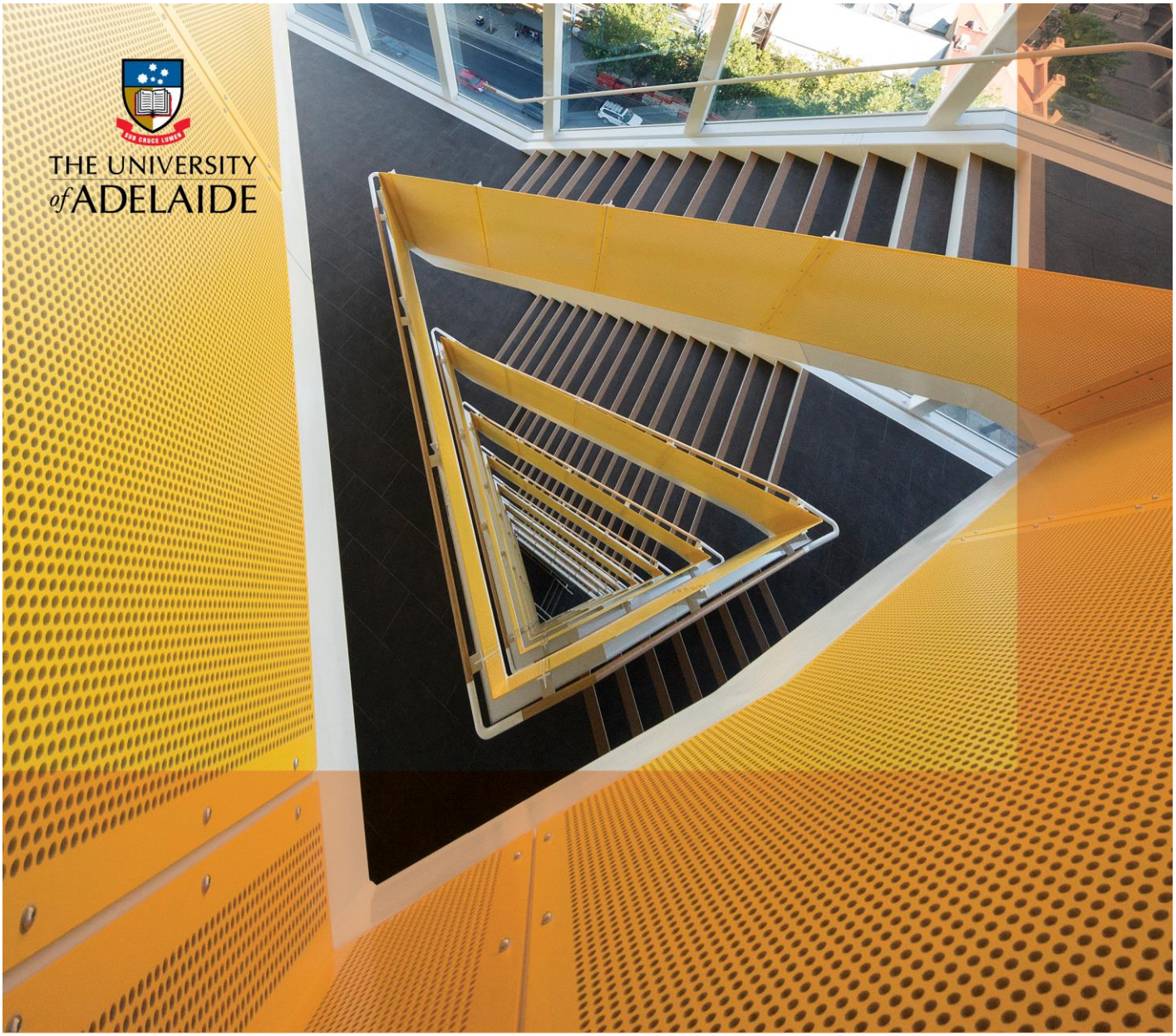

DESIGN STANDARD

K. Documentation

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Contents

Revision log

Current issue

K. Documentation - UoA Design Standards. DRAFT Version 4. August 2018

Previous issues

Version	Authors	Description/ updates	Revision	Date
1.0	Vicki Jacobs, Capital Project Delivery, UoA	K. Documentation - UoA Design Standards	DRAFT Version 1	December 2017
2.0	GHD	K. Documentation - UoA Design Standards	DRAFT Version 2	December 2017
3.0	Vicki Jacobs, Capital Project Delivery, UoA/ GHD	K. Documentation - UoA Design Standards	DRAFT Version 3	March 2018
4.0	Vicki Jacobs, Capital Project Delivery, UoA	K. Documentation - UoA Design Standards	DRAFT Version 4	August 2018

List of revised items

Version	Authors	Revised items	Date

Revision management

It is envisaged that revisions to this document will be undertaken at intervals of not more than two (2) years.

