Loughborough University

LU STANDARD O&M MANUAL

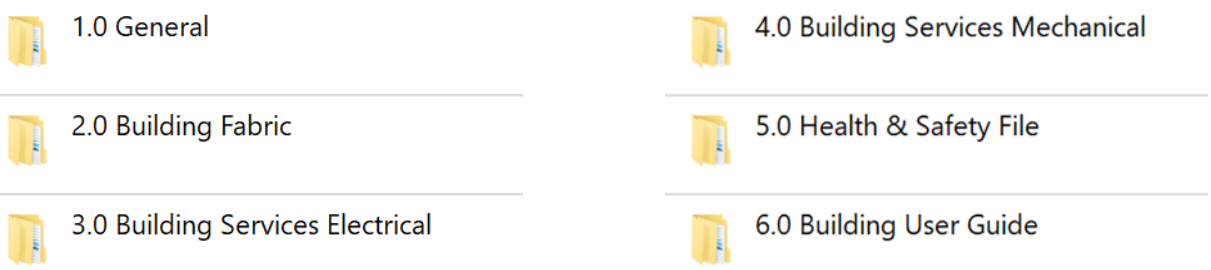
Operation & Maintenance Manual will generally comprise the Building Manual and Health and Safety File and is to be a comprehensive information source. This is a guide for the Contractor/ Employer and the end users which provides a complete understanding of the building and its systems, and which enables that "structure" to be operated and maintained efficiently and safely.

The information required in this document is not limited to buildings but is relevant to other "structures" that might be installed, constructed, erected or dismantled for, and on behalf of, the University. All, or part, of Building Manual may be developed dependent upon the relevance of each section to the structure.

The Contractor is required to obtain or prepare all the information to be included in the File and to produce electronic files of all the information upon completion of the works.

The Contractor must present draft building user manual information to the Principal Designer sequentially throughout the project to enable the University to comment upon the contents.

The File structure will consist of;



Content of Part 1: General

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

Index: List the constituent parts of the manual, together with their location in the document.

The Works: Description of the buildings and facilities.

Ownership and tenancy, where relevant.

Health and Safety information (Residual Hazards) – other than that specifically required by the Construction (Design and Management) Regulations.

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

Overall design criteria.

Environmental performance requirements.

Relevant authorities, consents and approvals.

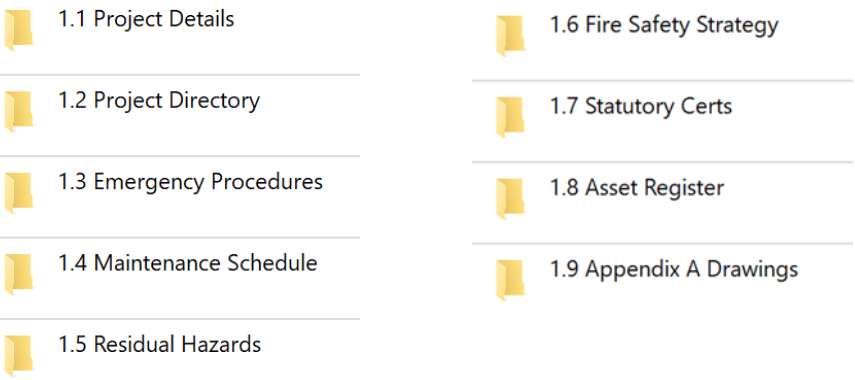
	Third party certification, such as those made by "competent" persons in accordance with the Building Regulations.
Operational Requirements and constraints of a general nature.	Maintenance schedules/ contracts and contractors. Fire safety strategy for the buildings and the site. Include: - drawings showing emergency escape and fire appliance routes, - fire resisting doors location of emergency alarm and firefighting systems, - services, shut off valves switches, etc - protected zones, - Fire strategy plans indicating Electronic Record drawings (DWG) are to be included of every level clearly indicating in red fire separation and compartment walls including details of their construction. - positions of signage, directions. Emergency procedures and contact details in case of emergency. Other specific requirements
Asset Register	The **Loughborough University LU Asset Register.xls** is maintained as an Excel document and must be reviewed and updated to accurately reflect the assets provided as part of the project. All required information must be appropriately populated within the register. Contractors are responsible for completing the **Asset Movement and/or Disposal Forms**, which are integral components of the LU Asset Register, for all assets affected by the works. These forms must be completed in accordance with project requirements. Please refer to the **Practical Completion Checklist** for further guidance. For the most up-to-date version of the LU Asset Register, please contact: **Email:** FIT@lboro.ac.uk
As Built Drawings	All drawings produced as part of any project at Loughborough University must be provided in both **AutoCAD (.DWG), PDF (.PDF) and where a model is provided Revit (.RVT) format.** For the most up-to-date guidance regarding the production of drawings, please contact: **Email:** F.M.CAD@mailbox.lboro.ac.uk

