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## **1.0 INTRODUCTION**

### **1.1 Overview**

This document sets out City University's requirements for the format, structure and content of Project Handover Record Information.

Its purpose is to ensure that projects are handed over consistently and the information required to satisfactorily operate and maintain the facility is both complete and capable of rapid incorporation into existing records.

Project Handover Record Information includes, but is not limited to, as-built records, operating & maintenance manuals, testing and commissioning information etc. A separate Health & Safety File and a Building Log Book is to be issued.

In this context it does not include project related information that may be required at Handover, such as snagging or punch lists, unfinished work schedules, draft Final Account information or the like, which are dealt with under separate City University Property Project Procedures.

### **1.2 How the City University Building Technical Records System works**

Every building at City University has its own set of permanent record information subdivided into the categories given below. Each time a project takes place that materially affects that building a set of Project Handover Record Information is created. This information when accepted, is incorporated into the master set.

Material from each project is either added to or substituted for, existing information depending on whether assets are added, modified or deleted. A strict record is kept of all changes to the master set.

In addition the Project Information Section describes the inputs for each project (existing records, survey info etc), processes carried out (design, demolitions, construction and commissioning etc) and outputs (as-built records, Operating & Maintenance info etc).

The Project Information Section within any building master set therefore builds into a comprehensive record of interventions and modifications, which when cross-referenced to the other sections provide an up to date picture of the current building status, including any residual hazards.

## **1.3 Building Record Information**

Each building within the estate has a master set of record documentation subdivided into the following sections:

### 1.3.1 O&M Manual Structure

**SECTION 1: Project Information**

**SECTION 2: Schedules of Summary information**

**SECTION 3: Operating & Maintenance: Mechanical Services**

**SECTION 4: Operating & Maintenance: Electrical Services and Controls**

**SECTION 5: Civils and Fabric Maintenance and Cleaning**

**SECTION 6: Manufacturer's Literature**

**SECTION 7: As built record information**

**SECTION 8: Testing and Commissioning data**

**SECTION 9: Residual Hazards**

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**SECTION 6: Cleaning or maintaining the structure**

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## **2.0 INSTRUCTIONS TO CONTRACTORS**

### **2.1 Introduction**

This document identifies a strict requirement for the production of Project Handover Record Information, so that a common approach to as-built documentation can be achieved for each and every part of the City University estate.

All submissions must comply with this document.

City University **WILL NOT ACCEPT HANDOVER** of projects without sufficient Project Handover Record Information in place and available with which to safely manage the operation and maintenance of the facility.

### **2.2 Current Requirements**

Information providers must avail themselves of the latest requirements by contacting the City University Responsible Manager before embarking on the production of information.

The Contractor shall also refer to the requirements of the Main Contract Preliminaries, and immediately bring any inconsistency with this document to the attention of the City University Responsible Manager.

This document specifies the minimum content, presentation and selection of essential information to be included in all technical manuals, and as separate delivery to any other information issued throughout the project, irrespective of the medium or form of presentation. Where there is uncertainty, and as the requirements of electronic media can change on a frequent basis, providers are strongly advised to confirm the latest requirements with the City University Responsible Manager.

### **2.3 Preparation for Project Handover**

Information providers shall review this document and agree with the relevant CU Responsible Manager what sections are to apply and if any further definition/clarification is required.

The final draft of the Project Handover Record Information shall be submitted in due time, and in any case not less than two weeks prior to practical completion, so that at least one copy of the complete final version is in the possession of the Client at practical completion, in order to comply with the Health and Safety legislation. Draft copies must be issued in sufficient time to enable comments to be made on these, and should any parts of project require to be handed over earlier, then the respective Handover Information must also be available to permit this to happen.

The submission will be checked by the Property Department Technical Records Manager and incorporated into the relevant Building Technical Record Set(s).

## **2.2 Number of copies and media required**

**1 copy of the electronic submission and 2 copies of the paper submission are required.**

The electronic submission shall consist of a full and complete set of documents generated electronically or converted from paper elements. Electronic media shall be submitted in CD or DVD form, properly labelled (jewel case and disc) and consistent with loading onto City University servers.

Detailed arrangements for provision of electronic media are given in Appendix D.

