HOARE LEA

Wakefield College Summer Projects 2023. Wakefield & Castleford. Heart of Yorkshire Education Group.

RIBA STAGE 3 MEP PERFORMANCE SPECIFICATION

REVISION T1 – 17 MAY 2023

Audit sheet.

Rev.	Date	Description of change / purpose of issue	Prepared	Reviewed	Authorised
T1	17/05/2023	Tender Issue	GAB/BB	GS	SM

This document has been prepared for Heart of Yorkshire Education Group only and solely for the purposes expressly defined herein. We owe no duty of care to any third parties in respect of its content. Therefore, unless expressly agreed by us in signed writing, we hereby exclude all liability to third parties, including liability for negligence, save only for liabilities that cannot be so excluded by operation of applicable law. The consequences of climate change and the effects of future changes in climatic conditions cannot be accurately predicted. This document has been based solely on the specific design assumptions and criteria stated herein.

Project number: 17/18088
Document reference: SPEC-17-18088-5A-BB-HLEA-MEP Performance Specification.docx

Contents.

Audit sheet.

Works Summary

Package 1 – Wakefield Campus

Package 6 - Castleford Campus

A	Preliminaries/General conditions.
A10	Project particulars
A11	Drawings and technical submissions
A12	The site/existing buildings
A13	Description of the work
A20	The Contract/Sub-contract
A30	Tendering/sub-letting/supply
A31	Provision, content and use of documents
A32	Management of the works
A33	Quality standards/control
A34	Security/safety/protection
A37	Operation/maintenance of the finished installations
A40	Management and staff
B1	Introduction
B2	Scope of works and related services
B3	Design criteria and standards
B4	Testing, commissioning, handover and aftercare
C	Alterations.
C20	Alterations and demolitions
U	Ventilation/air conditioning systems.
U10	General supply and extract ventilation systems

Works Summary

This section provides a brief summary of the works required to the mechanical, electrical and public health (MEP) engineering services at Radcliffe and Seacole Buildings, Wakefield and Castleford Campus on behalf of Wakefield College.

This summary is intended to provide clarity of the required works only and should be read in conjunction with the MEP specification sections, MEP tender drawings, Main Contract Preliminaries (by Mace) and building fabric tender documents (by Mace).

The contractor is required to develop the Hoare Lea RIBA Stage 3 design to RIBA Stages 4 & 5 and will assume design responsibility. The contractor shall therefore be required to amend and install all systems necessary to provide fully operational and controllable installations that achieve the performance criteria stated within the Hoare Lea tender documents.

Package 1 – Wakefield Campus

1. Radcliffe Building - Ground Floor New Fire Escape

A new fire escape is to be installed to the property, with new door and stairs from the property to Bell Street.

The MEP scope includes, but is not limited to:

- Verification and validation of existing services
- Provision of new maintained directional emergency lighting luminaire
- Amendments to lighting controls to suit
- Retain, re-use and modify existing lighting and power circuits from existing distribution boards
- Provision of new external lighting to the external escape stair
- Amendments to existing intruder alarm system, with new door contacts provided to the new escape door
- Provision of new disabled refuge outstation, expanded from existing building system
- Removal of redundant MEP services, as necessary
- Builderswork, as required
- Fire stopping, as required

Refer to Specification section C20.

2. Radcliffe Building - Ground Floor Animal Care

The existing partition between the Animal Care staff and exams offices is to be removed to create a larger single office space. The existing exams office entrance door shall also be relocated.

The MEP scope includes, but is not limited to:

- Verification and validation of existing services
- Relocation of existing LTHW radiator and associated pipework (inc. decoration)
- Amendments to lighting control
- Amendments to existing 3 compartment dado skirting to route through ceiling void and to extend to proposed desk positions
- Provision of 1 twin power outlet and 1 double data outlet per pair of desks
- Rewiring and certification of existing circuits affected by the works
- Retain, re-use and modify existing lighting and power circuits from existing distribution boards
- Replacement and testing of existing data cabling affected by the works
- Removal, relocation and disposal of door access control equipment to suit proposed layout
- Builderswork, as required
- Fire stopping, as required

Refer to Specification section C20.

3. Radcliffe Building - Third Floor Ventilation

The third floor provides a number of classrooms and staff office space. The floor is currently naturally ventilated and new mechanical ventilation systems are to be installed, using the existing glazing louvre bands. Each classroom is to be provided with a dedicated mechanical ventilation heat recovery unit with CO_2 monitoring to modulate system performance.

The MEP scope includes, but is not limited to:

- Verification and validation of existing services
- Installation of new MVHR units, ductwork and grilles
- Installation of new toilet extract fan system, including ductwork and extract valves
- Installation of new controls, including floor controller, local override controllers and CO_2 sensors
- Fire alarm modifications, as necessary
- New mechanical power supplies from existing distribution boards
- Builderswork
- Acoustic attenuation
- Fire stopping, as required

Refer to Specification section U10.

4. Seacole Building – Media Laboratory

The existing IT Lab on second floor of Seacole Building is to be extended into the adjacent circulation space and be repurposed as a Media Laboratory.

The MEP scope includes, but is not limited to:

- Verification and validation of existing services
- Amendments to existing MVHR unit ductwork and grilles, and rebalance to suit
- Relocation of existing circulation space VRF cassette and link operation to existing classroom VRF cassette controls. Single controller to be located at room entrance.
- Modifications to condensate drainage, as required
- Amendments to existing perimeter and provision of new dado trunking to suit room layout
- Relocation of existing door access control equipment to suit proposed layout
- Provision of 1 power outlet and 1 data outlet per desk
- Rewiring and certification of existing circuits affected by the works
- Replacement and testing of existing data cabling affected by the works
- Fire alarm modifications
- Provision of new LED lighting to previous circulation area to suit space use
- Retain, re-use and modify existing lighting and power circuits from existing distribution boards
- Amendments to lighting control
- New audio-visual provisions for teaching screen
- Acoustic attenuation
- Builderswork, as required
- Fire stopping, as required

Refer to Specification section C20.

Package 6 - Castleford Campus

1. Ground Floor Student Central

New acoustic partitions are to be installed below the curved bridge within the Student Central space.

The MEP scope includes, but is not limited to:

- Verification and validation of existing services
- Strip out of LED tape routed below bridge
- Relocation of wall mounted fused spurs below the bridge, as necessary

- Provision of new power containment
- Provide new lighting and power circuits from existing distribution boards
- Provision of new LED lighting to underside of acoustic bulkheads
- Provision of new LED lighting to the new store room
- Provision of new lighting control
- Provision of new maintained directional emergency lighting luminaires
- Fire alarm modifications
- Builderswork, as required
- Fire stopping, as required

Refer to Specification section C20.

2. First Floor Transient Offices

An existing first floor office is to be provided with a new access door, and a new office space is to be created on the first floor within existing circulation space.

The MEP scope includes, but is not limited to:

- Verification and validation of existing services
- Removal or relocation of existing electrical services to suit new door position.
- Provision of new door access control equipment to suit proposed layouts
- Rewiring and certification of existing circuits affected by the works
- Provision of new LED lighting
- Provision of new lighting control
- Retain, re-use and modify existing lighting and power circuits from existing distribution boards
- Fire alarm modifications
- Retain underfloor heating system and controls (thermostat to be located within the room)
- Amendments to existing supply ductwork and rebalance to suit room occupancy
- Provision of new supply and extract grilles
- Installation of cross talk attenuators within new partition
- Acoustic attenuation
- Builderswork, as required
- Fire stopping, as required

Refer to Specification section C20.

A Preliminaries/General conditions.

A10 Project particulars
A11 Drawings and technical submissions
A12 The site/existing buildings
A13 Description of the work
A20 The Contract/Sub-contract
A30 Tendering/sub-letting/supply
A31 Provision, content and use of documents
A32 Management of the works
A33 Quality standards/control
A34 Security/safety/protection
A37 Operation/maintenance of the finished installations
A40 Management and staff
B1 Introduction
B2 Scope of works and related services
B3 Design criteria and standards
B4 Testing, commissioning, handover and aftercare

HOARE LEA

WAKEFIELD COLLEGE SUMMER PROJECTS 2023

RIBA STAGE 3 MEP PERFORMANCE SPECIFICATION

A10 PROJECT PARTICULARS

Audit sheet

Rev.	Description	Prepared by	Reviewed by	Authorised by	Date
T1	Tender issue	BB	GS	SM	17.05.2023

A10 PROJECT PARTICULARS

A10 PROJECT PARTICULARS
A11 DRAWINGS AND TECHNICAL SUBMISSIONS
A12 THE SITE / EXISTING BUILDINGS
A20 THE CONTRACT/ SUB CONTRACT
A30 TENDERING/ SUB-LETTING/ SUPPLY
A31 PROVISION, CONTENT AND USE OF DOCUMENTS
A32 MANAGEMENT OF THE WORKS
A33 QUALITY STANDARDS / CONTROL
A34 SECURITY/ SAFETY/ PROTECTION
A37 OPERATION/ MAINTENANCE OF THE FINISHED INSTALLATIONS
A40 MANAGEMENT AND STAFF
B1 INTRODUCTION
B2 SCOPE OF WORKS AND RELATED SERVICES
B3 DESIGN CRITERIA AND STANDARDS
B4 TESTING, COMMISSIONING, HANDOVER AND AFTERCARE

A10 PROJECT PARTICULARS

CONTENTS

100 INTRODUCTION TO PRELIMINARIES / GENERAL CONDITIONS SECTION

200 DEFINITIONS

210 Metric and Imperial Conversions

A10 PROJECT PARTICULARS

100 INTRODUCTION TO PRELIMINARIES / GENERAL CONDITIONS SECTION

This Preliminaries / General Conditions section of the specification describes the building engineering systems Installer's obligations in relation to the management of the Works, production of information, design responsibility and other matters not directly related to the technical content of the Works, insofar as they relate to the building engineering systems sub-contract(s). Nothing in this specification overrides any requirement of the main contract preliminaries; this specification should be read in conjunction with the main contract preliminaries. For the avoidance of doubt, it is confirmed that except for particular actions on behalf of the Project Manager, none of the matters herein are for Hoare Lea to perform, including when novated or otherwise acting for the Main Contractor.

Unless specifically stated otherwise, references to regulations, standards and all other referenced documents are to the edition (including amendments, replacements and normative references) current at the time of tender.

200 DEFINITIONS

The following definitions apply throughout this specification. In addition, the definitions of different types of drawing and Building Information Models given in BSRIA BG6 – A Design Framework for Building Services, current edition, apply:

Installer:	The trade contractor appointed to undertake Mechanical, Electrical, Lift, Fire Protection or other building engineering system installation work in any single or combined sub-contract as defined by the main contract documentation.
Building Engineering Systems (Installation):	Each and every Installation from the following schedule: 1. Mechanical 2. Electrical 3. Fire Protection 4. Voice and Data Cabling 5. Security Systems 6. Foul Drainage 7. Commissioning
Project Manager	Throughout this specification the term "Project Manager" should be read as "Employer's Agent" and refers to the party named as such in the main contract preliminaries, or others acting on their behalf.
Client / Employer	The person or organisation named in the Main Contract as the Employer or their assignee
Submit:	Issue documentation in accordance with the contract (i.e. the specified number of copies, to the Project Manager and / or other members of the project team as required).
Works:	All building engineering systems shown on the drawings and described in the specification.
Drawings:	The tender drawings (or tender Building Information Model where applicable).

A10 PROJECT PARTICULARS

Elsewhere:	Detailed or specified in other clauses, sections, shown on the drawings, in the Building Information Model, or contained in the specification or main contract documentation.
System:	All equipment, accessories, controls, supports and ancillary items, including supply, installation, connection, testing, commissioning and setting to work necessary for that section of the Works to function.
Competent person:	A person who, by reason of theoretical and practical training, or actual experience, or both, is competent to perform the task or function or assume the responsibility in question and is authorised to perform such a task or function.
Trench:	A covered horizontal service space in the floor or ground with access from above.
Cavity:	A space enclosed within the elements of a building, within which services are installed, e.g. the space between ceiling and floor above.
Concealed services:	In relation to installation requirements, a pipe that is a Water Fitting must be located in compliance with the definitions and requirements of the WRAS Guide to The Water Supply (Water Fittings) Regulations. In relation to installation requirements, other pipework is “concealed” if it is behind a structural or finishes element, other than a single sheet of plasterboard, that would need to be removed or damaged in order to replace or repair the service and does not contain sufficient easily removable / openable access panels / hatches to obviate this need. In relation to inspection requirements, a service is “concealed” if it is located behind a structural or finishes element that does not contain sufficient easily removable / openable access panels / hatches to allow the service to be inspected along its entire length,
Terminal units:	Units such as radiators, convectors, fan coil units, induction units, variable or constant air volume boxes and other like equipment.
Ancillaries:	All specified fittings, accessories, inserts, test points, bracketing, terminal equipment connected to and installed in the engineering services system.
Equal and accepted:	The Project Manager will be the sole arbiter of whether any alternative product to that specified is acceptable. The acceptance of an alternative by the Contractor Administrator does not imply acceptance of a derogation from the performance requirements for the item in question unless this has been brought to the Project Manager’s attention and specifically agreed in writing. The absence of a response from the Project Manager to a proposed alternative may not be used as the basis for an extension of time claim and should be interpreted as a refusal of the alternative, if the decision becomes critical for programming purposes.
Lead Co-ordinator	A role undertaken either by the Main Contractor or by one Building Engineering Systems Installer to ensure co-ordination of design and installations.

210 Metric and Imperial Conversions

Some dimensions and units in metric have been converted from imperial units and approximated to the nearest practical dimension, i.e. 12” has been converted to 300mm. Metric sizes have been used for both metric and imperial components. Where only imperial components are available the imperial size

has been converted to the metric equivalent size. Due allowance should be made for metric and imperial conversions.

END OF SECTION A10

A11 DRAWINGS AND TECHNICAL SUBMISSIONS

CONTENTS

100 DRAWINGS OF INSTALLATIONS
- 110 GENERAL
- 120 SCHEDULE OF DRAWINGS FOR SUBMITTAL
- 130 DRAWINGS TO BE PROVIDED
- 140 PRODUCTION OF CO-ORDINATED DRAWINGS

200 LEAD CO-ORDINATOR’S ADDITIONAL RESPONSIBILITIES

300 CO-ORDINATION

400 INSTALLATION DRAWINGS

500 BUILDER'S WORK INFORMATION AND BUILDER’S WORK DETAILS

600 TECHNICAL SUBMISSIONS

700 COMMENTS ON INSTALLER'S DRAWINGS AND TECHNICAL SUBMISSIONS

800 REVISIONS AND VARIATIONS

A11 DRAWINGS AND TECHNICAL SUBMISSIONS

100 DRAWINGS OF INSTALLATIONS

110 GENERAL

Produce and submit all drawings, without exception, in a CAD format agreed at tender. Make independent enquiries to ensure that the CAD system is compatible with those systems being used by the design team and provide file translation facilities to suit the design team's format. In the absence of such enquiries and a written agreement to the contrary, the tender will be deemed to allow for AutoCAD, latest version. Issue drawing files in both DWG and PDF format.

Use a drawing layering convention and drafting protocols that allow some items (including dimensions, furniture, general text, drawing borders) to be 'frozen' without affecting the visibility of other aspects e.g. the building structure. Agree the layering convention and drafting protocols with the Project Manager prior to commencing drawing production.

Prepare all drawings in accordance with BS 1553 *Specification for graphical symbols for general engineering*.

On all drawings show the same project name as that on the cover of this specification.

Reproduce all drawings in accordance with BS EN ISO 5457 *Technical drawing documentation. Sizes and layout of drawing sheets*.

Agree with the Project Manager a document numbering system prior to preparing any documents.

When drawings are revised, indicate the revisions that have been made since the previous issue by means of "revision clouds".

120 SCHEDULE OF DRAWINGS FOR SUBMITTAL

Within one week of appointment prepare and submit a schedule of all drawings that you propose to submit for comment in connection with the Works. For every drawing on the schedule indicate the following:

1. drawing number and revision letter/number
2. drawing title and building engineering system
3. scale
4. latest date required on site
5. date that final comments are required
6. date on which comments were received
7. date issued for comment
8. date of commencement of drawing production

Revise and submit the drawing schedule on a monthly basis, updating it to take into account all revisions that have taken place.

Include the necessary time in the programme for production of drawings for submission; examination; alterations and resubmission in the event of the initial submission not being accepted; and the final issue.

130 DRAWINGS TO BE PROVIDED

Provide the following drawings and cross-reference them to each other for ease of interpretation. Where applicable, definitions of the contents of each drawing type are to be as contained within BSRIA's Building Applications Guide BG 6 *A Design Framework for Building Services*, Appendix C.

1. Detailed Schematics

2. Technical Design Drawings
3. Co-ordinated Working Drawings
4. Co-ordinated reflected ceiling plans (not in BG 6)
5. Installation Drawings
6. Shop / fabrication drawings (not in BG 6)
7. Manufacturer's Drawings
8. Plant and equipment drawings (not in BG 6)
9. Plant and equipment wiring diagrams (not in BG 6)
10. Builder's Work Information
11. Builder's Work Details
12. Record Drawings

140 PRODUCTION OF CO-ORDINATED DRAWINGS

Ensure that all Co-ordinated Working Drawings, Installation Drawings, Builder's Work Information and Builder's Work Details for the project are co-ordinated and that their production is timely. Prepare drawings to a common drawing production programme agreed with the Main Contractor.

Attend drawing production meetings arranged and chaired by the Main Contractor or Lead Co-ordinator. The purpose of the meetings is to resolve the effective production of the Co-ordinated Working Drawings, Installation Drawings, Builder's Work Information and Builder's Work Details, for each and every discipline.

No additional payment will be made for abortive draughting by any individual Installer caused by lack of knowledge of the requirements of any of the other work packages. Any work package proceeding prior to the submission of and receipt of comments on the relevant co-ordinated drawings will do so at that Installer's own risk.

No additional payment will be made to rectify work rendered abortive as a consequence of an Installer's failure to install in accordance with a properly produced and commented-upon drawing, or as a consequence of an Installer proceeding without relevant detailed information of the other sub-contract packages, structure or architectural form.

Produce and present all drawings in electronic form unless otherwise agreed in writing by the Project Manager.

Indicate on every Co-ordinated Working Drawing, Installation Drawing, Builder's Work Information Drawing and Builder's Work Detail all relevant details of all elements of structure, architectural form and other building engineering systems. Ensure that all drawings have independent layers of information in accordance with the following list and include the relevant aspects, in co-ordination, of the following:

1. Structure and architectural form
2. Mechanical works
3. Electrical works
4. Fire protection works
5. Voice and data cabling
6. Security works
7. Interior design

8. Furniture layouts

Depict all the above in a readily identifiable manner.

200 LEAD CO-ORDINATOR'S ADDITIONAL RESPONSIBILITIES

While the overall responsibility for programming and co-ordinating the entire Works is the Main Contractor's, the Main Contractor may designate one Building Engineering Systems Installer to act as Lead Co-ordinator. Unless otherwise specified elsewhere, the role of Lead Co-ordinator will be undertaken by the mechanical Installer.

The Lead Co-ordinator's additional responsibilities are as follows:

1. Create and maintain the architectural and structural information for the background to the co-ordinated drawings and liaise with the Main Contractor to ensure the latest architectural and structural information is used at all times.
2. Establish the layering convention to be used by all building engineering systems Installers.
3. Agree with the Main Contractor and the other building engineering systems Installers a programme for the production of the individual Installers' installation drawings, and of the Co-ordinated Working Drawings, Installation Drawings, Builder's Work Information and Builder's Work Details.
4. Manage all building engineering system Installers' exchange of information with each other, and with the Main Contractor and other related work package contractors.
5. Produce the Co-ordinated Working Drawings showing all the building engineering systems installations along with architectural and structural information. Update the co-ordinated drawings as necessary to incorporate spatial design changes instigated by the Main Contractor or any of the building engineering systems Installers.
6. Production of Co-ordinated Builder's Work Information and Builder's Work Details showing the builder's work requirements of all the building engineering systems installations. Update these drawings as necessary to incorporate any changes to the Co-ordinated Working Drawings.
7. Check the co-ordination of all services on the co-ordinated drawings.
8. Should more than one technical documentation specialist be employed by different Installers, agree with the Project Manager a common style and format for the Record Drawings and operating and maintenance instruction manuals, and co-ordinate their production.

300 CO-ORDINATION

Each and every building engineering systems Installer is responsible for ensuring its installation is fully co-ordinated with the remainder of the project and that all information relating to each and every installation is correctly indicated on the Lead Co-ordinator's Co-ordinated Working Drawings. Likewise ensure that all builder's work requirements are correctly indicated on the Lead Co-ordinator's co-ordinated Builder's Work Information and Builder's Work Details. Incorporate any spatial changes instructed in relation to the Works.

Following issue of the final Co-ordinated Working Drawings by the Lead Co-ordinator, each Installer may issue their installation drawings, using the routes agreed and shown on the Co-ordinated Working Drawings.

Ensure that the Installation Drawings include all works to be carried out by sub-traders / suppliers and that their works are fully co-ordinated with each other and with all other installations.

Take dimensions on site, check runs and levels, and mark on site actual locations of all builder's work holes required through walls, partitions, floors, etc, and also chases in walls, floors, etc, for conduits, pipes and the like, and offer them for inspection by the Project Manager prior to carrying out any work

of making them. Establish a method of working with the Project Manager to ensure that such builder's work proceeds without hindrance to the overall project programme. Ensure that setting out of plant and equipment, pipes and ducts etc, permits it to fit into the space allocated and allows access for maintenance and replacement purposes.

Agree with all sub-traders / suppliers, and be responsible for, the positions of their work or materials including pipe runs in ducts, conduits and cables, etc, and the positions of holes, chases, recesses, fixings and the like, before work is put in hand, in order to ensure that they do not conflict with other work.

To ensure co-ordination between sub-traders / suppliers, arrange and attend any necessary meetings with the relevant sub-traders / suppliers in order to agree such priorities as are necessary and in order to monitor progress. Obtain the necessary data for, and prepare, Co-ordinated Working Drawings showing all the work involved in the building engineering systems installation together with its associated builder's work and give all necessary instructions to overcome any potential conflicts.

Note that the responsibility for co-ordination of the Works is not limited to physical co-ordination, but also includes co-ordination of communications interfaces between systems supplied and installed by different specialists, including but not limited to IT systems, building management system, access control system, and automatic meter reading system. Arrange and attend any necessary meetings with the relevant sub-traders / suppliers to ensure any issues relating to communication interfaces between systems are resolved well before installation and commissioning. This includes communication interfaces between two systems that are within your sub-contract package, and communication interfaces between a system that is within your sub-contract package and another system that is in a different sub-contract package.

400 INSTALLATION DRAWINGS

Each of the building engineering system Installers is to produce, in accordance with the agreed programme, independent Installation Drawings, Builders Work Information and Builder's Work Details. Each Installer is responsible for the accuracy of its own information and for the physical relationship of its own Works to those of other Installers.

When preparing drawings for the installation show all components required for a complete installation, properly located, dimensioned and co-ordinated.

Produce plans, elevations, sections, details and schematics. Make them of a minimum scale but sufficient to illustrate and describe the design, fabrication, installation and fixings for all assembly conditions, interfaces and co-ordination with the other works.

As a minimum produce drawings in accordance with the following:

1.	Floor plans with co-ordinated services layout	1:50
2.	Plant rooms, services ducts details, etc	1:20
3.	Ductwork manufacturing details	1:50
4.	Co-ordinated sectional drawings / details	1:20
5.	Diagrammatic arrangements, wiring diagrams, etc	nts
6.	Builders work drawings*	
7.	Component details, hangers, supports, secondary steelwork, etc*	

(*use a scale that allows the intent to be clearly illustrated)

Base the Installation Drawings on the tender drawings taking into account any modifications that may have taken place, and correctly relate the details of the actual plant and equipment selected for

incorporation into the Works, to all other items. Properly include in the Works the layouts, routes and details of the building services engineering systems shown on the tender drawings, and make allowance for the installation, operation and maintenance of the Works by all other trades and disciplines. Accurately show the specified or selected plant and equipment in its true proposed location.

Base the Installation Drawings upon the latest issue of the architectural and structural drawings and any other drawings or information issued by the Project Manager during construction.

Submit Installation Drawings that clearly state that plant or equipment proposed complies in all respects with the specified requirements. Where alternatives or deviations from the specification are to be proposed for the Project Manager to consider, clearly detail each and every alternative or deviation proposed.

Submit details of plant and equipment in schedule form, accompanied by the supplier's certified working drawings where appropriate. Provide copies of the manufacturers' certified drawings for major items of plant, indicating physical dimensions, schematic arrangements of all components and fully detailed electrical wiring diagrams.

