



THE PRIORY, WARE

Mechanical Services Specification Part 1

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ISSUE & REVISION RECORD PART 1

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Part 1 Mechanical Services Specification

PRELIMINARIES – MECHANICAL & ELECTRICAL

GENERAL CONDITIONS

1. Extent of works

All services shown on the drawings and described in the Engineering Specifications shall be deemed to be included in the Contract works.

This document shall be read in conjunction with the Main Contract preliminaries and other documentation.

2. Contract definition of terms

The following definitions shall be as the Main Contract conditions and Form of Agreement. The Specification of Engineering Services includes definitions, which relate to that part of the Specification only and shall be interpreted as such.

Sub-Contractor shall mean the person or firm responsible for the execution of the works as stated in this Specification and indicated on the drawings.

Main Contractor shall mean the **Winning Tenderer**.

Project Manager shall mean a person or firm or their representative who is appointed on behalf of the Employer as the Employer's agent. In this instance, **Rob Berridge** from **Rob Berridge Heating Design Consultants (RBHDC) 07974 594250**.

Architect shall mean – **RBHDC**

Services Engineer or **Design Team** shall mean **Rob Berridge Heating Design Consultants (info@robberridge.co.uk)** or their representatives who are appointed on behalf of the Employer on all aspects regarding mechanical services matters.

Structural Engineer shall mean a person or firm or their representatives who are appointed on behalf of the Employer on all aspects regarding structural and civil engineering matters.

Acoustician shall mean Winning Tenderer or their representatives who are appointed on behalf of the Employer on all aspects regarding acoustic matters.

Employer shall mean **Ware Priory - Terry Philpott: 01920 460316**.

Drawings shall mean the drawings prepared by **Rob Berridge Heating Design Consultants**.

Co-ordination drawings shall mean drawings showing the inter-relationship of two or more engineering services and their positions relative to the structural and architectural details prepared by the Sub-Contractor.

Builders work information shall mean drawings, sketches and/or schedules showing the requirements of architectural and/or structural provisions necessary to facilitate the execution of the Sub-Contractor's

proposals for the execution of the Contract works and to allow their integration into the construction works.

Installation drawings shall mean drawings based on and incorporating the Co-ordination drawings and the latest issue of architectural and structural drawings showing the details of the Sub-Contractor's proposals for the execution of the Contract works. The drawings shall be to scale showing all important dimensions and in such detail as to enable all aspects of the Contract works to be installed.

Shop drawings shall mean fully dimensioned drawings issued by the manufacturers for the purpose of manufacturing equipment.

Manufacturing drawings shall mean certified drawings issued by the manufacturers for the purpose of manufacturing equipment.

Catalogue information shall mean information currently published with regard to physical dimensions, weight and performance of the manufacturer's items of equipment, which have been specified elsewhere.

3. Visit to site

It is deemed essential that the Tenderer visits the site and thoroughly acquaints themselves with the nature of the work and the conditions under which the work will be executed prior to submission of his tender price.

The Tenderer is especially requested to examine the means of access and approach to the site, and the local conditions, as no extra cost will be allowed on the grounds of lack or absence of information in this respect.

4. Sub-Contractor's obligations

The Sub-Contractor shall be responsible for all works detailed in the Engineering Specification and shown on the drawings and in particular the following:

- Inspecting all plant, equipment and materials as delivered or where specified at the manufacturer's works and if so requested or directed in the Specification, shall make the necessary arrangements and pay for travel and other expenses of the Engineer for the inspection and/or tests to be carried out at the works.
- Supplying and delivering to site, unloading, handling, temporary storage and protection, distribution and hoisting all plant and equipment required for the Contract works, providing suitable office, workshops and stores and clearing away on completion.
- Fixing or installing correctly all plant equipment and materials and ensuring that all associated works (electrical wiring, etc.) are properly executed.
- Undertaking specific detailed design tasks as indicated in this Specification.
- All on site co-ordination including all other manufacturers, suppliers or Sub-Contractors.

- Providing installation drawings, final or supplementary Builders work information and shop drawings.
- Testing and commissioning the complete installation including making adjustments and balancing as necessary.
- Demonstrating that the equipment is capable of the performance and method of operation specified to the satisfaction and acceptance of the Design Team.
- Demonstrating 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 Design Team.
- Providing record drawings of the complete installation including the fire brigades locational plan record charts.
- Providing operating instructions and maintenance manuals for the complete systems.
- Provide the full set of test results in an approved, bound format for all tests, commissioning and balancing operations.
- Instructing the Employer's staff in the use, operation and maintenance of the installations.
- Handing over all specified tools, keys, spares, oils, chemicals etc.
- Appointing a specialist commissioning Sub-Contractor who will be responsible for the testing, commissioning, works inspection, record drawings, operation and maintenance manuals, training of the Clients staff and operation of the plant for all mechanical and electrical services, after practical completion of the Main Contract.
- All necessary co-ordination and liaison, with the appointed commissioning management specialist.
- Provide maintenance for 12 months from practical completion or as otherwise agreed.

5. Sub-Contractors responsibilities for detailed production information

The Sub-Contractor shall be responsible to the Employer for, but not limited to, the detailed activities listed below for the production of further information including and in addition to those activities normally undertaken through the custom and practice of the industry all of which shall be generally subject to the approval of the Design Team.

Approval by the Design Team shall not relieve the Sub-Contractor of his responsibility of the suitability and correctness of the approved designs and his obligations as to their, 'Fitness for Purpose'.

The Sub-Contractors obligations shall include but shall not be limited to:

- Checking the provisions for and adequacy of the preliminary Builders work drawings or information previously issued by others prior to the Sub-Contractors award of contract.
- Final or supplementary Builders work information based upon manufacturing drawings including access to false ceilings and ducts for maintenance.
- Installation and shop drawings.

- Drain and vent point actual locations and pipe-work gradients.
- Detailed design and final exact locations of brackets and supports.
- Detailed design of expansion anchors and guide locations.
- Valve, damper and access door locations.
- All conduit dimensions, locations and routes.
- Calculating system water capacities and where relevant, chemical additives or vacuum degassing, water treatment to VDI2035.
- Final selection of all anti-vibration mountings to suit the particular application of the mounts.
- Calculating all cable sizes and electrical protection devices for all control systems.
- Full integration to any existing BMS with full written explanation of any control system alterations or new circuitry.
- Sound attenuation equipment, final details performance, specification and selection.
- Final location of test points, thermometers, thermostats, pressure gauges etc.

6. **Quantified schedule of rates *(To be agreed with The Priory & RBHDC)***

Quantified schedule of rates shall be prepared and submitted by the Sub-Contractor with the tender submission and shall only constitute part of the Contract in the following respects:

- The descriptions of the works and the rates and prices contained therein shall be used for the purpose of assessment of interim applications and variations.
- The Provisional and Prime cost sums contained therein shall be subject to adjustment in accordance with the rules and procedures contained in these Contract Conditions.

