



Tower of London Education- The Reveller

Contract Preliminaries

P02

Specification Details

Client	Historic Royal Palaces
Project Number	313293
Project Name	Tower of London Education- The Reveller
Specification Title	Contract Preliminaries
Specification Number	313293-HAH-XX-XX-T-ME-00002
Specification Status	Draft Tender Issue
Specification Revision	P02

Refurbishment of spaces at the Tower of London for educational purposes.

Specification - Systems

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Project information

Project management

PM_10_10_60/10 Project description

1. Project reference: 313293
2. Project title: Tower of London- The Reveller
3. Project description: Refurbishment

PM_10_10_60/20 Drawings and other documents

1. Details: Contractor to refer to document control information and highlight any discrepancies ASAP.
2. Contract drawings
 - 2.1. Generally: The same as the tender drawings.
 - 2.2. Exceptions: Where Value Engineering has been undertaken
 - 2.3. CAD data: In accordance with [BS EN ISO 19650-1](#).
3. Cross-references
 - 3.1. Accuracy: Check remainder of the annotation or item description against the terminology used in the cited section or clause.
 - 3.2. Related terminology: Where a numerical cross-reference is not given the relevant sections and clauses of the specification will apply.
 - 3.3. Relevant clauses: Clauses in the cited specification section dealing with general matters, ancillary products and execution also apply.
 - 3.4. Discrepancy or ambiguity: Give immediate notice in writing setting out the nature and assessed impact of the conflict. Do not proceed until instructions are received.
 - 3.5. Document precedence: Specification takes precedence over referenced documents.
4. Dimensions: Use numbered dimensions only. Do not scale direct from drawings.

PM_10_10_60/30 Project location

1. Details: Refurbishment of existing buildings.
2. Address
 - 2.1. Number/ Street: Tower of London
 - 2.2. Town/ City: London
 - 2.3. Post code: EC3N 4AB

PM_10_10_60/60 Access

1. Details: Refer to main contract preliminaries

PM_10_10_60/70 Preparatory work by others

1. Details: Refer to main contract preliminaries

PM_10_10_60/80 The works/ services

1. Details: Refer to Main Contract preliminaries and MEP Specifications
2. Related works: Provide trades with necessary details of related types of work. Before starting each new type or section of work, ensure that previous related work is complete, in accordance with the project documents, to a suitable standard, and in a suitable condition to receive new work.

PM_10_10_60/100 Work by others concurrent with the contract

1. Details: Refer to main contract preliminaries

PM_10_10_60/110 The subcontract work

1. Details: Refer to main contract preliminaries

PM_10_10_60/120 Completion work by others

1. Details: Refer to main contract preliminaries

PM_10_10_60/140 Products provided by, or on behalf of, employer/ client/ purchaser

1. **General:** Details of products to be fixed as part of the contract work are given in the work sections. Use for no other purpose than the works.
2. **Handling:** Accept delivery, check against receipts and take into appropriate storage.
3. **Surplus products:** Keep safe and obtain instructions.

PM_10_10_60/150 Work subject to nominated or named subcontract

1. Title: Refer to main contract preliminaries

PM_10_10_60/230 Provisional sum for undefined work

1. Details: Refer to separate Prov Sum's list

Ω End of Section

PM_30

Site, ground and environmental information

Project management

PM_30_10_93 Utilities and services survey information

1. Details: Contractor to undertake a GPR survey and provide detailed survey / CAD drawings to the design team.
2. Format: Hard copy. Electronic.
3. Provision: Provided.

Ground investigation reports

PM_30_20_35 Ground investigation report

1. Details: Refer to main contract preliminaries

Environmental information

PM_30_30_25 Ecology survey report

1. Details: Refer to main contract preliminaries

PM_30_30_27 Environmental impact report

1. Scheme type: Refer to main contract preliminaries

PM_30_30_85 Sustainability information

1. Assessment Information
 - 1.1. Scope and content: Refer to main contract preliminaries

Hazardous substances information

PM_30_40_06 Asbestos survey report

1. Details: Refer to main contract preliminaries

PM_30_40_46 Lead survey report

1. Details: Refer to main contract preliminaries

Ω End of Section

PM_40

Design and approvals information

Project management

PM_40_30 Design information

1. **Scope:** Please refer to separate Contractor Design Package summary schedule, main contract prelims or MEP specifications for details of CDP responsibilities.
 - 1.1. **Design drawings:** Detailed contractors design drawings to submitted for approval
 - 1.2. **Technical information:** Equipment that is proposed shall be submitted to Harley Haddow for review prior to procuring
 - 1.3. **Submittal date:** Prior to installation commencing

PM_40_30_23 Design philosophy statement

1. **Content:** Explanation of measures to meet stated objectives in terms of the evolution of the landscape and provision of a service to the public and users.
2. **Submittal date:** With Tender return

PM_40_60_05 Activities terminology

1. **Advise:** See 'Communicate'.
2. **Agree:** See 'Communicate'.
3. **Approve:** Record conformance of work to specified criteria by giving formal or official sanction.
4. **Communicate:** Includes advise, inform, agree, confirm, notify, seek or obtain information, consent or instructions, or make arrangements.
5. **Confirm:** See 'Communicate'.
6. **Ease:** Adjust moving parts of designated products, systems or work to achieve free movement and good fit in open and closed positions.
7. **Fix:** Receive, unload, handle, store, protect, place and fasten in position; dispose of waste and surplus packaging; to include labour, materials and site equipment for that purpose.
8. **Give notice:** Communicate in writing to the person administering the contract at the address listed.
9. **Inform:** See 'Communicate'.
10. **Keep for recycling:** As 'Keep for reuse', but relates to a naturally occurring material rather than a manufactured product.
11. **Keep for reuse:** Do not damage designated products, systems or work. Clean off bedding and jointing materials. Stack neatly, adequately protect and store until required by the employer or purchaser, or for use in the works as instructed.
12. **Make good:** Execute local remedial work to designated work. Make secure, sound and neat.
13. **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.
14. **Notify:** See 'Communicate'.
15. **Quote:** Use 'Estimate'.
16. **Recycle:** Collect, sort, process and convert discarded or recovered components into raw materials for use in the creation of new products.
17. **Refix:** Fix previously removed products.
18. **Remove:** Disconnect, dismantle as necessary and take out the designated products or work, together with associated accessories, fixings, supports, linings and bedding materials. Dispose of unwanted materials.

Removal of an item excludes removal and disposing of associated pipework, wiring, ductwork or other services.

Removal of a system includes this work.

19. **Remediate:** Action or measures taken to lessen, clean-up, remove or mitigate the existence of hazardous materials existing on a property; in accordance with standards, specifications or requirements as may be required by statutes, rules, regulations or specification.
20. **Repair:** Execute remedial work to restore something to its original working state. Make secure, sound and neat.

Excludes redecoration and replacement.

21. **Replace:** Supply and fix new products matching those removed. Execute work to match the original new state of that removed.
22. **Reuse:** Recover complete items to be fixed or used in the project or elsewhere without the requirement for recycling.
23. **Submit:** Deliver in a specified format to a specified person within a specified timeframe.
24. **Submit proposals:** Submit information in response to specified requirements.
25. **Supply and fix:** Supply of products, components or systems to be fixed, together with everything necessary for their fixing.

PM_40_60_08 BIM execution plan

1. **The pre-contract plan**
 - 1.1. **Contents:** Refer to separate document
 - 1.2. **Submittal date:** With the tender.
2. **The post-contract plan:** Update and resubmit as described in the employer's information requirements (EIR).

PM_40_60_22 Data security policy

1. **Records:** Retain, make available for inspection and supply on request information reasonably required to allow response to requests made under the provisions of the [Freedom of Information Act](#).
2. **Received requests:** Obtain instruction before proceeding.

Do not supply information to those who are not project participants without express written permission.

3. **Confidentiality:** Maintain at all times.

PM_40_60_23 Description terminology

1. **Attendance:** Includes:

The provision of temporary roads, pavings and paths, standing scaffolding, standing power-operated hoisting plant;

The provision of temporary lighting of an equivalent brightness to the finished lighting brightness;

The provision of water;

The clearing away of rubbish and paying all charges in connection with its disposal, the provision of secure hard standing space for the sub-contractor's own offices, plant and material storage;

The use of standing mess rooms, sanitary accommodation and welfare facilities; and

The provision of all health and safety facilities and all fire safety precautions, services, equipment,

signage, facilities, marshals and the like necessary to comply with the relevant parts of the [Joint Fire Code](#).

Additional requirements should be described as 'Special Attendance'.

2. **Building Manual:** A document containing information of use to subsequent building owners, occupiers and users about the requirements and procedures for effective operation, maintenance, decommissioning and demolition of the building.
3. **Construction Work:** Permanent work together with temporary work.
4. **Contractor :** The party who undertakes to perform the services, supply goods or carry out work defined in a contract. Includes main contractor, prime contractor, supplier, service provider, builder, subcontractor, etc. as the context dictates, which may be defined terms in certain standard contract forms.
5. **Contractor's choice:** Selection delegated to the contractor, but liability to remain with the specifier.
6. **Contractor's design:** Design to be carried out or completed by the contractor, supported by appropriate contractual arrangements, to correspond with specified requirements.
7. **Cost:** The amount paid or given by one party to another in exchange for goods, work, supplies or services.
8. **Designer:** A person or organization carrying out design on a project.
9. **Deviation:** Difference between a specified dimension or position and the actual dimension or position.
10. **Drawings:** Definitions as [BSRIA Building Applications Guide: Design framework for building services. 5th edition](#).
11. **Employer:** The party to the contract for whom the goods, work, supplies or services are provided. Includes client (in consultancy contracts and CDM Regulations), the employer, building owner or purchaser (in construction contracts), the developer (in development agreements and funding agreements), or the 'Main' contractor in contractor/ subcontractor agreements – which may be defined terms in certain standard contract forms.
12. **Estimate:** An approximate evaluation of quantity, number, extent, time or cost of part or the whole of a project.
13. **Execute:** To complete a task fully and put into effect. To fix, apply, install or lay products securely, accurately, plumb and in alignment.
14. **Existing:** Items retained in place to receive new work.
15. **Fastener:** Device for mechanically attaching something to something else.
16. **Manufacturer and Product reference:** Manufacturer – the person or legal entity under whose name or trademark the particular product, component or system is marketed.

Product reference – the proprietary brand name and/ or identifier by which the particular product, component or system is described.

References are as specified in the manufacturer's technical literature current on the date specified.

17. **Manufacturer's standard:** Where used in conjunction with a specified proprietary product, accessories to be those recommended by the product manufacturer.
18. **Permanent Work:** Work to be constructed and completed in accordance with the contract.
19. **Price:** An indication of the amount required to be paid by one party to another in exchange for goods, work, supplies or services.
20. **Product:** Material, both manufactured and naturally occurring, goods and accessories for permanent incorporation into the works.
21. **Requirements:** A description in outline or detailed form of the development, or a part of it, which one party wants another to undertake, design and/ or construct.
22. **Schedule of rates:** The subdivision of product and execution prices by a predetermined unit basis.

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23. **Schedule of Work/ Work Schedule:** The subdivision of work items by a predetermined classification. Can form the basis of a pricing document where bills of quantities are not used.
 24. **Schematic:** A drawing of a system showing components, products, systems and their interconnections.
 25. **Site equipment:** The contractor's apparatus, appliances, machinery, vehicles or things of whatsoever nature required in or about the construction for the execution and completion of the works and the remedying of defects.

Includes appliances, vehicles, consumables, tools, temporary work, scaffolding, cabins and other site facilities.

Excludes: temporary work, employer's products and equipment or anything intended to form or forming part of the permanent works.

26. **Specification:** Written description of requirements.
27. **System:** Products, components, equipment, accessories, controls, supports and ancillary items, including installation, necessary for that section of the work to function.
28. **Temporary work:** Incidental work to undertaken during construction but not intended to form part of the completed work.

PM_40_60_50 Master information delivery plan

1. **Compatibility with programme:** When submitting programme, confirm that it is compatible with the information release schedule.
2. **Alternative information release times:** Submit proposals.

Ω End of Section

PM_50

Financial and commercial information

Project management

PM_50_50_30 Tender acceptance criteria

1. **Tender acceptance period:** Tenders must remain open for acceptance, inline with the main contract prelims
2. **Assurance:** Nothing contained in this document or its application should be inferred to guarantee that a tender will be recommended for acceptance or be accepted, or that reasons for non-acceptance will be given.

PM_50_50_35 Tender documents

1. **Tender documents:** As described in the relevant section.

Refer to MEP document issue register for all relevant MEP tender information

PM_50_50_50 Tender instruction

1. **Qualifications:** Do not amend or alter documents without written instruction.
2. **Confidentiality:** Do not reveal details of parts of the tender or supporting documents (except for the necessary purposes of preparing that tender) without express written permission.

PM_50_50_50/10 Compliance with tender rules

1. **Compliance:** Failure to comply may result in tenders being rejected at the sole discretion of the employer.
2. **Costs:** No liability is accepted for costs incurred in the preparation of a tender.

PM_50_50_55 Tender site visit strategy

1. **Nature of the site:** Ascertain before tendering, including access thereto and local conditions and restrictions likely to affect the execution of the work.

PM_50_50_75/10 Error resolution

1. **Arithmetical errors:** Tender price will prevail. An opportunity will be given to confirm the tender or withdraw.
2. **Technical errors:** The tender is deemed to meet or exceed the requirements of the tender documents. Amendment of the tender to reflect this will not constitute a variation, and no claim for additional costs will be accepted.
3. **Corrections:** An endorsement will be added to the priced documents indicating that rates or prices (excluding preliminaries, contingencies, prime cost and provisional sums) inserted therein will be adjusted in the same proportion as the corrected total differs from that stated incorrectly.

PM_50_50_75/20 Error resolution

1. **Arithmetic and technical errors:** The tenderer will be given an opportunity to confirm an offer, or amend it to correct genuine errors. If correction means that the tender is no longer eligible for acceptance under the selected assessment criteria then it will be disqualified from that process.

Ω End of Section

PM_55

Contract information

Clauses - No Amendments

RECITALS

First The Works

- **Comprise:** The Contractor shall procure, install, set to work and commission all Mechanical, Electrical and Public Health (MEP) systems and equipment identified in the Tender documentation.

The MEP tender package is detailed to a Stage 4 coordinated-generic design utilising generic product information as detailed in BRSIA BG 6.

