline scope of the mechanical services.

The mechanical services contractor will undertake the on site design development, coordination, detailed design, installation, testing, commissioning and setting to work of the systems described in this document.

In addition the mechanical services contractor will provide such on-site training as may be required to fully acquaint the Clients representatives of the nature, operation, performance and control functions associated with the completed works.

The mechanical services contractor shall ensure that all equipment and materials utilised within the works are fit for purpose and suitable for the environments in which they will operate.

The mechanical services contractor and/or his specialists shall provide all necessary services to the site and shall allow for all interface points with existing services whether they are identified within the tender documentation or not.

The mechanical services contractor shall note that all quantities, lengths, sizes, and duties, stated in the tender documentation are indicative and subject to amendment by the mechanical services contractors that may be necessary to comply with their design.

The works shall be undertaken at such times as may be agreed with the Client to suit the planned site construction sequencing works and all other works carried out by other disciplines.

3.1 Employers Requirements, Obligations and Restrictions

In the event of the successful Contractor being a wholly owned subsidiary of a parent company or being dependent on another body to continue trading, an indemnity will be required from the parent company or body prior to the Contract being entered into. The indemnity being that as part of the consideration for the contract in the event of any lawful claim being founded by the Employer against the subsidiary not being honoured, the parent company or body will honour that claim in full.

3.2 Return of Tender

The Contractor shall return confirmed costs for the works described within this specification and on the associated drawings.

3.3 Visits to Site

The Contractor shall visit the site before completing his tender and will be deemed to have satisfied himself on the full nature of local conditions as regards accessibility, transport and

storage of materials, the supply of and conditions affecting labour, and to have obtained all necessary information on all matters affecting the execution of the works and the prices tendered for it.

The Contractor is advised to acquaint himself with any traffic regulations and restrictions and shall include for any costs associated with this element.

Claims on the grounds of want of knowledge in such respect will not be accepted.

3.4 Collusion between Tenderers

Should, in the opinion of the Engineer, collusion between tenderers have taken place in the preparation of tender, prices submitted by parties to such action shall be disregarded when tenders are being considered.

3.5 Royalties and Patent Rights

The prices quoted by the Contractor shall include any patent royalties, which may be legally expendable in respect of any articles, systems, processors or inventions included in his Tender.

3.6 Value Added Tax

Unless otherwise stated in the tender the Contract Price is deemed to exclude Value Added Tax. To the extent that the Tax is properly chargeable on the supply to the Purchaser of any goods or services provided by the Contractor under the Contract, the Purchaser of any goods or services provided by the Contractor under the Contract, the Purchaser shall pay such Tax as an addition to payments otherwise due to the Contractor.

The Contractor shall however allow for all incidental costs and expenses he may incur consequent upon the administration of this tax.

3.7 Labour on Costs

The Contractor shall allow in his tender for all disbursements arising from the employment of labour, with due regard to the current editions of the appropriate Working Rule Agreement.

No bonus or payments by result incentive system shall constitute a claim for extra payment or be reason to diminish the quality or quantity of the works required or implied by the Contract Documents.

The Contractor shall be deemed to have included in his tender for all costs for complying with the Health and Safety at Work Acts, current edition.

3.8 Holidays with Pay

The Contractor shall include in the Tender for all payments to be made in connection with the "Holidays with Pay" scheme of the trade or industry concerned.

3.9 Lack of Continuity

The Contractor's attention is drawn to the fact that no claims whatsoever on the grounds of any actual or apparent lack of continuity will be considered other than where any such lack of continuity may arise out of events or happenings provided for under the specific provisions of the Main Contract conditions.

3.10 Sub Letting

Should the Contractor sub-let or assign any part of the works written confirmation of the sub-contractor shall be given to the Engineer/Client. Where approval is given, the Contractor shall remain responsible for the portion of work that is sub-let, and its completion to the satisfaction of the Engineer.

3.11 Control of Works

The works detailed in this Specification will be under the control of the Engineer/Main contractor/Developer.

Regular supervision of the works from the office of the Contractor will be made to the Engineers requirements.

The contractor shall maintain on site during all working hours for each trade, a competent agent, supervisor or foreman who shall be a fully accredited representative with authority to take instructions and to carry them out, and shall not remove him at any time except with the permission of the Engineer /Main contractor/Developer.

3.12 Site Meetings

Meetings of the Engineer or his representative and the Main Contractor/Developer will be held on site at regular intervals and a responsible representative of the Contractor shall attend, unless notified to the contrary.

3.13 Incompetent Workmen

The Contractor will, at the request of the Main contractor/Developer when advised by the Engineer, immediately dismiss from the site any person employed there on by him who may, in the opinion of the Engineer be incompetent or commit an act of misconduct. Such persons will not be employed again on site without the written permission of the Engineer/Main contractor/Developer.

3.14 Trespass by Workmen

The workmen employed on site shall not trespass on any part of the grounds or buildings where their services are not required or in any way interfere with any of the property, staff of personnel working in these areas.

3.15 Local Agreements

The Contractor and his employees shall comply with all rules, practices and/or local agreements which shall be in force in the area of the site in which these works are to be carried out and shall avoid any complications which might cause strikes or trade disputes amongst his own or other workmen.

All work shall be carried out by the appropriate tradesmen.

3.16 Damage

Any damage caused by or attributed to the negligence of the Contractor or by his work people will be made good to the satisfaction of the Engineer or Architect.

The Contractor shall keep free from damage due to work in connection with this Contract, all property, including existing installations, furniture, fittings etc

The cutting and screwing of conduit or pipework will not be allowed on any of the finished off areas.

3.17 Damage to Public and Private Services

The Contractor must ascertain from the appropriate Statutory Authorities the actual location of the individual services and pay all costs associated with the protection and maintenance of these.

Any damage resulting from the execution of the works shall be notified to the Engineer and appropriate Service Authority and shall be made good to their satisfaction at the Contractors own expense.

3.18 Contractors Responsibilities

The Contractor shall be deemed to have carefully examined the Conditions, Specification and Tender Drawings.

Notwithstanding the provisions of these drawings, the Contractor will be held responsible for the works embodied therein and shall take his own particulars and provide at his own expense all necessary working and detail drawings, including where required plant foundation drawings and any other drawings of Builder's work associated with this Contract or as specified in the Schedule of Drawings, copies of which must be submitted for approval to the Engineer to make proper provision for incorporation of same into the main contract works to suit the contract programme.

The Contractor shall at all times co-operate in the co-ordination of his works with those of other Contractors and claims in respect of lack of such co-ordination will not be admissible for payment or justification for a claim for delay to the contract.

The Contractor shall notify the engineer of any inconsistency in drawn, described or implied information issued to the Contractor prior to installation.

3.19 Drawings and Specifications

The Engineers shall supply the Contractor (free of charge) with two copies of the signed Contract Drawings, including C.A.D. disks, electronic copies of the Specification and electronic copies of all further drawings issued during the progress of the works.

The Contractor shall prepare at his own expense all extra copies of the drawings he requires. A copy of all drawings and specification shall be kept on the site in the charge of the Foreman or Supervisor to which the Engineer shall have access at all reasonable times. All drawings and specifications remain the property of the Employers and upon final payment to the Contractor; he shall return them to the engineers.

The Specification shall be read in conjunction with the drawings and any additional or specific instructions contained on the drawings shall be deemed to be part of the Specification.