Where necessary for the proper co-ordination of the Works, make a survey of the site or building(s) or room(s) and existing installations as constructed, and prepare the Installation Drawings from the resulting site measurements. Where Record Drawings and / or a record BIM model of the existing installation are made available, do not rely on the accuracy of these and carry out a survey to verify the accuracy of the record information.

Show on the Installation Drawings all plant, equipment and cable tray / cable trunking / pipe / duct runs, etc. Include full details of all plant together with cable tray / cable trunking / pipe / duct sizes, wiring diagrams, schematic and inter-connection diagrams / drawings.

Show on wiring diagrams, (including internal diagrams for items of electrical equipment and diagrams of interconnection between items of equipment and components) references of all terminals and terminations with cable types clearly identified.

Ensure that circuit and layout diagrams for the electrical wiring of plant, etc, detail not only all circuitry within main control panels but also that within all external equipment (e.g. motor starters, thermostatic control devices), together with all interconnecting wiring from the main point of supply onwards and with all terminal markings. Indicate the required sizes and types of all cables on the layout diagrams together with the ratings of such items as fuses, switches and controllers.

Arrange circuit diagrams, where possible, so that the main sequence of events is from left to right and from top to bottom of the diagram. Comply, generally, with the IEC on-line database for diagram symbols. If abbreviations are employed for the designation of components, provide a schedule on the drawings that explains the meaning of the abbreviations.

Ensure that the circuit and layout diagrams for the electrical wiring of plant, etc, subsequently form part of the set of Record Drawings.

Individual circuit and layout drawings from the various component manufacturers are not acceptable in lieu of composite diagrams.

Where revisions take place to the building engineering systems installation, either under the authority of a Project Manager's Instruction, or by written agreement with the Project Manager, or as a consequence of revised architectural or structural drawings being issued, modify the Installation Drawings accordingly and re-issue for construction purposes. Issue revised drawings in accordance with and with regard to the agreed programme for construction.

Particular Installation Drawings may (by the prior, specific and express written permission of the Project Manager), omit minor details such as conduit, provided that an agreed method statement rigorously covers the installation intent. This permission will not be unreasonably withheld but will not be given

where either Employer operation or visual appearance is adversely affected, nor where such details are needed for informing other trades.

Ensure that the Installation Drawings include details of all local co-ordination around equipment, control panels, and individual plant, at access points and on architecturally finished surfaces. The intent is that all installations can be considered for spatial relationship, appearance and Employer operation.

Ensure that the Installation Drawings show sufficient detail to enable the erection staff to install the Works in accordance with the specification and show sufficient clearances for insulation, dismantling, maintenance, insertion of thermostats, thermometers, gauges and the like, painting, cleaning and commissioning. Show also on the drawings possible causes of obstruction or restriction, either structural or by other services, to enable alternative routes to be considered. Include electrical equipment and control items on the mechanical Installation Drawings

500 BUILDER'S WORK INFORMATION AND BUILDER'S WORK DETAILS

Prepare and issue Builder's Work Information and Builder's Work Details based on the Installation Drawings, in sufficient time to prevent abortive work. This information may modify or supplement any builder's work provision for the building engineering systems installation already made on the architect's and structural engineer's tender drawings.

Show clearly on the Builder's Work Information the requirements necessary to accommodate the installation of each and every building engineering system. In cases where preliminary builder's work and structural information has already been shown on the tender Drawings (e.g. the weight of items of equipment, sizes of access ways, etc), check that it is correct before incorporating it into Builder's Work Information.

Prepare all other necessary Builder's Work Information required for the execution of the Works, making due reference to the structural and architectural final dimensioned detail drawings as applicable. Fully dimension all such drawings.

Provide all Builder's Work Information in sufficient time to comply with the agreed programme requirements and meet all costs arising from failure to do so.

600 TECHNICAL SUBMISSIONS

For all plant and equipment proposed, submit all manufacturers' drawings and comprehensive technical information prior to the placing of orders and manufacture. Submit final details, including all technical aspects and calculations where applicable, in a clear, definable and easily read format with the specified technical details, notes and performance data clearly shown.

Include the following information as a minimum:

1. copies of manufacturers' certified drawings indicating physical dimensions, schematic arrangement of components and full electrical wiring diagrams
2. full description of controls systems describing the sequence of operation of all components under every operating condition likely to be experienced by the equipment
3. manufacturer's material and workmanship specifications including paint finish and RAL colour
4. full performance schedules, operating characteristic curves and charts for every individual item of equipment indicating all data necessary (e.g. fluid flow rates, pressures, operating temperatures, electrical currents, voltages, noise levels, etc) to properly describe in engineering terms, the performance of the equipment being offered, including the definitions of all engineering parameters at the interfacing points of connection
5. manufacturer's installation, operating and maintenance instructions

6. waiver of intellectual property rights on application or arrangement of equipment or materials as required on site, in favour of the Employer, as defined in the main contract

Ensure that all product information provided as part of technical submissions is in accordance with the Code for Construction Product Information (CCPI, cpicode.org.uk).

The submission of the above information does not remove the obligation for all equipment to comply with the specification. Any proposed deviations from the specification should be specifically drawn to the Project Manager's attention and their written agreement obtained before proceeding. The absence of a response from the Project Manager to a proposed deviation may not be used as the basis for an extension of time claim and should be interpreted as a refusal to accept the proposed deviation, if the decision becomes critical for programming purposes.

700 COMMENTS ON INSTALLER'S DRAWINGS AND TECHNICAL SUBMISSIONS

Allow at least five working days for comment by the Project Manager. Issue the drawings and technical submissions progressively, related to the construction programme, grouped according to building engineering system and in sequence with all other Installers' Installation / Co-ordinated Working Drawings, to facilitate reviewing.

Where drawings are issued out of sequence, are issued without supporting or referenced information, or are otherwise reliant on un-issued information, the Project Manager reserves the right to reject the drawing or comment only upon those elements unaffected by missing information.

The Project Manager's representative will, if requested, attend a series of meetings during the production of the Installation / Co-ordinated Working Drawings and Builder's Work Information to provide early comment upon presentation, detail, design queries and production programme.

Where details are replicated throughout a series of drawings and / or technical submissions, present and agree such details prior to draughting the entire scheme. Repeat or duplicate drawings need not, and should not, be submitted.

Submit drawings and technical submissions for comment in sufficient time prior to ordering equipment and to avoid delay to the Works.

Unless otherwise agreed in writing, do not commence any installation work until the relevant Installation and Co-ordinated Working Drawings have been issued and commented upon.

Take responsibility for any omission, errors or any discrepancies in the drawings and other particulars supplied directly or by suppliers, whether such drawings or particulars have been commented upon by the Project Manager or not, provided that such omission, errors or discrepancies are not due to inaccurate information of particulars furnished in writing to the Installer by the Project Manager.

Comments (or absence of comments) by the Project Manager on any drawing, model or technical submission do not mean that the Project Manager is responsible for the correctness of such, nor its suitability for purpose. These remain your responsibility.

Amend and re-issue as soon as possible all deliverables in response to the Project Manager's comments and continue to do so until all comments have been addressed to the Project Manager's satisfaction. Any installation work carried out while comments remain outstanding is at your risk.

Attend meetings associated with the submittal review procedure.

Issue electronic copies by email of every drawing and of every technical submission, for comment to the Project Manager and other parties as requested by the Project Manager.

800 REVISIONS AND VARIATIONS

Where the scheme is subject to revision or instruction, show the full effect of such revision on the Installation Drawings, Co-ordinated Working Drawings, Builder's Work Information, Builder's Work

A11 DRAWINGS AND TECHNICAL SUBMISSIONS

Details, and Record Drawings. Where the scheme revision involves change to the architectural or structural details give immediate notice to the Project Manager.

Where drawings are revised and updated during construction, issue to the Project Manager for comment on the revision only.

A variation in cost will only be considered by the Project Manager if a significant departure from the intent of the tender drawings has been necessary and is demonstrated. This will not include normal detail development relating to inclusion of, nor development of, factors within your design responsibility.

Maintain on site a marked-up record of the progress of the Works on a set of Installation Drawings, detailing the extent of completed actual installations and all departures from the Installation Drawings. Update them weekly, securely store them and keep them available for inspection on site. Incorporate them in a file of draft Record Drawings at no longer than monthly intervals.

END OF SECTION A11

HOARE LEA

WAKEFIELD COLLEGE SUMMER PROJECTS 2023

RIBA STAGE 3 MEP PERFORMANCE SPECIFICATION

A12 THE SITE / EXISTING BUILDINGS

A12 THE SITE / EXISTING BUILDINGS

CONTENTS

100	INSTALLER SURVEY - TENDER
200	INSTALLER SURVEY - INSTALLATION DRAWINGS
300	DILAPIDATION SCHEDULE
400	SYSTEM MEASUREMENTS

A12 THE SITE / EXISTING BUILDINGS

100 INSTALLER SURVEY - TENDER

Undertake a site survey prior to submitting the tender to verify all matters that could affect post-tender costs or Works. No allowance can or will be made post-tender for any omission of Works or cost arising from information available at the time of tender. Make arrangements through the Project Manager to visit the site in the first week after receipt of the invitation to tender.

200 INSTALLER SURVEY - INSTALLATION DRAWINGS

Undertake all site survey work prior to the preparation of Installation Drawings, Working Drawings, or Builder's Work Information to enable accurate preparation and dimensioning of them. Do not rely upon information contained in any tender drawings Refer to the main contract preliminaries for details of site access arrangements during construction.

300 DILAPIDATION SCHEDULE

Prior to commencement of work on site, prepare and agree with the Project Manager a schedule of dilapidations including the existing services systems and buildings. Use it throughout the contract to identify and agree any remedial work that is necessary.

400 SYSTEM MEASUREMENTS

Where modifications are to be undertaken to existing systems which serve both the works area and other areas of the property, full system validations shall be undertaken by the Contractor to ensure that reduced system performance is not experienced following implementation of the works.

System measurements are expected to include, but not be limited to:

- Ventilation flowrates
- LTHW flowrates
- MCWS pressure and flowrate
- HWS pressure and flowrate

END OF SECTION A12

HOARE LEA

WAKEFIELD COLLEGE SUMMER PROJECTS 2023

RIBA STAGE 3 MEP PERFORMANCE SPECIFICATION

A20 THE CONTRACT/ SUB CONTRACT

A20 THE CONTRACT/ SUB CONTRACT

CONTENTS

100 INSTALLER'S DESIGN RESPONSIBILITY
200 INSURANCE

A20 THE CONTRACT/ SUB CONTRACT

100 INSTALLER'S DESIGN RESPONSIBILITY

The contract will be let on a design and build basis, therefore you are responsible for developing the concept design described in the tender documents into a fully detailed building engineering systems design that achieves the stated design intent. Ensure that your design is fully co-ordinated, taking into account the room, furniture and equipment layouts prepared by the architect and design information (including drawings) prepared by all members of the project design team including other engineering systems designers/installers. Attend design team meetings, to contribute towards design development and co-ordination, as and when requested to do so by the main contractor or project manager. All such design is subject to the comment of the Employer's Agent.

The tender information has been produced to a design scope agreed with the Client. Notwithstanding any specific installer design responsibilities referred to elsewhere in this section, unless explicitly identified and excluded by the installer at tender stage, the installer's design scope will be deemed to include any items not covered by the tender information.

Ensure that the design undertaken to meet the requirements of this clause is fully co-ordinated and compatible with the remainder of the project design.

Comments by the Project Manager do not affect your responsibility for the suitability and correctness of designs and other obligations within the contract documentation.

200 INSURANCE

Under the terms and conditions of the main contract, the Main Contractor is required to secure certain policies of insurance, the benefits of which extend to sub-contractors either partly or in whole. Examine these policies and obtain such supplementary cover as is necessary.

Insure and indemnify the Main Contractor against such obligations in respect of the sub-contract as those for which the Main Contractor is liable. Produce insurance policies on demand.

END OF SECTION A20

HOARE LEA

WAKEFIELD COLLEGE SUMMER PROJECTS 2023

RIBA STAGE 3 MEP PERFORMANCE SPECIFICATION

A30 TENDERING/ SUB-LETTING/ SUPPLY

A30 TENDERING/ SUB-LETTING/ SUPPLY

CONTENTS

100 ALTERNATIVE EQUIPMENT SUPPLIERS

200 TENDER RETURNS

300 WARRANTY TO BE GIVEN BY THE INSTALLER

400 ORDERS FOR MATERIALS

A30 TENDERING/ SUB-LETTING/ SUPPLY

100 ALTERNATIVE EQUIPMENT SUPPLIERS

Include in the Tender for all equipment to be supplied by one of the manufacturers named in the specification and tender drawings and to be of the type described in the specification. Detail any alternative manufacturers offered for consideration together with:

1. the benefits to the Employer (cost / programme saving, technical benefits, value added, etc)
2. the cost difference at the time of tender
3. the impact on Part L compliance (including the CO_2 Target Emissions Rate and the final 'as constructed' CO_2 Building Emissions Rate).

Summarise on a "Schedule of Alternatives" sheet to be submitted with the tender, all alternatives offered, with all information pertinent to the evaluation of each alternative item and its operation.

Acceptance or rejection of any alternative is entirely at the discretion of the Project Manager, who is under no obligation to give a reason why an alternative is not acceptable. Note that alternatives will not be accepted for items for which a change would cause significant disruption to the design or construction of the Works.

Where alternative manufacturers' equipment is offered, include for all measures necessary to make the equipment and the total installation equivalent to that specified, e.g. upgrading pumps where pressure drops are higher, upgrading cable sizes where electrical loads are higher. Also include for all necessary redesign, draughting and co-ordination to facilitate the successful installation, and the costs of submittals, consequential delays and professional fees. Advise on the impacts on energy consumption and carbon emissions, etc. Include these measures in the information issued with the tender. These requirements also apply where the Installer chooses equipment from the manufacturer specified but having different performance characteristics from those specified.

Where the Project Manager agrees to accept equipment alternative to that specified, the proposer of the alternative will remain responsible for ensuring that the alternative is of equal performance and quality to that specified.

Additional costs resulting from non-compliance with the above will be borne by the proposer of the alternative.

Where a specific supplier / manufacturer is offered or agreed at tender then the Project Manager is under no obligation to accept alternatives during the progress of the contract.

200 TENDER RETURNS

Ensure that the tender includes for all work shown or described in the tender documents as a whole, and also includes everything that is clearly apparent as being necessary for the complete and proper execution of the Works but which is not explicitly referred to in the tender documents. Include within the tender for all costs necessary to ensure that the Works can be completed within the stated programme. Include for all necessary overtime and other expenses in the contract price that may be necessary in order to complete the Works in compliance with the contract programme, and/or to avoid disruption to the Employer. Payment will be made for the extra cost of overtime only if a prior written instruction has been issued by the Project Manager together with agreement to accept the costs involved.

Identify any aspects of the tender documents with which you, as tenderer, disagree or which in your opinion need to be changed to enable the Works to be properly completed. Submit particulars of each such suggested alteration with the tender and state the consequential change, if any, to the tendered price.

As part of the tendering process examine the performance specification and associated tender documents and check that all building engineering services systems can be designed, installed and commissioned in accordance with the intent of the performance specification.

A30 TENDERING/ SUB-LETTING/ SUPPLY

Examine the Architect's and structural engineer's drawings, if any, issued with or referred to in the tender documents (including those referred to in the main contract preliminaries). Submit all queries concerning such drawings to the Project Manager for clarification prior to submitting your tender.

Submit tenders for the Works on the tender forms accompanying this specification. Price preliminary items separately, in accordance with the pricing schedule, rather than including them in any of the materials and labour rates etc.

In addition submit the following information with the tender:

1. letter of conformity with the tender drawings and specifications, including a full reference to the tender documentation upon which the tender is based, and a statement that these preliminaries have been read, understood and included in the price. In the absence of any such confirmation, it is deemed that the contract includes full provision for compliance with these technical preliminaries.
2. schedule of proposed specialist installers and others to whom you intend to sub-let elements of the Works, identifying the trade association(s) of which each is a member. No sub-letting is to take place after award of contract without the Project Manager's consent.
3. schedule of proposed manufacturers and suppliers identifying the trade association(s) of which each is a member
4. details of any equipment proposed that causes any change to spatial requirements or allowances made in the tender scheme
5. simple bar chart programme to identify key dates, duration and sequencing of the main activities, including submissions
6. first draft of the proposed procurement schedule.
7. schedule of proposed drawings.
8. proposed management structure and CVs of key personnel working on the project. Ensure that the stated level of the management team is reflected within the cost included within the preliminaries and vice versa.
9. proposed site staff and CVs of key personnel working on the project
10. organisation chart showing the lines of responsibility on site and the reporting lines of authority with head office management
11. confirmation of willingness to provide a Design Warranty
12. confirmation that facilities for production of CAD drawings are available
13. proposed waste minimisation management plan
14. proposals for providing protective measures to materials and equipment before, during and after installation
15. quality management procedures
16. schedule of alternatives, if applicable

Tenders received after the time stated will be rejected.

Tenders qualified in any way will be rejected. All tenders will be assumed to be fully compliant with the tender documents unless explicitly stated otherwise in the tender return. You may, if you wish, submit on the tender summary sheet, a schedule of proposed derogations along with associated cost adjustments relative to your fully compliant tender. However, acceptance or rejection of any such

A30 TENDERING/ SUB-LETTING/ SUPPLY

derogation is entirely at the discretion of the Project Manager, who is under no obligation to give a reason why any proposed derogation is not acceptable.

No payment will be made for tenders.

The Employer is not bound to accept the lowest or any tender.

300 WARRANTY TO BE GIVEN BY THE INSTALLER

Design warranties may be required from certain sub-contracts/Installers. Refer to the main contract preliminaries and sub-contract documentation for details. Confirm your willingness to provide such a warranty with the return of tender.

400 ORDERS FOR MATERIALS

Allow in the tender price for the purchase of all materials and equipment from stockists and other suppliers at such time, and in such a manner, as may be necessary to allow for the completion of the work in accordance with the contract programme.

Clearly state in the tender return any difficulty foreseen with the delivery periods for the selected equipment.

Bear any additional costs resulting from non-compliance with the above.

END OF SECTION A30

HOARE LEA

WAKEFIELD COLLEGE SUMMER PROJECTS 2023

RIBA STAGE 3 MEP PERFORMANCE SPECIFICATION

A31 PROVISION, CONTENT AND USE OF DOCUMENTS

A31 PROVISION, CONTENT AND USE OF DOCUMENTS

CONTENTS

100

100 DRAWINGS AND SPECIFICATION

200 CONFLICT AND AMBIGUITY

300 SITE DOCUMENTATION

400 CONFIDENTIALITY

500 CALCULATIONS

A31 PROVISION, CONTENT AND USE OF DOCUMENTS

100 DRAWINGS AND SPECIFICATION

Carefully and thoroughly examine the drawings and the specification, as no allowance will be made for any deficiency of work or materials resulting from unfamiliarity with the specification's or drawings' contents.

The tender drawings have been prepared primarily to describe, in a basic manner, the design of the building engineering system(s), the working principles of the systems and the general intended methods of installation. They are intended to be read in conjunction with the specification to facilitate the preparation of an estimate and tender and to enable all other participants to appreciate the interrelation of the building engineering systems installation Works, as applicable, and the main works as a whole. Not all items or matters referred to in the specification are indicated on the drawings, nor are all items detailed on the drawings described in the specification. The tender drawings have been produced for the purpose of tender preparation only. Aspects of the tender drawings are not fully detailed in all respects. The size, capacity and position of all components including connection points, accessories, apparatus, equipment and room terminals shown on the tender drawings are approximate and for guidance in tender preparation.

The tender drawings are accordingly part diagrammatic with runs of piping, ducts, cables, conduits, trunking and the like, being shown to small scale and not necessarily indicating exact installation positions.

Do not use the tender drawings alone for the detailed pricing of the Works. Take independent dimensions to verify quantities etc, for the preparation of the tender. Allow for all necessary sets, bends, transformations, expansion measures, supports and other components required, or recommended by the manufacturer, to achieve a safe and fully functional and operational installation in accordance with the design intent. Where you elect to depart from the principles and general arrangements depicted on the tender drawings, be responsible for undertaking detailed checks on the duties of all equipment affected, demonstrating to the Project Manager that neither performance nor spatial co-ordination are compromised and adjusting the sizing of plant as required. Do not proceed with the ordering of any resized equipment until you have provided the necessary calculations to the Project Manager and received and acted in accordance with the Project Manager's comments. Be responsible for all costs arising from such changes.

Do not use tender or contract drawings for installation purposes.

200 CONFLICT AND AMBIGUITY

Immediately after receipt of the Tender documents check that the documents are complete and legible (e.g. check page and drawing numbers, whether any writing or figures are indistinct, etc) and promptly notify the Project Manager accordingly. No subsequent claim for loss consequent upon failure to comply with this requirement will be allowed.

Where there is contradiction between any elements, clauses or sections of the project tender documents (including the specification, the schedules and the drawings or model), notify the Project Manager prior to returning the tender. In the absence of notice being given prior to tender submission and to ensure that a positive decision is made, the Project Manager is the final arbiter of which element, clause or section of the project tender documents is deemed to have been included.

Should there be any doubt about the meaning of any clause or aspect of the tender documents, inform the Project Manager in writing in order that clarification may be provided prior to the submission of tenders. Any clarification of the meaning or intent will only be valid if issued in writing. All tenderers will be notified of any such explanation.

No liability will be admitted, nor claim allowed, in respect of errors in the tender that could have been avoided in the manner described above.

A31 PROVISION, CONTENT AND USE OF DOCUMENTS

Where the specification includes alternative choices, confirm the alternative selected in writing at tender stage. If the choice is not clarified at tender stage, the Project Manager's choice will be deemed to have been included.

300 SITE DOCUMENTATION

Notwithstanding the requirements of the main contract preliminaries, also allow in the tender for, and provide in a maintained indexed library on site, the following:

1. relevant copies of all technical equipment schedules 'as delivered to site'
2. relevant technical literature on every type of equipment or component used within the installation.
3. copies of all relevant information (technical queries, relevant instructions, current installation / working drawings, current programme)
4. copies of all signed daywork sheets

Ensure all of the above are accessible to the Project Manager (or Project Manager's representative) at all times that the site is open.

Keep all of the above up to date and in good order; it is solely for the Project Manager's (or Project Manager's representative's) use and must be maintained complete.

400 CONFIDENTIALITY

Treat all tender documentation as confidential and return them to the Project Manager if you are not successful.

Do not give any information relating to the Works to the press or other media without the written permission of the Project Manager or Employer.

500 CALCULATIONS

Present all calculations in a logical, recognised and agreed format and suitably indexed.

Agree with the Project Manager prior to commencement of design activities all software programs to be used in the preparation of the design.

Ensure that software used in calculating the energy performance of buildings, as required under Part L of the Building Regulations, is as approved by HM Government and agreed with the Project Manager prior to commencement of use. Arrange that such calculations are carried out by a suitably accredited energy assessor.

Reference calculations that are preliminary in nature, i.e. do not form part of the final submittal, independently and clearly mark them 'Preliminary'.

State the methodology, formulae, design criteria, assumptions and all design margins used in the calculations.

Where necessary, accompany calculation sheets with an annotated layout drawing identifying terminals, fittings and the particular sections of ductwork or pipework to which the calculation relates.

On each calculation sheet, drawing or schedule, clearly identify the originator, date of production, checker (who signs or initials) and date of check.

Allow ten working days for review or comment or otherwise on all calculations submitted to the Project Manager. Allow sufficient time in the programme for submittals with due allowance for incorporation of comments and resubmission in order not to cause delays.

END OF SECTION A31

HOARE LEA

WAKEFIELD COLLEGE SUMMER PROJECTS 2023

RIBA STAGE 3 MEP PERFORMANCE SPECIFICATION

A32 MANAGEMENT OF THE WORKS

A32 MANAGEMENT OF THE WORKS

CONTENTS

100 SETTING OUT OF THE WORKS
200 SITE CLEANLINESS
300 INSPECTION OF THE WORKS
310 Installer's "snagging"
320 Inspection before concealment
400 PROGRAMME AND ORDERING REPORTING
410 Information release schedule
420 Monitoring
430 Commissioning programme
440 Procurement schedule
500 ACCESS FOR PLANT INSTALLATION AND SUBSEQUENT REMOVAL
600 EASE OF MAINTENANCE
700 CO-OPERATION WITH OTHER TRADES
800 WASTE MANAGEMENT ON SITE

A32 MANAGEMENT OF THE WORKS

100 SETTING OUT OF THE WORKS

Accurately set out the Works and keep them correct in accordance with the final Installation Drawings, as amended by any Project Manager's instructions issued.

Take all necessary site measurements to ensure the Works are built in accordance with the Installation Drawings. Take responsibility for the accuracy of such dimensions and of the drawings made therefrom. Where services are to be installed adjacent to or near to other services take responsibility for the setting out of the new services and, if necessary, check the setting out of work by others that affects your own. Co-operate with all other trades such that all such work is completed within the programme.

