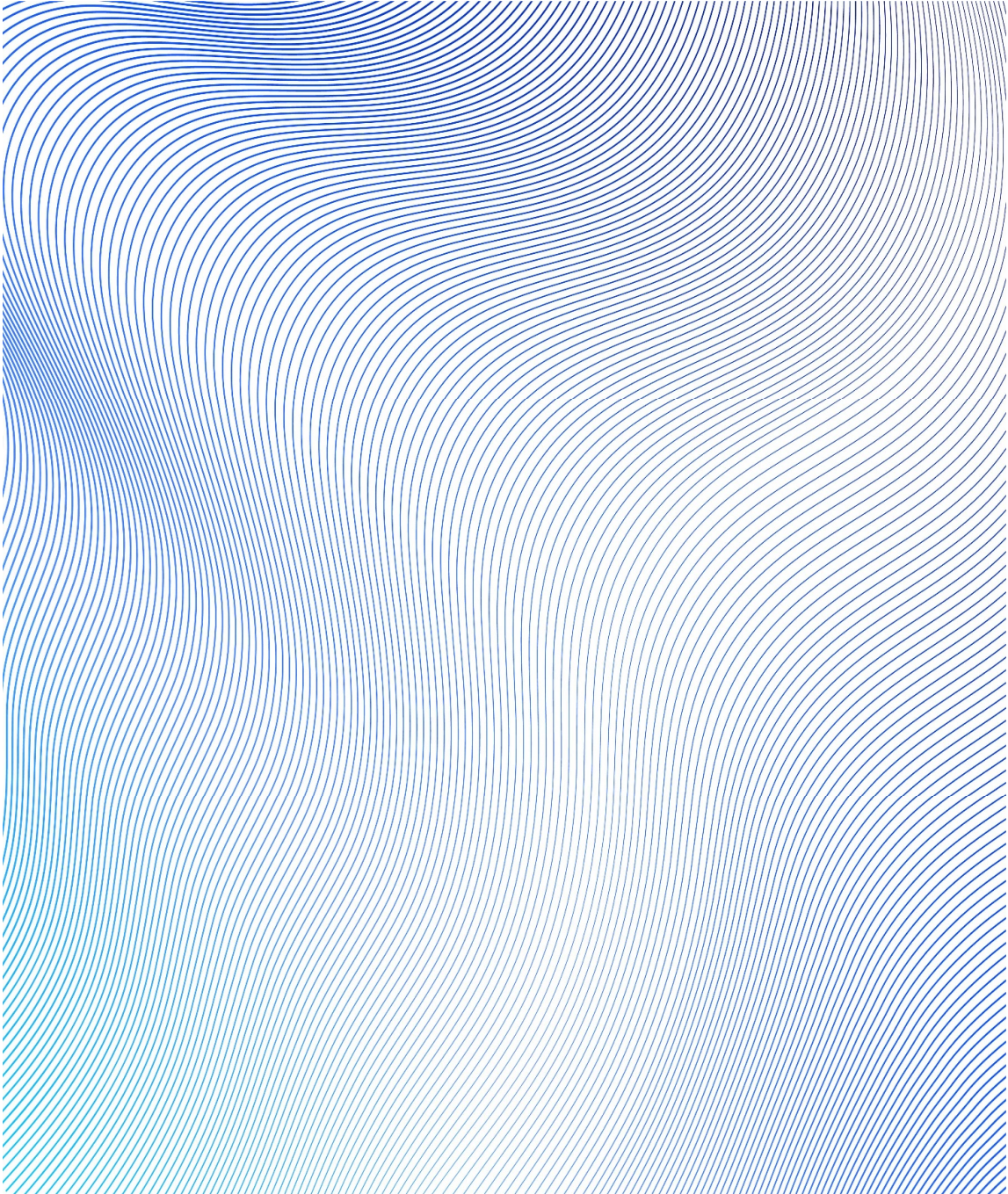


LMETB – RSTC Dundalk

MEP GENERAL SPECIFICATIONS

August 2026



Issue	Description	Date (DD.MM.YY)	Prepared By	Signed Off
Issue for Draft review	For review	15/07/26	AM	JM
Issue for Final Review	Final review	04/08/26	AM	JM
Issue for Tender	Tender	28/08/26	AM	JM

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A10 Project Particulars

10 WORK PACKAGE

20 GENERAL SPECIFICATION REQUIREMENTS

- General specification requirements for the provision of Mechanical, Electrical and Public Health services in connection with the noted project.

110 THE PROJECT

- Name: LMETB – RSTC Dundalk
- Nature: Heating system replacements / upgrades, electrical distribution upgrades, photovoltaics
- Location: Dundalk, Co. Louth

115 WORK PACKAGE

- Scope: The provision of Mechanical and Electrical Services installations in connection with the project.

140 MANAGER OF THE PROJECT

- Name: KSN Horizon
- Address: Beech House, Beech Hill Office Campus, Dublin 4, D04 V5N2
- Telephone: +353 (0) 1 277 6999

180 THE CONTRACT

This document has been prepared using the Common Arrangement of Sections and this Subcontract comprises the following:

- Electrical Services Installation
- Mechanical Services Installation

200A CONSULTANTS

- Description: M&E Consultant
- Name: Introba
- Address: Cathedral Court, New St S, The Liberties, Dublin 8, D08 C525

BUILDING OVERVIEW – RSTC:

The Regional Skills & Training Centre in Dundalk is a single-story building with original façade, constructed in the 1960s. It houses various trade training workshops (metal fabrication, carpentry, welding etc.), classrooms, offices, canteen and general spaces (toilets, storage etc.). There are some separate buildings on the site however these are not included in the scope of works of this project.

There are no planned upgrades to the building fabric as part of these works, nor to the distribution systems within the building in order to maintain full operation during the planned works.

The core objectives of the project is to reduce GHG emissions by 51% from 2016-2018 baseline and 50% reduction in overall energy use from a 2009 baseline.

SUMMARY OF MECHANICAL SCOPE OF WORK:

1. Installation of new Air Source Heat Pumps (ASHPs) in the parking area adjacent to the existing boiler room at ground level. Integral primary pump within each heat pump will distribute the LTHW from the heat pump(s) to the buffer tank. Condensate drainage from new ASHPs to drain to nearest drain. New heat pumps to be listed on the SEAI's triple 'E' product register.
2. New ASHP system to be complete with full controls package which can control the bivalent system (including existing boilers). Contractor to include for coordination with the existing BMS vendor (contact information in following section) for integration of new control panel with existing system. New heat pump control system shall be integrated into existing front end, to allow building operator to monitor full system (existing and new).
3. Installation of heat meters and electrical submeters as per schematic – refer to next section for contact info of Ultan Technologies for coordination.
4. Installation of new buffer tank in space where the existing LTHW headers are located (adjacent to existing boiler room), complete with associated heating piping to/from ASHPs and modification of existing piping to/from existing gas boilers.
5. New heating piping from buffer tank to tie into existing distribution headers.
6. Removal of existing direct gas-fired water heater located on the mezzanine level above the metal fabrication workshop. Remove existing gas piping from unit and cap at Mezzanine level, safely. Existing DHWS, DHWR and DCW piping to be capped at high level for connection to new calorifier.
7. Installation of new pump 'P-DHW-01' and associated low loss header, to be located in space adjacent existing boiler room. 3-way valves associated with 'ASHP-08' will direct heating water to the new calorifier on the mezzanine level via this pump. New distribution piping between pump and mezzanine level to be installed at high level throughout the workshop spaces.
8. Installation of new calorifier and re-connection of existing DHWS, DHWR and DCW piping.
9. Rebalance existing hydronic circuits.
10. Test and commission new bivalent heating system.
11. New bivalent system is to aim for a performance split of 80% heat pump / 20% boiler operation throughout the heating season. The bivalent point for the design is 6degC (adjustable); above this point the heat pumps provide full heating demand, below that point it is a combination of heat pump with top up from boilers as needed to meet the heating demand. The heat pumps will be designated as the lead heat source in order to maximise gas reduction. The system will be designed to operate in parallel. Refer to controls sequence for further information.

12. Note: existing system information is indicative only and shall be verified on site by the contractor. The contractor shall allow for all commissioning, balancing, controls integration, optimisation and minor modifications necessary to achieve stable operation of the new heat pump installation integrated with the existing boilers and distribution systems operating in bivalent mode. Existing pump duties and hydraulic performance shall be verified during commissioning, and any deficiencies shall be reported to the engineer. Allow for return visits (x2) and seasonal adjustment following practical completion.

SUMMARY OF ELECTRICAL SCOPE OF WORK:

1. Installation of a new electrical distribution board, cable tray, cables and isolator switches for new Air Source Heat Pumps (ASHPs) in the parking area adjacent to the existing boiler room at ground level.
2. Modification and recertification of the existing main electrical distribution board.
3. Remove power cables and breakers/fuse disconnects serving existing mechanical hot water system.
4. Install new power cables and breakers/fused disconnects on existing live distribution equipment. Shutdown of distribution equipment will be required.
5. Install new cable tray system to provide power for new mechanical units and photovoltaic system
6. Install a complete new photovoltaic system on the roof
7. Out of hours work may be required.
8. Some areas within the building that will require work (routing of cable tray and power shutdowns) will be operational during normal operating hours. Out of hours work may be required. Discuss phasing approach with general contractor and allow for this in the tender bid.
9. Note: existing system information is indicative only and shall be verified on site by the contractor. The contractor shall allow for minor modifications necessary to achieve the installation depicted on the drawings.

EXISTING SYSTEM CONTACTS:

Controls:

Thomas Moore

BMS Project Manager

Sirus Aircon

+353 86 020 6827 (Thomas.moore@sirus.ie)

Metering:

Cathal Brady

Ultan Technologies Limited

+353 87 052 4335 (cathal.brady@ultantechnologies.com)

A11 Tender and Contract Documents

115A TENDER DOCUMENTS

- The tender drawings are listed in associated document issue sheets.
- The contract documents will be the same as the tender documents.
- The Tender drawings illustrate the concept of the building engineering services systems and installations and are not 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.
- Do not use Introba's drawings as Installation / Working drawings under any circumstances.

125 INSPECTION

- Drawings and other specifications relating to the Contract generally may be inspected, by appointment with the CA, prior to the submission of tender.
 - Architectural documents may be inspected
 - Civil/Structural documents may be inspected

135 CONSTRUCTION PHASE PLAN

- Details of the Construction phase plan (if applicable) are included in the Main Contract Preliminaries

140 DRAWINGS AND TECHNICAL SUBMISSIONS

GENERAL:

- Produce and submit all drawings, without exception, in BIM format agreed at tender (tender to allow for AutoCAD latest version as a minimum) with files also provided in 'DXF' (drawing exchange format) and PDF format.
- 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.
- Agree the drawing layering convention with the Engineer so that some items (including dimensions, furniture, general text, drawing borders) can be 'frozen' without affecting the visibility of other aspects e.g. the building structure.
- On all drawings show the same Project name as that on the cover of this specification.