The drawings issued by the Engineer show generally the arrangement of the work as a guide only to the Contractor. They may not cover in every detail the whole of the work involved and are diagrammatic in certain particulars.

The position of plant and equipment shown on the drawings shall be assumed to be correct for the purposes of tendering but may be reasonably varied by agreement with the Engineer without any extra cost to the contract unless such alterations involves the removal of works already executed.

3.20 Additional Drawings

The Contractor shall prepare and co-ordinate working drawings showing the details of the installations, and particulars of builders work required and in a suitable scale of 1:50 for general layout, 1:20 for Plant Room, co-ordination details, and for containment details, and shall submit these drawings to the Engineer for approval at such a time to suit the requirements of the contract programme. The Engineers approval is only general and is not intended to serve as a check and does not relieve the Contractor from furnishing the materials and performing the works as required by the Engineers drawings and Specification.

The Contractor shall satisfy himself as to the fitness of the surfaces or structures to which he is to secure or mount his materials or components and his act of proceeding with this work shall be deemed to indicate such satisfaction.

3.21 Checking the Works

The Contractor shall satisfy himself as to the correctness of all connections between equipment or equipment supplied under any other contract before any of the former is put into operation, and reasonable notice shall be given by the Contractor to the Main contractor/Developer before any such connection is made.

It is the Contractor's responsibility to ensure that no damage is caused to any equipment or installation due to negligence on his part.

3.22 Contractors Plant and Equipment

The Contractor shall provide all plant and equipment necessary for the completion of the works including hand tools, power tools, gas and oxygen welding equipment, also any scaffolding trestles, ladders, podium steps etc required for the prompt and proper execution of the works.

3.33 Fire Precautions

The Contractor shall ensure safe methods of working are followed when using equipment, liquids and gases, which create a fire or explosion hazard. Petroleum products and other inflammable or vaporising liquids shall be used and stored in accordance with the regulations applicable to those products and also the manufacturer's instructions for use.

3.34 Noise Abatement

The Contractor will be required to carry out the works without excessive noise and to employ mufflers, screens etc., on all plant where in the opinion of the Main Contractor/Developer this is necessary by reason of excessive noise, which is likely to cause a nuisance or inconvenience to others. The Contractors tender shall be deemed to include any costs necessary for compliance with the above requirement.

3.35 Materials - General

The Contractor shall provide all materials and everything that may be necessary for the due and proper completion of the work to the entire satisfaction of the engineer. The materials are to be new, as specified, and must not be varied in any way without the permission, in writing, of the Engineer.

The Contractor shall remove any materials which do not meet the requirements of the Specification and drawings and replace them with approved materials at his own expense and shall meet the costs of any additional builder's work which may be involved in so doing.

The fact that a particular manufacturer's equipment shall be specified will not relieve the Contractor of the liability of reinsuring that such articles are in sound condition and in accordance with the proper clause of the Specification. The Contractor must ensure that at the time of tender, the quotation by the specified manufacturer complies with the appropriate clause of the specification. No extra cost will be granted for discrepancies found during the progress of the contract.

The Contractor may not substitute materials of alternative types or origin to the materials specified for these works, without obtaining written approval from the engineer before the works are started.

The Contractor shall, if required to do so by the Engineer, submit drawings or samples of materials and cost variations for approval.

The Contractor will be expected to place order for materials and equipment required for these works immediately he to proceed has received instructions. Delay in delivery, therefore, will not be acceptable as the basis of a request for an extension of time to complete the contract works. Upon request by the Engineer, the Contractor shall make all orders available for inspection.

No materials known to be deleterious at the time of specification or use, or which are prohibited in the Agreement for lease, shall be used in the Works. In particular the use of the following is expressly forbidden for use in the Works:

- (i) High alumina cement or concrete tricolor cement containing calcium chloride or susceptible to alkali/silica reaction.
- (ii) Woodwool slabs woodcrete, chipcrete, or conchips.

- (iii) Asbestos materials containing asbestos including asbestos cement and other asbestos based materials.
- (iv) Crocidolite
- (v) Mundic calcium silicate bricks or tiles glass fibre bricks.
- (vi) Sea washed aggregates or sea dredged aggregates save where the same comply with BS 882 and BS 8110.
- (vii) Materials containing fibres of less than 3 microns diameter and between five and one hundred microns in length where not sealed within other construction.
- (viii) Urea formaldehyde; polyurethane or polyisocyanate foams.
- (ix) Lead or lead products except where used as lead flashings.
- (x) Lindane, tributyltin oxide, pentachlorophenolate, or pentachlorophenol.
- (xi) Hardwoods from non-sustainable sources.
- (xii) Any substances or materials which are not in accordance with any relevant British Standards Institution Standards and current Codes of Practice or which have been declared deleterious in a publication of the Building Research Establishment.

3.36 Materials to be of E.E.C. Manufacture

All materials used in the execution of the works shall be manufactured by a member country of the E.E.C. unless otherwise definitely specified under the respective sections of the Specifications.

In cases where the Contractor is obliged to include for any articles or materials not of such manufacture, notwithstanding the terms of the Specification, he shall give details of such and of the country or origin. The onus of ensuring that this stipulation is observed by any Sub-Contractors who may be employed by the Contractor rests entirely with the latter.

3.37 Materials to Comply with British Standard Specification

All materials used in the execution of the works shall comply in all respects with the requirements of the current appropriate British Standard Specifications or Code of Practices, unless otherwise definitely specified under the respective sections of the Specification where no such Specification exists, goods materials and workmanship shall conform to the standards of British engineering practice.

Materials shall also comply with the requirements laid down in the Building Regulations 1985, and the Factories Act 1961, or/and any such later revision.

3.38 Samples

After the order has been placed with him, the successful Contractor may be required to provide, free of charge, and without delay, to the extent stated in the Specification, or as may be required by the Engineer, such samples of materials or workmanship proposed to be used by him in the execution of the works included in the contract or in such additional works as may be ordered.

3.39 Clearing of Rubbish

The Contractor shall be responsible for the clearing of all rubbish caused by the carrying out of his work.

All such rubbish shall be cleared away on the completion of each working day to the point designated by the Main Contractor and shall not be allowed to accumulate.

Upon completion of the works, the Contractor shall clear away all his tools, scaffolding, tackle, materials and rubbish to the Main Contractors and Engineers satisfaction.

3.40 Main Contractors Attendance

Refer to main contract preliminaries

3.41 Progress on Site

The contractor will be required to agree a programme for his works with the Client/Developer/Engineer.

The contractor should allow for all costs associated with phased works. It is likely that the project will have to be programmed in phases, including the separate disconnections and reconnections to the 1st floor, and adjacent amusement arcade.

It is anticipated that the date of:

- Commencement will be : Refer to main programme
- Completion will be : Refer to main programme

Throughout the contract the preparation and submission for approval of the Contractors drawings, the placing of orders for materials and their subsequent progressing and the retention on site of an adequate labour force, shall all be done in sufficient time to comply with the requirements of the programme.

The Contractor's attention is drawn to the fact that in order to comply with the programme it may be necessary to work in buildings, ducts, trenches, external areas or wherever, which may not at the time be covered in and weatherproof. The Contractor should allow in his tender for such sums he considers necessary to compensate for any additional expense that may be incurred due to any such compliance.

Progress meetings shall be held regularly by the main contractor/developer, the contractor shall allow in his costs for a representative to attend all meetings.