Loughborough University

LU STANDARD O&M MANUAL

File Structure

THE CONTRACTOR IS TO RENAME THE FOLDERS TO REFLECT INSTALLATION.



Content of Part 2: Building Fabric

Content

Obtain and Provide the following, including all relevant details not included in other parts of the manual.

Detailed design criteria, including:

- Floor and roof loadings.
- Durability of individual components and elements.
- Loading restrictions.
- Insulation values.
- Fire ratings.
- Door controls & ironmongery
- Other relevant performance requirements.

Construction of the building:

A detailed description of methods and materials used.

As-built drawings recording the construction, together with an index, including but not limited to;

Plan to 1:100 with all net room areas and room numbers marked thereon (reference to the University Estates Development Unit is required in this respect). Above ground drainage details will be required at each level.

Elevations and sections are required.

Full set of all final as built construction drawings included but not limited to waterproofing/tanking, fire/firestopping, structural, joinery details etc.

Below ground “as built” drainage and services details. Details should clearly indicate surface and foul water services with cover and invert levels at manhole positions related to sea level or a known datum on the University AutoCAD Campus plan. Details should indicate connections to services both within and without University control. Indicate on drawings flow direction and restriction, size, specification, type and manufacturers reference. Also indicate other drainage features.

	The contractor is also to provide fully completed 'Manhole Record sheets' for every drainage chamber provided as part of the works. A survey of all services located during the works must be recorded and passed to the University. Drawings should indicate the provision of service ducts for the development. A selection of other details may also be required by the supervising officer. Drawings – Foundation details, structural/civil engineering including elevations of structural frames indicating bracing, cross sections. Loughborough University require all as built drawings to comply with the LU CAD Standards document. Please contact F.M.CAD@mailbox.lboro.ac.uk for the latest version of the document and guidance where required. Information and guidance concerning repair, renovation or demolition/ deconstruction.
Operational Requirements and constraints of a building fabric nature.	Periodic building maintenance guide chart. Inspection reports. Manufacturer's instructions index, including relevant COSHH data sheets and recommendations for cleaning, repair and maintenance of components. Fixtures, fittings and components schedule and index. Guarantees, warranties and maintenance agreements – obtain from manufacturers, suppliers and subcontractors. Test certificates and reports required in the specification or in accordance with legislation, including but not limited to: - Air permeability. - Resistance to passage of sound. - Continuity of insulation. - Electricity and Gas safety. - Door controls. - Fire door certification. - CCTV Drainage survey of new and existing and new within the scope of the boundary of works. - Any other test certificates undertaken as part of the works.
File Structure	THE CONTRACTOR IS TO RENAME THE FOLDERS TO REFLECT INSTALLATION.