The Contractor shall ensure the services procured from the Mechanical, Electrical and Public Health (MEP) sub-contractors include for developing the detail of the Harley Haddow Tender and subsequent Contract package further in to working drawings in accordance with the Stage 5 requirement set out in BRSIA BG 6.

This shall include drawings (or Revit Models as applicable) with the specific models and blocks of equipment procured/approved via the technical submittal process and all necessary brackets, supports and fixing of all systems, not just MEP to demonstrate full coordination.

The MEP Sub-contractors will be bound to the conditions set out within the main contract preliminaries, those stated within the contract documentation stated above and this specification.

The contract price shall include everything necessary for all design development to allow a fully integrated installation on site including (but not restricted to); co-ordination, installation, supervision, services, operations, materials, consumables, labour and plant necessary for and incidental to the proper construction, completion, testing, commissioning and adjustment of the Works to the satisfaction of the CA and in accordance with the conditions of contract, the specifications and the drawings.

The Mechanical & Electrical sub-contractor shall be fully responsible for the co-ordination of the design intent to installation on site.

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

The Mechanical & Electrical sub-contractor shall be fully responsible for developing coordinated working drawings for all MEP systems including dimensioned drawings with invert and set out positions.

The Tender/Contract design drawings identify coordinated primary containment routes. It is the electrical subcontractors responsibility as part of the working drawing development to detail locations and routes of final conduit connections to outlets etc and ensure that within their Contract price all secondary containment including metal conduit drops to all power and data outlets as well as devices and switches identified on the drawings are allowed for.

For all visual equipment, the Mechanical & Electrical sub-contractor shall to setting out information from the Architect and incorporate in to the MEP working drawings.

Third Contract drawings

- **Contract drawings :** TENDER MEP DRAWINGS, DRAWING DEFINITION; TECHNICAL DESIGN DRAWING/MODEL

2D CAD drawings, which forms part of this tender shall be provided to the standards set out in BSRIA BG6/2018 coordinated-generic design.

Where a Revit Model has been produced, this has been used during the Stages 3 & 4 to ensure that all primary services can be accommodated within the building from. Where applicable, the contractor shall utilise the model to ensure detailed co-ordination of all systems within the building.

The model/drawings shall indicate the detailed MEP design, with locations of main plant items, pipes, ducts and cables using generic objects in positions that are feasible for the contractor and sub-contractor to price and install without major re-routing.

The drawings/model will not indicate the precise position of the services/plant, but it shall be feasible to install the services within the general routes indicated. It will be possible for the contractor and sub-contractor to produce co-ordinated working drawings and/or installation drawings without major re-routing of the services.

The drawings shall also provide sufficient information:

- Allow the completion of the Mechanical and Public Health service design from the design intent drawings.
- Allow the completion of the Electrical service design from the design intent drawings.
- To facilitate the preparation of an estimate and tender
- To enable all other participants to appreciate the inter-relation of the works with other trades and disciplines
- When read in conjunction with the architectural and structural engineering drawings to enable the preparation of the final or supplementary builder's work information, co-ordination, installation and shop drawings incorporating manufacturing drawings and final details of specified or selected plant and equipment.

The drawings indicate equipment, pipework, ductwork, cable tray routes and trunking, in sufficient detail to show how all the engineering services can generally be accommodated and coordinated with each other, the architecture and the structure. These drawings are provided for information purposes only.

The drawings will not necessarily show 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 installer shall be responsible for all detailed co-ordination of building services. The Mechanical & Electrical sub-contractor shall provide fully coordinated MEP working drawings for approval prior to proceeding on site with any installation works.

The decision of the CA as to what has a visual impact shall be final. Confirm mounting heights with the Architect before commencing the work on site. All elevation and setting out information will be provided by the Architect. Co-ordination 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 party or consultant.

Obtain all information required to produce the co-ordination and installation drawings or requirements at no cost.

Where the building is an existing structure, the contractor is responsible for surveying the existing building, the existing structure and the MEP services to prepare coordinated installation drawings prior to works progressing. The cost of obtaining such information must be included in the contract price.

These surveys must be undertaken at least four weeks prior to MEP services first fix installation.

Plant and equipment is shown based upon the manufacturers catalogue information and is subject to verification or revision as part of the sub-contractors working drawings when manufacturers drawings are available.

Interpret the design intent of the tender drawings and reflect same in the co-ordination and installation drawings subject to the comments of the CA. Where differences occur between the tender and the co-ordination and installation drawings these differences shall be deemed to be included in the contract price for the Works and no additional cost shall be allowed due to any variation in layout, arrangement or detail unless the deviation is specifically covered by a CA / HH Instruction before the production of the drawings.

Where sprinkler installations are provided, the information shown on the tender drawings will indicate the design intent but this must be subject to verification by the approved installer who shall accept full responsibility for the design in accordance with the LPC Rules.

Where BMS installations are provided the information shown on the drawings is subject to verification by the approved installer who shall accept full responsibility for the design.

Where Fire Detection and Alarm (including PAVA where applicable) installations are provided the information shown on the drawings is subject to verification by the approved installer who shall accept full responsibility for the design.

Where Intruder Detection, CCTV and Access Control installations are provided the information shown on the drawings is subject to verification by the approved installer who shall accept full responsibility for the design.

ARTICLES

3 Architect/ Contract Administrator

- Architect/ Contract Administrator: Refer to main contract preliminaries

4 Quantity Surveyor

- Quantity surveyor : Refer to main contract preliminaries

5 and 6 Principal Designer/ Principal Contractor

- Principal Designer: Refer to main contract preliminaries

5 and 6 Principal Designer/ Principal Contractor

- Articles 5 and 6: Refer to main contract preliminaries

CONTRACT PARTICULARS

Clause 1.1 BIM Protocol

- Protocol: Where applicable, refer to separate, project specific BIM protocol document

Clause 1.1 Date for Completion of the Works

- Date for completion of the Works (where completion by sections does not apply): Refer to main contract preliminaries

Clause 2.9.1.2 Master programme

- Critical paths: Refer to main contract preliminaries

CONDITIONS - No Amendments

Section 1: Definitions and Interpretation - No Amendments

Section 2: Carrying out the Works - No Amendments

Section 3: Control of the Works - No Amendments

Section 4: Payment - No Amendments

Section 5: Measurement and Valuation - No Amendments

Section 6: Injury, Damage and Insurance - No Amendments

Section 7: Assignment, Third Party Rights and Collateral Warranties - No Amendments

Section 8: Termination - No Amendments

Section 9: Settlement of Disputes - No Amendments

Ω End of Section

PM_60

Construction management information

Project management

PM_60_10_50 Site access information

1. **Details:** Refer to main contract preliminaries and Pre Construction Health and Safety Information
2. **Limitations:** Refer to main contract preliminaries
3. **Access for inspections:** Provide access at reasonable times for both on-site and off-site work.

PM_60_10_65/10 Health and safety information

1. **Content:** Describe the proposed organization and resources to safeguard the health and safety of operatives, including those of subcontractors, and of any person whom the works may affect.
2. **Policy document:** A copy of the contractor's health and safety policy documents, including risk assessment procedures.
 - 2.1. **Records:** Accident and sickness records for the past five years and of any previous Health and Safety Executive enforcement action.
 - 2.2. **Training:** Records of training and training policy.
 - 2.3. **Personnel :** The proposed number and type of staff responsible for health and safety on this project with details of their qualifications and duties.

PM_60_10_75/10 Use of the site

1. **General:** Do not use the site for any purpose other than carrying out the contract work.

PM_60_10_75/30 Traffic and vehicles

1. **Limitations:** Refer to Main contract preliminaries

PM_60_10_75/40 Storage, accommodation, mechanical plant, temporary works and services

1. **Position:** Refer to Main contract preliminaries
2. **Maintenance:** Alter, adapt and move as necessary. Remove when no longer required and make good.

PM_60_10_75/50 Management and staff – contract minimum requirement

1. **Details:** Allow for compliance with contract obligations.

The Tenderer shall submit with their tender a line management diagram starting at the site supervisors and rising through the management levels.

Relevant names and addresses shall be shown on the diagram.

The Tenderer shall set out details of their management team and the commitment to the project.

The Tenderer shall submit with their tender the curriculum vitae and references for each of the key personnel that will be used on the project. CV, qualifications, recent project experience and definition of the person's role in the contract shall be clearly stated.

Details shall be provided for both the site and office based teams

2. **Cost-significant items:** Project Specific management and staff.
Visiting management and staff.

Extraordinary support costs.
Staff travel.

PM_60_10_75/60 Management and staff – Full Time (Project) Services Co-ordinator

1. **Dedicated staff role:** The Main Contractor shall allow for the employment of a suitably qualified and experienced engineering Services Co-coordinator who will ensure compliance with the contract drawings, specification and programme.

The Services Co-ordinator must be a qualified Electrical or Mechanical Services Engineer and have at least ten years working experience in Building Services Installations including on-site installations works, and they must be able to communicate at all levels from Site Operatives to Consultant.

The service co-ordinator shall be employed (full/part-time and based full time on site) during the mechanical and electrical works from 1st fix right through to commissioning conclusion.

The service Co-ordinator must be fully competent in both mechanical and electrical installations.

The Services Co-ordinator shall provide at least the following duties:-

- Review HH MEP drawings, specifications, schedules and all project documentation to obtain a clear understanding of the design strategies in the context of the entire works .
- Carry out regular inspections to ensure compliance with the Contract Specification & good workmanship and shall provide programmes of works to rectify any defects or items of non compliance
- Prepare defects lists for all Engineering Services Works and shall ensure any defects are addressed timeously.
- Attend the project Pre-Start Meeting providing a programme of anticipated critical path inspections to be carried out. Notwithstanding the aforementioned these inspections shall be undertaken at regular intervals, not exceeding one working week.
- Identify areas of non-compliance or defects as the works progress to ensure a quality installation is provided within the projects programme.
- All installations offered up for inspection must be substantially complete. The Design Consultants will not prepare extensive defects lists. If significant defects exist the Contractor will be asked to correct defects and re-offer the systems for inspection when defects are substantially complete. All M&E installations shall be snagged and signed off by the Services Coordinator prior to them being offered to the design team for inspection.
- Co-ordinate and progress timeously the various items of builders work relative to Mechanical, Electrical and other Specialist Services installations, particularly the properly dimensioned positions of all holes to be cut or provided. This shall involve the procurement of Sub-Contractors Builders work Drawings detailing all services builders work requirements for approval by the Architect/Engineer.
- Co-ordinate the execution of all Services Installations and ensure that information is timeously exchanged with the various Services Sub-Contractors and Direct Works Contractors to maintain progress in accordance with the programme and to ensure all installations are commissioned at the proper time and to the full satisfaction of the Architect / Engineer.
- Ensure that each Engineering Service Sub-Contractor is provided with all relevant Contract Drawings to ensure that the services are set out to take into account building configuration, adjacent services and any particular Architectural requirements.
- Identify and report any conflict in the positioning between Engineering Services or with the structure.
- Ensure that services work carried out in common voids are carried out in a correctly sequenced manner to ensure compliance with programme, phasing and design requirements.

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- Check the services ceiling/floor voids, specifically to ascertain if structural tolerances have been exceeded, which may reduce services voids accordingly, and in such instances to take on-site dimensions and advise the Design Team of proposed corrective action to maintain the original floor/ceiling heights.
 - Timeously advise the Design Team of future access requirements to drain points, air points and other manual devices.
 - Monitor the progress of all Engineering Services Sub-Contractors Production / Working Drawings, the delivery of which is the ultimate responsibility of the Co-Ordinator. The Co-ordinator shall ensure that suitable procedures are in place to ensure these Production Drawings are co-ordinated. Prior to information being forwarded for approval the Services Coordinator should satisfy himself that suitable information is provided, this information has been properly co-ordinated and this information is issued timeously.
 - Review the subcontractor's RFI's/TQ's and action accordingly. Any non relevant or site co-ordination type query's should be dealt with by the Services Coordinator with suitable correspondence issued to the Design Team confirming action.
 - Convene Services Sub-Contractors Meetings and review the progress of all Sub-Trades and identify critical action items. The meetings should be recorded with minutes issued to the design team timeously.
 - Procure from the Commissioning specialist a logic diagram and full commissioning method statement at an early stage to ensure that sufficient time is made available for commissioning the systems prior to Practical Completion.
 - Provide a schedule of dates and time of all tests, commissioning, etc to be witnessed by the CA
 - Be responsible for ensuring record As-Built Drawings and the Operating and Maintenance Manuals are produced timeously and of a suitable standard for comment.
 - Ensure that the Operating and Maintenance Manuals for each discipline follow the same general format and together provide a "site specific" set of documents.

PM_60_10_75/70 Control and protection – contract minimum requirement

1. **Details:** Allow for compliance with contract obligations.
2. **Cost-significant items:** include

PM_60_10_75/110 Thermometers

1. **General:** Provide on site and maintain in accurate condition a maximum and minimum thermometer. Measure atmospheric shade temperature in an approved location.

PM_60_10_77/10 Security – contract minimum requirement

1. **Details:** Allow for compliance with contract obligations as set out in the main contract prelims

PM_60_10_77/30 Safety and environmental protection – contract minimum requirement

1. **Details:** Allow for compliance with contract obligations as set out in the main contract prelims

PM_60_10_83 Temporary services information

1. **Details:** Allow for compliance with contract obligations as set out in the main contract prelims
2. **Cost-significant items:** Refer to mains specifications and preliminaries

PM_60_10_83/10 Water

1. **Supply:** Refer to main preliminaries specification
2. **Continuity:** No liability will be accepted for the consequences of failure or restriction in supply.

PM_60_10_83/40 Water restrictions

1. **Emergency legislation:** If the water supply is or is likely to be restricted, inform without delay and ascertain the availability of water from alternative sources.
2. **Suitability:** Check pH value of water from a proposed new source and ensure that it is suitable for the plants, soil and turf being watered.
3. **Cost:** No extra payment will be instructed where the Contractor is entirely responsible for provision of water or
Ascertain and inform immediately where there is a provisional sum or the Employer is responsible for watering.

PM_60_10_83/60 Lighting and power

1. **Supply:** Refer to main contract preliminaries
2. **Metering:** Refer to main contract preliminaries
3. **Point of supply:** Refer to main contract preliminaries
4. **Available capacity:** Refer to main contract preliminaries
5. **Frequency:** 50 Hz, alternating.
6. **Phase:** Refer to main contract preliminaries
7. **Continuity:** No liability will be accepted for the consequences of failure or restriction in supply.