The paper submission shall consist of the following:

**Written documentation:** A4 submission generated from Microsoft Office applications, together with copies of manufacturer's literature as set out elsewhere in this document.

**Drawings, Schematic diagrams etc:** are required in 2 size formats:

A3 reductions (which must state the size at which they are to scale)

Full size paper plots.

**Detailed arrangements for provision of electronic media are given in Appendix D.**

## **3.0 STRUCTURE AND CONTENT OF SUBMISSIONS**

### **3.1 Structure**

Project Handover Record Information will only be accepted when correctly presented in line with the following structure:

**SECTION 1: Project Information**

**SECTION 2: Schedules of Summary information**

**SECTION 3: Operating & Maintenance: Mechanical Services**

**SECTION 4: Operating & Maintenance: Electrical Services and Controls**

**SECTION 5: Civils and Fabric Maintenance and Cleaning**

**SECTION 6: Manufacturer's Literature**

**SECTION 7: As built record information**

**SECTION 8: Testing and Commissioning data**

**SECTION 9: Residual Hazards**

**The full Index to be used is given at APPENDIX A.**

Any sections or sub-sections deemed not to be applicable must be agreed with the responsible P&F Manager. Each such occurrence shall be noted on the master index, individual indexes and a page inserted at the relevant position stating that the section is not applicable.

Further division of information must be agreed beforehand with the responsible P&F Manager.

### **3.2 Content**

Project scope will determine the exact information required within each Section described above.

All systems and material scope of the project must be covered in the submission: a draft detailed contents list is to be submitted to the responsible P&F Manager in good time for content to be agreed and sufficient information to be ready by Handover.

**Guidance on the information required is set out in APPENDIX B.**

## **4.0 GENERAL CONDITIONS**

### **4.1 Note:**

**It shall be the responsibility of contractors to ensure that Project Handover Record Information is properly compiled and presented in the format requested in this specification.**

This specification deals only with matters that are essential for the provision of technical documentation. It shall not be assumed the content is exhaustive. It has been prepared to ensure a common approach for the provision of technical information with which to safely operate, maintain and redevelop facilities.

### **4.2 Confidentiality**

The contractor shall ensure that (without City University's prior written consent) any confidential information herein (or procured during the course of complying with the requirements and clauses of this specification) will not be used (other than complying with the clauses of this specification), disclosed or used to the advantage (direct or indirect) of its Associated Companies.

### **4.3 Language**

All documentation must be submitted in (UK International) ENGLISH

### **4.4 Legibility**

All materials, howsoever produced, must be created from first generation information. Illegible, skewed, greyed or any other form of non first generation material is NOT acceptable.

### **4.5 Review of draft submissions**

A draft copy of the manuals shall be provided for comment in accordance with a schedule to be agreed with the P&F Responsible manager.

### **4.6 Certification**

All certificates must be legible and fully completed. They are to have the required signatures and dated. Those signing should have their names spelled out in text as well as signature.

Certificates failing to comply will be deemed not to have been presented.

### **4.7 Manufacturers' Literature**

The literature shall clearly identify the specific plant/equipment installed (i.e. model numbers AND NOT GENERIC)

### **4.8 Virus checking**

All electronic media and associated software must be certified virus checked. The virus checking software, version number and the date checked must be provided with the electronic media.

## 4.9 Standards and Reference Information

The manuals shall, in particular, be based on the Technical Manuals Specification; the Applications Guide AG1/87.1 published by BSRIA and BS4884. Attention is drawn to the following British Standards:

|        |   |
|--------|---|
| BS4884 | Technical Manuals<br>Part 1: 1992: Specification for presentation of essential information<br>Part 2: 1993: Guide to content<br>Part 3: 1993: Guide to presentation |
| BS4899 | User's requirements for technical manuals<br>(based on the principles of BS4884 (Part 1: 1991 Contents))  |
| BS5641 | Recommendations for loose-leaf publications   |

Reference shall also be made to other relevant CU Property Department Standards.

## 4.10 Warnings, Cautions and Notes

Warnings, cautions and notes shall be used to emphasise points accordingly. Warnings and cautions shall be placed immediately before the text to which they apply or in a prominent position on illustrations.