7. **Builders work**

The expression 'builders work' shall mean that work which shall be carried out by the Main Contractor in connection with, or consequent upon, the works and will embrace such work given below. The Sub-Contractor shall be responsible for marking out on site and providing drawings giving all necessary information for the execution of the works described.

The Sub-Contractors attention is drawn to the high degree of accuracy and care required in the marking out of builders work requirements and the preparation of detailed drawings which shall be prepared only after careful liaison and co-ordination with other trades.

- The cutting and forming of holes for conduit, pipe or ducts and conduit, pipe or duct fixings through wall, floor, ceilings, partitions and roofs and making good after the work is sufficiently advanced.
- The construction of concrete and/or brick ducts in floors, walls etc.

- The formation of concrete bases and plinths for plant and equipment.
- The building of manholes, pits, sumps etc.
- The excavation and forming of trenches for services etc., and the filling in of same after the services are laid.
- Excavation and forming of ducts and trenches for underground services.
- The cutting or forming of chases, recesses, in floors, walls and ceilings for pipes, ducts, conduits and fittings and making good.
- Excavation for and laying of pipes or sleeves for carrying cables or other services.
- The building of brackets and holderbats or other form of conduit or pipe suspension.
- The painting of all pipes, tubes and conduits etc., other than that of a protective nature, after fixing, unless specified to the contrary.
- The construction of plantroom chambers, housings and Builders work ducts unless otherwise stated on the construction drawings or written within part 2 of this tender document.
- The forming of lift wells, lift pits, tanking or lining of pits and the drilling and lining or bore holes if required.
- The installation of dividing beams for multiple wells and inter-well pit screens and lifting beams in plantrooms and machine rooms if required.
- The forming of access ways via doors, ceiling tiles, wall panels or manholes in floors.

In general all holes through walls, floors and beams for pipes and ducts required to be left out by the Main Contractor during the process of building.

Where holes or other Builders work of a significant nature have already been agreed by the Design Team the Sub-Contractor shall check such builders work provision and satisfy themselves that the allowances are sufficient.

Where conduits, pipes or fittings are fixed to concrete, brickwork, blockwork or woodwork, by means of saddles or clips, the Sub-Contractor shall themselves execute the work necessary and shall include the cost of such work in the price given in their Tender.

Where conduits or pipes are to be secured to structural steelwork, the purpose-made clips and hangers detailed on the relevant drawings shall be used so as to reduce as far as possible the drilling of steel. Where the use of such clips is impracticable the permission of the Services Engineer or Design Team must first be obtained before any drilling of structural steelwork is commenced. Such drilling and tapping shall then be executed by the Sub-Contractor and the cost of this work shall be included in their Tender.

Builders work information

The Sub-Contractor shall provide the specified Builders work drawings/details and shall issue the same for construction in compliance with the agreed programme. Where major structural and/or architectural

facilities or provisions for engineering services may have already been shown on the drawings the Sub-Contractor shall check that these are correct, satisfactory and adequate for the purpose and shall confirm same in writing to the Design Team within one month of the award of the Contract. Subsequent to this period and in accordance with the agreed programme, the Sub-Contractor shall check the installation drawings and shop drawings against the requirements of the certified manufacturing drawings and modify if necessary same and then issue the final or supplementary detailed Builders work information.

Where the preliminary Builders work facilities issued prior to the Sub-Contractors award of Contract are not correct or insufficient, the Sub-Contractor shall advise the Design Team immediately when such becomes evident and shall obtain further instructions or advice from the Design Team. No additional cost or time extension will be allowed for modifications to the Contract works due to either the Sub-Contractors failure to adequately inspect and check the existing or preliminary Builders work facilities and provisions or to revise supplement and/or issue final information, drawings/details for the actual requirements.

Wherever practicable and agreed with the Design Team/Main Contractor, the Sub-Contractor may elect to mark on site actual locations of minor non-structural holes, up to 200 x 200mm through partitions, walls, floors, etc., and also chases in non fair-faced walls, floors etc., for conduits, pipes and the like in preference to providing drawings of such Builders work requirements.

The Sub-Contractor shall be responsible for the design, supply and installation of all necessary secondary steelwork required to support their installation.

8. Supply of information

The Sub-Contractor is advised that supplementary information will be provided by the Design Team from time to time as may be necessary to enable the Sub-Contractor to complete the Contract works in accordance with the Contract conditions. The Sub-Contractor shall allow for such progressive release of further information by the Design Team during the course of execution of the Contract works.

In order to facilitate the orderly and timely production of all further information, which the Sub-Contractor considers to be required, a programme indicating the progressive release of such information to enable the Sub-Contractor to complete the Contract works in accordance with the Contract conditions shall be submitted to the Design Team for approval.

9. Drawings

The drawings accompanying this Specification and prepared by the Services Engineer or Design Team are primarily to describe the design of the Contract works, the working principles of the system, general arrangements, principles of services co-ordination and the intended methods of installation.

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

The drawings also provide sufficient information:

- To facilitate the preparation of the Sub-Contractors estimate and tender.

- To enable all other participants to appreciate the interrelation of the Contract works.
- When read in conjunction with the architectural and structural drawings to enable the Sub-Contractor to prepare final or supplementary Builders work information, installation and shop drawings incorporating manufacturing drawings and final details of specified or selected plant and equipment.

The tender drawings indicate equipment and pipe-work, in sufficient detail to show how the services can generally be accommodated and co-ordinated with each other, the architecture and the structure. Those drawings are provided for information purposes only. Telephone backup is constantly available - **Rob Berridge: 07974 594250.**

The Sub-Contractor is responsible for all detailed co-ordination of services with other disciplines and following the principles and zones defined.

Dimensions are stated for elements of the Contract works, which have a visual impact on the completed works.

The tender drawings will not necessarily show all dimensions required to construct the works nor will they accurately locate every item of equipment or plant ancillary which does not influence the visual impact of the completed works. The Design Team's decision as to what has visual impact shall be final.

The tender drawings do not detail the building fabric or structure whether new or existing nor are they based on survey drawings or installation drawings of any other Sub-Contractor or Consultant.

All information required by the Sub-Contractor to produce his installation drawings or requirements are to be obtained by the Sub-Contractor at their cost.

Where it is necessary to survey an existing building or existing structure or services within that building to prepare co-ordinated installation and shop drawings, the Sub-Contractor is responsible for obtaining that information and the cost of obtaining that information must be included in their Tender. In the case of new services installations within a 'shell and core' type of development the Sub-Contractor shall allow for all costs associated with obtaining all necessary details of the base services system from the relevant Sub-Contractors and/or Design Team for incorporation into the shop and installation drawings.

Plant and equipment is shown based upon the manufacturers catalogue information and is subject to verification or revision by the Sub-Contractor when manufacturers drawings/instructions are available.

The Sub-Contractor shall therefore interpret the design intent of the drawings and shall reflect this in his installation drawings, subject to the comments of the Design Team. Where differences occur between the drawings and the working/installation drawings, these differences shall be deemed to be included in the Contract price and no additional cost shall be allowed due to any variation in layout, arrangement or detail deriving from the Sub-Contractors drawings unless the deviation is specifically covered by an instruction issued by the Design Team before the production of the drawings.