1401 SCHEDULE OF INSTALLERS DRAWINGS

- Within two weeks of appointment prepare, and submit to the Contract Administrator, a schedule of all drawings that the Installer proposes to submit for comment in connection with the Works. For every drawing on the schedule indicate the following: -
 - Drawing number and revision number
 - Drawing title and building engineering system
 - Scale -
 - Latest date required on site

- Date that final comments are required
 - Date on which comments were received
 - Date issued for comments
 - Date of commencement of drawing production
- Revise, and submit to the Contract Administrator, the Drawing Schedule on a monthly basis updating it to take into account all revisions that have taken place.

1402 DRAWINGS PROVIDED BY THE INSTALLER

- Provide the following drawings and cross-reference them to each other for ease of interpretation: -
 - Schematic drawings
 - Installation/ Working drawings
 - Co-ordinated floor plans
 - Co-ordinated reflected ceiling plans
 - Shop/ Fabrication drawings

1403 DRAWINGS AND TECHNICAL SUBMISSIONS

- Manufacturer's drawings
- Plant and Equipment drawings
- Plant and Equipment wiring diagrams
- Builders Work drawings
- Record drawings

1404 PRODUCTION OF INSTALLATION/WORKING/BUILDERS WORK DRAWINGS

- Ensuring that all Installation/ Working and Builder's Work drawings for the project are co-ordinated and that their production is timely, requires that all building engineering services system Installers exchange information with each other and prepare their drawings to a common drawing production programme.
- It is the responsibility of the Mechanical/Electrical Installer to arrange, attend and chair drawing production meetings. It is the responsibility of every other building engineering services system Installer to attend those meetings.
- The purpose of the meetings is to resolve the effective production of the co-ordinated multidisciplinary Installation/ Working and Builder's Work drawings.
- No additional payment will be made for abortive draughting by any individual Installer caused by his lack of knowledge of the requirements of any of the other Installers.
- 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 drawing or to install without relevant detailed information of the other sub-contract packages, structure or architectural form.
- Produce and present all drawings in printed form.
- From the description of the required content of the Installation/ Working drawings given elsewhere in this specification, indicate on every Installation/ Working Drawing all relevant details of all elements of structure, architectural form and other building engineering services system that comprise the completed project. 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. External works
 - 5. Primary and secondary steelwork.
- Depict all the above in a readily identifiable manner.

- Each of the building engineering services system Installers will produce independent Installation/Working and Builders Work Drawings. Each Installer is responsible for the accuracy of his own information and for the physical relationship of his own works to the remainder.

1405 MECHANICAL/ELECTRICAL INSTALLERS ADDITIONAL RESPONSIBILITIES

- While the overall responsibility for programming and co-ordinating the entire works is the Main Contractor's, the Mechanical/Electrical Installer has the following particular additional responsibilities:
 - The production of the co-ordinated Installation/ Working drawings as described within this document i.e. IT IS THE MECHANICAL/ELECTRICAL INSTALLER'S RESPONSIBILITY TO PRODUCE INSTALLATION AND WORKING DRAWINGS UPON EACH OF WHICH ALL COORDINATED DETAILS OF THE STRUCTURE, ARCHITECTURAL FORM, AND MECHANICAL, ELECTRICAL AND SPRINKLER SYSTEMS ARE INDICATED.
 - THE PRODUCTION OF BUILDER'S WORK DRAWINGS WITH HIS OWN REQUIREMENTS, AND THOSE OF ALL OTHER BUILDING SERVICES ENGINEERING SYSTEM INSTALLERS, PROPERLY COORDINATED.
- The Mechanical/Electrical Installer is responsible for arranging a reasonable and agreed programme with the Main Contractor and all the other building services engineering system Installers, for the production of the fully detailed coordinated Installation/ Working and Builders Work drawings. The Contractor is responsible for arranging and an agreed programme with all statutory undertakers in connection with the project such that all supplies are provided for the points in the programme when needed.
- Submit, via the Contract Administrator, an asset register in the format and to the requirements of the Facilities Manager/ Engineering Manager.

1406 OTHER ENGINEERING SYSTEM INSTALLERS RESPONSIBILITIES

- Ensure that the Main Contractor is provided with all Working and Builders Work drawings produced and take responsibility for the programming and accuracy of information in them.
- Ensure that the main contractor is provided with drawings identifying where firestopping is required due to any works being implemented as part of this project scope, along with penetrations to the exterior of the building to ensure the correct fire stopping and procedures can be implemented.
- Every building engineering services system Installer to inform the Mechanical/Electrical Installer of sufficient reasonable programme periods that he needs for the execution of his responsibility for the production of his installation drawings; no programme allowance can or will be made for non compliance.
- Every building engineering services system Installer to submit, via the Contract Administrator, an asset register in the format and to the requirements of the Facilities Manager/ Engineering Manager.

1407 INSTALLATION/WORKING DRAWINGS

- Provide the appropriate Installation/ Working drawings for the engineering services installations as described herein and in accordance with the agreed programme.
- Note: Introba drawings are not, even if badged 'construction issue' to be installed to under any circumstances.
- When preparing drawings for the installation show all components required for a complete installation, properly located, dimensioned and co-ordinated.
- The term Installation drawings here includes 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: -
 - Floor plans with co-ordinated services layout 1:50
 - Plantrooms, services ducts details, etc. 1:20
 - Ductwork manufacturing details 1:50
 - Co-ordinated sectional drawings/ details 1:20
 - Diagrammatic arrangements, wiring diagrams, etc. NTS
 - Builders work drawings*
 - Components details, hangers, supports, secondary steelwork, etc* (*use a scale that clearly illustrates the intent)
- Base the Installation/ Working 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 sub-contract works, to all other items. Properly include in the sub-contract 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/ Working Drawings upon the latest contract issue of the Architectural and Structural drawings and any other drawings or information from trades or disciplines issued by the Contract Administrator during construction.
- Submit Installation/ Working drawings that clearly state that plant or equipment proposed complies in all respects with the specified requirements. Where the Installer wishes the Engineer to consider alternatives to or deviations from the specification, 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 manufacturer's certified drawings for major items of plant, indicating physical dimensions, schematic arrangements of all components and full 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/ Working drawings from the resulting site measurements.
- Show on the Installation/ Working drawings all plant, equipment and cable tray/ cable trunking/ pipe/duct runs, etc. Include on the drawings full details of all plant together with cable tray/ cable trunking/ pipe/ duct sizes, wiring drawings, 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., do not only detail 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 EN 60617 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 mechanical, electrical, lift and sprinkler works, either under the authority of a Contract Administrator's Instruction, or by written agreement with the Contract Administrator, or when revised architectural or structural drawings are issued, modify the Installation/Working drawings accordingly and re-issue them for construction purposes. Issue revised drawings in accordance with and with regard to the agreed programme for construction.
- Particular Installation/ Working drawings may (by the prior, specific and express written permission of the Contract Administrator), 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 Client operation or visual appearance is adversely affected nor where such details are needed for informing other trades.
- Ensure that the Installation/ Working drawings include details of all local co-ordination around equipment, control panels, individual plant at access points and on architecturally finished surfaces. The intent is that all installations can be considered for spatial relationship, appearance and Client operation.
- Ensure that the Installation/ Working drawings show sufficient detail to enable the erection staff to install the works in accordance with the Specification and to 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/ Working drawings.

1408 BUILDERS WORK DRAWINGS

- The Installer's attention is drawn to the fact that some Builder's Work provision has already been made on the Tender drawings due to the nature of the project and interfaces with the architectural and structural design. Produce Installation/ Working drawings as detailed elsewhere based upon the Builder's Work information provided by the Contract Administrator.
- Bring to the attention of the Contract Administrator any Builder's Work information shown on the Tender drawings that needs to be amended.
- Show clearly on the Builder's Work drawings the requirements necessary for the incorporation of all plant, equipment and installations of every building engineering services system. In cases where preliminary builders 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 on the Installer's Builder's Work drawings.
- Prepare all other necessary Builder's Work drawings 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 drawings in sufficient time to comply with the agreed programme requirements and meet all costs arising from failure to do so.

1409 TECHNICAL SUBMISSIONS BY THE INSTALLERS

For all plant and equipment proposed, submit for comment comprehensive technical information describing it. Include the following information as a minimum: -

1. Copies of manufacturer's 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. The Contractor will ensure all technical submittals are provided to a suitable standard and will achieve a status A within 3 iterations of the same technical submittal. The Engineer has not allowed to review multiple times the same technical submittal, for whatever reason. Additional reviews of the same technical submittal will require fees to be agreed by the Contractor with the Engineer for the additional reviews as may be required.
7. The Contractor should note when offering any Value Engineering (VE) items, particularly in relation to substitute products, the Contractor will allow within the saving offered to the Client for the appropriate number of reviews by the Engineer. Fees for review of such VE items will also be agreed with the Engineer.
8. In association with the comment/review process of submittals, the Engineer will not routinely re-review submittals (in conjunction with items 8 & 9 above) to purely achieve an A Status where B Status comments have been made previously. If the Contractor requires this to be undertaken the process will require fees/programme to be agreed with the Engineer as may be required.
9. Regarding the use of external FTP sites used by the Contractor, Introba have not allowed to upload to any common data environment (CDE) but will issue our information to the Contractor using our own document control system. This is including, but not limited to, the issue of drawings, specifications, schedules and electronic inspection/snagging tools. Similarly, Introba's review of all technical submittals, drawings, including mark-up of documents will be via Introba's document control system, rather than any external parties FTP site online tool unless specifically agreed otherwise.

Allowances purposes and (c), is 'CE' marked or that it does not legally require a 'CE' mark.

1. Manufacturer's letter of conformity with the specification or where necessary any variance from this specification, seeking the engineer's comments on the suitability of any such deviation.

1410 COMMENTS ON INSTALLER'S DRAWINGS AND TECHNICAL SUBMISSIONS

- Allow at least ten working days for comment by the Contract Administrator. Issue the drawings and technical submissions progressively, related to the construction programme, grouped according to building engineering services system and in sequence with all other Installer's Installation/ Working drawings, to facilitate reviewing.
- Where an Installer's drawings are issued out of sequence, or without supporting information, the Contract Administrator reserves the right to reject the drawing or comment only upon those elements unaffected by missing information.
- The Contract Administrator's representative will attend a series of meetings during the production of the co-ordinated Installation/ Working and Builder's Work drawings 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 the Installer shall present and agree such details prior to draughting of the overall scheme. Repeated or duplicated drawings need not be submitted.
- The Contract Administrator's representative will co-ordinate the response from all members of the design team to meet with the required ten working day period.
- Ensure that all drawings and technical submissions produced are commented on by the Contract Administrator before they are used for construction purposes.
- To each of the drawings and/ or technical submissions issued for comment, the Contract Administrator will apply a status, as follows: -

Status 'A'

No further comment, the drawing and/ or technical submission may be used for construction purposes subject to the Installer's design responsibility.

Status 'B'

Comments are made on the drawings and/ or technical submission, but subject to the incorporation of those comments the drawing/ submission may be used for construction purposes at the Installer's risk. The drawing/ submission must be revised to incorporate any comments and re-submitted for comment.

Status 'C'

The drawing and/ or technical submission is unacceptable. Redraw/ re-select and resubmit for comment.