Loughborough University

LU STANDARD O&M MANUAL

- 2.1 Arch Spec
- 2.2 Civil & Struc wks
- 2.3 Certs
- 2.4 Drnge & below Gnd installns
- 2.5 Finishes
- 2.6 Record Drawings & Index
- 2.7 Schedules
- 2.8 Door Controls & Ironmongery
- 2.9 Operational Requirements
- 2.10 Safety Data Sheets

Content of Part 3 & 4: Building Services Electrical & Mechanical

Content	Obtain and Provide the following, including all relevant details not included in other parts of the manual.
Detailed design criteria and description of the systems, methods and materials used, including:	- Services capacity, loadings and restrictions, - Services instructions. - Services log sheets. - Manufacturers' instruction manuals and leaflets index. - Fixtures, fittings and component schedule index.
As-built drawings for each system recording the construction, together with an index, including:	Diagrammatic drawings indicating principal items of plant, equipment and fittings. Record drawings showing overall installation. Schedules of plant, equipment, valves, etc. describing location, design performance and unique identification cross referenced to the record drawings. Identification of services – a legend for colour coded services. Loughborough University require all as built drawings to comply with the LU CAD Standards document. Please contact F.M.CAD@mailbox.lboro.ac.uk for the latest version of the document and guidance where required.
Product details, including for each item of plant and equipment	Name, address and contact details of the manufacturer. Catalogue number or reference. Manufacturer's technical literature, including detailed operating and maintenance instructions. Information and guidance concerning dismantling, repair, renovation or decommissioning.
Operation: A description of the operation of each system, including.	Starting up, operation and shutting down. Control sequences.

Procedures for seasonal changeover, diagnostics, troubleshooting and fault-finding.

Guarantees, warranties and maintenance agreements – obtain from manufacturers, suppliers and subcontractors.

Equipment settings: Schedules of fixed and variable equipment settings established during commissioning.

Preventative maintenance: Recommendations for frequency and procedures to be adopted to ensure efficient operation of the systems.

Lubrication: Schedules of all lubricated items.

Consumables: A list of all consumable items and their source.
Spares: A list of recommended spares to be kept in stock, being those items subject to wear and tear or deterioration and which may involve an extended delivery time when replacements are required.
Emergency procedures for all systems, significant items of plant and equipment.

Annual maintenance summary chart.

Commissioning records and test certificates list for each item of plant, equipment, valves, etc. used in the installations including:

- Electrical circuit tests.
- Corrosion tests.
- Type tests.
- Work tests.
- Start and commissioning tests.
- Metering

File Structure

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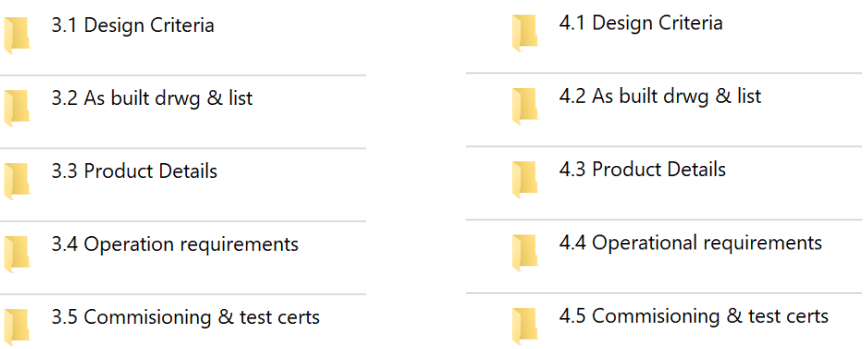
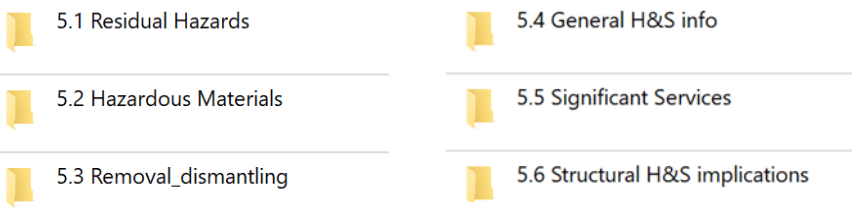


Content of Part 5: The Health and Safety File

Content:

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

Operational Requirements and constraints of a Health & Safety nature.	Residual hazards and how they have been dealt with. Hazardous materials used. Information regarding the removal or dismantling of installed plant and equipment. Health and safety information about equipment provided for cleaning or maintaining the structure. The nature, location and markings of significant services. Information and as-built drawings of the structure, its plant and equipment.
File Structure	THE CONTRACTOR IS TO RENAME THE FOLDERS TO REFLECT INSTALLATION.



