



THE UNIVERSITY OF
SYDNEY

Operation and Maintenance Manuals Standard

**Design, Engineering, Planning &
Sustainability**

University Infrastructure

Document Edition Control

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1 Purpose

The UI Operation and Maintenance Manual Standard sets out the University of Sydney's minimum requirements for the handover documentation for all projects. It ensures new and refurbished systems are energy efficient, fit-for-purpose, made from durable good-quality materials, contain no or minimal environmentally harmful substances, and are cost efficient to operate and maintain.

Applicable requirements documented in Workplace Health and Safety legislation, Disability Discrimination legislation, State Environmental Planning legislation, Commonwealth and State legislation, National Construction Codes (NCC), the Building Code of Australia (BCA) and Australian and New Zealand Standards (AS/NZS) are the minimum and mandatory compliance requirements.

Where any ambiguity exists between this standard and the aforementioned mandatory requirements then:

- a. the highest performance requirements must apply
- b. applicable requirements must follow this order of precedence:
 1. Workplace Health and Safety legislation
 2. Disability Discrimination legislation
 3. State Environmental Planning and Assessment legislation
 4. All other Commonwealth and State legislation
 5. NCC and BCA
 6. AS/NZS Standards
 7. This standard and other University standards

2 Scope

This standard describes minimum requirements of Operation and Maintenance manuals for buildings, assets and spaces owned, operated, maintained and/or managed by the University of Sydney. It applies to:

- New building construction;
- Refurbishment projects for University-owned spaces;
- Refurbishments of spaces that form part of a broader medium-term (less than five years); program/plan of progressive upgrades to a University-owned building;
- Refurbishment projects for long-term University-leased spaces;
- Asset replacements and equipment fit-outs;
- Facilities, operations and maintenance services;
- Equipment fit-outs;

The standards apply to all planners, project managers, consultants, contractors, sub-contractors, tenants, managing agents and University staff involved in the design, construction and maintenance of existing, new and proposed University buildings and facilities.

The Operation and Maintenance manuals standard provides:

- A reference document to enable consistency with the design and engineering objectives
- Details of the minimum documentation requirements for planning, architectural design for operations and maintenance.
- Support of the University Vision for the built environment and best practice.

Consultants/designers must include in the project specification detailed requirements for operation and maintenance manuals, including system description, operation procedures, testing and commissioning records, maintenance instructions, product support information and recovery protocols for any computer related systems. Contractors must provide these to the satisfaction of the consultant/designer. Providing a collection of manufacturers' brochures and catalogues is not acceptable to the University.

O&M manuals must be provided electronically in PDF bound as a complete manual. The bookmarks to be linked with content to navigate the pages. Submissions must come via a USB and a large file downloadable link or platform. O&M Manuals Review Checklist (Attachment 1) must be submitted with O&M manuals package.

As a minimum, the O&M manuals must include:

- Scope of works – area of building (split by service lines)
- Work, health & safety requirements
- System description
- Functional description of systems
- Manufacturer's Data
- All equipment selection calculations and schedules
- Maintenance requirements (Including manufacturer's requirements where applicable)
- Final commissioning test data
- All compliance documentation
- Certifications and QA
- Warranties & Guaranties
- As-built drawings (both CAD and PDF drawings)
- Asset register (as per the Asset Identification and Labelling Standard)

- Bespoke program files in native and excel/ pdf format (Fire Indicator Panel, PLC programs, include any system install files, login details, server details, CBUS, dynalite etc.)

Glossary of Terms

AS	<i>Australian Standard</i>
AMO	<i>Asset Management & Operations</i>
AUMS	<i>Advanced Utilities Monitoring System</i>
BCA	<i>Building Code of Australia</i>
BMCS	<i>Building Management Control System</i>
COS	<i>Central Operations and Services</i>
DLP	<i>Defects Liability Period</i>
FF&E	<i>Fixtures, Furniture and Equipment</i>
FM	<i>Facilities Management</i>
NCC	<i>National Construction Code</i>
O&M	<i>Operation and Maintenance</i>
PC	<i>Practical Completion</i>
PCA	<i>Principal Certifying Authority</i>
PLC	<i>Programmable Logic Controller</i>
QA	<i>Quality Assurance</i>
UI	<i>University Infrastructure</i>

3 Roles and Responsibilities

This standard is issued by UI. It is approved and signed off by the Chief of University Infrastructure Officer. UI is responsible for maintaining this standard and keeping it up-to-date.