**WARNINGS:**

***CALL ATTENTION TO INSTRUCTIONS, WHICH SHALL BE FOLLOWED PRECISELY TO AVOID INJURY OR DEATH.***

**CAUTIONS:**

***Call attention to instructions that shall be followed precisely to avoid injury, damaging the product, process or its surroundings.***

**NOTES:**

***Are used for supplementary information or emphasis.***

## 4.11 Change Control

The updating of this document will be subject to strict change control. The latest authorised version will be published to the P&F website for use by those working on Property Projects.

**INDEX OF STRUCTURE FOR ALL SUBMISSIONS**

Deviations from the index below will not be permitted, since the material must be capable of incorporation into City University Building Technical Record Sets.

Guidance for information required within each section is given at **APPENDIX B**.

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**GUIDANCE ON INFORMATION REQUIRED**

**SECTION 1: PROJECT INFORMATION**

**1.1 Directories**

Provide name, address, telephone, email and facsimile details for all project participants as set out in the index.

Also Include:

- Local and statutory authorities indicating their responsibilities
- Insurance details
- Specialist contractors required (e.g. hire equipment that may be specified for maintenance in the H&S file)

**1.3.1 Overview**

Include:

- Purpose of the project/objectives
- Functional description of building and its parts
- Areas affected; new construction; modified construction; demolitions
- Overview of any special hazards encountered or addressed (see 1.3.3 below)

**1.3.2 Principles of Design**

An overview from each design discipline giving a comprehensive but brief synopsis of how the final design solution was arrived at and how it meets the project objectives.

Services design – in conjunction with lead designer, provide energy philosophy.

Lead design – provide details of sustainability and environmental characteristics, strategies for thermal, acoustic and fire performance (cross refer to fire strategy documentation).

Structural design - provide details of design floor loadings

These summary documents should describe the design information and how it is organized, including cross-references to other parts of the Project Handover Record Information.

**1.3.3 Designer Risk Assessments**

Also include details of any special hazards (special services, asbestos and locations, confined spaces etc.)

**1.4.1 Principal Contractor's construction methodology report**

General details of the construction execution methodology used, particularly where special techniques or materials were employed,

**1.5 Significant Project Dates**

Historical dates of building showing construction period, planning and building approval dates, etc.

## **1.6 Statutory Approvals**

Include approval documentation including any constraints placed on the future use or development of the completed project.

Include:

- Local Authority Planning/listed building consent and any subsequent condition discharge notices;
- Building Control consent, condition discharge notices and completion certificates;
- Party Wall Award
- Environmental Discharge or Drainage Licences etc
- Other

## **1.7 Certification**

Original or first generation copies of all Certificates/Warrantees as supplied by Subcontractors, Manufacturers, Suppliers and 3<sup>rd</sup> Party Accreditors/certifying bodies other than Statutory bodies, should be included in this Section.

A summary list of all certificates supplied must be given in Section 2.7.

Include the following:

- Test certificates;
- Manufacturer's guarantees and warranties;
- Insurance certificates;
- Emergency lighting certificates as defined by BS5266 Part 1, 1998.
- Safety and fire certificates including Fire Alarm compliance with relevant BS;
- Material certificates;
- Sterilisation certificates (Hot and Cold Water systems)
- Letters of conformity (eg lifts) and associated certificates;
- Written schemes of examination, certification and diagrams as defined by the Pressure Systems and Transportable Gas Containers regulations;
- Certification as defined by the COSHH regulations. This shall include the identification and assessment of risk, and a simple schematic diagram;
- Identification and assessment of risk, and a simple schematic diagram (for the system under assessment) that satisfies the ACoP with regard to The Prevention or Control of Legionellosis (including Legionnaires' Disease);
- An assessment of risk in accordance with regulation 4(1)(b)(i) of the Manual Handling Operations regulations, 1992;

- All records following any test, test and examination or test and thorough examination in accordance with the relevant Acts defined in this specification, and in particular The Lifting Operations and Lifting Equipment regulations, 1998;
- A certificate of conformity for any equipment carrying a CE mark.