3.42 Testing

On completion of each installation or service or sections of such installations or services, the necessary tests later described must be carried out and test certificates prepared and recorded.

3.43 Notice of Testing

At least seven days' notice must be given by the Contractor of any test to be carried out on site, to enable the Engineer or their authorised representative to be present if they so desire.

3.44 Test Apparatus

The Contractor shall provide, free of charge, on the site and at his own and the manufacturer's works, such labour materials, apparatus and instruments as the engineer may consider requisite to test efficiently the plant, materials or works as far as completed, until the plant is accepted as a whole by the Engineer. The Contractor shall at all times give facilities to the engineer to accomplish such testing.

Instruments provided by the Contractor for such testing shall remain his property.

3.45 Failure under Test

Should the works on testing not conform to the Specification the Contractor must make them so conform at his own expense, and if he fails to do so within a reasonable period, not exceeding fourteen days, the Engineer shall be at liberty to call upon him to remove the defective part and reinstate the same without cost to the Employer.

3.46 Certificates of Test

Certificate of all tests must be furnished by the Contractor to the Engineer for all plant or materials specified to be tested at maker's works.

The tests on site specified are to be carried out in the presence of the Engineer and the accuracy of all tests will be to the satisfaction of the Engineer, whose decision will be final.

The tests carried out are to be properly recorded in a manner agreed with the Engineer at least fourteen days prior to the commencement of tests.

3.47 Instruction in Operation of Plant

The Contractor is to allow for instruction of the Employer's representatives in the full operation of the plant. All attendance costs associated with this instruction period are to be included in the tender price.

3.48 Trade Name Plates

These shall not be erected in any part of the installation without the approval of the Architect or Engineer.

3.49 Publicity

Information contained in drawings or in the Specification or photographs concerning this project shall not be copied or supplied by the Contractor to the Press, Radio, Television and

other social media for either private or public publication, or to any other unauthorised person with the prior approval, in writing, of the Main Contractor/Developer or Engineer.

3.50 Access to Plant

Plant arrangement shall be located and selected in such a manner that components may be installed, accessed, maintained, removed and replaced without difficulty and without compromising the safety of personnel. The installation shall, as a minimum, satisfy the following requirements:-

- Manufacturers recommendations.
- BS 8313 (Accommodation of Building Services in Ducts).
- BSRIA Application Guides - Design for Maintainability.
- BSRIA Technical Notes - Space Requirements for Building Services Distribution Systems.
- CDM Regulations.

All maintainable items of plant shall be accessible from floor level or via permanent access walkways, as necessary.

All items of plant which are likely to be replaced within the life of the building shall be arranged such that they can be removed without dismantling any elements of permanent structure and without comprising normal access and escape routes. For the purposes of this requirement permanent structure shall be defined as any building components which cannot be removed or reassembled within a time limit of two hours.

3.51 Methods of Wiring (Mechanical Wiring)

The methods of wiring employed on this project shall be as follows :

1. Sub-main distribution cables XLPE/SWA/LSF on cable tray.
2. Lighting and general power wiring shall be LSOH single cables on galvanised trunking. High impact PVC conduit is acceptable. Where cables drop to accessories they shall be protected by capping. Within the plant room / boiler house they shall be enclosed within galvanised conduit and trunking installed surface as required.
3. Data / Comms / Control wiring shall be Cat 5e UTP on cable basket with inlaid flat strip to suit for the main runs and in propriety cable straps clipped to the building fabric

across to cable drops. Where cables drop to accessories they shall be protected by high impact PVC conduit.

3.52 Flush/Surface Areas

The electrical contractor shall install the electrical services flush or surface as required in the various areas detailed below.

Flush areas shall be:- All areas with the exception the plant room and electrical intake room.

Surface areas shall be:- The plant and electrical intake room, including all basement areas (except new office)

3.53 Fixing Heights

Except where particular items are expressly mentioned elsewhere in the specification or shown on the drawings the following fixing heights above finished floor level to the underside of equipment shall be taken as a general guide.

The latest DDA requirements are listed below but may not be relevant in many rooms. The room loaded plans and wall elevations will take precedence.

<u>Item of Equipment</u>	<u>Height of Centre</u>
Thermostats	1200 - 1500mm (see CDS Wilman sections)
Controls	1200 - 1500mm (see CDS Wilman sections)
Isolators	1400mm or 150mm below ceiling level or adjacent equipment they supply

3.54 Environmental Aims

The general policy is to provide a building, which is environmentally friendly from the global, local external and internal aspects and which minimises the impact on the local community. The building is designed to address the following:

- . Minimise any negative impact on the local environment and where possible improve it
- . Minimise the effect of ozone depletion.
- . Minimise the effect on global warming.
- . Minimise air pollution.
- . Minimise water pollution.
- . Minimise rainforest depletion.
- . Minimise non-renewable resource depletion.
- . Avoid radon contamination.

- . Minimise the risk of Legionnaires disease and the spread of Legionella.
- . Minimise the effects of ionising and electro-magnetic radiation.
- . Avoid the use of potential irritants and/or toxic substances.
- . Avoid design features associated with Sick Building Syndrome.
- . Maximise the opportunity for recycling.
- . Enable planned preventative maintenance regimes to be used to maintain optimum performance.

4.0 TESTING AND COMMISSIONING

All mechanical works and specialist systems shall be thoroughly tested and inspected, set to work and commissioned in accordance with the relevant Regulations, British Standard Specifications, Codes of Practice, CIBSE Commissioning Codes, BSRIA Commissioning Guides together with any other related documentation.

Fully certified and calibrated instruments shall be provided to carry out all testing and commissioning. The mechanical services contractor shall provide such certification as may be necessary as to the accuracy of all instrumentation employed during the testing and commissioning phases of the works.

Test certificates shall be provided as part of the Operation and Maintenance Information provided by the mechanical services contractor as part of the works.

A HVAC competent contractor shall undertake the installation of the following systems, within the restaurant building:-

- Witness the mechanical works installations
- Pressure testing
- Mechanical wiring
- Chlorination
- Commissioning of systems (water, ventilation etc)

They shall be responsible for the following:-

- Test/commission certificates for all mechanical and specialist installations
- Certificates of cleaning and chlorination of the water systems

Upon completion of the works and testing, the HVAC competent contractor shall issue completion certificates for the testing they have undertaken, 'typically' as follows:-

- Test/commission certificates for all mechanical and specialist installations
- Certificates of cleaning and chlorination of the water systems

4.1 OPERATING & MAINTENANCE INSTRUCTIONS

Before the Date of Practical Completion the Contractor shall provide two sets of Operating and Maintenance Instructions for all the installations included in the Contract.

These sets shall be adequately bound with board covers to withstand continual usage using a binder system which permits information to be removed for upgrading and allows new information to be added. The manuals shall contain an index and be divided into appropriately titled logical sections to the Client Representatives approval.

Each set shall incorporate a detailed description of the operating procedures for each installation and item of equipment, together with details of the regular maintenance routines recommended by the Manufacturer of each item of equipment, together with typical fault finding routes and a description of emergency action which should be taken in the event of breakdown of equipment. In addition, for each item of equipment, a list of spare parts shall be given which the manufacturers recommended should be kept in store.

The manuals and instructions shall contain, though not be limited by the following information:-

- ☐ Index.
- ☐ Set of reduced A3 size prints from the "As Fitted" record drawings.
- ☐ General description of the systems, equipment used and method of control systems.
- ☐ Schematic diagrams and control diagrams.