Where sprinkler installations are provided, the information shown on the Co-ordination drawings will indicate the design intent but shall be subject to verification by the approved installation Sub-Contractor who must accept ultimate responsibility for the design in accordance with LPC Rules.

10. Installation & shop drawings

The Sub-Contractor shall provide fully co-ordinated installation and shop drawings for the installation.

The installation and shop drawings shall be based upon the latest contract issue of the architectural, structural and engineering drawings and any other drawings or information on trades or disciplines issued during construction.

Where required the Sub-Contractor shall obtain all information on the structure, building fabric and building services installed by others whether these be new or existing.

The installation drawings shall confirm and/or amend the information provided on the Tender drawings and be based on detailed manufacturers information obtained by the Sub-Contractor. They shall also indicate any additional information, which the Sub-Contractor considers necessary to enable the works to be installed.

Where an alternative detail is proposed by the Sub-Contractor, which modifies any detail shown on the Tender drawings it must be submitted to the Design Team for comment and approval prior to installation at least five working days before those particular modifications are due to start.

The Sub-Contractor shall liaise directly with other appropriate Sub-Contractors for any other building element, ceilings, cladding, structure or whatever is considered necessary to ensure full and complete co-ordination with their building services installation drawings.

Where sprinklers are to be provided, the Sub-Contractor must produce detailed installation drawings which are sufficient for LPC approval. The final design responsibility will rest with the LPC approved installer but the detailed design must follow the proposals indicated on the co-ordination drawings unless there is a specific reason for modification.

The Sub-Contractor shall prepare all drawings on a computer aided drafting system AUTOCAD or compatible, producing drawings in standard DWG format and as stated elsewhere in this specification.

11. Site supervision

The Sub-Contractor shall, during the whole time that the works are in progress, maintain on site a competent Foreman who shall be authorised to accept and implement on behalf of the Sub-Contractor all instructions by the Main Contractor. Regular supervision of the works is also to be carried out by the Sub-Contractors supervising engineer who must also be available to attend and report at all site meetings, if required.

The Sub-Contractor shall also provide and maintain on the site for the execution of the works such charge-hands and operatives who are careful and skilled in their trades. The Services Engineer shall have the right to request the withdrawal of any employee whose general conduct or handling of the job is not, in the Services Engineers opinion, satisfactory.

12. Workmanship & materials

All materials, articles and workmanship shall be of the best quality and execution as detailed in the Specification and drawings. All materials shall be new and in accordance with the current issue (including amendments) at the date of Tender of the appropriate Specification issued by the British Standards Institution.

All materials considered by the Design Team to be unsound or not in accordance with the Specification shall be immediately removed by the Sub-Contractor at his own expense and all work carried out imperfectly or with faulty materials must be immediately removed and properly replaced by the Sub-Contractor to the satisfaction of the Design Team.

13. Preparation of drawings

All drawings are to be issued on Vectorworks as a dwg or pdf file. The drawing controller will issue drawings to all parties requiring copies. Generally all drawings will be issued via email. Where this is not possible, prints will be taken and drawings will be issued traditionally.

Where drawings require sign-off, this will be done using hard copies and sent back to the drawing controller or Design Team for status update and issue.

Drawings plots shall be "A" size to BS 3429, with an agreed logo/title block in the bottom, right-hand corner. Every plant and section layout drawing shall be multi-layer, with each service shown on a separate layer/overlay, for subsequent easy modification.

The Design Team will provide building outline drawings in agreed Vectorworks dwg format.

The standard drawing size is to be A1 or AO for all drawings. **A1 however is the preferred size.** Drawing units are to be metric with one unit being one millimetre. The title block information shall include the scale, drawing title, drawing number, date, company name, Employer, Architect and Services Engineers details.

All necessary sets in pipes and ducts around piers, columns, beams or other obstructions, although not shown on the Design Teams drawings, shall be carried out in accordance with good practice.

All drawings shall be read in conjunction with the Design Teams drawings and it shall be the Sub-Contractors responsibility to ensure that work is being carried out in accordance with the latest issue of the relevant drawings, assuming authority has been issued.

The Sub-Contractor must make provision for detailing and install the works specified herein to meet the building conditions on site and must satisfy themselves of the building conditions to provide every contingency in connection therein.

Scales used on drawings shall be selected appropriately to convey clearly the proposals.

Sub-Contractors suggested drawings or submittals

The Sub-Contractor shall on a weekly basis of commencement of the Contract, prepare a drawing schedule of all of his proposed drawings required for approval or comment.

The schedules shall indicate the following:

- Drawing number and revision number.
- Drawing title and service.
- Scale.
- Latest date required on site.
- Date required for final approval.
- Date for submission for approval.
- Date for commencement of drawing production.

The Sub-Contractor shall review and update the drawing schedule as necessary on a weekly basis during the contract period taking into account any revision, which may take place.

In planning the production of drawings and other information the Sub-Contractor shall take into account not only the number of drawings, schedules, etc., to be produced but also:

- The time required for submission to the Design Team and the Sub-Contractor.
- Examination by the Design Team.
- Alterations and re-submission in the event of the initial submission not being approved.
- Final issue for construction purposes.
- The Sub-Contractor shall state in the form of Tender the period required for his work.

14. Approval of any Sub-Contractors revised drawings or submittals

The Design Team will be offering comments on the technical content of the Sub-Contractors drawings or submittals in the process of giving approval.

The Sub-Contractor shall allow at least **5 working days** for approval by the Design Team of the drawings and submittals. The drawings and submittals shall be issued progressively grouped, as agreed in advance with the Services Engineer according to service to facilitate checking.

Design documents shall only be submitted to the Design Team for review in discrete packages, relating to a discrete element or section of the works. Each package shall contain all drawings, design calculations, where necessary, support information, manufacturers literature etc., necessary to facilitate an independent review. All documents (excluding drawings) submitted for approval must be adequately bound.

All drawings are to be clearly identified with a 'status' during the course of the project. The following categories are to be used and the appropriate definition of each category is given:

Preliminary	Drawing presented for informal comment as appropriate. Any comment, or lack of comment is not to be construed or implied as giving approval.
Information	Drawing presented for information only and no comments are required.
For Approval	Review by the Services Engineer/Architect/Design Team.

Construction Approved drawing for construction.

Revised items on drawings shall be indicated by 'clouds' around the changes and annotated with the revision number/letter.

All drawings shall require the approval of the Sub-Contractors Design Manager to verify that the drawing has been developed from an approved design and that the information does not conflict with the requirements of other design disciplines.

Only drawings which have been reviewed and which have incorporated the Design Teams comments may be progressed to 'Construction' status. Should it become necessary to revise the drawing, its status must be changed to 'For Approval' and be re-submitted.