Responsibility table:

Division	Team	Responsibilities
UI or COS	UI project manager or COS project manager	<ul style="list-style-type: none"> • Preliminary review • Manage overall review/delivery process
UI	Engineering	<ul style="list-style-type: none"> • Review services drawings and relevant documents on the O&M manuals. Engineering services sections include but not limited to <ul style="list-style-type: none"> ○ Mechanical ○ AUMS ○ BMCS ○ Electrical ○ Hydraulics ○ Fire ○ Lab\Medical gas ○ Roofing ○ Guttering ○ Water proofing ○ Lighting ○ Lift • Ensure that the O&M manuals meets the industry and University design standards • Upload final version of O&M manuals on G-drive and TRIM (Records Online) – see section 8.5
	Planning	<ul style="list-style-type: none"> • Review architectural drawings and relevant documents on the O&M manuals. Architectural sections include but not limited to <ul style="list-style-type: none"> ○ Façade ○ FF&E, ○ Interior design • Ensure that the O&M manuals meets the industry and University design standards
COS	AMO	<ul style="list-style-type: none"> • Review asset register • Maintenance records
	Protective Services / Security	<ul style="list-style-type: none"> • Review Security section of O&M manuals
	Open Spaces / Grounds	<ul style="list-style-type: none"> • Landscaping section of O&M manuals
ICT	ICT	<ul style="list-style-type: none"> • Review ICT Section of O&M manuals
	AV	<ul style="list-style-type: none"> • Review Audio Visual section of O&M manuals

4 Small Fit-out O&M Manuals Requirements

This section is only applicable when it is nominated in the scope of works. Otherwise, provide full O&M manuals package as required.

O&M manuals for a small fit-out must include the following items,

- Scope of works – must include short brief of works and room(s)/area(s) of the building
- Equipment Schedule
- CAD and PDF drawing of works including equipment details and location in relation to building – if existing CAD file is not available, PDF drawing is acceptable. Only as-built drawings are acceptable.
- Maintenance requirements
- Commissioning Data
- All compliance documentation
- Warranties
- Asset Register

5 Technical Requirements

5.1 Format

The 'O&M Manuals Folder Template' must be used to submit the final O&M manuals. The 'O&M manuals folder template' can be downloaded on the Contractors Page (<https://www.sydney.edu.au/about-us/working-with-the-university/contractors.html>) in Forms section.

Folders that are not relevant to the project must be deleted thus any empty folder must not be submitted in the final O&M manuals package.

5.2 Submission

Attachment 1 Checklist must be submitted along with the O&M manuals.