## **SECTION 2: SCHEDULES OF SUMMARY INFORMATION**

**Note: All schedules are to be provided in MS Excel spreadsheet format or in a database format capable of exporting to MS Excel.**

### **2.1 Equipment (asset) schedule**

The contractor shall supply an electronic spreadsheet in MS Excel or database capable of export to MS Excel which contains the following fully populated field information which can then be uploaded into the City University Asset Maintenance system.

- **Unique reference number [contractor defined – CU asset number will be allocated later]**
- **Description of Asset**
- **Manufacturer Product Code**
- **Tag**
- **Manufacturer Model Type**
- **Serial Number**
- **Manufacturer Name**
- **Comments connected to Asset**
- **Life span of Asset**
- **Date of Installation**
- **Building Name**
- **Floor Level**
- **Location description (Room name)**
- **Room number**

Contractors should follow this field order and submit a sample format for review and agreement with the P&F Responsible Manager before commencing data collection.

### **CAUTION – PLEASE NOTE!**

**CITY UNIVERSITY WILL NOT TAKE BACK POSSESSION OF FACILITIES FOR WHICH THIS INFORMATION IS NOT SATISFACTORILY PROVIDED.**

### **2.2 Planned Preventative Maintenance Schedule**

A schedule of all recommended maintenance as set out in SECTIONS 3 and 4 shall be provided which cross-refers to the Equipment (asset) Schedule given in 2.1.

### **2.3 Recommended Spares**

A complete list of Recommended Spares and Consumables shall be provided in accordance with Specification and the Recommendations of the Plant Manufacturers and Suppliers.

It shall include supplier's recommendations for both spares and 'running spares' (i.e. parts required for scheduled replacement due to wear or deterioration, which are identified within the PPM schedules).

## **2.4 Lubrication Schedule**

This Section shall also include a List of Recommended Lubricants, for each item of plant or equipment etc. These are the Manufacturer's or Supplier's recommended lubricant, or an equivalent such that all lubricants, where possible, are supplied by one oil company.

A schedule of all plant requiring lubrication shall be provided together with manufacturer's recommendations on the type of lubricant and the method and frequency of application. Where the type of lubricant is identified by product name, a generic reference (e.g. British Standard) shall also be given. Information must also be provided on special requirements for the handling and storage of lubricants.

## **2.5 Warranty Information**

A schedule is required of: suppliers', manufacturers' and installers' or other organisations with warranty responsibility against the equipment concerned with; unique identification details, warranty period, details of exclusions, spares, maintenance and lubrication requirements – along with call-out and service level agreement details.

## **2.6 Schedules of As-Built Record Information**

A schedule is required of all the information provided in Section 8.

The following populated fields are to be provided:

Dwg no; Revision; Title; Originator; Scale and Plot size at which the dwg is to scale.

## **2.7 List of certification provided**

A schedule is required of all the certificates provided in Section 1.7.

## **2.8 List of Manufacturer's literature provided**

A schedule is required of all the information provided in Section 6.

## **SECTIONS 3, 4: OPERATION AND MAINTENANCE**

Items of M&E systems, plant and equipment should be incorporated in line with the structure given in Appendix A. For each sub-section provide information covering the following:

- Description
- Operation
- Fault Finding
- Emergency information
- Maintenance
- Preventative Maintenance Procedures
- Major Overhaul and Inspection
- Equipment Data
- Disposal Instructions
- Parts Identification and Recommended Spares

### **Description**

This section shall comprise a written detailed description of the works/systems including all component plant items, location(s), areas served and immediate dependencies on other systems.

It shall include details of the original design criteria and make reference to key calculations that have been carried out. It shall be of sufficient detail to enable a person with no prior knowledge of the project to gain a good appreciation of the extent and complexity of the Building and each service installed after reading it.

Where manufacturers and suppliers have provided specific or additional information, relating to the individual items of plant, reference shall be made to their location in Section 6 Manufacturers' Literature.

### **Operation**

This part shall comprise a written description of how all installed systems are to be used and controlled. Extracts from manufacturers operating and maintenance literature may be included.

It shall commence with the preparation of the Plant and proceed through Plant Start Up and Normal Operating Procedures, Shut-down under normal, emergency and fire conditions. It shall indicate what plant is manually or automatically controlled and what actions should be taken in the event of plant failure.

