

JCT MINOR WORKS 2016 WITH CONTRACTORS DESIGN PORTION

MECHANICAL & ELECTRICAL SERVICES

PERFORMANCE BRIEF

1.0 THE PROJECT

- 1.1 The project involves the refurbishment of the Sileby Memorial Park Sports Pavilion located on Seagrave Road Sileby LE12 7TP as indicated on the tender drawings provided.

2.0 SCOPE

- 2.1 The Mechanical and Electrical design and installation work (M&E) are to be procured as set out in the JCT Minor Works with Contractors Design Portion procurement route and are to be fulfilled in full compliance with the main specification documentation and the information referred to therein. This contract shall include for both the installation works and the preparation of all design drawings and calculations.
- 2.2 For the avoidance of doubt the whole of the Mechanical and Electrical design and installation work required forms part of the Principal Contractors contractual obligations and is to be designed priced and installed accordingly with the JCT Minor Works with Contractors Design Portion requirements.
- 2.3 The Principal Contractor and their appointed designers shall be responsible for the whole of the services design process required for the proposed refurbishments and shall provide this for verification to The Employer requires as early as possible post tender all (M&E) design information is provided by their appointed Building Services design team in good time to accord with the dates given for executing and competing the works on site.
- 2.4 The Principal Contractor and their appointed designers & installers will ultimately be fully responsible for examination of the existing services situation and include in their design proposals for all costs for completing the design and upgrading of the existing services installations.
- 2.5 The whole of the Mechanical Services installation works shall also be carried out by a Mechanical Contractor who is a registered and approved member of the Heating and Ventilation Services Contractors Association (HVCA) and Gas Safe Registered as appropriate.
- 2.6 The whole of the Electrical Services installation works shall also be carried out by an Electrical Contractor who is a registered and approved member of the NICEIC and is also a member of the ECA.
- 2.7 The scope of the project shall include the design, supply, delivery, installation, testing, commissioning, and maintaining during the first year after handover, of the entire mechanical and electrical installations as detailed and designed by the Principal Contractors design teams specification, and/or as shown on the services design drawings.
- 2.8 The Mechanical and Electrical Contractors' programme of work shall be in accordance with Principal Contractors' master programme. In particular, the Subcontractor installation and completion dates referred to within the documentation are to be met.

3.0 DESIGN RESPONSIBILITY, DESIGN DEVELOPMENT & COORDINATION

- 3.1 Whilst the project general design requirements have been outlined in the Schedule of the Works and tender drawings, it shall be the Principal Contractors Mechanical and Electrical designers and their appointed Subcontracts responsibility to design, supply, install, test and commission all mechanical, electrical and public health services in their entirety.
- 3.2 The scope of the design input shall include the verification and subsequent design development of the design proposals provided. This shall include the provision of all technical drawings, calculations, and other documentation as required to complete the work.
- 3.3 The Mechanical and Electrical Contractors shall note that the drawings and specifications provided as part of this enquiry document are indicative only as a guide.

They do not show or refer to every component, system or solution that is required to meet the performance requirements or design intent set out in the enquiry as required to complete the refurbishments.

- 3.4 It is the Principal Contractor's responsibility to ensure that due allowance is made at tender stage for all costs associated with meeting the requirements of the enquiry whether shown on the drawings or not. Where necessary the cost of these items may be separately shown in the pricing schedules or otherwise included in other items in the pricing schedules.
- 3.5 The Mechanical and Electrical design solution shall be in accordance with the requirements of the main programme. This includes for the supply of a full set of "Construction and Setting Out drawings" demonstrating that the design has been developed and that full coordination has taken place with the General Arrangement plans and elevation drawings provided.
- 3.6 The Principal Contractor shall include for the design development of the scheme indicated in the tender document information and develop a working design through to a completed installation. This shall include all design development costs, and associated installations costs, including the supply, erection, fixing, connecting, setting to work, testing commissioning and maintaining in accordance with the manufacturer's recommendations of the entire works as described in this specification, on the tender drawings and as may be reasonably inferred as necessary to complete the design.
- 3.7 The tender information pertaining to mechanical and electrical information provided shows general "design intent" only. The Principal Contractor shall be responsible for developing the design proposals. For clarity, the Principal Contractor as their designers, shall take full responsibility for his/her design and make due allowance for design development and redesign as necessary to achieve sign off as "construction issue."
- 3.8 Information provided by the designer to communicate the requirements to The Employer requires can be provided in various forms. This may include hand marked up drawings, sketches, extracts of drawings, schedules, faxes, emails, and the like at the discretion of his/her design team. The Principal Contractor shall take overall responsibility for incorporating this information into his design and installation proposals in a timely and speedy manner.
- 3.9 The responsibility for the design of Mechanical and Electrical services installation shall remain with the Principal Contractor, his design team and M&E Contractors and shall include completing both the design and installation works and the preparation of all drawings and calculations required.
- 3.10 The Principal Contractor shall allow for the issue of working drawings, placing all necessary orders, delivery to site, off-loading and erection of all materials and equipment, all labour for installation, supervision and inspection, specialist labour and all necessary instruments and attendance for testing and commissioning, provision of operating and maintenance instructions and record drawings, supply of special tools, training of the Employer's staff; in accordance with the details outlined in this specification and associated drawings to achieve completely functioning systems, fully adjusted, and ready for use.
- 3.11 The Principal Contractor shall provide mechanical and electrical design services and installation that are compliant with current Building Regulations including any planning requirements and shall include for all necessary meetings, attendances, calculations (where applicable), drawings and submissions to achieve Building Regulations approval. They shall also include for liaising with Building Control and members of the design team in pursuit of Building Regulations approval.
- 3.12 The information detailed in the Schedule of the Works and the tender drawings shall be interpreted as being an "indicative" description/representation only of the minimum level of provision required; these shall be assessed and developed by the mechanical and electrical designers so that these proposals provide a full and complete installation and integrated with the existing services as called for.