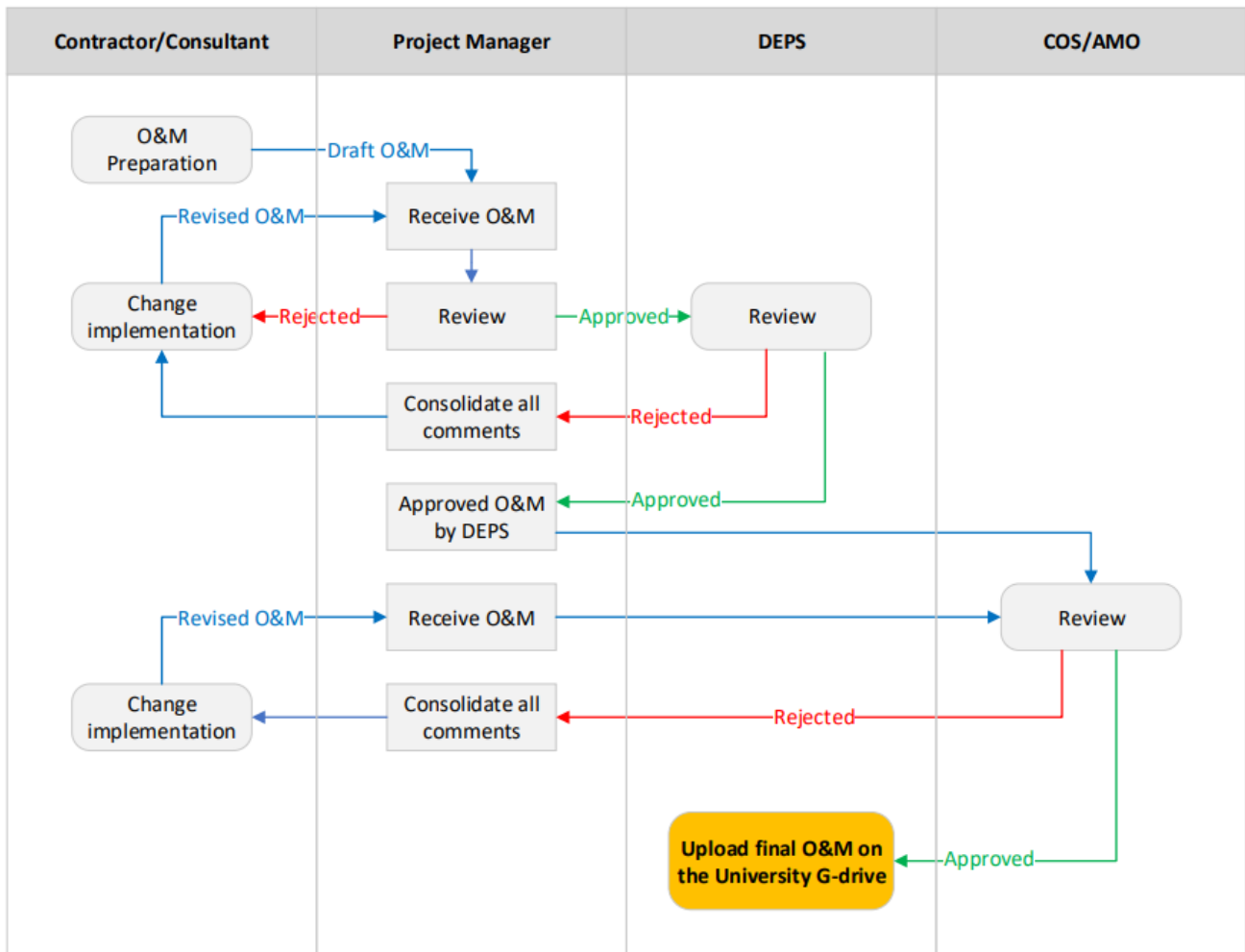
Single combined PDF file submissions are not acceptable for the final O&M manuals. The document files shall be provided via both a USB and a large file downloadable link or platform. All documents must not be password protected.

O&M manuals must be provided electronically in the zip folder. Attachment 2 O&M Manuals Folder Template must be used by contractors on their submissions. Irrelevant folders to the project must be deleted (Empty folders must be removed).

Draft O&M manuals must be submitted minimum four weeks prior to practical completion. Final O&M manuals must be submitted four weeks after of practical completion.

Projects will not be considered as being completed until the handover of all as-built documentation, manuals and related documentation is accepted by the University, which will comprise all information necessary to enable the safe and efficient ongoing operation and maintenance of the works.

5.3 Review process



5.4 Review Comments

A spread sheet has been developed for the capturing and tracking of comments on the O&M submission during the review phase, comments are to be provided on the spread sheet.

Usyd O&M Comments Register Rev 1 (Attachment 3) is the spread sheet to be utilised.

5.5 As-built Drawings

The as-built drawings must be issued electronically, both individually in PDF and CAD format (*.dwg) and as part the O&M manuals. Only as-built drawings are acceptable. Construction drawings, workshop drawings or similar are not acceptable.

The drawings to be dimensionally accurate. Drawings marked 'Not to scale' are not acceptable. Xrefs must be bounded and submit one sheet / drawing per file.

The drawings must contain only one floor plan of a building per building plan CAD drawing file (*.dwg). Multiple floor plans on one drawing file are not acceptable.

For As-built drawings the following standard naming convention applies:

[Building Code]_[Drawing Type]_[Drawing #]_[Floor Level]_[Drawing Title]

e.g. A02-H-600 – LEVEL 6 GENERAL ARRANGMENT
A02-M-5004 – LEVEL 5 SECTIONS
F21-E-100 – LEVEL 1 LIGHTING LAYOUT
F21-F-300 – LEVEL 3 FIRE SPRINKLER DRAWING

Drawing Type as per **USYD Documentation Standards Section 7.8.15. Contract Document File Name.**

5.6 Asset Register

Contractors must submit the university designed Asset Management Master Asset Data Capture Spreadsheet (COS-ASSET-F001) designed for recording operational and maintenance activities including materials used, test results, comments for future maintenance actions and notes covering asset condition.

The asset register must be issued electronically, both individually in excel format (*.xlxs / *.xls) and as part the O &M manual (pdf).