PM_60_10_83/90 On-site communications

1. **Communications**
 - 1.1. **General:** Refer to main contract preliminaries
 - 1.2. **Telephones:** Refer to main contract preliminaries
 - 1.3. **Photocopier and Fax:** Refer to main contract preliminaries
 - 1.4. **Internet and Email:** Refer to main contract preliminaries
 - 1.5. **Additional Facilities:** Refer to main contract preliminaries
2. **Restrictions on use:** Refer to main contract preliminaries
3. **Costs:** Pay fees and charges associated with connection, rental subscriptions and the like.

PM_60_10_83/170 Use of permanent heating system

1. **Permanent heating system :** Refer to main contract preliminaries
2. **Requirements:** Take responsibility for operation, maintenance and remedial work. Arrange supervision by and indemnification of the appropriate subcontractors. Pay fuel and associated costs.

PM_60_10_83/190 Beneficial use of installed systems

1. **Permanent systems:** Refer to main contract preliminaries
2. **Other uses:** If permission is given for any other use of a system before the works are accepted as complete, enter into a separate written agreement recording details of the terms and conditions of use.

PM_60_10_85 Temporary works information

1. **Details:** Allow for compliance with the contract obligations.

PM_60_10_85/30 Temporary accommodation made available

1. **Accommodation made available by the Employer:** The following may be used for the duration of the contract without charge provided that:

It is used solely for the purposes of carrying out the works.

The use to which it is put does not involve undue risk of damage.

Temporary adaptations are approved by or on behalf of the employer before being carried out.

It is vacated on completion of the works or determination of the contract.

When vacated, its condition is at least equivalent to its condition at the start of the contract.

PM_60_20_60/10 Preconstruction information

1. **Scope:** Integral with the project specification, including but not restricted to the following:

Description of project.

Client's consideration and management requirements.

Environmental restrictions and on-site risks.

Significant design and construction hazards.

The health and safety file.

PM_60_20_60/20 Pre-construction information

1. **Availability:** Integral with the project specification, including but not restricted to the following:

Description of project.

Client's consideration and management requirements.

Environmental restrictions and on-site risks.

Significant design and construction hazards.

The health and safety file.

PM_60_20_79/10 Setting out

1. **General:** Submit details of methods and equipment to be used in setting out the works.
2. **Levels and dimensions:** Check and record the results on a copy of drawings. Give notification of discrepancies and obtain instructions before proceeding.
3. **Completion of setting out:** Give notice before commencing construction.

PM_60_20_79/20 Setting out records

1. **Record drawings:** Include details of grid lines, setting-out stations, benchmarks and profiles. Retain on site throughout the contract, and hand over on completion.

Contract programme and progress

PM-60_30_85 Substitute Products

1. **Details :** **All tender prices MUST include all equipment manufacturers / systems types / specialists as detailed within the specification, schedules and drawings. Failure to comply with this will result in the Tender being rejected.**

If the contractor wishes to propose a products of different manufacture to those specified, the contractor must submit a cost saving proposal giving reasons for each proposed substitution, full technical details for appraisal and programmes advantages.

Substitutions which have not been notified at tender stage may not be considered. If no options are given or the contractor fails to confirm manufacturers at the time of the tender return, it shall be deemed that the contractor is in full compliance with the tender documentation and manufacturers / specialist contained within.

2. Compliance: In certain cases, manufacturers of equipment are mentioned in the Specification. The tender shall be based on all named manufacturers. Nevertheless, the Contractor will be held responsible for ensuring that the equipment will give the performance specified.

Other "equal and approved" shall mean by approval of the CA / Lead designers and alternatives shall only be considered prior to submission of Tender, when they have been submitted and approved in writing.

Alternative equipment, specialists or methods of carrying out the works in addition to those described in the tender documents may be submitted. Alternative offers shall be indicated on the appropriate document and include:

- Details of the alternative equipment, specialist or method proposed.
- Full technical data for each such alternative together with details of any consequential amendments to the design and/or other parts of the works. Demonstrate compliance with any stated British (or other equivalent recognised International) Standards.
- A detailed breakdown of any omissions or additions to the basic tender sum indicated on the appropriate document.
- The impact of all proposed alternative equipment or materials on Part L compliance including:
 - The CO2 Target Emissions Rate.
 - The final 'as constructed' CO2 Buildings Emissions Rate.

The Contractor must confirm equivalence in quality, operation and space requirements to those items which have been specified by name. They must also demonstrate the proposed alternative is fully equivalent to the specified item and identify any constructional, cost, programme, maintenance or other differences.

The Contractor must include for all necessary measures to ensure alternative manufacturer's equipment and the total installation is equivalent to that specified.

The Tenderer shall include the costs necessary for re-sizing and reselection of associated equipment (including pipework, ductwork and cable sizes) resulting from the proposed alternative together with all resulting design and coordination.

Alternative offers will only be considered if accompanied by a compliant tender.

Additional costs resulting from non-compliance with the above will not be accepted. All alternatives must be declared during the tender process. No alternatives will be accepted following agreement of the Tender proposals.

3. Reasons : Submit reasons and relevant information for the proposed substitution. This must be accompanied by a justifiable cost saving and overall benefit to the Client and contract.

PM_60_30_19/20 Divergence from the statutory requirements

1. **Divergence:** Between the drawings or specification and the requirements of the Building Regulations, other statutes, statutory undertakers and other regulatory authorities.
2. **Action:** Give notice immediately.

PM_60_30_19/80 Alternative method proposals

1. **General:** In addition to and at the same time as tendering for the works as defined in the tender documents, alternative methods of construction and installation may be submitted for

consideration. Alternatives, which would involve significant changes to other work, may not be considered.

2. **Alternative method proposals:** Include a complete and precise statement of the effects on cost and programme.
3. **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.
4. **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.

PM_60_30_19/90 Alternative time proposals

1. **General:** In addition to and at the same time as undertaking to complete the contract work by the date for completion or period specified in the contract, an alternative proposal based upon a different date or period may be submitted.
2. **Date for Completion:** If any such proposal is accepted, the date for completion or period inserted in the contract will be the date stated in or determined from the alternative proposal.

PM_60_30_20/10 Programme

1. **Master programme:** When requested and before starting work on site, submit in an approved form a master programme for the works.
2. **Include**
 - 2.1. **Information:** Design, production information and proposals provided by the contractor, subcontractors or suppliers, including inspection and checking.
3. **Planning:** Planning and mobilization by the contractor.
4. **Dates:** Earliest start and finish dates for each activity and identification of critical activities.
5. **Engineering services:** Running in, adjustment, commissioning and testing of engineering services and installations.
 - 5.1. **Instructions:** Work resulting from instructions issued in regard to the expenditure of provisional sums.
6. **Concurrent work:** Work by others and concurrent with the contract. The nature and scope of which, the relationship with preceding and following work and relevant limitations are suitably defined in the contract documents.
7. **Exclusions:** Work that is not well defined: where and to the extent that the programme implications for this are impossible to assess, exclude from the programme and confirm this when submitting the programme.

PM_60_30_20/110 Submission of programme

1. **Further information:** Submission of the programme will not relieve the contractor of the responsibility to advise of the need for further drawings or details or instructions in accordance with the contract.

PM_60_30_45/20 Adjoining property

1. **Agreement:** Access to and/ or use of the following has been agreed with adjacent owners.
2. **Permission:** Obtain as necessary from other owners if required to erect scaffolding on, or otherwise use, adjoining property.

PM_60_30_45/40 Adjoining property restrictions

1. **Precautions:** Prevent trespass of workpeople and take precautions to prevent damage to adjoining property. Pay charges. Remove temporary protection and make good on completion or when directed.
2. **Damage:** Bear cost of repairing damage arising from execution of the works.

PM_60_30_45/50 Existing structures

1. **Duty:** Check proposed methods of work for effects on adjacent structures inside and outside the site boundary.
2. **Supports**
 - 2.1. **Standards:** In accordance with [BS 5975](#) and [BS EN 12812](#).
 - 2.2. **Requirements:** Provide and maintain incidental shoring, strutting, needling and other supports as may be necessary to preserve stability of existing structures on the site or adjoining, which may be endangered or affected by the works.

Do not remove until new work is strong enough to support existing structure.

Prevent overstressing of completed work when removing supports.

3. **Adjacent structures:** Monitor and immediately report excessive movement.

PM_60_30_45/70 Materials for recycling or reuse

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

PM_60_30_45/90 Scaffolding

1. **Scaffolding:** Make available to subcontractors and others at all times.

PM_60_30_66/10 Progress report

1. **Requirement:** Notwithstanding any obligations under the contract, the report must include the following.
2. **Progress statement:** Detailing matters materially affecting the regular progress of the works with reference to the master programme.
3. **Progress reports:** Subcontractors' and suppliers'.
 - 3.1. **Information:** Requirements for further drawings or details or instructions to fulfil obligations under the conditions of contract.

PM_60_40_40/20 Domestic subcontracts

1. **Details:** Provide details of proposed subcontractors and the work for which they will be responsible.
2. **Submittal date:** At Tender Submission

PM_60_40_40/100 Ownership of products

1. **Ownership:** At the time of each valuation, supply details of those products not incorporated into the works which are subject to reservation of title inconsistent with passing of property as required by the conditions of contract, together with their respective values.
2. **Evidence:** When requested, provide evidence of freedom of reservation of title.

PM_60_40_40/150 Listed products stored off site

1. **Evidence of title:** Submit reasonable proof that the property in 'listed items' is vested in the contractor
2. **Supplier:** For products purchased from a supplier include a copy of the contract of sale and a written statement from the supplier that conditions of the sale relating to the passing of property have been fulfilled and the products are not subject to encumbrance or charge.
3. **Subcontractor:** For products purchased from a supplier by a subcontractor or manufactured or assembled by a subcontractor, copies of the subcontract with the subcontractor and a written

statement from the subcontractor confirming that conditions relating to the passing property have been fulfilled and the products are not subject to encumbrance or charge.

PM_60_40_40/200 Labour and equipment returns

1. **Records:** Provide for verification at the beginning of each week in respect of each of the previous seven days.
2. **Include**
 - 2.1. **Labour:** The number and description of craftsmen, labourers and other persons directly or indirectly employed on or in connection with the works or services, including those employed by subcontractors.
 - 2.2. **Equipment:** The number, type and capacity of mechanical, electrical and power operated equipment employed in connection with the works or service.

PM_60_40_40/210 Overtime working schedule

1. **Requirement:** Prior to overtime being worked, submit notice of times, types and locations of work to be done.
2. **Concealed work:** If executed during overtime for which notice has not been submitted, it may be required to be opened up for inspection and reinstatement at the contractor's expense.

PM_60_40_58 Progress photographs

1. **Number of locations:** To be agreed
2. **Frequency of intervals:** Fortnightly
3. **Image format:** jpeg

PM_60_40_60/10 Monitoring

1. **Progress**
 - 1.1. **Records:** Record on a copy of the programme kept on site.
 - 1.2. **Delays:** Minimize. Take appropriate action to recover lost time.
 - 1.3. **Corrective action:** Where progress falls below target, submit proposals.
 - 1.4. **Submittal date:** As soon as possible.
 - 1.5. **Completion forecast:** Submit on the last working day of each week.
2. **Key Performance Indicators**
 - 2.1. **Performance:** Record performance against each KPI.
 - 2.2. **Corrective action:** Where performance falls below target, submit proposals.
 - 2.3. **Submittal date:** As soon as possible.

PM_60_40_60/20 Progress meetings

1. **General:** Meetings will be held to review progress and other matters arising from administration of the contract.
2. **Frequency:** Refer to main contract preliminaries
3. **Venue:** Refer to main contract preliminaries
4. **Accommodation:** Ensure availability at the time of such meetings.
5. **Attendees:** Refer to main contract preliminaries
6. **Chairperson**
 - 6.1. **Name:** Refer to main contract preliminaries
 - 6.2. **Duties:** Refer to main contract preliminaries

PM_60_40_60/30 Contractor's progress meetings

1. **General:** Hold meetings with appropriate subcontractors and suppliers shortly before main site meetings to facilitate accurate reporting of progress.

PM_60_50_10 Budget

1. **Content:** The list of market prices of articles manufactured outside the United Kingdom required by conditions of contract clause C3.

PM_60_50_12 Cash flow forecast

1. **Submission:** Before starting work on site, submit a forecast showing the gross valuation of the works at the date of each interim certificate throughout the contract period and based on the programme for the works.

PM_60_50_17 Completion certificate

1. **Notice:** Give reasonable notice to person countersigning daywork vouchers before starting work to be recorded.
2. **Information requirements**
 - 2.1. **Details:** Include a full description of the work undertaken and time spent on individual tasks.
 - 2.2. **Reference:** To the instruction under which the work is authorized.
 - 2.3. **Signature:** Sign by contractor's person in charge as evidence that the operatives' names, the time spent by each, the plant and materials shown are correct.

PM_60_50_27/10 Measured quantities

1. **Measured quantities:** When ordering products and constructing the works, the accuracy and sufficiency of the measured quantities is not guaranteed.
2. **Precedence:** The specification and drawings shall override the measured quantities.

PM_60_50_63/50 CDP analysis

1. **Content:** A breakdown of the contract sum into the following categories.

PM_60_60_26/30 Noise – consent by local authority

1. **Consent:** Granted by the local authority under Part III of the [Control of Pollution Act](#) relating to the works providing the following are met.

PM_60_60_26/40 Noise and vibration

1. **Noise control:** In accordance with [BS: Code of practice for noise and vibration control on construction and open sites. Noise](#)
2. **Equipment:** Fit compressors, percussion tools and vehicles with effective silencers of a type recommended by manufacturers of the compressors, tools or vehicles.
3. **Restrictions:** Obtain consent before using percussion tools and other noisy appliances.

Do not use radios or other audio equipment or permit employees to use in ways or at times that may cause nuisance.

PM_60_60_26/60 Pollution

1. **Prevention:** Protect the site, the works and the general environment including the atmosphere, land and water courses against pollution.
2. **Contamination:** If pollution occurs inform immediately, including to the appropriate authorities and provide relevant information.

PM_60_60_26/90 Pesticides

1. **Use:** Not permitted.

PM_60_60_26/120 Nuisance

1. **Duty:** Prevent nuisance from smoke, noise, dust, rubbish, vermin and other causes.
2. **Surface water:** Prevent hazardous build-up on site, in excavations and to surrounding areas and roads.