4.0 DESIGN DEVELOPMENT & RESPONSIBILITY

- 4.1 The aim of the design solution is to provide a completed refurbished building which meets the specification/schedule of works without detriment to reliability of the existing building services whilst complying with all relevant legislation.

4.2 The responsibility for the detailed mechanical and electrical design activities listed within this specification (unless noted otherwise in any particular technical specification) in addition to and including those activities normally undertaken through the custom and practice of the industry, shall be the responsibility of the Principal Contractor and any subsequent consultants/design specialists and installers employed by them.

4.3 The M&E services design will eliminate foreseeable health and safety risks to anyone affected by the work and, where that is not possible, take steps to reduce or control those risks, including for the installation and future maintenance, repair, or removal of fixed services.

5.0 TECHNICAL SUBMISSION AND DESIGN CALCULATIONS

5.1 As part of the detailed mechanical design solution produce as a minimum the following calculations or any other required to complete the design:

- Thermal Model for As Built EPC requirements
- Water maximum demand calculations.
- Cold water service pipework sizing.
- Hot, cold and drinking water services supply - rerouting and pipework sizing.
- Above and below ground soil and waste pipework sizing.
- Air volume flow rate requirements.
- Pump sizing
- Fan sizing
- Pipework sizing.
- Heat loss calculations for the heating system
- Grille and diffuser sizing and selections
- Sanitary installations

5.2 As part of the detailed electrical design solution produce as a minimum the following calculations or any other required to complete the design:

- Electrical maximum demand calculations.
- Detailed cable calculations on all disconnection times, earth fault loop impedance, short circuit protection and discrimination, including volt drop, current carrying capacities of cables, space factors, grouping etc. to establish sizes for all cables and equipment on in line with BS7671 produced on Amtech, etc. Amtech.p17 file issued to BEC for comment and approval.
- Protective device discrimination graphs / Study on approved software such as Amtech. Amtech.p17 file issued for comment and approval.
- Protective and equipotential bonding conductor sizing calculations or as Table in IEE Wirings Regulations.
- Schedule of loads including diversity values.
- Complete building lighting design calculations, including provision of Isolux diagrams, photometric data and glare calculations on Dialux / Relux software.
- Completed building emergency lighting calculations on Dialux / Relux software
- Containment sizing calculation for any containment runs.
- Lightning protection risk assessment.

5.3 The Mechanical and Electrical Contractor/Designer shall allow for completing the project using AutoCAD or compatible programme to illustrate full co-ordination of M&E services with other disciplines.

5.4 The Mechanical Contractor/Designer shall provide a full set of installation drawings for comment/approval by The Employer requires prior to installation. This shall include but not be limited to the following:-

- All space heating design requirements
- All H&C water supply design requirements

- All Ventilation design requirements
- All drainage design requirements above and below ground
- Designed layout drawings for each internal services requirement
- A full set of coordinated layouts and sections showing the entirety of the mechanical, electrical design layout and proposed installation components
- Detailed prescriptive specifications
- The Rainwater Harvesting equipment and improvement design work as called for in the Schedule of the Works.

5.5 The Electrical Contractor shall provide a full set of installation drawings for comment/approval by the Employer prior to installation. This shall include but not be limited to the following:-

- NTS LV Schematic
- NTS Earthing Schematic
- Design layout drawings for each internal service
- All lighting layouts including schematic controls
- Reflected ceiling plan (RCP) layouts
- All small power layout requirements
- All electrical appliances requirements
- All hot water requirements
- Internal and external doors/roller shutter power and automation requirements
- Full set of coordinated layouts and sections showing mechanical and electrical layouts
- Detailed prescriptive specifications

5.6 The MEP Contractor shall provide a full set of technical submittals for every service including full product details for comment/approval by the CA/Client.