Endorsement body

Director of Infrastructure

Owner

Director, Capital Projects Delivery

Contact person

Associate Director, Capital Project Delivery

Authors and acknowledgements

The standards have been developed by Capital Projects with the assistance of UoA staff, external consultants, contractors, and colleagues from other education institutions. The University conveys its thanks.

Abbreviations

AS/NZS	Australia or Australian/New Zealand Standards
BCA	Building Code of Australia
CPD	University of Adelaide- Capital Projects Delivery
DDA	Disability Discrimination Act
NCC	National Construction Code
OSH	Occupational Safety and Health
SEPP	State Environmental Planning Legislation
SiD	Safety in Design
UoA	University of Adelaide
WHS	Work, Health and Safety
UoA SBI	UoA Systems and Business Improvement Team

1. Introduction

This section outlines the purpose, structure, related documents, and definitions for the University of Adelaide (UoA) Design Standards.

1.1 Purpose of the document

The UoA Design Standards (the Standards) respond to the strategic vision for the University, outlined in Beacon of Enlightenment 2016-2035, and the guiding planning principles contained in the UoA Masterplan 2016-2035. Prepared in recognition of the University's unique historical context, the Standards are guided by the aims of supporting physical, social and cultural connectivity, embracing diversity, equity and accessibility, and promoting sustainability and academic excellence.

The Standards specify the minimum, mandatory requirements for the design, construction and management of all University of Adelaide infrastructure projects. Requirements are specific to the University's needs, and are over and above minimum mandatory Authority requirements. They include:

- Methodological requirements for project delivery; and
- Technical requirements for the finished product.

The objective is to support the consistent delivery of a high quality product, while allowing sufficient scope for innovation, creativity and technological advancements.

The Standards must be used by any parties involved in the planning, design, construction, occupation management, maintenance and operation of UoA facilities. This includes external consultants and contractors, UoA planners, designers and project managers as well as professional and faculty staff, facility managers, maintenance contractors and other service providers – all of whom must be aware of the Standards as they apply to their project and scope of work.

1.2 Structure of UoA Design Standards

K. Documentation Design Standard (this document) is a part of the UoA Design Standards suite of documents (the Standards).

The Standards are divided into the following volumes for ease of use:

- A. Project Process Checklist
- B. Building and Architecture
- C. Mechanical Services
- D. Electrical Services
- E. Communication Services
- F. Hydraulic Services
- G. Fire Services
- H. Security Services
- I. Vertical Transport
- J. External Works

- K. Documentation (this document)
- L. Metering and Monitoring
- M. Audio Visual
- N. Signage and Wayfinding

The Standards must be considered in their entirety, regardless of the project's size, specific disciplines or responsibilities.

In particular, UoA staff and consultants using this volume must ensure familiarity with the mandatory project procurement obligations, detailed in A. Project Process Checklist.

Each volume is structured into four parts:

- Part 1 – Introduction
- Part 2 – General requirements
- Part 3 – Technical requirements
- Part 4 – Schedules

1.3 Related documents and legislation

1.3.1 Documents

During the earliest strategic feasibility and planning stages of the project, review and analysis of the latest edition of the following UoA strategic planning documents must be carried out and outcomes of that review reflected in the Project Brief (refer to clause 1.4 – Definitions of this volume).

These documents should also be read in conjunction with the UoA Design Standards.

- UoA Masterplan 2016-2035
- UoA Strategic Plan - Beacon of Enlightenment, 2013-2035
- Disability Action Plan 2013-2019
- Campus/ Building-specific Disability Action Plans
- Dormwell Framework
- UoA Reconciliation Statements
- Campus/ Precinct/ Building-specific Masterplans (e.g. Waite Masterplan, Union House Masterplan)
- Campus/ Building-specific Conservation Management Plans
- Faculty Masterplans
- Technical discipline/ space-specific Masterplans, including:
  - ITS Strategy Masterplan
  - Mechanical Services Masterplan
  - SAMP
  - Teaching Spaces Masterplan
  - Labs Standards and Masterplan
  - Library of the Future Masterplan
  - Space Standards Guidelines
  - Deferred Maintenance Schedule
  - Bushfire Prevention Plans
  - Campus Water Management Plan
- Campus Sustainability Plan 2017 and associated documents, including:
  - The Carbon Neutral Adelaide Action Plan 2016-2021
  - Innovation Hub/ Smart Cities
  - Building Performance Rating System