- ❑ Schedule of routine maintenance.
- ❑ Schedule of period maintenance for specialised equipment.
- ❑ Schedules of method of adjustments, typical fault finding routine.
- ❑ Wiring diagrams of plant etc.
- ❑ Service manual for all specialised plant giving details as listed above.
- ❑ Separate from the service manual shall be duplicate sets of manufacturer's catalogues relating to specialised plant.
- ❑ Schedule of equipment giving name, address and telephone number of manufacturer, serial number of plant, horsepower, duties and electrical supply.
- ❑ Description of emergency action which should be undertaken in the event of breakdown of equipment. Telephone numbers of essential contacts to include.
- ❑ Test and Performance Data.
- ❑ Test Certificates.
- ❑ Recommended spares part list giving item description, part number and replacement time scale.
- ❑ Health and Safety notes, advice and declaration.

All issues of the electronic Operation and Maintenance Manuals shall be supplied in the following formats:-

Documents - Word (*.doc) and Acrobat (*.pdf) formats.

Technical Data Sheets - Acrobat (*.pdf) format.

Drawings - Autocad (*.dwg), Autodesk (*.dwf) and Acrobat (*.pdf) formats.

4.2 RECORD DRAWINGS

The Contractor shall provide, before the Date of Practical Completion, two paper prints. In addition the contractor shall provide disks containing the drawings fully compatible with the latest version of Autocad to BS 1192.

The "As Installed" drawings shall show the following:

- ❑ 1:100 or 1:50 scale drawings and a system diagram of the complete installation showing all switchgear and distribution with the appropriate code letters and identification marks.
- ❑ The system diagram shall record the values of prospective short circuit current and earth fault loop impedance at the origin of the installation.
- ❑ The location of the Supply Authority connection provided within the Sub-Contract whether carried out by the Contractor or by the appropriate Authority, together with the points of origin and termination, size and type of cables.
- ❑ The layout, location and extent of all luminaries showing the type in accordance with the schedule of luminaries, all electrical outlets, telephones, alarm circuits, isolators, starters, motors, appliances, distribution boards and any other outlet, or system installed under the Sub-Contract.
- ❑ The detailed layout of the switchrooms, meter rooms, generator and motor rooms showing where appropriate all existing as well as those items installed under this Sub-Contract. The "As Installed" schematic diagrams of all circuits including control circuits showing switchgear cable, fuse type, size and reference.
- ❑ Complete cable schedules and distribution board schedules.

- ❑ Manufacturer drawings showing the arrangement and assembly of component parts of all machines and any piece of equipment which may need servicing.
- ❑ Diagrams illustrating the principles of operation of automatic controls and of instrumentation, present in combination with any foregoing item.
- ❑ Manufacturers internal wiring diagrams for each piece of electrical equipment supplied under the Sub-Contract, together with physical arrangement drawings where necessary to locate and identify the component parts.
- ❑ The nature and position of all component parts of the earthing system shall be submitted by the Sub-Contractor. The positions of drains, water pipes, structural steelwork, etc., within 4500mm of the location of earth electrodes shall be indicated on the plans.
- ❑ Layouts giving circuit details including circuit reference loading, origin, route, distribution and where buried for each cable, conduit, tray and trunking. The circuit reference shall relate to the appropriate cable schedule and distribution board schedule.
- ❑ Interface details with existing equipment or equipment installed separately from these works.

Two prints of each "As Installed" drawing shall be issued to the Client's Representative for approval prior to final issue.

The Contractor shall also supply and fix in the main switchroom:

- ❑ Notices regarding the electrical installation.
- ❑ Instructions in the form prescribed by HM Stationery Office as to the treatment of persons suffering from electric shock.
- ❑ HMSO Form F954 Electricity.
- ❑ Poster 117 First Aid in Emergency.
- ❑ Health and Safety Poster.
- ❑ Schematic Wiring Diagram of Mains Distribution

The Contractor shall also provide and fix typewritten circuit lists for every distribution board. These shall be enclosed in folders of sheets of transparent non-flammable material, and fixed inside the distribution board.

The Contractor shall also provide reproduced "A3" size copies of all Record Drawings, perforated and incorporated in rigid loose leaf type bindings with protective coverings, for inclusion in the Operating and Maintenance Manuals.

4.3 EMPLOYER'S REPRESENTATIVE TRAINING

The Contractor shall include for training the client's designated personnel in the function, use and maintenance requirements of the systems. The training for each system must be carried out by persons having an in depth knowledge of their function, operation and maintenance.

The training shall be provided in two parts as follows:

- ❑ Outline demonstration of the key functions and operation of each system prior to handover.
- ❑ Detailed training and instruction on each system within three months of handover. The contractor should allow for a minimum of one half day's training for **each** system as defined in the headings of Section 5 of this specification. Additional time should be allowed for complex or large systems.

The training should demonstrate all aspects of the installations to the satisfaction of the client's designated personnel.

The contractor shall be responsible for scheduling and programming the pre and post-handover training to suit the client's designated personnel.

4.4 MAINTENANCE EQUIPMENT AND SPECIAL TOOLS

One complete set of all special spanners, tools, necessary for maintaining in good order the whole of the Contract Plant and equipment shall be supplied by the Contractor together with one suitably fitted container for the Client's maintenance staff. The container shall be provided with a strong lock, for which four keys shall be supplied.

The spanners, tools, etc., supplied under this clause shall not be used during the erection of the plant, otherwise they will be rejected.

All heavy parts of plant shall be provided with some convenient means of slinging or handling during erection or overhaul, and items requiring extraordinary arrangements for removal for maintenance purposes shall be clearly identifiable, and the Client's maintenance staff instructed on the procedures required to carry out such works.

The Contractor shall allow in his tender for ensuring that all equipment which may require dismantling for normal routine maintenance purposes can be readily so done and the Contractor may be required to prove to the Client Representative that dismantling and re-assembling can be carried out with a minimum amount of external work.

4.5 WARRANTY & MAINTENANCE

4.5.1 Warranty

It shall be deemed that Warranty on the plant equipment and installation shall commence at the date of Practical Completion of the Contract Works (Building Works and Services Installations) unless specifically otherwise agreed by the Client's Representative in writing.

The contractor shall warrant all materials, plant, equipment and systems installed against fault, failure and incorrect or inadequate performance for a period of twelve calendar months from the date of practical completion.

The warranty shall include all replacement parts, equipment and labour. The contractor shall allow for carrying out warranty work outside normal working hours as necessary to suit the clients operation of the building. The contractor shall provide a single point of contact for reporting faults and problems which occur on all systems.

The contract shall provide attendance to faults reported within the following periods.

<u>System</u>	<u>Maximum Response Time</u>
AC Plant	4 hours
Ventilation systems (Non-Essential)	1 day
Kitchen ventilation Systems	4 hours
Heating Systems	4 hours

The contractor shall use his best endeavours to clear faults as quickly as possible. Where faults in essential systems cannot be cleared immediately the contractor shall make appropriate temporary arrangements to restore services.

All faults must be cleared within a maximum of three working days.

The contractor shall prepare and submit to the client a brief report on the circumstances of each fault and what action has been taken.