6.0 CO-ORDINATION

6.1 The M&E designer will allow for consulting with the Principal Contractor and the M&E Installer/Subcontractor as necessary to ensure co-ordination of the work with related building elements and services and correct positioning of equipment of co-ordination/installation/working drawings and other information detailing the services required including:

- Specific builders work requirements including sizes and locations of all holes and openings.
- Identify access required for future maintenance.
- The complete mechanical and electrical installation.
- Other information may be required by the Principal Contractor together with equipment manufacturer's working drawings and wiring diagrams of all equipment being provided by the M&E Designer and Installer as part of this contract.
- The M&E Contractor shall make any necessary amendments to accord with the Principal Contractor's requirements.
- Will provide sufficient copies of the final versions of the drawings/information, including 3 copies for the Principal Contractor and distribute them to all interested parties.
- Make all due allowances for the necessary attendance at co-ordination meetings as directed by the Principal Contractor.
- The M&E Contractors' installation work shall ensure that in fixing the work in this contract it will not obstruct the fixing or future maintenance of adjacent services.
- The M&E Contractors shall also fully co-operate with the Principal Contractor and all other Sub Contractor installers/designers.
- All of the implications of these restrictions and methods which are to be adopted must be fully considered and allowances for them made in the tender price
- By way of confirming the design to the Principal Contractor the M&E designer shall provide co-ordinated installation drawings and design calculations (where appropriate) to support and illustrate the development of the design indicated in the relevant specification and drawings

- The M&E Contractors shall be responsible for ensuring the co-ordination of their installations within the building structure and with known zones and routing of other installations identified on the drawings and at meetings. He shall attend co-ordination meetings to be held weekly or more often as necessary on site chaired by the Principal Contractor and any other Sub - Contractors in attendance.
- The M&E Contractors shall request from other Sub - Contractors deemed necessary to carry out his co-ordination function. The Main Contractor shall confirm the status of relevant installation package information and issue appropriate information
- Lack of knowledge with respect to other work packages shall not be considered and the M&E Contractors shall carefully examine all information available.

7.0 SUMMARY OF GENERAL BUILDING SERVICES SCOPE

7.1 The scope of the mechanical and electrical services design and installation shall include, but not be limited to, the following: -

- Design development and coordination of ALL new M&E services requirements including maintaining the existing.
- Provision of dimensioned and setting out drawings required
- Preparation of method statements, and Construction Phase Health and Safety Plan.
- Details of the Mechanical and Electrical services as required meeting Building regulations and the requirements of this specification.
- Provision of all Labelling and Charts
- Testing and Commissioning of all Mechanical and Electrical systems to meet current legislative requirements.
- Operating and Maintenance Manuals of all newly installed services
- Building Logbook
- Demonstration of commissioning and operation of any plant and associated systems
- Any other items mentioned in this specification or as reasonably inferred as necessary to complete the design and installation works for completing the refurbishments.

8.0 BUILDERS WORK

8.1 It shall be the Mechanical and Electrical Contractors responsibility to provide a full set of builder's work drawings, showing all required dimensions and setting out.

8.2 The Mechanical and Electrical Contractor shall make due reference to all available information when providing builders work information to ensure that the dimensions are as accurate as possible, this information may include, but not be restricted to:

- Architectural drawings.
- Fixtures and fittings drawings.
- Etc.

8.3 The Mechanical and Electrical services contractor(s) shall ensure that all necessary liaison takes place to ensure that the locations of all services are fully coordinated with the existing to be retained.

8.4 The Principal Contractor shall be responsible for all builders' work in connection with the mechanical and electrical services installation work above holes of 50mm ϕ . Holes up to 50 mm ϕ shall be provided by the M&E Contractors in liaison with the Main Contractor.

8.5 Builder's work by the Principal Contractor shall not include drilling and fixings for brackets etc. which will remain the responsibility of the Mechanical and Electrical contractors.

8.6 The Mechanical and Electrical contractors will be responsible for identifying and marking out of all builder's work. He/she shall produce any necessary drawings detailing builders' work requirements for submission to the Principal Contractor as previously stated.

9.0 BUILDING SERVICES SYSTEMS SUPPLY, INSTALLATION AND MANAGEMENT

The Mechanical and Electrical Design Contractor shall be responsible for developing the indicative proposals indicated on the tender drawings and provide a fully developed and coordinated installation proposal as required by the **Contractors Design Portion of the contract.**

The Mechanical and Electrical Contractor should make all necessary allowance for this coordination including, where necessary, the rerouting of services or the setting up and down of services etc.

