



# **Operating & Maintenance Manual**

**Enter Building or Project  
name here**

**for  
Electrical Services**

**Items in Blue are for information or identifies input change**

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## 1 Contents

Add details as required here and anywhere that follows in the rest of the document.

## **2 General Description**

A General description of the scope, purpose and manner of working of each system or equipment forming part of the works.

Four (4) weeks prior to Practical Completion the Contractor shall issue one (1) set of draft O & M manuals for comment. On Projects of less than 8 Weeks duration a draft H&S file is to be presented at Practical Completion. This is to be returned with suitable comments one week after Practical Completion and the CDM Coordinator is to ensure this is returned by 4 weeks after PC.

These comments shall be incorporated into the manuals prior to the Final issue **electronic copy** of the Manuals at Practical Completion. The availability of this information is essential to enable the Employer to satisfactorily operate and maintain the plant and hence the Contractor should note that the Practical Completion Certificate will not be issued by the Contractor Administrator until these instructions have been approved by the Engineer and issued to the Employer.

. The Manual shall be created by us of the University Templates at all times which are indexed, divided and appropriately cover titled.

The manual shall contain full operating and maintenance instructions for each item of equipment included in the Works presented in a form to deal systematically with each system and shall include the following where applicable:-

The installation shall be deemed incomplete if the contractor or sub-contractor fails to provide sufficient information to allow the systems to be easily maintained.

Upon completion all accessories, components, spares and tools shall be provided. Testing, commissioning, and instruction shall be satisfactorily completed and all "As Fitted / Built" drawings, Operating and Maintenance manuals shall be complete and available for issue.

Certification of Practical Completion will not be issued until testing and commissioning of the installations has been carried out to the satisfaction of the CU Project Building Services Engineer.

#### **FAILURE TO PROVIDE MAINTENANCE MANUALS, RECORDS, RECORD DRAWINGS & SPARES**

If the Operating and Maintenance Manuals and CAD "As Fitted / Built" and/or Record Drawings and spares are not provided by the Contractor in compliance with Clauses within the Specification, then either the Engineer via the CU Project Manager, Contractor Administrator and/or Main Contractor may arrange without further notification to the Contractor for them to be prepared by other persons.

The full and total cost of this work along with all associated costs incurred by any other party shall then be deducted from the Consultant's or Contractor's account. Negative results will be achieved during the University post contract reviews which will affect the future use of a Consultant or Contractor who failed to deliver what is requested.

### **3 Emergency Shutdown Procedures**

This information should be offered in short, but concise instructions in layman terms for use in emergencies covering possible out of hours use.

## **4 Essential Contact in Case of Breakdown**

Companies and Organisations that were responsible for break down cover during the 12 months defect warranty period. This should support a formal reporting process of all defect works during this period.

**Main Contactor**

**Electrical Services Installation Contractor**

**BMS Controls Contractor**

**Sub Contractor**

**Sub Contractor**

## **5 Design & Construction Team Members**

Companies and Organisations that were responsible for the design, construction and installation of this project are listed below for reference purposes.

**Client**

**Architect**

**Main Contactor**

**Electrical Services Installation Contractor**

**BMS Controls Contractor**

**Sub Contractor**

**Sub Contractor**

## **6 Design Parameters**

Data on general design parameters and associated normal operating temperatures, pressures, etc., based on the commissioning tests and detailed results of all commission tests and regulating valve and damper settings are to be recorded, and pump and fans performance curves with actual performance point marked.



## **7 Controls Philosophy**

A detailed description of the scope, purpose and manner of working of each system of automatic controls and/or monitoring instruments.

## **8 Automatic Control System Settings**

System settings for achieve design parameters, including internal wiring diagrams of equipment and panels

## **9 Schedule of Components**

Schedule of all plant, equipment, fixtures and fittings. Their manufactures details, locations and settings.  
Legend for colour coding of all services

## **10 Manufacturers Contact Details**

The names and addresses of suppliers of all major components of the works as may potentially be required to obtain spare parts or replacements. The names and addresses of suppliers of oils and greases together with a schedule of various types required, and where applicable any special limitation on usage

## **11 Operating Instructions**

Clear and comprehensive instructions for the starting up, running and shutdown of each system or apparatus. Instructions in respect of the care of apparatus normally subject to seasonal disuse.

Instructions in respect of any precautionary measures from time to time as necessary.

## **12 Technical Literature Manual**

Manufacturer's literature for all plant and equipment, fixtures and fittings. Copies of manufacturers data with respect of the nature, type and method of operation of individual pieces of equipment, together with their detailed Maintenance Instructions. General manufacturers information will not be acceptable without specific details clearly marked up. Such data, in the form of individual booklets and the like shall be indexed and cross-referenced to the Operating and Maintenance Instructions and may be presented, suitably protected, in box files or folders.

## **13 Preventative Maintenance Procedures & Equipment**

Instructions as to the nature, extent and frequency of servicing necessary to properly maintain the works in good condition, and the materials to be utilised for this purpose. This information may be supported in detail but not replaced by Maintenance Instructions provided by the suppliers of particular component.

## 14 List of Spares

Spares, tools, and test equipment being supplied under contract including types of lubricant required for each item and frequency of lubrication plus list of additional recommended spares

Should the Contractor be required to provide any spare equipment as part of the Contract, the exact requirements and details shall be as defined in the particular specification.

Any spare items of equipment which may be specified shall be handed over to the Engineer or Clerk of Works, and written receipt obtained. Two sets of any special tools required for maintenance shall be provided. At



least two keys are to be provided for each individual lock.

## 15 Fault Finding Procedures

The Contractor shall provide to the Employer the following items for maintenance and operation of the plant.

- a) Two keys for each lockable distribution board installed.
- b) 1 No. bulb for each run and trip light.
- c) 6 No. spare control relays.
- d) 3 No. spare fuses for each fuse rating installed.
- e) Add any other items as required

The contractor shall submit a schedule to the C.A. of spare parts recommended to be obtained and kept in stock by the Employer for the maintenance of the services installations. State against each item the manufacturer's current price including packaging and delivery to site.

Procedures for fault finding.

Procedures to adopt in an emergency should any item fail in it's operation

## 16 Commissioning Results & Test Records

Statutory Test and Inspection Certificates for all Electrical systems and Circuits (Including a written scheme of examination certified as meeting the requirements).

Full commissioning data for all

Copies of all distribution board schedules

Luminaries schedule cross referenced with the "As fitted" Record Drawings

Master copies of all log books, e.g. for Fire Alarm, Emergency Lighting, etc. in addition to the separate log books to be installed adjacent to the respective equipment

ISSUED COPY

## 18 As Fitter Drawings Drawing Numbers and Titles

Please follow the University BIM protocol, EIR and AIR and assets template issued for this project  
A BIM model should be handed over alongside extracted DWG CAD drawings and PDF versions of the drawings.  
Native Revit BIM models should be handed over alongside the IFC and any NWD files.

Files shall be uncorrupted and configured in a manner to enable further revisions to be undertaken at a later date. Copyright of Record drawings shall pass to the Employer.

**Note** that all drawings must be produced in accordance with current Coventry University Estates BIM Protocol

In addition the Contractor shall obtain and provide one set of manufacturers' detailed drawings of all switchgear, wiring diagrams, etc., as may be appropriate. These drawings need not be prepared especially as record drawings but may be copies of the manufacturers working drawings with suitable titles and reference numbers added. Where the drawings are of a generic nature a specific reference to the equipment installed shall be added

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