Content of Part 6: The Building User Guide

Content:	- Building services information. - Emergency information. - Energy & environmental strategy. - Water use. - Transport facilities. - Materials & waste policy. - Re-fit/ re-arrangement considerations. - Reporting provision. - Training. - Links & references. - Building Log Book
Training	The principal contractor will be required to arrange an explanation and demonstration of the installations and systems installed both during the project and a full demonstration prior to practical completion. These are to include University FM Services staff and may also include building users, where appropriate. It will need to cover as a minimum the function, operation, and procedures listed. To include all the following or as required by the project: Mechanical and Electrical Services, Fire Alarm, CCTV, Intruder Alarm, Drainage Access and Cleansing procedures. The contractor is required to video each training session.

Building Log Book

Log books are a legal requirement in new buildings and in existing buildings where services are changed. They will improve access to information for Building Managers or others responsible for managing buildings, enabling them to improve the operation of their building. Specifically, they provide a place to record ongoing building energy performance, which should help improve energy efficiency.

Using logbooks should improve the understanding, management and operation of buildings resulting in lower costs and reduced carbon dioxide (CO2) emissions to the atmosphere. This should also contribute to improved occupant comfort, satisfaction and productivity.

The log book should give ready access to information on the design, commissioning and energy consumption of their building. It will enable fine tuning of the building with consequent improvements in energy efficiency. The log book will also provide explicit information about the metering strategy implemented about the building, and on the scope for monitoring and benchmarking energy consumption.

File Structure

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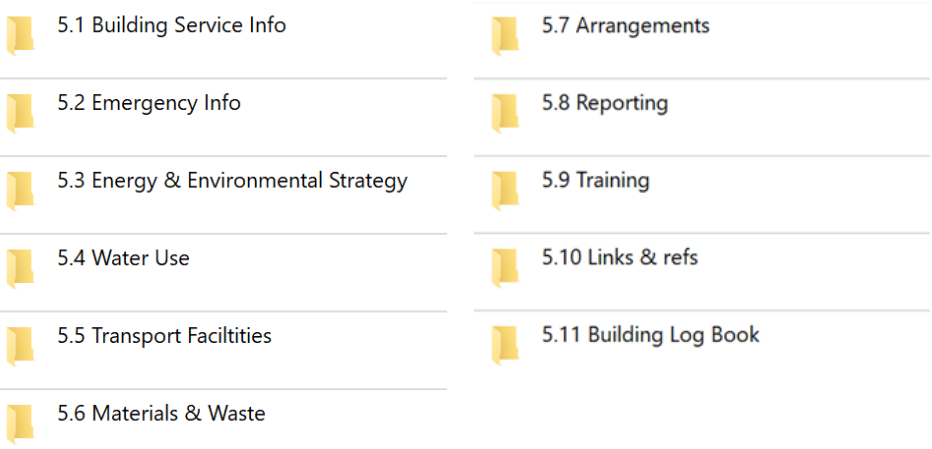

Information to be issued at Practical Completion

Essential Building Manual

Purpose	This document is designed to provide basic information for LU FM maintenance, cleaners, caretakers, security etc. to operate/ maintain all new builds or refurbished facilities. This information must be provided a minimum 5 days prior to practical completion, PC cannot be achieved without this information being in place. The following information is to be supplied electronically only,1st issue one memory stick or disc only. Once the initial draft has been accepted LU will require four separate copies at PC.