On receipt and checking of the Sub-Contractors drawings the following conditions shall apply:

- A Proceed, No Comment.**
- or **B Proceed but incorporate comments. Incorporate the comments on the drawing prior to their re-issue for final comment.**
- or **C Rejected with or without comments; in this case the drawings shall be re-submitted after correction or with further information added.**

If no comments are received from the Design Team within a period of 10 working days from issue, then the Sub-Contractor is obliged to infer status A. The Sub-Contractor shall advise the Design Team in writing immediately that work is now commencing on that inference.

Where drawings are revised and updated during construction, these shall be issued to the Design Team for approval of the revision only, the revision being clearly marked.

Approval of any drawing or submittal by the Design Team shall not mean that the Design Team is responsible for the correctness of the drawing or submittal or its suitability for purpose and these responsibilities shall remain with the Sub-Contractor. Refer to clause 14 titled 'Mistakes on drawings revised by the Sub-Contractor'.

Builder's work information and installation drawings shall not be approved in detail but shall be examined by the Design Team for general suitability.

Record drawings shall be approved in the same manner as the Sub-Contractors drawings except that **28 working days** shall be allowed for approval purposes.

15. Revisions to Sub-Contractors drawings

Where revisions take place to the Main Works under the authority of an instruction, the Sub-Contractor shall modify the drawings accordingly and shall re-issue for construction purposes any such modified drawing. The issue of revised drawings shall be in accordance with and with regard to the agreed programme for construction and where time is available re-issues shall be grouped together, on a weekly basis.

Providing all revisions are properly incorporated into the Sub-Contractors drawings and the final installation is correct according to the drawings, then the final issue of these drawings may be used in conjunction with the draft set of marked up prints kept on site, as the basis for the Sub-Contractors record drawings.

16. Mistakes on drawings revised by the Sub-Contractor

The Sub-Contractor shall be responsible for any error, discrepancy or omission in any drawing prepared by them, or on their behalf whether or not such drawing has been submitted to the Design Team and approved by and/or issued on an instruction.

The said indemnity shall be subject to the proviso that such error, discrepancy or omission is not due to any inaccurate data, drawing or information provided by the Employer or by the Design Team on their behalf.

The Sub-Contractor shall reimburse the Employer for any abortive expenditure, which the Employer may incur in placing reliance on any such error, discrepancy or omission for which the Sub-Contractor is responsible.

For the purpose of interpretation of this clause, 'drawing' shall be deemed to include schedules or other approved methods of presentation.

17. Co-ordination of services

All aspects of the services installation require detailed co-ordination to avoid any possible clash or conflict with other trades and disciplines.

Where one or more Sub-Contractors are appointed for the Contracted works, they shall each install their portion of the works in accordance with the co-ordinated principles indicated on the drawings.

The Sub-Contractor shall undertake all detailed co-ordination in relation to his installation and shop drawings, and Builders work information. No extra cost or claim will be allowed due to conflict of works or installation, where full liaison with other Sub-Contractor(s) would have prevented such an occurrence.

The Sub-Contractor shall initiate all such co-ordination meetings that are necessary with other specialist Sub-Contractors and all surveys that are necessary to proceed with production of the co-ordinated installation drawings.

When any new, revised or updated architectural, structural or Services Engineer drawing is issued under the authority of an instruction, the Sub-Contractor shall examine such drawing and if necessary, modify the works accordingly to prevent any clashes or abortive work due to such instruction. No extra cost or claim will be allowed to cover any clashes or abortive work which results from the Sub-Contractor not requesting an explanation from the Design Team of the services aspect of any such a revision.

18. Co-ordination of services on site

The Sub-Contractor shall be responsible for the co-ordination of the installation of services.

Where minor clashes of services occur on site, which were not foreseeable at the design or co-ordination drawings stage then these clashes or minor co-ordination matters shall be resolved by discussion and agreement between the Sub-Contractors and Sub-Contractor. The Design Team shall be informed of the action to be taken by an approved means. Such minor clashes and their resolutions shall be the responsibility of the Sub-Contractor and no instructions will be issued to cover these matters or any payments made or delay claim accepted for resolving the clashes of services.

19. Site dimensions & levels

The Sub-Contractor shall use a laser levelling measurement system to install all building services installation work wherever possible. The Sub-Contractor will co-ordinate the measurements with all other Sub-Contractors on site to prevent any clashes. It is crucial to the wellbeing of the client and project that communication at all levels is constantly maintained.

20. Alternative manufacturers equipment

Where the Sub-Contractor has offered alternative equipment or materials in accordance with the clause entitled 'Specified Manufacturers' indicated elsewhere, which has been accepted by the Design Team prior to the award of the contract and which subsequently varies the main works in any way whatsoever, then the Sub-Contractor shall be responsible for meeting all the additional costs arising from such a change and not claim for additional costs or delay to the completion of the works will be allowed.

In such an event the Sub-Contractor will be solely responsible for the cost of re-designing any services affected by these equipment changes.

21. Manufacturers technical data

The co-ordinated drawings have been prepared based on current catalogue information of the equipment specified elsewhere.

Revisions to or modifications of the physical characteristics of the equipment, sometimes occurs between the published catalogue information and the final information issued on the manufacturing drawings. When such revisions or modifications arise, the Sub-Contractor shall incorporate these and their effects on other parts of the Contract works onto the installation drawings and where necessary the final Builders work information.

The cost of such modifications to the drawings and also the construction works shall be the responsibility of the Sub-Contractor and in addition, no extension to the programme and delay claims will be permitted as a result of such manufacturing changes.

All manufacturers data relating to the specified plant within part 2 of this tender document and the tender drawings will be supplied by the design team and will accompany the full tender package.

Full and current manufacturers O & M's are expected on completion and upgraded throughout the life of all supplied plant. (subject to maintenance contract).

22. Equipment & plant performance guarantees

Where equipment and plant performance data and duties are identified in the Specification, the Sub-Contractor shall check and ensure that the equipment (where the manufacturer is named and/or a figure number is quoted) is capable of the stated duty or performance in all respects and shall obtain a written undertaking from the selected manufacturer that all aspects of the defined specification will be achieved.

The Sub-Contractors attention is drawn to the fact that more than one clause of the Specification may cover the total performance of the equipment and shall therefore ensure that suppliers obtain or have seen all sections of the Specification prior to giving the written guarantee of performance.

23. Patent rights

The Sub-Contractor shall indemnify the Employer and the Design Team against all claims, costs or expenses in connection with any patented, copy-righted or protected articles supplied by the Sub-Contractor and used on or in connection with the Contract works and any payments or royalties payable in one sum or by instalments shall be included in the Contract price and paid by the Sub-Contractor to whomsoever they may become due. In the event of any claim being made on the Employer or the Design Team in connection with such patented or protected articles, they shall immediately notify the Sub-Contractor who shall, at his own expense, conduct any negotiations or litigation in connection with such claim.

24. Site dimensions & setting out of the works

The Sub-Contractor shall obtain their own dimensions on site for all plant and materials (including equipment specified) to be supplied and installed by them and shall be entirely responsible for the actual setting out and accuracy of dimensions and levels of the works.