- 9.1 Information to be provided by the Principal Contractors design team post tender to communicate the design are to be provided to the CA/Employer. This may include hand marked up drawings, sketches, extracts of drawings, schedules, faxes, emails and the like at the discretion of the design team. The Mechanical and Electrical Contractor shall be responsible for incorporating this information into his installation proposals in a timely and speedy manner.
- 9.2 The Mechanical and Electrical Design Contractor shall in the majority of cases communicate their proposed design using electronically prepared drawings.
- 9.3 The Mechanical and Electrical Design Contractor shall undertake to complete the design in a spirit of partnership i.e. in a cooperative non-confrontational manner.
- 9.4 The Mechanical and Electrical Design Contractor shall cover the preparation of all drawings, including detailed builders' work, all necessary schedules, and submission of all drawings.
- 9.5 The Mechanical and Electrical Design Contractors detailing obligations shall include but not be limited to the following: -
- Fabrication drawings and the coordinated Installation/Working Drawings and Record Drawings.
 - Drain points shall be inserted at all low-level positions and vent points at all high-level locations, with Auto Air Vents and bottles wherever possible.
 - Pipework gradients in accordance with BSRIA documents Application Guide 1/89 Flushing and cleaning of Water Systems.
 - Bracket and support detailed design and locations. (All types, loads and locations must be declared to the Contract Administrator prior to installation for comment (10 working days). Particular reference is drawn to roof/purlin loads as indicated on the Structural Engineers drawings
 - Details of Electrical wiring diagrams of all equipment supplied by the Mechanical and Electrical Contractor showing all interconnections between equipment to enable the necessary wiring to be undertaken.
 - Details of all equipment component design and selection necessary insofar as such items have been selected by the Mechanical and Electrical Contractor for that item of equipment to meet the engineering specification and performance indicated.
 - The positioning of any new plant shall include identified maintenance space and indicated upon as fitted drawings.
- 9.6 Dimensioning of, and final installation details of, the Automatic Control panels to suit the detailed requirement of the particular agreed manufacturers of controls equipment and cable entry/exit accommodation such that:
- Cable entry is possible in the selected location.
 - Doors are not fouled by other plant, equipment, services or structural elements.
 - Safe operating and maintenance clearances are provided in all access positions when installed on site.
 - Fire alarm system, component and cabling requirements to meet with particular manufacturer's and the engineering specifications' requirements.
 - Attenuator design and selection to satisfy the particular and performance requirements of the specification, including spatial allowances made within tender drawings.

- Design of elements of the scheme provided by the Mechanical and Electrical Contractor for self-weight and other applied forces/loadings in reasonable use. In particular, any buried tanks or pipework will require designed anchorage encasement or foundations.
- Submit calculations and proposals to demonstrate the design has fully considered the requirements for thermal expansion accommodation and anchorage, including provision of bellows or bends.
- Acoustic design or modification of equipment to meet with the noise levels specified. All levels to be achieved with all M&E operating plant
- Valve, damper and access locations.
- System water capacities, and chemical additives - and arranging of the facilities required by BSRIA Application Guide 8/91 pre-commission cleaning of water system
- Selection of all anti-vibration mountings to suit the particular application of the mounts.
- Final exact locations of control sensors detectors and thermostats.
- Capacity, location and design of electrical conduit system, similarly trunking where used in lieu of multi-conduit installation.
- Duct platforms, access covers and gratings, ladders and additional structural steelwork where required and detailed in the sub-contract documentation.
- Selection of regulation devices to comply with CIBSE Technical Memorandum TM8.
- Sizing of cable terminations on items of equipment provided under the sub-Contract where cable sizes are specified.
- Ensuring cable sizing selections as specified are not invalidated by Sub - Contractor selection of alternative routes during installation.
- Detailed design of earthing and bonding requirements for electrical engineering services, mechanical engineering services, architectural and structural elements requiring earthing and bonding.

9.7 Design of cable or cable trunking terminations on to electrical equipment provided under the subcontract and dimensioning of and final installation details of electrical switchgear to ensure that:

- Cable entry is possible in the selected location.
- Fuse sizes installed in plug tops are appropriate for the rating of connected equipment.
- Sizing and detailed design of refrigerant pipework between items of equipment provided under contract works.
- Detailed coordination and planning of services within Service Risers including provision of plan, section, and elevation drawings.
- Programming and co-ordination of installation activities to minimise disruption and inconvenience to the site.

10.0 SERVICES DESIGN CRITERIA

10.1 All Mechanical and Electrical design shall comply with the following as a minimum:

- The Planning Permission and all associated conditions
- Secure by Design
- Building Regulations and all current amendments as at the date of tender return
- The Construction (Design and Management) Regulations 2015 and all current amendments as at the date of tender return
- The Health and Safety at Work Act 1974 including all relevant amendments and enactments current as at the date of tender return
- The Fire Precautions Act 1971 including all relevant amendments and enactments current as at the date of tender return
- Requirements of the Local Environmental Health Officer
- The Equality Act 2010
- Control of Asbestos Working Regulations 2012

- All relevant British Standards and Approved Codes of Practice in relation to the works
- CIBSE Guides, Codes of Practice and Knowledge Series Information
- Water Fittings Regulations
- Regulations imposed by local Water and Electrical Undertakings
- BS: 7671 - Requirements for electrical installations. IET Wiring Regulations eighteenth edition
- BS 5266 Parts 1-10 and BS EN 50172 — Code of Practice for Emergency Lighting
- BS 5839 Parts 1-11 and PD6531:2010 — Fire Detection and Alarm Systems for Buildings
- The Energy Performance of Buildings (Certificates and Inspections) (England and Wales) Regulations 2007
- Current British Standard Specification and Codes of Practice
- Conservation of Fuel and Power Part L2, 2010 Edition, DCLG
- Chartered Institution of Building Services Engineers Guides and Commissioning Guides
- BSRIA Commissioning Guides
- EEC Legislation
- Current Building Regulations
- British and EEC Acts of Parliament
- Standards and Guidelines including current practice, published by HVCA
- Ductwork Standard (HVCA) DW144
- Water Supply (Water Fittings) Regulations 2010
- Current Gas Safety Regulations
- Institute of Gas Engineers UP/1 and 2
- HSE ACOP L8 Legionella Disease
- Gas Register Recommendations
- Manufacturer's Recommendations
- Environmental Protection Act
- The Employer requires Requirements including all supporting documentation
- Any other relevant legislation regarding Sports Facility Changing Rooms as at the date of tender of tender return.