Rectify all errors arising from the inaccurate setting out or lack of site co-ordination of services, at no additional cost.

200 SITE CLEANLINESS

It is the responsibility of all operatives to maintain site cleanliness. Provide and enforce all site cleaning procedures fully in accordance with the Project Manager's requirements.

Leave the site in a clean condition making good any damage caused to any parts of the site.

Prior to any air-conditioning or ventilation system being started ensure that all of the following are 'signed-off' by the Project Manager, as being complete:

1. the temporary protection of the air inlet(s) where site conditions require
2. the cleaning of ducting including builder's work ducts
3. the dust-sealing of all structural and architectural components and surfaces within the air-stream, including floor voids and voids above false ceilings
4. the cleaning of rooms and spaces served by the system

300 INSPECTION OF THE WORKS

310 Installer's "snagging"

Be responsible for ensuring that your own work (and that of any sub-contractors) is carried out in accordance with the specification and drawings and to a high standard of workmanship. Prior to offering any part of the Works to the Project Manager for inspection, carry out a full, independent inspection or "snag" of the Works, arrange rectification of any defects discovered, and produce a record of all remaining snags, proposed action and programme to clear. The Project Manager will then consider the quantum and impact of snags, carry out their own inspection and produce a composite schedule of defects. Prior to offering the Works to the Project Manager for re-inspection, provide a written response to each individual item on the composite defects schedule stating what has been done to rectify it. Global responses such as "all defects have been rectified" will not be acceptable and the Project Manager's re-inspection will not take place. If defects stated as having been rectified are found not to have been, reimbursement of the Employer for the Project Manager's abortive time to carry out the inspection will be charged at time charge rates.

320 Inspection before concealment

Whenever work requiring inspection or testing is subsequently to be concealed, provide due notice to the Project Manager so that inspection may be made or tests witnessed before concealment.

Failure to give due notice, of at least 48 hours, will lead to you being responsible for the expense of the work of uncovering, and subsequently reinstating the concealment, to allow proper inspection.

The Project Manager reserves the right to forego their inspection; this does not relieve you from responsibility for giving due notice.

A32 MANAGEMENT OF THE WORKS

Where the Project Manager believes that the installation may be defective, uncover, and subsequently reinstate concealment of, a specific area selected by the Project Manager for inspection, at no additional charge. This will be restricted to 1 linear metre or 1m², depending on the nature of the work, for each area of concealment. Where Works are proven defective by such uncovering, uncover, bring into compliance with the specification, and subsequently reconceal, the entire installation, all at no additional charge.

Do not build in, cover or otherwise obscure any portion of the Works requiring the inspection and approval of statutory authorities and utility providers, until such approval has been obtained.

400 PROGRAMME AND ORDERING REPORTING

Within two weeks of appointment, submit a detailed bar chart sub-programme for your Works, to assist the Main Contractor in producing a master programme for the Works. Ensure that this takes into account any restrictions on working hours etc detailed in the main contract preliminaries. No undertaking is given that the Works will necessarily be able to proceed continuously. No claim will be allowed for discontinuity of work due to the necessity to conform to the contract programme.

Make due allowance in the programme(s) of the Works for the following as a minimum:

1. notices to utility providers and those undertaking enabling / strip-out works
2. statutory authority approvals, including Building Regulations
3. ordering and installation periods
4. the completion of drawings and transmittals etc, and the minimum of five working days for comment (including for subsequent resubmittals following the receipt of comments on the initial issue)
5. work resulting from instructions issued in respect of the expenditure of provisional sums
6. concurrent work by other trades
7. any temporary works necessary for the completion of the building engineering systems installations
8. pre-commissioning, commissioning and performance testing of the building engineering services installations
9. preparation and provision of Record Drawings and operating and maintenance instruction manuals
10. period for employer training and instruction
11. breakdown of works between sub-trades and areas of the site / building

Keep on site full, up-to-date, records of the programmed installation activities showing the 'critical path' and a full equipment procurement schedule.

The programme and critical path analysis will be taken as a record of intent and will be used by the Project Manager to minimise the cost and adverse effect of any instructions by ensuring that they are made in co-ordination with the programme.

410 Information release schedule

Within one week of appointment, submit a full information release schedule detailing in a single schedule all drawings, technical submittals, method statements, calculations, programmes, samples and other documents and information that you propose to issue during the contract, either to meet your obligations in this specification, or for any other reason. For each item, show on the schedule, as

applicable, the proposed issue date of the draft for comment, the date by which comments are required, and the proposed final issue date.

420 Monitoring

Record progress of the Works weekly on a copy of the programme kept on site.

Update or redraft the programme without delay if any circumstances arise that affect the progress of the Works.

Liaise with the Main Contractor and other building engineering systems Installers as applicable to facilitate the programming and co-ordination of the work of all utility providers, to meet the main contract programme.

Publish the bar chart programme, critical path analysis, and procurement schedule, at a minimum of two weekly intervals and, on demand by the Project Manager, at any revision.

430 Commissioning programme

Provide a separate and detailed commissioning programme for comment by the Project Manager. Make due allowance for the following:

1. commissioning, demonstration and instruction procedures
2. provision of a written notice before each (or each series of) test, inspection, commissioning or demonstration procedure is implemented
3. demonstration to the Project Manager that test instruments and equipment are accurate

440 Procurement schedule

Provide a procurement schedule that lists all items of plant and equipment that form part of the Works together with the following information:

1. delivery period from order to site
2. latest instruction date (date before which issue of an instruction affecting the item will not cause a delay nor incur a cancellation cost)
3. latest order date (date by which an order must be placed to ensure delivery in line with the programme)
4. actual order date

Provide with the tender return a first draft of the procurement schedule.

Publish all revisions to the programme, critical path analysis and procurement schedule as soon as practicable. Ensure that the programme, critical path analysis and procurement schedule are in accordance with those of the main contract.

500 ACCESS FOR PLANT INSTALLATION AND SUBSEQUENT REMOVAL

Check on site and with the Installation Drawings if plant such as boiler(s), tank(s), cistern(s), cylinder(s), calorifier(s), pressure vessel(s), switchgear, transformer(s), chiller(s) and all other large plant, has to be ordered before the building work is at a suitable point to enable the dimensions of all doorways etc, serving as access to be site checked. Ensure that every item can be admitted to its allotted position and installed in such a way, together with all other services, that it can be replaced with similar equipment at some future date.

Demonstrate, if requested by the Project Manager, that plant and equipment can be removed for replacement or maintenance purposes, and subsequently re-install it using the same materials, except that jointing materials (e.g. gaskets) must be renewed. If the installation arrangements preclude equipment removal, modify the arrangement accordingly. Equipment that cannot be readily maintained

in position is not acceptable, unless specifically agreed in a particular case, in writing by the Project Manager, that maintenance after removal is acceptable. Interpret the absence of a response by the Project Manager on this matter as non-acceptance, should the decision become critical for programming purposes.

Review the provision of builder's work shown in the tender documents and highlight any additional requirements needed to ensure that access for plant installation and subsequent removal is adequate and do so to suit the construction programme.

600 EASE OF MAINTENANCE

In selecting equipment and preparing Installation Drawings, consider access for maintenance and removal of equipment at all times. Ensure that there is adequate space provided for maintenance and to allow all serviceable components to be replaced without disturbance to the surrounding installations.

Include, whether or not specifically indicated in the specification, on the drawings or in the equipment schedules, all component parts and other items necessary to facilitate proper maintenance of plant and equipment, including, but not limited to, the following: cleaning and access ports on pressure vessels and heat exchangers; easy access to oiling and greasing points; low level drain plugs and / or cocks in all vessels, plant and/or pipework containing fluids or gases.

Ensure that all pipework in ducts and ceiling voids is fully accessible for repair, replacement and routine servicing and includes flanged and valved sections to permit easy removal of all pipework. Ensure all conduit, trunking and pipework etc for future use is installed with draw-wires to allow the installation of additional circuits without the removal of fixed sections of walls, ceilings etc.

Where pipes cross access routes at low level install purpose-made step-overs to provide safe access.

Ensure that ease of subsequent removal is achieved for all electric motors, thermostats, heat exchanger batteries, and of any other item to which it may be reasonably anticipated that maintenance would be required.

Select similar items of apparatus and equipment made and provided by the same manufacturer where practicable such that corresponding parts of all apparatus and equipment are interchangeable, to reduce the need for different attention and spares.

700 CO-OPERATION WITH OTHER TRADES

Through and as directed by the Main Contractor, co-operate with and provide information to other trades.

Take particular care to co-operate with other trades in setting out the Works where buried underground or installed in common ducts, subways, services shafts, trenches, ceiling voids, floor voids or any such areas that are to accommodate several building engineering systems.

Inspect each area of the site in good time to ensure it is in a suitable state, before commencing work in it, and also to ensure that any previous work carried out by others does not affect the quality of any work to be carried out.

800 WASTE MANAGEMENT ON SITE

Ensure that the following general principles of waste management are implemented:

1. the elimination of the need for material use where possible
2. reduction of the material used in the installation process
3. the reuse of materials where possible
4. the recycling of materials where possible
5. the responsible disposal of non-recyclable materials

A32 MANAGEMENT OF THE WORKS

Co-operate with the Main Contractor and any recycling contractor that it employs, by sorting and placing in designated containers on the site, all waste materials from the Works that it is agreed will be recycled.

END OF SECTION A32

HOARE LEA

WAKEFIELD COLLEGE SUMMER PROJECTS 2023

RIBA STAGE 3 MEP PERFORMANCE SPECIFICATION

A33 QUALITY STANDARDS / CONTROL

A33 QUALITY STANDARDS / CONTROL

CONTENTS

100 QUALITY MANAGEMENT PROCEDURES
200 ENVIRONMENTAL MANAGEMENT PROCEDURES
300 HEALTH AND SAFETY MANAGEMENT PROCEDURES
400 EQUIPMENT AND PLANT PERFORMANCE GUARANTEES
500 OPERATIONAL LIFE
600 TECHNICAL METHOD STATEMENTS
700 SAMPLES
800 SUITABILITY OF MATERIALS
900 DELETERIOUS MATERIALS
910 Prohibited Materials List
1000 MATERIALS AND WORKMANSHIP
1100 DATE-DEPENDENT FUNCTIONALITY
1200 PRESSURE EQUIPMENT AND PRESSURE SYSTEM SAFETY REGULATIONS
1300 INSPECTION BY EMPLOYER'S INSURERS
1400 INFORMATION SECURITY
1410 General
1411 Highly secure environments
1420 Design and construction
1430 System configuration
1440 System hardening

A33 QUALITY STANDARDS / CONTROL

100 QUALITY MANAGEMENT PROCEDURES

Provide for comment by the Project Manager a fully documented quality management plan (QMP) in accordance with the current edition of ISO 9001, prior to commencement of draughting, procurement or installation.

Provide the QMP in concert and agreement with the main contract procedures.

Ensure that the QMP details specific procedures related to the tendered project and is not generalised.

Provide the QMP with the tender return.

If you are not an ISO 9001 registered company, declare such at tender and operate a system for the project that is in accordance with the principles of ISO 9001.

200 ENVIRONMENTAL MANAGEMENT PROCEDURES

Provide for comment by the Project Manager a fully documented environmental management plan (EMP) in accordance with the current edition of ISO 14001, prior to commencement of draughting, procurement or installation.

Provide the EMP in concert and agreement with the main contract procedures.

Ensure that the EMP details specific procedures related to the tendered project and is not generalised.

Provide the EMP with the tender return.

If you are not an ISO 14001 registered company, declare such at tender and operate a system for the project that is in accordance with the principles of ISO 14001.

300 HEALTH AND SAFETY MANAGEMENT PROCEDURES

Provide for comment by the Project Manager a fully documented occupational health and safety management plan (OHSMP) in accordance with the current edition of BS ISO 45001, prior to commencement of draughting, procurement or installation.

Provide the OHSMP in concert and agreement with the main contract procedures.

Ensure that the OHSMP details specific procedures related to the tendered project and is not generalised.

Provide the OHSMP with the tender return.

If you are not a BS ISO 45001 registered company, declare such at Tender and operate a system for the project that is in accordance with the principles of BS ISO 45001.

Refer to the main contract preliminaries for the requirements of health, safety and welfare. Check that facilities provided by others fulfil the obligations and advise accordingly. Ascertain the accuracy and sufficiency of information provided by the Employer or the Project Manager to ensure the safety of all persons and the Works.

Undertake the management of health and safety in conformity with the requirements of the Construction (Design and Management) (CDM) Regulations and the corresponding Approved Code of Practice. Comply with the requirements of the CDM Regulations and of the Principal Designer and the Principal Contractor by:

1. compiling risk assessments.
2. preparing method statements.
3. providing information on the Works that might affect the health and safety of any person.

4. providing all necessary input to the Pre-Construction Information and Construction Phase Plan.
5. Providing all necessary input to the Health and Safety File.

Comply with the Control of Substances Hazardous to Health Regulations and the Control of Substances Hazardous to Health (Amendment) Regulations 2003.

400 EQUIPMENT AND PLANT PERFORMANCE GUARANTEES

Where equipment and plant performance data and duties are identified in the specification, thoroughly check that the equipment offered by the manufacturer complies in every respect with the detailed materials and performance specification given. Obtain and submit for comment written confirmation from the selected manufacturer:

1. that all aspects of the stated specification are achieved, and
2. that the equipment is 'CE' marked or that it does not legally require a 'CE' mark.

More than one clause of this specification may cover the total performance of the equipment. Therefore, ensure that suppliers obtain, or have seen, all relevant sections of the specification and all relevant drawings prior to giving the written guarantee of performance.

All of the equipment described in the tender documents (including specification, schedules and drawings requires a performance guarantee. Prepare a schedule of guarantees, including every such item, detailing (a) manufacturer (b) equipment and (c) date of guarantee.

500 OPERATIONAL LIFE

Select equipment and carry out all installation work such that the operational life of each part of the installation achieves the economic life expectancy factors contained in the edition of CIBSE Guide M – *Maintenance engineering and management* current at the time of tender.

600 TECHNICAL METHOD STATEMENTS

In advance of any Works being carried out on site, submit for comment by the Project Manager a technical method statement for the following aspects of the installation:

1. TQ (technical query) procedures
2. Quality control and samples procedure
3. The minimisation and management of waste materials
4. Installation Drawings production
5. Temporary works
6. Disconnection and amendment or removal of existing systems
7. Connection to existing building engineering systems
8. Maintaining operation of existing building engineering systems
9. Ductwork installation
10. Ductwork cleaning
11. Ductwork pressure testing
12. Pipework installation
13. Pipework flushing, cleaning and pressure testing
14. Painting, thermal insulation and cladding

A33 QUALITY STANDARDS / CONTROL

15. Switchgear installation
16. Fire protection installation
17. Cabling and busbar installation
18. Automatic control system installation
19. Installation of large plant items (including offloading and positioning)
20. Ceiling void installation
21. Commissioning and testing
22. Production of operating and maintenance instruction manuals
23. Production of record drawings
24. All other method statements called for under the project Health and Safety plan, or otherwise required to satisfy Health and Safety criteria

700 SAMPLES

Provide samples of all items that may be viewed in or on the building, within the normally occupied space or on the exterior. Submit all samples and ensure comments are received and acted upon prior to confirming orders for supply. Any products not conforming to the approved range of samples will be rejected.

Make the samples available at the Project Manager's office, or at another location agreed with the Project Manager. The Project Manager will undertake to comment on samples within five working days of receipt.

Ensure all samples are an accurate representation of the finished product. Where a range of colour, grain, texture, etc, may be anticipated in a finished product, provide sufficient examples to indicate the range of finishes. Label each sample to indicate which item(s) it relates to, which area(s) of the building the item(s) occurs in and the specification clause(s) or drawing(s) that refer to it.

Adequately protect all samples. Remove / dispose of samples only when instructed. Do not use samples in the final installation unless agreed with the Project Manager. Interpret the absence of a response by the Project Manager on this matter as non-agreement, if the decision becomes critical for programming purposes.

Provide samples including but not limited to, the following:

1. sanitary ware and sanitary fittings
2. grilles, diffusers and external louvres
3. thermal and acoustic insulation
4. room-mounted control sensors
5. dado / skirting trunking
6. wiring accessories
7. luminaires
8. room-mounted security / communication equipment
9. loudspeakers and sounders
10. surveillance ("CCTV") cameras
11. fire and smoke detectors

12. fire alarm equipment
13. security system equipment
14. all labelling, signage and notices
15. pro-forma testing and commissioning data sheets
16. typical record drawings and schematics

800 SUITABILITY OF MATERIALS

Supply materials and components to suit the climatic conditions and other conditions of use to which the materials and components will be exposed during the installation process and after it is completed, and to withstand any test specified herein or in any document referred to herein.

Use materials and products that are:

1. new unless specified otherwise.
2. suitable for the services and conditions of use normally expected to apply after the installation is complete.
3. able to withstand the testing and commissioning conditions specified.
4. free from animal hair; unable to initiate mould growth, support vermin, or support bacterial life.
5. free from the use of CFCs at any stage of manufacture, installation or subsequent operation except where specified.
6. resistant to corrosion, oxidation, distortion, rot, etc.
7. resistant to attack from insects, animals and birds.
8. free from objectionable odours at the maximum or normal working conditions of operation.
9. prevented from suffering deterioration at the maximum or normal working conditions of operation.
10. capable of being applied to a base surface without causing damage or deterioration of the base.
11. not a fire hazard and that do not produce dense or toxic fumes when subjected to excessive heat, such as fire.
12. approved under the Water Regulations Advisory Scheme, as applicable.
13. not in themselves deleterious nor can become deleterious when properly maintained and used in the intended circumstances of the building(s) of this project. Refer to clause 900.

Confirm with each manufacturer that each component or item of equipment proposed to be installed is not foreseeably identified for withdrawal from either manufacture or continuing manufacturer support for a period of fifteen years. Do not use any equipment or components identified as end-of-line or otherwise not expected to have manufacturer continuing support or spares availability. Include within the technical submission a declaration of intent from the manufacturer, confirming the continuance of manufacture and manufacturer support for each component or item of equipment.

Whenever possible ensure products are manufactured and / or stocked:

1. under the BSI Kitemark Scheme, and/or
2. under the BSI Safety Mark Scheme, and/or

3. by firms of Assessed Capability to ISO 9001, and/or
4. by Stockists of Assessed Capability of ISO 9001.

900 DELETERIOUS MATERIALS

Do not use any materials and / or procedures deleterious to health or safety in the Works. Comply with all requirements in relation to deleterious or prohibited materials in the main contract, in addition to the below.

[For the purposes of this clause "deleterious material or product" means “a material or product that is generally accepted, or generally suspected in the construction industry at the time of tender as:

1. posing a threat to the health or safety of any person occupying or working in or being near any building(s) of this project, or
2. posing a threat to the structural stability, or performance, or physical integrity of any building(s) of this project or any part or component or system thereof, or
3. having the effect of reducing the normal life expectancy of any building(s) of this project or any part or component or system thereof, or
4. not being in accordance with any relevant British Standard, Code of Practice, good building practice or any applicable Agrèment Certificate.”]

910 Prohibited Materials List

The following materials or procedures should not be used in the installation:

1. asbestos or asbestos-containing product, as defined in the United Kingdom’s ‘The Control of Asbestos Regulations 2006’ or any statutory modification or re-enactment thereof
2. lead where the metal or its corrosive products may be directly ingested, inhaled or absorbed. Applications of lead such as roofing, flashings, rainwater goods and copper alloy fittings containing lead that are specifically required are acceptable, until equal or better alternatives are available.
3. lead-based paints and primer
4. urea formaldehyde foam or materials that may release formaldehyde beyond British Standard limits
5. pitch polymer DPC
6. materials that generally comprise mineral fibres, either man-made or naturally occurring, that have a diameter of 3 microns or less and a length of 200 microns or less, or which contain any fibres not sealed, encapsulated, or otherwise stabilised to ensure that fibre migration is prevented. Test evidence must be available and produced confirming that the materials fulfil the requirements of European Directive 97/69/EC and the approved supply list of current HSE CHIP regulations and consequently are not classified as a possible human carcinogen.
7. chlorofluorocarbons (CFCs) or hydrochlorofluorocarbons (HCFCs) or any goods and / or materials containing the same (e.g. materials in which CFCs, HCFCs or hydrofluoroalkanes (HFAs) have been used as blowing agents)
8. any species of hardwood from the tropical rainforests, unless it is obtained from sustainable sources
9. polychlorinated biphenyls (PCBs), polychlorinated terphenyls (PCTs) or any goods and /or materials containing the same
10. chrysotile amosite crocodilite

A33 QUALITY STANDARDS / CONTROL

11. Cemfil
12. spray-applied fire protection / insulation of any kind
13. vermiculite-containing fibrous dust
14. polyurethane foam and polyisocyanurate foam (where these fail to meet LPCB – LPS 1181)
15. PTFE fabrics, except where the use of PTFE is as a jointing tape in plumbing applications and on specialist applications such as valve seats, bearing material or sealing rings in pre-manufactured items of plant and equipment
16. lindane – wood treatment / insecticidal spray
17. pentachlorophenol (PCP) or timber treated with pentachlorophenol – biocide / wood preservative
18. tributyltin (TBT)
19. CCA (chromated copper arsenate) preservatives where there is a likelihood of continuous skin contact, or for any domestic / residential situations. Refer to EC directive 2003/02/EC.
20. materials generally accepted within the construction industry as:
    - being deleterious in themselves, or in the particular situation or in combination with other materials known to be used, or
    - known to become deleterious with the passage of time, or
    - being damaged by or causing damage to the structure in which they are to be incorporated or to which they are affixed, or
    - posing a hazard to health and safety, or
    - posing a threat to the structural stability or performance or the physical integrity of the Works of any part or component.
21. materials having the effect of significantly reducing the normal life expectancy of the Works or part thereof.

1000 MATERIALS AND WORKMANSHIP

Use the best materials and workmanship of their respective kinds in accordance with the specification. Ensure that all materials (unless otherwise stated) conform to the statutory requirements detailed herein. References to recognised standards of materials and workmanship, i.e. British Regulations, Standards, Codes of Practice, BRE Recommendations, DIN Standard, ISO Standards, etc, relevant to the design, installation or performance of the Works, represent the minimum standard to be complied with. Transport, unload, stack, store, and fix / install / apply all materials in full accordance with manufacturer's instructions, including all safety precautions and any ancillary or associated components (e.g. warning label, electromagnetic screen, electrical isolator, fuse, pressure relief valve, isolating valve, strainer, air vent, drain valve) that such installation instructions require or recommend.

Where materials and components are not specifically described, use the best of their kind and, if required, submit samples or drawings of such materials or components to the Project Manager for comment.

Use competent and experienced operatives, appropriate to the work to be carried out. Ensure that standards of workmanship are supervised by a competent person. Ensure that an inspection of the installation is carried out by a competent person prior to offering it to the Project Manager for inspection.

Make available for inspection by the Project Manager when required copies of orders to suppliers.

A33 QUALITY STANDARDS / CONTROL

Immediately remove and replace all materials considered by the Project Manager to be unsound, faulty or installed imperfectly or not in accordance with the specification, at no additional cost. Failure to act within a reasonable period of notice will empower the Project Manager to employ other persons for this purpose and to pay the same out of any monies that may be or become due to you.

The Project Manager may, at all reasonable times, inspect any drawings or inspect, examine and test the material and workmanship of any plant (or portion thereof) contracted for at the premises of the manufacturer or Installer.

Provide all equipment and materials by manufacturers who have available maintenance and servicing capability covering the project's geographical location.

Include adequate provision in the design and construction for appropriate fire barriers, building expansion joints and steelwork supports and fixings, as required and where detailed in the specifications and the architectural drawings provided or referred to in the tender documents. Make allowance for building movement in the installation of the engineering systems.

Pack all equipment carefully for transport so that it is protected against all climatic conditions. Take adequate precautions to prevent mechanical damage to any equipment during transit.

Within one month of appointment provide to the Main Contractor details of the dimensions and weight of all heavy and large items to be brought to the site and the dimensions and wheel loadings of the vehicles to be used in their transport.

For all the equipment supplied under this contract, level and adjust it on its foundations prior to grouting. Provide all shimming and packing required for adjustments. All necessary adjustment for foundation levels and all bedding and grouting of plant on foundations and cementing into walls and floors will be carried out by others. Ensure that such work is adequately and properly carried out and that the above levels and adjustments made are not thereby disturbed.

1100 DATE-DEPENDENT FUNCTIONALITY

For all items of equipment supplied under this contract that have date logic embedded in the control devices, date display devices or computer software that they contain, obtain from the manufacturer of the equipment a written statement that neither the performance nor the functionality of the equipment will be adversely affected by dates prior to, during and after the year 2000.