PM_60_60_26/130 Asbestos-containing materials

1. **Requirement:** Report immediately suspected materials discovered during execution of the works. Do not disturb and agree methods for safe removal or encapsulation.

PM_60_60_26/150 Antiquities

1. **Requirement:** Report immediately fossils, antiquities and other objects of interest or value discovered during execution of the works.
2. **Preservation:** Keep objects in the exact position and condition in which they were found.

PM_60_60_26/160 Moisture

1. **Wetness or dampness:** Prevent where this may cause damage to the works.
2. **Drying out:** Control humidity and the application of heat to prevent:

Blistering and failure of adhesion.

Damage due to trapped moisture.

Excessive movement.

PM_60_60_26/180 Infected timber and contaminated materials

1. **Removal:** Where instructed to remove material affected by fungal and/ or insect attack from the building, minimize the risk of infecting other parts of the building.
2. **Testing:** Carry out and keep records of appropriate tests to demonstrate that hazards presented by concentrations of airborne particles, toxins and other micro-organisms are within acceptable levels.

PM_60_60_26/190 Waste

1. **Waste:** Includes rubbish, debris, spoil, containers and packaging, and surplus material requiring disposal.
2. **Requirement:** Minimize production and prevent accumulation of waste. Keep the site and works clean and tidy. Clean out voids and cavities in the construction before closing.
3. **Disposal:** Collect and store in suitable containers. Remove from site and dispose of in a safe and competent manner, as approved and directed by the Waste Regulation Authority.
4. **Recyclable material:** Sort and dispose at a materials recycling facility approved by the Waste Regulation Authority.
5. **Documentation:** Retain on site.

PM_60_60_26/210 Invasive species

1. **General:** Prevent the introduction or spread of species (e.g. plants or animals) that may adversely affect the site and the works economically, environmentally or ecologically.
2. **Requirement:** Report immediately suspected invasive species discovered during execution of the works. Do not disturb and agree methods for safe eradication or encapsulation.

PROTECTION OF

PM_60_60_26/230 Existing services

1. **Confirmation:** Notify service authorities, statutory undertakers and/ or adjacent owners of proposed work not less than one week before commencing site operations.
2. **Identification:** Before starting work, check and mark positions of mains and services. Where positions are not shown on drawings obtain relevant details from service authorities, statutory undertakers or other owners.
3. **Work adjacent to services:** Comply with service authority's or statutory undertaker's recommendations.

Adequately protect, and prevent damage to services.

Do not interfere with their operation without consent of service authorities, statutory undertakers or other owners.

4. **Identifying services**
 - 4.1. **Below ground:** Use signboards, giving type and depth.
5. **Overhead:** Use headroom markers.
6. **Damage to services**
 - 6.1. **Action:** Immediately give notice and notify appropriate service authority or statutory undertaker.
 - 6.2. **Repair:** Make arrangements for making good without delay to the satisfaction of service authority, statutory undertaker or other owner as appropriate.
7. **Liability:** Measures taken to deal with an emergency will not affect the extent of the contractor's liability.
8. **Marker tapes or protective covers:** Replace, if disturbed during site operations, to service authority's or statutory undertakers recommendations.

PM_60_60_26/250 Roads and footpaths

1. **Duty:** Maintain roads and footpaths within and adjacent to the site and keep clear of mud and debris.
2. **Damage:** Make good if caused by site traffic, or otherwise consequent upon the works, to the satisfaction of the employer, local authority or other owner.

PM_60_60_26/280 Existing topsoil and subsoil

1. **Duty:** Prevent over compaction of existing topsoil and subsoil in those areas which may be damaged by construction traffic, parking of vehicles, temporary site accommodation or storage of materials and which will require reinstatement prior to completion of the works.
2. **Protection:** Submit proposals.
3. **Submittal date:** Before starting work.

PM_60_60_26/290 Retained trees, shrubs and grassed areas

1. **Protection:** Preserve and prevent damage.
2. **Replacement:** Mature trees and shrubs if uprooted, destroyed, or damaged beyond reasonable chance of survival in their original shape, as a consequence of the contractor's negligence, must be replaced with those of a similar type and age at the contractor's expense.

PM_60_60_26/310 Retained trees

1. **Protected area:** Unless agreed otherwise, do not dump spoil or rubbish, excavate or disturb topsoil, park vehicles or plant, store materials or place temporary accommodation within an area which is the larger of the branch spread of the tree or an area with a radius of half the tree's height, measured from the trunk.

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2. **Roots:** Do not sever if exceeding 25mm in diameter. If unintentionally severed, give notice and seek advice.
 3. **Ground levels:** Do not change within an area 3m beyond branch spread.

PM_60_60_40/10 Insurance

1. **Documentary evidence:** Before starting work on site submit details and/ or policies and receipts for the insurances required by the conditions of contract.

PM_60_60_40/100 Professional indemnity insurance

1. **Requirement:** Provide and maintain PI insurance in respect of contractor designed work.
 - 1.1. **Level of cover:** Refer to main contract preliminaries
 - 1.2. **Period of insurance for these purposes:** Refer to main contract preliminaries
2. **Amount of indemnity required:** Refer to main contract preliminaries
3. **Sub-limits of cover**
 - 3.1. **Pollution and contamination claims**
 - 3.1.1. **Level of indemnity:** An annual aggregate amount.
 - 3.1.2. **Limit of cover:** Refer to main contract preliminaries
4. **Expiry of required period of CDP Professional Indemnity Insurance:** Refer to main contract preliminaries
5. **Documentary evidence:** Details and/ or policies and receipts for the insurances required.

PM_60_60_40/110 Insurance claims

1. **Notice:** If an event occurs which may give rise to a 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/ client, the person administering the contract on their behalf and the insurers.
2. **Failure to notify:** Indemnify the employer/ client against loss, which may be caused by failure to give such notice.

PM_60_60_60/10 Removal or replacement of existing work

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

PM_60_60_60/20 Ownership of materials

1. **Alteration or clearance work:** Materials arising become the property of the contractor except where otherwise stated. Remove from site as work proceeds.

PM_60_60_60/30 Measurement

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

PM_60_60_60/50 Security

1. **Protection:** Safeguard the site, the works, products, materials, and existing buildings affected by the works from damage and theft.
2. **Access:** Take reasonable precautions to prevent unauthorized access to the site, the works and adjoining property.
3. **Special requirements:** Refer to main contract preliminaries

PM_60_60_60/70 Stability

1. **Responsibility:** Maintain the stability and structural integrity of the works and adjacent structures during the contract.

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2. **Design loads:** Obtain details, support as necessary and prevent overloading.

PM_60_60_60/80 Occupied premises

1. **Extent:** Existing buildings will be occupied and/ or used during the contract.
2. **Details:** Refer to main contract preliminaries
3. **Works:** Carry out without undue inconvenience and nuisance and without danger to occupants and users.
4. **Overtime:** If compliance with this clause requires certain operations to be carried out during overtime, and such overtime is not required for any other reason, the extra cost will be paid to the contractor, provided that such overtime is authorized in advance.

PM_60_60_60/90 Access control

1. **Controlled areas:** Refer to main contract preliminaries
2. **Control type:** Refer to main contract preliminaries
3. **Authorized persons:** Submit a list of the names of persons requiring access together with other related information reasonably required.
4. **Return of equipment :** On request or on completion of the work to which it relates.

PM_60_60_60/100 Occupier's rules and regulations

1. **Occupier's rules and regulations:** Comply.
2. **Details**
 - 2.1. **Location:** Refer to main contract preliminaries
 - 2.2. **Arrangements for inspection:** Refer to main contract preliminaries

PM_60_60_60/110 Mobile telephones and portable electronic equipment

1. **Restricted area:** Refer to main contract preliminaries
2. **Restriction:** Refer to main contract preliminaries

PM_60_60_70/10 Climatic conditions - records

1. **Climatic conditions:** Record accurately and retain.
2. **Information**
 - 2.1. **Air temperatures:** Daily maximum and minimum, including overnight.
 - 2.2. **Delay records:** Due to adverse weather, include description of the weather, types of work affected and number of hours lost.

PM_60_60_75/20 Explosives

1. **Use:** Not permitted.

PM_60_60_75/50 Fire prevention

1. **Requirement:** Prevent personal injury or death, and damage to the works or other property from fire.
2. **Standard:** Comply with the [Joint Fire Code: Fire Prevention on Construction Sites](#).

PM_60_60_75/60 Smoking on site

1. **Smoking on site:** Not permitted.

PM_60_60_75/70 Burning on site

1. **Burning on site:** Not permitted.

PM_60_60_75/100 Electromagnetic interference

1. **Duty:** Prevent excessive electromagnetic disturbance to other susceptible apparatus.

PM_60_60_75/120 Laser equipment

1. **Construction laser equipment:** Install, use and store in accordance with [BS EN 60825-1](#) and the manufacturer's instructions.
2. **Class 1 or Class 2 laser equipment:** Ensure laser beam is not set at eye level and is terminated at the end of its useful path.
3. **Class 3A and Class 3B laser equipment:** Do not use without approval and subject to submission of a method statement on its safe use.

PM_60_60_75/140 Powder-actuated fixing systems

1. **Use:** Not permitted.

PM_60_60_75/150 Existing features

1. **Protection:** Prevent damage to existing buildings, fences, gates, walls, roads, paved areas and other site features which are to remain in position during execution of the works.

PM_60_60_75/160 Existing work

1. **Protection:** Prevent damage to existing work, structures or other property during the execution of the works.
2. **Removal:** Minimum amount necessary.
3. **Replacement work:** To match existing.

PM_60_60_75/170 Building interiors

1. **Protection:** Prevent damage from exposure to the environment, including weather, flora, fauna and other causes of material degradation during the execution of the works.

PM_60_60_75/180 Existing furniture, fittings and equipment

1. **Protection:** Prevent damage or move as necessary to enable the works to be executed. Reinstall in original positions.
2. **Removal by employer/ client**
 - 2.1. **Timing:** Before work starts in relevant areas.

PM_60_60_75/210 Especially valuable or vulnerable items

1. **Protection:** Ensure provision and maintenance of special protective measures to prevent damage.
2. **Method statement:** Submit within one week of request describing special protection to be provided.

PM_60_60_88/10 Meter readings

1. **Charges for service supplies:** Where to be apportioned ensure that:

Meter readings are taken by relevant authority at possession and/ or completion as appropriate.

Copies of readings are supplied to interested parties.

PM_60_60_88/20 Mechanical plant – contract minimum requirement

1. **Details:** Allow for compliance with contract obligations.

PM_60_70_17/10 Outline construction phase health and safety plan

1. Content

- 1.1. **Risk assessment:** Method statements on how risk from hazards identified in the pre-construction information and other hazards identified by the contractor will be addressed. Procedures for carrying out risk assessment and for managing and controlling the risk.
- 1.2. **Management system:** Details of the proposed management structure, responsibilities and arrangements for issuing health and safety directions. Include procedures for informing other contractors and employees of health and safety hazards.
- 1.3. **Selection:** Proposed procedure for ensuring competency of other contractors, the self-employed and designers.
- 1.4. **Communication:** Procedures for communications between the project team, other contractors and site operatives. Include arrangements for cooperation and coordination between contractors.
- 1.5. **Emergency:** Procedures including those for fire prevention and escape.
- 1.6. **Records:** Arrangements for ensuring that accidents, illness and dangerous occurrences are recorded.
- 1.7. **Personnel :** Procedures for ensuring that persons on site have received relevant health and safety information and training. Include arrangements for consulting with and taking the views of people on site, for preparing site rules and drawing them to the attention of those affected and ensuring compliance.
- 1.8. **Monitoring:** Monitoring procedures to ensure compliance with site rules, selection and management procedures, health and safety standards and statutory requirements. Review procedures to obtain feedback.

PM_60_70_17/20 Construction phase health and safety plan

1. **Delivery to the Client:** Refer to main contract preliminaries
2. **Confirmation:** Do not start construction work until written confirmation is received that the construction phase health and safety plan includes the procedures and arrangements required by the CDM Regulations.
3. **Content:** Develop the plan from and draw on the outline construction phase health and safety plan and the pre-construction information.

PM_60_70_20/10 Execution hazards

1. **Common hazards:** Not listed. Control by good management and site practice.
2. **Significant hazards:** Refer to risk schedule and develop as appropriate
3. **Hazard:** Refer to risk schedule and develop as appropriate
4. **Precautions assumed:** Refer to risk schedule and develop as appropriate

PM_60_70_25/10 Health and safety hazards

1. **Hazards:** Refer to risk schedule and develop as appropriate
2. **Limitations:** The nature and condition of the site and/ or buildings cannot be fully ascertained before they are opened up.
3. **Information:** The accuracy and sufficiency of this information is not guaranteed. Ascertain if additional information is required to ensure the safety of persons and the works.
4. **Training:** Ensure that all relevant personnel are aware of the hazards listed and have received appropriate training to deal with them.

PM_60_70_40/20 Health and safety information

1. **Content:** Describe the proposed organization and resources to safeguard the health and safety of operatives, including those of subcontractors, and of any person whom the works may affect.
2. **Include**

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- 2.1. **Policy document:** A copy of the contractor's health and safety policy documents, including risk assessment procedures.
 - 2.2. **Records:** Accident and sickness records for the past five years and of any previous Health and Safety Executive enforcement action.
 - 2.3. **Training:** Records of training and training policy.
 - 2.4. **Personnel :** The proposed number and type of staff responsible for health and safety on this project with details of their qualifications and duties.

PM_60_70_40/60 Outline construction phase health and safety plan

1. Content

- 1.1. **Risk assessment:** Method statements on how risk from hazards identified in the pre-construction information and other hazards identified by the contractor will be addressed. Procedures for carrying out risk assessment and for managing and controlling the risk.
- 1.2. **Management system :** Details of the proposed management structure, responsibilities and arrangements for issuing health and safety directions. Include procedures for informing other contractors and employees of health and safety hazards.
- 1.3. **Selection:** Proposed procedure for ensuring competency of other contractors, the self-employed and designers.
- 1.4. **Communication:** Procedures for communications between the project team, other contractors and site operatives. Include arrangements for cooperation and coordination between contractors.
- 1.5. **Emergency:** Procedures including those for fire prevention and escape.
- 1.6. **Records:** Arrangements for ensuring that accidents, illness and dangerous occurrences are recorded.
- 1.7. **Personnel:** Procedures for ensuring that persons on site have received relevant health and safety information and training. Include arrangements for consulting with and taking the views of people on site, for preparing site rules and drawing them to the attention of those affected and ensuring compliance.
- 1.8. **Monitoring:** Monitoring procedures to ensure compliance with site rules, selection and management procedures, health and safety standards and statutory requirements. Review procedures to obtain feedback.