10.2 Where there is conflict between any standards the Mechanical and Electrical Designer/Contractor shall bring it to the attention of the Principal Contractor and the CA. The most onerous version/interpretation shall apply prior to any decision or interpretation by the Principal Contractor.

11.0 BUILDING REGULATIONS COMPLIANCE

11.1 The Mechanical and Electrical Contractor shall be responsible for installing, commissioning, and setting to work the M&E systems to comply with the requirements of Approved Building Regulations Documents.

11.2 The Principal Contractors appointed Mechanical and Electrical design specialist will be responsible for the production of all calculations and documentation required to prove compliance with the Building Regulations approved Part L document.

12.0 INFORMATION PROVIDED FOR TENDERING

12.1 The Principal Contractor and any subsequent Mechanical and Electrical/Designers or Subcontractors shall utilise all the information provided in the preparation of his tender price.

12.2 The Principal Contractor is to formally advise the CA or Clients representative in writing during tender stage if they consider there is insufficient information provided to formulate an accurate tender price. Otherwise, it will be deemed accepted that sufficient information has been provided for remodeling and redesigning of the existing services arrangements as required to complete the refurbishment works satisfactorily.

13.0 SITE VISIT

- 13.1 Prior to submission of his tender the Mechanical and Electrical Designer/Contractor is advised to visit site to ascertain the works involved. No claim for lack of site knowledge in connection with this work will be considered.

MECHANICAL AND ELECTRICAL SERVICES (M&E) REQUIREMENTS

The Contractor shall be responsible for developing and completing the full design, supply, installation and commissioning of the Contractor's Design Portion works as described below. This includes, but not limited to, compliance to all current relevant Statutory Authorities, British Standards, manufacturer guidance/standards and associated work regulations.

It is deemed that the Principal Contractor will be familiar with the JCT 2016 Minor Works Building Contract with Contractor's Design 2016 and has full understanding of his contractual responsibilities in relation to the Contractor's Design Portion ('the Employer's Requirements').

Details provided on the General Arrangement drawings pack are indicative and the and the Principal Contractors design consultants /installers are required to undertake to provide upgraded services to serve the refurbished building. The services design **MUST** allow for maintaining all mechanical, electrical, heating ventilation and drainage services in the accommodation that is outside of the areas to be refurbished. All design and installation work must be in full compliance with all legislative requirements and factored into to the specified contract period. If you are in doubt of the requirements seek clarification from The Employers requirements or CA during the tender period.

The Contractor shall supply the Contract Administrator with all necessary drawings and other documents illustrating the compliance with the Employer's Requirements. The issued format is to be electronic, and the Contractor is to allow not less than 7 days from the date of their receipt for the Contract Administrator comments on each drawing or other document before commencing work to which they relate.

The mechanical and electrical systems will be simple to operate, robust in use and also be easy to maintain. Provision of specialist systems that require unusual skills to operate and maintain will be avoided where possible.

Scope:

The Employer requires that the Principal Contractor and their appointed design consultants/installers thoroughly examine the existing mechanical and electrical services provision and thereafter allow to develop a "best practice" approach to undertake to install new/upgrade and install new complaint and functional services provision. embracing the requirements of the RIBA Outline Plan of Work from stage 3 to ratify the indicative design provided through stages 4A and 5 which can overlap through to approval of the design, installation and practical completion of the works on site. This must be consistent with the overall delivery period stated to complete the refurbishment works.

The Employer requires that the Principal Contractor shall be responsible for owning the whole of the design and the cost for examining the existing services arrangements and thereafter undertake to update and redesign the buildings existing service provision in the most cost effective way and thereafter to supply all labour and materials and complete the installation to satisfy these Clients brief. No deviation will be permitted form these requirements unless agreed in writing. Where British Standards are referred to the latest standard shall apply including any subsequent amendments

The Principal Contractors Mechanical, Electrical, and Plumbing. (MEP) Contractor shall be responsible for the detailed design activities normally undertaken through the custom and practice of the industry, all of which are subject to the comments of The Employer requires Representatives.

The MEP Contractor shall also take care in the selection of materials and goods to be used in the contract works in so far as the goods are selected by the Electrical Contractors. He shall also give a warranty on the satisfactory performance of any portion of the works for which the work is detailed within the contract by means of a performance specification.

Coordination:

Ensure the refurbished building's essential systems are installed correctly and efficiently, contributing to its comfort, safety, and functionality

Working closely with other trades and stakeholders to coordinate the installation of any upgrading to the existing systems ensuring they don't clash and function together effectively.