Where the control devices, date display devices or computer software of such equipment is required to interoperate or interact with other items of equipment or systems (including building management systems, programmable logic controllers) or computer software (including asset registration, maintenance scheduling, electronic operating and maintenance instruction manuals), obtain from the manufacturer of the equipment a written statement of the range of dates (e.g. "from 1st January 1950 to 31st December 2100 inclusive") over which the equipment will operate without either its performance or its functionality being adversely affected.

For each such item of equipment submit such written manufacturer's statements to the manufacturer of the equipment or system or computer software with which it must interoperate or interact, and obtain written confirmation therefrom, prior to placing the order for that equipment, that the said equipment or system or computer software and the item of equipment, have compatible date-dependent functionality.

To avoid ambiguity in all communications about this clause, use the edition current at the time, of BS EN 28601 *Specification for representation of dates and times in information interchange* regarding the expression of dates, including calendar dates, ordinal dates, week numbers and times in numeric form, including a combination of alphabetic and graphic characters.

1200 PRESSURE EQUIPMENT AND PRESSURE SYSTEM SAFETY REGULATIONS

Ensure that all pressure equipment, including but not limited to vessels, piping, safety accessories and pressure accessories, and assemblies, with a maximum allowable pressure greater than 0.5 bar comply

with the Pressure Equipment Regulations. “Assemblies” means several pieces of pressure equipment assembled to form an integrated, functional whole.

As a minimum, mark pressure equipment with:

1. unique identification of the manufacturer
2. unique identification of the model and serial number
3. the year of manufacture
4. maximum / minimum allowable pressure limits
5. UKCA/UKNI/CE Mark

Provide a declaration of conformity for all pressure equipment.

Ensure that pressure equipment is:

1. designed for adequate strength taking into account internal / external pressure, ambient and operational temperatures, static pressure and mass of contents in operating and test conditions, corrosion and erosion, fatigue, etc.
2. provided with means to ensure safe handling and operation, examination, draining and venting.
3. provided with protection against exceeding the allowable limits of pressure.
4. where necessary, designed and fitted with suitable accessories to meet damage limitation requirements in the event of external fire.

Ensure all components or sub-assemblies in their finished assembly are used within their safe operating range and correctly installed and tested. Ensure that adequate instructions are provided by the manufacturer for the safe installation, testing and operation.

Where a system requires a ‘Written Scheme of Examination’ under the Pressure System Safety Regulations, have it prepared by an authorised competent person accredited by UKAS and incorporate it in the operating and maintenance instruction manual.

1300 INSPECTION BY EMPLOYER’S INSURERS

Ensure that the equipment, plant or materials satisfy the Employer’s insurance company’s requirements in all respects. The installations subject to inspection and certification will not be accepted on behalf of the Employer until certification has been received from the insurers.

Inform the Project Manager when the installation or equipment is ready for examination and provide a programme for the inspection and certification by the Employer’s insurers. Provide all necessary information to enable the insurers to approve the design before manufacture. Arrange for the attendance of the insurance company’s representative at agreed stages of manufacture and installation. Provide all necessary attendance, access and facilities for such inspecting and testing as is required.

Include all your costs associated with the insurance company’s inspections in the tender price.

1400 INFORMATION SECURITY

1410 General

Provide network security system(s) to protect from potential information security and cybersecurity risks including, intrusion, remote access, viruses, spy-ware and malware. Put in place, and into use, effective protection and homogenous policies for infrastructure, servers, workstations, controllers, network connected equipment, internet connected systems/devices, WiFi devices, IOT devices and mobile devices supplied under the contract. Include in the operating and maintenance instruction manuals

details of the requirement for ongoing management of network and cyber security by the Employer. Where relevant and applicable, apply the requirements of ISO/IEC 27000 Series of Standards relating to “Information Technology - Security Techniques”.

1411 Highly secure environments

Identify highly secure government and military environments against the relevant country-specific standards, performed by an accredited Information Security advisor.

1420 Design and construction

Comply with policies and procedures as required by the contract to protect confidentiality, integrity and availability of information and systems performance.

1430 System configuration

Comply with policies and procedures as required by the contract to protect confidentiality, integrity and availability of information and systems performance.

Provide input to the technical and operational security risk assessment process, led by the Employer’s network contractor.

1440 System hardening

Take measures to configure systems and comply with procedures as required by the Employer to protect confidentiality, integrity, systems performance and availability of information. As a minimum and as applicable to the subcontract works:

~ Implement manufacturer recommendations, overriding such recommendations with the Employer’s more secure guidelines where available.

~ Provide an initial inventory of all assets within the environment on handover, ensuring continual inventorying of authorised and unauthorised devices and software, in accordance with the Employer’s policies and procedures where available.

~ Remove all default accounts and passwords from all devices, creating new accounts, implementing secure identity and access management (IDAM) controls and procedures, in accordance with Employer’s policies and procedures where available.

~ Ensure all software is up-to-date with proper patch management procedures in place and applied, including throughout the service period, in accordance with the Employer’s policies and procedures where available.

~ Ensure full disk encryption is enabled and enforced across all devices in accordance with the Employer’s policies and procedures where available.

~ Ensure secure configurations for all devices are implemented, disabling all unnecessary services, functions and/or daemons prior to go live, in accordance with the Employer’s policies and procedures where available.

~ Ensure continual vulnerability assessments and penetration tests are completed with at least one (1) vulnerability assessment and one (1) penetration test completed prior to handover, in accordance with the Employer’s policies and procedures where available.

~ Ensure frequent system back-ups are completed, retained for a defined period of time in line with industry guidelines and/or regulatory controls, in accordance with the Employer’s policies and procedures where available.

~ Ensure all service technicians are trained, and certified where applicable, to ensure compliance with established policies and notification of potential information security incidents, in accordance with the Employer’s policies and procedures where available.

A33 QUALITY STANDARDS / CONTROL

- ~ Ensure all other Employer's policies and procedures are enforced.
- ~ Ensure full compliance with any other regulatory framework and/or standard as required and defined within project contracts.

END OF SECTION A33

HOARE LEA

WAKEFIELD COLLEGE SUMMER PROJECTS 2023

RIBA STAGE 3 MEP PERFORMANCE SPECIFICATION

A34 SECURITY/ SAFETY/ PROTECTION

A34 SECURITY/ SAFETY/ PROTECTION

CONTENTS

100 PROTECTION OF EQUIPMENT
- 110 Delivery
- 120 Handling
- 130 Storage
- 140 Protection of Works
- 150 Identification
- 160 Rotating Plant
  - 161 Machine Guards

200 EXISTING SYSTEMS

300 PROTECTION OF THE EXISTING SITE

400 NOISE AND NUISANCE

A34 SECURITY/ SAFETY/ PROTECTION

100 PROTECTION OF EQUIPMENT

The Project Manager is not obliged to accept anything other than new, totally undamaged, correctly installed and selected equipment.

Properly protect the installation at all times, as required by the main contract preliminaries. Where appropriate, (e.g. for some types of electrical installation work, or for some types of materials requiring particular environmental conditions) ensure that the installation work does not commence until the affected rooms or areas of the building can be maintained weathertight, without unacceptable risk of water or dust reaching the installations. If the measures taken prove to be inadequate, the Project Manager will decide whether repairs may be effected and suitable recompense made to the Employer, or whether damaged installations are to be completely replaced.

No payment or allowance for delay and disruption will be made for repair, if agreed appropriate by the Project Manager, or replacement, if required by the Project Manager.

110 Delivery

Provide adequate and safe protection for all materials and products during transport to site. Deliver, with open ends effectively plugged, capped and/or sealed for all ducting, piping, tubes, conduit, trunking and associated equipment.

120 Handling

Offload and transport about the Works, all materials and products in the manner recommended by their manufacturers.

130 Storage

Store all materials and products in the manner recommended by their manufacturers.

Provide sufficient, safe and secure storage for all materials and products.

Provide properly made racks with adequate supports to prevent distortion for storage of conduits, pipes and similar materials.

Store all fittings, accessories and sundry items in clean bins, or bagged and stowed on racks, and maintained under suitable weatherproof cover. Where not stored in dry buildings, raise all material off the ground and protect accordingly.

140 Protection of Works

Provide adequate and safe protection for all materials and products during and after installation stage to prevent wilful, accidental or resultant damage to the Works.

Ensure all items forming part of the Works, whether in storage, in the course of installation, or installed, are protected against ingress of water, dust or foreign bodies, formation of condensation, extremes and rapid changes of temperature, direct sunlight, high winds, excessive humidity, building works and operations to other items. Ensure that all protection is adequate for its purpose, including fire resistance. Maintain, alter, adapt, replace or repair protective measures as necessary as the Works proceed. Replacement parts or equipment or making good will not be accepted in lieu of protective measures. Prevent the Works from becoming wet or damp and dry out the Works accordingly.

Take all reasonable fire precautions in respect of stores, workshops and other installations. Where it is necessary to use any naked flame or welding equipment in executing the Works and where combustible materials are in use, give adequate protection to other adjacent materials and personnel. Ensure suitable fire extinguishers are readily available at the position where such work is proceeding.

Protect throughout erection and after installation, vulnerable or delicate materials or finishes, with hardboard covers or heavy duty polythene sheet.

A34 SECURITY/ SAFETY/ PROTECTION

Such items include but are not limited to:

1. control panels
2. switchboards
3. distribution boards
4. heater batteries
5. finned piping
6. refrigeration condensers
7. heat emitters (radiators, convectors, trench, over-door heaters, etc)
8. gauge glasses.

Protect the surface finish of all items from damage and paint splashes. Install items such as grilles, diffusers, luminaires, switches, accessories etc, as near to completion as practicable.

Install filter media no earlier than when the plant items concerned are being commissioned and tested.

Cover all plant items with polythene sheeting (or plywood if more appropriate) except when being worked upon.

Cap all open ends of pipes, ducts, conduits and trunking etc, except when being worked upon.

Leave plant and equipment in a ready-to-paint condition where specified as part of the Works, or where they are to be painted by others.

Properly clean and paint with corrosion-resistant paint at works, and again immediately after installation or after the removal of temporary protection, all those parts that are liable to corrosion.

When final finishes are applied at the manufacturer's works, ensure adequate protection is provided up until the point of installation. Inspect on delivery and do not accept anything that is damaged.

Replace material, plant or equipment where deterioration has occurred prior to handover.

At Practical Completion, remove all protective measures (including removal from site) and clean down and prepare the Works for hand over.

Ensure all materials used for protection are recyclable.

Do not remove protection to the work of others without an instruction, and subsequently replace protection so removed, where required.

Provide proposals for providing protective measures as part of the tender return.

150 Identification

Where appropriate, ensure that materials, plant and equipment bear the brand name, serial / batch number and any other data required to identify their nature in relation to the Works.

160 Rotating Plant

Immediately prior to Practical Completion adjust, ease and lubricate moving parts as necessary to ensure easy and efficient operation.

Ensure that whenever, to avoid damage or deterioration, it is necessary to operate at regular intervals motive plant items delivered and/or installed, the necessary temporary electricity and/or fuel supplies are provided.

Ensure that rotating plant is hand-turned periodically throughout periods when such temporary supplies are not available.

A34 SECURITY/ SAFETY/ PROTECTION

161 Machine Guards

Properly protect every rotating, reciprocating or moving part of compressors, pumps, fans and other machines supplied, using the machine manufacturer's standard or purpose-made machine guards to comply with the Factories Act. Ensure that all machine guards are manufactured from solid sheet metal or wire mesh or iron frame, all galvanised after manufacture, and have hinges and / or removable sections to allow for maintenance and tachometer readings.

200 EXISTING SYSTEMS

Where existing building engineering systems are retained redundant, make them safe by all necessary means including, as applicable, their disconnection, termination, isolation, draining down and labelling, so that it is impossible for any person to unwittingly expose themselves to electrical shock, fluid leaks, or exposed hot surfaces.

Where existing systems, or parts of existing systems are to be removed, take all reasonable measures to establish what materials are present within such systems and make all necessary allowances for removal and disposal in accordance with relevant legislation, including measures to ensure the safety of operatives undertaking the Works.

Do not commence work that requires interruption or interference with the operation of any existing services or buildings without prior written permission of the Project Manager. Give at least seven days' notice to the Project Manager of the intention to proceed with such Works.

Allow for carrying out outside of normal working hours any work on existing systems that would cause disruption or loss of services to occupants.

300 PROTECTION OF THE EXISTING SITE

Provide everything necessary for the protection of the site and be responsible for and take all reasonable steps for protecting, securing, lighting and watching all places on or about the site. Leave no steps, ladders or other plant in circumstances that makes it possible for unauthorised persons to enter the site, or any building on the site, or any adjoining buildings.

Take all necessary measures to protect the finishes and fabrics of the building as well as all furniture and fittings that remain in the area of the Works.

Install temporary protection as required to prevent damage by the Works to any elements of the building fabric, including any soiling of carpets, luminaires, finishes, walls etc surrounding the Works, from whatever cause.

If protection is inadequate, or improperly installed or maintained, and resultant damage occurs (or damage is caused by negligent action of site personnel), promptly repair the damage at your own expense and, if instructed by the Project Manager, by use of the appropriate specialist contractor.

Make such repairs at least sufficient to restore the damaged element to its condition immediately prior to the damage occurring. Where resultant damage is localised and the local repair of it would remain noticeable, then repair the whole section of works.

Fully tape at the edges all temporary floor finishes such as "hardboard", to prevent tripping hazards. Erect adequate signage warning of all potential trip hazards.

Install adequate temporary signage to warn of all wet surfaces arising as a result of the Works. Failures to sign wet surfaces adequately that result in a claim of injury to personnel, will result in you compensating the victim at your own expense.

Install protection to prevent damage by the Works to any element external to the Works area (whether on the site or on adjoining properties), including damage to hard-standings, grassed areas, pavements, roads, etc. Repair all damage at no additional charge so as to return the damaged element to its condition immediately prior to the damage occurring.

A34 SECURITY/ SAFETY/ PROTECTION

Ascertain and comply with any police regulations as may affect the Works.

400 NOISE AND NUISANCE

Ensure that the Works are undertaken with as little noise as possible. Ensure that no nuisance by noisy working is caused to the occupants of either the premises in which the Works are located or of adjacent buildings outside the site boundary.

Take all necessary precautions to prevent nuisance from smoke, rubbish and other causes.

Fit all compressors, percussion tools and vehicles with effective silencers of a type recommended by the manufacturers of the equipment.

Ensure all internal combustion engines used in the execution of the Works are fitted with efficient suppressors in the ignition system in accordance with the recommendations of British Standards so as to prevent electrical interference to radio or television equipment in the vicinity. Prevent all temporary electrical installations, such as motors or the like, from creating such interference and fit with suppressor equipment in accordance with British Standards and to the satisfaction of the Project Manager.

END OF SECTION A34

HOARE LEA

WAKEFIELD COLLEGE SUMMER PROJECTS 2023

RIBA STAGE 3 MEP PERFORMANCE SPECIFICATION

A37 OPERATION/ MAINTENANCE OF THE FINISHED INSTALLATIONS

A37 OPERATION/ MAINTENANCE OF THE FINISHED INSTALLATIONS

CONTENTS

100 RECORD DOCUMENTS

110 CAD RECORD DRAWINGS

200 OPERATING AND MAINTENANCE INSTRUCTION MANUALS

210 General

211 Scope
212 Definitions
213 Writing style and use of English
214 Graphics and illustrations
215 Indexing and cross-referencing
216 Errors in the documentation
217 Collection of information
218 Reader ability
219 Copyright

220 Manual presentation

230 Contents

240 Standards

300 PRODUCTION OF CAD RECORD DRAWINGS AND OPERATING AND MAINTENANCE MANUALS

400 PROVISION OF SCHEDULE OF SPARES AND SPECIAL TOOLS

500 SOFTWARE LICENCES

600 PATENT RIGHTS

700 WATER MANAGEMENT LOG-BOOK

800 REMOTE COMMUNICATION WITH PLANT AND EQUIPMENT

A37 OPERATION/ MAINTENANCE OF THE FINISHED INSTALLATIONS

100 RECORD DOCUMENTS

Ensure that the record documents make it possible to comprehend the extent and purpose of the Works and the method of operation thereof.

Ensure that the record documents set out the extent to which maintenance and servicing is required and how, in detail, it should be executed.

Ensure that the record documents provide sufficient, readily accessible and proper information to enable spares and replacements to be ordered.

Correlate record documents so that the terminology and the references used are consistent with those used in the physical identification of the component parts of the installations.

Issue operating and maintenance instruction manuals and record drawings of the final as-built layouts in draft form for comment prior to the testing and commissioning period, or two weeks prior to completion or completion of section, whichever is earlier, to allow checking for accuracy. Comments will be provided within two weeks of receipt of the drawings. Revise as necessary the complete set of draft operating and maintenance instruction manuals and record drawings to incorporate testing and commissioning data where applicable, and hand over the final set(s) of operating and maintenance instruction manuals and record drawings in accordance with the main contract preliminaries.

Issue at a time in accordance with the main contract preliminaries, the complete agreed package of operating and maintenance instruction manuals and Record Drawings made up of 2 sets of “hard copy” white prints / bound manuals and 2 electronic sets on a USB flash drive or USB hard drive.

Issue a further copy of the final version of the O&M instruction manual and Record Drawings to the Principal Contractor for insertion into the Health & Safety File in accordance with the Principal Contractor’s programme.

110 CAD RECORD DRAWINGS

Provide Record Drawings of the complete installation on completion or completion of section as defined in the main contract preliminaries.

Produce all Record Drawings upon common building outlines and structural details agreed by the Project Manager.

Produce all Record Drawings using AutoCAD (latest release). Provide every drawing in DWG, DXF and PDF format.

Provide the information contained upon the final versions of Record Drawings such that independent 'layers' are created with selected categories of information on each layer. Agree the content of each ‘layer’ with the Project Manager prior to creation of the CAD drawing files.

Produce Record Drawings to comply with the definitions in BSRIA’s Building Applications Guide BG 6 *A Design Framework for Building Services*, Appendix C.

Include the following information on the Record Drawings:

1. location, including level if buried, of utility service connections, including those provided by the appropriate authority, indicating points of origin and termination, size and material of service, emergency shut-off isolation locations, pressure and/or other relevant information
2. disposition and depth of all underground systems
3. schematic drawings of each system indicating principal items of plant, equipment, zoning, means of isolation etc in sufficient detail to make it possible to comprehend the system operation and the interconnections between various systems
4. details of the principles of application of automatic controls and instrumentation

5. diagrammatic dimensioned plans and sections / of each system or service showing sizes and locations of all ancillaries, plant, equipment controls, test points, and means of isolation etc including any items forming an integral part of the engineering systems provided by others (such as plenum ceilings, builder's work shafts, chimneys etc)
6. identification of all terminals/cables etc by size/type and duty/rating as recorded from the commissioning results
7. detailed wiring drawings / diagrams / schedules for all systems, including controls, showing origin, route, cable / conduit size, type, number of conductors, length, termination size and identification, and measured conductor and earth continuity resistance of each circuit. Ensure routes indicate whether cable / conduit is surface-mounted, concealed in wall chase, in floor screed, cast in-situ, above false ceiling etc
8. details of co-ordination of wiring and connections with cable core identification, notation of fire alarm, security, control and instrumentation and similar systems provided as part of the Works
9. details to show inter-connections between the Works and equipment or systems provided by others to which wiring and connections are carried out as part of the Works
10. location and identity of each room or space housing plant, machinery or apparatus

Ensure that the Record Drawings conform to the following standards:

1. all hard copy Record Drawings on best quality paper, with CAD files provided on a USB flash drive or USB hard drive.
2. all titles, headings, etc have a height not less than 5mm
3. all other lettering upper case in a height of not less than 3mm
4. all non-essential setting-out dimensions from installation drawings removed

Show the following information on every Record Drawing:

1. Employer's name
2. name of contract and, where appropriate, the zone or floor designation
3. description of drawing, its number and scale
4. name and address of originator
5. your confirmation that the completed Record Drawing is a true record

Note that in the event of non-compliance with this clause, the Project Manager reserves the right to have the Record Drawings prepared by others and to deduct the cost of preparation from monies otherwise due. The sum deducted will be the actual cost and may be greater than any sum declared in the schedule of rates or prior quotations.

200 OPERATING AND MAINTENANCE INSTRUCTION MANUALS

210 General

Note: some of the following is reproduced from *BSRIA BG 79/2020 Handover Information and O&M Manuals.*

This section of the specification details the type and content of the O&M manual required, to provide for the safe and efficient operation and maintenance of engineering services, including as-fitted and other drawings.

A37 OPERATION/ MAINTENANCE OF THE FINISHED INSTALLATIONS

Issue of operating and maintenance instruction manuals is a pre-requisite of Practical Completion of the Works and the Practical Completion certificate will not be issued until the Project Manager is satisfied that the manuals have been produced in accordance with this specification.

211 Scope

The engineering services covered by this specification are:

Mechanical

Air conditioning and comfort cooling

Compressed air

Mechanical ventilation systems

Electrical services

Access control systems

Cable containment

CCTV

Data and IT systems

Earthing and bonding

Lighting circuits and control

Power circuits and control

Power and containment for mechanical and public health systems

Security - intruder detection and alarm

Public health services

Domestic water systems

Drainage above ground – foul

Fire engineering services

Fire detection and alarm systems

Submit to the Project Manager with the draft version of the operating and maintenance instruction manual, written confirmation from the manufacturer of every major plant item, a list of documents that the manufacturer considers should be held on site for the proper operation and maintenance of the plant supplied. The Project Manager will use these written confirmations when determining whether or not the operating and maintenance instruction manual is complete.

212 Definitions

Refer to BS 5643 for guidance on defining terms in the technical documentation. In addition to the terms defined in that standard, and those in section A10 of this specification, the following definitions of terms will apply:

- Equipment: Any engineering plant, machine or component
- System: A basic concept of equipment or appliances, connected, associated, or independent so as to form a complex unity
- Installation: A specific system placed in position and set up for use

A37 OPERATION/ MAINTENANCE OF THE FINISHED INSTALLATIONS

- Specialist author: The person or organisation that writes, collates and presents the information and produces the final operating and maintenance manual (this could be the installer or a third party employed by the installer).

213 Writing style and use of English

Write all documentation in plain English. If appropriate, refer to a style guide nominated by the Client. Make the text of descriptive sections concise and complete. The overall aim of the document is to provide clarity in conjunction with brevity on a need-to-know basis.

Avoid jargon. Define all new terms when first introduced. Where appropriate, use terminology that accords with BS 5643.

Only use abbreviations once their meaning has been made unambiguous. Use imperatives for instructions regarding the operation, maintenance and disassembly of engineering services.

214 Graphics and illustrations

Ensure all graphical material is legible and fully annotated to suit the purpose for which it has been included in the O&M manual. Ensure that illustrations, drawings and diagrams that are incorporated in the manual are easily understood in conjunction with the supporting text.

Where possible, use original artwork rather than second or third generation scans. If original artwork cannot be obtained, and where necessary to ensure legibility, redraw diagrams and illustrations.

Where diagrams are provided in electronic format, check the resolution and file format of the imagery for suitability. Where possible use compressed file formats (such as JPG) for their small file size, but ensure the images retain enough resolution for fine detail to be readable. If necessary for legibility, use higher resolution bit-mapped file formats (such as TIF).

Use EPS or PDF files where possible, to ensure a reasonable file size with no loss of detail and enable layering. If EPS files are provided, supply the name and version of the original software that created them, and include in the O&M manual a freeware EPS viewer. If PDF files are provided, include a freeware PDF reader in the final manual.

215 Indexing and cross-referencing

Provide the manual with an alphabetical index or indexes, which follow the text and comply with BS ISO 999.

Arrange the indexing and cross-referencing included in other parts of the manual to provide easy access to any required information.

216 Errors in the documentation

Make the specialist author responsible for the correction of any errors or omissions in the documentation provided to the Client.

217 Collection of information

Make the specialist author responsible for maintaining close liaison with all parties who are required to provide information for the manual, including designers, installers and equipment manufacturers and suppliers. Ensure each of these sources is aware of the information required by the specialist author. Arrange such liaison to give all parties adequate time to collate the necessary information.

Provide copies of all orders for plant and equipment to the specialist author. Arrange for the specialist author to ensure that the performance and technical information included within the manual is for the actual equipment installed, preferably by undertaking a site inspection.

A37 OPERATION/ MAINTENANCE OF THE FINISHED INSTALLATIONS

Arrange for the specialist author to use all the information provided and such other information believed to be necessary to produce a satisfactory O&M manual. Where appropriate, modify information to provide a single, uniform presentation.

218 Reader ability

Prior to commencing production of the manual, identify the intended maintenance strategy for the installation and the level of technical competence and comprehension of the personnel likely to be employed. Prepare the manual to suit this level of reader. Ensure that the manual states the reader's assumed level of technical comprehension and competence. Provide training in the use of the manual for searching for specific items, so that the building operators will be able to use them after the building is handed over.