- Obtain status 'A' with all drawings and technical submissions as soon as possible. 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, commence no installation work until the relevant Installation/Working drawings have been commented upon and issued.
- 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 Contract Administrator 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 Contract Administrator.
- Comments on any drawing or any technical submission by the Contract Administrator does not mean that the Contract Administrator is responsible for the correctness of such, nor its suitability for purpose. These responsibilities remain with the Installer.
- Issue three copies of every drawing and of every technical submission to the Contract Administrator for comment; one of each of which will be returned to the Installer, with comments marked as appropriate.
- Instigate in addition, an electronic mail system of 'issue and comment return' with all Design Team parties about the drawings. Issue digitised Working drawings by email to the respective offices. Confirm in the tender response that the technical support necessary to implement this system is available.
- Issue all manufacturers' drawings and details to the Contract Administrator for comment prior to manufacture or placing orders. 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.
- After final comment provide the Contract Administrator with six copies of the drawings/ technical submissions for distribution in addition to those required for construction.

1411 REVISIONS AND VARIATIONS

- Where schemes are subject to revision or instruction, then the Installation/ Working drawings, and the Record drawings, must show the full effect of such revision. Where the scheme revision involves change to the architectural or structural details give immediate notice to the Contract Administrator.
- Where revisions are required in the Main Contract works or other sub-contract works due to the Installer changing or revising his drawings or Installation, all costs for such revision will be the Installer's responsibility including the design team consultants' costs incurred in the incorporation or administration of such revision.
- Where drawings are revised and updated during construction issue to the Contract Administrator for comments on the revision only.
- Only if the Installer can give proof that a significant departure from the intent of the Tender drawings has been necessary, will a variation in cost be considered by the Contract Administrator. This will not

include normal detail development relating to inclusion of, nor development of, factors within the Installer's design responsibility.

- Maintain on site, a marked-up record of the progress of the works on a set of Installation/ Working drawings, detailing the extent of completed actual installations and all departures from the Installation/Working 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 more than monthly intervals.
- Following receipt of instructions which vary the Works, the Contractor shall forthwith price such Variations and within 7 days, submit his fully priced estimate for the varied work.

At the same time any programme effects shall be notified by the Contractor and fully explained, such submissions shall include a costed estimate of any related expenses which may be incurred consequent upon acting upon the instruction. If the Contractor fails to submit as above within 7 days, he shall forfeit his right to additional costs or additional time for the Variation(s).

END OF SECTION A11

A12 The Site/Existing Buildings

250 SITE LOCATION

For details of construction, site boundaries, access etc., refer to Architects existing and proposed site plans.

260 HEALTH AND SAFETY HAZARDS

- General: The nature and condition of the site/ building cannot be fully and certainly ascertained before it is opened up. However, the following hazards are or may be present:
 - Asbestos.
- Information: The accuracy and sufficiency of this information is not guaranteed by the Employer or the Employer's representative. Ascertain if any additional information is required to ensure the safety of all persons and the Works.
- Site staff: Draw to the attention of all personnel working on the site the nature of any possible contamination and the need to take appropriate precautionary measures.

270 EXISTING MAINS/SERVICES

- Every effort has been made to identify the approximate locations of services where they are known to exist on the site; it is the Contractor's sole responsibility to ascertain the exact position of these existing underground service pipes, cables and ducts.
- NB: No mechanical excavations are to be undertaken within 2 metres of any underground services. The Contractor shall allow within his rates, based upon the information provided, for all hand digging required around existing services and protection throughout the contract; no claim shall be entertained for lack of knowledge in this respect.
- The Client cannot guarantee that all existing services have been recorded and identified and the Contractor shall consider this when selecting appropriate methods of works.

280 SITE VISITS

- Before tendering, the Contractor must ascertain the nature of the site, access thereto and all local conditions and restrictions likely to affect the execution of the works. A site visit must be made prior to appointment. No claims arising from failure to do so will be considered.

END OF SECTION A12

A13 Description of the Work

170 DEFINITIONS

- **Installer**

Throughout this specification and the associated Tender drawings, the term "Installer" means the Installer appointed to undertake Mechanical, Electrical, Lift, Sprinkler or other building services engineering system installation work in any single or combined sub-contract as defined by the main contract documentation

- **Engineering System Installation**

The term "Engineering System Installation means each and every Installation from the following schedule: -

1. Mechanical
2. Electrical
3. Commissioning

The Specification

The document comprising the Conditions of Particular Application and the technical specification comprising the Design of the Works, Description of the Works and Material and Workmanship and the Tender Drawings.

The Design Drawings

Any Design Drawings prepared by the Services Consultant to illustrate the proposed Mechanical and Electrical Services Installations, which comprise the Tender Design Drawing Issue.

Clients Representative

Person/Persons identified by the Client as Employers Agent or Contract Administrator and or his professional team.

The Contractor

The Services Sub-Contractor appointed to execute the works specified herein.

Directed

The direction of the contractor by the Clients Representative.

Accepted

Accepted without comment by the Clients Representative.

The Works

The complete Engineering Services Installation and associated Builders Works detailed herein.

The Engineer

The Engineering Services Consultant.

All definitions are as described within the Main Contract preliminaries. To ensure that the Installer's Tender fully complies with all responsibilities, include in it a full reference to all the Tender documentation upon which the Tender is based.

180 CONFLICT

- Immediately after receipt of the Tender documents, the Contractor must check that the documents are complete and legible (e.g. check page and drawing numbers, whether writing or figures are indistinct, etc.) and promptly notify the Contract Administrator 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), notify the Contract Administrator 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 Contract Administrator is the final Arbiter of which element, clause or section of the project Tender documents prevails.
- Where there is any doubt in the mind of the Tenderer as to the meaning of any clause or aspect of the Tender documents, set out the particulars of such doubt in writing and submit the same as soon as possible to the Contract Administrator to obtain clarification prior to the submission of Tenders.

Should there be any discrepancy within this Specification and the Design Drawings issued, the Contractor shall give written notice to the Client's Representative/Engineer who will issue instructions in regard thereto. This document is to be read in conjunction with the main contract preliminaries, in the case of discrepancy the more onerous shall be used.

If in the view of the Contractor elements of systems are inadequately described within the Tender Documents, then this fact shall be brought to the Engineers/Clients Representative's attention at Tender Stage. In the absence of any such notice, any portion of the work which reasonably and obviously would be inferred as necessary for the complete, safe and satisfactory operation of the works as a whole be not specified, or expressly described in this Specification and/or the Design Drawings, the Contractor shall, notwithstanding such omission, provide and execute such work as part of his Contract, and shall not be entitled to any extra payment on that account.

190 SCOPE OF WORK

- The Installer is responsible for 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.) Undertake specific detailed design as indicated herein.

1. Provide and operate CAD/ Drawing Production Facilities.
2. Provide co-ordinated Installation/ Working Drawings for all services and detailed wiring diagrams for all equipment and control panels.
3. Ensure the complete integration of the works with the remainder of the project.
4. Inspect all plant, equipment and materials as delivered or, where specified, at the manufacturer's works.
5. Arrange delivery, offloading, lifting, hoisting and all other storage and movement of all plant, equipment and materials.
6. 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.
7. Install and fix all collars, flashings, kerbs, stopping up and sealing required for the associated building services engineering system(s).
8. Ensure all associated work (including electrical wiring, connecting pipework, builders work, etc.), is properly executed.
9. Test and commission the complete installation(s) including making adjustments and balancing as necessary.
10. Demonstrate that the equipment is capable of the performance and method of operation specified, to the satisfaction and acceptance of the Contract Administrator.

11. Demonstrate 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 Contract Administrator (including return visits for seasonal tests).
12. Provide all Installation / Working, Builder's Work and Record drawings, showing the complete installation and structure, architectural form and other services systems.
13. Provide operating instructions and maintenance manuals for the complete systems as a word document and an e-document. (Price for "Microsoft Word ", latest release).
14. Provide the full set of test results in an approved format for all tests, commissioning and for and not balancing operations as a word document and an e-document. (Price "Microsoft Word", latest release). Make typewritten data entries in the various forms sheets in the same word processing format as the relevant e-document. Do handwrite the entries
15. Instruct the Employer's staff in the use, operation and maintenance of the installations.
16. Hand over all specified tools, keys, spares, oils, chemicals, etc.
17. Survey existing building engineering services systems and associated buildings, where relevant.
18. Remove existing building engineering services systems as described in Section C20 of this specification, where relevant.
19. Obtain approval from the Structural Engineer and/ or Architect of proposed fixings.
20. 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 Contract Administrator prior to carrying out any work of making them. Establish a method of working with the Contract Administrator to ensure that such builder's work proceeds without hindrance to the overall project programme.
21. Carry out maintenance of existing building engineering services systems during or throughout, as appropriate, the works.
22. Provide material samples, method statements, equipment, technical literature and any other submissions detailed within this specification.
23. Undertake air pressure testing/ air leakage testing of the building.
24. Ensure all materials, equipment and components used, together with methods of installation, comply with Statutory Requirements.
25. Prepare an asset register in a format specified by the Facilities Manager/ Engineering Manager.
26. Cooperate with the specialist Recycling Contractor for the project in the minimisation and management of waste materials resulting from the works described in the specification, in accordance with the project waste minimisation and management plan.
27. Ensure that the location and installation of all building engineering systems meets the requirements of the project Access Consultant.

END OF SECTION A13

A20 Work Package Contract (A70)

100 THE CONTRACT/SUB-CONTRACT

- Refer to the Main Contract Preliminaries

110 CONTRACTOR'S DESIGN RESPONSIBILITY

The allocation of design responsibility between Employer and Contractor will be described in this section.

Refer to schedules for specific design activity schedule.

- The Contractor and manufacturers/suppliers shall provide the Employer with Warranties in respect of the works so far as they are designed by the Contractor, in the form set out in the contract documents
- The Contractor shall be responsible for developing the design of the engineering systems from the level detailed in the Tender issue to that necessary for installation and successful operation. The design which he undertakes is fully co-ordinated and compatible with the remainder of the project design. The form of contract will include design responsibility.
- The Contractor shall allow within his tender for all necessary costs, resources and programme implications to discharge these design obligations.
- The Contractor shall allow all costs for the complete junction of his works and the remainder of the project. Specifically all supports will be provided by the Contractor up to and including the final attachment to primary structure. Similarly the Trade Contractor shall provide details of all flashings, kerbs and stopping up or sealing required to be installed by the Main Contractor.
- Undertake the detailed design activities listed below, in addition to those activities normally undertaken through the custom and practice of the industry, all of which shall be subject to the comment of the Employers Representative.
- Ensure that the detailed design undertaken is fully co-ordinated and compatible with the remainder of the project design including spatial compatibility of equipment selection and interfaces with other packages.
- Comments by the Employers Representative do not relieve the Trade Contractor of his responsibility for the suitability and correctness of designs and other obligations within the contract documentation.