1.3.2 Relevant legislation

The planning, design and construction of each UoA facility must fully comply with current legislation. Legislation includes but is not limited to:

- Australia or Australian/ New Zealand Standards (AS/NZS)
- National Construction Code (NCC)
- Building Code of Australia (BCA)
- Occupational Safety and Health (OSH) legislation
- Disability Discrimination Act (DDA)
- Accessibility Aspiration Design Factors
- State Environmental Planning Legislation (SEPP)
- Commonwealth and State Legislation
- Local Council and Authority requirements
- Relevant Heritage Acts (for both Places and Natural Resources)

1.4 Definitions

For the purpose of this document, the following definitions apply:

Must	Indicates that a statement is mandatory
Should/ shall	Indicates a recommendation
May/ can	Indicates the existence of an option
The Standard/s	The University of Adelaide Design Standards
Project Manager	University of Adelaide staff member responsible for delivering the building project
Strategic Project Brief	The strategic project brief developed by the University, during the project feasibility phase. Used to develop the consultants scope of works. Refer to clause 2.1 of this document for further discussion.
Return Brief/ Project Brief	The detailed brief prepared by the consultant/ design team at the end of the detailed briefing phase, and signed off by the Project Stakeholder/s, prior to commencement of Concept Design, against which mandatory milestone certification checkpoints are measured. Refer to clause 2.1 of this document for further discussion.

2. General requirements

This section outlines:

- General administrative requirements related to the use of the B. Building and Architecture, and the process for project delivery for all projects, including: project specific documentation; discrepancies; departures; certification of compliance; project procurement process; value management; safety in design; WHS; environmental management; independent building commissioning; manufacturer's specifications; and professional services requirements; and
- General design requirements related to the B. Building and Architecture, including the University policy on sustainable design as well as durability, economy and flexibility.

2.1 Project specific information

Project-specific information will be contained in project- specific documentation, such as Project Brief. The Standards will supplement any project-specific documentation. Refer below clause 2.2- Discrepancies for clarification of precedence, should a discrepancy between Project Specific Documentation and The Standard arise.

Extracts from the Standards may be incorporated in contract documentation specifications. However, the consultant and the contractor must fully investigate the needs of the University and produce designs and documents that are entirely fit for purpose, which meet the intent of the Project Brief.

2.1.1 The project brief

In accordance with A. Project Process Checklist and clause 2.4 Certification of Compliance, the Project Brief must be developed and signed-off in the following manner, and utilised as a measure, against which periodic certification must be carried out.

- The Pre-feasibility Statement and preliminary project brief contained therein, communicates proposed project objectives and scope, preliminary budget and any project- specific strategic targets (if known).

- The Strategic Project Brief is typically developed by the University during the feasibility phase of the project. This brief reflects outcomes of the strategic project investigations. The Strategic Project Brief must be interrogated and verified by the Project Delivery Unit, Project Manager and key strategic stakeholders, prior to proceeding to the next Detailed Briefing Phase of the project delivery process. It is from this verified Strategic Brief, that the consultants brief will be developed.
- The Strategic Project Brief must:
- Identify project- specific sustainability targets, over and above the Standards, and associated reporting obligations;
- identify proposed project budget and funding source. This must include:
- Capital Budget (separated into construction and university costs), and
- Operating Budget (reflecting project- specific sustainability targets);
- identify other strategic targets associated with the project;
- identify list of known Stakeholders with a preliminary engagement plan developed. This includes identification of key stakeholders with whom sign-off approvals obligations will sit. Refer below Clause 2.4 Certification of Compliance with the Standard;
- identify general spatial and operational requirements of the end users;
- identify decanting and relocations proposals associated with works;
- identify a list of further investigations that are required (e.g. Heritage, DDA etc.);
- identify an indicative project program for the delivery of works;
- identify strategic risks associated with the project (Refer Clause 2.7 Risk Register);
- communicate any safety in design risks identified to date (Refer Clause 2.8 Safety in Design);
- The Return Brief (also referred to as Project Brief) is typically prepared by the Consultant at the end of the detailed briefing phase, during which intensive stakeholder consultation has occurred. The Project Brief must be signed-off by key stakeholders prior to proceeding to the next Concept Design Phase of the project delivery process. It is against the signed- off Return Brief (also typically referred to as Project Brief), that the mandatory, milestone, compliance certifications will be measured. (Refer to clause 2.4 Certification of compliance, in this document). For very simple projects, compliance may be measured against the Strategic Project Brief, or equivalent, provided it meets all mandatory due diligence obligations, related to the development of a brief, listed in A – Project Process Checklist.
- The Return Brief must:
- Meet the obligations of the Strategic Project Brief (including, but not limited to budget and sustainability targets);
- identify detailed operational and spatial requirements of the end users;
- include room data sheets for complex projects (refer to Vol. A Checklist for clarification).