As the development proceeds, the Sub-Contractor shall measure on site all work by others that may foreseeably affect his works. These dimensions shall be incorporated into the installation drawings or marked up on revised installation drawings if they have already been issued initially.

The Sub-Contractor shall rectify at their own expense and be responsible for any claim by others caused by any errors arising from their own inaccurate setting out or failure to check site dimensions.

25. Schedule of Sub-Contractors

No change shall be made to the Sub-Contractors without the prior consent of the Design Team in writing.

26. Inspection before concealment

Whenever work requiring inspection or testing is subsequently to be concealed, 7 days notice shall be given to the Design Team so that inspection may be carried out and/or tests witnessed before concealment. Photographic or Skype evidence may be permitted on agreement with the design team. Date authentication must be produced.

Failure to give due notice may necessitate the Sub-Contractor uncovering the work and reinstating it at their own expense.

Draft record drawings of the services to be concealed shall be issued to the Design Team at the time notice is given.

27. Specialist commissioning

The Sub-Contractor shall employ an independent company who specialises in testing and commissioning of building services to undertake on his behalf all commissioning activities. The Commissioning Engineer shall be appointed by the Sub-Contractor from a short list jointly agreed with the Sub-Contractor, Main Contractor, Commissioning Management Specialist and Services Engineer, BMS Management Team - unless otherwise agreed by the Design Team.

28. Commissioning & testing

The services Sub-Contractor is responsible for testing and commissioning the complete installation.

The services Sub-Contractor shall allow in his Tender for attendance, co-ordination and all necessary liaison with the Commissioning Validation Engineer, as required to suit the Main Contractors programme.

The Sub-Contractor is required to offer each system to the Commissioning Validation Engineer for acceptance, prior to operating the installation or selected parts thereof in the presence of the Design Team and shall make all specified tests to the satisfaction of the Design Team.

Should tests fail to demonstrate that the plant and equipment are properly installed and functioning correctly, the cause of the failure shall be investigated and should this be due to incorrect or faulty works by the Sub-Contractor or their Sub-Contractor or suppliers, then the Sub-Contractor shall without delay, carryout such remedial measures and adjustments as may be necessary and repeat the commissioning and testing procedure to the satisfaction of the Commissioning Validation Engineer, then the Design Team.

Where it is not possible at the particular time of commissioning and testing for full load conditions to be obtained or simulated, the Sub-Contractor shall repeat such operations of full load or a simulation thereof at a time when this can be achieved as agreed with the Design Team.

Where portions of the work are commissioned and tested separately, the Sub-Contractor shall, upon final completion, demonstrate to the Commissioning Validation Engineer and the Design Team that all the several portions are capable of proper simultaneous operation in accordance with the requirements of the Contract.

The Sub-Contractor shall indicate on drawings where access is required into ceiling voids, service risers etc., and ensure with the Main Contractor these points are not closed up until the commissioning works are complete and are available at the start of the commissioning works.

The Sub-Contractor is to provide all necessary attendance to operate and maintain the plant and equipment during the commissioning period as required and deemed necessary.

In cases where the construction programme is such that the Sub-Contractor 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., the Sub-Contractor shall take all necessary precautions against and shall be responsible for any damage caused whilst working in such areas for that purpose.

For the purposes of commissioning and testing of the installation, the Sub-Contractor shall provide all necessary skilled and unskilled labour and all necessary instruments and testing equipment.

The Commissioning Specialist duties shall include, but are not limited to:

- The testing, commission, balance and set-to-work the systems stated in the Specification and indicated on the drawing
- Provide documentation for tests.
- Provide a 'working' manual for use by the Client. The Manual shall be a working document on site for inspection by others.
- Provide weekly reports detailing progress, commissioning and demonstration activities.
- Keep a diary/log of all significant activities.
- Ensure all system are fully operational and integrated.
- Measure and reconcile noise levels at agreed locations to verify compliance with design criteria.
- Prepare comprehensive commissioning schedules and method statements and procedures.
- Verify all pre-commissioning and setting to work activities.
- Monitoring and reporting of all site 'starting' of main plant.
- Monitor progress against the program of works.
- Certification is to be attained and witnessed as necessary for inclusion into the record documentation.
- A report shall be submitted for every test, demonstration, balance or commission witnessed, together with an engineering appraisal on the performance, either on or off-site, shall be the responsibility of the Commissioning Specialist.
- Co-ordinate and liaison are necessary with the Commissioning Validation Engineer.

29. System demonstration

Subsequent to the completion of all testing and commissioning to the satisfaction of the Design Team, the Sub-Contractor, when directed by the Design Team shall operate the plant and shall demonstrate that the overall systems function correctly in accordance with the requirements of the Specification. A period of at least **one weeks** full running and operation shall be considered reasonable for this demonstration. During this period the Sub-Contractor shall be responsible for the recording of results and the operation and maintenance, if applicable, of the plant and may if appropriate, use this time to instruct the Employers staff and/or designated Maintenance Provider in the operation and maintenance of the systems.

30. Instruction of Employers staff

The Sub-Contractor shall at a time to be agreed and prior to practical completion instruct the Employers staff and/or designated Maintenance Provider in the use, correct operation and general maintenance of the Contract works and shall satisfy themselves that such staff are competent to take over the installation on completion. During such periods of instruction, the Sub-Contractor shall be responsible for the correct operation and maintenance of the installation. Site staff should hold appropriate qualifications in system maintenance (BMS) and be limited to, 'User Parameters'!

The Sub-Contractor shall employ the services of all relevant specialist Sub-Contractors, and suppliers necessary for this purpose and shall provide each person with a comprehensive set of teaching notes and diagrams.

'Formal' presentations shall be carried out over 'half day' periods and should contain the following information:

- Introduction.
- System Scope (demonstrated with the aid of schematics).
- Demonstration/training (by Controls Specialist where applicable) of the Control System linked to an electronic projector to demonstrate system monitoring – 'what to expect'.
- An electronic projector system 'walk through' of the Operation and Maintenance Manuals, highlighting important areas of Health and Safety.
- Instruction to staff will be on a, 'need to know' basis. ***Please Note: Onsite Responsible Persons/Staff must NOT touch plant technical parameters unless specifically trained to do so and this must be recorded in the final sign-off documents.***

31. Record documentation

The Sub-Contractor shall supply to the Design Team, **as a prerequisite to practical completion of the works**, comprehensive record documents finished in detail and approved by the Design Team. The Sub-Contractor is advised that great importance will be placed upon quality, accuracy, clarity and completeness of the record documents and upon them being made available promptly.

The Sub-Contractor shall demonstrate from time to time, as required by the Design Team throughout the execution of the works, that adequate and accurate records are being kept such as will ensure the ultimate completeness and accuracy of the record documents and that the record documents are themselves being progressively compiled as the work on site proceeds.

The Sub-Contractor shall maintain on site a complete set of progress drawings to indicate the progress and extent of the installation works.