The Contractor's design obligations include, but are not limited to: -

1. Preparation of Fabrication drawings and the co-ordinated Installation/ Working drawings and Record drawings
2. Undertaking bracket and support detailed design and the selection of appropriate locations for them. Declaring all types, loads and locations to the Employers Representative ten working days prior to installation, for comment. Design, fabricate, supply, erect secondary steel supports necessary for the support of services including pipe and ductwork supports, platforms, access covers, and gratings, ladders and additional structural steelwork where required to facilitate safe access to and maintenance of items and primary structure interfaces.
3. Preparation of all Electrical wiring diagrams of all equipment supplied by the Contractor showing all interconnections between equipment to enable the necessary wiring to be undertaken
4. Selecting all equipment and components to meet the requirements and performance specified or scheduled, and be responsible for the design of the equipment and components selected.
5. Undertaking automatic controls detailed design insofar as it is required to meet with full physical and operational requirements of the Specification. Ensuring the full compatibility of the plant and equipment with the specified function. Where there are interfaces (including

- relays or other devices or modifications to hardware or software) be responsible for their design and the incorporation of them
6. Dimensioning of, and final installation details of, the Automatic Control panels to suit the detailed requirements of the particular agreed manufacturers of controls equipment and the cable entry/ exit accommodation such that:-
 - a. Cable entry is possible in the selected location, and
 - b. Doors are not fouled by other plant, equipment, services or structural elements, and
 - c. Safe operating and maintenance clearances are provided in all access positions when installed on site
 7. For the following system component cabling and configuration design to meet the particular and performance requirements of the engineering specification;
 - o BMS Interfaces
 - o Energy Monitoring
1. Designing and selecting attenuators to satisfy the particular and performance requirements of the specification, including spatial allowances shown on the Tender drawings
 2. Designing elements of the scheme provided by the Trade Contractor to account for self-weight and other applied forces/ loadings in reasonable use. (E.g. the design of anchorage, encasement and foundations for buried tanks or buried piping.)
 3. Designing systems to safely and reliably accommodate thermal expansion and contraction (including the provision of anchors, bellows, compensators, loops and bends.) Designing systems to safely and reliably accommodate and control their movement due to hydraulic pressures and building settlement
 4. Identify where services compromise fire compartmentation lines and provide fire-stopping, fire dampers, sleeves, luminaire fire hoods etc. as required to maintain the integrity of the compartmentation.
 5. Select and detail sleeves, inserts, frames, and fixing anchors, and any other items required to be cast or built into the structures by others, including coordination of positions to such extent and accuracy to allow structural construction to proceed and allowing for linear penetration seal fire stopping to be correctly installed to manufacturers tested details.
 6. Designing acoustic treatment (including attenuators, silencers, absorption materials, baffles, mutes, cladding and jacketing) or modification of equipment, to comply with the noise levels specified, including when all building engineering services systems and plant are operating
 7. Selecting valve, damper and access locations
 8. Calculating system water capacities, and the quantities of chemical additives required, and providing the facilities required, for pre-commissioning cleaning of water systems, all in accordance with BSRIA Application Guide BG29/ 2012 'Pre-commission cleaning of pipework systems'
 9. Selecting all anti-vibration mountings to suit the particular application of the mounts
 10. Selecting exact locations of instruments, control sensors, detectors and thermostats
 11. Calculating pump and fan duties to suit the piping and ducting layouts shown on the Contractor's final Installation drawings and taking into account items of plant and equipment selected for incorporation into the works
 12. Selecting the capacity, location and design of electrical conduit, trunking, tray and cable ladder systems
 13. Designing platforms, access covers, gratings, ladders, walkways, balustrades, guardrails and all additional structural steelwork where required, to suit the building engineering services systems and where indicated in the Tender documentation
 14. Select, position and carry out final sizing of regulating devices (including regulating valves, balancing valves, flow measuring orifice plates, commissioning sets, balancing dampers etc.) in

accordance with the manufacturer's recommendations to achieve the specified function and to suit characteristics of items served and the final configuration of installed systems.

15. Selecting cable terminations on items of equipment provided by the Trade Contractor to suit the cable sizes proposed by other Trade Contractors (including the Electrical Contractor, the Automatic Control System Contractor, etc.) or the specified cable sizes, as appropriate
16. Ensuring that the specified cable sizes are not invalidated by Trade Contractor selection of alternative cable routes
17. Designing earthing and bonding requirements for electrical building engineering services systems, mechanical building engineering services systems, architectural elements and structural elements that require earthing and bonding.
18. Designing cable and cable trunking terminations on to electrical equipment provided under the contract and dimensioning of, and final installation details of, electrical switchgear, to ensure that: -
 - o Cable entry is possible in the selected location, and
 - o Doors are not fouled by other plant, equipment, services or structural elements, and
 - o Safe operating and maintenance clearances are provided in all access positions when installed on site
19. Ensuring fuse sizes installed in plug tops are appropriate for the rating of connected equipment
20. Sizing and designing earthing and electromagnetic screening of electrical power systems and ensuring compliance with the appropriate EMC directives
21. Designing all temporary works, facilities and provisions required during construction, to meet the specified requirements
22. Selecting and positioning commissioning sets and orifice plates to achieve the specified function and to suit the characteristics of items served and final systems configuration
23. Ensuring that the design of the lightning protection system components meet particular manufacturer's and the specification's requirements
24. Ensuring that the design of the security system(s) components and cabling requirements meet the particular manufacturer's and the specification's requirements
25. Ensuring that details of making-good, fire stopping and weather proofing are effective
26. Prepare building log book and building user guide for the works

120 STATUTORY REQUIREMENTS AND REGULATIONS

Notwithstanding details of plant equipment and materials specified elsewhere in this document, the Contractor must ensure that all parts of this installation comply with all relevant Statutory Instruments, the latest editions of or amendments to Regulations and Acts of Parliament including but not limited to:

- o All relevant Irish, British and European Standards and Code of Practice
- o The NSAI IS 10101 National Rules for Electrical Installations
- o The Asbestos at Work Regulations
- o The Building Regulations including Part L
- o The Building Safety Act
- o The Regulations for Electrical Installations, issued by the I.E.T.
- o The Energy Conservation Act
- o The Construction (Design and Management) Regulations
- o The Control of Substances Hazardous to Health (COSHH) Regulations
- o The Disability Discrimination Act
- o The Electricity at Work Regulations
- o The Environmental Protection Act
- o The Health and Safety at Work Act
- o The Manual Handling Operations Regulations

o The Workplace (Health, Safety and Welfare) Regulations

- 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 and utility providers as necessary about the connection of drainage, electricity, gas, telecommunications and water supply.
- Do not build-in, cover or otherwise obscure any portion of the works requiring the inspection and approval of such authorities and utility providers, until such approval has been obtained.

130 PRACTICAL COMPLETION

- Practical completion of the Contractor's works, or agreed phase or part of the works, will not be effected until the Contractor has fulfilled his obligations under the Main Contract conditions and in particular demonstrated to the satisfaction of the Employers Representative 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 his Agent's use of the Building or agreed part thereof. In respect of this clause, specifically but not uniquely, the Contracts Administrator 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 Contracts Administrator 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 Contracts Administrator 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. Simulated failure conditions and load recovery have been demonstrated for critical systems. Demonstrate operation for periodic maintenance of all critical systems and equipment
 6. All instruction of the Employer's staff has been satisfactorily completed in accordance with the programme for handovers agreed with the Contracts Administrator
 7. All documentation required for the completion of the Health & Safety File under the CDM Regulations has been delivered to the Contracts Administrator.
- Where 'snags', omissions or defects are rectified in an area of the building that the Employer has occupied following 'Practical Completion', provide the Employer with a full time (i.e. 0900-1700 hours, Monday to Friday) member of staff, of no less seniority than the Site Foreman involved in the original installation, to be present throughout the period of rectification work in the area(s) occupied by the Employer, to supervise and co-ordinate the rectification and completion work and report upon progress whenever required.
- Where Practical Completion is declared but there is a failure to supply specified Record Drawings, Operating and Maintenance documentation, Log-books, Health and Safety File documentation, or instruction of the Employer's staff, provide the Employer with full time staff to operate and maintain all of the building engineering services systems installed under the contract, in a safe, efficient and economical manner to meet the Employer's work practices, and Health and Safety Regulations.
- Upon completion of the works, the Contractor is responsible for the repair or replacement of all damaged work and remove from site all gear and the like, re polishing and cleaning any apparatus which may have become dirty and shall carry out any other adjustment, tidying up or other work

which in the reasonable opinion of the Client's Representative may be necessary, or beneficial, to the final appearance of the works.

A30 Tendering/ Subletting/ Supply

110 SCOPE

- The requirements of this section of the general specification are supplementary to those stated elsewhere in the tender documents.

160 EXCLUSIONS

- Inability to tender: Immediately inform if any parts of the work as defined in the tender documents cannot be tendered.
- Relevant parts of the work: Define those parts, stating reasons for the inability to tender.

480 PROGRAMME

- Programme of work: Prepare a summary showing the sequence and timing of the principal parts of the Works and periods for planning and design. Itemize any work which is excluded.
- Submit: Within one week of request.

500 TENDER STAGE METHOD STATEMENTS

- Method statements: Prepare, describing how and when the following is to be carried out:
 - Commissioning and Testing of Engineering Systems (Commissioning Plan and Commissioning Programme).
- Statements: Submit within one week of request.

510 ALTERNATIVE METHOD TENDERS

- General: In addition to and at the same time as tendering for the Works as defined in the tender documents, alternative methods of construction/ installation may be submitted for consideration. Alternatives, which would involve significant changes to other work, may not be considered.
- Alternative tenders: Such alternatives will be deemed to be alternative tenders and each must include a complete and precise statement of the effects on cost and programme. This includes impact of all proposed alternatives on Part L compliance.
- Safety method statement: Carry out a health and safety risk assessment for each alternative and where appropriate provide a safety method statement suitable for incorporation in the Health and Safety Plan.
- Full technical data: Submit for each alternative together with details of any consequential amendments to the design and/ or construction of other parts of the Works.
- Submit: With tender.

530 SUBSTITUTE / ALTERNATE PRODUCTS

- Details: If products, alternate materials, or performance specifications of different manufactures to those specified are proposed, submit details with the tender giving reasons for each proposed substitution. Substitutions, which have not been notified at tender stage, may not be considered. Alternates shall not be adopted without the prior written approval of the Employer's Representative / Design Team.

- Performance Verification: Where such alternates are proposed, the Contractor shall provide a detailed, independently verifiable analysis demonstrating that the substitutions will have no adverse effect on the final operational energy demand or thermal performance of the completed building. Substitutions accepted will be subject to the verification requirements of clause A31/200.
- Calculation and Methodology: The analysis shall:
 - Be prepared by a suitably qualified professional (e.g., building services engineer or energy modeller);
 - Include all necessary calculations, simulations, and supporting data;
 - Be based on recognised methodologies and standards (e.g., CIBSE TM54, SAP, SBEM, or equivalent, as applicable); and
 - Demonstrate equivalence or improvement in predicted energy demand and carbon emissions relative to the specified design.
- Approval Requirement: No alternative materials or systems shall be incorporated into the Works until the Employer (or their Representative) has reviewed and accepted the Contractor's analysis in writing.
- Responsibility: Approval of any proposed alternate shall not relieve the Contractor of responsibility for ensuring that the completed Works meet all specified performance criteria, including energy and environmental performance targets.