This shall include clear instructions for the safe and efficient operation, under both normal and emergency conditions, of each building element/engineering system installed and shall include:

- Recommended procedure for operation and control;
- An outline of the general operating mode (including limits of capability, modes, set-points);
- Procedures and sequences for start-up, running and shut-down, under both normal and emergency conditions;
- Interlocks between plant items;
- Operating procedures for standby plant, if applicable;
- Precautions necessary to overcome known hazards;
- The means by which any potentially hazardous plant may be made safe;
- Operator checks to ensure compliant function.

The procedures described will take full account of all health, safety and environmental protection information as relevant in the form of Risk Assessments, Method Statements, Material Safety Data Sheets etc. This is to ensure that safe systems of work are achieved and maintained during the Client's use, repair, maintenance and eventual disposal and or demolition.

### **Fault Finding Procedures**

Provide a sequence of "Actions or Checks", to be taken by maintenance or operating personnel upon finding a plant malfunction or failure, in order to analyse the reason for the system's failure to function correctly. The procedures shall provide a basic "step by step" method of eliminating the cause of the plant failure by checking each item of equipment, one after the other, in a methodical and systematic manner.

### **Emergency information**

This section shall list points of contact in the event of emergencies for items of plant, equipment and systems covered under the defects liability period(s) or warranties.

## **Maintenance**

Comprises maintenance procedures as defined by manufacturers, HVAC guidelines or legislation.

The manufacturer's recommendations and instructions/job plans for maintenance shall be detailed for each building element/item of plant and equipment installed, (i.e. planned preventive maintenance tasks). These instructions shall include the following:

- The isolation and return to service of plant and equipment;
- Adjustments, inspection, examination, calibration and testing;
- Dismantling and re-assembly;
- Details of Warranty periods and Call out arrangements;
- The exchange of components and assemblies;
- Dealing with hazards which may arise during maintenance;
- The nature of deterioration and the defects to be looked for;
- Special tools, test equipment and ancillary services;

Maintenance/call out details for equipment during the warranty period shall be clearly identified within the Site Health and Safety File.

## **Preventive Maintenance Procedures (Job sheets and Frequency Log Sheets)**

This Part shall contain the necessary technical information, procedures and instructions on preventative maintenance job sheets, relating to the individual plant items that comprise the installed works/systems. Sufficient information including frequency log sheets shall be provided to enable planned preventative maintenance programmes to be established.

Job sheets shall provide the detail and/or reference to the health and safety information needed to ensure safe systems of work. Maintenance task specific health and safety information shall be included in detail on the job sheets so that there is no doubt on the part of the maintenance operative as to how safe working is to be achieved.

Each job sheet shall have a Reference Number and Plant and/or System Title and then provide details of the maintenance tasks to be undertaken and the frequency for completion of such tasks.

Frequency Log Sheets shall be prepared, separately from job sheets, to indicate in a summary tabulation the time points for maintenance of each installed item.

The frequency of understanding each task should be expressed as a specific time interval, i.e. daily, weekly, monthly, bi-annually or annually and should cover a complete maintenance cycle for the installation including the procedures for the logical diagnosis and correction of faults.

Inspections and tests for insurance or other mandatory requirements shall be separately identified.

### **Major Overhaul and Inspection**

Full routine maintenance procedures, references to disposal of hazardous items of materials (COSHH) and reference to the main sources of information etc. shall also be provided.

### **Equipment Data**

Comprises schedules of plant which include technical and performance data.

Points of contact shall also be clearly identified where the Client can obtain advice particularly in the event of failure of an item of plant, equipment or system.

### **Disposal Instructions**

Include the following:

- Any known dangers likely to arise during the disposal of specific items of plant, equipment or systems, together with the necessary precautions and safety measures that must be taken.
- Methods for safety disposing or destroying the plant, equipment, system or any parts (i.e. fluids). Sources from which further advice can be obtained.

### **Parts Identification and Recommended Spares**

This element shall comprise of a parts identification list detailing and identifying replaceable assemblies, sub-assemblies and components. It shall be cross-referenced to the schedule of recommended spares given in Section 2.