Standards:

The M&E installation will comply with the current versions of the following:

- Relevant British and European Standards
- Relevant CIBSE Design Guides.

Maintenance and Support:

Offer maintenance and support services for the systems they install, ensuring their continued proper operation.

Warranty of design and installation:

The Principal Contractor shall warrant that all reasonable skill and care has been taken in the design of the works in so far as the works have been, or will be, designed by him or by specialists employed by him to satisfactorily complete the installation by the date of Practical Completion.

The upgrading of the building's existing electrical and mechanical services is expected to provide energy efficient and provide hot and cold water supply, above and below ground drainage, heating, lighting, and ventilation as stated in the Schedule of the Works and the drawings provided. The existing CCTV system, intruder alarms, Wi-Fi and external lighting arrangements are to generally remain as is but positioned where affected by modifications required.

The design life for the M&E services installation will be between 15 to 25 years, dependant on individual items of equipment. Reference life expectancy factors for various systems are provided in CIBSE Guide M, Maintenance Engineering and Management, 2014.

The Contractor is to include in his Contractors Design Portion for obtaining and paying for any consents and all costs involved in providing new or re-routing of the existing services to achieve the required outcome. Timescales for which are to be built into the onsite execution phase. No Provisional Sums for the supply of services will be considered as part of your CDP or claims thereafter.

Insurers Requirements :

The building insurers shall be consulted on the scheme to gain their approval as part of the design process, with particular attention to the fire safety requirements

Mechanical Services

The scope of the Mechanical Services requirements is as provided for the modifying and upgrading the existing services situation including all design as and where required, alongside installing, connecting, testing, and commissioning of the system by the date of Practical Completion.

The Employer requires that in completing the final part of the Principal Contractor acknowledges that they are required to undertake full responsibility for meeting the design requirements set out in the Schedule of the Works and associated documents. No deviation will be permitted from these requirements unless agreed in writing. Where British Standards are referred to the latest standard shall apply including any subsequent amendments.

Your design must also demonstrate that care has been taken in the selection of materials and products to be used and that you can warrant satisfactory performance of the same.

The Mechanical Contractor shall allow for :

- a) The part removal of existing heating system. This shall include (but is not limited to) redundant radiators, pipework, plant, controls, flues, etc. This excludes parts of the building outside the scope of the refurbishment works.
- b) Removal of redundant extract fans and any other ventilation ducting or systems.

- c) Removal of all other mechanical services being made redundant by or not required as part of their design.

The Contractor shall allow to safely strip out and dispose of accordingly the existing redundant services within the building. Refer to the main contract preliminaries for the site waste management plan.

You shall ensure that all existing equipment and services which are remaining shall be fully inspected, validated against their new design, and tested before any modification works are undertaken with defects or non-compliances brought to the attention of the contract administrator.

Space Heating

Updating the space heating including any specific requirements for maintaining services to any non-refurbished areas as indicated on the plans provided.

- The Mechanical Contractor shall allow for alterations to the existing heating system design, supply, installation, testing and commissioning of the heating services as follows.
- New Low Surface Temperature radiators (LST) heating controls with the inclusion for mobile app/Wi-Fi remote operation
- The boiler shall be recommissioned in accordance with CIBSE Commissioning Codes for Boilers.
- An approved commissioning certificate shall be included within the O&M Manuals.

Ventilation

- New mechanical extract ventilation (MEV) where required and shown on the plans
- Retaining of ventilation requirements in all areas not being refurbished.

Hot and Cold Water Supply

Modification of the existing water supply including any specific requirements for maintaining services to any non-refurbished areas:

- Mains fed cold water in the new kitchen facility
- Cold water supply with drinking quality water.
- Dedicated hot water heater supply.
- Zip Econoboil sealed hot water unit.
- Appropriate temperature blended hot water to all sinks and basins
- All new and existing sanitary/showering supply in the building.
- Thermostatic mixing valves/blenders fitted as and where required.
- Upgrading of the existing Rainwater Harvesting System

Electrical Design Requirements

The scope of the Electrical Services requirements is as provided for the modifying and upgrading the existing services situation including all design as and where required, alongside installing, connecting, testing, and commissioning of the system by the date of Practical Completion.

Modification of the existing electrical services including any specific requirements for maintaining services to non-refurbished areas as detailed on the general arrangement plans and described the Schedule of the Works.

Your design must demonstrate that care has been taken in the selection of materials and products to be used and that you can warrant satisfactory performance of the same for:

- Space heating and ventilation (MEV) including any control requirements.
- All lighting requirements with presence detection (LED) with supporting calculations with IP rating commensurate with any specific location requirements.
- All small power requirements including new kitchen appliances.
- All emergency lighting requirements.
- All heat and smoke detection requirements
- Fire shutters, fire alarms, electric, door closers and escape signage.
- Call point requirements.
- New door access and new and existing roller shutter security installations and controls
- Maintaining the existing CCTV and intruder alarm services.

You shall ensure that all existing equipment and services which are remaining shall be fully inspected, validated against their new design, and tested before any modification works are undertaken with defects or non-compliances brought to the attention of the contract administrator.