540 QUALITY CONTROL RESOURCES

- Statement: Describe the organisation and resources to control the quality of the Works, including the work of subcontractors.
- QA staff: Identify in the statement the number and type of staff responsible for quality control, with details of their qualifications and duties.
- Submit: With the Tender.

550 HEALTH AND SAFETY INFORMATION

- Content: Describe the organisation and resources to safeguard the health and safety of operatives, including those of subcontractors, and of any person whom the Works may affect.
- Include:
 - A copy of the contractor's health and safety policy document, including risk assessment procedures.
 - Accident and sickness records for the past five years.
 - Records of previous Health and Safety Executive enforcement action.
 - Records of training and training policy.
 - The number and type of staff responsible for health and safety on this project with details of their qualifications and duties.
- Submit: With the Tender.

555 HEALTH AND SAFETY STATEMENT

- Content: Describe any significant and unavoidable hazards which may arise as a result of carrying out the work and the measures proposed to safeguard the health and safety of operatives and of any person who may be affected by the work.
- Submit: With the tender.

590 SITE WASTE MANAGEMENT PLAN

- Person responsible for developing the Plan: The Contractor.

- Content: Include details of:
 - Principal Contractor for the purposes of the regulations.
 - Location of the site.
 - Description of the project.
 - Estimated project cost.
 - Types and quantities of waste that will be generated.
 - Resource management options for these wastes including proposals for minimization/ reuse/ recycling.
 - The use of appropriate and licensed waste management contractors.
 - Record keeping procedures.
 - Waste auditing protocols.
- Additional requirements: None.
- Submit with tender.

595A ENVIRONMENTAL POLICY

- Project Environmental Management System: Develop a system compatible with the Employer's policy.
 - Format: Project Specific Report.
 - Submit: with tender.

710 PROPOSED MANUFACTURERS/ SUPPLIERS

- General: Prepare a list, identifying all items for which the choice of manufacturer/ supplier is at the discretion of the Contractor. Include details of choice/ selection
- Submit: with the Tender.

800 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 Contract Works but which is not explicitly referred to in the Tender documents.
- 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.
- Examine the Architect's and Structural Engineer's drawings, if any, issued to you with the Tender documents. Submit all queries concerning such drawings to the Contract Administrator for clarification prior to submitting your Tender.
- Submit Tenders for the Contract Works on the Tender Forms accompanying this Specification.

In addition submit with the Tender the following information: -

- Letter of conformity with the Tender drawings and specifications
- Schedule of proposed specialist Contractors identifying the Trade Association(s) of which each is a member
- Schedule of proposed manufacturers and suppliers identifying the Trade Association(s) of which each is a member
- Simple bar chart programme to identify main activities
- Proposed first draft of the procurement schedule
- Proposed schedule of drawings

- Proposed management structure and CV's of key personnel
 - Proposed site staff and CV's of key personnel
 - Confirmation of willingness to provide a Design Warranty
 - Confirmation that facilities of e-mailing of CAD drawings are available
 - Proposed waste minimisation management plan
 - Quality Assurance procedure
 - List of suggested alterations
- Tenders received after the time stated shall be rejected.
 - Tenders qualified in any way shall be rejected.
 - No payment will be made for Tenders.
 - The Employer does not bind himself to accept the lowest or any Tender.
 - Design and Build additional item:

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

810 SCHEDULE OF RATES

- Following receipt of formal written notice from those inviting Tenders that your Tender is being considered for acceptance, return, within one week of that notice, a fully priced Schedule of Rates with every item quantified and priced so that its sub-totals summate to the total of your Tender. Include Rates for all Sub-Trader's work included in the Tender. The prices of such a Schedule of Rates will be the basis for the valuation of all variations of the Sub-Contract Works.
- The priced Schedule of Rates is deemed to include for all items required, whether mentioned in the Schedule or not.
- Ancillary items not shown separately in such Schedule of Rates will be assumed to be included in the general Rates stated.

820 WARRANTY TO BE GIVEN BY THE SUB-CONTRACTOR EMPLOYED BY THE CONTRACTOR

- A Design Warranty(ies) shall be provided by the Installer in respect of those elements of the building engineering services systems (including software) for which the Installer, as sub- contractor, or a specialist in his employment, has design responsibility. Refer to the Main contract documents for further detail.
- Where a Design Warranty is required provide it on a standard form
- Confirm willingness to provide such a warranty with the return of Tender.

830 POST TENDER MEETING

- Upon selection of the prospective Installer, a meeting shall be convened to obtain the final agreement of the prospective Installer on all matters raised in the Tender.
- Specifically all matters relating to the production of contract information and site liaison shall be agreed.
- The agreed minutes of this meeting or meetings will (if required by the Contract Administrator) form part of the contract document to demonstrate that the Installer has understood his responsibilities.

840 ORDER 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 any difficulty foreseen with the delivery periods for the selected equipment, in the Tender return.
- Additional costs resulting from non-compliance with the above shall be borne by the Installer.

A31 Provision, Content and Use of Documents

110 DEFINITIONS

- Meaning: Terms, derived terms and synonyms used in the preliminaries/ general conditions and specification are as stated therein.

120 COMMUNICATION

- Definition: Includes advise, inform, submit, give notice, instruct, agree, confirm, seek or obtain information, consent or instructions, or make arrangements.
- Format: In writing to the person named in clause A10/140 unless specified otherwise.
- Response: Do not proceed until response has been received.

125 CONTRACTOR

- Definition: Contractor/ subcontractor responsible for the whole of the work package described in section A10/115.

130 PRODUCTS

- Definition: Materials, both manufactured and naturally occurring, and goods, including components, equipment and accessories, intended for the permanent incorporation in the Works.
- Includes: Goods, plant, materials, site materials and things for incorporation into the Works.

135 SITE EQUIPMENT

- Definition: All appliances or things of whatsoever nature required in or about the construction for completion of the Works but not materials or other things intended to form or forming part of the Permanent Works.
- Includes: Construction appliances, vehicles, consumables, tools, temporary works, scaffolding, cabins and other site facilities.

140 DRAWINGS

- Definitions: To BSRIA BG 6 A design framework for building services. Design activities and drawing definitions.
- CAD/BIM data: In accordance with ISO 19650.

160 TERMS USED IN SPECIFICATION

- Remove: Disconnect, dismantle as necessary and take out the designated products or work and associated accessories, fixings, supports, linings and bedding materials. Dispose of unwanted materials. Excludes taking out and disposing of associated pipework, wiring, ductwork or other services.
- Fix: Unload, handle, store, place and fasten in position including all labours and use of site equipment.
- Supply and fix: Includes all labour and site equipment for unloading, handling, storing and execution. All products to be supplied and fixed unless stated otherwise.

- Keep for reuse: Do not damage designated products or work. Clean off bedding and jointing materials. Stack neatly, adequately protect and store until required by the Employer/ Purchaser or for use in the Works as instructed.
- Make good: Execute local remedial work to designated work. Make secure, sound and neat. Excludes redecoration and/ or replacement.
- Replace: Supply and fix new products matching those removed. Execute work to match original new state of that removed.
- Repair: Execute remedial work to designated products. Make secure, sound and neat. Excludes redecoration and/ or replacement.
- Refix: Fix removed products.
- Ease: Adjust moving parts of designated products or work to achieve free movement and good fit in open and closed positions.
- Match existing: Provide products and work of the same appearance and features as the original, excluding ageing and weathering. Make joints between existing and new work as inconspicuous as possible.
- System: Equipment, accessories, controls, supports and ancillary items, including installation, necessary for that section of the work to function.

170 MANUFACTURER AND PRODUCT REFERENCE

- Definition: When used in this combination:
 - Manufacturer: The firm under whose name the particular product is marketed.
 - Product reference: The proprietary brand name and/ or reference by which the particular product is identified.
- Currency: References are to the particular product as specified in the manufacturer's technical literature current on the date of the invitation to tender.

200 SUBSTITUTION OF PRODUCTS

- Products: If an alternative product to that specified is proposed, obtain approval before ordering the product.
- Reasons: Submit reasons for the proposed substitution.
- Documentation: Submit relevant information, including:
 - manufacturer and product reference;
 - cost;
 - availability;
 - relevant standards;
 - performance;
 - function;
 - compatibility of accessories;
 - proposed revisions to drawings and specification;
 - compatibility with adjacent work;
 - appearance;
 - copy of warranty/ guarantee.
 - Manufacturer to confirm no plans to make this specific product obsolete
- Alterations to adjacent work: If needed, advise scope, nature and cost.
- Manufacturers' guarantees: If substitution is accepted, submit before ordering products.

210 CROSS REFERENCES

Accuracy: Check remainder of the annotation or item description against the terminology used in the section or clause referred to.

Related terminology: Where a numerical cross-reference is not given the relevant sections and clauses of the specification will apply.

Relevant clauses: Clauses in the referred to specification section dealing with general matters, ancillary products and execution also apply.

Discrepancy or ambiguity: Before proceeding, obtain clarification or instructions.

220 REFERENCED DOCUMENTS

Conflicts: Specification prevails over referenced documents.

240 SUBSTITUTION OF STANDARDS

Specification to European Standard: Substitution may be proposed complying with a grade or category within a national standard of another Member State of the European Community or an international standard recognised in Ireland.

Before ordering: Submit notification of all such substitutions.

Documentary evidence: Submit for verification when requested as detailed in clause A31/200. Any submitted foreign language documents must be accompanied by certified translations into English.

250 CURRENCY OF DOCUMENTS

Documents are to the editions, including amendments and revisions, current on the date of the Invitation to Tender.

440 DIMENSIONS

Scaled dimensions: Do not rely on.

440A INTERPRETATION OF DOCUMENTS

Drawings provided to a scale of 1:50 or smaller and/or expressed in symbolic terms or which are in diagrammatic format, give indication locations only and details of components are not to be inferred.

Arrangements shown on Tender Drawings are intended to indicate layout to be generally adhered to, but actual routes of services are to be such as to ensure the neatest possible arrangement.

DOCUMENTS PROVIDED BY CONTRACTOR/ SUBCONTRACTORS/ SUPPL510 DESIGN AND PRODUCTION INFORMATION

- General: Complete the design and detailing of parts of the works as specified.
- Provide:
 - Production information based on the drawings, specification and other information.
 - Liaison to ensure coordination of the work with related building elements and services.
- Additional information: Request as necessary and provide information in time to meet the programme.

- Submission: Until confirmed that resubmission is not required, resubmit for further checking and comment, and incorporate any necessary amendments.
- Design/production information: Submit two copies, one can be returned with comments. Ensure that any necessary amendments are made without delay.
- Tenderer's changes to Employer's Requirements: Support request for substitution or variation with all relevant information.
- Employer's amendments to Employer's Requirements: If considered to involve a variation, which has not already been acknowledged as a variation, notify without delay (maximum period 7 days), and do not proceed until instructed. Claims for extra cost, if made after it has been carried out, may not be allowed.
- Final version of design/ production information:
 - Include Coordination drawings, builderswork information and record drawings.
 - Submit three copies.