These drawings shall be updated on a weekly basis and shall be available for inspection by the Design Team at all times.

Progress drawings shall be updated to indicate complete services works prior to the covering-up of services by ceiling tiles, ceiling panels, access covers, duct doors etc.

Record documents shall comprise the following, all as described in this Specification.

- Record drawings and schedules.
- Operating and maintenance instructions
- Tenants instructions for each demise

Record drawings

Six weeks (minimum) before the Sub-Contract completion date, the Sub-Contractor shall hand over a draft copy of every record drawing to the Design Team for comment. All progress drawings shall be submitted together with the draft record drawings.

Photographic reference is acceptable but must be absolutely clear in all aspects and be accompanied by a full written description and sent to info@robberridge.co.uk. This will be approved/rejected by return.

Draft record drawings in this context refers to record drawings that have been prepared on the basis of the progress drawings but shall be complete in all instances including reference numbers except for such modifications as may be found necessary during commissioning/acceptance tests/handover procedures etc.

Final draft record drawings shall be handed over to the Design Team for comments within fourteen days of successful acceptance tests/handover procedures etc. These drawings shall incorporate any modifications found necessary.

Record drawings shall show to the approval of the Design Team the work as completed and shall record as a minimum the following:

Related electrical installations

Layout drawings should indicate

- Cable origin. Path, destination, loading, conductor metal and size, insulation type and colour (if required for identification), number of cores in the cable and number of cables in trunking.
- Whether cables conduit and trunking are concealed in wall chases, screed, cast in-situ or run on the surface.
- The location route and depth of underground cables.

Layout drawings should show the following:

- HV/LV switchboards (panels).
- Primary cable/trunking distribution routes.
- Distribution switchgear.
- Distribution boards.
- Trunking tray and ladders in switch rooms and plant rooms.

- Single/three phase wiring and cable routes including sub-circuits.
- Electrical equipment including isolators, starters, socket outlets, control equipment and other associated equipment.
- Sections through risers and ceiling voids.
- Lighting configuration including distribution boards, switch locations and circuit identification.
- Emergency lighting luminaires and supply circuits.
- Lightning conductors and air terminals
- Earth electrodes and test clamps.
- Earth clamps.
- Main earth terminal.
- Cables providing specialist earth circuits.
- I.T. and telecommunication cabling, fibre optics etc.
- The identification and location of cabling concealed within the building structure or buried underground, including the depth and point of entry to the building of power of telecommunication cabling, fibre optics etc.

Schematic drawings should detail the following:

- Electrical systems including cable size, type and number of cores.
- Fire alarm systems.
- Emergency lighting.
- Other ancillary systems e.g. security, public address etc. Production drawings of factory built equipment should form part of the record drawings.

Mechanical installation

Layout drawings should show the following:

- The installation of mechanical services, including the size and route of ductwork and pipe-work.
- Arrangement of plant in plant rooms including identity, size and rating of plant.
- The identification and location of services concealed within the building structure or buried underground, including the depth and point of entry to the building of water and gas services.
- The location and identification of pipe-work regulating, isolating and control valves.
- The location and identification of regulating dampers and fire/smoke dampers including access points.
- The location of acoustic silencers.
- The location of air distribution grilles, diffusers and terminal units.
- Detail of vibration dampers.

Schematic drawings should detail the following:

- Heating, ventilation, air conditioning and piping/plumbing systems, including flow rates, temperatures and pressures.
- Arrangement of control systems including where appropriate sensors, field controllers/out stations and control panels.

Detailed wiring and controls drawings should be provided for all equipment and shall indicate:

- Origin, route and destination of each cable.
- Conductor size and number of cores (including spare cores), insulation type/rating, name/number of British Standard or industry code to which the cable complies.
- Cable identification method and colour.

- Joints and draw boxes.
- Power supply cables and their fuse reference
- Location and type of sensors.

Production drawings of factory built equipment should form part of the record drawings.

Each drawing shall show the following minimum information:

- a. The name of the Contract and where appropriate, the zone or floor designation.
- b. Description of drawing, drawing number and scale.
- c. Name and address of the Sub-Contractor and the Consulting Services Engineer.

The completed drawings shall be signed by the Sub-Contractor as record drawings and shall be submitted to the Architect at the same time as the operating and maintenance manual is handed over for comment.

Each record drawing shall include the words 'record drawing' in 18mm uppercase lettering in the bottom right-hand corner adjacent to the title block.

Operating and maintenance manuals, manufacturers & Sub-Contractors

Prior to the Sub-Contract completion date, the Sub-Contractor shall hand over a draft copy of each operating and maintenance manual to the Services Engineer for comment.

The draft copy of each manual shall conform to the required format required by this Specification to enable all relevant comments to be made by the Services Engineer.

The Sub-Contractor shall prepare the operating and maintenance manual as:

- A paper copy as outlined elsewhere.
- A Digital CAD or pdf format capable of being read by a desktop PC.

The Sub-Contractor shall submit with his tender, an outline specification and proposal for supplying the operating and maintenance manual in a digital CAD or pdf format.

As a minimum, the format shall provide:

- A simple and 'user friendly' navigation approach, allowing information to be accessed easily.
- A search facility.
- Printing of all information.
- All data, schedules, drawings and other information as contained in the paper copy of the manual.
- Clear instructions on the screen.
- A set-up programme creating a programme start icon.

The format shall be complete with a user instruction manual.

Three copies of the final approved manual in both formats are to be provided within one calendar month of the contract completion date and passed to the Employers representative.

The manual shall be arranged as follows:

- How to use the manual.
- Emergency information.
- Contractual and legal information.
- System description and design intent.
- Asset list/equipment schedule.
- Parts identification and recommend spares.
- Spares policy.
- Commissioning data.
- Operation.
- Maintenance.
- Fault finding.
- Lubrication.
- Modification information.
- Disposal instructions.
- Names and addresses of manufacturers.
- Index of plans and drawings.
- Manufacturers literature.

The manual shall conform to the following minimum standards:

- a. The covers shall be substantial, of adequate size, distinctive and of sufficient strength to protect the contents for the life of the installation. The method of binding shall give a permanent anchorage along the left hand side whilst allowing the text to be flat without damage to the spine.
- b. The manuals shall be prepared on an approved typeface on top quality A4 paper suitable for direct insertion into the manuals.
- c. The front cover and where appropriate the spine, shall have the following information clearly displayed in permanent lettering:
 - i. *Name of logo type of the Client.*
 - ii. *Name of building and details of the services included in the manual.*
 - iii. *A volume number where the manual runs to more than one.*
- d. The title page shall contain the following:
 - i. *Title of the building.*
 - ii. *Services referred to in the manual.*
 - iii. *Full name and address of the Client.*
 - iv. *The Authors reference number of the manual.*
 - v. *Date of completion and date of handover of the services to the Client.*
 - vi. *Date of issue.*
 - vii. *Name and address of manual author.*
- e. The preliminary pages should contain:
 - i. *Full name, address and telephone number of the Consulting Services Engineer.*
 - ii. *Full name, address and telephone number of the services Sub-Contractor and all Sub-Contractors.*
 - iii. *Any limitations on the use of the manual.*
 - iv. *Record of amendments to the manual.*
 - v. *Contents list.*
 - vi. *Description of how to use the manual.*
 - vii. *List of all supplementary documents.*
- f. Each section of the manual shall be divided by a stiff divider the same size as the holder. The divider shall be labelled to identify the section of the manual which is following.