You shall allow to safely strip out and dispose of accordingly the existing redundant services within the building. Refer to the main contract preliminaries for the site waste management plan.

The Principal Contractor is required to contract with and provide to the Employer all of the electrical design, labour and installation responsibility and costs to include but not limited, to the following requirements: -

- Design/supply and install responsibility
- Strip out and removal of any redundant existing electrical services (apart from changing rooms 3 & 4, the kit store, lightning protection, external lighting, CCTV and intruder alarm that are to remain as part of the new design)
- Test, service and validate external lighting, CCTV, intruder alarm and fire alarm prior to any works.
- Test incoming electrical supply characteristics
- New primary and secondary containment inc bracketry (reuse existing where appropriate)
- New dado and metallic trunking
- New communication systems and information technology
- New low voltage switchgear and sub-mains
- New small power / low voltage final circuits and outlets etc
- New hand dryers
- New electrical requirements and final connections for mechanical services
- New internal lighting
- New emergency lighting
- Presence detection and any other lighting controls
- Retain existing external lighting and controls and reconnect to new electrical systems.
- Retain CCTV system
- Retention of the existing intruder alarm system
- New fire alarm system and control panel
- New door access controls
- New disabled toilet alarm system
- Retain and test lightning protection
- Provision of labelling and charts
- Testing and commissioning
- Provision of operating and maintenance manuals, drawings and product literature
- Provision of the building logbook

- Provision of building users guide
- Maintenance throughout the defects period
- Any other item mentioned in this specification or as reasonably inferred as necessary
- White goods and domestic appliances installations

Builders work In Connection With (BWIC)

Include for all builders' work required in connection with the Mechanical and Electrical services design and installation work and be responsible for identifying and marking out of all builder's work necessary to complete the installations.

Standards

All latest industry standards, guides, and recommendations shall be adhered to in design of the new and updated services. Where those standards, guides, and recommendations are less onerous than the above, the above shall take precedence. Before commencement of any design, any discrepancies shall be highlighted, and a final decision made by the Client as to the Employers requirements.

ELECTRICAL

The existing electricity supply shall be retained.

The Electrical upgraded installation shall comply with the following standards, guides, recommendations, and regulations as a minimum:

- Current Edition IET Wiring Regulations BS7671
- BSEN 61439-3 Low-Voltage Switchgear and Control Gear Assemblies
- IEC 61439-3 Low-Voltage Switchgear and Control Gear Assemblies
- BS EN 60947
- BS159
- BS5486
- BS EN 60439
- BSEN 60898

All the above referred to documents shall be the latest editions.

Any changes to these from the date of this document to completion of the contract shall be highlighted by the contractor to the consultant for review in good time for any alterations to the contract to be implemented.

This is not an exhaustive list, and all standards, guides, recommendations, and regulations shall be adhered to.

DOMESTIC HOT & COLD-WATER SYSTEMS

The existing water supply shall be retained.

The upgraded installation shall comply with the following standards, guides, recommendations, and regulations as a minimum:

- Approved Document G
- CIBSE Guide G
- BS 8558
- BS EN 806
- BS 5422
- BS 5970
- HS(G)70
- WRAS guidelines
- ACOP L8
- Non Domestic Building Services Compliance Guide

All the above referred to documents shall be the latest editions.

Any changes to these from the date of this document to completion of the contract shall be highlighted by the contractor to the consultant for review in good time for any alterations to the contract to be implemented.

This is not an exhaustive list, and all standards, guides, recommendations, and regulations shall be adhered to.

HEATING SYSTEMS

The existing boiler supply shall be retained.

The upgraded installation shall comply with the following standards, guides, recommendations, and regulations as a minimum:

- Approved Document L
- CIBSE Guide B1
- Current British Standards
- Building Regulations
- Specification and Codes of Practice
- Conservation of Fuel and Power Part L2, 2010 Edition,
- Chartered Institution of Building Services Engineers Guides and Commissioning Guides
- BSRIA Commissioning
- Non-Domestic Building Services Compliance Guide Guides

All the above referred to documents shall be the latest editions.

Any changes to these from the date of this document to completion of the contract shall be highlighted by the contractor to the consultant for review in good time for any alterations to the contract to be implemented.

This is not an exhaustive list, and all standards, guides, recommendations, and regulations shall be adhered to.

VENTILATION SYSTEMS

The Mechanical Contractor shall allow for the provision of mechanical ventilation services as follows:

The Mechanical Contractors Installation shall comply with the following standards, guides, recommendations, and regulations as a minimum:

- CIBSE Guide B
- CIBSE Guide H
- CIBSE Guide A
- Approved Document F (ADF)
- Approved Document L
- HVCA DW144
- All relevant British Standards and Codes of Practice
- BS EN 14173 (Structural Adhesives)
- HSG 258 (Controlling Airborne Contaminants at Work)
- BS 5588 (Fire Safety)
- BS 7346 (Smoke Control)
- BS 9999 (Fire Safety)
- Non-Domestic Building Services Compliance Guide

All the above referred to documents shall be the latest editions.