2.2 Discrepancies

The Standards outline the University's general requirements above and beyond mandatory authority requirements and legislation.

Where the Standards outline a standard higher than the relevant legislation, the Standards will take precedence.

If any discrepancies are found between any relevant legislation, the Standards, or project-specific documentation, these discrepancies must be highlighted in writing to the Associate Director, Capital Projects Delivery.

2.3 Departures

The intent of the Standards is to achieve consistency in the quality of the design and construction of the University's built forms.

In addition, University staff, consultants and contractors are expected to apply industry best-practice and strive for improvement and innovation in design and construction techniques wherever possible. In recognition of this expectation, application to depart from the Standards, must be made in writing to the Associate Director, Capital Projects Delivery via the UoA Project Manager, using the Alternative Design Solution Application Form. The application must include:

- Reference to the Standard clause under consideration
- Details of the departure and alternative proposal
- Impact of that departure on:
  - Compliance with the Project/ Return Brief
  - Project capital budget
  - Operating budget

Where a departure from the Standards is sought, dual-approval to proceed must be issued in writing by both the Associate Director, Capital Projects Delivery and the Director of Infrastructure. Until this approval is granted, the consultant is not authorised to proceed to the next project phase. Any departures made without written confirmation must be rectified at no cost to UoA.

At the completion of the project, all authorised Alternative Design Solution Application Forms must be submitted to the Associate Director, Capital Projects Delivery by the UoA Project Manager. Alternative Design solutions shall be monitored over time for success and may be considered for inclusion in subsequent versions of the Standards.

2.4 Certification of compliance

At regular intervals the consultant team must certify in writing that both the Standards, and the Project Brief, have been met.

This can be done using the templates provided in A- Project Process Checklist, or an equivalent, approved reporting tool.

Discrepancies and departures must be declared, with justification, at this time, in accordance with clauses 2.2 Discrepancies and 2.3 Departures of this document.

Approval must be granted prior to proceeding to the next project phase in accordance with the process outlined in A- Project Process Checklist.

It should be noted that The Standards, as they relate to this clause, refer to all Volumes of the Standard, including A- Project Process Checklist.

2.4.1 Frequency of certification

Frequency of certification is based on the size and complexity of the project. Refer to A. Project Process Checklist for frequency of certification requirements based on the complexity of the project.

For new all new building projects, (multi-disciplinary) projects, or projects with a value greater than $500,000, Certification must occur at the end of each of the following project phases:

- Concept Design Phase
- Design Development Phase
- 50% Complete Contract Documentation Phase
- 100% Complete Contract Documentation Phase
- Project Hand-Over Phase

For very small or simple (single discipline) projects, Building Standard Certification must occur at the following times:

- At an agreed point, prior to the end of the 50% Complete Documentation Phase
- At an agreed point prior to the end of the 100% Complete Contract Documentation Phase

2.4.2 Additional certification requirements

In addition to the above mandatory certification check-points, certification of compliance with the Design Standards and The Project Brief, must also occur as part of any Value Management Session, in accordance with clause 2.6. Value management of this document.

2.5 Project procurement process

All project team members must follow the project process outlined in A. Project Process Checklist. The checklist is a planning and tracking tool to be used by the project manager, consultants and contractors, to ensure adherence to the approved UoA process for project delivery and to ensure the Standards are achieved as a minimum on all projects.

A. Project Process Checklist Design Standard caters for different project complexity types. For clarification of the project complexity type, refer to Manager, Capital Projects Delivery.

A. Project Process Checklist Design Standard does not alleviate any responsibility to ensure familiarity and compliance with all aspects of the Design Standards. The checklist (or an approved, project specific version) must be maintained as an active document throughout the project, and must be submitted to the Manager, Capital Projects Delivery, via the UoA Project Manager at project completion.

A. Project Process Checklist Design Standard is divided into project delivery phases. While the order of actions listed can be varied to suit a project, all actions listed must be completed, and certified as complete, prior to proceeding to the next phase. Project-specific variations of the checklist involving alteration to the number of mandatory milestone certification checkpoints, or elimination of any action, must be treated as a departure from the Standards and submitted for approval to the Associate Director, Capital Project Delivery at the commencement of the project start-up phase.