## **SECTION 5: CIVILS AND FABRIC MAINTENANCE AND CLEANING**

This Section shall detail a recommended cleaning schedule with all building elements that require cleaning or routine maintenance.

It shall contain the following minimum information:

- Recommended maintenance schedules for the building elements;
- Maintenance procedures for each material together with recommended frequency for which inspections or maintenance should be carried out;
- Risk assessments identifying where manual handling or COSHH assessments may be required by maintenance/cleaning contractors in due course..
- Location of cleaners stores, toilets, etc;

This information shall be compiled to provide any cleaning contractor with the information necessary to plan and carry out cleaning to a minimum standard, and fully comply with H&S and other relevant legislation.

This section should cross refer to Finishes schedules and other information contained in the as-built records (Section 8) and listed in the Summary Information Schedules (Section 2).

## **SECTION 6: MANUFACTURERS' LITERATURE**

The literature shall be collated in alphabetical order and clearly indexed in separate sub-sections. Literature shall either be project specific only or, if Manufacturer's Brochures are provided, the actual installed items (ie model numbers) shall be highlighted. The index shall state Manufacturer, Item of Plant/equipment supplied, installer, and what literature is enclosed.

This Manufacturers' information, in conjunction with Sections 3 and 4, will enable the Operating and Maintenance Staff to establish full "working routines" and enable them to operate and maintain the equipment and systems in order to ensure the most efficient use of the installation.

The literature for each item shall include basic selection data sheets, performance parameters, application (ie suitability for use), installation, operation and maintenance instructions. It should also cover methods of operation and control, protective measures and safety/welfare consideration in use. Literature should be specific, relate to the actual models of equipment installed and be provided in electronic format/scanned as appropriate.

## **SECTION 7: AS BUILT RECORD DRAWINGS**

An index shall be provided for all 'as-built' drawings as set out in Section 2.6 above.

Numbers of copies and format for as-built records shall be as set out in Section 2 of this document ('Instructions to Contractors' read in conjunction with Appendices C and D).

### **7.1 Base information issued to the designers**

Includes previous as-built documentation, feasibility information, studies etc.

## **THE SUBMISSION ONLY REQUIRES THIS INFORMATION TO BE LISTED**

### **7.4 Design dwgs by Discipline**

#### **7.4.1 Architecture – include:**

- Site and location plans
- Fire zone plans and all Fire Strategy information
- Floor Plans for every level
- Reflected ceiling plans for every level
- Roof Plans indicating falls, outlets and roof safety systems
- General Arrangement Elevation dwgs
- General Arrangement key sections and location of detailed dwgs
- Door, Ironmongery, Sanitary and Finishes Schedules
- Specifications for all items

#### **7.4.2 Mechanical Engineering – include all information**

#### **7.4.3 Electrical Engineering – include all information**

#### **7.4.4 Structural Engineering – include all information including bending schedules and calculation plans**

#### **7.4.5 Civil Engineering – include all information including bending schedules and calculation plans**

#### **7.4.6 Public Health Engineering – include all information**

#### **7.5 Subcontractor dwgs by Trade**

All as-fitted information except by agreement with the P&F Responsible Manager

#### **7.6 Formal Consent records**

Include original stamped paper records, plus submitted dwgs to format and number described elsewhere in this document.

#### **Technical requirements for drawn information**

It is requirement that each drawing shall contain:-

- Drawing number
- Revision No and detail of revision (revision also to be identified in clouds or noted)
- Scale
- Title (building/area/system)
- Project identification
- References to other applicable drawings.

#### **Note:**

**Dwgs should state scale that applies when printed at certain size.**

**All drawings SHALL include room numbers and area identifications and Building names as agreed with City University.**

### **SECTION 8: TESTING AND COMMISSIONING DATA**

#### **Plant Operating Maintenance Log**

The contractor shall produce and maintain a Plant Operation and Maintenance Log for all systems that have been installed under the contract. This list shall include for all details of maintenance requirements from time of installation through to commissioning and on to handover.

The log shall demonstrate compliance with the Manufacturers Warranty requirements.

As soon as equipment is delivered to site it shall be allocated a new Bar Code Number from a batch supplied from the P&F department. The contractor shall ensure that all further operating logs use this number for record purposes.

#### **Commissioning reports**

This Part shall be comprised of witnessed testing, commissioning and validation reports provided by the Sub-Contractors for every installed system and shall include:

- Introduction to system/element and the activities that took place during testing/commissioning
- Factory Acceptance records
- Site Acceptance records
- Installation Testing Results
- Commissioning Results
- Conclusions

Commissioning records shall be on a form approved by the P&F Responsible Manager and shall include:

- Measurement data recorded;
- Measurement points and location;
- Test equipment used and copies of the calibration certificates;
- A clear statement of whether design requirements were achieved;

**Note:**

Prior to **ANY** testing/commissioning taking place, the contractor is to provide a clear and specific Method Statement, determining

- how the test is to take place;
- what relevant information is being used (drwgs, specs etc);
- what systems or part systems are being tested;
- relevant mark up drawings;
- expected test results or parameters;

All such method statements are to be issued for review at least 5 days before test is scheduled and to be signed off by the Consultant Engineer, and the P&F responsible Manager.

A form shall be provided at the time of the test and signed by all parties present. This shall be re-signed by all parties following the witnessing of the test along with the results.

The Contractor should note that failure to comply with this request may result in the system(s) not being accepted by the Responsible Manager.

**SECTION 9: RESIDUAL HAZARDS**

This section is to contain details of all and any hazard appertaining to the building or services. It also needs to contain the results of any Studies or reviews undertaken on such issues. The purpose of this part is to provide a summary of the Health & Safety Risks which need to be managed when carrying out maintenance on the Building or possible future refurbishment or demolition.

A clear statement shall be made concerning those hazards and safety precautions of which the operators and maintainers of the installations need to be made aware. This shall include the following:

- Any known feature or operational characteristic of the equipment or systems installed which could produce a hazard;
- Any known hazards against which protection can be provided;
- Any mandatory requirements relating to safety;
- Any other safety precautions that should be observed;
- Written schemes of examination, certification and diagrams as defined by the Pressure Systems and Transportable Gas Containers regulations;
- Certification as defined by the COSHH regulations. This shall include the identification and assessment of risk, and a simple schematic diagram;

### **Hazardous Area Services**

For any electrical, Mechanical or instrumentation equipment in a hazardous area, the following typical minimum recommended documentation shall be provided in the original format: The definition of a 'Hazardous Area', shall be an Area(s) in which flammable liquids, gases or dusts are present as part of normal operations. The hazardous Area shall be classified as a zone, and the level of this zoning shall be determined by the type and quantity of flammable liquid, gas or dust that is present, its usage and risk.

- The classification of areas in which each item of electrical or instrument equipment and any interconnecting cables are to be installed, including their location;
- Details of the coding and certificate numbers for any item of certified equipment, including evidence the apparatus group and temperature class is appropriate for the materials present;
- Reference to any special conditions listed in the certification documentation and the methods by which such conditions are to be met;
- For uncertified equipment, details of type, number, manufacturer and justification for its suitability;
- Inspection check lists against which commissioning and routine inspections should be carried out, including any electrical or instrument testing required;
- A record of all inspections, maintenance operations and tests, including dates, modifications and their justifications, details of any defects found and the corrective actions taken;
- Any statutory documentation requirements associated with the works including compliance to ATEX and DSEAR regulation noting results of Hazardous area assessments.

**PAPER MEDIA – DETAILED REQUIREMENTS**

Paper documentation shall be presented in standard A4 4-hole lever arch files (referred to hereafter as volumes), organised according to the index given at **APPENDIX A**.

The spine of each volume shall contain a printed label with the following information:

- Project name and City University project number
- Section and Sub-sections contained within (if applicable).

No information contained within a section, sub-section or other subdivision agreed beforehand with the City University Responsible Manager shall be split across more than one volume. If the contents of one subdivision are so extensive as to fill more than one volume then it shall be clearly indicated the number of each volume and the total number of volumes relating to that subdivision.

Each volume shall start with a full overall index of all Sections, stating Project Name and City University project number.

Each Section or sub-section shall start with a cover sheet indicating Project Name and City University project number, plus a detailed index of the material contained within that subdivision.

Requirements for the page layout, margins, fonts, headers and footers to be used are to be agreed with the P&F Responsible Manager.

As-built dwgs and other record information are to be provided UNFOLDED as follows:

- A4 information: as above
- A3 information: as above, filed in A3 landscape format hard-backed folders.

Larger format dwgs: supplied in the order given by the Schedules provided in Section 2.6, neatly rolled and protected by stout cardboard or plastic tubing.

**ELECTRONIC MEDIA – DETAILED REQUIREMENTS**

**The electronic submission shall consist only of the following:**

- Electronically generated written documents in MS Word or Excel
- Electronically generated drawn documents in AutoCAD 2000 or later and submitted in .DWG format.
- PDF format electronic documents generated from scanned and other material and assembled in line with guidance below.

**Assembly and presentation of electronic documents**

Electronic documents shall consist of either:

Single documents relating to one complete section in which are embedded all other electronic files, subject to a maximum size of 5MB; or

A master folder with files arranged in order within a sub-folder structure that matches the main index.; a master folder and sub-folders matching the document structure

In all cases it should be straightforward for City University to reconstitute the documents into paper format (if required) from the electronic submission.

**Referencing & Navigation within Electronic Documents**

The electronic submission must be easily navigable. There shall be a full index provided in each Section with hyperlinks direct to each indexed entry.

Any reference or cross-reference to another document, file, volume, part, section, manual, book, literature or drawing shall be made by hyperlink wherever possible. The files submitted may eventually be located in the same document, on a server, Intranet or Internet and this must be taken into consideration at the time of finalising the links. Where there is any doubt, P&F shall be consulted as to the methodology and final submission of the electronic format of the material.

**Search capability**

Indexes, documents, files and their components must be searchable through use of the associated application or an agreed proprietary software application, e.g. Acrobat Reader, etc.

Final copies of electronic information whether scanned documents, drawings, illustrations, diagrams, certificates or manufacturer's literature, etc., shall be provided on CD-ROM and indexed to reflect the storage structure as detailed elsewhere in this document.

**Scanned and Rendered Media**

Only PDF format documents will be accepted.

## PDF Format

All PDF files must be rendered with a full set of thumbnails and word searched enabled.

Bookmarks shall be used.

Each PDF file is to contain no more than 100 pages of content or 400Kb file size, whichever is the greater. Each file must be indexed and linked such that the end of one file links to the beginning of the next. All files that cover a single topic must be linked and indexed in this way.

Where a document has been split into a number of files, the position of the split between each file (making up a whole document) must be at a convenient location. Consideration should be given to a separate file for each chapter, section or division of the document within the limits above. This should also be considered when linking the files together to ensure a continuous document.

All files, including the index file, related to a single topic must be in a single folder on the transfer medium (e.g. CD-ROM). Each topic folder must have a meaningful name related and relevant to the topic of discussion. All files and folders must be indexed for use on the Windows XP platform. Indexes must be optimised for CD-ROM.

Accented characters and non-English characters are not to be used in the names of files and folders.

The meta-data or document information fields (also sometimes identified as properties fields) must be completed with relevant information for each file.

A descriptive title is to be used in the title field. Always use the keyword field for words to be used during a search and the subject field for the document's subject. Do not use these fields for other purposes. Always use the same word for the same category when completing keywords fields. E.g. don't use 'calorifier' for some documents and 'heat exchanger' in others.

Complete the author field with the name of the person that compiled the information. Add the document file number to the keyword field. Ensure the full company name is entered in the company field.

Compress PDF documents to conserve disk space. For continuous tone images, such as photographs, JPEG medium compression saves a lot of space with little loss of quality. Whether a document is compressed or otherwise, when at a zoom factor of 400% there must be no degradation of the read quality of the image.

Keywords are to be separated by a comma and no space. Left edge binding is to be set for each PDF document. Printing and editing features must be enabled on all PDF documents. **There must be no passwords set on any documents.**

The opening view must be set to "Bookmarks". The opening page number must be set to the first page, in each document.

Magnification level must be set to "Fit Width". Select "Centre Window on Screen". **Do not** set the "Open In Full Screen Mode" option.