Schedule of Information

Full size A0 layout drawing (PDF only) for each/every floor/level (Inc. roof where applicable) of relevant building/facilities.	Each drawing must show – - All standard LU room/area refs. - All powered access doors. - All doors/entry points with door access and location of G4 main control units. - All doors entry points must show locking facility type/suite etc. - All types of floor covering. - All fire doors and their classification. - All fire compartments. - All fire dampers. - Location of main fire alarm panel and power supply unit if separate. - All main incoming service points, this must include but is not limited to, electricity, mains cold water, any gases/compressed air, district heating. - All main drainage routes and main connection points to main system (external or internal). - Location of all main isolation valves for main mechanical services. - Location of all main elec. Isolation points. - Location of all elec. Distribution boards. - Location of all Digicom units. - Location of all external lighting controls. - Location emergency lighting central battery or control equipment/self-test units. - All Data comms rooms/cabinets. - All lifts whether they be platform, stair, passenger, goods or evacuation type. - Location of all ventilation units or LEV systems. - Location of all meters connected to Databird system and Databird transmitter/aerial itself. NB. All the above detail will be shown using appropriate blocks. A fully detailed key of symbols will be displayed on each drawing.
Certification/test sheets for the following systems:	- Main elec. inst. - Mech. Controls elec. Inst. - Fire alarm. - Emergency lighting. - Gas. - Water, dosing etc.

	- Lightning protection where new or modified system. Refer to Practical Completion Checklist in the ITT appendices.
Basic detail for building specifics, to include but not limited to:	- External construction method type i.e. fabric, walls/roof. - Internal construction method type i.e. fabric, walls, ceilings, floors. - All floor coverings, type, recommended cleaning process and materials to be used. - All shower cubicles, wash hand basins, toilets etc. recommended cleaning. process and materials to be used. - All powered or manual external doors, product details/manufacturer. - All powered or manual internal doors, product details/manufacturer. - Fire compartmentation and escape routes/strategy. - Main elec. Inst. type and installation method. - Fire alarm type/manufacturer. - Emergency lighting type/manufacturer. - Door access type/manufacturer. - Data system type and basic details. - Cold water supply/system, basic scope of works. - Hot water system, basic detail, heat source etc. - Ventilation system, basic detail/scope of works. - Any gases and their purpose. - Air Conditioning, type of units, their purpose etc. - Natural vent, basic detail.
12 months maintenance schedule	Refer to LU Standard Maintenance Schedule in the ITT Appendices
Asset Register	General: Provide to the Employer on a monthly basis and asset tag register. The asset tag register must be aligned and with the programme of works and inform the Employer when asset tagging will be carried out. Please refer to the LU Asset Register.xls. This Excel sheet is to be assessed and updated to reflect the assets provided in the project and then populated with the required information. The contractor is to complete the Asset Movement / Disposal Notification Form for all assets affected by the works. Refer to the Practical completion checklist.
Draft Building User Guide	General: Provide to the Employer all user guides that will be required within the first month of operation. The information will consist of but not limited to; - Building services information. - Emergency information.

Timescales for Completion

Complete Building User Manual	The Principal Contractor is to issue the completed Building Manual no later than 4 weeks after Practical Completion.

	The information should then be amended in the light of any comments and resubmit to the Principal Designer. Do not proceed with production of the final copy of the H&S File until authorised to do so by the Employers Agent.

Presentation of O&M Manual

At Practical Completion.	Provide 2 electronic copies on USB stick of all Information identified as being issued at Practical Completion. Important – Electronic folder and file names be kept as short as possible and suggest a max of 15 characters for each including spaces to enable them to be transferred onto the University computer servers.
Completed Building Manual no later than 4 weeks after Practical Completion.	Provide 2 electronic copies on USB sticks of the full building Manual and issue 1 copy to the Principal Contractor and 1 copy to the Project Manager. Important – Electronic folder and file names be kept as short as possible and suggest a max of 15 characters for each including spaces to enable them to be transferred onto the University computer servers.

Maintenance Service

Refer to the LU standard maintenance schedule located in the ITT Appendices.