2. **Submittal date:** Within one week of request.

PM_60_70_40/80 Health and safety file information

1. **Information:** Provide as required by principal designer.

PM_60_70_60/10 Product hazards

1. **Hazardous substances:** Site personnel levels must not exceed occupational exposure standards and maximum exposure limits stated in the current version of HSE document [EH 40](#).
2. **Common hazards:** Not listed. Control by good management and site practice.

PM_60_70_75/10 Supervision

1. **Requirement:** The whole of the contract work and any significant parts must be under the close control of competent trade supervisors to ensure maintenance of satisfactory quality, progress and coordination.
2. **Evidence:** Submit, including: details of the person proposed; their relevant skills, training and knowledge; practical experience; qualifications; membership or registration with professional bodies; employment history; work-related assessments; and management structure.
3. **Replacement of supervisory personnel:** Give maximum possible notice before changing supervisory personnel.

PM_60_70_75/20 Coordination of engineering services

1. **Suitability:** Site organization staff must include one or more persons with appropriate knowledge and experience of mechanical and electrical engineering services to ensure compatibility between engineering and the works generally.
2. **Evidence:** Submit on request, including: details of the person proposed; their relevant skills, training and knowledge; practical experience; qualifications; membership or registration with professional bodies; employment history; work-related assessments; and management structure.

PM_60_70_80 Social responsibility registration scheme

1. **Registration:** Before starting work, register with the Considerate Constructors Scheme and pay the appropriate fee.
2. **Address:** Considerate Constructors Scheme Office, PO Box 75, Great Amwell, Ware, Hertfordshire, SG12 0YX.
 - Tel. 01920 485959.
 - Fax. 01920 485958.
 - Free phone 0800 7831423
 - Web. www.ccscheme.org.uk
 - E mail. enquiries@ccscheme.org.uk
3. **Standard**

PM_60_70_93 Vehicle safety report

1. **Vehicle equipment (minimum):** Audible alert to other road users to the planned movement of the vehicle when the vehicle's indicators are in operation. Prominent signage at the rear of the vehicle to warn cyclists of the dangers of passing the vehicle on the inside.

Properly adjusted class VI mirror(s) or Fresnel lens to eliminate the near-side blind spot.

Side underrun guards.
2. **Drivers:** Trained on vulnerable road user safety through an approved course.

Hold a current valid Certificate of Competence.

Have a valid driving licence and be legally able to drive the vehicle.
3. **Registration Scheme membership:** Submit evidence of registration with and accreditation to the Fleet Operator Recognition Scheme (FORS).
4. **Level of accreditation:** Gold.

PM_60_70_95 Welfare responsibility registration scheme

1. **Membership:** Register and provide evidence of registration
2. **Address:** Constructing Better Health, B&CE Building, Manor Royal
Crawley, West Sussex
RH10 9QP
 - Tel: 0345 873 7726
 - Email: info@cbhscheme.co.uk
 - Website: www.cbhscheme.co.uk

PM_60_90_40/10 Safety provisions for site visits

1. **Access:** Provide at reasonable times.
2. **Inspections:** Agree dates and times several days in advance, to enable affected parties to be present.
3. **Safety:** Submit details in advance of safety provisions and procedures (including those relating to materials, which may be deleterious) which will require compliance when visiting the site.
4. **Protective clothing and/ or equipment:** Provide and maintain on site for visitors to the site.

PM_60_90_40/30 Inspections

1. **Standard:** Inspection, or other action, of products or executions must not be taken as approval, unless confirmed in writing and including: date of inspection; part of the work inspected; respects or characteristics which are approved; extent and purpose of the approval; and associated conditions.

PM_60_90_40/40 Defects in existing work report

1. **Undocumented defects:** When discovered, immediately give notice. Do not proceed with affected related work until response has been received.
2. **Documented remedial work:** Do not execute work which may hinder access to defective products or executions, or be rendered abortive by the remedial work.

PM_60_90_70 Quality control and management report

1. **Details:** If products of different manufacture to those specified are proposed, submit details with the tender, giving reasons for each proposed substitution. Unless notified at tender stage, proposals for substitutions may not be considered.
2. **Compliance:** Substitutions accepted will be subject to verification requirements detailed in the specification.

PM_60_90_70/20 Substitution of products

1. **Products:** If an alternative product to that specified is proposed, obtain approval before ordering the product.
2. **Reasons:** Submit reasons and relevant information for the proposed substitution.
3. **Information to be submitted:** 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 or guarantee.

4. **Alterations to adjacent work:** If needed, provide details of scope, nature and cost.

-
5. **Manufacturers' guarantees:** If substitution is accepted, submit before ordering products.

PM_60_90_70/30 Equivalent products

1. **Inadvertent omission:** Wherever products are specified by proprietary name, the phrase 'or equivalent' is deemed to be included.

PM_60_90_70/40 Substitution of standards

1. **Specification:** To British Standard or European Standard.
2. **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 recognized in the UK.
3. **Ordering:** Submit notification of all such substitutions before ordering.
4. **Documentary evidence:** Submit for verification when requested. Submitted foreign language documents must be accompanied by certified translations into English.

PM_60_90_70/60 Currency of documents

1. **Currency:** References to published documents are to the editions, including amendments and revisions, current on the date of the invitation to tender.

PM_60_90_70/70 Incomplete documentation

1. **Products and executions:** Where and to the extent that products or executions are not fully documented, they are to be as follows.
2. **Requirements**
 - 2.1. **Standard:** Of a kind and quality appropriate to the nature and character of the part of the works where they will be used.
 - 2.2. **Suitability:** Suitable for the purposes stated or to be reasonably inferred from the project documents.
3. **Contract documents:** Omissions or errors in description and/ or quantity shall not vitiate the contract, nor discharge any obligations or liabilities under it.

PM_60_90_70/80 Workmanship skills

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

PM_60_90_70/100 Quality of products

1. **Generally:** New.
2. **Supply:** Each product from the same source or manufacturer.
3. **Quantity:** Whole quantity of each product required to complete the works is to be of a consistent kind, size, quality and overall appearance.
4. **Tolerances:** Where critical, measure a sufficient quantity to determine compliance.
5. **Deterioration:** Prevent: order in suitable quantities to a programme and use in appropriate sequence.
6. **Recycling:** Proposals for recycled products may be considered.

PM_60_90_70/180 Quality of execution

1. **Generally:** Fix, apply, install or lay products securely, accurately, plumb, neatly and in alignment.
2. **Colour batching:** Do not use different colour batches where they can be seen together.
3. **Dimensions:** Check on site.

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4. **Finished work:** Not defective, damaged, disfigured, dirty, faulty or out of tolerance.
 5. **Appearance:** Adjust joints open to view so that they are even and regular.

PM_60_90_70/260 Samples

1. **Products or executions:** Comply with specification requirements and, in respect of the stated or implied characteristics, either to an express approval or to match a sample expressly approved as a standard for the purpose.

PM_60_90_70/270 Approval of products

1. **Programme:** Undertake or arrange submissions, samples, inspections and tests to suit the works programme.
2. **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.
3. **Complying sample:** Retain on site in good, clean condition. Remove when no longer required.

PM_60_90_70/280 Approval of execution

1. **Programme:** Undertake or arrange submissions, samples, inspections and tests to suit the works programme.
2. **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.
3. **Complying sample:** Retain on site in good, clean condition. Remove when no longer required.

PM_60_90_70/290 Accuracy of instruments

1. **Measurement:** Use instruments and methods described in [BS 5606](#), Appendix A.
2. **Accuracy:** Maintain

PM_60_90_70/310 Critical dimensions

1. **Critical dimensions:** Set out and construct the works in accordance with the critical dimensions and tolerances stated.

PM_60_90_70/330 Quality control

1. **Procedures:** Establish and maintain to ensure that the works, including the work of subcontractors, comply with specified requirements.
2. **Records:** Maintain full records, keep copies on site for inspection and submit copies on request.
3. **Content of records**
 - 3.1. **Identification:** Describe each element, item, batch or lot, including location in the works.
 - 3.2. **Inspections, tests and approvals:** Describe purpose and dates.
 - 3.3. **Nonconforming work:** Describe nature and extent of work found.
 - 3.4. **Corrective action:** Details of work carried out.

PM_60_90_70/350 Quality control resource statement

1. **Resources:** Describe the proposed organization and resources to control the quality of the works, including the work of subcontractors.
2. **QA staff:** Identify in the statement the number and type of staff responsible for quality control, with details of their qualifications and duties.

Ω End of Section

PM_70

Testing, commissioning and completion information

Project management

PM_70_80 Commissioning information

1. **General:** Submit relevant drawings and preliminary performance data to enable users to become familiar with the installation.
2. **Submittal date:** At commencement of commissioning.

PM_70_80/01 Commissioning Programme

1. **Submittal date:** Prepare comprehensive programmes for the pre-commissioning checks, setting to work, testing, commissioning, system proving and environmental testing of the contract works. Submit programme within 4 weeks of contract appointment.

Review and update the commissioning programme at agreed intervals and if necessary revise and amend the programme to suit the progress of the contract works. Due account shall be taken of any phasing requirements.

2. **Format:** Electronic and Hard Copy.
3. **Commissioning manager:** Employ an independent company who specialises in testing and commissioning of building services to undertake all commissioning and testing activities associated with the contract works and as specified elsewhere.

The commissioning specialist shall be a member of The Commissioning Specialists Association (CSA).

Submit with the tender details of the independent company to be employed.

PM_70_80/02 Commissioning & Testing

1. **Requirements:** All commissioning management, commissioning, testing, dosing etc shall be undertaken by an independent Commissioning manager appointed and managed by the Main Contractor.

All commissioning shall be carried out in strict accordance with BSRIA Standards.

Where used in the specification the following definitions shall apply:

- **Commissioning** - the advancement of an installation from the stage of static completion to working order to the specified requirements.
- **Testing** - the measurement and recording of specified quantifiable characteristics of an installation or parts thereof. This includes off site testing.
- **Setting to work** - the process of setting a static system in motion
- **Regulation** - the process of adjusting the rates of fluid flow in a distribution system to achieve specified values
- **Environmental testing** - the measurement and recording of internal environmental conditions
- **System proving** - the measuring, recording, evaluating and reporting on the seasonal performance of the systems against their design values
- **System demonstration** - demonstrating the capability of the installation to achieve and maintain the specified performance criteria
- **Fine-tuning** - the adjustment of the system where usage and system proving has shown such a need. This may include the re-assessment of design values and control set points to achieve the required system performance.

Notify the CA & HH in writing when the Works or parts thereof are ready for testing and commissioning. A minimum of 2 weeks notice shall be provided for each element prior to carrying out commissioning and subsequent re-commissioning.

Provide all necessary facilities to enable tests to be witnessed and inspections carried out including all necessary instruments and recorders to monitor systems during commissioning system proving and environmental testing.

Appoint a "competent person" to supervise the whole of the testing, commissioning, system proving, system demonstration and instruction of the employer's staff.

Co-ordinate the activities of all specialised personnel, including manufacturer's representatives, together with providing any attendance required.

Indicate on drawings where access is required into ceiling voids, service risers etc and ensure these points are not closed up until the commissioning and testing is complete.

The object of the witnessing stage is to enable the CA & HH to establish a level of confidence in the commissioning and operation of all MEP Plant and Systems.

Harley Haddow and the CA will only witness selected test and commissioning readings and confirm recorded results and determine if the specified requirements have been satisfied.

Following the full and extensive commissioning exercise, the specialist shall allow for additional readings to be taken (circa 25%) at Harley Haddow's discretion. These readings will be used to prove the commissioning exercise previously undertaken

Should the tests fail to demonstrate that the plant and equipment are properly installed and functioning correctly, the cause of the failure shall be investigated. Should the failure be due to incorrect or faulty work then without delay, carry out such remedial works, measures and adjustments as may be necessary and repeat the commissioning and testing procedure to the satisfaction of the CA.

Ensure all requirements such as cleanliness, protection from harmful external and internal elements are provided prior to commencement of commissioning

Where it is not possible at the particular time of commissioning and testing for full load conditions to be obtained or simulated, undertake to repeat such operations of full load or a simulation thereof at a time when this can be achieved.

The Works shall be fully tested, commissioned and be fully operational prior to witnessing and inspection by the CA & HH

Where portions of the work are required to be commissioned and tested separately, then upon final completion, demonstrate to the CA & HH that all the several portions are capable of proper simultaneous operation in accordance with the requirements of the specification.

In cases where the construction programme is such that the commissioning, testing, balancing, adjustment, needs to be undertaken in an area of the building taken over and occupied by the Employer, then take all necessary precautions against and be responsible for any damage caused whilst working in such areas for that purpose.

All certification documents shall be submitted to the CA & HH for examination before any system is offered for witnessing and final acceptance.

Provide a written statement to the CA & HH confirming that each installation has been correctly tested and commissioned and that the performance requirements can be achieved.

Provide a written statement to the CA & HH confirming that each installation has been correctly tested and commissioned and that the performance requirements can be achieved.

Undertake the following:

- Test, commission, regulate and set to work the Works
- Prepare comprehensive programmes, commissioning plans, schedules and method statements and procedures supported by risk assessments for the pre-commissioning checks, setting to work, commissioning, system proving and environmental testing of the Works
- Develop and complete the initial commissioning plan and submit to the CA & HH
- Comply with the requirements of the Building Regulations for the inspection and commissioning of the building services systems. Prepare all necessary submittals including commissioning plans and reports.
- Obtain all compliance approvals from the building control bodies.
- Provide all specialist personnel including manufacturer's representatives and coordinate their activities, together with providing any attendance required.
- Provide and submit standard proforma for the various requirements for commissioning records and certification for agreement with the CA prior to commencement of the works
- Monitor progress against the program of works and provide weekly reports detailing progress of testing and commissioning activities
- Maintain a diary/log of significant commissioning and testing activities
- Measure and reconcile noise levels at agreed locations to verify compliance with design criteria
- Submit to the CA & HH all certification documents prior to any system being offered for final acceptance
- Confirm in writing to the CA & HH that each installation has been correctly tested and commissioned and that the performance requirements can be achieved.
- Ensure all certification is attained and witnessed as necessary for inclusion in the record documentation
- Provide and submit a report for every test, demonstration, balance or commissioning activity witnessed, together with an engineering appraisal on the performance, either on or off-site
- As necessary co-ordinate and liaise with the Employer's representative
- Maintain on site at all times full records of all testing, commissioning and performance testing
- Prepare a written report on the operational and performance testing
- A final commissioning report detailing the results of the commissioning and commenting on the performance of systems

Performance testing, system demonstration, system proving or environmental and capacity testing, until commissioning of the system is completed to the satisfaction of the CA & HH.