4.5.2 Maintenance

The contractor shall include for full co-operation and handover of all engineers codes, passwords, software etc with regard to maintenance of the following systems during the first twelve months:

- ☐ Control Systems

5.0 MECHANICAL INSTALLATIONS DESCRIPTION

Strip Out - The Electrical contractor shall make himself fully aware of the strip out items/ and or revised locations of the existing mechanical services within the existing office. Please see CDS Wilman drawings and tender drawings for full details.

5.1 General

To provide mechanical services equipment, as required, providing the potential to create a suitable environment within the new Lecture Centre Coffee Shop.

The general requirements of the Mechanical Services can be summarised, as follows:-

- Provide efficient systems to minimise the use of energy.
- Provide comfortable environments for employees.
- Provide simple plant and system arrangements without compromising health and safety.
- Provide a cost effective installation with minimal maintenance and running costs.

5.2 Infrastructure

Incoming supplies

The mechanical services contractor shall undertake the testing, commissioning and setting to work of all aspects of the works associated with the required incoming water supplies, as generally described below.

The incoming water supply (existing)

- Cold mains water service – CONNECT TO EXISTING SUPPLY IN RISER AT 1ST FLOOR LEVEL VIA 25MM CONNECTION.

All pipework services shall be pressure tested in accordance with the relevant Regulations and Guidelines, certificates shall be submitted to the client prior to handover.

All water services pipework shall be flushed and chlorinated following completion of the works, chlorination certificates shall be submitted to the client prior to handover.

5.3 Above Ground Drainage

The above ground foul drainage system shall be installed, tested, and set to work to provide safe and effective drainage from building services plant and counter/bar equipment.

The above ground foul drainage system shall comply with the requirements or recommendations of:

- BS EN 12056 Part 1 - Gravity Drainage Systems Inside Buildings - General and Performance Requirements.
- BS EN 12056 Part 2 - Gravity Drainage Systems Inside Buildings - Sanitary Pipework, Layout and Calculation.
- BS EN 12056 Part 3 - Gravity Drainage Systems Inside Buildings – Roof Drainage Pipework, Layout and Calculation.
- BS EN 12056 Part 5 - Gravity Drainage Systems Inside Buildings - Installation and Testing Instructions for Operation, Maintenance and Use.
- CIBSE Guide G Part 3 - Sanitary Accommodation, Pipework and Drainage.
- Institute of Plumbing Guide - Part 7 - Sanitary Plumbing and Drainage.

Any supplementary standards not listed.

Soil stacks and branch pipes shall be designed to minimise secondary ventilation with additional measures taken where the constraints detailed in the design parameters cannot be met.

Where necessary SVPs shall extend to terminate above external roof level with automatic air admittance valves provided elsewhere.

Pipework falls shall be based on the requirements of BS EN 12056 - 2 with access points located at all changes of direction, at each floor level and above each connection to the below ground drainage system.

Intumescent fire sleeves shall be provide where large bore plastic pipes penetrate fire rated parts of the structure.

Condensate drainage from plant and equipment shall incorporate glass running traps and discharge into the foul drainage system via waste valves and tundishes.

Generally all pipework shall be installed utilising unplasticised PVC pipe with solvent welded type fittings. Where required slip type fittings shall be provided to prevent damage caused by thermal expansion. Pipes carrying condensate or forming tank overflows/warning systems shall be installed utilising copper pipe with capillary type fittings. (Refer to Appendix B).

Exposed pipework and traps in kitchen areas shall be chromium plated copper.

All traps shall be white polypropylene complying with BS3943.

Allowance shall be made for pipework thermal expansion.

Rodding access shall be provided at ends of pipe runs, changes of direction, stub stacks and at the base of all soil and waste stacks.

The final connection to the drains shall be made by the mechanical contractor and shall include for rodding access.

The above ground foul drainage system shall be pressure tested as the work progresses.

5.4 Cold Water Service

The cold water system shall be installed, tested, commissioned and set to work to provide water at acceptable flow and pressure to all 'draw offs'.

Additional key performance objectives shall be:-

- Ensure minimum risk of legionella growth.
- System design to minimise water consumption.
- Provision of adequate water metering.

The cold water system shall comply with the requirements or recommendations of:-

- The Water Supply (Water Fittings) Regulations.
- HSE - Legionnaires Disease - Approved Code of Practice (L8)
- BS EN 806 Specification for installations inside buildings conveying water for human consumption.
- CIBSE Guide G Part 2 - Water Services and Utilities.

- CIBSE TM 13 - Minimising the Risk of Legionnaires Disease.
- Institute of Plumbing Guide Part 2 - Hot and Cold Water Supplies.
- HVCA TR/20 Installation and Testing of Pipework Systems Part 5 - Cold Water Service.

Key design criteria shall be as follows:-

- Maximum pipeline water velocity - 1.0 m/s.
- Maximum pipeline pressure drop - 250 Pa/m.
- Main supply water pressure - 1.0 bar (g).
- Maximum cold water temperature - 10.0 °C.

The contractor shall connect to the existing supply to serve all water draw off points located on the site, and as shown on the drawings.

From the domestic water position this shall supply all areas and equipment and supplies to the counter, and domestic hot water heater.

Internal pipework and valves shall be thermally insulated and vapour sealed where concealed (e.g. ceiling voids, service risers etc) or installed within plantrooms. Additionally pipework and valves within the plantrooms shall be protected by the provision of aluminium cladding.

Isolation valves shall be provided to all pipework branch sections and drain valves at low points for draining down the system.

All pipework shall be installed utilising copper pipe to BSEN 1057 R250 with capillary, pressfit or compression fittings which shall be chrome plated where exposed within public areas. (Refer to Appendix B).

Prior to the application of thermal insulation the cold water system shall be pressure tested as the work progresses and flushed and sterilised as a whole.

Following the application of thermal insulation all services shall be identified.

Allowance for water flow restrictors to wash basins, and sinks to meet the requirements of the water authority.

- Wash basin and Sink flow regulators restricted to 5 litres/minute

Flow restrictors shall be as Arrow Valves/Hattersley/Boss Ltd or equal and approved.

5.5 Domestic Hot Water Service

The hot water system shall be installed, tested, commissioned and set to work to provide water at acceptable flow, temperature and pressure to all draw offs.

Additional key performance objectives shall be:-

- Ensure minimum risk of legionella growth.
- System design to minimise water consumption.

The hot water system shall comply with the requirements or recommendations of:-

- The Water Supply (Water Fittings) Regulations.
- Scottish Technical Handbook (Non-Domestic)
- HSE - Legionnaires Disease - Approved Code of Practice (L8).
- BS EN 806 Specification for installations inside buildings conveying water for human consumption.
- CIBSE Guide G Part 2 - Water Services and Utilities.
- CIBSE TM 13 - Minimising the Risk of Legionnaires Disease.

- Institute of Plumbing Guide Part 2 - Hot and Cold Water Supplies.
- HVCA TR/20 Installation and Testing of Pipework Systems Part 4 - Hot Water Service.

Key design criteria shall be as follows:-

- Maximum pipeline water velocity - 1.0 m/s.
- Maximum pipeline pressure drop - 250 Pa/m.

Hot water for the back counter area is to be generated by a suitably sized electric water heater, located at low level below the worktop/sink area.

The heater shall be provided with all necessary controls and methods of temperature and pressure relief.

Hot water production shall be provided during all normal operating flow regimes.

The electric direct water heater shall provide stable water temperature during all flow conditions, and recirculation system for on-demand hot water in the bar area.