Any changes to these from the date of this document to completion of the contract shall be highlighted by the contractor to the consultant for review in good time for any alterations to the contract to be implemented.

This is not an exhaustive list, and all standards, guides, recommendations, and regulations shall be adhered to.

ABOVE GROUND DRAINAGE SYSTEMS

The Mechanical Contractor shall allow for the provision of Above Ground Drainage Systems and the installation shall comply with the following standards, guides, recommendations, and regulations as a minimum:

- BS EN 12056
- Approved Document Part G

All the above referred to documents shall be the latest editions.

Any changes to these from the date of this document to completion of the contract shall be highlighted by the contractor to the consultant for review in good time for any alterations to the contract to be implemented.

This is not an exhaustive list, and all standards, guides, recommendations, and regulations shall be adhered to.

TESTING AND COMMISSIONING

- The M&E engineering services systems are to be thoroughly commissioned and tested to prove that they are capable of achieving the specified performance, to prove the correct and stable operation of all control systems and are safe to operate and maintain.
- All testing and commissioning carried out on the Low Voltage Switchgear Installation shall be in full compliance with the Current Edition IET Wiring Regulations BS7671.
- All testing and commissioning results shall be presented on standardised NICEIC, ECA or ELECSA approved certification.
- The Electrical Contractor shall allow to install a full set of testing and commissioning certificates within the front cover of all distribution panels / boards at practical completion stage.
- All testing and commissioning carried out on the Earthing and Bonding System shall be in full compliance with the latest version of the current Edition IET Wiring Regulations BS7671 and BSEN 62446-1.
- All bonding connections shall be accessible for inspection, testing and maintenance purposes.
- All testing and commissioning carried out on the Wiring Systems shall be in full compliance with the latest version of the current Edition IET Wiring Regulations BS7671.
- All testing and commissioning carried out on the Small Power shall be in full compliance with the latest version of the current Edition IET Wiring Regulations BS7671.
- All testing and commissioning carried out on the Lighting and Control Installation shall be in full compliance with the latest version of the current Edition IET Wiring Regulations BS7671.
- All testing and commissioning carried out on the emergency lighting Installation shall be in full compliance with the latest version of the current Edition of IET Wiring Regulations BS7671 and BS5266.
- All testing and commissioning carried out on the CCTV Installation shall be in full compliance with the latest version of the Current Edition IET Wiring Regulations BS7671 and Codes of NSI.
- All testing and commissioning carried out on the Intruder Alarm System shall be in full compliance with the latest version of the Current Edition IET Wiring Regulations BS7671, Codes of NSI and BS4737 Intruder alarm systems in buildings.
- All testing and commissioning carried out on the Fire Alarm System shall be in full compliance with the latest version of the current Edition IET Wiring Regulations and BS5839 Fire detection and fire alarm systems.
- All testing and commissioning carried out on the Access Control System shall be in full compliance with the latest version of the Current Edition IET Wiring Regulations.
- All testing and commissioning carried out on the Disabled Toilet Alarm System shall be in full compliance with the Current Edition IET Wiring Regulations.
- All new heaters shall be tested in accordance with manufacturers recommendations, including testing the operation of all control functions.
- All heaters shall be tested in accordance with manufacturers recommendations, including testing the operation of all control functions.
- All above ground drainage and vent pipes within the building shall be tested as specified to the satisfaction of the supervising LBCO.

- v) All below ground drainage and vent pipes within the building shall be tested as specified to the satisfaction of the supervising LBCO.
- w) The Mechanical and Electrical Contractor shall include for attendance during the testing and commissioning of all of the automatic controls systems, and other specialist systems including the fire alarm system.
- x) The Mechanical and Electrical Contractor shall include in his Tender for all costs arising out of carrying out of the aforementioned tests by suitably qualified operatives and including night time visits.
- y) All test certificates are to be made available prior to handover. Handover will be postponed should these certificates not be available.
- z) Pipework is to be pressure tested to 1.5 times the working pressure. A record is to be made of the test pressure, time and duration of test and submitted to the mechanical consulting engineer prior to handover.
- aa) The Contractor shall thoroughly flush and then chlorinate the new sections of water system in accordance with HS(G)70 and BS6700 prior to completion and provide test certificates on completion to prove that the whole is in satisfactory condition. The works shall be carried out by a specialist contractor.
- bb) Legionella, water quality, and bacteria testing will be undertaken on the cold-water supply on completion of the works. Satisfactory results shall be provided before occupation and use.
- cc) All ventilation systems shall be commissioned in accordance with CIBSE commissioning code A: Air distribution systems.

MAINTENANCE DURING DEFECTS PERIOD

Ensure that sufficient allowance is made within the Tender Return for the maintenance of the systems during the Defects Liability Period. Note that the Tenderer is responsible for the ongoing maintenance of all installations and equipment installed under the Contract during the 12 months defects liability period.

HEALTH & SAFETY MANUALS

Provide all drawings, certifications and manuals/folders at least 4 weeks prior to Practical Completion. Provide draft versions of the manuals in pdf form for electronic comment.