The personnel expected to use the manual will be:

Non-technical (such as a property manager or caretaker)

General technical (with broad-based maintenance skills)

Specialists

219 Copyright

Confirm that the Client has sole copyright to the O&M manual document and is able to reproduce any part for its own use.

220 Manual presentation

Present the manual in a fully digital, searchable, editable and updateable environment where documents can be collated, sorted, distributed, accessed, edited and printed within a systems user's access rights.

Ensure that the manual supplier suitably responds to the end user's computer competence, computer system compatibility, technical competence, and intended maintenance strategy, to ensure that the manual is suitably presented. Confirm that the manual supplier has ensured that full software support is provided in the form of a 'help desk'.

Make the final electronic O&M manual clear to read, easy to navigate and easy to understand by all levels of user. Ensure that the electronic manual is capable of being printed out clearly, both in its entirety and as selected pages from it. Ensure that the manual is capable of having images loaded into it that can be printed legibly. Ensure that the manual is protected to prevent overwriting of information.

Ensure that the general contents and format of the manual are in accordance with BS EN 82079-1 *Preparation of instructions for use. Structuring, content and presentation. General principles and detailed requirements* and *BSRIA BG 79/2020 Handover Information and O&M Manuals*. Ensure that manufacturer's information is prepared in accordance with *BS 4940 Technical information on construction products and services*.

230 Contents

Follow the guidance and include all the information set out in section 4.6 of BSRIA Guide BG 79/2020.

Ensure that all product information included within the operating and maintenance instruction manual is in compliance with the Code for Construction Product Information (CCPI, cpicode.org.uk)

In addition, ensure that the following are included:

1. diagrammatic drawings of each system indicating principal items of plant, equipment, valves etc
2. a set of drawings of the installation upon which is recorded all plant settings, water flow-rates, pump heads and noise level readings as adjusted and measured during the testing

and commissioning period. Record protection and overload relay settings and incorporate calibration charts.

3. legend of all colour-coded services
4. schedules (system by system) of plant, equipment, valves etc, stating their locations, duties and performance figures. Each item must have a unique number cross-referenced to the record and diagrammatic drawings and schedules.
5. a copy of all test certificates, inspection and test records, commissioning and performance test records including, but not limited to, electrical circuit tests, corrosion tests, type tests, start and commissioning tests, for the installations and plant, equipment, valves etc, used in the installation
6. schedules of all fixed and variable equipment settings established during commissioning
7. procedures for seasonal change-overs and / or precautions necessary for the care of apparatus subject to seasonal disuse
8. a list of normal consumable items
9. procedures for fault-finding in diagrammatic and tabular form to show the action necessary to correctly identify defective pieces of equipment and the steps to be taken to rectify faults
10. documentation of the procedures for updating and / or modifying software operating systems and control programs
11. instructions for the creation of control procedure routines and graphic diagrams
12. details of the software revision for all programs provided
13. two back-up copies of all software items, as commissioned
14. performance guarantees (as detailed in clause A33, 2000)
15. health and safety (CDM) relevant information (e.g. safety measures in maintenance, COSHH substances, disposal instructions, risk assessments etc), written schemes of examination for pressure systems, written schemes of examination and tests for systems at risk of causing Legionellosis

Provide and permanently fix an indelible asset label to all plant and equipment listed in the asset register. Ensure that each label is located in an accessible position on the asset and it is of a design, size and format accepted by the facilities manager

In the absence of a project-specific schedule, use the form in appendix B of BSRIA BG79/2020 to record the issue or certificates and other handover documentation.

240 Standards

Notwithstanding the above, provide O&M manuals, system records and full documentation in accordance with the legislation, standards and guidance applicable to individual systems, as referred to in the system sections of this specification and as listed below.

For intruder alarm systems:

BS 4737	Intruder alarm systems in buildings

For heating systems, as applicable:

BS EN 12170	Heating systems in buildings. Procedure for the preparation of documents for operation, maintenance and use. Heating systems requiring a trained operator

A37 OPERATION/ MAINTENANCE OF THE FINISHED INSTALLATIONS

BS EN 12171	Heating systems in buildings. Procedure for the preparation of documents for operation, maintenance and use. Heating systems not requiring a trained operator

300 PRODUCTION OF CAD RECORD DRAWINGS AND OPERATING AND MAINTENANCE MANUALS

Employ a technical documentation specialist to produce the Record Drawings and operating and maintenance instruction manuals.

Ensure that the selected technical documentation specialist produces a fully word-processed document and CAD drawings, with various packages of work in an agreed common style and suitably indexed for ease of use. Ensure that, prior to production of drawings or documentation, their final required content, format and style is confirmed and agreed by the technical documentation specialist. No manufacturer's literature will be accepted except as a supplement to the document; a full understanding of all items or systems must be achieved without such literature.

Refer to the “Lead Co-ordinator’s additional responsibilities” in relation to Record Drawings and operating and maintenance manuals in section A11 of this specification.

400 PROVISION OF SCHEDULE OF SPARES AND SPECIAL TOOLS

Compile and submit to the Project Manager one month before completion of the Works, a complete list of special tools, test equipment and spare parts to cover 12 months’ operation of the installations. Submit an additional list of special tools and test equipment likely to be needed during the useful life of the installation, i.e. over and above the 12 month period. This requirement is in addition to the provision of the spares and tools detailed elsewhere in the specification.

Wherever spares or tools, special or otherwise, are required by other clauses within the specification, provide them irrespective of the requirement of this particular clause.

Provide a fully itemised schedule of spares for each and every system and item of equipment installed as part of your Works.

Price each item of equipment upon the spares schedule highlighting those items that are specified and thus included in the tender price, together with a total cost. Forward the priced schedule to the Project Manager for consideration by the Employer, noting that the Employer reserves the right to choose the spares that will be supplied by you up to the value included in the tender and to choose the spares that will be supplied at additional cost to the contract.

500 SOFTWARE LICENCES

For all computer software supplied as part of your Works, obtain on behalf of the end user all appropriate licences, permissions, copyright waivers, rights of use, source codes, etc, from the owners of the software rights.

Ensure the end user is registered with the software supplier for updating, etc.

For any equipment that requires a maintenance “code” to reset the system, ensure that the code is unique to that specific item of equipment, and include all such codes in the O&M manual.

600 PATENT RIGHTS

Indemnify against all claims, costs or expenses in connection with any patented, copyrighted or protected articles supplied and used on or in connection with the Works. Include in the contract price and make any payments or royalties payable in one sum or in instalments to whomsoever they may become due. In the event of any claim being made in connection with such patented or protected articles, conduct any negotiations or litigation in connection with such claims at your own expense.

A37 OPERATION/ MAINTENANCE OF THE FINISHED INSTALLATIONS

700 WATER MANAGEMENT LOG-BOOK

Where the project includes Water Fittings, provide, as part of the handover documentation, a building water management log-book in accordance with the requirements of BS8558 and, for healthcare projects, HTM 04.

800 REMOTE COMMUNICATION WITH PLANT AND EQUIPMENT

Where plant and equipment is provided with the capability to communicate with a manufacturer's/installer's service personnel or remote monitoring facility via a mobile data connection, make all necessary arrangements to ensure that the item is within range of a reliable mobile data signal. Pay particular attention to this item in basement locations, where extensions to the antennae may be necessary.

END OF SECTION A37

HOARE LEA

WAKEFIELD COLLEGE SUMMER PROJECTS 2023

RIBA STAGE 3 MEP PERFORMANCE SPECIFICATION

A40 MANAGEMENT AND STAFF

A40 MANAGEMENT AND STAFF

CONTENTS

100 INSTALLER'S STAFF

A40 MANAGEMENT AND STAFF

100 INSTALLER'S STAFF

Maintain on the site of the Works an experienced engineer and site staff for carrying out your Works.

Designate a senior member of your office staff to be your organisation's representative.

Ensure that this person is an experienced engineer-designer and is competent and duly authorised to:

1. co-ordinate the work in your office, between your office and the site, and between the suppliers and your office and site, and
2. liaise with the Main Contractor and/or Architect/engineer and other parties, and
3. attend progress meetings, and
4. generally represent your organisation on all aspects related to your contract and interfaces with all other Installers.

All directions or instructions given by the Main Contractor or Project Manager to your representative are deemed to have been given to your organisation.

END OF SECTION A40

HOARE LEA

WAKEFIELD COLLEGE SUMMER PROJECTS 2023

RIBA STAGE 3 MEP PERFORMANCE SPECIFICATION

B1 INTRODUCTION

B1 INTRODUCTION

CONTENTS

100 TITLE AND NATURE OF PROJECT

WAKEFIELD COLLEGE SUMMER PROJECTS 2023

RIBA STAGE 3 MEP PERFORMANCE SPECIFICATION

B1 INTRODUCTION

100 TITLE AND NATURE OF PROJECT

Wakefield College require refurbishment to numerous areas within Radcliffe and Seacole Buildings, Wakefield and their Castleford Campus.

Please refer to Works Summary section within the specification for further details.

END OF SECTION B1

HOARE LEA

WAKEFIELD COLLEGE SUMMER PROJECTS 2023

RIBA STAGE 3 MEP PERFORMANCE SPECIFICATION

B2 SCOPE OF WORKS AND RELATED SERVICES

B2 SCOPE OF WORKS AND RELATED SERVICES

CONTENTS

100 SUMMARY OF BUILDING ENGINEERING SERVICES SYSTEMS TO BE PROVIDED

200 SCHEDULE OF DRAWINGS

300 SCOPE OF WORK

B2 SCOPE OF WORKS AND RELATED SERVICES

100 SUMMARY OF BUILDING ENGINEERING SERVICES SYSTEMS TO BE PROVIDED

The building engineering services systems covered under the scope of this document include systems described under the following Common Arrangement of Work Sections (CAWS) system categories, and any other system or sub-system detailed in the attached specification(s) or on the associated tender drawings:

R1 Drainage

S1 Water supply

T7 Local cooling / refrigeration

U1 Ventilation

V2 General LV distribution / lighting / power

W3 Communications – data

W4 Security

W5 Protection

200 SCHEDULE OF DRAWINGS

Refer to tender drawing issue sheet.

300 SCOPE OF WORK

All Works detailed in the specification or schedules or shown on the tender drawings, and the following site-based activities:

(Only activities specifically declared as "at works" or "off-site" may take place off site.)

1. Undertake specific design activities as indicated in section A20.
2. Provide and operate CAD / Drawing Production Facilities as specified in section A11 of this specification.
3. Provide Developed Design Drawings, Technical Design Drawings, Co-ordinated Working Drawings, Installation Drawings, Builder's Work Information, Builder's Work Details and Record Drawings, as defined in BSRIA BG 6 and as specified in section A11 of this specification.
4. Provide detailed wiring diagrams for all equipment and control panels as specified in section A11 of this specification.
5. Undertake surveys as detailed in section A12 of this specification.
6. Ensure the complete integration of the Works with the remainder of the project.
7. Inspect all plant, equipment and materials as delivered or, where specified, at the manufacturer's works.
8. Arrange delivery, offloading, lifting, hoisting and all other storage and movement of all plant, equipment and materials as specified in section A34 of this specification.
9. Install and fix correctly all plant, equipment and materials including positioning, levelling, packing, and shimming. Install and fix all secondary steelwork necessary to support the installed plant. Provide all supports up to and including the final attachment to primary structure.
10. Supply and install all collars, flashings, kerbs, stopping up and sealing required for the associated building engineering system(s) to achieve weatherproofing and acoustic stopping of services passing through the internal and external elements of the building.

B2 SCOPE OF WORKS AND RELATED SERVICES

11. Ensure all associated work (including electrical wiring, connecting pipework, builder's work, etc), is properly executed.
12. Test and commission the complete installation(s) as specified in section B4 of this specification.
13. Prepare such reports, calculations and details as required for submission to any appropriate authority including the co-ordination of such information by suppliers, specialists etc needed to be included in any submission.
14. Demonstrate that the equipment is capable of the performance and method of operation specified, and that the overall and complete systems perform correctly in the required manner and as intended by the specification to the satisfaction and acceptance of the Project Manager (including return visits for seasonal tests). Provide the full set of test results in an approved format for all tests, commissioning and balancing operations. Refer to sections B4, Y51 and Y81 of this specification.
15. Provide operating and maintenance instruction manuals for the complete systems as specified in section A37 of this specification.
16. Instruct the Employer's staff in the use, operation and maintenance of the installations, as specified in section A37 of this specification.
17. Hand over all specified tools, keys, spares, oils, chemicals, etc as detailed in section A37 and elsewhere in the specification.
18. Remove existing building engineering services systems as described elsewhere in this specification, where applicable.
19. Mark on site actual locations of all builder's work holes, chases etc as described in section A11 of this specification.
20. Carry out maintenance of existing building engineering services systems during or throughout, as appropriate, the Works.
21. Provide material samples, method statements, equipment technical literature and any other submissions detailed within this specification. Refer in particular to sections A11 and A33 of this specification.
22. Ensure all materials, equipment and components used, together with methods of installation, comply with Statutory Requirements.
23. Prepare an asset register and provide asset labelling as specified in section A37 of this specification.
24. Ensure that the location and installation of all building engineering systems meets the requirements of the project access consultant.

HOARE LEA

WAKEFIELD COLLEGE SUMMER PROJECTS 2023

RIBA STAGE 3 MEP PERFORMANCE SPECIFICATION

B3 DESIGN CRITERIA AND STANDARDS

B3 DESIGN CRITERIA AND STANDARDS

CONTENTS

100 DESIGN CRITERIA

200 CODES AND STANDARDS

210 Statutory requirements and regulations

220 REFERENCE DOCUMENTS

B3 DESIGN CRITERIA AND STANDARDS

100 DESIGN CRITERIA

Refer to individual specification sections.

200 CODES AND STANDARDS

210 Statutory requirements and regulations

Carry out the Works in accordance with all relevant standards and Codes of Practice current at the time of Tender and applicable to the location of the project, and all Statutory Instruments and Regulations as they apply to the project,

Ensure that all products that are subject to 'The Construction Products Regulations' (CPR) bear a UKCA/UKNI/CE marking as required by relevant market and are accompanied by a Declaration of Performance (DoP). Include the DoP, along with any other information required to be provided by the Regulations, in the operating and maintenance manual.

Ensure that all energy-related products that are subject to 'The Ecodesign for Energy-Related Products Regulations' are compliant on installation with the applicable implementing measure(s) listed in the Schedule 1 - Declaration of Conformity as amended from time to time by The Ecodesign for Energy-Related Products and Energy Information (Amendment) Regulations. Ensure that all energy-related products bear a UKCA/UKNI/CE marking as required by relevant market and comply with all other labelling requirements of the Energy-Related Products Regulations.

Comply with *Fire Prevention on Construction Sites, The Joint Code of Practice on the Protection from Fire of Construction Sites and Buildings Undergoing renovation*, published by the Fire Protection Association, including, where required, producing a strategy for the execution of your Works in accordance with the Code.

Carry out the Works in accordance with the requirements and regulations of all relevant local authorities, fire brigades, and utility providers including drainage, electricity, gas, telecommunications, and water supply. Notify all such authorities in accordance with their regulations and obtain any required approvals for the installation.

Comply with British Telecom LN 550 (all buried ducts for services other than piped or LV/HV cabling).

For dwellings, ensure that all wiring and electrical work is designed, installed, inspected and tested in accordance with the requirements of BS7671 and the Building Regulations, Part P, by an Installer registered with a Part P competent person electrical self-certification scheme authorised by the Secretary of State. Within 30 days of completion of the work provide the building control body with, the Installer's self-certification registration body's confirmation that the scheme has been successfully self-certified, and a copy of a Building Regulations compliance certificate.

220 REFERENCE DOCUMENTS

Legislation, standards and guidance applicable to individual systems and products are listed in the individual system and reference specification sections.

HOARE LEA

WAKEFIELD COLLEGE SUMMER PROJECTS 2023

RIBA STAGE 3 MEP PERFORMANCE SPECIFICATION

B4 TESTING, COMMISSIONING, HANDOVER AND AFTERCARE

B4 TESTING, COMMISSIONING, HANDOVER AND AFTERCARE

CONTENTS

100 TESTING

200 COMMISSIONING

300 PRACTICAL COMPLETION AND HANDOVER

310 Practical Completion

320 Instruction of Employer's representatives

B4 TESTING, COMMISSIONING, HANDOVER AND AFTERCARE

100 TESTING

For mechanical testing requirements refer to section Y51 and the testing and commissioning clauses of the individual system specification sections.

For electrical testing requirements refer to section Y81 and the testing and commissioning clauses of the individual system specification sections.

200 COMMISSIONING

For mechanical commissioning requirements refer to section Y51 and the testing and commissioning clauses of the individual system specification sections.

For electrical commissioning requirements refer to section Y81 and the testing and commissioning clauses of the individual system specification sections.

300 PRACTICAL COMPLETION AND HANDOVER

310 Practical Completion

Practical Completion of the Works, or agreed phase or part of the Works, will not be effected until all obligations under the Main Contract conditions are fulfilled, and in particular that it is demonstrated to the satisfaction of the Project Manager that the following aspects are complete:

1. All installation Works are complete other than minor ‘snags’, omissions or defects that could reasonably be completed within an agreed programme without causing disruption to the Employer's or their Agent's use of the building or agreed part thereof. In respect of this clause, specifically but not uniquely, the Project Manager shall be the sole arbiter of what may be considered ‘minor’, ‘reasonably be completed’, ‘an agreed programme’ and ‘disruption to the Employer’.
2. All tests and demonstrations have been undertaken in the presence of the Project Manager as required in the specification(s).
3. All final copies of the Record Drawings, schedules, operating and maintenance instruction manuals and ‘Part L’ Log-books have been supplied to the Project Manager in an agreed format.
4. All spares, keys, tools, oils, chemicals and other materials required by the specification for the running and maintenance of the building engineering services systems as specified, have been supplied.
5. All instruction of the Employer's staff has been satisfactorily completed in accordance with the programme for handovers agreed with the Project Manager.
6. All necessary certification by the Employer’s insurers has been completed.
7. All documentation required for the completion of the Health & Safety File under the CDM Regulations has been issued to the satisfaction of the Principal Designer and/or Principal Contractor, as appropriate, and that the complete file has been passed to the Client.

In the case of phased or partial handovers continue to operate and maintain all elements out with the partial handover that are necessary for full enjoyment of the handed-over area and access thereto.

320 Instruction of Employer’s representatives

At a time to be agreed prior to completion, or completion of section as defined in the main contract preliminaries, instruct up to two representatives of the Employer in the use and correct operation of the Works, being satisfied that such staff are capable of taking over the installation. Throughout this period of instruction, be responsible for the correct operation and maintenance of the installation.

Submit to the Project Manager a detailed programme for the training of the Employer’s staff.

B4 TESTING, COMMISSIONING, HANDOVER AND AFTERCARE

Issue handouts for the training sessions in the form of précised versions of the Operating and Maintenance Instructions detailing in simple terms the functions and method of operation of each system.

Issue a certificate of attendance to each attendee at the end of each training session.

C Alterations.

C20 Alterations and demolitions

HOARE LEA

WAKEFIELD COLLEGE SUMMER PROJECTS 2023

RIBA STAGE 3 MEP PERFORMANCE SPECIFICATION

C20 ALTERATIONS AND DEMOLITIONS

Audit sheet

Rev.	Description	Prepared by	Reviewed by	Authorised by	Date
T1	Tender Issue	BB/GAB	GS	SM	17/05/2023

CONTENTS

100 PERFORMANCE OBJECTIVES

200 DESIGN PARAMETERS

300 SYSTEM DESCRIPTION

- 310 General
- 320 Making safe and decommissioning
- 330 Strip out
- 340 Storage and reuse of existing equipment for future use
- 350 Low temperature hot water system
  - 351 System description
- 360 Refrigerant-based cooling systems
  - 361 System description
- 370 Ventilation systems
  - 371 System description
- 380 Low voltage electrical systems
  - 381 System description
  - 382 System components and equipment
- 390 Lighting, Emergency Lighting and Small Power
  - 391 System description
  - 392 System components and equipment

400 SYSTEM DESCRIPTION (CONTINUED)

- 410 Fire detection and alarm system
  - 411 System description
  - 412 System components and equipment
  - Remote indicators
- 420 Disabled Refuge Alarms (DRA) Emergency Voice Communications (EVC)
  - 421 System description
  - 422 System components and equipment
- 430 Security systems
  - System description
  - Access control system
  - Intruder alarm system
  - 431 System components and equipment
  - Intruder Alarm Door Monitors
  - Access Control Controllers
  - Access Control Pushbuttons
  - Access Control Break Glass Units
  - Access Control Electromagnetic locks
- 440 Containment
  - 441 System description
  - 442 System components and equipment

500 SYSTEM DESCRIPTION (CONTINUED)

510 IT / Communications systems
511 System description
512 System components and equipment
520 Building management systems/controls
521 System description
530 Above ground foul drainage systems
531 System description
600 CONTROL REQUIREMENTS
700 SCOPE OF WORKS
710 Responsibilities
720 Detail coordination
800 PAINTING AND THERMAL INSULATION
900 FIXING TO BUILDING FABRIC
1000 IDENTIFICATION OF MECHANICAL AND ELECTRICAL SERVICES
1100 TESTING AND COMMISSIONING
1110 Compliance
1120 Visual examination
1200 SCHEDULE OF INSTALLER'S SUBMISSIONS
1210 Handover documentation
1220 Record drawings
1230 Operating and maintenance instruction manuals
APPENDIX A REFERENCE DOCUMENTS

100 PERFORMANCE OBJECTIVES

Low temperature hot water and chilled water systems

To distribute low temperature hot water to serve repositioned heat emitters, to maintain the heating internal design temperatures in each space and satisfy other heating loads in the building as applicable, whilst minimizing distribution losses, maximizing energy efficiency and ensuring safety in operation.

Refrigerant cooling systems

To distribute cooling to repositioned cooling terminal units in the remodelled area(s).

Ventilation systems

To provide mechanical ventilation provisions to the remodelled area(s) by supplying filtered outside air to, and extracting vitiated air via the repositioned / new grilles / diffusers.

Lighting, Emergency Lighting and Small Power

To provide effective internal artificial lighting throughout the remodelled area(s), including the use of repositioned / new light fittings and switches, that will meet the design criteria.

To provide small power throughout the remodelled area(s), including the use of repositioned / new outlets and switches.

Fire detection and alarm system

To provide fully automatic fire detection and alarm coverage to satisfy the area coverage for the remodelled area(s), including the use of repositioned / equipment, and operational and performance criteria as outlined elsewhere in this specification.

Disabled Refuge Alarms (DRA) Emergency Voice Communications (EVC)

To provide disabled refuge alarm coverage throughout the remodelled area(s), including the use of relocated / new equipment.

Security systems

To provide security system coverage throughout the remodelled area(s), including the use of relocated / new equipment.

IT / communications

To provide complete IT / communications capability throughout the remodelled area(s), including the use of repositioned / new outlets and switches.

Containment

To provide a cable containment system throughout the remodelled area(s), including the use of relocated / new equipment.

Building management systems/controls

To amend existing automatic control systems to suit the remodelled area(s) and associated MEP systems.

Above ground foul drainage systems

To provide foul drainage above ground to serve the repositioned / new sanitary appliances and other drainage outlets throughout the remodelled area(s), for connection to the below ground drainage systems.

Validations

Contractor to verify and validate existing MEP services, prior to modifications, and present the results to the Contract Administrator; Refer to Section A12.

Fire safety

Provide and install protection of openings and fire stopping in accordance with the Building Regulations, Part B.

Provide and install an intumescent fire-sleeve on all plastic pipework exceeding 40 mm nominal internal diameter passing through fire compartment floors or walls. Ensure that the fire-sleeve has an appropriate Agrément Certificate. Ensure that the fire-sleeve has a fire rating compatible with the wall, floor or cavity barrier to which it is fitted.

Ensure that pipework concealed within building facades is non-combustible, either cast iron or stainless steel, and complies with BS EN 13501, class A7-s1 or A1

Where openings in the building fabric are required for cabling relevant fire-stopping measures, as outlined in Section Y60, are to be used.

Testing and Commissioning

Refer to Section 1000

200 DESIGN PARAMETERS

Refer to C20 Appendix A for Reference Documents to be adhered to.

Refer to Hoare Lea Y Clauses.

Fresh air provision: 12l/s/person

Extract to be balanced against fresh air provision unless otherwise stated.

Refer to electrical layouts for required lux levels per area.

300 SYSTEM DESCRIPTION

310 General

The description of the engineering systems within this document is provided for guidance only. Determine the actual level of service alteration / removal required based on a detailed survey during the tender period.

Whilst this specification defines particular requirements in relation to the building services systems, include any works required to comply with all statutory regulations applicable to the scope of works, whether or not these are explicitly described herein.

If in doubt about the scope of works or about the effect an element of work may have on other areas of the building / site, consult with the Contract Administrator.