Reduced water temperatures for safety purposes shall be achieved by the provision of thermostatically controlled TMV blending valves at all hand washing 'draw offs'. All TMV's shall be complete with isolating valve, basket strainer and check valve. Each outlet shall be provided with a TMV. (with the exception of the cleaners sink) note – 'danger hot water' sign required at this point.

The hot water service pipework shall be copper tube to BSEN 1057 R250 with solder or pressfit type joints suitable for potable hot water and WRAS listed.

Suitably sized pumped secondary return system(s) with Multi-Therm self-regulating valves and bronze circulating pump shall be installed.

All pipework shall be installed utilising copper pipe with capillary or compression fittings which shall be chrome plated where exposed within public areas.

Isolation valves shall be provided to all pipework branch sections with a facility for draining.

Internal pipework and valves shall be thermally insulated where concealed to prevent heat loss (e.g. ceiling voids, service risers, basement etc). Allow for pipework thermal expansion.

Prior to the application of thermal insulation the hot water system shall be pressure tested as the work progresses and flushed and sterilised as a whole.

Following the application of thermal insulation all services shall be identified in accordance with BS1710.

5.6 Gas (Natural) Service

Not required

5.7 Low Temperature Hot Water (LTHW) Heating

The existing LTHW heating system shall be retained as existing, with the removal of one radiator unit and the relocation of one radiator (to create new door openings), this will be compensated by the addition of 2 no. new 2kw overdoor heaters within the new areas.

Existing pipework for the removed radiator and relocated radiator will need to be extended and adapted to maintain the existing heating circuit within the existing pipework floor trench, and made good.

The low pressure hot water (LTHW) system shall be installed, tested, commissioned and set to work to provide sufficient heating water to maintain the specified internal design conditions and supplement the domestic hot water requirements.

The LTHW system shall comply with the requirements and recommendations of:-

- The Clean Air Act.
- CIBSE Guides A, B, C, F, H, J and L.
- HVCA TR/20 Installation and Testing of Pipework Systems Part 1 - Low temperature hot water.

Key design criteria shall be as follows:-

- | | |
|------------------------------------|--|
| • LTHW flow temperature | 70.0 °C. |
| • LTHW return temperature | 40.0 °C. |
| • Winter external design condition | -6.0 °Cdb/-6.0 °C wb. |
| • Maximum pipework velocity | < 50mm n.b - 1.5 m/s.
50mm n.b - 3.0 m/s. |
| • Maximum pipework pressure drop | 250 Pa/m. |

Pipework and Fittings

All LTHW pipework shall be installed utilising carbon steel pipe incorporating screwed fittings up to 50mm nominal bore and welded or flanged fittings where 65mm and above. Pipework associated with expansion and system top up shall be installed utilising copper pipe incorporating hermosyphon protection.

All internal pipework and valves shall be thermally insulated where not used as useful heating surface. Where pipework transfers below ground (e.g. basement) it shall be insulated as if located externally.

Prior to the application of thermal insulation the LTHW system shall be pressure tested as the works progress and flushed and cleaned as a whole.

Following the application of thermal insulation the LTHW system shall be suitably identified.

LTHW Air Curtains (not required – section not used)

NOTE - Electric 2 x 2kw overdoor air curtain to be provided by mechanical contractor

5.8 Fire Suppression

Not required

5.9 Air Conditioning (Heat Pumps)

Not required

5.10 Ventilation

The mechanical services contractor shall undertake the supply, installation, testing, commissioning and setting to work of all aspects of the works associated with the ventilation system(s) serving the coffee shop, as generally described below.

Supply Ventilation shall be provided throughout the coffee shop via the existing 300mm dia circular ductwork, this leg is supplied via the main atria system (programmed to be replaced in the summer as it is asbestos affected) via existing surface mounted supply ductwork, as shown on the layout drawings. This leg will be extended, and 2 of the supply grilles will be relocated to improved cross ventilation. There is a suspicion that the supply flow rates may not be enough to serve the demands of the new extract system, although with natural ventilation (via windows) and the creation of the new double front door, that make up air in line with purge ventilation requirements of the building regs can be met. It is the intention to keep the counter area under negative pressure due to coffee odours.

CDS Wilman are to employ a specialist to record readings of the air flows for the detailed design stage.

Extract Ventilation is a stand-alone system currently serving the office area and tea making facility area. This existing system will be maintained as much as possible, but be adapted as follows :

- Retain existing ducting as much as practically possible to negate additional builders work.
- Install new 3 speed higher duty fan unit
- Install new 3 speed controller & timer unit
- Install new carbon filter unit
- Install new 400 x 400mm extract grille
- Alter/extend/transform existing 300mm dia ducting to suit.
- Remove leg to redundant office (now a store room)

The ventilation system(s) shall comply with the requirements and recommendations of:-

- HVCA DW / 144 – Specification for sheet metal ductwork
- HVCA DW / 172 – Specification for kitchen ventilation systems
- HVCA DW / 143 – Ductwork leak testing
- HVCA DW / TM2 –Internal Cleanliness of New Ductwork Installations
- CIBSE TM50 – Energy Efficiency in Commercial Kitchens

External Design Criteria

Summer: - 31.0°Cdb / 21.5°Cwb deg.
Winter: - -6.0°Cdb / 100: Sat.

Internal Design Criteria

The following internal design conditions are based on the values recommended by the CIBSE and may not necessarily comply with the standard requirements of CDS Wilman.

Summer: - 23.0°Cdb (+/- 2.0°C).
Winter: - 21.0°Cdb (+/- 2.0°C).

Humidity

No humidity control is proposed.

Ventilation

The degree of fresh air ventilation provided shall be that necessary to provide the levels of indoor air quality required by the Building Regulations.

Condense

No condense system(s) is proposed.

The mechanical contractor shall be fully responsible for the range of galvanised sheet steel ductwork complete with all ancillary equipment required for a complete working system.

All external ductwork, and atmosphere side ductwork shall have thermal insulation, externally acoustical insulation and vapour barrier protection to prevent heat gain/loss, noise break out/in and condensation formation respectively.

The mechanical contractor shall be responsible for testing, commissioning and setting to work the ventilation system(s) in its entirety.

It is envisaged, the 'make-up' air (supply) shall be provided by the immediate adjacent area, (via double doors) the newly installed front double doors, and opening windows.

Control

Supply ventilation will be controlled 'as existing' times of operation shall be mirrored with the new extract system.

The new extract system shall be fitted with a new 3 speed controller, located within the new counter area, and wired via a new time switch.

The manufacturer's recommendations should be observed at all times.

5.11 Electromagnetic Compatibility

All items of mechanical plant and equipment should fully comply with the EMC Directive 89/336/EEC and subsequent amendments.

The EMC Directive will be mandatory throughout Europe from 1st January 1996 and any services installation completion that is beyond this date should comply with the EMC Directive.

In brief all mechanical plant and equipment must be designed in such a way that: Electromagnetic disturbances generated by any plant and equipment do not cause interference to any other systems.

The performance of the product is not affected by electromagnetic disturbances within the environment in which the product is intended to operate.

The Contactor shall ensure that all items of mechanical plant and equipment have the required EMC Directive Declaration of Conformity.

If the manufacturers proposed products do not comply with the EMC Directive the engineer must be informed before purchase and installation.

6.0 Appendix A - DRAWING SCHEDULE

Refer to the drawing issue sheet issued under separate cover.