Submit to the CA & HH written reports signed by a "competent person" to confirm that:

- Prior installation - all system designs can be commissioned
- Post installation - installations complete and ready for commissioning
- System cleanliness - specified cleanliness has been achieved
- Pre-commissioning checks - completion of pre-commissioning checks
- Commissioning and testing - demonstrate compliance with specified requirements and confirm that each installation has been correctly tested and commissioned and achieving the specified performance
- All necessary checks and witnessing by the Local Authority, Government offices, Statutory Authorities etc have been undertaken

During the 12 months after practical completion and in consultation with the CA & HH undertake to:

- Assess the need for fine tuning of the installations
- Ensure the requirements for fine tuning are incorporated in the commissioning specification
- Ensure that fine tuning activities are programmed, planned in advance and agreed with the CA & HH and employer prior to commencement
- Arrange that the relevant parties are retained and appointed to provide input to fine tuning activities
- Ensure that fine tuning activities are planned with regard to the health and safety of occupants and such that any disturbance to them is minimised
- Provide a mechanism by which the employer can provide feedback on the performance of the building both before and after fine tuning
- Attended meetings as requested by the CA & HH to deal with issues arising from fine-tuning of the Works.
-

Costs for fine-tuning and adjustment of the Works during the 12 months after practical completion shall be included in the contract price.

Allow for 6 of visits during the 12 months after practical completion and provide rates for additional visits.

2. Inspections and Tests: Prior to commencement of the works submit schedules indicating those parts of the contract works for which inspections and tests are required to substantiate conformity with the specification.

Should any alternative item be proposed that does not carry appropriate certification, ensure independent testing is carried out at no expense to the contract works to confirm compliance.

Provide method statements supported by risk assessments detailing the procedures for carrying out all on site tests.

Agree in advance with all parties procedures for inspections and tests including periods of notice.

Where a test indicates non-compliance with the specification submit immediately details of the non-compliance and details for corrective action.

Maintain records of all specified inspections and tests performed including third party and works testing and maintain copies of all records on site for inspection.

3. Static Testing: Progressive static testing shall include the following tests, but other tests may be required and witnessed:

- Insulation resistance
- Earth fault loop impedance
- Earth continuity
- Pressure testing of hydraulic systems
- Air leakage testing of ductwork systems(Class B)

The CA & HH shall be given the opportunity to witness all static tests. Advance notice of 5 working days shall be given to the CA & HH

- Environmental testing

Provide a temporary installation of portable recorders to

- record temperature
- record humidity (In areas where humidity control is included)

The corresponding external conditions shall also be recorded whilst tests are in progress.

The period of testing shall be 1 week.

The final locations of the test instruments shall be agreed with the CA & HH prior to commencement of the environmental testing period.

4. Fuel for Testing: Fuel for testing and operating the Works will be recoverable from the Client.

PM_70_85_10/30 The building manual

1. **Purpose:** The building manual is to be a comprehensive information source and guide for owners and users of the completed works. It must provide an overview of the main design principles and describe key components and systems within the finished works to enable proper understanding, efficient and safe operation and maintenance.
2. **Scope**
 - 2.1. Part 1: General.
 - 2.2. Part 2 : Fabric.
 - 2.3. Part 3 : Services.
 - 2.4. Part 4: The health and safety file
 - 2.5. Part 5: Building user guide.
3. **Responsibility for production:** Main Contractor / Sub-Contractors
4. **Date required:** 2 Weeks before PC
5. **Compilation:** Prepare all information for contractor designed or performance specified work including as-built drawings. Obtain or prepare all other information to be included in the manual.
6. **Reviewing the Manual:** Prepare and circulate a complete draft. Amend in the light of any comments and recirculate. Do not proceed with production of the final copies until authorized.
7. **Final copies of the Manual**
 - 7.1. Number of copies: Two
 - 7.2. Format: 1 x Hard Copy, 1 on Memory Stick (USB)
 - 7.3. Latest date for submission: Two weeks before the date for completion stated in the contract.
8. **As-built/ record drawings and schedules**
 - 8.1. Number of copies: Two
 - 8.2. Format: 1 x Hard Copy, 1 on Memory Stick (USB)

PM_70_85_10/80 Content of the building manual part 1: general

1. **Content:** Obtain and provide the following, including all relevant details not included in other parts of the manual.
2. **Index:** List the constituent parts of the manual, together with their location in the document.
3. **The Works:** Description of the buildings and facilities.

Ownership and tenancy, where relevant.

Health and safety information – other than that specifically required by the [Construction \(Design and Management\) Regulations](#).

4. **The Contract:** Names and addresses and contact details of all significant consultants, contractors, subcontractors, suppliers and manufacturers.

Overall design criteria.

Environmental performance requirements.

Relevant authorities, consents and approvals.

Third-party certification, such as those made by 'competent' persons in accordance with the Building Regulations.

5. **Operational requirements and constraints of a general nature:** Maintenance contracts and contractors.

Fire safety strategy for the buildings and the site. Include drawings showing emergency escape and fire appliance routes, fire resisting doors, location of emergency alarm and firefighting systems, services, shut off valves switches, etc.

Emergency procedures and contact details in case of emergency.

Other specific requirements.

6. **Timescale for completion:** Practical Completion

PM_70_85_10/100 Content of the building manual part 3: building services

1. **Content:** Obtain and provide the following, including all relevant details not included in other parts of the manual:

- 1.1. **Detailed design criteria and description of the systems, including:** Including:

Services capacity, loadings and restrictions.

Services instructions.

Services log sheets.

Manufacturers' instruction manuals and leaflets index.

Fixtures, fittings and component schedule index.

- 1.2. **As-built/ record drawings:** For each system recording the construction, together with an index, including:

Diagrammatic drawings indicating principal items of plant, equipment and fittings.

Record drawings showing overall installation.

Schedules of plant, equipment, valves, etc. describing location, design performance and unique identification cross referenced to the record drawings.

Identification of services – a legend for colour coded services.

- 1.3. **Product details:** Including for each item of plant and equipment:

Name, address and contact details of the manufacturer.

Catalogue number or reference.

Manufacturer's technical literature, including detailed operating and maintenance instructions.

Information and guidance concerning dismantling, repair, renovation or decommissioning.

- 1.4. **Operation:** A description of the operation of each system, including:

Starting up, operation and shutting down.

Control sequences.

Procedures for seasonal changeover.

Procedures for diagnostics, troubleshooting and fault-finding.

- 1.5. **Guarantees, warranties and maintenance agreements** – obtain from manufacturers, suppliers and subcontractors: Obtain from manufacturers, suppliers and subcontractors.
- 1.6. **Commissioning records and test certificates list for each item of plant, equipment, valves, etc. used in the installations** – including: List for each item of plant, equipment, valves, etc. used in the installations, including:

Electrical circuit tests.

Corrosion tests.

Type tests.

Work tests.

Start and commissioning tests.

- 1.7. **Equipment settings**: Schedules of fixed and variable equipment settings established during commissioning.
 - 1.8. **Preventative maintenance**: Recommendations for frequency and procedures to be adopted to ensure efficient operation of the systems.
 - 1.9. **Lubrication**: Schedules of all lubricated items.
 - 1.10. **Consumables**: A list of all consumable items and their source.
 - 1.11. **Spares**: A list of recommended spares to be kept in stock, being those items subject to wear and tear or deterioration and which may involve an extended delivery time when replacements are required.
 - 1.12. **Emergency procedures** : For all systems, significant items of plant and equipment.
 - 1.13. **Annual maintenance summary chart**: For all systems.
 - 1.14. **Other specific requirements**: See Specific information Below
2. **Timescale for completion**: Practical Completion

PM_70_85_10/101 Operation & Maintenance Manuals

1. **Test Certificates**: Ensure test certificates include:
 - Project title
 - Contractor's name
 - Specific location of the item in the Works, including plant identification, system etc
 - Details of the plant / equipment, including manufacturers' reference number
 - Date, time and duration of inspection / test
 - Weather conditions during the test, where applicable
 - Details of the test / inspection
 - Instruments used, serial numbers, and calibration dates, where applicable
 - Number and type of deficiencies found, where applicable
 - Any corrective action taken, where applicable
 - Itemised readings for all tests, where applicable
 - Name and signature of those inspecting / witnessing test / testing
 - Other relevant particulars.

Formal test certificates must be issued in duplicate to the CA within 5 working days of the test.

Handwritten results must be provided within 2 working days of the test being carried out.

Maintain records of all specified inspections and tests performed including third party and copies of works test certificates on site

2. **Record Documentation**: Be advised that great importance will be placed upon quality, accuracy, clarity and

completeness of the record documents and upon these being made available promptly. Practical completion will not be granted unless an approved copy of the record documentation has been prepared, and is available for handover to the Employer.

Comply with the requirements of the CDM Regulations in providing the appropriate input to the health and safety file for the Works.

Comply with the requirements of the Building Regulations in providing all necessary documentation and information.

Provide record documentation, as detailed elsewhere, to include but not limited to:

- Record drawings and schedules.
- Plant room and switch room drawings, schedules and schematics.
- Operating and maintenance manuals.
- Blank maintenance logs.
- Building log book information.

Ensure record documents clearly record the arrangements of the various sections of the Works as actually installed and identify and locate all component parts.

The record documents shall set out the extent to which maintenance and servicing is required and how, in detail, it should be executed. Sufficient, readily accessible and proper information shall be provided to enable spares and replacements to be ordered.

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

Demonstrate as required throughout the execution of the contract works that complete and accurate records are being maintained and that the record documents are being progressively compiled as the work on site proceeds.

3. Operating and maintenance manuals: Employ an independent company who specialises in the preparation of operation and maintenance manuals to provide the manuals in accordance with the requirements of this specification.

Submit details of the proposed specialist to the CA & HH for approval prior to commencement of the Works

4 weeks before the contract completion date provide a draft copy of the operating and maintenance manual to the CA for comment.

Retain a copy of all the delivered record documentation for at least one year after practical completion. If requested by the Employer or CA & HH during this period, provide additional copies subject to a charge.

Undertake the following activities with respect to the preparation of the operation and maintenance manual:

- Liaison with the Planning Supervisor and any other parties associated with the production of the Health and Safety File, to ensure that the required information is complete and that the method of presentation and terms used are consistent.

- Liaison with designated members of the design team to obtain all information necessary to convey a thorough

understanding of the design intent and operating principles of the installations.

- Liaison with designated contractors and specialist subcontractors to obtain all necessary details of the installed systems and equipment to enable safe and proper operation and maintenance.

- Liaison with specialist equipment suppliers as necessary to ensure that clear operating and maintenance instructions are included in the Manual.

-
- Preparation of additional written, diagrammatic and/ or pictorial information as necessary for the operation and maintenance of the engineering services installations;
 - Re-drafting and restructuring information provided by others as necessary so as to ensure consistency with other parts of the manual and other sections of the Health and Safety File.
 - Submitting periodic reports to the CA on the progress of the preparation of operation and maintenance manuals.
 - Collating all the information into a co-ordinated, indexed and cross-referenced document.
 - Providing all stationery, printed material and binders required for the production of the draft and final editions of the operation and maintenance manuals.

The manual supplier shall be responsible for the correction of any errors or omissions in the manual.

General requirements

- All documentation shall be in English as spoken and written in the United Kingdom.
- All units of measurement shall be metric, conforming to the SI system.
- The text of descriptive sections shall be concise and complete avoiding possible ambiguity or misunderstanding. All information shall be pertinent to the specific installations. Irrelevant material or material of a general nature shall not be acceptable. Where generic standard clauses are used as the basis for certain parts of the manual, they shall be edited to ensure that all text is relevant to the Works.
- Jargon shall be avoided. All new terms shall be defined when first introduced. Abbreviations shall only be used if they have been defined or their meaning is clear from the text.
- The imperative mode shall be used for instructions regarding operation, maintenance, disassembly etc.
- Illustrations, drawings and diagrams incorporated into the manual shall be easily read in conjunction with the relevant text.

All aspects of the manual shall comply with relevant requirements of the CDM Regulations for the provision of information for the Health and Safety File. Where appropriate, the maintenance procedures and frequencies detailed in the manual shall be in accordance with details provided by the manufacturer for specific items of equipment. Where specific requirements are not pertinent, the procedures and frequencies shall be as recommended in HVCA Standard Maintenance Specifications for Services in Buildings.

Care shall be exercised to ensure that maintenance procedures and frequencies described in manufacturers' printed details are accurately reflected in the text of the manual.

The manual supplier shall identify, from the CA, the intended maintenance strategy for the Works and the level of technical competence and user ability of the personnel likely to be employed. The manual shall be written in a style to suit the abilities of all users. Where necessary, prepare separate sections to suit the following levels of competence:

- non-technical - eg building manager or caretaker requiring simple directions for basic operations.
- general technical - with broad-based maintenance skills required for routine maintenance, inspections etc and detailed analysis of system operation.
- specialist - in individual fields and with respect to particular items of equipment.