600 DRAWN AND OTHER INFORMATION

- Design documents: Include: Schedules of all equipment provided, including luminaires, plant/equipment, diffusers, grilles, valves, distribution boards, switchgear, mechanical control panels, air handling units, dampers, commissioning stations, control systems. Specifications for all contractor supplied/designed equipment/systems.
- Format: Drawings at A1 and Schedules on A4.
- Methods of presentation: Comply with agreed standards for sizes, titles, scales of drawings, systems for recording revision, etc.
- Construction stage method statements: Develop from tender stage method statements, show final proposals and submit before starting work on site.
- Preparatory work by others: Confirm and amplify information provided.

620 AS BUILT DRAWINGS AND INFORMATION

- General: Provide the following Drawings/ information:
 - - Drawings; calculations; operations and maintenance manuals; building log book, and building user guide.
- Submit: At least two weeks before date for completion.

640 MAINTENANCE INSTRUCTION AND GUARANTEES

- Components and equipment: Obtain or retain copies, register with manufacturer and hand over when requested before completion of the Works.

A32 Management of the Works

GENERALLY

110 SUPERVISION

- General: Accept responsibility for coordination, supervision and administration of the Works, including subcontracts. This shall be carried out by the Contractor's Supervising Engineer who shall also be available for all Site Meetings.
- Coordination: Arrange and monitor a programme with each subcontractor, supplier, local authority and statutory undertaker, and obtain and supply information as necessary for coordination of the work.
- If, in the opinion of the Clients Representative the Contractor fails to adequately supervise the works, the Clients Representative may at his sole discretion provide his own "Inspection" or "Clerk of Works" personnel. The cost of employing such personnel shall be deducted from the Contractor's account.

130 INSURANCE CLAIMS

- Notice: If any event occurs which may give rise to any claim or proceeding in respect of loss or damage to the Works or injury or damage to persons or property arising out of the Works, immediately give notice to the Employer, the person named in clause A10/140 and the Insurers.
- Failure to notify: Indemnify the Employer against any loss, which may be caused by failure to give such notice.

210 PROGRAMME

- Master programme: Immediately when requested and before starting work on site the Contractor must submit in an approved form, a master programme for the Works, which must include details of:
 - Planning and mobilisation by the Contractor
 - Preparation of working drawings prior to site installation
 - Specialists and Contractors work
 - Subcontractor's work.
 - 3rd party works such as Statutory Undertakers (Utilities), which the contractor shall manage
 - Running in, adjustment, commissioning and testing of all engineering services and installations.
 - Work resulting from instructions issued in regard to the expenditure of provisional sums.
 - Work by others concurrent with the Contract.
- Submit two copies.

250A MONITORING

- Progress: Record on a copy of the programme kept on site.
- Avoiding delays: If any circumstances arise which may affect the progress of the Works submit proposals or take other action as appropriate to minimize any delay and to recover any lost time.
- Mark up "As Installed" drawing details weekly and before work is hidden from view.
- Marked up "As Installed" drawing details to be available weekly for review by CA and Consultant

260 SITE MEETINGS

- General: Site meetings will be held to review progress and other matters arising from administration of the Contract.
- Frequency: Weekly between Main Contractor, Contractor & sub-contractors and Monthly between the Consultant, Main Contractor and Contractor or more frequently if required.
- Location: On site.
- Accommodation: Ensure availability at the time of such meetings.
- Attendees: Attend meetings and inform subcontractors and suppliers when their presence is required.
- Chairperson (who will also take and distribute minutes): Main Contractor.

270 SETTING OUT OF THE WORKS

- Accurately set out the Works and keep them correct in accordance with the status 'A' Installation drawings, as amended by any Contract Administrator's instructions issued.
- Where services are to be installed adjacent to or near to other services take responsibility for the setting out of the new services. 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.

275 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 Contract Administrator's requirements.
- Prior to any air conditioning or ventilation system being started ensure that all of the following are 'signed-off' by the Contract Administrator, as being complete: -
 1. The temporary protection of the air inlet(s) where site conditions require.
 2. The cleaning of ducting including builders-work ducts.
 3. The dust-sealing of all structural and architectural components and surfaces within the airstream, including floor voids and voids above false ceilings.
 4. The cleaning of rooms and spaces served by the system.

280 INSPECTION BEFORE CONCEALMENT

- Whenever work requiring inspection or testing is subsequently to be concealed, provide due notice to the Contract Administrator so that inspection may be made or tests witnessed before concealment.
- Failure to give due notice, of at least 48 hours, could result in the Installer being responsible for the expense of the work of uncovering, and subsequently reinstating the concealment.
- The Contract Administrator reserves the right to forego his inspection; this does not relieve the Installer from responsibility for giving due notice.
- Where the Contract Administrator believes that the installation may be defective the Installer shall, at his own expense, uncover a specific area selected by the Contract Administrator for inspection. This shall be restricted to 1 linear meter or 1m², depending on the nature of the work, for each area of concealment. Reinstatement of the concealment shall be at the Installer's expense. Where works are proven defective by such uncovering, the entire installation shall be uncovered, brought into

compliance with the specification by the Installer, and subsequently reconcealed, all at the Installer's expense.

ACCESS FOR PLANT INSTALLATION AND SUBSEQUENT REMOVAL

- Check on site and with the drawings if 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. This is to 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 Engineer, 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, that maintenance after removal is acceptable.
- The Installer's attention is drawn to the fact that some builder's work provision has already been made on the Tender drawings. Review this provision 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.

286 WASTE MANAGEMENT ON SITE

- Before commencement of work on site submit to the Contract Administrator a Waste Management and Minimisation Plan for the Installer's works identifying: -
 - the waste measurement and control procedures that will be used
 - the waste materials that will be recycled on site, locally, or sent off-site for recycling
 - the waste materials that will be sent off-site for disposal
- Ensure that the following general principles of waste management are implemented: -
 - the elimination of the need for material use where possible
 - reduction of the material used in the installation process
 - the reuse of materials where possible
 - the recycling of materials where possible
 - the responsible disposal of non-recycled materials.
- Ensure that all waste material is sorted according to type prior to recycling, in particular, metals, cardboard, plastics, glass and wood.
- Make records using suitable measures (volume, weight), and forward them to the Contract Administrator at agreed intervals.
- Cooperate with the Main Contractor and any Recycling Contractor that he employs, by sorting and placing in designated containers on the site, all waste materials from the Installer's works that it is agreed will be recycled.

COMMISSIONING AND TESTING

- Notify the Contract Administrator in writing when, the Installer's works, or parts thereof, are ready for testing and commissioning. Carry out the tests. Prove that all test results accord with the specification. Operate the installation or selected parts thereof in the presence of the Contract Administrator and make all specified tests to the satisfaction of the Contract Administrator.
- Directly employ a specialist company to undertake commissioning.
- The commissioning of the Electrical, Sprinkler, Lift, Voice and Data Cabling, and Catering installations, systems or items of plant, may be undertaken by the manufacturer or the Installer provided that it is

fully witnessed by the Commissioning Company employed by the Mechanical Installer for co-ordination, documentation and publishing in the final report.

- If the initial tests fail to demonstrate that the plant and equipment are properly installed and functioning correctly, investigate the cause of the failure. If this is due to incorrect or faulty work by the Installer or his Installers or suppliers, then without delay, carry out such remedial measures and adjustments as may be necessary and repeat the commissioning and testing procedure to the satisfaction of the Contract Administrator.
- Where it is not possible at the particular time of commissioning and testing for full load conditions to be obtained or simulated, repeat such operations of full load or simulation thereof at a time when this can be achieved.
- Where portions of the Works are commissioned and tested separately, upon Completion or Completion of Section, as defined in the Main Contract Preliminaries, demonstrate to the Contract Administrator that all the several portions are capable of proper simultaneous operation.
- In cases where the construction programme is such that the Installer will need to return to the portion of the building taken over and occupied by the Employer in order to undertake testing, balancing, adjustment, etc., take all necessary precautions against, and be responsible for, any damage caused whilst working in such areas for that purpose.
- Provide all necessary skilled and unskilled labour and all necessary instruments and testing equipment for the purposes of commissioning and testing of the installation.
- Subsequent to the completion of all testing and commissioning to the satisfaction of the Contract Administrator, operate the plant and demonstrate that the system(s) function correctly in accordance with the requirements of the Specification. Allow a period of at least fourteen days full running and operation for this demonstration. Take responsibility throughout this period for the operation and maintenance of the system(s).

289 WORKS TESTING

- In addition to the general requirements of the mechanical, electrical and lift building engineering services Specifications, the Installer's attention is brought to the following aspects all as detailed elsewhere: -
 1. Electrical switchgear – testing at works
 2. Electrical switchgear - temporary heating for protection
 3. BMS's and control panels - testing at works

290 NOTICE OF COMPLETION

- Requirement: Give notice of the anticipated dates of completion of the whole or parts of the Works.
- Associated works: Ensure necessary access, services and facilities are complete.
- Period of notice (minimum): One month.

420 REMOVAL/ REPLACEMENT OF EXISTING WORK

- Extent and location: Agree before commencement.
- Execution: Carry out in ways that minimize the extent of work.

430 PROPOSED INSTRUCTIONS

- Estimates: If a proposed instruction requests an estimate of cost, submit without delay and in any case within seven days.

440 MEASUREMENT

- Covered work: Give notice before covering work required to be measured.

450 DAYWORK VOUCHERS

- Before commencing work: Give reasonable notice to person countersigning daywork vouchers.
- Content: Before delivery each voucher must be:
 - Referenced to the instruction under which the work is authorised.
 - Signed by the Contractor's person in charge as evidence that the operatives' names, the time daily spent by each and the equipment and products employed are correct.
- Submit: By the end of the week in which the work has been executed.

460 INTERIM VALUATIONS

- Applications: Include details of amounts requested under the Contract together with all necessary supporting information.
- Submission: At least seven days before established dates.

A33 Quality Standards/ Control

110 INCOMPLETE DOCUMENTATION

- General: Where and to the extent that products or work are not fully documented, they are to be:
 - Of a kind and standard appropriate to the nature and character of that part of the Works where they will be used.
 - Suitable for the purposes stated or reasonably to be inferred from the project documents. Contract documents: Omissions or errors in description and/ or quantity shall not vitiate the Contract nor release the Contractor from any obligations or liabilities under the Contract.

120 WORKMANSHIP SKILLS

- Operatives: Appropriately skilled and experienced for the type and quality of work.
- Registration: With Construction Skills Certification Scheme.
- Evidence: Operatives must produce evidence of skills/ qualifications when requested.

130 QUALITY OF PRODUCTS

- Generally: New. (Proposals for recycled products may be considered).
- Supply of each product: From the same source or manufacturer. Each product shall be of the manufacturers current range with no current plans to make product obsolete. Where such plans exist advise the Engineer
- Whole quantity of each product required to complete the Works: Consistent in kind, size, quality and overall appearance.
- Tolerances: Where critical, measure a sufficient quantity to determine compliance.
- Deterioration: Prevent. Order in suitable quantities to a programme and use in appropriate sequence.