7.0 Appendix B – MECHANICAL EQUIPMENT SCHEDULES

All equipment schedules shown on the layout drawings.

8.0 Appendix C – SCHEDULE OF PREFERRED MANUFACTURERS

The following schedule lists preferred electrical manufacturers to be considered for the scheme and used as a quality benchmark:-

Equipment	Manufacture/Supplier
AC Equipment	~~Toshiba, Daiken, Mitsubishi, Absolute K~~
Automatic Controls	Open protocol
Boilers	~~Elco, Bosch, Veissmann~~
DHWS Cylinder	~~Elco, Heatre Sadia~~
Pumps	~~Grundfos Pumps Limited, Armstrong Holden~~ ~~Brooke Pullen, Smedegaard~~
Expansion Vessels	~~Spirotech, Engineering Appliances~~
Extract Fans	Vent Axia Limited, Nuaire Limited, Flaktwoods
Grilles and Diffusers	Coleman Moducel, Krantz, Complete Vent Solutions
~~Louvres and Door Transfer Grilles~~	~~Coleman Moducel, Krantz, Complete Vent Solutions~~
Air Silencers	~~Gaice, IAC Limited~~
Valves	Crane/Hattersley, Oventrop, Arrow
Flues	A1 Bridge Flue Systems, Dinak
~~Fire and Smoke Dampers~~	~~Action Air Limited~~
Radiators	~~Stelrad, Sensotherm~~
Ventilation	Woods, Expelair, Absolute K

9.0 REGULATIONS & STANDARDS

The design, installation and operation of the Mechanical Services Systems shall comply with all statutory obligations where applicable, including but not limited to the following:

- CIBSE Guides to current practice and Technical Memoranda
- Relevant HVCA Documents
- Relevant British Standards (BS), European Standards (BS EN) and Codes of Practice (BS CP)
- The Water Regulations Guide (WRAS)
- The Institute of Plumbing and Heating Engineering (IPHE) Guide
- Water Supply (Water Fittings) Regulations 1999
- Scottish Technical Handbook (Non-Domestic)
- Health and Safety Executive Requirements
- CDM Regulations
- Requirements of the Local Authority District Surveyors and Building Control
- The Offices, Shops, and Railway Premises Act
- Manufacturer's Instructions and Recommendations for Installation and Testing

The Contractor shall also submit all appropriate documentation, Scottish Technical Handbook (Non-Domestic), Section 3 and energy consumption calculations, and other data necessary to support the planning and statutory approvals process.

The mechanical installations shall be provided in accordance with the British Standards identified below, but not limited to:-

BS 1552:1995

Specification for open bottomed taper plug valves for 1st, 2nd and 3rd family gases up to 200mbar

BS 1710:1984

Specification for identification of pipelines and services

BS 21:1985

Specification for pipe threads for tubes and fittings where pressure-tight joints are made on the threads (metric dimensions).

BS 2767:1991

Specification for manually operated copper alloy valves for radiators

BS 2790:1992

Specification for design and manufacture of shell boilers of welded construction. Partially replaced by Parts 1-6 and Part 8 of BS EN 12953

BS 2879:1980

Specification for draining taps (screw-down pattern)

BS 3533:1981

Glossary of thermal insulation terms

BS 4076:1989

Specification for steel chimneys

BS 5154:1991

Specification for copper alloy globe, globe stop and check, check and gate valves. Partially replaced by BS EN 12288:2003

BS 5440-1:2008

Installation and maintenance of flues and ventilation for gas appliances of rated input not exceeding 70 kW net (1st, 2nd and 3rd family gases). Part 1 Specification for installation and maintenance of flues

BS 5854:1980

Code of practice for flues and flue structures in buildings

BS 5970:2012

Code of practice for thermal insulation of pipework and equipment in the temperature range of -100°C to +870°C

BS 6798:2009

Specification for installation of gas-fired boilers of rated input not exceeding 70 kW net

BS 6956-1:1988

Jointing materials and compounds. Part 1 Specification for corrugated metal joint rings

BS 6956-5:1992

Jointing materials and compounds. Part 5 Specification for jointing compounds for use with water, low pressure saturated steam, 1st family gases (excluding coal gas) and 2nd family gases

BS 7074-1:1989

Application, selection and installation of expansion vessels and ancillary equipment for sealed water systems. Part 1 Code of practice for domestic heating and hot water supply

BS 7074-2:1989

Application, selection and installation of expansion vessels and ancillary equipment for sealed water systems. Part 2 Code of practice for low and medium temperature hot water heating systems

BS 7350:1990

Specification for double regulating globe valves and flow measurement devices for heating and chilled water systems

BS 759-1:1984

Valves, gauges and other safety fittings for application to boilers and to piping installations for and in connection with boilers. Part 1 Specification for valves, mountings and fittings

BS 7671:2008+A2:2013

Requirements for electrical installations. IEE Wiring Regulations. Seventeenth edition

BS 7786:2006

Specification for un-sintered PTFE tapes for general use.

BS EN 10226-1:2004

Pipe threads where pressure tight joints are made on the threads. Taper external threads and parallel internal threads. Part 1 dimensions, tolerances and designation

BS EN 10242:1995

Threaded pipe fittings in malleable cast iron

BS EN 10253-1:1999

Butt-welding pipe fittings. Part 1 Wrought carbon steel for general use and without specific inspection requirements

BS EN 10255:2004

Non-alloy steel tubes suitable for welding or threading. Technical delivery conditions

BS EN 10346:2009

Continuously hot-dip coated steel flat products. Technical delivery conditions

BS EN 1057:2006+A1:2010

Copper and copper alloys. Seamless, round copper tubes for water and gas in sanitary and heating applications

BS EN 1092-1:2007+A1:2013

Flanges and their joints. Circular flanges for pipes, valves, fittings and accessories, PN designated. Part 1 steel flanges

BS EN 1092-2:1997

Flanges and their joints. Circular flanges for pipes, valves, fittings and accessories, PN designated. Part 2 cast iron flanges

BS EN 1092-3:2003

Flanges and their joints. Circular flanges for pipes, valves, fittings and accessories, PN designated. Part 3 copper alloy flanges

BS EN 1092-4:2002

Flanges and their joints. Circular flanges for pipes, valves, fittings and accessories, PN designated. Part 4 aluminium alloy flanges

BS EN 12067-2:2004

Gas/air ratio controls for gas burners and gas burning appliances. Part 2 Electronic types

BS EN 1254-1:1998

Copper and copper alloys. Plumbing fittings. Part 1 fittings with ends for capillary soldering or capillary brazing to copper tubes.

BS EN 1254-2:1998

Copper and copper alloys. Plumbing fittings. Part 2 fittings with compression ends for use with copper tubes

BS EN 1254-3:1998

Copper and copper alloys. Plumbing fittings. Part 3 Fittings with compression ends for use with plastics pipes

BS EN 126:2012

Multifunctional controls for gas burning appliances

BS EN 12756:2001

Mechanical seals. Principal dimensions, designation and material codes

BS EN 12828:2012

Heating systems in buildings. Design for water-based heating systems

BS EN 12831:2003

Heating systems in buildings. Method for calculation of the design heat load

BS EN 13190:2001

Thermal insulation products for buildings. Factory made products of phenolic foam (PF). Specification

BS EN 13501-1:2007+A1:2009

Fire classification of construction products and building elements. Classification using test data from reaction to fire tests

BS EN 13502:2002

Chimneys. Requirements and test methods for clay/ceramic flue terminals

BS EN 13611:2007+A2:2011

Safety and control devices for gas burners and gas-burning appliances. General requirements

BS EN 13823:2010

Reaction to fire tests for building products. Building products excluding floorings exposed to the thermal attack by a single burning item

BS EN 13831:2007

Closed expansion vessels with built-in diaphragm for installation in water

BS EN 14303:2009

Thermal insulation products for building equipment and industrial installations. Factory made mineral wool products (MW). Specification.