- g. All pages comprising the manual shall be subsequently numbered according to each Section, (i.e. Section 1:1/1, 1/2 etc., Section 2:2/1, 2/2 etc.).

Practical completion will not be granted by the Design Team if the Sub-Contractor fails to undertake the above procedure for the preparation of the record documentation and leaves the production of such drawings too late in the construction/commissioning period.

32. Beneficial use of installations

The Sub-Contractor shall, if required prior to practical completion and after the issue of a written instruction, operate the installations or any part of them, provided that such operation is practicable and does not prejudice the Sub-Contractors responsibilities and obligations under the Contract. The Sub-Contractor will be reimbursed in respect of all labour and other direct operating charges arising from the use of such installations at day-work rates or where no such rates are applicable at reasonable rates to be agreed with the Design Team beforehand.

33. Noise/nuisance

The Sub-Contractor will be held responsible for carrying out the work with as little noise as possible and no nuisance is to be caused to the Employer. The Sub-Contractor shall fully comply with the requirements of the Environmental Protection Act 1990 (latest amendment) and the Employer.

The Sub-Contractor shall take all necessary precautions to prevent nuisance from smoke, rubbish and other causes. The Sub-Contractor shall fit all compressors, percussion tools and vehicles with effective silencers of a type recommended by manufacturers of the equipment.

34. Suppressers

All internal combustion engines used on the Contract works, whether to drive plant at the site or in transport vehicles, shall be fitted with efficient suppressers in the ignition system in accordance with the recommendations of BS 833, so as to prevent electrical interference to radio or television receiving apparatus in the vicinity.

All temporary electrical installations such as motors or the like shall be prevented from creating such interference and the Sub-Contractor shall be responsible for fitting suppresser equipment in accordance with the latest issue of BS 613, as directed by and to the satisfaction of the Design Team.

35. Advertisements

NO advertisements shall be displayed by the Sub-Contractor at or adjacent to the site of the works other than on the Main Contractors site sign board.

36. Practical completion

As a pre-requisite to the issue of a Practical Completion Certificate in respect of the complete Contract works or part thereof, the Sub-Contractor will be required to demonstrate to the satisfaction of the Design Team that he has:

- I. Achieved practical completion. For the purposes of the Contract this shall be accomplished when, in the opinion of the Design Team all works and tests have been completed other than minor snags or defects which could be reasonably completed within an agreed programme without causing disruption to the Employer's use of the building or part thereof.
- II. Made in the presence of the Design Team the tests and demonstrations specified.
- III. Supplied to the Design Team the necessary specified record drawings and schedules, the final copies of the Operating Instructions and Maintenance Manual for the installation approved by the Design Team.
- IV. Instructed the Employer's staff in the use and correct operation of the installation in accordance with the programme to be agreed with the Design Team.
- V. Handed over all spares, keys, tools, oils and chemicals as specified elsewhere.

37. Defect liability

The Sub-Contractor shall be liable for making good defects in the installations for a period of **twelve months** from the date of issue of the Certificate of Practical Completion of the installations, unless otherwise agreed.

If, as part of the liability defects, the Sub-Contractor replaces or renews any portion of the Contract works, the Defects Liability Period in respect of that portion of the Contract works shall be deemed to commence from the date of such replacement or renewal, or as manufacturers guarantees allow should any failure be proved to be their error.

If the replacements or renewals are of such a character as may affect the efficiency of the Contract works or any portions thereof, the Design Team may require that new tests be carried out to demonstrate that the plant is continuing to work satisfactorily.

The Sub-Contractor shall take all necessary precautions in the remedying of defects in the Contract works to minimise the risk of damage to the buildings, the decorations, the fittings and the equipment. In the event of such damage occurring the Sub-Contractor shall bear the cost of replacement or making good, subject to the proviso that the Sub-Contractor shall be granted the benefit of any settlement in respect of such damage accepted by the Sub-Contractors insurers under the Contract works policy taken out by the Sub-Contractor in accordance with the requirements of the Contract.

The Sub-Contractor shall agree with the Design Team a programme for the carrying out and the completion of any work not finally finished at the time of the Contract works being offered for acceptance and which does not prejudice the issue of a Practical Completion Certificate.

The Sub-Contractor shall also produce prior to completion a written statement for the approval of the Design Team setting out the manner in which the Sub-Contractor intends to deal with defects which

arise during the Defects Liability Period to ensure that disruption to the Employers use of the building is kept to a practical minimum.

38. Rights of access during defects liability period

The Sub-Contractor shall have the right of access as agreed with the Architect or employer, at all reasonable working hours, at the Sub-Contractors own risk and expense, to all parts of the Contract works for the purpose of inspecting the working of the installations and to the records of the working and performance thereof for the purpose of examining the same and taking notes therefrom. Subject to the Employers approval, which shall not be unreasonably withheld, the Sub-Contractor may, at their own risk and expense, make any tests, which is considered desirable.

The Sub-Contractor shall liaise closely with the Employers staff during the Defects Liability Period and all necessary remedial works and/or rectification of defective materials and equipment shall generally be carried out in such a manner as to avoid or minimise shut-down time and inconvenience to the Employer.

39. Sub-Contractor to provide everything necessary

The Sub-Contractor shall provide everything necessary for the proper execution and completion of the Contract works to the true intent and meaning of the Contract documents. Details of construction or materials which have not been referred to in the Specification or drawings but the necessity for which may be reasonably be implied or inferred from the said Specification or drawings or which are usually or essential to the completion of all works in all trades, shall be installed by the Sub-Contractor with no increase in the Sub Contract price.

40. Works testing

Items of plant and equipment listed in the Particular Specification may require works testing. The Sub-Contractor is to include all costs of such tests including the Architects/Services Engineers expenses. The Sub-Contractor shall notify the Services Engineer one month in advance of such tests and shall provide with the programme a schedule of works tests visits. The Activities to be completed at the visit shall be programmed for approval.

A signed works test document will be submitted on completion of test prior to delivery of equipment to site.

41. Plant and equipment performance testing

Where stated elsewhere in this specification, plant and equipment shall be tested at the manufacturers works or in a recognised and approved testing facility to demonstrate performance complies to the stated and specified duties. Performance testing shall demonstrate but not be limited to the following:

- Full, partial and minimum load.
- Temperature readings from calibrated equipment on ALL circuits.

- Response to load change.
- Efficiency.
- Noise levels.