The manual shall have an alphabetical index or indexes. The indexing and cross-referencing in other parts of the manual shall be arranged to provide easy access to required information.
Content and layout

The manual shall be arranged as follows unless an alternative format and contents are agreed with the CA prior to issue of the draft document:

Outline of Contents;

- Front cover and fly sheet
- General details to be shown on all volumes
- Document title - Operating and Maintenance Manual
- Employer name and logo
- Premises name
- Services referred to in the manual
- Volume reference where the manual runs to more than one volume
- Description of contents (eg General Information and Design Details)
- Spine details to be shown on all volumes
- Services referred to in the manual
- Volume reference where the manual runs to more than one volume
- Description of contents (eg General Information and Design Details)

Title pages;

- Premises name and address (authenticated postal address, phone, fax, e-mail etc)
- Services referred to in the manual
- Full name and address of the Employer
- Date of completion and date of handover of the services to the Employer
- Date of issue
- The author's reference number of the manual
- Name and address of the author of the manual

Contents and index;

- Contents list for the whole manual. To comprise a master list of main headings of each section for each volume of the manual, for cross reference. (Copies of this master contents list to be included in the master contents list for the Health and Safety File)
- Detailed contents for the particular volume. To include a structured contents list showing main headings and details of contents of each section in that volume, with paragraph numbers and page numbers.
- Detailed contents for each section. To be located at the front of each section of the manual, giving a detailed, structured list of the contents of the respective section.
- Index comprising a comprehensive alphabetical index for all sections of the manual

Section 1 General information and introductory overview;

- Full name, address, telephone and facsimile numbers, website address and email address of the design team and all installing contractors, sub-contractors and specialists for the Works
- Full name, address, telephone and facsimile numbers, website address and email address of all public utilities and local authorities
- Any limitations on the use of the manual
- Record of amendments to manual schedule (including space for future records)
- Description of how to use the manual
- List of all supplementary documents
- Distribution list and locations of all copies of the manual
- Scope including a brief description of which systems and details are included in the manual

Section 2 Contractual and legal information;

- Details of ownership, leases etc defining areas of responsibility for operation and maintenance
- Construction / handover dates including installation start date(s), practical completion date and end of defects liability date

- Details and copies of all manufacturers' guarantees or warranties together with maintenance agreements offered by sub-contractors or manufacturers. Include expiry dates.
- Insurance inspection reports. Documents pertinent to Employer's / User's liability
- Local and public authority consents. To include permissions required for access, alterations etc
- Safety and fire certificates. Certificates confirming that the premises and installed systems may be safely utilised.

These shall include examination certificates by competent persons for pressure systems etc, together with written schemes of examination for pressure systems.

- Software licence information.

Section 3 Health and safety;

- Features or characteristics that may produce a hazard. Flammable, toxic or otherwise deleterious substances necessary for the operation of systems; restricted access; pressure systems etc
- Known hazards against which protection can be provided
- Mandatory requirements relating to safety. To include details of all systems and equipment requiring periodic inspection/ examination/ testing to comply with relevant regulations, approved codes of practice etc
- Relevant safety precautions. To include procedures to minimise the risk of damage or injury from recognised hazards.

Requirements for special manual procedures, permits to work etc.

- Details of recommended first aid equipment to be maintained on the premises.

Section 4 Emergency information;

- Contact information for:
- Utility supplier emergency services (gas, water, electricity)
- Provider of emergency call out service
- Installer's emergency staff
- Security/fire systems
- Location of first aid equipment
- Emergency control locations
- Water main stopcock(s)
- Gas shut -offs
- Electricity isolation points
- Specific systems/plant

Section 5 Description of services and design intent;

- A schedule of the floor areas of each of the building zones categorised by environmental servicing type
- Description of the whole building and intended use
- Design philosophy including all design criteria
- A full description of each of the installed systems and items of equipment. To include as a minimum a written explanation of the following:
 - Scope
 - Intended purpose
 - Plant and distribution locations; divisions of main zones; etc, cross-referenced to schematics
 - Function
 - General design parameters
 - Installed capacities
 - System capacities (based on commissioning results)
 - Restrictions of the systems
 - Planned operational efficiency and most economic mode of operation
 - Expected service life
 - Manufacturers information concerning correct operation

Section 6 Equipment schedules;

- System by system schedules of all plant, equipment, valves, distribution boards etc stating as minimum:
- Component type

- Unique asset number
- System
- Location
- Number off
- Duty and size
- Performance figures
- Manufacturer and supplier
- Manufacturer's model and/or reference number
- Manufacturer's serial number and nameplate details
- Original order number for the particular plant/equipment item
- Each item of plant/equipment must have a unique asset number cross-referenced to the record drawings and schedules.

Section 7 Systems operation;

- Descriptions of the operational and control strategies to include:
- Control and operating strategy for each system
- Outline of general operating mode including summer and winter operation
- Start-up and shut down procedures. Description of procedures for whole system and individual items of plant, from fully off to fully operational, including interlocks etc.
- Interlocks and inter-dependencies between plant and systems.
- Procedures for emergency shut down and operating procedures for standby plant.
- Means of making safe potentially dangerous plant
- Precautions necessary to overcome known hazards when operating each system, bringing into operation all standby equipment included in each system
- Instructions on fault finding and emergency in case of plant malfunction or equipment failure control sequences for all systems installed
- Details of all software provided and procedures for updating and/or modifying software operating systems and control programs
- Instructions for the creation of control procedure routines and graphic diagrams where applicable.

Section 8 Energy management;

- Energy management strategy to enable energy consumption to be monitored and controlled.
- Metering philosophy. To include a schedule of the building's energy supply meters and sub-meters, indicating for each meter, the fuel type, its location, identification and description, and instructions on their use.
- Carbon emissions and the comparable performance benchmarks / target figures for energy consumption and energy costs. (Design assessments to be in accordance with Building Regulations)
- The measured air permeability of the building
- Forms for recording plant running hours, energy consumption and energy costs.

Section 9 Maintenance;

- Maintenance instructions for each item of plant, co-ordinated from manufacturer's details and recognised industry guidelines including frequency and recommended routine maintenance activities guidance on the nature of deterioration and defects look for dismantling and re-assembly adjustment, calibration and testing special tools needed for maintenance (cross referenced to the particular item) test equipment and auxiliary services
- Reference to spare parts / replacements
- Programme / frequencies for planned preventive maintenance.
- Comprehensive schedules identifying:
 - routine periodic checks on plant / system status and condition.
 - periodic verification of accuracy of controls, instruments etc.
 - routine visual and physical checks, measurements and certification of continuing fitness for purpose and safety.
 - routine checks / changes to plant / system components / settings to compensate for wear, operational requirements, experience in use etc so as to ensure continuing optimum performance.
- Recommended frequencies and procedures for routine lubrication of moving parts, including

generic specification for lubricants.

- Procedures for fault finding and identifying causes of abnormal operation of plant / equipment.

Section 10 Spares and tools;

- Schedule of types of replaceable assemblies, components etc particular to specific plant.
- Schedule of specialist tools / equipment particular for specific plant and necessary for undertaking work at height etc.
- Separate parts lists shall be provided for each item detailed in the equipment schedule.
- Schedule of normal consumable items
- Recommended stocking levels
- Schedule of personal protective equipment necessary for operation / maintenance activities / tasks

Section 11 Drawings;

- A schedule of all engineering services record drawings for the Works. The information to include drawing title, number, source, revision, date, system detail, file/storage location. The schedule to include space to record future modifications and dates.
- An A3 size reduced copy of all record drawings together with an index.
- An A3 size reduced copy of all plantroom and switchroom drawings, schematics and schedules
- Legend for all colour-coded services
- Schematic drawings of each system, indicating principal items of plant, equipment, valves, etc.
- A schedule of all manufacturers' drawings for the Works. The information to include drawing title, number, source, revision, date, system detail, file/storage location. Schedule to include space to record future modifications and dates.

Section 12 Testing and commissioning data;

- Copy of report(s) confirming that the Works were satisfactorily commissioned signed by a competent person(s)
 - Copies of all test certificates, records, commissioning and performance test records for the Works. All certification shall be signed and witnessed.
 - Method statements for the testing and commissioning procedures undertaken including description of equipment used.
 - Copies of calibration certificates for all test equipment.
- Schedules of all fixed and variable equipment settings established during commissioning.

Section 13 Manufacturers' data;

- Schedule of all manufacturers and suppliers indicating company name, address, telephone and facsimile numbers, email address(es), website address and equipment unique asset number. (Sorted in company order alphabetically)
- Product (manufacturer's) data/ literature for all items of equipment and plant installed. The information to be project specific and include detail drawings, electric circuit details and operating and maintenance instructions.

Section 14 Materials and substances;

- Register of harmful substances. Details of any materials that could be hazardous to health, used in connection with or otherwise relevant to operational or maintenance activities.
- COSHH details
- Register of recyclable materials
- Methods for safe disposal or destruction of any parts, materials or components. Provide a data sheet for each material known to constitute a potential hazard, with detailed procedures for its safe, authorized disposal.

Section 15 Modification information;

- Details of allowances made by plant manufacturer or system designer for modifications
 - Provide space in manual to record future modifications.
- The manual shall conform to the following minimum standards:
- 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.
 - The manuals shall be prepared on an approved typeface on top quality A4 suitable for direct

insertion into the manuals

- The front cover and where appropriate the spine, shall have the information clearly displayed in permanent lettering.
- Dividers between sections shall be stepped, overlapping printed card. The divider shall be labelled to identify the section of the manual that it proceeds.
- All pages comprising the manual shall be subsequently numbered according to each section (i.e. section 1 pages numbered 1/1, 1/2, etc., section 2 2/1, 2/2 etc.).

Checking of drafts

A draft copy of the operating and maintenance instruction manuals contained in a temporary loose leaf binder(s) shall be issued to the CA for examination prior to the testing and commissioning.

The draft copy of the manual shall conform to the required format and contain all the information identified in this specification with the exception of any information not available at that time (such as commissioning results).

Draft versions of the manual shall clearly display the word "DRAFT".

Final documentation

Once approved a draft copy shall be handed over prior to instructing the employer's staff in the operation and use of the services installations. This copy shall contain all testing and commissioning data and test results, actual control set points and the like in draft form.

Prior to practical completion provide the following copies of the final manual which shall include all testing and commissioning results and final plant duties and control settings, etc. in a typed form.

- The number of paper format copies shall be 2No.
- The number of copies in electronic format on Memory Stick shall be 3No.

All memory sticks and other electronic forms of delivery media associated with the manual shall be clearly labelled with:

- A heading stating "O&M manual" and disc number if more than one disc
- Details of the premises and systems covered
- The issue number of the manual and date of release

Copyright

The Employer shall have sole copyright to all documents produced specifically for the manual. The Employer shall be entitled to produce copies of all parts of the manual for their own use.

If the Employer transfers ownership or responsibility of the installations they shall be entitled to transfer their copyright of documents included in the manual.

PM_70_85_10/110 Content of the building manual part 4: the health and safety file

1. **Content:** Obtain and provide the following, including all relevant details not included in other parts of the manual, including:

Residual hazards and how they have been dealt with.

Hazardous materials used.

Information regarding the removal or dismantling of installed plant and equipment.

Health and safety information about equipment provided for cleaning or maintaining the structure.

The nature, location and markings of significant services.

Information and as-built drawings of the structure, its plant and equipment.

PM_70_85_10/120 Content of the building manual part 5: the building user guide

1. **Content:** The Main contractor shall be responsible for compiling the building log book.

Prepare and submit to the party responsible for compiling the building log book all necessary information for inclusion in the document to meet the requirements of the Building Regulations and in accordance with CIBSE TM31 Building Log Books - A guide and templates for preparing building log books.

Clearly, there are direct links between the building log book and the operating and maintenance manual, record drawings etc. The building log book information is an additional requirement to the responsibilities for the production of record documentation as stated elsewhere.

Practical Completion will not be granted if the required information is not issued.

2. **Timescale for completion:** Prior to Practical Completion

PM_70_85_10/140 Presentation of building manual

1. **Format:** A4 size, plastics covered, loose leaf, four ring binders with hard covers, each indexed, divided and appropriately cover titled
2. **Selected drawings :** Where these are needed to illustrate or locate items mentioned in the manual: if larger than A4, to be folded and accommodated in the binders so that they may be unfolded without being detached from the rings.
3. **As-built/ record drawings:** The main sets may form annexes to the manual.

PM_70_85_20 Defects rectification report

1. **Non-compliant items**
 - 1.1. **Opening up, inspection, testing, making good, adjustment of the Contract Sum, or removal and re-execution:** Submit proposals
 - 1.2. **Submittal date:** As soon as possible after discovery of items which are, or appear to be, non-compliant.
2. **Acceptability:** Such proposals may be unacceptable, and contrary instructions may be issued.

PM_70_85_20/30 Measures to establish acceptability

1. **General:** Wherever inspection or testing shows that the work, materials or goods are not in accordance with the contract, and measures (e.g. testing, opening up, experimental making good) are taken to help in establishing whether or not the work is acceptable, such measures will be at the expense of the contractor, and will not be considered as grounds for revision of the completion date.

PM_70_85_20/40 Rectification and defects

1. **Notice:** Give reasonable notice for access to the various parts of the works.
2. **Access arrangements:**
3. **Completion:** Give notice when remedial works have been completed.

PM_70_85_30/10 Tests and inspection schedule

1. **Timing:** Agree and record dates and times of tests and inspections to enable affected parties to be represented.
2. **Confirmation:** Provide one working day prior to each test or inspection. If sample or test is not ready, agree a new date and time.
3. **Records:** Submit a copy of test certificates and retain copies on site.

PM_70_85_35/10 Partial possession by employer

1. **General:** If clauses 2.33 to 2.37 of the conditions of contract are applied ensure necessary access, services and other associated facilities are also complete.

PM_70_85_35/60 Completion in sections or in parts

1. **General:** Where it is proposed to take possession of a section or part of the works and such section or part will, after its practical completion, depend for its adequate functioning on work located elsewhere on the site, complete that other work in time to permit such possession to take place.
2. **Remainder of the Works:** During execution, ensure that completed sections or parts of the works have continuous and adequate provision of services, fire precautions, means of escape and safe access.

PM_70_85_35/100 Work before completion

1. **General:** Make good damage consequent upon the works. Remove temporary markings, coverings and protective wrappings unless otherwise instructed.
2. **Cleaning:** Clean the works thoroughly inside and out, including accessible ducts and voids. Remove splashes, deposits, efflorescence, rubbish and surplus materials.
3. **Cleaning materials and methods:** As recommended by manufacturers of products being cleaned, and must not damage or disfigure other materials or construction.
4. **COSHH dated data sheets:** Obtain for materials used for cleaning and ensure they are used only as recommended by their manufacturers.
5. **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.
6. **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.
7. **Security at completion**
 - 7.1. **General:** Leave the works secure with accesses closed and locked, where appropriate.
 - 7.2. **Keys:** Account for and adequately label keys. Hand over to the duly authorized person with an itemized schedule. Retain a duplicate schedule signed by that person as a receipt.

PM_70_85_45/10 Tools and consumables

1. **General:** Provide tools and portable indicating instruments for the operation and maintenance of all services plant and equipment (except any installed under named subcontracts) together with suitable means of identifying, storing and securing.
2. **Quantity:** Two complete sets.
3. **Consumables:** Supply a complete list of all consumables necessary for the operation.
4. **Submittal date:** At completion.