BS EN 14304:2009+A1:2013

Thermal insulation products for building equipment and industrial installations. Factory made flexible elastomeric foam (FEF) products. Specification.

BS EN 14314:2009+A1:2013

Thermal insulation products for building equipment and industrial installations. Factory made phenolic foam (PF) products. Specification.

BS EN 14336:2004

Heating systems in buildings. Installation and commissioning of water based heating systems

BS EN 1434-1:2007

Heat meters. General requirements

BS EN 1434-2:2007

Heat meters. Constructional requirements

BS EN 1434-3:2008

Heat Meters. Data exchange and interfaces

BS EN 1434-4:2007

Heat meters. Pattern approval tests

BS EN 1434-5:2007

Heat meters. Initial verification tests

BS EN 1434-6:2007

Heat meters. Installation, commissioning, operational monitoring and maintenance

BS EN 1443:2003

Chimneys. General requirements

BS EN 14459:2007

Control functions in electronic systems for gas burners and gas burning appliances. Methods for classification and assessment

BS EN 14989-1:2007

Chimneys. Requirements and test methods for metal chimneys and material independent air supply ducts for room sealed heating applications. Part 1 Vertical air/flue terminals for C6-type appliances

BS EN 14989-2:2007

Chimneys. Requirements and test methods for metal chimneys and material independent air supply ducts for room sealed heating applications. Part 2 Flue and air supply ducts for room sealed appliances

BS EN 1514-1:1997

Flanges and their joints. Dimensions of gaskets for PN-designated flanges. Part 1 Non-metallic flat gaskets with or without inserts

BS EN 15287-1:2007+A1:2010

Chimneys. Design, installation and commissioning of chimneys. Part 1 Chimneys for non-room sealed heating appliances

BS EN 15287-2:2008

Chimneys. Design, installation and commissioning of chimneys. Chimneys for room sealed appliances

BS EN 15502-1:2012

Gas fired heating boilers. General requirements and tests

BS EN 15502-2-1:2012

Gas-fired central heating boilers. Specific standard for type C appliances and type B2, B3 and B5 appliances of a nominal heat input not exceeding 1 000 kW

BS EN 161:2011+A3:2013

Automatic shut-off valves for gas burners and gas appliances

BS EN 16297-1:2012

Pumps. Rotodynamic pumps. Glandless circulators. . General requirements and procedures for testing and calculation of energy efficiency index (EEI)

BS EN 16297-2:2012

Pumps. Rotodynamic pumps. Glandless circulators. Calculation of energy efficiency index (EEI) for standalone circulators

BS EN 1775:2007

Gas supply. Gas pipework for buildings. Maximum operating pressure less than or equal to 5 bar. Functional recommendations

BS EN 1856-1:2009

Chimneys. Requirements for metal chimneys. Part 1 System chimney products

BS EN 1856-2:2009

Chimneys. Requirements for metal chimneys. Part 2 Metal flue liners and connecting flue pipes

BS EN 1857:2010

Chimneys. Components. Concrete flue liners

BS EN 1859:2000

Chimneys. Metal chimneys. Test methods

BS EN 298:2012

Automatic burner control systems for burners and appliances burning gaseous or liquid fuels

BS EN 303-1:1999

Heating boilers. Heating boilers with forced draught burners. Part 1 Terminology, general requirements, testing and marking.

BS EN 303-2:1999

Heating boilers. Heating boilers with forced draught burners. Part 2 Heating boilers with forced draught burners. Special requirements for boilers with atomizing oil burners

BS EN 303-3:1999

Heating boilers. Heating boilers with forced draught burners. Part 3 Gas-fired central heating boilers. Assembly comprising a boiler body and a forced draught burner

BS EN 303-4:1999

Heating boilers. Heating boilers with forced draught burners. Part 4 Heating boilers with forced draught burners. Special requirements for boilers with forced draught oil burners with outputs up to 70 kW and a maximum operating pressure of 3 bar. Terminology, special requirements, testing and marking.

BS EN 303-6:2000

Heating boilers. Heating boilers with forced draught burners. Part 6 Specific requirements for the domestic hot water operation of combination boilers with atomizing oil burners of nominal heat input not exceeding 70 kW

BS EN 303-7:2006

Heating boilers. Part 7 Gas-fired central heating boilers equipped with a forced draught burner of nominal heat output not exceeding 1000 kW

BS EN 304:1992

Heating boilers. Test code for heating boilers for atomizing oil burners

BS EN 60038:2011

CENELEC standard voltages

BS EN 676:2003+A2:2008

Automatic forced draught burners for gaseous fuels.

BS EN 751-2:1997

Sealing materials for metallic threaded joints in contact with 1st, 2nd and 3rd family gases and hot water. Part 2 Non-hardening jointing compounds

BS EN 837-1:1998

Pressure gauges. Part 1 Bourdon tube pressure gauges. Dimensions, metrology, requirements and testing

BS EN ISO 1182:2010

Reaction to fire tests for products. Non-combustibility test

BS EN ISO 11925-2:2010

Reaction to fire tests. Ignitability of products subjected to direct impingement of flame. Single-flame source test

BS EN ISO 12241:2008

Thermal insulation for building equipment and industrial installations. Calculation rules

BS EN ISO 1716:2010

Reaction to fire tests for products. Determination of the gross heat of combustion (calorific value)

BS EN ISO 4126-1:2013

Safety devices for protection against excessive pressure. Part 1 Safety valves

BS EN ISO 9453:2006

Soft solder alloys. Chemical compositions and forms

BS EN ISO 9908:1998+A1:2011

Technical specifications for centrifugal pumps. Class III

BS ISO 22967:2010

Forced draught gas burners

10.0 TENDER RETURN SUMMARY

TENDER SUMMARY

1.0	PRELIMINARIES (INC CDM)	£.....
2.0	UTILITIES	£.....
	2.1 ATTENDANCES	£.....
3.0	ABOVE GROUND DRAINAGE and PLUMBING	£.....
4.0	COLD WATER SERVICE	£.....
5.0	DOMESTIC HOT WATER SERVICE and HEATER	£.....
6.0	~~GAS (NATURAL) SERVICE~~ (not required)	£.....
7.0	LTHW HEATING (radiators)	£.....
8.0	~~AIR CONDITIONING~~ (not required)	£.....
9.0	VENTILATION	£.....
10.0	CONTAINMENT	£.....
11.0	STRIPPING OUT (existing office)	£.....
12.0	OVERDOOR WARM AIR CURTAINS	£.....
12.0	TESTING /COMMISSIONING/STAFF TRAINING	£.....
13.0	O & M MANUALS AND DRAWINGS	£.....
14.0	MISCELLANEOUS	£.....

Sub Total	£
Other	<u>£.....</u>
Grand Total	<u>£.....</u>

Signed

Date.....

On behalf of (Company).....