The asset register must show all system variations (this includes all assets installed and removed as part of the project) and ensure all relevant assets are recorded as shown in the prescribed template. Existing asset register of areas impacted to be requested from the Asset Management Office prior to works commencing for accurate asset data updates.

5.7 Manual Naming Convention

For O&M manuals the following standard naming convention applies:

[Building Code]_[Floor Level]_[Project Name]_[O&M]_[Month of PC]_[Year of PC]

e.g. A14 L4 Room 400 O&M August 2017
G12 L3 ICT Fit Out O&M August 2017

The University of Sydney naming convention for CAD Drawings must follow **USYD Documentation Standards Section 7.8.15 CAD Drawing Guidelines.**

All background folders and files handed over as part of the Electronic O&M manuals must follow the same format, including the service name.

[Building code]_[Building Service]_[Service Type] [Floor Level]_[Room Number]_[Project Name]_[O&M]_[Rev #]_[Month of Construction]_[Year of Construction]

e.g. A14 Hydraulic Sewer L4 Room 400 O&M Rev 2 August 2017
G12 Mechanical Air L3 ICT Fit Out O&M Rev 3 August 2017

6 Authorisation of Variations

Project managers, consultants, contractors, commissioning agents and facilities maintenance personnel must ensure compliance with these requirements is achieved.

Variations to this standard must only be considered where:

- a. The University Standard's requirement cannot physically or technically be achieved.
- b. The alternative solution delivers demonstrated and proven superior performance for the same capital and life cycle cost or better.

Consultants and contractors must identify and justify requirements of the standard that do not apply to the project or which need to be varied and these which must be approved by the issuer of this standard. Formal requests for all variations to this Standard must be submitted using the UI Request for Dispensation Form (UI-ENG-F001). The issuer of this standard or their delegated authority must review and consider requirements of stakeholders from clients, projects and facilities management before deciding whether to approve variations. Their formal sign-off is required for acceptance of any non-compliances and departures from this standard's requirements.

7 Quality Control

7.1 Design Standard Compliance

Compliance with requirements of this standard must be checked throughout the design, construction and commissioning phases of projects by UI's services consultant. Any issues or deviations from this standard must be reviewed and approved in writing by the issuer of this standard.

Competent UI & COS consultants and representatives must check compliance with this standard. Any non-conformances with requirements of this standard must be documented and provided to the UI Project Manager for issue to contractors and their consultants.

Project Managers must maintain a formal register of non-conformances and manage close out of outstanding non-conformances. Contractors and their consultants issued with non-conformances must take appropriate corrective actions. The Project Manager must ensure:

- a. Proposed corrective actions are implemented.
- b. Close out of non-conformances in relation to this standard is formally approved and signed off by the author of the standard or their delegate.

7.2 Design Standard Certification

Notwithstanding UI's internal quality control processes, contractors and their consultants must implement their own robust quality assurance and control procedures to ensure compliance with requirements of this standard.

7.3 Construction Compliance

Consultants and contractors are expected to include check sheets for each system component detailing each item that needs to be checked, tested and verified during the installation process. Such check

sheets must be completed and verified by the project consultant/contractors, including the identification of any defects and the closing out of such defects and included in the O&M manuals.

7.4 Acceptance

The University will only accept projects as complete when all of the above have been carried out, submitted and verified.

The items listed in this standard are not an exhaustive list of the relevant requirements. The consultant/contractor must incorporate all relevant standards and Authorities requirements into project specific design, documentation and installation.

7.5 Documentation and Records

All project-developed software and documentation must become the property of the University upon project handover. A complete O&M manuals must be saved on the University G-drive ([G:\apspd](#)) and TRIM (Records Online). DEPS on each project is responsible to upload the final O&M manuals on both G-drive ([G:\apspd](#)) and TRIM (Records Online).

Example G-drive location:

G:\apspd\01 Camperdown\F21 Chau Chak Wing Museum\2021-06-24 Final Handover Docs
G:\apspd\01 Camperdown\F23 Administration Building\Projects\2019-06-29 F23 O&M from Omtrak
G:\apspd\02 Darlington\G12 Services Building\projects\2019-04-08 O&M Level 2 HR Refurbishment

Any queries regarding the Records Online or require any assistance, contact the Records Online Helpdesk via records.online@sydney.edu.au or phone 9036 9537 (x 69537).