135 QUALITY OF EXECUTION

- Generally: Fix, apply, install or lay products securely, accurately, plumb, neatly and in alignment.
- Colour batching: Do not use different colour batches where they can be seen together.
- Dimensions: Check on-site dimensions.
- Finished work: Not defective, e.g. not damaged, disfigured, dirty, faulty, or out of tolerance.
- Location and fixing of products: Adjust joints open to view so they are even and regular.
- Make proposals for providing benchmarks and mock ups in order to set agreed quality standards with the Engineer prior to undertaking extensive site installation works.

136 EXPOSED SERVICES

- The Contractor will ensure within any areas of the intended scheme where there are areas of exposed Services the services installation is undertaken in such a manner as to be appropriate for the aesthetics of the interior design. Benchmarking and sign-off of mock-up areas and samples shall be undertaken by the contractor and approved by the client team before services installation commences to ensure a suitable appearance is achieved for the exposed services installation in its entirety.

The services installer shall, as far as practicable, follow the requirements scheduled below:

- High level containment and wiring shall be installed adjacent to, equally spaced from, and parallel with, other local containment.
- High level LV wiring shall be generally contained within galvanised trunking following the perimeter of the space served or the principal pipework routes.
- Electrical supplies for all units shall be presented in a uniform position in relation to the unit served throughout the installation.
- Outgoing conduit ways from trunking to final equipment shall emanate at a right-angle to the trunking and be positioned to route to the device served without bends. Conduit finishes shall be consistent within each space.
- Where the fabric of the soffit permits, emergency lighting and fire alarm cabling shall be clipped direct to the soffit. All clips shall be metal.
- Fixings for all high-level equipment and containment, including containment for IT and mechanical services shall be installed at consistent intervals throughout each space.
- High level devices such as smoke detectors and PIRs shall not be installed on downstand beams and shall be centred within local space available.
- The installer shall allow for all exposed pipework to be installed in pre-covered self-seal tubes in accordance with the main thermal insulation specification clauses. The contractor will identify within their return any extra over cost associated with this element.
- The installer shall allow for ductwork on the floors to be fabricated and installed using ductwork system to provide symmetrical setting out where possible. This will be in accordance with the main ductwork specification clauses. The contractor will identify within their return any extra over cost associated with this element.
- The installer shall allow for the option of exposed pre-insulated ductwork for consideration and should be provided for within their tender.
- The installer shall allow for the option of exposed sections of public health pipework to be painted with a suitable finish to match the adjacent Architectural finishes. The contractor will identify within their return any extra over cost associated with this element.
- The installer shall allow for the uniform spacing of all supports (drop rods, uni-strut bracketry etc) to mechanical and electrical services where exposed to view including, but not limited to
 - Pipework
 - cable tray
 - Controls Cabling
 - Ductwork
 - PH Pipework
 - Domestic Water Services

140 COMPLIANCE

- Compliance with proprietary specifications: Retain on site evidence that the proprietary product specified has been supplied.
- Compliance with performance specifications: Submit evidence of compliance, including test reports indicating:
 - Properties tested.
 - Pass/ fail criteria.
 - Test methods and procedures.
 - Test results.
 - Identity of testing agency.
 - Test dates and times.
 - Identities of witnesses.
 - Analysis of results.

160 RELATED WORK

- Details: Provide all trades with necessary details of related types of work. Before starting each new type or section of work ensure previous related work is:
 - Appropriately complete.
 - In accordance with the project documents.
 - To a suitable standard.
 - In a suitable condition to receive the new work.
- Preparatory work: Ensure all necessary preparatory work has been carried out.

170 MANUFACTURER'S RECOMMENDATIONS/ INSTRUCTIONS

- General: Comply with manufacturer's printed recommendations and instructions current on the date of the Invitation to tender.
- Changes to recommendations or instructions: Submit details.
- Ancillary products and accessories: Use those supplied or recommended by main product manufacturer.
- Agrément certified products: Comply with limitations, recommendations and requirements of relevant valid certificates.

210 SAMPLES

- Products or executions: Comply with all other specification requirements and in respect of the stated or implied characteristics either:
 - To an express approval.
 - To match a sample expressly approved as a standard for the purpose.

220 APPROVAL OF PRODUCTS

- Submissions, samples, inspections and tests: Undertake or arrange to suit the Works programme.
- Approval: Relates to a sample of the product and not to the product as used in the Works. Do not confirm orders or use the product until approval of the sample has been obtained.
- Complying sample: Retain in good, clean condition on site. Remove when no longer required.

230 APPROVAL OF EXECUTION

- Submissions, samples, inspections and tests: Undertake or arrange to suit the Works programme.
- Approval: Relates to the stated characteristics of the sample. (If approval of the finished work as a whole is required this is specified separately). Do not conceal, or proceed with affected work until compliance with requirements is confirmed.
- Complying sample: Retain in good, clean condition on site. Remove when no longer required.

320 SETTING OUT

- Preparatory work by others: Check and record setting out against the dimensions shown on the drawings, and record the results on a copy of the drawings.
- Discrepancies: Notify and obtain instructions before proceeding.

330 APPEARANCE AND FIT

- Tolerances and dimensions: If likely to be critical to execution or difficult to achieve, as early as possible either:
 - Submit proposals; or
 - Arrange for inspection of appearance of relevant aspects of partially finished work.
- General tolerances (maximum): To BS 5606, tables 1 and 2.

505 COOPERATION

- Execution of work: Cooperate with other contractors, suppliers, Local Authorities and statutory undertakers.

540 DEFECTS IN EXISTING WORK

- Undocumented defects: When discovered, immediately give notice. Do not proceed with affected related work until response has been received.
- Documented remedial work: Do not execute work which may:
 - Hinder access to defective products or work; or
 - Be rendered abortive by remedial work.

560A TESTS AND INSPECTIONS

- Timing: Agree and record dates and times of tests and inspections to enable all affected parties to be represented.
- Confirmation: Three working days prior to each such test or inspection. If sample or test is not ready, agree a new date and time.
- Records: Submit a copy of test certificates and retain copies on site.

630 QUALITY CONTROL

- Procedures: Establish and maintain to ensure that the Works, including the work of subcontractors, comply with specified requirements.
- Records: Maintain full records, keep copies on site for inspection, and submit copies on request.
- Content of records:
 - Identification of the element, item, batch or lot including location in the Works.
 - Nature and dates of inspections, tests and approvals.
 - Nature and extent of nonconforming work found.
 - Details of corrective action.

710 WORK BEFORE COMPLETION

- General: Make good all damage consequent upon the Works. Temporary markings, coverings and protective wrappings: Remove unless otherwise instructed.
- Cleaning: Clean the Works thoroughly inside and out, including all accessible ducts and voids. Remove all splashes, deposits, efflorescence, rubbish and surplus materials.
- Cleaning materials and methods: As recommended by manufacturers of products being cleaned, and must not damage or disfigure other materials or construction.
- COSHH dated data sheets: Obtain for all materials used for cleaning and ensure they are used only as recommended by their manufacturers.
- Minor faults: Touch up in newly painted work, carefully matching colour and brushing out edges. Repaint badly marked areas back to suitable breaks or junctions.
- Moving parts of new work: Adjust, ease and lubricate as necessary to ensure easy and efficient operation, including doors, windows, drawers, ironmongery, appliances, valves and controls.

A34 Security/ Safety/ Protection

140 CONSTRUCTION PHASE HEALTH AND SAFETY PLAN

- Content: Detailed proposals for managing health and safety during the construction phase together with site rules and emergency procedures. Include method statements for:
 - Management of any residual construction/ health hazards identified at tender stage.
 - Any other significant hazards arising from the development of the design of the works.
- Submit: To Principal Contractor. Minimum period before the programmed date for the start of the works: two weeks.

150 PROTECTION OF EQUIPMENT

- The Contract Administrator 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 weather tight, without unacceptable risk of water or dust reaching the installations. If the measures taken by the Installer prove to be inadequate, the Contract Administrator will decide whether repairs may be effected and suitable recompense made to the Employer, or whether damaged installations are completely replaced.
- All costs for replacement remain with the Installer.

160 DELIVERY

- Provide adequate and safe protection for all materials and products during transport to site. Deliver, with open ends effectively plugged, capped and sealed, all ducting (where so specified), piping, tubes, conduit, trunking and associated equipment.

170 HANDLING

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

180 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 racks 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.

190 PROTECTION OF WORKS

- Provide adequate and safe protection for all materials and products during and after installation stage.

- Ensure all items are protected against ingress of water and dust, formation of condensation, extremes and rapid changes of temperature, direct sunlight, building works and operations to other items.
- Protect throughout erection and after installation, vulnerable or delicate materials or finishes, with hardboard covers or heavy duty polythene sheet. Such items include but are not limited to: -
 - control panels
 - switchboards
 - distribution boards
 - heater batteries
 - heat emitters (radiators, convectors, trench, over door, etc.)
 - 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.
- Paint parts liable to corrosion immediately after removal of any temporary protection.
- Replace material, plant or equipment where deterioration has occurred prior to handover.

200 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.

210 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.

220 EXISTING SYSTEMS

- Where existing electrical systems are retained redundant, make them safe by all necessary means including their disconnection, termination, isolation and labelling, so that it is impossible for any person to unwittingly expose themselves to electrical shock.

230 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 Works or Sites. 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 project area.
- 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, improperly installed or maintained and resultant damage occurs (or damage is caused by negligent action of site personnel) the Installer will promptly repair the damage at his own expense and, if instructed by the CA, 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 tripping hazards.
- Install adequate temporary signage to warn non-contract staff of the building works and of all wet surfaces. Failures to sign wet surfaces adequately which result in a claim of damage to personnel, will result in the Installer compensating the victim at his own expense.
- Install protection to prevent damage by the Works to any element external to the Works area, including damage to hardstandings, grassed areas, pavements, roads, etc. Repair all damage at the Installer's own expense so as to return the damaged element to its condition immediately prior to the damage occurring.

390 SMOKING ON SITE

- Smoking on site: Not permitted.

640 MATERIALS FOR RECYCLING/ REUSE

- Duty: Sort and prevent damage to stated products or materials, clean off bedding and jointing materials and other contaminants.
- Storage: Stack neatly and protect until required by the Employer or for use in the Works as instructed.

A37 Operation/ Maintenance of the Finished Works

110A BUILDING MANUAL

- Information: Provide the following to Principal Contractor:
- The parties: Names, addresses (including e-mail), telephone and fax numbers of subcontractors, suppliers and manufacturers.
- Works undertaken:
 - Full details of the operation and/ or maintenance.
 - List maximum loads, services capacity and restrictions.
 - Limitations of any user performance.
 - Full maintenance instructions including access provisions.
- Systems operation:
 - Full instructions for all equipment and systems.
 - Procedures for seasonal changeovers and fault finding.
 - Record drawings/schedules for each system indicating principal items of plant, equipment, valves etc.
 - Identification of services with a legend for colour-coded services.
 - Instruction for dismantling and removing equipment and systems.
- Product details:
 - Copies of manufacturers' current literature including COSHH dated data sheets and recommendations for cleaning, repair and maintenance.
 - Schedules including manufacturer and product reference.
 - Guarantees, warranties and maintenance agreements.
 - Test certificates and reports required in the specification.
 - Emergency procedures including telephone numbers for emergency services.
- Copies of the information:
 - Submit 3 copies.
 - Latest date for submission: two weeks after request by Principal Contractor.
- Operations and Manual:
 - €50,000 retention on non-completion of O and M.