The tests shall be conducted to simulate design conditions and all ancillary plant and equipment needed to support the tests together with all instrumentation shall be provided by the Sub-Contractor/Supplier and included in the Tender costs.

Upon successful completion of the performance tests the plant and equipment shall be thoroughly cleaned and returned to its 'as new' condition and correctly packaged for delivery to site.

Full records of the tests shall be issued to the Service Engineer in duplicate. These tests are in addition to works test stated elsewhere in the Specification.

42. Quality control

The Sub-Contractor shall prepare a method statement within the Tender submission to indicate fully the quality control programme and indicate clearly the role of the Design Team in that programme.

The objective of the quality control programme shall be:

- Full compliance with the Contract documentation in regard to materials and workmanship.
- Establishment of standards that will be acceptable to the Design Team by means of a sample installation prior to full-scale erection of all major elements and trades required.
- Submission to the Design Team of samples of the proposed manufacturers items to be utilised in the Contract prior to ordering for agreement with the Design Team.

The Design Team shall issue a Quality Control Instruction where the installation fails to meet the standard required in the Contract documentation and the Sub-Contractor will, in writing, submit their proposals for compliance.

43. Information to press

No information related to the Contract shall be given by the Sub-Contractor or any agent employed by him to the press or other media without the written permission of the Employer, obtained through the Architect/Project Manager and Design Team.

44. Health & safety at work

The Sub-Contractors attention is drawn to the CDM regulations, Health and Safety at Work Act etc., incorporating the Electricity at Work Regulations 1989 and to the COSHH Regulations 2002.

The Sub-Contractor shall comply with Employers health and safety requirements for working on the site.

It is incumbent upon the Sub-Contractor to make himself familiar with the above acts and regulations and ensure compliance during the contract works.

45. Method statement (RAMS)

The Sub-Contractor shall compile and supply a method statement of each item of work to the Design Team before commencing on site. A full RAMS (Risk Assessment Method Statement) will be required prior to the start of any works. Websites like: <https://www.hsdirect.co.uk> may be helpful in this regard.

46. Line management diagram

As part of the tender return documentation, the Sub-Contractor shall compile and supply a line management diagram starting at the site supervisors and rising through at least three further management levels. Relevant names, addresses and telephone numbers shall be shown on the diagram.

47. COSHH regulations

The Sub-Contractor shall ensure that the provisions of the Control of Substances Hazardous to Health Regulations 2002 (COSHH Regulations) are observed.

Where the use of substances falling within the scope of the Regulations forms part of the installation, commissioning, testing, operation and maintenance of the works, this shall be notified to the Services Engineer in writing, together with the additional costs, if any, of use of any 'non-hazardous' alternative.

Throughout the course of works and under all circumstances, the Sub-Contractor shall ensure that all substance falling within the scope of the Regulations are positively so identified at all times and that they are transported, handled, stored, used and disposed of in strict accordance with their manufacturers/suppliers recommendations.

Where the use of substances, falling within the scope of the Regulations, are required for the operation and maintenance of the completed works, the Sub-Contractor shall ensure that:

- Suitable facilities are available for the on site storage of such substances and the warning/instruction notices are provided at the point of their storage and use.
- An initial issue of any special protective clothing, eye protectors and similar safety equipment, sufficient for one year's operation and maintenance of work is provided.
- Client's staff have been fully trained in the use, handling, storage, transport and disposal of the substances concerned prior to handover.
- The type, use and control of the substances have been fully and correctly identified in the O&M manuals.

48. Photographs

No photographs of the site or of the works or any part thereof shall be taken except with the permission in writing of the Design Team and no such photographs shall be published or otherwise circulated without the like permission.

49. Samples

After the order has been placed with them, the Sub-Contractor shall furnish free of charge and without delay to the extent stated in the Specification, or as may be required by the Design Team, such samples of material and workmanship proposed to be used by them in the execution of the work included in their Contract or in such additional works as may be ordered.

If the samples submitted by the Sub-Contractor do not, in the opinion of the Design Team, meet the requirements or fail to satisfy the terms of the Specification, the Design Team may obtain samples elsewhere of the articles or materials from the same source without prejudice to their right to reject part or all of such articles or materials should they not prove equal in all respects to the samples they obtain or provide.

In the case of articles of special construction, working drawings may be temporarily substituted for the samples, if preferred by the Sub-Contractor. Such drawings when approved will be retained by the Design Team until the articles concerned are supplied, as a sample.

The samples submitted by the Sub-Contractor and approved, shall remain the property of the Employer until the completion of the Contract.

The Sub-Contractor shall take specific note that samples of the items of equipment listed elsewhere will be required. The samples shall include all alternative finishes available. The equipment shall not be placed on order until the Design Teams approval has been obtained.

The Design Team undertake to approve samples, finishes etc., within 7 working days of submission for approval.

50. Provisional sums

The Tenderer shall include in his Tender the provisional sums detailed in the pricing document. Any part or the whole of these sums unexpended will be deducted from the amount due to the Sub-Contractor. Equally, additional sums above any stated PC sum must be brought to the attention of the design Team and Employer, prior to engagement of those services.

51. Authorities and regulations

The Sub-Contractor shall comply with the provision of all Act of Parliament, British Standards, Regulations and Byelaws, which may be applicable to the works. In particular they shall comply with all relevant sections of the Factories Act, Health and Safety at Work Act, CDM Regulations, Electricity at Work Regulations, COSHH Regulations and amendments thereto, WRAS, Gas Safe Register and OFTEC governing bodies.

52. Progress Drawings

The Sub-Contractor shall arrange for a full set of white prints of installation drawings to be kept on the site showing the progress of all work in connection with the Contract. Such prints shall be kept up to date to incorporate all modifications to the instalments to enable 'as installed' record drawings to be available at practical completion.

53. Programme

The Sub-Contractor will be required to comply with the agreed programme for the works and due allowance shall be made in the programme for testing, commissioning and independent witnessing to verify commissioning results. The latter shall be carried out after the testing and commissioning has been successfully concluded and signed off by the Main Contractor.

54. Maintenance if required by Employer

The Sub-Contractor shall include, as a cost option, for twelve months maintenance from the date of practical completion.

The Sub-Contractor shall be responsible for the preparation of work schedules, record sheets and the implementation of maintenance tasks, which shall include, for e.g., the following:

- Planned maintenance.
- Breakdown maintenance
- Shut down maintenance.
- Arranging for and supervising the attendance of specialist maintenance teams for carrying out major services on certain plant items, e.g. chillers, boilers etc.
- Carrying out periodic safety checks on mechanical and electrical equipment and plant.
- Carrying out performance tests on major plant items to ensure optimum performance on a regular basis.

55. Scaffolding

The Sub-Contractor will be responsible for the supply of any moveable towers, steps or ladders for the complete erection of their works, where not supplied. The Tenderer shall ascertain the extent of their responsibility for these items and for hoisting of plant before submitting their Tender.

I hereby confirm that I have read, understand and will adhere to the contents of this specification **(PART 1)**

Signed: Date:

Please print name:

Company: