



THE UNIVERSITY of EDINBURGH
Estates Department



Estates Design Guideline No.19

Building Maintenance Operations Manual
Log Books Handover

Important Note on Estates Design Guidelines, Assets & Standards

These Design Guidelines, Assets and Standards and the associated suite of documents have been produced in order to furnish external design consultants and contractors with guidance on required University standards for inclusion within their proposed project design.

These guidelines are to be used as supplementary information during project design stage, and as such, detail the minimum standards expected from the University Estates Department.

Please note, these guidelines do not absolve the project design team including, sub-consultants and sub-contractors of their legal and contractual obligations under, design liability, statutory regulations and health and safety legislation.

Estates Design Guidelines (Assets & Standards) No. 19	
EDG No. 19 Building Maintenance & Operations Manual, Log Books & Handover Procedures – Approval Procedure	
Estates Design Guidelines (Assets & Standards) No. 19 Building Maintenance & Operations Manual, Log Books & Handover Procedures Lead: Building Services Engineer (Mechanical)	Name Signed Off Date
Estates Design Guidelines (Assets & Standards) No. 19 EDG No. 19 Building Maintenance & Operations Manual, Log Books & Handover Procedures - Equality Check Lead: Building Services Group Manager	Name Signed Off Date
Estates Design Guidelines (Assets & Standards) No. 19 Building Maintenance & Operations Manual, Log Books & Handover Procedures - check and approval Lead: Director of Estates Operations	Name Signed Off Date
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1 Introduction

The UoE Design Guidelines (as a whole), have been developed for employees of the UoE, Design Teams, Architects, Engineers, Project Managers, external consultants and contractors. This documentation has been developed to enable Design Teams and Contractors to have a broad understanding of the principles that the University of Edinburgh will require to be adopted for any future developments.

The guide is primarily designed to be used in conjunction with Royal Institute of British Architects (RIBA) stages. The actual extent and scope of the design guide to be incorporated for any future development will be based upon the specific project requirements.

The UoE Design Guidelines aim to discuss strategic matters and does not provide an exhaustive treatment of statutory or best practice design and compliance requirements; its primary purpose is to establish a starting point for design briefs, support the consultation process and outline existing assets and standards. It is the responsibility of Design Team readers/duty holders to ensure subsequent designs are complete, compliant and able to meet the final approved brief when measured in use.

1.1 Important Notice – Essential Prior Reading

It is essential for readers of this document to first refer to the Guide No. 1 – *“General Introduction to Design Guidelines, Assets & Standards Principles and Application”* – which serves to provide the principles and overview with vital information and context that apply to all projects.

1.2 Purpose of the University of Edinburgh Estates Design Guidelines (Assets and Standards)

The purpose of the Estates Guidelines is to act as a briefing document to give designers an overview of the minimum design requirements, constraints and challenges presented by the University of Edinburgh’s particular needs. It applies to all new-build, refurbishment, minor works and change of use projects, including property leased by the University, controlling quality in the production of designs, specifications and the subsequent performance of buildings, developed to a consistently high standard and ensuring continuity throughout the University Estate.

The University of Edinburgh encourages innovation; however, all project Design Teams should ensure that their proposed projects have end user considerations and ease of maintenance at its core.

The use of the University of Edinburgh Estates Guidelines, Assets and Standards will not take the place of, or remove, any of the professional responsibility from Design Teams and Contractors to fully comply with the requirements within this document. Given the complex, diverse and growing estate, not all eventualities can be fully defined within this document.

Should any projects deviate from these guidelines, a technical submittal outlining the deviation, reason why and impact to the University maintenance strategy should be prepared and forwarded to the nominated University project representative for liaison with the Building Services Group (BSG).

A review of this deviation shall be carried out by the BSG; a final decision on the deviation shall be communicated to the appropriate design/construction team.

1.3 Interpretation of UoE Estates Design Guidelines, Assets and Standards

The Estates Design Guidelines, Assets and Standards are required to be issued with all project contractual documentation in order to inform project design and construction teams of expected standards to ensure quality continuity across its Estate.

1.4 Glossary of Terms:

1.4.1 Enforced Requirements

The use of the word(s) 'shall', 'are required', 'is required' 'must' or 'will' denotes a requirement that is non- negotiable and shall be used as the basis for designs, technical submissions and/or activities. If such a statement conflicts with a statutory obligation then a technical submittal shall be issued to the University project representative for liaison with the BSG for their final decision regarding compliance with the documentation.

1.4.2 Requirements Needing Confirmation

The use of the word 'may' denotes a negotiable requirement or indication of a solution, where innovation and further calculation, design and discussion may be required to arrive at an optimised solution.

1.4.3 Quality

The Design Guide aims to arrive at the University of Edinburgh's highest design aspirations and standards. It may be that, at the University of Edinburgh's sole discretion, solutions are value managed and then value engineered during subsequent design iterations. Design Teams and Contractors are encouraged to consider where value management and subsequent value engineering may result in an improved financial performance should funding constraints occur. All mechanical and electrical value management and value engineering exercises carried out shall be forwarded to the BSG for review.

1.4.4 Assets and standards

The Design Guidelines endeavours to set out Assets and Standards that will maximise the benefits realisation for the UoE to achieve its strategic objectives and maximise value for money. This will involve coordinated and optimised planning in conjunction with

Procurement, robust asset selection with particular reference to existing legacy assets and standards on the University Estate, for reasons of utilisation and continuity of maintenance, replacement of parts, renewal and ultimate disposal.

1.4.5 Currency of Third Party Documents

Where superseded standards and regulatory documents are referred to in the text, the reader shall apply current revisions and amendments to their project. Should there be any ambiguity, the BSG should be contacted for clarity.

1.4.6 Proof

Where the word 'proof' is used, e.g. 'proof is required', a written report or installation certificate must be produced for approval depending on context.

1.5 Review Design Data Process (RDD)

All proposed designs shall be submitted to the Project Manager and respect Estates Teams and Building Services Group for review and comments, the response will be categorised as follows:

- A. Design Team to acknowledge comments and continue to develop the design to the next stage.
- B. Design Team to acknowledge comments and update the design in accordance with comments and resubmit for consideration before proceeding to the next stage.
- C. Design Team to acknowledge comments and completely review and update the design in accordance to the agreed design principles and resubmit for consideration before proceeding to the next stage.

In addition to the above, the UoE may request specific technical submission to support the RDD and may include the request setting out with proof, e.g. calculations, drawings, etc.

The purpose of the RDD is to ensure designs meet the strategic requirements of the UoE and do not compromise the future operations and maintenance provision. The obligations owed by external architects, consultants and contractors to UoE and their liabilities to UoE is not in any way diminished or otherwise reduced by the RDD.

1.6 The Obligations Owed

By external Design Teams, consultants and contractors to University of Edinburgh and their liabilities to University of Edinburgh is not in any way diminished or otherwise reduced by the approval process. University of Edinburgh is not taking over the roles and duties of the external Design Teams, consultants and contractors who will remain legally responsible for the design and/or works carried out by them or on behalf of their staff, agents, sub-consultants and/or sub-contractors.

1.7 Version Control and Updates

The Estates Design Guidelines are to be reviewed and updated by the Mechanical and Electrical Engineering Services Working Group by the end of January in each calendar year. The version number will, using 2018 as an example, move from 2018 V1.0 at the end of January to 2019 V1.0 for the following year.

The UoE Estates respective Project Management (PM) Teams will send e-mail notifications to the directory of current Design Teams and Contractors appointed following any update or change. Any updates to the Design Guidelines, which cause significant change to a project design, should be raised and discussed with the respective Project Management Team and application of the Change Control Process will be required.

Any new items or amended content will be highlighted in yellow to enable identification of changes from previous versions.

1.8 Purpose of UoE Design Guideline No. 19

The purpose of this document is to set out the guidelines and standards that apply to University of Edinburgh (hereby referred to as UoE) Estate and its requirements for the successful completion and handover of a project. This document will apply to newly constructed buildings and existing buildings scheduled to be refurbished. In some cases, this standard exceeds the Building Regulation requirements, as it represents good practice in the Higher Education sector.

The Building (Scotland) Regulations set out to ensure that new buildings and works achieve the objectives of the Building (Scotland) Act 2003 in terms of health, safety, welfare, convenience conservation of fuel, power and sustainable development and the purpose of this guide will be to provide a standard policy specifying the standard that is required by the UoE.

This UoE Design Guideline No. 19 is for designers, engineers, specifiers, installers and commissioning and maintenance engineers from UoE Estates from the Developed Design Stage (RIBA Stage 3) to when the building is in use (RIBA Stage 7):

To align the requirements of the Technical Standards (Scotland) Regulations/Building Regulations and CIBSE/BSRIA guides

To provide an indication of non-prescriptive preferred procedures and appropriate standards. The content is not a statement of requirements or intended to replace existing British or European technical standards or national guidance; reference to these will still be necessary.

For any general and specific queries, advice is to be obtained from the UoE Building Services Manager. In the event those documents referred to within this document, which have been superseded, then most recent versions are to be referred to.

This document applies to all buildings managed or owned by the UoE. Any tenanted buildings must not have building works, adaptations or change any building or part of a building which will affect building engineering services or any other building elements without first receiving permission from the Project Manager/Building Services Manager and the Landlord of the property or nominated agent and written in the respective lease.

This document indicates the University's generic handover and documentation client requirements. Consultants must also refer to specific project requirements identified by the University's Project Manager and they must fully integrate them into the project handover procedures and the testing and commissioning plan. Consultants and contractors must obtain approval in writing for any variation from these requirements.

Before incorporating these client requirements in, e.g. tender documentation, etc., please always check with the undersigned that you have current issue of both these client requirements and the field equipment list.

Please always approach the University Estates Engineers directly to discuss any point of clarification or possible improvement and to obtain further copies of the client requirements.

Estates Operations – Development Engineers
9 Infirmary Street
Edinburgh
EH1 1NP

General Enquires: 0131 650 9157

2 Handover Procedures, Guidelines and Documentation

The handover of completed buildings, areas or engineering systems is a critical stage of the contract process. This stage of the project must be handled in an efficient and effective manner.

The successful delivery of the handover process will yield a smooth transfer of the building and its services to the buildings end users and University's Estates Department.

All parties will be made aware of their responsibilities in planning for the possession and occupation of a building/facility.

Where the contract sets out the requirement for sectional completion, the Contractor will ensure that all services required to allow occupation and use of the defined space are tested and commissioned timeously. As the University will be taking possession of the space and services, all necessary documentation must be completed in advance of the certification of sectional completion.

3 Handover Procedure

A formal, structured process will be adopted on all projects to ensure that the project is handed over to the University in a clear and unambiguous manner.

3.1 Handover Activities

An activities chart illustrating the minimum requirements is set out below. Where partial completion or partial occupation is required then certain steps may have to be repeated.

This activity chart is aimed at larger capital development projects. A process for Small & Minor Works is included within Appendix H, this process will also apply to Estates Operations backlog maintenance projects. Each project should assume they are subject to the activities determined within this section of the document, unless advised otherwise.

Commissioning & Handover (C&H) Works Element	Stage 3	Stage 4a & 4b	Stage 5	Stage 5	Stage 5	Stage 5	Stage 6	Stage 7
			1 st Fix	2 nd Fix	Commissioning	Handover	Fit Out*	
Design Team C&H Strategy (See section 3.2)								
Contractor's Defect Management Plan (See section 3.3)								
Commissioning & Handover Programme (See section 3.4)								
Familiarisations (See section 3.5)								
Inspections (See section 3.6)								
Witness Testing and Commissioning (See section 3.7)								
Acceptance Testing (See section 3.8)								
Handover Documentation Checklist (See section 3.9)								
Project Specific T59B Sign Off (See section 3.10)								
Demonstrations (See section 3.11)								
Project Specific T59C Sign Off (See section 3.12)								
Practical Competition (See section 3.13)								
Staff Training (See Section 3.14)								
Seasonal Commissioning (See section 3.15)								
Post Occupancy Evaluation (See section 3.16)								
Defects Close out (See section 3.17)								

*Fit out is project specific as there are many different arrangements.

3.2 Design Team C&H Strategy

The Design Team shall drive the Commissioning and Handover (C&H) process from an early stage by outlining their C&H strategy as part of their staged reports. A review of the measures required for the successful C&H will be outlined within the report and a summary of the measures implemented. This may be the inclusion of flushing loops, additional programme time for commissioning, temporary heaters for load testing, etc.

3.3 Contractor's Defect Management Plan

The format of a Defects Management Plan (DMP) will be introduced at an early stage of the construction programme and the format will be agreed with the University's Development Engineers and Quality Management Team.

The Contractor shall maintain the DMP pre and post practical completion. The Contractor will ensure that all affected parties are fully aware of the process to be adopted for the reporting and rectification of notified defects that have been recorded at the time of practical completion or may occur during the defects liability period. The procedure will take account of any access limitations imposed once the building is in operation.

Any defects noted by the University staff or their representatives during site inspections and the training and familiarisation sessions, will be reviewed by the Design Consultants and will be addressed accordingly.

Each defect should be attributed a severity:

- Minor Defect – Aesthetic, no significant impact on building operation or comfort
- Medium Defect – Affects operational performance or occupant comfort
- Major Defect – A Health and Safety, significant performance or comfort issue requiring immediate repair

3.4 Commissioning & Handover Programme

In conjunction with the University's Project Manager, the Contractor will develop and issue a project specific commissioning and handover programme which covers all the activities required to achieve a successful handover of the project.

3.5 Familiarisations

The Contractor will coordinate familiarisation walk rounds with the UoE Project Manager and UoE Development Engineers. This will allow the Estates Department maintenance staff the opportunity to visit the site after the first fix mechanical and electrical install but before services are enclosed by ceiling and raised floor.

All attendees will be provided with the appropriate Personal Protective Equipment (PPE.) 'Informal' discussions and a walk round will be carried out over 'half day' periods. The

number of familiarisation walk rounds shall vary by project, subject to project complexity and agreed with the UoE Development Engineer.

As an indication, the familiarisation for the Estates Department maintenance staff should include, but not be limited to:

- Building services system scope (demonstrated with the aid of schematics and/or other drawings/visual aids.) To include an overview of the purpose and normal operating functions of the works and explaining the philosophy and method of control used
- Physical tour(s) of inspection of the works illustrating main plant items, service routes, key fabric elements such as roofs/facades, and the location of essential isolating points of all incoming services.

The Contractor will ensure there is sufficient expertise to address technical questions.

3.6 Inspections

Throughout the Construction Stage there will be a requirement for regular site inspections, this may consist of a site walkround between the Design Team, Contractor, Sub-Contractors and the Estates Project Team. The aim is to monitor progress, identify construction defects and resolve disputes.

3.7 Witness Testing and Commissioning

The Estates Project Team will determine the extent of Witness Testing and Commissioning, this may involve the Estates project Team and Wider Estates Operations Team. The Estates Project Team may wish to attend at every opportunity or not at all. This will be over and above the Design Team duties.

3.8 Acceptance Testing

The Estates Project Team will determine the extent of Acceptance Testing on each project. It is unlikely that extensive acceptance testing will be included within the cost plan therefore a project specific agreement may be required. This will be over and above the Design Team duties.

3.9 Handover Information Checklist

There is a variety of information that needs to be handed over to the Maintenance Team in support of continued operational involvement in an area or service that has undergone contract work. A number of formal test documents are required in relation to statutory requirements on engineering service items – for further details please refer to Appendix F **Handover Information** Checklist. A project specific list should be drawn up and agreed between the Contractor, Design Team, University Project Manager and University Development Engineer.

3.10 Project Specific T59B Sign Off

The Estates Development Engineers will issue a project specific T59B End of Stage 5 Checklists. An example of an Electrical Systems T59B can be seen within Appendix G.

Sign off of the T59B will be undertaken by the Designer. The Designer shall undertake a review of the Record Documentation (See Section 4) in addition to all Inspections, Witnessing, Commissioning and Acceptance Testing necessary to for sign off.

A complete and signed copy of the T59B must be submitted to the UoE Development Engineers and Project Manager prior to the commencement of Demonstrations and the T59C sign off process, without receipt of the T59B there is a risk of cancellation of the attendance of Estates Operations staff and a potential delay to the Handover programme.

3.11 Demonstrations

Following the Design Team completion of the T59B document, key members of the UoE Estate Department will be provided with a T59C demonstration of the installed systems.

As an indication, the demonstration should include, but not be limited to:

- System scope (demonstrated with the aid of schematics and/or other drawings/visual aids.) To include an overview of the purpose and normal operating functions of the works and explaining the philosophy and method of control used
- Demonstration and training (by Controls Specialist) of the building control system
- An electronic projector style 'walk through' of the operation and maintenance manuals, highlighting important areas of health and safety together with all other items of importance
- Highlighting, demonstrating and providing delegate experience in all maintenance procedures identified in the O&M Manuals
- Physical tour(s) of inspection of the works illustrating aspects covered in the presentation and the location of essential isolating points of all incoming services
- Explaining and illustrating all operator alarms, their possible causes and actions required
- Explaining all known and typical fault scenarios which are capable of being recognised and/or rectified by the operators
- Identifying and demonstrating all safety equipment and interlocks including all interlocks with other suppliers systems/equipment
- Identifying the noise levels in the various areas and highlighting the need for any protection required
- Specifying and illustrating any hazards associated with the works and the methods employed to deal with them
- Providing instruction on the correct operation of plant items and the safe limits of their operation

- Explaining the mode of operation and sequence of events resulting from both power failure and fire alarm conditions
- Demonstrating any alarms and explaining their meaning and possible causes
- Highlighting any associated hazardous maintenance materials which may require special disposal considerations
- Highlighting the signs, cause and effect of known/possible breakdown or fault conditions
- Indicate and demonstrate (where practicable) arrangements made for access and removal of specific items of equipment or key large or heavy subassemblies/components
- Explaining the approach to maintenance of key fabric elements such as roofs, rainwater systems, windows and doors
- Demonstration of the safe day-to-day running and maintenance of all systems, plant and equipment
- Providing sufficient expertise to address delegate questions.

All health and safety issues relating to the works will be brought to the attention of all attendees.

All attendees will be provided with the appropriate Personal Protective Equipment (PPE.)

'Formal' presentations will be carried out over 'half day' periods.

All attendee names will be recorded and signatures obtained from all attendees confirming they have understood the Demonstration. A schedule of names will be provided within the operating and maintenance documentation.

3.12 Project Specific T59C Sign Off

The Demonstration will end upon the completion of the T59C document. Comments shall be collated and reviewed by the Design Team before being submitted for inclusion onto the Defects Management Plan, if necessary. The UoE Estates Department may wish to prevent the issue of the Practical Completion Certificate should there be:

- Significant defects
- Significant system performance gaps
- Health and Safety non-compliances
- Inadequate documentation available for review at the demonstration
- Inadequate demonstration of equipment operation
- Inadequate expertise to address questions.

3.13 Practical Competition

Practical completion can be issued by the UoE Project Manager once the T59C process has been completed.

3.14 Staff Training

Upon completion of the T59C document, members of the UoE Estate Department and building users will be provided with staff training of the installed systems.

All attendees will be provided with the appropriate Personal Protective Equipment (PPE.) 'Formal' discussions and a walk round will be carried out over 'half day' periods. The number of staff training walk rounds shall vary by project, subject to project complexity and agreed with the UoE Development Engineer.

All attendee names will be recorded and signatures obtained from all attendees confirming they have understood the training given.

Comments shall be collated and reviewed by the Design Team before being submitted for inclusion onto the Defects Management Plan, if necessary.

Technical Staff Training

UoE Estates Trades Engineers will be presented with an overview of the O&M information and record drawings. As an indication, the staff training should include, but not be limited to:

- Building services system scope (demonstrated with the aid of schematics and/or other drawings/visual aids.) To include an overview of the purpose and normal operating functions of the works and explaining the philosophy and method of control used
- Demonstration and training (by Controls Specialist) of the building control system
- An electronic projector style 'walk through' of the operation and maintenance manuals, highlighting important areas of health and safety together with all other items of importance
- Highlighting, demonstrating and providing delegate experience in all maintenance procedures identified in the O&M Manuals
- Physical tour(s) of inspection of the works illustrating aspects covered in the presentation and the location of essential isolating points of all incoming services
- Explaining and illustrating all operator alarms, their possible causes and actions required
- Explaining all known and typical fault scenarios which are capable of being recognised and/or rectified by the operators
- Identifying and demonstrating all safety equipment and interlocks including all interlocks with other suppliers systems/equipment
- Identifying the noise levels in the various areas and highlighting the need for any protection required

- Specifying and illustrating any hazards associated with the works and the methods employed to deal with them
- Providing instruction on the correct operation of plant items and the safe limits of their operation
- Explaining the mode of operation and sequence of events resulting from both power failure and fire alarm conditions
- Demonstrating any alarms and explaining their meaning and possible causes
- Highlighting any associated hazardous maintenance materials which may require special disposal considerations
- Highlighting the signs, cause and effect of known/possible breakdown or fault conditions
- Indicating locations of all roof drainage outlets and associated safe access points for ongoing maintenance
- Indicate and demonstrate (where practicable) arrangements made for both fabric and M&E maintenance access, as well as removal and replacement of specific items of equipment or key large or heavy subassemblies/components
- Demonstration of the safe day-to-day running and maintenance of all systems, plant and equipment
- Providing sufficient expertise to address delegate questions.

Non-Technical Staff Training

Non-technical building users will be provided with training which should include, but not be limited to:

- Building services system scope (demonstrated with the aid of schematics and/or other drawings/visual aids.) To include an overview of the purpose and normal operating functions of the works and explaining the philosophy and method of control used
- Health and Safety file overview
- Building occupation information such as Fire Plan, Statutory Compliance, Emergency Procedures and the Health & Safety file location
- Review of the Building User Guide and how to use it
- Physical tour.

3.15 Seasonal Commissioning

Where seasonal commissioning forms part of the contract, this will be attended by the Estates Project Team and key Estates Operation stakeholders. The format and extent of the seasonal commissioning is typically defined by an appointment criteria, however the method of data capture and format of reporting shall be agreed at the outset by all involved. The Contractor should ensure they have resource to extract the information required rather than rely on Estates staff to provide this service.

3.16 Post Occupancy Evaluation

Where a Post Occupancy Evaluation (POE) forms part of the contract, this will be attended to by the Estates Project Team and key Estates Operations stakeholders. The format and extent of the POE is typically defined by an appointment criteria, however the method of data capture and format of reporting shall be agreed at the outset by all involved. The Contractor should ensure they have resource to undertake the take rather than rely on Estates staff to provide this service.

3.17 Defects Close out

During the defects liability phase, it is expected that regular site meetings are attended by the Contractor to report on the resolution of ongoing defects. At the end of this process the UoE Project Team will attend a close out meeting to ensure all defects have been successfully resolved.

4 Record Documentation

Record documentation will be produced by the Contractor and submitted to the Design Team for review accompanied by an updated **Handover Information** Checklist. It is essential the Design Team fully review this documentation to ensure it is to a satisfactory standard prior to completion of the T59B document and for submission to the University's Development Engineer for approval. Failure to ensure the quality and completeness of this documentation could result in a delay of issuing the Practical Completion Certificate.

Formalising the structure of record documentation will assist the University staff by providing familiarity. The required presentation of the volumes and parts of the operating and maintenance information can be found in Appendix A. Any movement away from this structure shall be agreed in advance with the UoE Development Engineer.

4.1 Design Team Review

A draft copy of the following information will be submitted to the Design Team for review and any actions to resolve undertaken by the Contractor:

- Defects Management Plan
- Health and Safety File
- Building Log Book
- Building User Guide
- Operation and Maintenance Manual
- Warranties and Guarantees (including Insurance Backed Guarantees)
- Record Drawings
- **Handover Information** Checklist (Appendix F)

The draft copies will conform to the required format and contain all the information identified in this guideline with the exception of any information not available at that time, such as commissioning results.

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

Once the Design Team have approved, a final draft copy will be submitted to the UoE Project Manager and Development Engineer. This copy will be complete with all testing and commissioning data and test results, actual control set points and the like in draft form.

Once the final draft copy has been approved by the Design Team and the T59B document is signed off, the T59C demonstrations can be arranged through the UoE Project Manager and Development Engineer.

Practical completion may be awarded once the University's comments on the documentation have been resolved and the Project Manager and Development Engineer are satisfied with the completeness of the documentation.

4.2 Health and Safety File

Health and Safety files received from contractors as part of project works will be referenced in the same manner as O&M files. The Health and Safety file will be compliant with the requirements of Construction Design and Management Regulations 2015 (CDM 2015.)

The Principal Designer must prepare the Health and Safety file. They are accountable to the client and should liaise closely to agree the structure and content of the file as soon as practicable after appointment.

Where the Principal Designer's appointment finishes before the end of the project, the Principal Contractor must take on responsibility for ensuring that the file is reviewed, updated and revised for the remainder of the project.

The file must contain information about the project likely to be needed to ensure Health and Safety during any subsequent work, such as maintenance, cleaning, refurbishment or demolition.

Any statutory documentation requirements associated with the works, including compliance to ATEX and DSEAR regulation noting results of hazardous area assessments, will be included within the file. Appendix B contains further details on the information required within the Health and Safety file.

4.3 Log Book

The log book is a requirement within Section 6 of the Non-Domestic Scottish Technical Handbooks. The purpose of a building log book will be to afford an easily accessible focal point of current information for all those working in the building. It has four main functions:

- I. *Summary of the building* – it is a summary of all the key information about the building including the original design, commissioning and handover details and information on its management and performance. In being a summary it does not wholly duplicate or replace the O&M manuals. The log book is necessary for compliance with Scottish Building Regulations Section 6 – Energy, Clauses 6.8.1 and 6.8.2
- II. *Key reference point* – it is the single document in which key building energy information is logged. It will be regarded as the hub document linking many other relevant documents. The log book will provide key references to the detail held in less accessible O&M manuals, BMS manuals and commissioning records
- III. *Source of information/training* – it provides a key source of information for anyone involved in the daily management or operation of the building and to anyone carrying out work on the building and its services
- IV. *Dynamic document* – it is a place to log changes to the building and its operation. It is also used to log building energy performance and continual fine-tuning commissioning.

There are direct links between the Building log book and the O&M manual, record drawings and the Health and Safety file, etc. The log book is a summary of key information with the other relevant documents referred to within it.

It is acceptable to have overlap between the Building log book and these other documents but it is essential that the content and written style of the log book is uncomplicated and concise in nature.

The compilation of a Building log book will be as described in 'Building Log Book Toolkit, a guide and template for preparing log books', CIBSE TM31: and made suitable for the property and will be provided to enable completion by the Lead Consultant/Designer.

The log book will record ongoing building energy performance information in order to improve energy efficiency.

Refer to the Carbon Trust website – GPG348 Good Practice Guide: Building log books – a users' guide; "Better information for better buildings"; Guidance for facilities managers.

The format of the log book is to follow the CIBSE TM31 document as an outline skeleton for the installer to complete. Refer to Appendix C for a sample contents list.

4.4 Builder User Guide

The Building User Guide provides the end users/occupants of the building with a simple, quick and easy guide to the everyday functions of the building in order to ensure a safe and healthy work environment while complimenting the efficient operation of the building to the full potential provided by the design.

The format and contents of the document will be aligned to the Building Manuals and Building User Guides: Guidance and worked examples (BG 26/2011.)

4.5 Operating and Maintenance Manuals

A model specification for preparation of operating and maintenance manuals is provided in BG79/2020: Handover, O&M Manuals, and Project Feedback (Hastings, Pennycook and Bunn, 2007.) This includes a table identifying the division of responsibilities for procurement of information required within the manuals.

The project Operating and Maintenance (O&M) Manuals will be presented in a structured, data deliverable, format in accordance with Level 2 BIM compliance.

The manuals will cover all aspects of the construction – Architectural, Structural, Civil, Mechanical and Electrical and all specialist services. A uniform format will be followed across all disciplines. Please refer to Appendix A and D for a recommended format and content.

Manufacturer's literature will only be applicable to the operation, maintenance and health and safety of the building and its services.

All residual health and safety risks will be included in the manuals and will also include details of any special hazards (special services, asbestos and locations, confined spaces, etc.)

All certificates must be legible and fully completed. They are to have the required signatures and dated. Those signing should have their names spelt out in text as well as signature. Certificates failing to comply will be deemed not to have been presented.

Once all the available information has been compiled, drafts of all sections of the O&M Manuals will be submitted to the University's Project Manager and Development Engineer two weeks in advance of the UoE demonstrations of the operation of the building services. Any draft manuals will be issued with notes of what is missing.

The record documents will 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 will be provided to enable spares and replacements to be ordered.

The maintenance procedures and frequencies detailed in the manual will be in accordance with details provided by the manufacturer for specific items of equipment. Where specific requirements are not pertinent, the procedures and frequencies will be as recommended in SFG20 or, where there is no appropriate maintenance schedule, then reference will be made to HVCA Standard Maintenance Specifications for Services in Buildings.

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

General requirements:

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

The manual will conform to the following minimum standards:

- The covers will be substantial, of adequate size, distinctive and of sufficient strength to protect the contents for the life of the installation. The method of binding will give a permanent anchorage along the left-hand side whilst allowing the text to be flat without damage to the spine
- The manuals will 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 will have the information clearly displayed in permanent lettering
- Dividers between sections will be stepped, overlapping printed card. The divider will be labelled to identify the section of the manual that it proceeds

- All pages comprising the manual will be subsequently numbered according to each section, i.e. section 1 pages numbered 1/1, 1/2, etc. and section 2 pages numbered 2/1, 2/2 etc.

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

- 2 number paper copies
- 2 number copies in electronic format on flash drive
- 1 number file hosted downloadable link.

All flash drives and other electronic forms of delivery media associated with the manual will be clearly labelled with:

- A heading stating "O&M manual" and disc number if more than one disc
- Details of the UoE Unique Project Number, Building Number and systems covered
- The issue number of the manual and date of release.

One copy of the manual will be delivered to 9-11 Infirmary Street by the Contractor and the other copy will be left in the building in an agreed location with the UoE Development Engineer.

4.6 Record Drawings

Record Drawings are the building and services installations as installed at the date of practical completion. All record drawings will be produced in AutoCAD/BIM format using AutoCAD/Revit **latest software release** as appropriate. The AutoCAD/BIM masters will be produced in a structured manner using best practice in the use of colours, layering and file creation methods.

The main requirements of the record drawings are described in Appendix E.

Where BIM Level 2 modelling will occur, record drawings will be prepared in BIM software and exported to the current AutoCAD format as prior to production of the drawings. Final version of the model will be issued in both native format as well as Navisworks file available to review by free version of the software.

All drawings will be suitably layered with different services on each layer. A detailed list of layers, external references or equivalent (if used) and list of files will be provided with the discs.

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

Record Drawing Format

A drawing based on the detailed design drawing or co-ordinated working drawing with the primary purpose of defining that information needed by the tradesmen on site to install the works. The main features of installation drawings are:

- Plan layouts to a scale of at least 1:50, accompanied by cross sections to a scale of at least 1:20 for all congested areas
- Plant room layouts to a scale of at least 1:20, accompanied by cross sections and elevations to a scale of at least 1:20
- A3 copies to be provided within the O&M manuals
- A1 minimum or A0 dependant on scale will be provided as part of the record drawings package.

Record Drawing Issue

Issue, prior to practical completion, the complete approved package of record drawings in the following numbers:

- 2 number copies of Revit Model in electronic format on flash drive
- 2 number copies in AutoCAD and PDF electronic format on flash drive
- 2 number copies in paper format
- 1 file hosted downloadable link

All flash drives and other electronic forms of delivery media associated with the manual will be clearly labelled with:

- A heading stating "O&M manual" and disc number if more than one disc
- Details of the UoE Unique Project Number, Building Number and systems covered
- The issue number of the manual and date of release.

Displayed Record Drawings

The Contractor will provide (and hang in a prominent plant room location) framed plantroom and switch room drawings, services schematics, valve charts, electrical distribution charts and the like. The drawings will be issued for review by the University's Development Engineer who will also advise on the preferred location. Adequate time will be allowed for manufacture and installation prior to practical completion.

Provide information as stated above 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.

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

4.7 Asset List

Two separate assets lists shall be provided; one for all stripped out assets and another for all newly installed assets. The Asset Lists shall be in spreadsheet form with the following information provided as a minimum:

- Asset Type
- Manufacturer
- Model
- Barcode (8 digits)
- Serial Number
- NRM code
- Room Number
- Location description

Please liaise with the Technical Compliance Engineer to agree the format of the asset schedule as well as the extent of the assets to be scheduled. Please allow for all asset from large ticket items such as transformers, Generators, chillers, etc to individual fire alarm components such as panels, heads and key switches.

5 BIM

Refer to the UoE Design Guidelines No. 21 – Building Information Management (BIM) Protocol.

All information will comply with BSI:

- PAS 1192-2:2013: Specification for Information Management for the Capital/Delivery Phase of Construction Projects using Building Information Modelling (BSI, 2013) for information during a single project.
- PAS 1192-3:2014: Specification for Information Management for the Operational Phase of Assets using Building Information Modelling (BSI, 2014) for the use and management of information during the operation of a building.

If Building Information Modelling (BIM) is being used on the project, the common data environment will be transferred to the University, including the final published information and the archive which provided a record of all activities in the common data environment during the project.

Appendices

Appendix A Operating and Maintenance Manuals – Volumes/Parts

The following is the sequence of presentation of Operating and Maintenance information presented in a project's suite of manuals. On major projects, more than one volume may be required to accommodate the Part information. Each volume shall be consequentially referenced:

- Part 1: General
- Part 2: Fabric
- Part 3: Mechanical and Electrical Services
- Part 4: Structural and Civil Engineering
- Part 5: Landscaping
- Part 6: The Health and Safety File

CONTENT OF THE BUILDING MANUAL – PART 1: GENERAL

Content: obtain and provide the following, including all relevant details not included in other parts of the manual:

1. Index:
 - List the constituent parts of the manual, together with their location in the document
2. The works:
 - Description of the building(s) and facilities
 - Ownership and tenancy, where relevant
 - Health and Safety information
 - Other than that specifically required by the Construction (Design and Management) Regulations
3. The contract:
 - Names, addresses and contact details of all significant consultants, contractors, sub-contractors, 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
4. 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 fire-fighting systems, services, shut-off valves switches, etc
- Emergency procedures and contact details in case of emergency
- Other specific requirements

5. Description and location of other key documents

CONTENT OF THE BUILDING MANUAL – PART 2: BUILDING FABRIC

1. Content: obtain and provide the following, including all relevant details not included in other parts of the manual:
 - Detailed design criteria, including:
 - Roof, floor and external hardstanding loadings
 - Durability and lifespan of individual components and elements
 - Insulation values
 - Fire ratings and compartmentation lines
 - Other relevant performance requirements
2. Construction of the building:
 - A detailed description of methods and materials used
 - As-built drawings recording the construction, together with an index
 - Information and guidance concerning repair, renovation or demolition/ deconstruction
 - Maintenance Access Strategy
3. Fire plans
4. Periodic building maintenance guide chart
5. Inspection reports
6. Manufacturer's instructions index, including relevant COSHH data sheets and recommendations for cleaning, repair and maintenance of components

CONTENT OF THE BUILDING MANUAL – PART 3: MECHANICAL AND ELECTRICAL SERVICES

Refer to Appendix D for details of contents.

CONTENT OF THE BUILDING MANUAL – PART 4: STRUCTURAL AND CIVIL ENGINEERING

1. Description of structural and civil engineering construction
2. Detailed design criteria, including:

- Roof, floor and external hardstanding loadings
 - Loading restrictions and limitations
3. Structural and civil engineering as-built drawings, together with an index
 4. Structural and civil engineering installation inspection requirements
 5. Geotechnical reports/ground condition/contamination reports
 6. Traffic impact study and Road Safety Assessment
 7. Environmental impact statements
 8. Ecological reports
 9. Health and Safety information about equipment provided for cleaning or maintaining the structure and its environs
 10. Information and guidance concerning repair, renovation or demolition/deconstruction

CONTENT OF THE BUILDING MANUAL – PART 5: LANDSCAPING

1. General requirements:
 - Definitions
 - Contact person
 - Existing conditions and examination of site
 - Safety
 - Laws, codes and ordinances
2. Scope of maintenance works
3. Checklists:
 - Inventory of planting (including detailed layout drawings)
 - Weekly landscape maintenance checklist
 - Monthly landscape maintenance checklist
4. Care of planted areas:
 - Trees
 - Shrubs and vines
 - Groundcover
 - Fertilizer
 - Weed control
 - Mulch and/or rock layer
 - Lawns
5. Irrigation:

- Water application and scheduling
 - Irrigation system scheduled maintenance
 - Irrigation system repair and maintenance
6. Clean up and litter removal
 7. Chemicals, herbicides and pesticides
 8. Hard landscaping:
 - Snow clearance/salting
 - Drain silt clearance
 - Surface infiltration
 - Sustainable drainage/culverts
 - Porous/pervious paving/roadways
 - Signage
 9. Communications and reporting

CONTENT OF THE BUILDING MANUAL – PART 6: THE HEALTH AND SAFETY FILE

Refer to Appendix B for details of contents.

Appendix B The Health and Safety File

The file must contain information about the project likely to be needed to ensure health and safety during any subsequent work such as maintenance, cleaning, refurbishment or demolition. When preparing the health and safety file, information on the following should be included:

- A brief description of the work carried out
- Any hazards that have not been eliminated through the design and construction processes and how they have been addressed, e.g. surveys or other information concerning asbestos or contaminated land
- Key structural principles, e.g. bracing, sources of substantial stored energy (including pre or post-tensioned members) and safe working loads for floors, roofs and hardstandings
- Hazardous materials used, e.g. lead paints and special coatings
- Information regarding the removal or dismantling of installed plant and equipment, e.g. any special arrangements for lifting such equipment
- Health and Safety information about equipment provided for cleaning or maintaining the structure e.g. Maintenance Access Strategy
- The nature, location and markings of significant services including underground cables, gas supply equipment, fire-fighting services, etc
- Information and as-built drawings of the building, its plant and equipment, e.g. the means of safe access to and from service voids and fire doors.

There should be enough detail to allow the likely risks to be identified and addressed by those carrying out the work. However, the level of detail should be proportionate to the risks. The file should not include things that will be of no help when planning future construction work such as pre-construction information, the construction phase plan, contractual documents, safety method statements, etc.

Information must be in a convenient form, clear, concise and easily understandable.

Appendix C Building Log Book List of Contents

1. Building history
2. Purpose and responsibilities
3. Links to other key documents
4. Main contacts
5. Commissioning, handover and compliance
6. Overall building design
7. Summary of areas and occupancy information
8. Summary of main building services plant
9. Internal environmental treatment
10. Overview of the BMS
11. Metering, monitoring and targeting strategy
12. Building energy performance records
13. Water management
14. Waste management
15. Summary of plant inspection and maintenance
16. Maintenance review
17. Results of in-use investigations

Appendix: relevant compliance and tests certificates

Appendix D Mechanical and Electrical Manual Contents

The O&M manuals will be arranged as follows unless an alternative format and contents are agreed with the University's Development Engineer 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 (e.g. 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 (e.g. General Information and Design Details)

Title Pages

- Premises name and address (authenticated postal address, phone, fax, e-mail, etc)
- University of Edinburgh Unique Project Number
- 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 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 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, wayleaves etc
- Safety and fire certificates. Certificates confirming that the premises and installed systems may be safely utilised. These will 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 will 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 will 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 addresses, 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, authorised 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

Test Certificate – 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.

Appendix E Record Drawing Information

The following are required from the record drawings:

- Provide a record of the locations of all the systems and components installed including pumps, fans, valves, strainers, terminals, electrical switchgear, distribution and components
- 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 will be marked with its size and air quantity flowing. Each terminal unit or grille will 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 will be provided, incorporating details of each instrument and equipment item and written description of the sequence of operation of each system. All diagrams will 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 will be provided at practical completion. Record drawings of the final "as installed" layouts will be issued in draft form to the CA for examination 4 weeks prior to the testing and commissioning period to allow checking for accuracy.

Appendix F **Handover Information** Checklist

PROJECT NAME	UoE PROJECT NUMBER	PROJECT MANAGER	CONTRACTOR	ISSUE	DATE

REF	HAND OVER REQUIREMENT	DOCUMENT REFERENCE	Not Applicable <input checked="" type="checkbox"/>	DOC. LOCATION	DOC. STATUS	DESIGN TEAM	ESTATES TECHNICAL	COMMENTS
		Legislation/Guidance		<ul style="list-style-type: none"> O&M Other 	<ul style="list-style-type: none"> Complete In Progress Post PC N/A 	<ul style="list-style-type: none"> Checked Not Checked 	<ul style="list-style-type: none"> Checked Not Checked 	Note deviations or limitations to hand over documentation
1	Fire Safety							
1.1	Fire Safety Manual (Design Information)	BS 9999 H.4.1	<input type="checkbox"/>					
1.2	Fire Detection & Alarm Test Certificate	BS 5839-1	<input type="checkbox"/>					
1.3	Fire Extinguisher Schedule Installed	BS 5306-8	<input type="checkbox"/>					
1.4	Fire Hydrant/Fire Main/Risers Test Certification	BS 9990	<input type="checkbox"/>					
1.5	Emergency Lighting Certificate	BS 5266 / 50172	<input type="checkbox"/>					
1.6	Sprinklers System Certification	BS 12845 / 9251	<input type="checkbox"/>					
1.7	Pressurised Escape Route/Staircase System	BS 12101	<input type="checkbox"/>					
1.8	Smoke Ventilation/Extraction Systems	BS 12101	<input type="checkbox"/>					
1.9	Fire Strategy	PAS 911	<input type="checkbox"/>					

REF	HAND OVER REQUIREMENT	DOCUMENT REFERENCE	Not Applicable <input checked="" type="checkbox"/>	DOC. LOCATION	DOC. STATUS	DESIGN TEAM	ESTATES TECHNICAL	COMMENTS
		Legislation/Guidance		<ul style="list-style-type: none"> O&M Other 	<ul style="list-style-type: none"> Complete In Progress Post PC N/A 	<ul style="list-style-type: none"> Checked Not Checked 	<ul style="list-style-type: none"> Checked Not Checked 	Note deviations or limitations to hand over documentation
1.10	Fire Systems Cause & Effect Matrix	BS 9999	<input type="checkbox"/>					
1.11	Compartmentation Drawing	BS 9999	<input type="checkbox"/>					
1.12	Voice Alarm Systems	BS 5839-8	<input type="checkbox"/>					
1.13	Refuge & Fire Telephone Systems	BS 5839-9	<input type="checkbox"/>					
1.14	Gaseous Fire Suppression Systems & Integrity Test	BS ISO 14520	<input type="checkbox"/>					
1.15	Kitchen Fire Suppression System	BS EN 16282-7	<input type="checkbox"/>					
1.16	Fire Doors Schedule & Certification	BS 8214	<input type="checkbox"/>					
1.17	Fire Curtains	BS 8524	<input type="checkbox"/>					
1.18	Smoke Control Systems	BS 7346	<input type="checkbox"/>					
1.19	Fire/Smoke Damper Schedule & Tests	BS 9999	<input type="checkbox"/>					
1.20	Pre-occupation Fire Safety Assessment	BS 9999 8.3.2	<input type="checkbox"/>					
1.21	Schedule and Drawings for Fire Stopping	BS 9999	<input type="checkbox"/>					
1.22	Electrically powered hold-open devices	BS 7273-4:2015	<input type="checkbox"/>					
2	Lifts, Lifting Equipment & Working at Heights							
2.1	Passenger/Goods Lift Commissioning Certification	BS 8486	<input type="checkbox"/>					

REF	HAND OVER REQUIREMENT	DOCUMENT REFERENCE	Not Applicable <input checked="" type="checkbox"/>	DOC. LOCATION	DOC. STATUS	DESIGN TEAM	ESTATES TECHNICAL	COMMENTS
		Legislation/Guidance	<input checked="" type="checkbox"/>	<ul style="list-style-type: none"> O&M Other 	<ul style="list-style-type: none"> Complete In Progress Post PC N/A 	<ul style="list-style-type: none"> Checked Not Checked 	<ul style="list-style-type: none"> Checked Not Checked 	Note deviations or limitations to hand over documentation
2.2	Passenger/Goods Lift Declaration of Conformity	Lifts Regulations	<input type="checkbox"/>					
2.3	Disabled/Stair Lift Commissioning Certification	BS 6440	<input type="checkbox"/>					
2.4	Lifting Beams Certification	LOLER	<input type="checkbox"/>					
2.5	Lifting Equipment Certification	LOLER	<input type="checkbox"/>					
2.6	Roof Gantry Certificate	BS 6037	<input type="checkbox"/>					
2.7	Safety Restraint Test Certification (Anchor Devices)	BS 7883	<input type="checkbox"/>					
3	Water Systems							
3.1	Domestic Water System Flushing & Disinfection	BS 8558	<input type="checkbox"/>					
3.2	Water Hygiene Sampling (TVC 22 °C; TVC 37 °C; Coliform; E Coli; Pseudomonas aeruginosa; Legionella and disinfection residuals)	BS 8558	<input type="checkbox"/>					
3.3	Records of weekly flushing of all outlets (post disinfect, prior to PC/handover)	BS 8558	<input type="checkbox"/>					
3.4	Water Outlet Temperatures Certificate	ACOP L8	<input type="checkbox"/>					
3.5	TMV Schedule and Testing Certificate		<input type="checkbox"/>					
3.6	Legionella Risk Assessment	ACOP L8	<input type="checkbox"/>					
3.7	Quality Assurance Certification of Copper Pipework	BS EN 1057 (ref BS 8558 4.2.3.2)	<input type="checkbox"/>					

REF	HAND OVER REQUIREMENT	DOCUMENT REFERENCE	Not Applicable <input checked="" type="checkbox"/>	DOC. LOCATION	DOC. STATUS	DESIGN TEAM	ESTATES TECHNICAL	COMMENTS
		Legislation/Guidance	<input checked="" type="checkbox"/>	<ul style="list-style-type: none"> O&M Other 	<ul style="list-style-type: none"> Complete In Progress Post PC N/A 	<ul style="list-style-type: none"> Checked Not Checked 	<ul style="list-style-type: none"> Checked Not Checked 	Note deviations or limitations to hand over documentation
3.8	RPZ Valve (Type BA Device) Notification to Water Supplier & Installation Compliance Certificate	Water Supply (Water Fittings)	<input type="checkbox"/>					
3.9	Drainage and Waste Tightness & Pressure Tests		<input type="checkbox"/>					
3.10	Foul/storm Drainage systems CCTV Report		<input type="checkbox"/>					
4	Asbestos							
4.1	Updated Asbestos Register	CoA Regs	<input type="checkbox"/>					
5	Mechanical							
5.1	Gas Boilers and Equipment Certificate	Gas Safety Regs	<input type="checkbox"/>					
5.2	Gas Soundness Test Certificate	IGE/UP/1	<input type="checkbox"/>					
5.3	Gas Schematic Drawing adjacent to Gas Meter	Gas Safety Regs	<input type="checkbox"/>					
5.4	Heating/Cooling Pipework Pressure Test	BESA TR/6	<input type="checkbox"/>					
5.5	Heating/Cooling Systems Flush and Clean	BSRIA BG 29	<input type="checkbox"/>					
5.6	Heating/Cooling Systems Dosing	BSRIA BG 50	<input type="checkbox"/>					
5.7	Heating/Cooling Commissioning Data	CIBSE COM W	<input type="checkbox"/>					
5.8	Pressure Systems Test Certificate	PSSR	<input type="checkbox"/>					

REF	HAND OVER REQUIREMENT	DOCUMENT REFERENCE	Not Applicable <input checked="" type="checkbox"/>	DOC. LOCATION	DOC. STATUS	DESIGN TEAM	ESTATES TECHNICAL	COMMENTS
		Legislation/Guidance	<input checked="" type="checkbox"/>	<ul style="list-style-type: none"> O&M Other 	<ul style="list-style-type: none"> Complete In Progress Post PC N/A 	<ul style="list-style-type: none"> Checked Not Checked 	<ul style="list-style-type: none"> Checked Not Checked 	Note deviations or limitations to hand over documentation
5.9	Pressure Systems Schedule & Written Scheme	PSSR	<input type="checkbox"/>					
5.10	Mechanical Ventilation Commissioning Data	CIBSE COM A	<input type="checkbox"/>					
5.11	Air-conditioning Test Certificates		<input type="checkbox"/>					
5.12	F-Gas Register	F-Gas Regs	<input type="checkbox"/>					
5.13	Steam/Condensate Commissioning		<input type="checkbox"/>					
5.14	Ductwork Cleaning Certificate	BS 15780	<input type="checkbox"/>					
5.15	Oil Boiler Certification	OFTEC	<input type="checkbox"/>					
6	Electrical							
6.1	Electrical Installation & Earthing Test Certification	BS 7671	<input type="checkbox"/>					
6.2	Standby Generator System Test Certificate	G59 / G83	<input type="checkbox"/>					
6.3	UPS Test Certificate		<input type="checkbox"/>					
6.4	Lightning Protection System Certificate	BS 62305	<input type="checkbox"/>					
6.5	Disabled Toilet Alarms Certificate	BS 8300	<input type="checkbox"/>					
6.6	BMS Commissioning Certificate	CIBSE COM C	<input type="checkbox"/>					
6.7	Voice & Data Certificate		<input type="checkbox"/>					

REF	HAND OVER REQUIREMENT	DOCUMENT REFERENCE	Not Applicable <input checked="" type="checkbox"/>	DOC. LOCATION	DOC. STATUS	DESIGN TEAM	ESTATES TECHNICAL	COMMENTS
		Legislation/Guidance	<input checked="" type="checkbox"/>	<ul style="list-style-type: none"> O&M Other 	<ul style="list-style-type: none"> Complete In Progress Post PC N/A 	<ul style="list-style-type: none"> Checked Not Checked 	<ul style="list-style-type: none"> Checked Not Checked 	Note deviations or limitations to hand over documentation
6.8	Induction Hearing Loop	BS 7594	<input type="checkbox"/>					
6.9	Declaration of Performance for Cabling	CPR	<input type="checkbox"/>					
7	Building							
7.1	Modifications to Roof Plant or Structures Detailed		<input type="checkbox"/>					
7.2	Automatic/Revolving Doors Certificate		<input type="checkbox"/>					
7.3	Automatic Barriers Certificate		<input type="checkbox"/>					
8	Security Systems							
8.1	Intruder Alarm Test Certificates	BS 9263	<input type="checkbox"/>					
8.2	CCTV Test Certificates	BS EN 62676	<input type="checkbox"/>					
8.3	Access Control Installation Certificate	BS 60839	<input type="checkbox"/>					
8.4	PA System Test Certificate	BS 6259	<input type="checkbox"/>					
8.5	Building Intercom System	BS EN 62820	<input type="checkbox"/>					
8.6	Panic Alarm / Nurse Call System		<input type="checkbox"/>					
9	Specialist Services							
9.1	Laboratory/Industrial Waste Drainage		<input type="checkbox"/>					

REF	HAND OVER REQUIREMENT	DOCUMENT REFERENCE	Not Applicable <input checked="" type="checkbox"/>	DOC. LOCATION	DOC. STATUS	DESIGN TEAM	ESTATES TECHNICAL	COMMENTS
		Legislation/Guidance	<input checked="" type="checkbox"/>	<ul style="list-style-type: none"> O&M Other 	<ul style="list-style-type: none"> Complete In Progress Post PC N/A 	<ul style="list-style-type: none"> Checked Not Checked 	<ul style="list-style-type: none"> Checked Not Checked 	Note deviations or limitations to hand over documentation
9.2	Treated/De-ionised/Distilled Water		<input type="checkbox"/>					
9.3	Medical/Laboratory Gases		<input type="checkbox"/>					
9.4	Vacuum System		<input type="checkbox"/>					
9.5	Clean Rooms Verification		<input type="checkbox"/>					
9.6	Cold Rooms		<input type="checkbox"/>					
9.7	Fume Cupboards	COSHH	<input type="checkbox"/>					
9.8	Local Exhaust Ventilation	COSHH	<input type="checkbox"/>					
9.9	Compressed Air		<input type="checkbox"/>					
9.10	Catering Equipment		<input type="checkbox"/>					
10	Health & Safety							
10.1	Health and Safety File	CDM Regs	<input type="checkbox"/>					
10.2	Operating & Maintenance Manuals	BSRIA 1/2007	<input type="checkbox"/>					
10.3	Staff Training & Familiarisation		<input type="checkbox"/>					
10.4	Demonstration of Plant, Equipment & Systems to Estates Maintenance/Technical Teams		<input type="checkbox"/>					


REF	HAND OVER REQUIREMENT	DOCUMENT REFERENCE	Not Applicable <input checked="" type="checkbox"/>	DOC. LOCATION	DOC. STATUS	DESIGN TEAM	ESTATES TECHNICAL	COMMENTS
		Legislation/Guidance		<ul style="list-style-type: none"> O&M Other 	<ul style="list-style-type: none"> Complete In Progress Post PC N/A 	<ul style="list-style-type: none"> Checked Not Checked 	<ul style="list-style-type: none"> Checked Not Checked 	Note deviations or limitations to hand over documentation
10.5	Building User Guide	BSRIA BG 26	<input type="checkbox"/>					
10.6	Deleterious Materials Statement		<input type="checkbox"/>					
10.7	Residual Hazards Register		<input type="checkbox"/>					
11	Sustainability							
11.1	Building Energy Log Book (Electronic & Paper)	CIBSE TM 31	<input type="checkbox"/>					
11.2	Air Permeability Tests	CIBSE TM 23	<input type="checkbox"/>					
11.3	BRUKL Report	Section 6	<input type="checkbox"/>					
11.4	Energy Performance Certificate	Section 6	<input type="checkbox"/>					
11.5	Sustainable Accreditation	BREEAM/Other	<input type="checkbox"/>					
11.6	Automated Metering System Sign-Off	Section 6	<input type="checkbox"/>					
11.7	Combined Heat & Power		<input type="checkbox"/>					
11.8	PV System Commissioning		<input type="checkbox"/>					
11.9	Solar Thermal Commissioning		<input type="checkbox"/>					
11.10	Air/Ground Source Heating/Cooling		<input type="checkbox"/>					
11.11	Rainwater Harvesting Commissioning		<input type="checkbox"/>					

REF	HAND OVER REQUIREMENT	DOCUMENT REFERENCE	Not Applicable <input checked="" type="checkbox"/>	DOC. LOCATION	DOC. STATUS	DESIGN TEAM	ESTATES TECHNICAL	COMMENTS
		Legislation/Guidance	<input checked="" type="checkbox"/>	<ul style="list-style-type: none"> O&M Other 	<ul style="list-style-type: none"> Complete In Progress Post PC N/A 	<ul style="list-style-type: none"> Checked Not Checked 	<ul style="list-style-type: none"> Checked Not Checked 	Note deviations or limitations to hand over documentation
12	Project Management							
12.1	Building Regs Completion Certificates	Building Regs	<input type="checkbox"/>					
12.2	Confirmation of Discharging all Relevant Planning Conditions		<input type="checkbox"/>					
12.3	Snagging List at PC		<input type="checkbox"/>					
12.4	Asset Register Issued	UoE AMG	<input type="checkbox"/>					
12.5	Planned Preventative Maintenance Schedules		<input type="checkbox"/>					
12.6	Soft Landings Arrangements Agreed	BSRIA BG 45	<input type="checkbox"/>					
12.7	Initial Maintenance Arrangements Agreed		<input type="checkbox"/>					
12.8	Warranty Schedule		<input type="checkbox"/>					
12.9	Maintenance & Access Strategy		<input type="checkbox"/>					
12.10	Key Schedule & keys		<input type="checkbox"/>					
12.11	All Access Codes, Engineers Codes, Passwords, Fobs, Transmitters for Systems		<input type="checkbox"/>					
12.12	Spares Schedule		<input type="checkbox"/>					
12.13	Tools/Maintenance Equipment		<input type="checkbox"/>					

REF	HAND OVER REQUIREMENT	DOCUMENT REFERENCE	Not Applicable <input checked="" type="checkbox"/>	DOC. LOCATION	DOC. STATUS	DESIGN TEAM	ESTATES TECHNICAL	COMMENTS
		Legislation/Guidance	<input checked="" type="checkbox"/>	<ul style="list-style-type: none"> O&M Other 	<ul style="list-style-type: none"> Complete In Progress Post PC N/A 	<ul style="list-style-type: none"> Checked Not Checked 	<ul style="list-style-type: none"> Checked Not Checked 	Note deviations or limitations to hand over documentation
12.1 4	Record drawings – Electrical (CAD & PDF)		<input type="checkbox"/>					
12.1 5	Record drawings – Mechanical (CAD & PDF)		<input type="checkbox"/>					
12.1 6	Record drawings - Building (CAD & PDF)		<input type="checkbox"/>					
12.1 7	Record drawings - Infrastructure (CAD & PDF)		<input type="checkbox"/>					
12.1 8	Plantroom Drawings Displayed		<input type="checkbox"/>					
13	Landscaping							
13.1	Landscaping to specification: planting (report)	BS 3936-1	<input type="checkbox"/>					
13.2	Landscaping to specification: trees (report)	BS 8545/4043	<input type="checkbox"/>					
13.3	Landscaping to specification: grassed areas (report)	BS 4428	<input type="checkbox"/>					
13.4	Record drawings – Drainage (CAD & PDF)		<input type="checkbox"/>					
13.5	Record drawings – Irrigation (CAD & PDF)		<input type="checkbox"/>					
13.6	Certification where applicable (e.g. sports facilities)		<input type="checkbox"/>					

The current statutory legislation or guidance is quoted but it is recognised that older or alternative standards may be used in some cases so please amend if applicable or note agreed derogations in the comments section.

Appendix G T59 End of Stage 5 Checklist

	THE UNIVERSITY of EDINBURGH Estates Department	T59 END OF STAGE 5 CHECKLIST	
		Estates Lead:	
	Project Lead:		
	Filing Ref:	Version:	

PROJECT NAME – RIBA STAGE 5 PART B – HANDOVER CHECKLIST: MAIN CONTRACTOR DEMONSTRATION TO DESIGN TEAM
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Note: For each demonstration, the relevant Design Team representative must attend. At the end of the demonstration by the Main Contractor, they should certify by initialling and dating to confirm the following:

- That they are satisfied with the outcome of the demonstration
- All UoE requirements under the project scope have been provided

If they are not satisfied, they should indicate this with reasons why and a new date scheduled for a follow-up demonstration.

Item	System	DT Attendee	Accepted Y / N	DT Attendee Initials	Date
ELECTRICAL					

Item	System	DT Attendee	Accepted Y / N	DT Attendee Initials	Date
1.	Electrical Distribution				
a)	High voltage (HV) electrical test certificates, switchboard, TX's, cabling, relays etc				
b)	Low voltage (LV) electrical test certificates inc switchgear, UPS, PDU's BTU's, cabling, small power etc				
c)	HV/LV protection settings commissioning information / grading document				
d)	As installed network and earthing schematic/s on all HV/LV/TX/generator/UPS switch room locations detailing rating/settings of installed equipment, cable sizes/types etc. Drawing be installed adjacent to LV schematic in main plant space				
e)	Generator black start (simulation) and control system overview and demonstration. Operational principles to be provided.				
f)	UPS overview and demonstration including all commissioning, design, test certification and operational principles				
g)	Electrical installation certificate/s signed by appropriate parties (designer, contractor etc.)				
h)	As installed HV/LV and Generator earthing drawings provided inc external earth farm location drawing etc				
i)	Lightning and surge protection test and commissioning certificates provided inc copy of LPSP risk assessment and as installed lightning protection drawing				

Item	System	DT Attendee	Accepted Y / N	DT Attendee Initials	Date
j)	All supplies metered, gateway installed and final commissioning onto elcomponents, by UoE carried out				
k)	Operational procedures provided for HV (temp supply and castell arrangement)/LV switchgear, UPS, generator and associated controls (cause and effect)				
l)	Circuit charts provided on all DB's inc electronic copy sent for future use				
m)	Final circuit wiring cable markers installed in DB's and all associated supplies/outgoing ways labelled on DB c/w printed labels				
n)	Distribution Board keys provided when works complete				
o)	BWIC to HV rooms carried out i.e. walls painted, floors treated, fire stopping, trench cover plates provided, trenches free from water ingress etc				
p)	Heaters installed in HV switch room location				
q)	All electrical safety signage and first aid signage installed in all electrical area's				
r)	Installed fuse ratings labelled on all LV switchgear supplies				
s)	All HV/LV switchgear and associated cabling labelled				
t)	Rubber matting installed at all HV/LV/UPS/Generator & HMI switchboard locations				
u)	As installed network schematic provided in electronic formats (CAD/PDF)				
v)	All sockets, FCU's, isolators, accessories labelled with circuit identification				
w)	All HV/LV switchgear, UPS, generator/controls general arrangement and wiring detail drawings provided, including UPS battery racks layout				

Item	System	DT Attendee	Accepted Y / N	DT Attendee Initials	Date
x)	Cable calc and confirmation of cabling for future incoming supply cables				
	If not accepted, give reasons:				
2.	General, Emergency and External Lighting				
a)	General and emergency lighting demonstration				
b)	General, emergency and external lighting signed test/design/installation certificates				
c)	Emergency Lighting logbook provided				
d)	External lighting demonstration inc. controls/emergency				
e)	As installed drawings with installed and recorded lux levels (general, emergency and external) provided in CAD/PDF formats				
f)	All light switches labelled with circuit reference				
g)	As installed luminaire schedule provided				
h)	Luminaire warranty information provided in log book and O&M				
	If not accepted, give reasons:				

Item	System	DT Attendee	Accepted Y / N	DT Attendee Initials	Date
3.	Fire Detection and Gas Suppression System				
a)	Fire alarm and gas suppression overview and demonstration inc fire detection in genset containers				
b)	Verification and demonstration of alarm/pre-alarm signal/s link				
c)	Cause and effect demonstration for both general fire detection and gas suppression systems				
d)	Copy of as installed cause and effect matrix document				
e)	Signed testing, commissioning, design and acceptance test certificates for both fire detection and gas suppression systems				
f)	Gas suppression wiring and as installed drawings provided. Gas suppression as installed schematic/computer room layout mounted in A3 frame at all panel locations.				
g)	Gas suppression warning signs installed at all entrance/exit locations to computer hall				
h)	Gas suppression operational procedures provided at control panel locations and in electronic word/PDF format				
i)	Drawing provided with recorded FA dB levels and device/loop numbers				

Item	System	DT Attendee	Accepted Y / N	DT Attendee Initials	Date
j)	A3 Zone chart provided at panel locations and electronically in both CAD and PDF format				
k)	A3 Zone chart updated				
l)	All fire detection devices numbered/labelled				
m)	As installed drawings provided in CAD/PDF formats				
n)	FA and GS System warranty and technical information provided in O&M				
	If not accepted, give reasons:				
4.	Public Address (PA) System				
a)	Public Address overview and demonstration				
b)	PA system wiring and as installed drawings				
c)	PA system commissioning, design and installation certificates provided				
d)	PA zone drawing provided				

Item	System	DT Attendee	Accepted Y / N	DT Attendee Initials	Date
e)	System warranty and equipment information provided in O&M				
	If not accepted, give reasons:				
5.	Security System/s – Access, CCTV, Doorguard and Intruder Alarm				
a)	Access Control, CCTV and Intruder Alarm system overview and demonstration				
b)	Verification and demonstration of alarm signal/s link and CCTV feed				
c)	Access, CCTV, Doorguard and Intruder as installed schematic and layout drawings provided				
d)	System warranty and equipment information provided in O&M				
e)	Demonstration of access controlled door release on FA activation (under FA demonstration)				
	If not accepted, give reasons:				
6.	Data / Structured Cabling				
a)	Overview of data network				

Item	System	DT Attendee	Accepted Y / N	DT Attendee Initials	Date
b)	All data cabling test and commissioning results provided				
c)	As installed network schematic, detailing connections and cabling routes provided				
	If not accepted, give reasons:				
7.	External Services, O&M Information and Misc.				
a)	External services as installed drawings (CAD/ and PDF format)				
b)	Duct details and drawing for future incoming supply cabling				
c)	Building access and maintenance strategy document, to include details on TX8 replacement methodology				
d)	Building user guide (BUG) document				
e)	Building H&S and M&E O&M Information, 1 hard copy and electronic copy				
f)	Building fire strategy document				
g)	All Building GA and M&E drawings in CAD and PDF format				
h)	All M&E system keys, operational devices labelled and handed over, including door keys for restricted area's i.e. HV room and TX area				
	If not accepted, give reasons:				

Item	System	DT Attendee	Accepted Y / N	DT Attendee Initials	Date

Approvals	Signature	Date
Project Board endorsed (signed by EDM)		
EDM endorsed		

Appendix H Small & Minor Works Commissioning & Handover

The following activities will be undertaken during the Commissioning and Handover stages of Small & Minor Works Projects to facilitate a complete and efficient transfer of the project to the University's Operations Team.

Commissioning & Handover (C&H) Works Element	Stage 3	Stage 4a & 4b	Stage 5	Stage 5	Stage 5	Stage 5	Stage 6	Stage 7
			1 st Fix	2 nd Fix	Commissioning	Handover	Fit Out*	
Contractor's Defect Management Plan (See section 3.3)								
Commissioning & Handover Programme (See section 3.4)								
Inspections (See section 3.6)								
Handover Documentation Checklist (See section 3.9)								
Project Specific T59B Sign Off (See section 3.10)								
Handover Familiarisation (See section 3.5)								
Project Specific T59C Sign Off by UoE S&M PM (See section 3.12)								
Practical Competition (See section 3.13)								
Defects Close out (See section 3.17)								

*Fit out is to be covered on a case by case basis as there are many different arrangements.

Appendix I Design Guidelines

Please find the most current version of the University Of Edinburgh Estates Department, Design Guidelines and Relevant Policies here:

<https://www.ed.ac.uk/estates/about-us/design-guidelines/engineering-design>



THE UNIVERSITY *of* EDINBURGH
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