8 Document Amendment History

Provision	Amendment	Commencing
1.0	First Issue	

9 Attachments



ATTACHMENT 1 – CHECKLIST

PROJECT FINALISATION	O&M MANUALS REVIEW CHECKLIST
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RFP / Project Name	
Description	
Company Name	
Date	

Introduction	Contractor			UI / COS Project Manager			Comments
	Yes	No	N/A	Yes	No	N/A	
Project Overview							
Statutory Requirement							
Project Contacts							
USYD Training							
Site Location							
Drawing & Document Register (Categorised by Disciplines & Trades)							
Design Drawings							
Project Specific Reports							
Specifications							
Construction Elements	Contractor			UI / COS Project Manager			Comments
	Yes	No	N/A	Yes	No	N/A	
Introduction							
System Description							
Operation & Technical Data							
Maintenance Requirements							
Warranties (start date from PC)							
Certificates / Registrations							
Help & Contact							
Spares List							
Final Commissioning Data							
As Built Drawings							
Practical Completion Documentation	Contractor			UI / COS Project Manager			Comments
	Yes	No	N/A	Yes	No	N/A	
Project Approvals REF / CDC / Exempt							
BCA Report							
Installation Certificates							
Fire Engineering Report							
Risk Management Plans							
Design Certificates							
Consultant Inspection Reports							

Occupation / Crown Completion Certificate							
Defect List							
Asset Register							

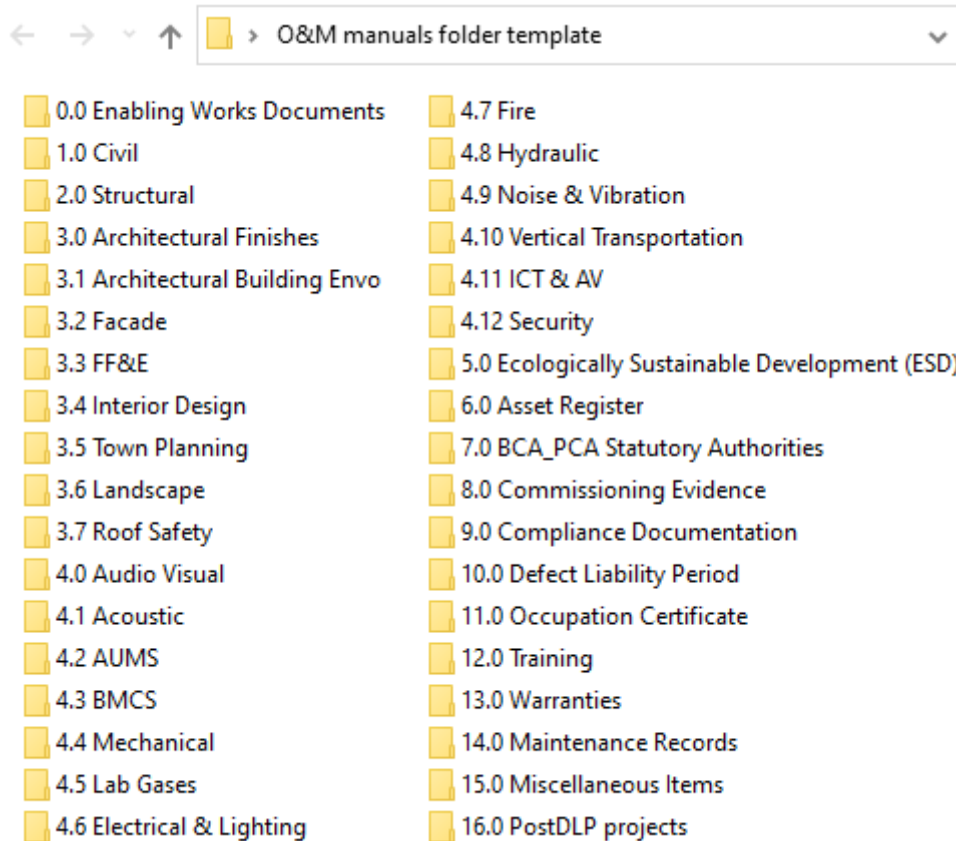
	Name	Position Title	Signature	Date
Contractor				
UI / COS Project Manager				

ATTACHMENT 2 – O&M MANUALS FOLDER TEMPLATE

Note click on file to download. (Download will not work when standard is opened in a web browser)



O&M manuals folder template.zip



ATTACHMENT 3 – USYD O&M COMMENTS REGISTER REV 1

Note click on file to download. (*Download will not work when standard is opened in a web browser*)



Usyd O&M Comments Register Rev 1.xlsm