In the area to be demolished, as indicated on the Architect’s drawings, safely isolate, disconnect, remove and dispose of the electrical, mechanical and public health services in accordance with this specification. Leave the identified systems in a safe condition and the defined area(s) clear and ready for the next phase of works.

Ensure continued availability of the MEP systems serving the rest of each building throughout the alteration / strip-out works.

Remove, adapt, relocate and modify the existing mechanical, electrical and public health engineering systems as indicated on the drawings and within this specification.

Ensure that any existing services to the adjacent areas / floors are maintained and any alterations required to the services are carried out to achieve this.

Ensure smoke vents, and any other air intakes / exhausts for systems still operational, are kept clear and operational during construction / demolition works. Before stripping any services out, identify them, to ensure any possible impact on parts of the building outside the work area are noted and the required action agreed. Ensure that any alterations to the services associated with the adjacent areas / floors prior to decommissioning/removal are completed in such a manner as to constitute a safe and permanent arrangement.

During the removal of services, take great care not to damage the building structure. Repair damage caused to any element of the building at no additional cost to the contract.

Make good any existing services penetrations through the structure where they are not able to be re-used.

Execute all works without causing a nuisance to other building occupiers, due to noise or other issues. Undertake movement of materials, equipment and tools in a sensitive and non-disruptive manner. Carry out any noisy works “out of hours” as agreed with the Employer.

320 Making safe and decommissioning

Provide a qualified and competent engineer based permanently on site to be responsible for:

- the isolation and making safe of systems
- implementing and operating a permit-to-work system
- implementing a safety ‘lock-off and tag-off’ system logging and recording the decommissioning, including the production of a status document at the end of the contract covering all systems

Carry out the decommissioning of all engineering services systems identified in the tender documents. Employ, on a sub-contract basis, any specialists required to ensure that the equipment is properly decommissioned and made safe. Carry out decommissioning to a sufficient extent to render all systems into an inert state, to allow them to be stripped-out by unskilled personnel.

The scope of the decommissioning works includes but is not limited to:

- drain down fluid systems in a sequenced manner to ensure that there are no isolated legs remaining and water leakage is kept to an absolute minimum
- make all necessary provisions for venting and draining of water systems, including determining the location of system air vents and drain points, to allow systems to be adequately drained prior to removal, and to avoid potential damage to components due to partial vacuum
- where existing drain points are not sufficient for the complete safe draining of a water system, make the necessary alterations to allow the system to be drained
- capture, store, remove from site and dispose of all fluids drained from engineering systems
- obtain the written agreement of the Employer and the Water Authority prior to discharging chemically treated water into the foul drainage system
- safely remove from site and dispose of all other fluids, and chemically treated water that cannot be discharged into a foul drainage system

- safely remove all hazardous materials associated with the engineering systems to be stripped out, such as lamps, fire alarm detectors, etc

330 Strip out

As part of the strip-out works, remove all items identified within the tender drawings and specification.

As part of the strip-out works, remove all bracketry, supports, bases etc.

340 Storage and reuse of existing equipment for future use

Disconnect and store all existing equipment that is specified to be re-installed and reused as part of the refurbishment works. In general, the existing equipment to be reused comprises:

- Door access control equipment
- Luminaires
- Switches
- PVC dado trunking & fittings
- Fire alarm equipment
- Grilles
- Air conditioning equipment
- Radiators

350 Low temperature hot water system

351 System description

The LTHW radiator and associated pipework within the Radcliffe Building Animal Care office to be relocated to suit new door position.

The LTHW underfloor heating manifold, and associated pipework and controls, serving Castleford Campus circulation area to be retained.

Strip-out / demolitions

Not applicable.

Alterations

Relocate existing LTHW radiator within the works area, and make any necessary pipework alterations, as shown on the drawings. Radiator and pipework to be redecorated following relocation.

New pipework material shall match existing.

New drain cocks and air vents shall be provided, as required, to ensure draining and filling of the system can be achieved.

360 Refrigerant-based cooling systems

361 System description

Relocate existing VRF cassette within Seacole Media Laboratory area and amend controls to link operation to the existing VRF cassette to be retained in it’s existing position.

Verify the operation of the existing split air conditioning systems to be retained within the Radcliffe Animal Care offices.

Strip-out / demolitions

Not applicable

Alterations

Relocate existing VRF cassette, and make any necessary pipework alterations, as shown on the drawings. Existing condensate drainage to be modified to suit.

Controls to be modified to ensure a single room controller is provided at the room entrance, with both VRF cassettes within the space linked to this controller.

Size and detail the design of refrigerant pipework to / from / between items of equipment provided, or affected, as part of these works.

Refrigerant and condensate pipework shall be conducted in the same material as existing. Refrigerant pipework to be fully insulated and vapour sealed using nitrile rubber Class O insulation.

370 Ventilation systems

371 System description

Retain, modify and re-balance existing mechanical ventilation systems, where installed within the works areas.

Amend MVHR ductwork and provide new grilles, as indicated on the tender drawings, within the Seacole Building Media Laboratory.

Modify the supply ductwork serving existing Catsleford Campus circulation space and provide new grilles to suit. Install new cross talk attenuators to the new partition line within existing ductwork and to allow a return air path to the corridor. Provide new unducted ceiling extract grille to allow return air path.

For details of the Radcliffe Building third floor ventilation systems to be installed, please refer to specification section U10.

Strip-out / demolitions

Not applicable.

Alterations

Relocate / modify existing ventilation systems within the works areas, and make any necessary ductwork alterations to provide fully controllable and maintainable systems, as shown on the drawings.

New ductwork shall be zinc coated galvanised steel to BESA DW/144.

Volume control dampers and access hatches shall be provided to all balancing and cleaning of the ductwork within the works areas.

Cross talk attenuators shall be provided to ensure speech privacy between spaces. Contractor to size attenuators.

For specification of ductwork, grilles, ancillaries, etc refer to specification section U10.

380 Low voltage electrical systems

381 System description

Strip-out / demolitions

Not Application

Alterations

Not Application

382 System components and equipment

Not Application

390 Lighting, Emergency Lighting and Small Power

391 System description

Carry out modifications and extensions to existing lighting and power final circuits, as detailed upon the layouts.

Lighting;- To provide a complete internal artificial lighting system throughout the building(s), that will meet the design criteria and reflect the architectural and aesthetic requirements of each area and location respectively.

To ensure the internal lighting system solution and installation provides a safe, comfortable, balanced and interesting visual environment. To consider the vertical illuminance of surfaces within an environment, in conjunction with the recommended horizontal working plane illuminance.

To achieve good quality colour appearance and colour rendering by ensuring that LED light source colour is within a range of three MacAdam ellipses or less and has a minimum colour rendering index of 85.

To achieve the recommended levels of illuminance, luminance, uniformity and glare control by selection of particular luminaire, LED light source and optical control, together with the selection and recommendation of the associated environmental reflectance properties.

Emergency lighting;-

The intention of the system is to provide sufficient illumination to allow people to evacuate a building safely when the normal lighting has failed in an emergency situation.

To provide throughout all areas, including external escape routes and open areas, as detailed on the drawings and in the specification, a complete emergency lighting installation to allow safe egress from the building and provide anti-panic lighting in the event of circuit(s) failure or total mains failure.

To provide emergency lighting in areas where the use of the space creates an inherent hazard to safe and easy escape.

To provide an emergency lighting system that clearly and unambiguously indicates all escape routes, internally and externally as required; and provides illumination along such routes and the immediate external areas of escape routes, so as to allow safe movement towards and through all exits.

To provide emergency lighting coverage to all fire alarm call-points and firefighting equipment provided along escape routes in order they can be located when the normal lighting has failed.

To provide escape route directional signs, where a direct line of sight to an exit is not possible, to direct persons towards a final escape exit.

Defined escape route lighting

This enables the safe exit by the occupants from buildings and immediate external areas by providing them with appropriate visual conditions and direction-finding on escape routes and special locations. It ensures that the fire alarm call-points, firefighting equipment and safety equipment can be located and used.

Design standard: 1 lux (min), operation in 5 seconds.

Small Power;- To provide distributed power supplies using 400-V three-phase 50-Hz circuits and 230-V single-phase 50-Hz circuits and any other voltages/frequencies within the definition of LV.

To provide a system of sufficient capacity to adequately meet the load characteristics of all individual circuits whilst remaining within equipment voltage and frequency tolerances.

To provide a means of fault clearance and isolation on every circuit and coordinated protection of cables and switchgear.

To provide a system designed to provide complete selectivity under fault conditions.

To ensure that circuit design makes allowances for anticipated fault levels, installed cable length, environmental influences, diversity, installation methods, and that circuit disconnection is achieved safely within periods prescribed in BS 7671.

To provide outlets that are suitable for the connected equipment and the environment in which they are installed.

To ensure that all appliances are fused for the corresponding load, taking into account the manufacturer's recommendation and any inrush current.

Design distributed power fully in accordance with BS 7671, taking into consideration, amongst other applicable design criteria, the following in respect of BS 7671:

- The requirements of Chapter 52 in respect of the general design and selection of wiring systems.
- The requirements of Chapter 43 in respect of protection provided against overcurrent.
- The requirements of Chapter 41 in respect of protection against electric shock.

Adopt a grouping factor not exceeding *0.8*, ambient temperature of *30°C*, *XLPE* insulated conductors, and equally sized phase, neutral and CPC conductors.

Configure ring and radial final circuit arrangements in accordance with BS 7671 as detailed in Regulation 433.1 and informed in Appendix 15. Ensure main and radial final circuits are designed to minimise disruption on failure of a circuit or operation of a protective device.

Size circuit components to achieve disconnection times as described in BS 7671.

Provide RCD protection on power circuits to meet the requirements of BS 7671 and of the rating indicated by the distribution board schedules.

Take responsibility for the final cable selection, through undertaking a full selectivity study of the complete electrical system using recognised software programme. Submit full details of all software used and all calculations undertaken. Include full details of the protective device settings of all adjustable ACBs and MCCBs, and all fuse ratings required to ensure maximum selectivity between devices.

Strip-out / demolitions

Ensure that all lamps containing mercury, such as fluorescent lamps, are disposed of in special landfill sites that are supervised by the local authority. Use only sealed lamp crushers or other safe means and ensure adequate ventilation during disposal.

Safely dispose of all equipment containing printed circuit boards (PCBs) in accordance with the relevant regulations and the local authority's requirements.

Do not remove cabling unless both ends of the service are visible and confirmed redundant by a suitably qualified electrical engineer. If in doubt, leave all cabling in place until such confirmation is obtained.

Where electrical accessories are removed from retained circuits, reconnect / rewire the circuit to allow the safe operation of the retained equipment.

Alterations

Carry out alterations to the existing lighting, emergency lighting and small power systems, as detailed upon the layouts, including any necessary cable alterations and relocations.

Where existing lighting and small power circuits are to be modified to suit the new layouts, re-route the existing circuit cabling accordingly. Where this is not practicable, rewire the entire circuit with new cabling. Do not joint cables. Wire new radial lighting circuits and new radial and/or ring main power circuits serving equipment, using new circuit cabling connected to the existing distribution boards.

392 System components and equipment

Retain and relocate existing luminaires and socket outlets as detailed upon the layouts.

Where new luminaires are required:-

Comply with Section Y73 of this specification and the luminaire schedule on the layouts. Ensure they are the most recent generation available.

Provide all lamp drivers with digital (DALI) addressable capability, suitable for dimming and daylight regulation where particularly specified.

Ensure luminaire ballasts comply with BS EN IEC 62384 and the following criteria:

~	efficiency	*90% or better*
~	power factor	*0.9 or better*
~	harmonics	*-compliance with BS EN 61000-3-2*
~	mean time to failure	*50,000 hrs at max ambient temperature, operating 24 hours per day*
~	lamp failure	L80/B10 at 50 000 hrs.
~	over voltage	*provide protection to BS EN 61000-4-5*

Ensure that all LED light sources provided on the project are of the same colour temperature and have a stable colour over the lamp life.

Install recessed luminaires fixed to the suspended ceiling grid or direct to the structure using purpose incorporated fixing positions, together with conduit accessories, suspension rods, side frame brackets, clamps, clips or other equal method.

New lighting controls to comply with Section Y74 of this specification.

Ensure that each and every lighting control device is suitably rated with regard to the circuit protective device and the load being switched taking account of the load type (e.g., inductive loads), and the in-rush current characteristic of the load.

Only install control devices with a minimum in-rush current withstand-capability greater than 125% of the cumulative in-rush current of the connected loads.

Where new emergency lighting is required;

Unless specified otherwise use only luminaires whose emergency output duration under emergency conditions is 3 hours.

Ensure that self-contained luminaires automatically switch over to their secondary supply on failure of the primary unswitched supply.

Ensure that upon return of the unswitched supply the luminaire automatically switches back to the primary supply and recharges the battery.

Except where the design of the lighting control system includes the function to initiate an 'Emergency lighting test mode', prevent the lighting control system from effecting the operation and charging of the emergency lighting system. Do not dim circuits feeding battery chargers.

Install local self-contained 3-hour duration-maintained battery/inverter units to provide a secondary power source to illuminate LED light sources of luminaires at a reduced output in the locations indicated on the layout drawings.

Provide the units complete with self-contained sealed Lithium-ion or Nickel Metal Hydride (NiMH) batteries, inverter and changeover module housed within the body of the luminaire or within a separate proprietary sheet steel ventilated box type enclosure fixed to the rear of the respective luminaire.

Ensure that each luminaire/unit is complete with indicating LED to indicate the correct operation of the emergency lighting system.

Ensure that the luminaires are factory-converted by the emergency lighting/luminaire manufacturer to ensure correct operation and compliance with all other relevant standards.

Ensure that the battery chargers are capable of automatically charging the batteries that have been discharged so that they can perform at least 80% of their specified duration within 12 hours of commencement of charge.

Where new cabling is required;-

Only install internal BASEC-approved cabling in accordance with the following;-

- BS 7211, 6491B LSZH, insulated only, single-core cable, 450/750-volt grade, contained in steel trunking and/or conduit
- BS 6724, XLPE insulated, LSZH bedded, single wire armoured, LSF sheathed cable, 600/1000-volt grade unless otherwise specified. Arrange single-core wire armoured cables in trefoil and provide aluminium wire armour and non-ferrous or insulated gland plates to prevent circulating currents.

Provide copper/LSZH singles in trunking and/or conduit for the final circuits from the distribution boards.

Provide external cabling in accordance with the following:

- BS 5467, XLPE insulated, single wire armoured, pre-sheathed cable, 600/1000-volt grade.

Installation methods and containment to comply with Sections Y60 & Y63.

Where applicable, only install equipment that complies with the Ecodesign Regulations.

400 SYSTEM DESCRIPTION (CONTINUED)

410 Fire detection and alarm system

411 System description

Carry out modifications and extensions including new devices to the existing fire alarm installation, as detailed upon the layouts.

Provide a fully automatic fire detection and alarm system to satisfy the area coverage, and operational and performance criteria as outlined elsewhere in this section. Ensure that the fire alarm system complies with the recommendations of BS 5839-1 for non-domestic premises and BS 5839-6 for domestic premises as applicable to the system category as specified in this specification.

Provide audible alarms and combined audible/visual alarms of the nature and type indicated, to achieve the required sound levels and intelligibility specified, and the remote information criteria, in compliance with all relevant British Standards.

Ensure all control and indicating equipment, standard power supply units and standard repeater units comply with the EMC requirements described in BS EN 54 part 2 and BS EN 54 part 4.

Use a BAFE scheme SP203-1 certificated firm for the design, installation/ installation, and commissioning of the fire detection and alarm system specified herein. Ensure that a BAFE certificated firm issues a signed BAFE SP203-1 Certificate of Compliance in respect of the specified alarm system.

Alterations

Relocate all fire alarm and detection devices as necessary to provide building coverage in accordance with current British Standards and the Layouts. Where required, re-programme / re-identify fire alarm addresses to suit the revised layout and locations.

412 System components and equipment

Provide all system components from a single manufacturer's standard product range. Ensure that all components of the fire detection and alarm system are compatible and connectable to BS EN 54-13, and fully capable of delivering the requirements of this specification.

Do not use any equipment or components identified as end-of-line or otherwise not expected to have manufacturer continuing support and spares availability.

Ensure that all requirements of the chosen manufacturer's equipment are included for in the tender. Provide all ancillary components and items such as separate power supplies for bells, interface units, zone isolators etc. Provide for the manner in which the system is to be wired, which varies from one manufacturer to another. Determine the requirement for additional items by reference to architectural, mechanical and electrical drawings.

Arrange that the fire detection and alarm system is not susceptible to nor causes electromagnetic interference. Design and install the fire detection and alarm system such that it complies with the Electromagnetic Compatibility Regulations.

Optical beam detectors

Provide detectors of the obscuration or scatter light type, with sensitivity adjustment via the system control panel.

Ensure that point detectors comply with BS EN 54-7.

Provide detectors of the infra-red obscuration type, with sensitivity adjustment via the system control panel. Use transmitting and receiving units specifically designed for operation on the detector loops.

Ensure that optical beam smoke detectors comply with BS EN 54-12.

Ensure that access to transmitter and receiver units facilitates maintenance, all as indicated on the drawings.

Allow for interfacing for connection onto the loop with appropriate interface units.

Ensure that each detector is addressable. Provide beam detectors with individual isolation at the panel to facilitate maintenance.

Ensure that transmitter and receiver units are carefully aligned and mounted to establish and maintain maximum beam signal strength.

Locate interface units discreetly, where appropriate.

Short circuit (line) isolating modules

Provide short circuit isolating modules to BS EN 54-17 and install between zone boundaries.

Provide these as proprietary units, capable of isolating the relevant section of the wiring installation either under circuit fault conditions, or whilst alteration/extensions are effected, leaving the remainder of the system unaffected.

Interface units

Provide interface units of the addressable type connected to the local loop circuit and which provide the required inputs and outputs for control or indication functions.

Ensure each input/output way is fully programmable from the control panel and fully monitored for open- and short-circuit conditions.

Remote indicators

Provide remote LED indicators to indicate the operation of automatic detectors that are mounted in locations where they cannot readily be seen (eg within all plant rooms, switchrooms, substations, lift motor rooms, ceiling voids, and ducts). Connect the remote LED indicator units to the respective detector back-plate terminals and install flush or surface to ceiling or wall boxes, as required.

Provide all cabling for the complete system in soft-skinned fire resistant cable rated at 300/500 V to BS 7629-1. Ensure that the soft-skinned cable is of the 'standard' fire resisting type.

Ensure that 'standard' fire resisting cables meet the BS EN 50200 PH 30 classification and the 30 min survival time when tested in accordance with Annex E of BS EN 50200.

Provide all fire detection, alarm and signalling cabling using fire resistant cabling with red outer sheath.

Ensure that all cable sizing is in accordance with the manufacturer's recommendations subject to a minimum size of 1.5 mm^2 for detection / actuation circuits and 2.5 mm^2 for sounder circuits.

Install and terminate all cable in accordance with the manufacturer's recommendations.

Only install BASEC-approved cables.

420 Disabled Refuge Alarms (DRA) Emergency Voice Communications (EVC)

421 System description

Provide each refuge station with a flush-mounted panel equipped with a call button to facilitate two-way communication.

Provide wiring for the disabled refuge call system with *enhanced* fire-resistant cables with *red sheath colour to match the fire alarm system cabling/ white sheath colour with appropriate labelling* and ensure that there is segregation from other LV services.

Arrange for cable size to be determined by the system manufacturer. Lay the cables on cable tray with the fire alarm system cabling.

Alterations

To provide, install, test & commission a new Disabled Refuge outstation as indicated on the Layouts.

422 System components and equipment

Equip all BS 5839-9 Type B outstations with audio frequency induction loops. Mount outstations where background noise is normally below 40 dB(A). Do not mount fire alarm sounders near outstations.

Provide all cabling for the complete system in soft-skinned fire resistant cable rated at 300/500 V to BS 7629-1. Ensure that the soft-skinned cable is of the 'standard' fire resisting type.

Ensure that 'standard' fire resisting cables meet the BS EN 50200 PH 30 classification and the 30 min survival time when tested in accordance with Annex E of BS EN 50200.

Provide all fire detection, alarm and signalling cabling using fire resistant cabling with red outer sheath.

Ensure that all cable sizing is in accordance with the manufacturer's recommendations subject to a minimum size of 1.5 mm^2 for detection / actuation circuits and 2.5 mm^2 for sounder circuits.

Install and terminate all cable in accordance with the manufacturer's recommendations.

430 Security systems

System description

Employ a specialist Security System Installer registered with the National Security Inspectorate as a NSI Gold installer to design, install, test, commission and demonstrate the security systems. Ensure the Security System Installer has the necessary expertise and capacity to provide professional and timely maintenance and emergency repair services of all systems during the design life of the systems.

Access control system

The existing Paxton Net2 systems shall be extended and modified to suit repositioned and new doors as shown on the Layouts. To design, provide, install, commission, and demonstrate an access control system designed for use in an education environment.

To provide a system that allows authorised operators to easily add, suspend, cancel, or change the access control information and authorisations of any person or groups of people.

To provide a system that continues to function normally when mains power and communication links to the central controller are lost.

To provide a system that does not prevent persons from escaping in the event of a fire.

Ensure that the system complies with the requirements of the Equality Act.

Intruder alarm system

To amend the existing intruder alarm and emergency alarm systems to suit the proposed layouts, which will transmit alarm signals when an unauthorised person enters a protected area, when a person activates the emergency alarm, when a fault occurs or when the system is tampered with.

Strip-out / demolitions

Safely isolate, disconnect and remove all distribution and control equipment, field devices, wiring and containment associated with: access control systems and intruder alarm and detection systems. (Field devices include break-glasses, door contacts, PIRs, etc.) where instructed to do so on the Layouts.

Strip out all power and data cabling associated with the security systems.

Do not remove cabling unless both ends of the service are visible and confirmed redundant by a suitably qualified electrical engineer. If in doubt, leave all cabling in place until such confirmation is obtained.

Alterations

To provide, install, modify, test & commission a new/existing security systems as indicated on the Layouts.

To provide dedicated new power supplies for door access controllers.

431 System components and equipment

Provide new intruder alarm equipment and reuse existing removed door access equipment if suitable.

Intruder Alarm Door Monitors

Install concealed magnetic reed switch monitors to detect the opening of doors, windows or other openable building elements.

Install concealed monitors in doors. On gates and garage doors provide weatherproof, rugged, aluminium clad, surface mounted monitors fitted with stainless steel armoured cables. Ensure that the detectors generate an alarm when the door or gate is opened by no more than 50 mm. Ensure that the monitors cannot be defeated by the use of external magnets.

Intruder Alarm Cabling

Comply with specification section Y61.

Access Control Token Readers

Provide close proximity non-contact readers to read proximity cards and fobs.

Ensure that every reader provides visual and audible indication that a token has been read and access granted or denied.

Access Control Controllers

Provide new access controllers, compatible with the existing system, to control all transactions relating to networked access controlled points. Install the controllers in a secure location within easy reach for maintenance.

Ensure that all controllers are fully intelligent and capable of operating in a standalone mode when communication with the central control computer is lost.

Ensure that failure of any individual controller does not compromise communication with, or operation of, any other controller within the system.

Ensure that there is no noticeable delay between the time when access is requested and the release of the relevant lock.

Provide a rechargeable battery for each controller to ensure normal operation of all hardwired access points for at least four hours when mains power is disconnected.

Ensure the batteries are no older than six months from date of manufacture at the time of installation and mark the date of installation on each battery in indelible ink. Install the batteries with the relevant access controller in the same enclosure, or where that is not possible in a separate lockable powder coated steel enclosure adjacent to the controller.

Connect all hardwired access control devices to the access controllers.

Access Control Pushbuttons

Provide flush mounted momentary pushbuttons to temporarily release the locks.

Use round stainless steel pushbuttons with bevelled collars, mounted in stainless steel face plates. Engrave the face plates with the words “PRESS TO EXIT” in clear green letters.

Ensure that all pushbuttons can be upgraded to readers at any time in the future without the need for builders work or changes to containment.

Access Control Break Glass Units

Provide semi-flush mounted, resettable, 3-pole break glass units (BGUs) to allow people to escape through access points in the event of an emergency. Use green-coloured BGUs engraved with the words “EMERGENCY DOOR RELEASE” in clear white letters.

Ensure that both conductors of the cable between the access controller and the lock are disconnected when the BGU is operated, and that the access point unlocks and remains unlocked until the BGU is reset.

Set up the system to generate an alarm signal when a BGU is operated.

Ensure that the BGUs can be reset by means of a reset key without the need to open the unit or replace any element. Provide three reset keys.

Weatherproof BGUs where installed in areas that are located externally or open to the elements.

Access Control Fire Alarm Interfaces

Provide fire alarm interfaces (FAIs) to automatically unlock access controlled points in the event of a fire.

Provide 3-pole, normally-open contacts held in closed position by a healthy signal from the fire alarm system.