PM_70_85_45/20 Schedule for spare parts

1. **General:** Prepare a priced schedule of recommended spare parts that should be obtained and kept in stock for maintenance of the services installations.
2. **Content:** Include in the priced schedule for:

Manufacturers' current prices, including packaging and delivery to site.

Checking receipts, marking and numbering in accordance with the schedule of spare parts.

Referencing to the plant and equipment list in part 3 of the building manual.

Painting, greasing, etc. and packing to prevent deterioration during storage.

3. **Latest date for submission:** Practical Completion / with O&M Manual

PM_70_85_52/10 Manufacturer's recommendations and instructions

1. **General:** Comply with manufacturer's printed recommendations and instructions current on the date of the invitation to tender.
2. **Exceptions:** Submit details of changes to recommendations or instructions.
3. **Execution:** Use ancillary products and accessories supplied or recommended by main product manufacturer.
4. **Products:** Comply with limitations, recommendations and requirements of relevant valid certificates.

PM_70_85_64/20 Mechanical and electrical services

1. **Final tests and commissioning:** Carry out so that services are in full working order at completion of the works.
2. **Confirmation:** Provide a Building Regulations notice, signed by a suitably qualified person, to Building Control, confirming that systems have been commissioned in accordance with approved procedures.
3. **Records:** Include in the building manual

PM_70_85_64/40 Continuity of thermal insulation

1. **Record and report:** Confirm that work to new, renovated or upgraded thermal elements has been carried out to conform to the specification.
 - 1.1. **Content:** Address of premises, the contractor's name and address, the name, qualification and signature of a competent person responsible for checking compliance and the date on which the installation was checked.
2. **Submit:** Before completion of the works.
3. **Copy:** Include in the building manual.

PM_70_85_90/10 Training

1. **Objective:** Before completion, explain and demonstrate to designated maintenance staff the purpose, function and operation of the installations including items and procedures listed in the building manual.
2. **Time Allowance (minimum) :** 1 Day

PM_70_85_96 Works completion certificate

1. **Requirement:** Give notice of the anticipated dates of completion of the whole or parts of the works.
2. **Associated work:** Ensure necessary access, services and facilities are complete.
3. **Period of notice (minimum):** 2 Weeks

PM_70_90/10 Record drawings and information

1. **Record drawings**
 - 1.1. **Drawings scope:** As the construction period progresses the design team will not update drawings to reflect changes which arise. All design/client changes will be covered via an Engineers instruction and sketch "part Plan". It is the contractors responsibility to maintain a set of up to date "working" drawings which included all changes arising throughout the contract.

Record drawing (MEP Contactors Responsibility)

Drawing showing the building and services installations as installed at the date of practical completion. The main features of the record drawings are:

- Provide a record of the locations of all the systems and components installed including pumps, fans, valves, strainers, terminals, electrical switchgear, distribution and components.
- Use a scale not less than that of the installation drawings.
- Have marked on the drawings the positions of access points for operating and maintenance purposes.
- The drawings should not be dimensioned unless the inclusion of a dimension is considered necessary for location.
- The location, including level if buried of public service connections provided within the contract, no matter who installed them, together with the points of origin and termination, size and materials of pipes, line pressure, flow and other relevant information.
- Location and depth of all buried services
- Schematic drawings of each system indicating principal items of equipment, zoning, means of isolation, etc in sufficient detail to understand the system operation and the inter-connections between various systems
- The layout, location and extent of all piped services showing pipe sizes, together with all valves for regulation, isolation and other purposes, drain cocks, test points, gauges, flow or pressure switches and other instruments.
- Location, identify, size and details of all equipment and controls equipment served by, or associated with, each of the various services.
- The layout, location and extent of all air ducts, including those formed in builder's work or otherwise outside the contract, showing dampers and other equipment, acoustic silencers, grilles, diffusers, other air terminals, balancing dampers, access panels, fire dampers, turning vanes, hand holes, test holes, gauges and instruments. Each duct and terminal shall be marked with its size and air quantity flowing. Each terminal unit or grille shall have its duty clearly shown as recorded from the commissioning results.
- The location and identity of each room including space housing plant, machinery or apparatus.
- Detailed general arrangements of all boiler houses, machinery spaces, air handling plant rooms, tank rooms, electrical switch-room and other plant or apparatus, including the location, identity, manufacturer, size and rating of each item.
- All necessary sections, elevations, isometrics and schematics of the plant spaces.
- Control and wiring diagrams shall be provided incorporating details of each instrument and equipment item and written description of the sequence of operation of each system. All diagrams shall include full details of internal panel wiring and connections to field mounted items.
- Layout, location and extent of electrical switchgear, distribution boards cables and termination points.
- Detailed general arrangements of all switch-rooms, riser cupboards, service trenches, transformer chambers, generator rooms and other plant or apparatus, including the location, identity, manufacturer, size and rating of each apparatus.
- Details to show inter-connections between the works and equipment or systems provided by others to which wiring and connections are carried out as part of the works
- Detailed wiring drawings and diagrams for all systems showing origin, route, cable containment size, type and number of conductors, length termination size and identification, and measured conductor and earth continuity resistance of each circuit. Indicate if cable/conduit is surface mounted, concealed in wall chase, in floor screed, cast in-situ, in false floor, above ceiling void, etc.
- Logic flow diagrams for each individual control or monitoring specification and for each engineering system to illustrate the logical basis of the software design

Record drawings of the complete Works shall be provided at practical completion.

Record drawings of the final "as installed" layouts shall be issued in draft form to the CA for examination 4 weeks prior to the testing and commissioning period to allow checking for accuracy.

Record drawings will be prepared on the current Autocad format as agreed with the CA prior to production of the drawings.

All drawings shall be suitably layered, with different services on each layer. A detailed list of layers, external references or equivalent (if used) and list of files shall be provided with the discs. If the drawings were produced from CAD drawings provided by the CA, the same layering system shall be used.

The drawings shall be produced in full size metric units.

Once approved the complete set of record drawings shall be revised as necessary to incorporate testing and commissioning data where applicable, and the final set(s) of record drawings and computer discs shall be handed over at practical completion.

Issue at practical completion the complete approved package of record drawings in the following numbers:

- USB Flash Drives - 2no sets of complete record drawings
- 'white' prints 2no sets of complete record drawings

Each drive shall be labelled identifying project title, issue date and index of contents.

Valve charts, electrical distribution charts in panels and the like, shall be issued for examination at agreed dates to allow adequate time for manufacture and installation prior to practical completion.

Where portions of the work are to be concealed, draft copies of record drawings shall be supplied to the CA

- before the work is concealed in order to facilitate checking and examination.

The record documents shall be correlated so that the terminology and the numerical and/or other references used therein are consistent with and similar to those used in the physical identification of component parts of the Works.

Each record drawing shall show the following information:

- The name of the contract and, where appropriate, the zone or floor designation.
- Description of drawing, drawing reference and scale.
- Name and address of the contractor and the consulting engineer.

The completed drawings shall be signed as record drawings.

Each record drawing shall be endorsed with the words 'Record Drawing' in the bottom right hand corner adjacent to the title block.

Mark up 'as installed' details weekly and before any work is hidden from view.

Failure to undertake the above procedure for the preparation of record drawings and leaving the production of such drawings too late in the construction/commissioning period will result in practical completion not being granted by the CA.

Plant and switch room drawings, schedules and schematics

Provide good quality plant and switch room drawings, schedules, schematics and instructions and hang in the respective plant room or any other appropriate location or where directed by the CA.

Protect surfaces of such information by pressure lamination and hang using suitable fixings and provide backboards if necessary.

A sample shall be submitted for approval prior to commencing production.

Provide information as stated elsewhere and include:

- All information required under statutory or other regulations
- Location of all incoming service isolating and metering facilities
- Emergency operating procedures including details for emergency call out service
- First aid instructions for treatment of persons after electrical shock
- Schematic drawings of installations showing identification and duties of equipment
- Controls schematics
- Valve schedules showing reference, type, location, application/service and normal operating position

Prior to being fixed, plant and switch room drawings, schedules, schematics and instructions shall be submitted for review by the CA. The review procedure shall be as for record drawings as stated elsewhere and all items shall be fixed prior to practical completion.

Drawings format: Design Team change - Sketch part plan and instruction. M&E Sub-Contractor to Maintain a set of up to date paper and electronic **"Working" drawings, that should be no more than 1 week out of date.**

All information shall be provided in editable electronic format.

HH will not be responsible for providing the design / tender / contract drawings in DWG format. The MEP contractors shall allow for generating the drawings from scratch

The record documents shall be correlated so that the terminology and the numerical and/or other references used therein are consistent with and similar to those used in the physical identification of component parts of the Works.

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A sample shall be submitted for approval prior to commencing production.

Provide information as stated elsewhere and include:

- All information required under statutory or other regulations
- Location of all incoming service isolating and metering facilities
- Emergency operating procedures including details for emergency call out service
- First aid instructions for treatment of persons after electrical shock
- Schematic drawings of installations showing identification and duties of equipment

Controls schematics

- Valve schedules showing reference, type, location, application/service and normal operating position

Prior to being fixed, plant and switch room drawings, schedules, schematics and instructions shall be submitted for review by the CA. The review procedure shall be as for record drawings as stated elsewhere and all items shall be fixed prior to practical completion.

- 1.2. **Drawings format:** Design Team change - Sketch part plan and instruction. M&E Sub-Contractor to Maintain a set of up to date paper and electronic "Working" drawings, that should be no more than 1 week out of date.

All information shall be provided in editable electronic format.

2. Record specification

- 2.1. **Specification format:** This document is the responsibility of the MEP Contractor

Be advised that great importance will be placed upon quality, accuracy, clarity and completeness of the record documents and upon these being made available promptly.

Practical completion will not be granted unless an approved copy of the record documentation has been prepared, and is available for handover to the Employer.

Comply with the requirements of the CDM Regulations in providing the appropriate input to the health and safety file for the Works.

Comply with the requirements of the Building Regulations in providing all necessary documentation and information.

Provide record documentation, as detailed elsewhere, to include but not limited to:

- Record drawings and schedules.
- Plant room and switch room drawings, schedules and schematics.

- Operating and maintenance manuals.
- Blank maintenance logs.
- Building log book information.

Ensure record documents clearly record the arrangements of the various sections of the Works as actually installed and identify and locate all component parts.

The record documents shall set out the extent to which maintenance and servicing is required and how, in detail, it should be executed. Sufficient, readily accessible and proper information shall be provided to enable spares and replacements to be ordered.

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

Demonstrate as required throughout the execution of the contract works that complete and accurate records are being maintained and that the record documents are being progressively compiled as the work on site proceeds.

All information shall be provided in editable electronic format.

2.2. **Submittal date:** Prior to project Hand-Over

PM_70_90/20 Technical information

1. **Retain:** Available on site for reference by supervisory personnel.
2. **Information:** Manufacturer's current information and relevant British Standards, relating to products to be used in the works.

Ω End of Section

PM_80

Asset management information

Project management

PM_80_10_25/01 Mechanical and Electrical Services

1. Final tests and commissioning: Carry out so that services are in full working order at completion of the Works.
2. Confirmation: Provide a Building Regulations notice, signed by a suitably qualified person, to Building Control that systems have been commissioned in accordance with approved procedures.
3. Records: A copy to be lodged in the Building Manual.

PM_80_10_25/10 Energy performance certificate

1. **Assessment:** The production of the EPC is the responsibility of the Main Contractor. The EPC must be Undertaken by a member of an approved accreditation scheme. Submit details of scheme name and evidence of qualifications when requested.

Assessment to be carried for each individual commercial space, dwelling, retail unit etc within the project scope.

2. **Method:** Simplified Building Energy Model (SBEM).
3. **Certificate:** Include in the building manual. Provide framed copy for display purposes
4. **Report:** To be submitted for approval
5. **Submittal date:** Prior to PC being awarded. Building Control will require the EPC prior to granting occupation.

PM_80_10_25/20 Air Permeability

1. **Method:** Pressure test in accordance with the ATTMA publication: TS 1: Measuring Air Permeability of Building Envelopes
2. **Requirement:** To meet the minimum requirement as set out in the 'As Designed' SBEM/SAP calculation. Where no SBEM/SAP information is provided the requirement is to meet requirements set out in Part L.

The contractor will be fully expected to achieve this level and must undertake an intermediate test once the building envelope is wind and water tight so that any remedial works can be undertaken prior to areas and junctions being closed / covered up.

A final certified test will be required prior to PC which will effect the Part L verification and the associated EPC

3. **Copy :** Include within the Building Manual

PM_80_10_25/30 Continuity of Thermal Insulation

1. **Record and Report :** Confirm that work to new, renovated or upgraded thermal elements has been carried out to conform to the Specification.
2. **Content :** Address of premises, the Contractor's name and address, the name, qualification and signature of a competent person responsible for checking compliance and the date on which the installation was checked.
3. **Submit :** Before Completion of the works
4. **Copy :** Include within the building Manual

PM_80_10_50 Maintenance requirements

1. **Scope:** Provide a comprehensive maintenance service. Include all planned preventative maintenance, as set out within the maintenance schedule and replacement of all consumable items.
2. **Plant and equipment to be maintained:** All MEP items.
3. **Terms:** Every quarter
4. **Commencement:** From PC
5. **Duration:** 1 Full year post PC

PM_80_10_50/10 Maintenance instructions and guarantees

1. **Components and equipment:** Obtain or retain copies, register with manufacturer and hand over on or before completion of the works.
2. **Information location:** In 'Building Manual'.
3. **Emergency call out services**
 - 3.1. **Telephone numbers:** Provide for use after completion.
 - 3.2. **Extent of cover:** 24 hours, seven days a week.

PM_80_10_50/20 General Requirements

1. **Quality:** Prepare a method statement to indicate fully the quality control programme for the Works and indicate clearly the role of the CA in that programme.

The objective of the quality control programme shall be:

- Full compliance with the ISO 9001 standards and procedures
- Full compliance with the specification in regard to materials and workmanship
- Establishment of standards that will be acceptable to the CA by means of a sample installations prior to full scale erection of all major elements and trades required
- Submission to the CA for agreement of any samples of proposed manufacturer's items to be utilised in the Works prior to ordering
- Establishment of method statements defining quality standards

The quality control system will be subject to audit at any time during the duration of the contract. The CA shall issue a quality control instruction where the installation fails to meet the standard required in the specification.

Where the installation fails to meet the required standard submit written proposals for compliance. The quality control system shall include a suitable methodology and recording procedure which shall enable the personnel responsible for any work to be identified.

Ω End of Section