115 HEALTH AND SAFETY INFORMATION

- Content: Obtain and provide the following information: Pre-Construction information and all information relevant to residual risks.
- Format: incorporate into Health and Safety File and submit in hard copy and electronically.
- Deliver to: Contract Administrator No later than: 1 week prior to Practical Completion.

125 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 Contract Administrator.
- Produce all Record Drawings using AutoCAD, (latest release). Provide every drawing file in both 'drawing format' (.DWG) and 'drawing exchange format' (.DXF).
- Incorporate the required information onto every drawing, number of copies given herein, and produce agreed computer disk copies for the Client's use.
- 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 Contract Administrator prior to creation of the C.A.D. drawing files.
- Issue Record drawings of the final "as installed" layouts in draft form for approval prior to the testing and commissioning period, to allow checking for accuracy. Once approved, revise as necessary the complete set of draft Record Drawings to incorporate testing and commissioning data where applicable, and hand over the final set(s) of 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 Record drawings made up of 2 sets of white prints and 2 e-copies.
- Maintain on site a set of Drawings for the purpose of progressive marking up of alterations and variations. Make these drawings available for inspection by the Contract Administrator at any time and use as the basis for the Record drawings.
- Issue a set of draft marked up white prints 8 weeks prior to Completion or Completion of Section as defined in the Main Contract Preliminaries, for the Contract Administrator's comments. Comments will be provided within 4 weeks of receipt of the drawings.
- Indicate on the Record drawings the completed works as installed and show all plant, equipment and pipe/ cable/ conduit routes, together with full details of plant/ cable/ pipe/ duct sizes and schematic diagrams as appropriate.
- Provide good quality plant and switch room drawings, schedules and schematics.
- Provide and install the following in each plant room and switch room, any other appropriate location or where directed by the CA:
 - Schematic drawings of circuit layouts showing identification and duties of equipment, numbers and locations, controls and circuits.
 - Schedules in the form of printed sheets showing the number, type, location, application/service and symbol, and normal operating position of each means of isolation.
 - First aid instructions for treatment of persons after electrical shock.
 - All other items required under Statutory or other regulations.
 - Location of all incoming service isolating and metering facilities.
 - Emergency operating procedures and telephone numbers for emergency call out service applicable to any system or item of plant and equipment.
 - Prepare electrical drawings in accordance with IS EN 61082-1.
 - Protect surface of drawings by framing under glass or other rigid, transparent, cleanable and protective surface
- Show on the Record drawings: -
 - any other information, particularly that shown on Installation/ Working drawings, that may be useful in the operation, maintenance or subsequent modification or extension of the installation, and all reference numbers or letters, for the control equipment of plant items or any parts thereof, corresponding to the lettering, numbering or any identification fixed to plant or equipment, and on the Record electrical schematic diagram, show the identification reference numbers and letters of all cables.
- Ensure that the Record drawings conform to the following standards: -
 - all hard copy Record drawings are on best quality paper, with CAD files provided in native and PDF format

- all titles, headings, etc. have a height not less than 5mm
 - all other lettering is upper case in a height of not less than 3mm.
- Every Record drawing shall show the following information: -
 - Employer's name
 - Name of Contract and, where appropriate, the zone or floor designation
 - Description of drawing, it's number and scale
 - Name and address of originator
 - The Installer's signature that the completed Record drawing is a true record
- Submit for comment all Record drawings at the same time as the Operating and Maintenance Instruction Manuals.
- Note that in the event of non-compliance with this Clause, the Contract Administrator reserves the right to have the Record drawings prepared by others and to deduct the cost of preparing them from monies otherwise due to the Installer. The sum deducted will be the actual cost and may be greater than any sum declared by the Installer

130 OPERATING AND MAINTENANCE INSTRUCTION MANUALS

GENERAL

- Provide operating and maintenance instruction manuals as detailed herein. This shall contain no less information and in the format recommended in BSRIA Guide BG79/2020 'Handover Information and O&M Manuals'.
- Produce all manuals using an agreed word processing package. (Tender to allow for Word For Windows latest release).
- For every major plant item submit to the Contract Administrator with the draft version of the Operation and Maintenance Manual, written confirmation from every manufacturer of a list of documents that the manufacturer considers must be held on site for the proper operation and maintenance of the plant supplied. The Contract Administrator will use these written confirmations when determining whether or not the Operating and Maintenance Manual is complete.
- The major plant to which this requirement applies includes, but is not limited to, the following: - heat recovery equipment, air handling units, lighting controllers, earthing equipment, automatic control and BMS equipment.
- Issue a draft copy of the operating and maintenance instruction manuals contained in a temporary loose-leaf binder for approval of content, layout and form. Issue a draft copy of the manual 8 weeks prior to Completion or Completion of Section as defined in the Main Contract Preliminaries, for the Contract Administrator's comments. The Contract Administrator will provide such comments within 4 weeks of receipt of the manuals.
- Hand over two copies of the final document and an electronic version to the Contract Administrator at Completion or Completion of Section as defined in the Main Contract Preliminaries, including all testing and commissioning results, and final plant duties and control settings etc., in a typed form (i.e. the commissioning data must be part of the word processed document. Handwritten entries are not acceptable).
- Issue a further copy of the final version of the O&M Instruction manual to the Principal Contractor for insertion into the Health & Safety File (CDM) in accordance with the Principal Contractor's programme.
- In the word processed format operating and maintenance instructions, cover all items of plant and equipment and include a detailed physical and functional description of the complete installation, supplemented with manufacturer's details and maintenance instructions for all components, plant and equipment and all diagrams, data and an asset register, as may be required for the successful operation and maintenance of the plant and equipment.

- The manual shall conform to the following minimum standards: -
 - Multi-ring PVC bound stiff binder able to withstand constant usage, or where a thicker type of binder is required it shall have steel locking pins.
 - Print on the cover the following information: - "Operating and Maintenance Instruction Manual" (Project Name and Service).
 - Where more than one volume is required, the cover shall also be printed with volume number.
 - Provide each section of the manual with a stiff full-page divider. Label the divider as to the section of the manual. Do not obscure the labels with the manual's content, i.e. where a drawing or other information is incorporated using a transparent plastic pocket the label/ tab must be visible.
 - Typewrite all written instructions within the manual with a margin on the left hand side.
 - Arrange the manual as follows: -
 - Ensure that the general contents of the manual are in accordance with BSRIA TN15/95 – Handover Information for Building Services.
 - Section One - Index and how to use the manual
 - Section Two - Description of Systems, i.e. a full description of each of the systems installed, written to ensure that the end user fully understands the scope and facilities provided. For each system this should be based upon the 'System Description' clause in the specification and include appropriate aspects of the 'Performance Objectives' and 'Design Parameters' clauses of the specification.
 - Section Three - Health & 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.
 - Section Four - Description of the operational routines. The description must include step by step instructions on starting and stopping each plant or system (including seasonal change overs) and a fault diagnosis procedure 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.
 - Section Five - Planned maintenance instructions and asset register. This section must include step-by-step instructions on the maintenance of all items of plant including maintenance frequencies and procedures. Include data for ordering replacements and normal consumable items. Include full sets of manufacturer's maintenance instructions including wiring diagrams, cable schedules and circuit charts. Protection and overload relay settings shall be recorded and calibration charts shall be incorporated. This section shall include 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.
 - Section Six - Manufacturer's information. This section must include an asset list/ equipment schedule, part's identification referenced to record drawings, recommended spares policy and manufacturer's relevant literature. The contact name, address and telephone number/ fax number of all manufacturers used shall be included.
 - Section Seven - A set of Record Drawings and Test Certificates. If necessary, due to the number of drawings that have to be included in the manual, every drawing shall be photographically reduced in size to suit the manual. Record documents shall also include all plant room and switch room schedules and schematics.
 - Section Eight - Emergency measures and information. Include telephone numbers of the Installer's emergency staff and names, addresses and telephone numbers of all manufacturers.
 - Section Nine - Performance guarantees (as detailed in clause A33 -2000).

ELECTRONIC O&M MANUALS

- Provide a computer based O&M manual system, written, compiled and completed in accordance with the requirements of this specification and BSRIA document BG79/ 2020 Handover, O&M manuals and project feedback.
- Forward the manual supplier's name, address and details to the Engineer for approval prior to procurement. (A list of electronic O&M manual providers/ software producers appears within the BSRIA document.)
- Make all text in English, with all terms defined when first introduced.
- Make the manual supplier responsible for all corrections of errors or omissions in the manual.
- Ensure that the manual supplier identifies 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 users. 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 pictures loaded into it. Ensure that the manual is protected to prevent overwriting of information and Record drawings.

140 BUILDING LOG BOOK

- Provide documentation for the users of the building to meet the requirements of Part L of the Building Regulations.
- Log book shall be produced using the CIBSE TM31 Main Template
- The log book shall include details of the metering strategy in accordance Part L of the Building Regulations
- For small businesses with a floor area <200m² (with approx 15 occupants) then CIBSE TM31 Small Business template shall be used

150 PROVISION OF SCHEDULE OF SPARES AND SPECIAL TOOLS

- Compile and submit to the Contract Administrator one month before completion of the works, a complete list of special tools, test equipment and spare parts to cover twelve 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 months period. Failure to give this information in good time, which prevents the Employer from carrying out proper maintenance of the installation, will result in the Installer being responsible for carrying out the maintenance at his own cost. 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 by the mechanical/ electrical/ lift/ sprinkler Installer as appropriate.
- 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 Contract Administrator for consideration by the Employer, noting that the Employer reserves the right to choose the spares that will be supplied by the Installer up to the value included in the Tender and to choose the spares that will be supplied at additional cost to the Contract.

190 MAINTENANCE SERVICE

- Scope; provide a comprehensive maintenance service for the following items of plant and equipment: Include all planned preventative maintenance, as set out within the maintenance schedule and replacement of all consumable items
 - Mechanical Services, lighting installations
- Terms: Fully comprehensive.
- Commencement: At practical completion.
- Duration: 12 Months.

200 INSTRUCTION OF EMPLOYERS REPRESENTATIVES

- At a time to be agreed prior to Completion or Completion of Section as defined in the Main Contract Preliminaries, instruct up to four representatives of the Employer in the use and correct operation of the Contract 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.
- Issue handouts for the training sessions in the form of precise versions of the Operating and Maintenance Instructions detailing in simple terms the functions and method of operation of each system.

A50 Products By/ On Behalf of the Employer

120 PRODUCTS PROVIDED BY/ ON BEHALF OF EMPLOYER

- General: Details of such products are given in the work sections, for fixing by the Contractor. Use for no other purpose than the Works.
- Handling: Accept delivery, check against receipts and take into appropriate storage.
- Surplus products: Keep safe and obtain instructions.

REFERENCE CONTACT INFORMATION

For meters:

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For switchgear alterations:

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