Ensure that both conductors of the cable between the access controller and the lock are disconnected when the FAI is operated, and that the access point unlocks and remains unlocked until the fire alarm signal is restored.

Set up the system to generate an alarm signal when a FAI is operated.

Access Control Electromagnetic locks

Provide electromagnetic locks consisting of pull magnets and armature plates to provide effective locking of access controlled points. On double doors where both leaves are electronically locked provide a single unit with two integral electromagnetic locks.

Ensure that the pull strength of each individual lock is to be no less than 5,000 N, except on low security internal doors, where the pull strength of each individual lock may be no less than 2,500 N.

Take responsibility for liaising with the Main Contractor to coordinate the installation of each lock to ensure that the required clear head height of the door opening is maintained.

Provide all brackets, trims and mounting hardware to suit the specific requirements of each door.

Install all locks on the secure side of the door.

Ensure that the lock engages automatically when the door is returned to the closed position.

Access Control Cables

Install all cables between power and data outlets and security equipment.

Install all network cables between data outlets and security equipment. Use Cat 6 unshielded twisted pair (UTP) network cables. All network cables shall be Cat 6 unshielded twisted pair (UTP).

Comply with specification section Y61.

Only install BASEC-approved cables.

440 Containment

441 System description

Relocate existing / provide new and make any necessary cable alterations, as shown on the drawings.

Strip-out / demolitions

Strip out all redundant containment within the strip-out area back to the risers. Ensure that any electrical bonding rings that are required to be removed during the process are replaced afterwards to maintain electrical continuity.

Where the removal of redundant circuits results in any containment or conduit 'dead-legs', remove these in their entirety back to the main containment system.

Alterations

442 System components and equipment

New containment to comply with Y60.

500 SYSTEM DESCRIPTION (CONTINUED)

510 IT / Communications systems

511 System description

Relocate existing / provide data outlets and make any necessary cable / containment alterations, as shown on the drawings.

Clients' nominated IT Specialist to conduct all associated IT works.

Strip-out / demolitions

Manage and coordinate all telecommunications service disconnections.

Take on the responsibility for liaising with the providers, to obtain approval of the proposed disconnections/abandonments and asset protection, before commencing any removal works.

Take all reasonable steps to ensure that the service disconnections and asset protection works are completed and operational prior to commencing the works.

Ensure that communications cabling is not removed unless both ends of the services are visible and confirmed redundant by a suitably qualified electrical engineer. If in doubt, leave all communications cabling in place until such confirmation has been obtained.

Ensure that work around the communications riser is undertaken carefully, to avoid interfering with other departments within the building. Accept liability for any loss of service to other tenants due to cabling damaged during the strip-out.

Alterations

Relocate existing / provide and make any necessary cable / containment alterations, as shown on the drawings.

512 System components and equipment

Ensure all RJ45 outlets conform to the requirement of Category 6 as defined by ANSI/TIA.

Ensure all RJ45 outlets are fitted with spring-loaded sliding shutters to prevent the ingress of dirt and dust.

New cabling to be compatible with the existing application and complaint with the following;

ensure that the performance of the cabling meets the following requirements:

- based on internationally recognised standards for design, performance and component type and quality.
- supports a wide range of current and future data and voice communications techniques with any outlet being able to be used for any service type.
- correctly structured and fully documented.
- has a minimum of a 25-year life, warranted by the manufacturer.

520 Building management systems/controls

521 System description

Contractor to reprogramme / modify existing automatic control systems to suit the new installed equipment.

Strip-out / demolitions

Not applicable.

Alterations

Carry out alterations to the existing building management system / controls systems to suit the revised architect's layouts/drawings.

530 Above ground foul drainage systems

531 System description

Contractor to modify and extend existing VRF condensate drainage pipework within Seacole Building to suit new air conditioning cassette location.

Strip-out / demolitions

Not applicable.

Alterations

Carry out alterations to the existing condensate drainage system to suit the revised architect's layouts/drawings.

Pipework material shall be selected to match existing.

Pumped drainage shall not be permitted without the express permission of the Project Manager.

600 CONTROL REQUIREMENTS

Refer to tender drawings and relevant specification sections.

Control of existing services in other areas of each building to be maintained throughout the works.

700 SCOPE OF WORKS

710 Responsibilities

Refer to main contract preliminaries.

720 Detail coordination

Agree all proposed methods of fixing the system(s) to structure, roof, cladding, chimneys, equipment, etc with the Contract Administrator.

Agree the colours and finishes of all exposed materials of the system(s) with the Contract Administrator.

800 PAINTING AND THERMAL INSULATION

Comply with specification section Y50, and schedule Y50.

900 FIXING TO BUILDING FABRIC

Comply with specification section Y90.

1000 IDENTIFICATION OF MECHANICAL AND ELECTRICAL SERVICES

Comply with specification sections Y54 and Y82.

1100 TESTING AND COMMISSIONING

1110 Compliance

Comply with specification sections Y51 and Y81.

1120 Visual examination

Visually examine the installation, including checking for the following:

- the services are supported adequately
- services are arranged and, where applicable painted / insulated correctly
- handwheels or levers are fitted to valves and dampers with clear indication of open/closed position
- electrical bonding is complete
- installation drawings and line diagrams have been prepared and fitted at the primary meter and elsewhere as appropriate

Fully test and commission all systems remaining in operation following the completion of the works. Rectify any faults and retest accordingly prior to the building being handed over to the Employer.

1200 SCHEDULE OF INSTALLER'S SUBMISSIONS

Submit the following for the Contract Administrator's comment:

- programme of works
- drawing production schedule
- detailed site survey and verification of the extent of services in the relevant areas
- strip-out drawings
- full technical method statements for the strip-out works
- technical submissions for new equipment
- co-ordinated working drawings
- co-ordinated reflected ceiling plans
- co-ordinated installation drawings
- builders work information / details
- approved plumber's certification
- manufacturer's details of isolation valves and any additional pipework ancillaries
- certificate of soundness
- purging certificate

- ~ testing and commissioning certificates
- ~ safety record

Provide technical method statements for the following aspects of the work:

- ~ detailed survey to identify the full extent of systems to be decommissioned and current status of decommissioning
- ~ decommissioning of systems
- ~ removal and disposal of hazardous materials such as treated water, refrigerants and gases, fuel and other chemicals
- ~ removal of debris/materials and equipment from site
- ~ health and safety considerations arising from the proposed works and method of execution
- ~ permit-to-work system
- ~ safety lock-off and tag-off system

Provide samples of all items that may be viewed in or on the building, within the normally occupied space or on the exterior. Submit all samples and ensure comments are received and acted upon prior to confirming orders for supply. Any products not conforming to the approved range of samples will be rejected.

1210 Handover documentation

At Handover, provide a full set of documentation clearly defining the status of each existing system and each remaining system and in particular those items or systems which remain 'live', including but not limited to:

- ~ live water supplies
- ~ live drainage connections
- ~ live gas supplies
- ~ live electrical supplies
- ~ live IT / comms supplies

Where retained services exist within and adjacent to the site boundary, ensure these are accurately recorded on drawings and marked up on site with identifying posts as appropriate, including but not limited to:

- ~ capped off or isolated / redundant gas supplies
- ~ capped off or isolated / redundant water supplies
- ~ capped off or isolated / redundant drainage connections
- ~ isolated or redundant electrical supplies
- ~ isolated or redundant IT / comms supplies

At Handover, provide a full set of the following test and commissioning documentation, including but not limited to:-

- ~ NICEIC Minor Works Electrical Certificates
- ~ Emergency Lighting Certificates
- ~ Fire Alarm Certificates

- ~ Intruder Alarm Certificates
- ~ Door Access Certificates
- ~ Disabled Refuge Certificate
- ~ Ventilation Commissioning Certificate
- ~ Air conditioning / F-Gas commissioning certificate

1220 Record drawings

Submit record drawings for all new and altered services, including all new items of equipment and systems installed under the contract.

Identify the extent of any redundant services left concealed or buried following the works. Define the location of such systems and their respective means of safe isolation, and include a system-by-system description.

Modify existing record drawings to reflect those existing items of equipment and systems that are impacted by these alterations.

1230 Operating and maintenance instruction manuals

Submit operating and maintenance instructions manuals for the new items of equipment and systems installed under the contract.

Modify existing operating and maintenance instructions manuals to reflect those existing items of equipment and systems that are impacted by these alterations.

APPENDIX A REFERENCE DOCUMENTS

This specification is written based on legislation, standards and guidance in force in the UK generally, and within England by default. For projects in Scotland, Wales, Northern Ireland, the Channel Islands and the Isle of Man, give appropriate consideration to any locally applicable legislation, standards and guidance that deviates from or is additional to those in force within England. Similarly for projects outside the UK comply with the corresponding national legislation, standards and guidance.

Comply fully with the edition (including amendments, replacements and associated normative references) of each of the following, current at the time of tender:

Environmental Protection Act

Health and Safety at Work etc Act

Pollution Prevention and Control Act

The Building Regulations

The Construction (Design and Management) Regulations

The Construction (Health, Safety and Welfare) Regulations

The Construction Products Regulations

The Contaminated Land Regulations

The Control of Asbestos Regulations

The Control of Substances Hazardous to Health Regulations

The Electrical Equipment (Safety) Regulations

The Electricity Act (As amended by the Utilities Act)

The Electricity at Work Regulations

The Electricity Safety, Quality and Continuity (Amendment) Regulations

The Electromagnetic Compatibility Regulations

The Equality Act

The Fluorinated Greenhouse Gases Regulations

The Gas Safety (Installation and Use) Regulations

The Hazardous Waste Regulations

The Ionising Radiations Regulations

The Management of Health and Safety at Work Regulations

The Manual Handling Operations Regulations

The Meters (Certification) Regulations

The Notification of Cooling Towers and Evaporative Condensers Regulations

The Offices Shops and Railway Premises Act

The Ozone-Depleting Substances Regulations

The Personal Protective Equipment Regulations

The Pressure Systems Safety Regulations

The Provision and Use of Work Equipment Regulations

The Regulatory Reform (Fire Safety) Order

The Site Waste Management Plans Regulations

The Supply of Machinery (Safety) Regulations

The Waste Electrical and Electronic Equipment (WEEE) Regulations

The Water Supply (Water Fittings) Regulations

The Water Supply (Water Quality) Regulations

BS 67	Specification for ceiling roses
BS 416-1	Discharge and ventilating pipes and fittings, sand-cast or spun in cast iron
BS 1363	13 A fused plugs, socket-outlets, adaptors and connection units
BS 1710	Specification for identification of pipelines and services
BS 3858	Specification for binding and identification sleeves for use on electric cables and wires
BS 4363	Specification for distribution assemblies for reduced low voltage electricity supplies for construction and building sites
BS 4514	Unplasticized PVC soil and ventilating pipes of 82.4 mm minimum mean outside diameter, and fittings and accessories of 82.4 mm and of other sizes. Specification
BS 4856-1	Methods for testing and rating fan coil units, unit heaters and unit coolers. Thermal and volumetric performance for heating duties; without additional ducting
BS 4856-3	Methods for testing and rating fan coil units, unit heaters and unit coolers. Thermal and volumetric performance for heating and cooling duties; with additional ducting
BS 4856-4	Methods for testing and rating fan coil units, unit heaters and unit coolers. Acoustic performance; without additional ducting
BS 4856-5	Methods for testing and rating fan coil units, unit heaters and unit coolers. Acoustic performance; with additional ducting
BS 5228	Code of practice for noise and vibration control on construction and open sites
BS 5254	Specification for polypropylene waste pipe and fittings (external diameter 34.6 mm, 41.0 mm and 54.1 mm)
BS 5266-1	Emergency lighting Part 1: Code of practice for the emergency lighting of premises
BS 5391-1	Acrylonitrile-butadiene-styrene (ABS) pressure pipe. Specification
BS 5392-1	Acrylonitrile-butadiene-styrene (ABS) fittings for use with ABS pressure pipe. Specification
BS 5422	Method for specifying thermal insulating materials for pipes, tanks, vessels, ductwork and equipment operating within the temperature range -40°C to +700°C
BS 5733	General requirements for electrical accessories. Specification
BS 5839-1	Fire detection and fire alarm systems for buildings. Code of practice for design, installation, commissioning and maintenance of systems in non-domestic premises
BS 5839-6	Fire detection and fire alarm systems for buildings. Code of practice for design, installation, commissioning and maintenance of systems in domestic premises

BS 5970	Thermal insulation of pipework, ductwork, associated equipment and other industrial installations in the temperature range of -100ºC to +870ºC. Code of practice
BS 6187	Code of practice for full and partial demolition
BS 6387	Test method for resistance to fire of cables required to maintain circuit integrity under fire conditions
BS 6880-1	Code of practice for low temperature hot water heating systems of output greater than 45 kW. Fundamental and design considerations
BS 6880-2	Code of practice for low temperature hot water heating systems of output greater than 45 kW. Selection of equipment
BS 6880-3	Code of practice for low temperature hot water heating systems of output greater than 45 kW. Installation, commissioning and testing
BS 7211	Electric cables. Thermosetting insulated, non-armoured cables for voltages up to and including 450/750 V, for electric power, lighting and internal wiring, and having low emission of smoke and corrosive gases when affected by fire
BS 7375	Distribution of electricity on construction and demolition sites. Code of practice
BS 7430	Code of practice for the protective earthing of electrical installations
BS 7592	Sampling for Legionella bacteria in water systems. Code of practice
BS 7593	Code of practice for the preparation, commissioning and maintenance of domestic central heating and cooling water systems
BS 7629-1	Electric cables. Specification for 300/500 V fire resistant, screened, fixed installation cables having low emission of smoke and corrosive gases when affected by fire. Multicore cables
BS 7671	Requirements for electrical installations. IET Wiring Regulations
BS 8000-0	Workmanship on construction sites. Part 0: Introduction and general principles
BS 8000-13	Workmanship on building sites. Part 13: Code of practice for above ground drainage and sanitary appliances
BS 8000-15	Workmanship on building sites. Part 15: Code of practice for hot and cold water services (domestic scale)
BS 8519	Selection and installation of fire resistant power and control cable systems for life safety and fire-fighting applications. Code of practice
BS 8551	Provision and management of temporary water supplies and distribution networks (not including provisions for statutory emergencies). Code of practice
BS 8558	Guide to the design, installation, testing and maintenance of services supplying water for domestic use within buildings and their curtilages. Complementary guidance to BS EN 806
BS 8580	Water quality. Risk assessments for Legionella control. Code of practice
BS 9251	Fire sprinkler systems for domestic and residential occupancies. Code of practice
BS 9252	Components for residential sprinkler systems. Specification and test methods for residential sprinklers

C20 ALTERATIONS AND DEMOLITIONS

BS 9991	Fire safety in the design, management and use of residential buildings. Code of practice
BS 9999	Fire safety in the design, management and use of buildings. Code of practice
BS 12735-1	Copper and copper alloys. Seamless, round tubes for air conditioning and refrigeration. Tubes for piping systems
BS EN 378-1	Refrigerating systems and heat pumps. Safety and environmental requirements. Basic requirements, definitions, classifications and selection criteria
BS EN 378-2	Refrigerating systems and heat pumps. Safety and environmental requirements. Design, construction, testing, marking and documentation
BS EN 378-3	Refrigerating systems and heat pumps. Safety and environmental requirements. Installation, site and personnel protection
BS EN 378-4	Refrigerating systems and heat pumps. Safety and environmental requirements. Operation, maintenance, repair and recovery
BS EN 442-1	Radiators and convectors. Technical specifications and requirements
BS EN 442-2	Specification for radiators and convectors. Test methods and rating
BS EN 442-3	Specification for radiators and convectors. Evaluation of conformity
BS EN 681	Elastomeric seals. Material requirements for pipe joint seals used in water and drainage applications
BS EN 806-1	Specifications for installations inside buildings conveying water for human consumption. General
BS EN 806-2	Specifications for installations inside buildings conveying water for human consumption. Design
BS EN 806-3	Specifications for installations inside buildings conveying water for human consumption. Pipe sizing. Simplified method
BS EN 806-4	Specifications for installations inside buildings conveying water for human consumption. Installation
BS EN 806-5	Specifications for installations inside buildings conveying water for human consumption. Operation and maintenance
BS EN 1057	Copper and copper alloys. Seamless, round copper tubes for water and gas in sanitary and heating applications
BS EN 1074-1	Valves for water supply. Fitness for purpose requirements and appropriate verification tests. General requirements
BS EN 1124	Pipes and fittings of longitudinally welded stainless steel pipes with spigot and socket for waste water systems
BS EN 1254-1	Copper and copper alloys. Plumbing fittings. Fittings with ends for capillary soldering or capillary brazing to copper tubes
BS EN 1254-5	Copper and copper alloys. Plumbing fittings. Capillary fittings with short ends for brazing to copper tubes
BS EN 1329-1	Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure. Unplasticized poly(vinyl chloride) (PVC-U). Specifications for pipes, fittings and the systems
BS EN 1567	Building valves. Water pressure reducing valves and combination water reducing valves. Requirements and tests

BS EN 1717	Protection against pollution of potable water in water installations and general requirements of devices to prevent pollution by backflow
BS EN 12056-1	Gravity drainage systems inside buildings. General and performance requirements
BS EN 12056-2	Gravity drainage systems inside buildings. Sanitary pipework, layout and calculation
BS EN 12056-5	Gravity drainage systems inside buildings. Installation and testing, instructions for operation, maintenance and use
BS EN 12201-1	Plastics piping systems for water supply, and for drainage and sewerage under pressure. Polyethylene (PE). General
BS EN 12201-2	Plastics piping systems for water supply, and for drainage and sewerage under pressure. Polyethylene (PE). Pipes
BS EN 12201-3	Plastics piping systems for water supply, and for drainage and sewerage under pressure. Polyethylene (PE). Fittings
BS EN 12239	Ventilation for buildings. Air terminal devices. Aerodynamic testing and rating for displacement flow applications.
BS EN 12259-14	Fixed firefighting systems. Components for sprinkler and water spray systems. Sprinklers for residential applications
BS EN 12380	Air admittance valves for drainage systems. Requirements, test methods and evaluation of conformity
BS EN 12464-1	Light and lighting. Lighting of work places. Indoor work places
BS EN 12735	Copper and copper alloys. Seamless, round tubes for air conditioning and refrigeration. Tubes for equipment
BS EN 12828	Heating systems in buildings. Design for water-based heating systems
BS EN 12845	Fixed firefighting systems. Automatic sprinkler systems. Design, installation and maintenance
BS EN 12897	Water supply. Specification for indirectly heated unvented (closed) storage water heaters
BS EN 13030	Ventilation for buildings. Terminals. Performance testing of louvres subjected to simulated rain.
BS EN 13032-1	Light and lighting. Measurement and presentation of photometric data of lamps and luminaires. Measurement and file format
BS EN 13032-2	Light and lighting. Measurement and presentation of photometric data of lamps and luminaires. Presentation of data for indoor and outdoor work places
BS EN 13032-3	Light and lighting. Measurement and presentation of photometric data of lamps and luminaires. Presentation of data for emergency lighting of work places
BS EN 13032-4	Light and lighting. Measurement and presentation of photometric data of lamps and luminaires. LED lamps, modules and luminaires
BS EN 13076	Devices to prevent pollution by backflow of potable water. Unrestricted air gap. Family A. Type A
BS EN 13077	Devices to prevent pollution by backflow of potable water. Air gap with non-circular overflow (unrestricted). Family A. Type B

BS EN 13141	Ventilation for buildings. Performance testing of components / products for residential ventilation
BS EN 13501-1	Fire classification of construction products and building elements. Classification using data from reaction to fire tests
BS EN 13501-3	Fire classification of construction products and building elements. Classification using data from fire resistance tests on products and elements used in building service installations: fire resisting ducts and fire dampers.
BS EN 13501-6	Fire classification of construction products and building elements. Classification using data from reaction to fire tests on electric cables
BS EN 13959	Anti-pollution check valves. DN 6 to DN 250 inclusive. Family E, type A, B, C and D
BS EN 14324	Brazing. Guidance on the application of brazed joints
BS EN 14336	Heating systems in buildings. Installation and commissioning of water based heating systems
BS EN 14451	Devices to prevent pollution by backflow of potable water. In-line anti-vacuum valves DN10 to DN50 inclusive. Family D, type A
BS EN 14453	Devices to prevent pollution by backflow of potable water. Pipe interrupter with permanent atmospheric vent DN 10 to DN 20. Family D, type C
BS EN 14511	Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors for space heating and cooling
BS EN 14623	Devices to prevent pollution by backflow of potable water. Air gaps with minimum circular overflow (verified by test or measurement). Family A, type G
BS EN 15450	Heating systems in buildings. Design of heat pump heating systems
BS EN 15650	Ventilation for buildings. Fire dampers
BS EN 16084	Refrigerating systems and heat pumps. Qualification of tightness of components and joints
BS EN 16430-1	Fan-assisted radiators, convectors and trench convectors. Technical specifications and requirements
BS EN 16430-2	Fan assisted radiators, convectors and trench convectors. Test method and rating for thermal output
BS EN 50107-1	Signs and luminous-discharge-tube installations operating from a no-load rated output voltage exceeding 1 kV but not exceeding 10 kV. General requirements
BS EN 50107-2	Signs and luminous-discharge-tube installations operating from a no-load rated output voltage exceeding 1 kV but not exceeding 10 kV. Requirements for earth-leakage and open-circuit protective devices
BS EN 50107-3	Product standard covering luminous signs with discharge lamps and/or LED (light emitting diodes) and/or EL (electroluminescent) light sources with a nominal voltage not exceeding 1000 V, with the exclusion of general lighting, traffic- or emergency related purpose.
B BS EN 50131-1	Alarm systems. Intrusion and hold-up systems. System requirements
BS EN 50131-3	Alarm systems. Intrusion and hold-up systems. Control and indicating equipment
BS EN 50131-6	Alarm systems. Intrusion and hold-up systems. Power supplies

BS EN 50174-1	Information technology. Cabling installation. Installation specification and quality assurance
BS EN 50174-2	Information technology. Cabling installation. Installation planning and practices inside buildings
BS EN 50174-3	Information technology. Cabling installation. Installation planning and practices outside buildings
BS EN 50525-1	Electric cables – Low voltage energy cables of rated voltages up to and including 450/470 V (U0/U). Part 1: General requirements
BS EN 50525-2-11	Electric cables – Low voltage energy cables of rated voltages up to and including 450/470 V (U_0/U). Part 2-11: Cables for general applications – Flexible cables with thermosplastic PVC insulation
BS EN 50525-2-12	Electric cables – Low voltage energy cables of rated voltages up to and including 450/470 V (U_0/U). Part 2-12: Cables for general applications – Cables with thermosplastic PVC insulation for extensible leads
BS EN 50525-2-21	Electric cables – Low voltage energy cables of rated voltages up to and including 450/470 V (U_0/U). Part 2-21: Cables for general applications – Flexible cables with crosslinked elastomeric insulation
BS EN 50525-2-31	Electric cables – Low voltage energy cables of rated voltages up to and including 450/470 V (U_0/U). Part 2-31: Cables for general applications – Single core non-sheathed cables with thermosplastic PVC insulation
BS EN 50525-2-41	Electric cables – Low voltage energy cables of rated voltages up to and including 450/470 V (U_0/U). Part 2-41: Cables for general applications – Single core cables with crosslinked silicone rubber insulation
BS EN 50525-2-42	Electric cables – Low voltage energy cables of rated voltages up to and including 450/470 V (U_0/U). Part 2-42: Cables for general applications – Single core non-sheathed cables with crosslinked EVA insulation
BS EN 50525-2-71	Electric cables – Low voltage energy cables of rated voltages up to and including 450/470 V (U_0/U). Part 2-71: Cables for general applications – Flat tinsel cables (cords) with thermoplastic PVC insulation
BS EN 50525-3-41	Electric cables – Low voltage energy cables of rated voltages up to and including 450/470 V (U_0/U). Part 3-41: Cables with special fire performance – Single core non-sheathed cables with halogen-free crosslinked insulation, and low emission of smoke
BS EN 60061-1	Lamp caps and holders together with gauges for the control of interchangeability and safety. Lamp caps
BS EN 60061-2	Lamp caps and holders together with gauges for the control of interchangeability and safety. Lampholders
BS EN 60061-3	Lamp caps and holders together with gauges for the control of interchangeability and safety. Gauges
BS EN 60061-4	Lamp caps and holders together with gauges for the control of interchangeability and safety. Guidelines and general information
BS EN 60238	Edison screw lamp holders
BS EN 60335-2-40	Household and similar electrical appliances. Safety. Particular requirements for electrical heat pumps, air-conditioners and dehumidifiers
BS EN 60357	Tungsten halogen lamps (non-vehicle). Performance specifications
BS EN 60529	Degrees of protection provided by enclosures (IP code)

BS EN 60570	Electrical supply track systems for luminaires
BS EN 60598-2-2	Luminaires. Part 2-2: Particular requirements – Recessed luminaires
BS EN 60598-2-4	Luminaires. Part 2-4: Particular requirements – Portable general purpose luminaires
BS EN 60598-2-5	Luminaires. Part 2-5: Particular requirements – Portable general purpose luminaires
BS EN 60598-2-6	Luminaires. Part 2-6: Particular requirements – Luminaires with built-in transformers or converters for filament lamps
BS EN 60598-2-13	Luminaires. Part 2-13: Particular requirements – Ground recessed luminaires
BS EN 60598-2-14	Luminaires. Part 2-14: Particular requirements – Luminaires for cold cathode tubular discharge lamps (neon tubes) and similar equipment
BS EN 60598-2-20	Luminaires. Part 2-20: Particular requirements – Lighting chains
BS EN 60598-2-22	Luminaires. Part 2-22: Particular requirements – Luminaires for emergency lighting
BS EN 60598-2-24	Luminaires. Part 2-24: Particular requirements – Luminaires with limited surface temperatures
BS EN 60598-2-25	Luminaires. Part 2-25: Particular requirements – Luminaires for use in clinical areas of hospitals and health care buildings
BS EN 60838-1	Miscellaneous lamp holders. General requirements and tests
BS EN 60838-2-1	Miscellaneous lamp holders. Particular requirements. Lamp holders S14
BS EN 60838-2-2	Miscellaneous lamp holders. Particular requirements. Connectors for LED-modules
BS EN 60838-2-3	Miscellaneous lamp holders. Particular requirements. Lamp holders for double-capped linear LED lamps
BS EN 60839-11-1	Alarm and electronic security systems. Electronic access control systems. System and components requirements
BS EN 60839-11-2	Alarm and electronic security systems. Electronic access control systems. Application guidelines
BS EN 60927	Auxiliaries for lamps. Starting devices (other than glow starters). Performance requirements
BS EN 60947-2	Low-voltage switchgear and controlgear. Part 2: Circuit-breakers (IEC 60947-2:2016)
BS EN 60947-4-2	Low-voltage switchgear and controlgear. Part 4-2: Contactors and motor-starters – AC semiconductor motor controllers and starters
BS EN 60947-4-3	Low-voltage switchgear and controlgear. Part 4-3: Contactors and motor-starters – AC semiconductor controllers and contactors for non-motor loads
BS EN 60947-6-1	Low-voltage switchgear and controlgear. Part 6-1: Multiple function equipment – Transfer switching equipment
BS EN 60947-7-3	Low-voltage switchgear and controlgear. Part 7-3: Ancillary equipment – Safety requirements for fuse terminal blocks
BS EN 60947-8	Low-voltage switchgear and controlgear. Part 8: Control units for built-in thermal protection (PTC) for rotating electrical machines

BS EN 60968	Self-ballasted lamps for general lighting services. Safety requirements
BS EN 60969	Self-ballasted lamps for general lighting services. Performance requirements
BS EN 61000-3-2	Electromagnetic compatibility (EMC) Limits. Limits for harmonic current emissions (equipment input current up to and including 16 A per phase)
BS EN 61000-4-5	Electromagnetic compatibility (EMC): Testing and measurement techniques – Surge immunity test
BS EN 61000-6-1	Electromagnetic compatibility (EMC). Generic standards. Immunity for residential, commercial and light-industrial environments
BS EN 61000-6-2	Electromagnetic compatibility (EMC). Generic standards. Immunity for industrial environments
BS EN 61047	D.C. or A.C. supplied electronic step-down convertors for filament lamps. Performance requirements
BS EN 61111	Live working. Electrical insulation matting
BS EN 61184	Bayonet lampholders
BS EN 61347-1	Lamp controlgear. Part 1: General and safety requirements
BS EN 61347-2-1	Lamp controlgear. Part 2-1: Particular requirements for starting devices (other than glow starters)
BS EN 61347-2-2	Lamp controlgear. Part 2-2: Particular requirements for d.c. or a.c. supplied electronic step-down convertors for filament lamps
BS EN 61347-2-3	Lamp controlgear. Part 2-3: Particular requirements for a.c. and/or d.c. supplied electronic control gear for fluorescent lamps
BS EN 61347-2-7	Lamp controlgear. Part 2-7: Particular requirements for battery supplied electronic controlgear for emergency lighting (self-contained)
BS EN 61347-2-8	Lamp controlgear. Part 2-8: Particular requirements for ballasts for fluorescent lamps
BS EN 61347-2-9	Lamp controlgear. Part 2-9: Particular requirements for electromagnetic controlgear for discharge lamps (excluding fluorescent lamps)
BS EN 61347-2-10	Lamp controlgear. Part 2-10: Particular requirements for electronic invertors and convertors for high-frequency operation of cold tubular discharge lamps (neon tubes)
BS EN 61347-2-11	Lamp controlgear. Part 2-11: Particular requirements for miscellaneous electronic circuits used with luminaires
BS EN 61347-2-12	Lamp controlgear. Part 2-12: Particular requirements for d.c. or a.c. supplied electronic ballasts for discharge lamps (excluding fluorescent lamps)
BS EN 61386	Conduit systems for cable management
BS EN 61439-1	Low-voltage switchgear and control assemblies. General rules and design verifications
BS EN 61439-2	Low-voltage switchgear and control assemblies. Power switchgear and control gear assemblies
BS EN 61439-3	Low-voltage switchgear and control assemblies. Distribution boards intended to be operated by ordinary persons (DBO)
BS EN 61439-6	Low-voltage switchgear and control assemblies. Busbar trunking systems (busways)
BS EN 61535	Installation couplers intended for permanent connection in fixed installations

BS EN 61547	Equipment for general lighting purposes. EMC immunity requirements
BS EN 61558-2-1	Safety of power transformers, power supplies, reactors and similar products. Particular requirements and tests for separating transformers and power supplies incorporating separating transformers for general applications
BS EN 62031	LED modules for general lighting. Safety specifications
BS EN 62208	Empty enclosures for low-voltage switchgear and control gear assemblies. General requirements
BS EN 62262	Degrees of protection provided by enclosures for electrical equipment against external mechanical impacts (IK code)
BS EN 62305-4	Protection against lightning. Electrical and electronic systems within structures
BS EN 62384	DC or AC supplied electronic control gear for LED modules. Performance requirements
BS EN 62471	Photo biological safety of lamps and lamp systems
BS EN 62504	General lighting. Light emitting diode (LED) products and related equipment. Terms and definitions.
BS EN 62560	Self-ballasted LED-lamps for general lighting services by voltage > 50V. Safety specifications
BS EN 62612	Self-ballasted LED lamps for general lighting services with supply voltages > 50V. Performance requirements
BS EN 62676-1-1	Video surveillance systems for use in security applications. System requirements. General
BS EN 62676-3	Video surveillance systems for use in security applications. Analog and digital video interfaces
BS EN 62676-4	Video surveillance systems for use in security applications. Application guidelines
BS EN 62707-1	LED-binning. General requirements and white colour grid
BS EN 62717	LED modules for general lighting. Performance requirements.
BS EN 62722-2-1	Luminaire performance. Particular requirements for LED luminaires
BS EN 62776	Double-capped LED lamps designed to retrofit linear fluorescent lamps. Safety specifications.
BS EN 62931	GX16t-5 capped tubular LED lamp. Safety specifications
BS EN IEC 62442-3	Energy performance of lamp controlgear. Controlgear for tungsten-halogen lamps and LED light sources. Method of measurement to determine the efficiency of controlgear
BS EN ISO 1182	Reaction to fire tests for products. Non combustibility test
BS EN ISO 1452-2	Plastics piping systems for water supply and for buried and above-ground drainage and sewerage under pressure. Unplasticized poly(vinyl chloride) (PVC U). Pipes
BS EN ISO 1452-3	Plastics piping systems for water supply and for buried and above-ground drainage and sewerage under pressure. Unplasticized poly(vinyl chloride) (PVC-U).Fittings

BS EN ISO 3382-1	Acoustics. Measurement of room acoustic parameters. Performance spaces
BS EN ISO 3382-3	Acoustics. Measurement of room acoustic parameters. Open plan offices
BS EN ISO 3740	Acoustics. Determination of sound power levels of noise sources. Guidelines for the use of basic standards
BS EN ISO 5136	Acoustics. Determination of sound power radiated into a duct by fans and other air-moving devices. In-duct method
BS EN ISO 6509	Corrosion of metals and alloys. Determination of dezincification resistance of brass
BS EN ISO 7010	Graphical symbols. Safety colours and safety signs. Registered safety signs.
BS EN ISO 9001	Quality management systems. Requirements
BS EN ISO 16890-1	Air filters for general ventilation. Technical specifications, requirements and classification system based upon particulate matter efficiency (ePM)
BS EN ISO 17672	Brazing. Filler metals
BS EN ISO/IEC 27002	Information technology. Security techniques. Code of practice for information security controls
BS ISO 10294-1	Fire resistance tests. Fire dampers for air distribution systems. Test method
BS ISO/IEC 27001	Information technology. Security techniques. Information security management systems. Requirements
DD CLC/TS 50131-7	Alarm systems. Intrusion and hold-up systems. Application guidelines
Open Network Video Interface Forum (ONVIF) specifications and protocols	
ISO 11801-6	Information technology. Generic cabling for customer premises. Distributed building services
AFSP	Fire and smoke resisting dampers (Grey book)
ASFP	Fire stopping and penetration seals for the construction industry (Red book)
ASTM D1784	Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds
ASTM F438	Standard Specification for Socket-Type Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 40
ASTM F439	Standard Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80
BBA	British Board of Agrément Certificate, as appropriate.
BESA DW/143	Guide to good practice. Ductwork air leakage testing
BESA DW/144	Specification for sheet metal ductwork
BESA DW/145	Guide to good practice for the installation of fire and smoke dampers
BESA TR 19	Guide to good practice. Internal cleanliness of ventilation systems
BESA TR/20	Installation and testing of pipework systems
BSI BES 6001	Responsible sourcing of construction products
BSRIA BG 29/2021	Pre-commission cleaning of pipework systems
BSRIA BG 46/2015	Domestic ventilation systems
BSRIA BG 49/2015	Commissioning air systems
BSRIA BG 50/2013	Water treatment for closed heating and cooling systems

BSRIA BG 57/2015	Legionnaires' disease. Risk assessment
BSRIA BG 58/2015	Legionnaires' disease. Operation and maintenance logbook
BSRIA TN 10/97	VRF based air conditioning systems - performance, installation and operation notes
BSRIA TN 12/2000	Location of fresh air intakes
CIBSE AM 10	Natural ventilation in non-domestic buildings
CIBSE AM 14	Non-domestic hot water heating systems
CIBSE	Design Guides
CIBSE	Code for Lighting
CIBSE	SLL Lighting Guides
CIBSE	Technical Memoranda
CIBSE	Commissioning Codes
CIPHE	Plumbing engineering services design guide
DCSF BB 100	Design for fire safety in schools
ESFA BB 101	Guidelines on ventilation, thermal comfort and indoor air quality in schools
HM Government	Approved Documents to the Building Regulations
HSE ACoP L8	Legionaires' disease – The control of Legionella bacteria in water systems
HSE HSG274	Part 2: Legionnaires' disease – The control of legionella bacteria in hot and cold water systems
ICEL 1001	Scheme of product and authenticated photometric data registration for emergency lighting luminaires and conversion modules
IoR	Code of practice for the minimisation of refrigerant emissions from refrigerating systems
IoR	Safety code of refrigerating systems utilising A1 refrigerants
IoR	Safety code of refrigerating systems utilising A2 & A3 refrigerants
LPC Rules for Automatic Sprinkler Installations and all other documents incorporated or referred to therein ("the LPC Rules"), including:	
LPCB Technical Bulletins (TBs)	
LPCB Loss Prevention Standards (LPSs)	
RISC Authority Recommendations (RC) documents	
Mandatory Fire Suppression for Wales – A Technical Guide, Approved Document B Volumes 1 and 2	
REHVA, Guidebook 1	Displacement ventilation in non-industrial premises
WRAS	Water Fittings and Materials Directory
WRAS	Water Regulations Guide
Water Industry	Approved Installation Method (AIM) 08 01 Type BA Device – Verifiable backflow preventer with Reduced Pressure Zone (RPZ Valve)

END OF SECTION C20

U Ventilation/air conditioning systems.

U10 General supply and extract ventilation systems

HOARE LEA

WAKEFIELD COLLEGE SUMMER PROJECTS 2023

RIBA STAGE 3 MEP PERFORMANCE SPECIFICATION

U10 GENERAL SUPPLY AND EXTRACT VENTILATION

Audit sheet

Rev.	Description	Prepared by	Reviewed by	Authorised by	Date
T1	Tender issue	BB	NH	SM	19.04.2022
T2	Tender update	BB	GS	SM	17.05.2023

U10 GENERAL SUPPLY AND EXTRACT VENTILATION

CONTENTS

100 PERFORMANCE OBJECTIVES
200 DESIGN PARAMETERS
300 SYSTEM DESCRIPTION
400 CONTROL REQUIREMENTS
- 410 Demand control
- 420 Fan speed control

500 SCOPE OF WORKS
600 SYSTEM COMPONENTS
- 610 Air ductlines
  - 611 General
  - 612 Classification
  - 613 Zinc-coated steel ductwork
  - 614 Flexible ducting and flexible joints
- 620 Air ductline ancillaries
  - 621 General
  - 622 Access openings
  - 623 Volume control dampers
  - 624 Fire and fire / smoke dampers
  - 625 Ductwork penetrations through non-fire-rated walls, floors and partitions
  - 626 Vibration isolation mountings
- 630 Grilles and diffusers

700 EQUIPMENT
- 710 MVHR units
- 720 Toilet extract fans
- 730 Silencers and acoustic treatment

800 PAINTING AND THERMAL INSULATION
900 HANGERS AND SUPPORTS
1000 FIXING TO BUILDING ‘FABRIC’
1100 IDENTIFICATION OF MECHANICAL SERVICES
1200 TESTING AND COMMISSIONING
- 1210 General
- 1220 Air leakage testing

U10 GENERAL SUPPLY AND EXTRACT VENTILATION

100 PERFORMANCE OBJECTIVES

To design, coordinate, install, test and commission reliable mechanical ventilation systems that supplies filtered outside air to and extracts vitiated air from the Radcliffe Building third floor.

To provide CO_2 control to classroom ventilation systems.

To mechanically ventilate the toilet areas and cleaners' rooms/stores of Radcliffe Building third floor, automatically during operating hours to ensure a fresh and odour-free environment.

Take in outside air, and discharge vitiated air direct to atmosphere, on the external façade, through existing louvres.

To extend existing mechanical supply and extract ventilation systems serving the Castleford Campus second and third floor areas, without any reduction in their performance nor interruption to their operation throughout the construction contract.

200 DESIGN PARAMETERS

This specification is written based on legislation, standards and guidance in force in the UK generally, and within England by default. For projects in Scotland, Wales, Northern Ireland, the Channel Islands and the Isle of Man, give appropriate consideration to any locally applicable legislation, standards and guidance that deviates from or is additional to those in force within England. Similarly for projects outside the UK comply with the corresponding national legislation, standards and guidance.

Comply fully with the edition (including amendments, replacements and associated normative references) of each of the following, current at the time of tender:

The Building Regulations, Part F

HM Government	The Building Regulations, Approved Document F: Ventilation
The Construction (Design and Management) Regulations	
The Health and Safety at Work etc Act	
The Control of Substances Hazardous to Health Regulations	
The Workplace (Health, Safety and Welfare) Regulations	
BS 5925	Code of practice for ventilation principles and designing for natural ventilation
BS 9999	Fire safety in the design, management and use of buildings. Code of practice
BS EN 1366-1	Fire resistance tests for service installations. Ventilation ducts
BS EN 1366-2	Fire resistance tests for services. Fire dampers
BS EN 12239	Ventilation for buildings. Air terminal devices. Aerodynamic testing and rating for displacement flow applications.
BS EN 13141	Ventilation for buildings. Performance testing of components / products for residential ventilation
BS EN ISO 7730	Ergonomics of the thermal environment. Analytical determination and interpretation of thermal comfort using calculation of the PMV and PPD indices and local thermal comfort criteria
BESA DW/143	Guide to good practice. Ductwork air leakage testing
BESA DW/144	Specification for sheet metal ductwork
BESA TR 19	Guide to good practice. Internal cleanliness of ventilation systems
BRE GPG 257	Energy-efficient mechanical ventilation systems
BSRIA TN 12/2000	Location of fresh air intakes

BSRIA TN 12/94.1	Carbon dioxide-controlled mechanical ventilation systems
BSRIA BG 49/2015	Commissioning air systems
BSRIA BG 65/2016	Floor plenum airtightness. Guidance and testing methodology
REHVA, Guidebook 1	Displacement ventilation in non-industrial premises
CIBSE Guide A	Environmental design
CIBSE Guide B1	Heating
CIBSE Guide B2	Ventilation and ductwork
CIBSE Guide B3	Air conditioning and refrigeration
CIBSE Guide B4	Noise and vibration control for building services systems
CIBSE Guide C	Reference data
CIBSE TM 21	Minimising pollution at air intakes
CIBSE AM 10	Natural ventilation in non-domestic buildings
CIBSE AM 13	Mixed mode ventilation systems
DCSF BB 100	Design for fire safety in schools
ESFA BB 101	Guidelines on ventilation, thermal comfort and indoor air quality in schools
HTM 03-01	Heating and ventilation systems. Specialised ventilation for healthcare premises
HTM 05-02	Firecode. Guidance in support of functional provisions (fire safety in the design of healthcare premises)
BB101	Ventilation, thermal comfort and indoor air quality 2018
BB93	Acoustic design of schools - performance standards

The system achieves the following criteria in the locations listed:

Room / Area	Ventilation Rate
Classrooms / Workshops / Labs	8 l/s/person
Offices	12l/s/person
Toilets / Cleaners Store	10 air changes/hour

300 SYSTEM DESCRIPTION

New mechanical ventilation heat recovery (MVHR) units shall be installed to Radcliffe Building third floor. MVHR units shall be located in ceiling voids throughout and connected to the existing louvre bands within the glazing installations.

Classroom MVHR units shall be linked to in-room CO_2 sensors installed at high level to maintain CO_2 concentration levels below 750 ppm by modulating fan performance.

Where rooms are served by a dedicated MVHR, a room controller shall be provided for local control override for short periods of time. Central floor controllers shall be provided for setting time schedules and monitoring performance.

New toilet extract system to be designed and installed to serve the Radcliffe Building third floor toilets and cleaners store, as indicated on the drawings. The extract fan shall be a twin fan (duty and standby) unit with standalone programmable controller. Operate extract duty fans at constant design volume flow rates during occupation. Agree occupation times with the client.

400 CONTROL REQUIREMENTS

410 Demand control

Configure the system to provide demand-controlled ventilation when enabled. Proportionally control the supply and extract volumes to ensure the indoor CO_2 level is below 750 ppm.

420 Fan speed control

Provide all fans with inverter drives, to afford variable flow systems as describe herein. Control each system fan inverter via pressure sensors strategically located within the ductwork arrangement to afford the optimum control.

500 SCOPE OF WORKS

The scope of works for the supply and extract ventilation systems are as shown on the drawings, this specification and other documentation used to describe the ventilation systems. Perform and deliver the scope of works to conform to the relevant A sections.

Include as part of the tender all specialist design, plant and equipment necessary to deliver a fully compliant installation.

600 SYSTEM COMPONENTS

610 Air ductlines

611 General

Provide ducting as specified in specification section Y30, and as noted below:

Unless stated otherwise, provide all ductwork as zinc-coated steel.

612 Classification

Install all ducting to BESA Specification DW/144 Class A.

Carry out air leakage testing strictly in accordance with BESA DW/144, Appendix A and BESA DW/143. Include all system components including air handling units in the tests.

613 Zinc-coated steel ductwork

Install zinc-coated steel ducting throughout.

614 Flexible ducting and flexible joints

Except in exposed ductwork systems where there is no suspended ceiling, install flexible ducting at final connections to all grilles and plenum boxes. Ensure all flexible ductwork is installed in accordance with specification section Y30. Fully coordinate ductwork arrangements with the final grille layouts to minimize offsets.

620 Air ductline ancillaries

621 General

Install and provide all exposed ductwork, components and ancillaries in accordance with specification sections Y30 and Y31 except where stated otherwise below.

622 Access openings

Install access openings in accordance with specification section Y31 and additionally as necessary to internally clean all sections of the supply and extract ductwork and air handling units.

623 Volume control dampers

Install VCDs in accordance with specification section Y31 and as noted below:

Provide balancing dampers at all branch ductwork and at terminals of the single blade type.

624 Fire and fire / smoke dampers

Install fire dampers and damper installation frames in ductwork passing through all fire-rated structures. Install fire stopping between the ductwork installation frame and the structure. Where required as part of the fire strategy for the building, install automatic fire and smoke dampers.

Install fire dampers and fire and smoke dampers in accordance with specification section Y31, the manufacturer's recommendations, and as noted below:

Provide dampers constructed from corrosion-resistant materials, complete with non-vision transfer grille, which maintain integrity and do not permit passage of flame or smoke.

Unless otherwise specified, provide fire dampers with operation by fusible link. Where specified provide fire and smoke dampers operated by a signal from the fire protection system in line with the fire strategy.

Access hatches shall be provided in ductwork in close proximity to fire dampers to allow inspection, cleaning and manual resetting.

625 Ductwork penetrations through non-fire-rated walls, floors and partitions

Where ductwork penetrates non-fire-rated walls, floors and partitions use the following method of installation:

Ensure that the closure of the space around the ductwork is made with due care and attention not to damage the ductwork or insulation.

626 Vibration isolation mountings

Install vibration isolation mountings in accordance with specification section Y52.

630 Grilles and diffusers

Install grilles, diffusers and associated plenum boxes as scheduled in locations shown on the design drawings and in accordance with specification section Y46.

Use concealed fixing wherever possible for neatness.

Provide all grilles and diffusers with a polyester powder-coated finish in a colour agreed by the Project Manager.

Select the grilles and diffusers such that noise levels due to regenerated noise do not exceed those specified in specification section Y45. Note that where more than one grille is present in the room, the combined total of regenerative noise from each grille should not exceed that value stated.

Include for any changes in section between the ductwork sizes on the drawing and the final connection sizes of the grilles and diffusers.

Support plenum boxes separately from the structure and not from the ceiling grid. Internally paint all plenum boxes with a matt black finish.

Before placing any order for grilles, diffusers and plenums, obtain details of the ceiling construction and ensure that each proposed selection is compatible with the ceiling.

Co-ordinate grille and diffuser finishes with the other associated trades to avoid creating an airflow restriction.

700 EQUIPMENT

710 MVHR units

Provide low-noise high-efficiency whole house mechanical ventilation and heat recovery (MVHR) units.

Ensure that the casing of each unit is of robust construction, manufactured from corrosion-resistant metal, and fully lined with high density B-s3, d0 (class '0') flame retardant acoustic insulation designed to limit noise breakout from the unit.

Ensure each unit has the facility to connect, via tapered air spigots supplied with the unit, the number and size of air inlet and discharge outlet ducts required.

Provide units that comprise plate heat exchanger, condensate drip tray, integral controls including adjustable temperature set points, speed controller, and summer/winter bypass switch. Incorporate filters into the unit.

Route condensate in copper pipe to fall and connect to the nearest foul drainage system via an inline dry trap.

Suspend from the unit from the soffit on purpose designed anti vibration mountings. Do not secure the unit to a dry wall partition. Select the mounts to ensure no structure-borne noise is apparent. Provide access for maintenance and filter replacement.

720 Toilet extract fans

Install toilet extract fan units in locations shown on the drawings and in accordance with specification sections Y41 and Y92.

730 Silencers and acoustic treatment

Install silencers and acoustic treatment in accordance with specification section Y45 and additionally where shown on the drawings.

Allow a margin of 5 dB across the whole acoustic spectrum when selecting the required attenuators.

800 PAINTING AND THERMAL INSULATION

Paint all ducting, fittings, supports and brackets in accordance with specification section Y50.

Ensure that all painting, thermal insulation, vapour sealing and cladding of the system is in accordance with specification section Y50, except as noted below:

900 HANGERS AND SUPPORTS

Provide all hangers and supports to comply with this section and specification section Y30.

Wire-rope suspension systems are not permitted.

1000 FIXING TO BUILDING 'FABRIC'

Comply with specification section Y90.

1100 IDENTIFICATION OF MECHANICAL SERVICES

Comply with specifications sections Y54 and Y30.

1200 TESTING AND COMMISSIONING

1210 General

Comply with specification section Y51.

1220 Air leakage testing

Undertake air leakage testing of ductwork in accordance with specification section Y30.

END OF SECTION U10

HOARE LEA

BEN BRINDLE
PRINCIPAL ENGINEER

+44 161 672 7235
benbrindle@hoarelea.co.uk

HOARELEA.COM

Royal Exchange
Manchester
M2 7FL
England