Project managers, consultants and contractors must ensure that adequate time and resources are allocated to meet the requirements of A. Project Process Checklist Design Standard and, in particular:

- Mandatory milestone certification checkpoints and associated approvals processes (refer to clause 2.4 Certification of compliance)
- Engagement and consultation obligations with stakeholders

- DDA, Safety in Design, and Risk Management workshops
- UoA peer reviews
- Two-step value management process, refer to 2.6 Value- management

2.6 Value management

1. A mandatory two-step value management (VM) session must be carried out when the project has reached the 50% Complete Contract Documentation Phase (or at a time deemed appropriate by the UoA Project Manager). Additional value management sessions may be required and must follow the same process. Consultants and Project Managers must make appropriate allowance for resources and time to meet the requirements of this clause.

Any value management sessions must take the following two-step process:

1. Value management (VM) session; followed by
2. Written certification (in accordance with disclosure and approvals obligations set out in clause 2.4 Certification of compliance in this volume), that the proposed value managed solution:

- Meets the requirements of the Design Standard
- Meets the requirements of the Brief. This includes (but is not limited to) confirmation of the following:
  - Estimated order of cost for capital and operating budget; and
  - Project-specific sustainability objectives

2.7 Risk Register

The Risk Register records details of all the risks identified at the beginning and during the life of the project, their grading in terms of likelihood of occurring and seriousness of impact on the project, initial plans for mitigating each high-level risk, the costs and responsibilities of the prescribed mitigation strategies and subsequent results.

This Risk Register must be maintained for all projects, throughout the life of the project. Initial risk assessment must form part of the Project Feasibility Phase for the project. If strategic risks are identified, they must be recorded and managed separately to those that are related to workplace health and safety. The preliminary register (or list of issues) must be communicated in the Strategic Project Brief.

The register must continue to be developed and maintained by the UoA Project Manager for all projects. Later the register will be maintained by the Managing Contractor, Service Delivery maintenance staff, and potentially end-users. The register will be updated regularly as existing risks are re-graded in the light of the effectiveness of the mitigation strategy, and new risks are identified. For larger projects a Risk Management Plan may be required also. In smaller projects, the Risk Register can be used as the Risk Management Plan.

Refer to clause 2.8 for further discussion about Safety in Design and the mandatory Safety in Design Risk Assessment Workshop.

Refer to A. Project Process Checklist for the Project Risk Register Template.

Refer to clause 2.8 Safety in Design/ workplace health and safety for discussion on cultural safety.

2.8 Safety in Design/ workplace health and safety

Safety in Design (SiD) aims to prevent injuries and disease by considering hazards as early as possible in the planning and design process. A safe design approach considers the safety of those who construct, operate, clean repair and demolish an asset (the building, structure, plant or equipment) as well as those who work in or with it. Designers are in a unique position to reduce the risks that arise during the life cycle of the asset during the design phase.

In accordance with Safety in Design/ WHS Legislation, at each phase of the design process, risk identification must take place with the view to eliminating the risk, or where this is not possible, reducing risk as low as reasonably practicable, through the implementation of control measures. Safety in Design Risk Assessments must be carried out throughout the job and reported on at regular team meetings, keeping the status of control measures and the residual risks at a current level. Refer to clause 2.7 Risk Register for further information about reporting obligations.

For all new building projects, complex refurbishment projects, or high-risk projects a mandatory Safety in Design Risk Assessment Workshop must be carried out no later than the 50% Documentation Phase. This should be led by a member of the consultant team and in addition to the contractor, the consultant team and relevant other parties such as fabricators/ operators specific to the project, the workshop must be attended by a UoA WHS Representative and the UoA End-User Representative.

The assessment should involve hazard identification, assessment of risk of harm for each hazard, and strategy for eliminating or controlling the risk. One outcome of the assessment may be that Safe Operating Procedures (SOP) need to be developed. The SOPs identified in the Safety in Design Risk Assessment Workshop must be incorporated into the End-User Building User Guide and Safety Induction.

As part of the Safety in Design Risk Assessment, confirm with the Associate Director Capital Projects Delivery, as to whether consultation with the Gender Equity and Diversity Committee (or delegate) is required, to establish risks associated with cultural and gender safety associated with the project.

2.9 Independent building commissioning

For all new buildings, or where the Project Brief requires it, an independent commissioning agent not involved with the design or construction of the project must be engaged.

Detailed testing and commissioning requirements must be specified for each project by the UoA-appointed consultant/designer.

Project hand over inspection and testing plans (ITPs) must be developed by the consultant/contractor to allow the system to be handed over to the University. Detailed testing and commissioning records must be provided for each system and each component, taking into account the requirements of the Standards. All such records must be witnessed and verified by the UoA-appointed project consultant/ designer.

2.10 Post-occupancy Building Services Performance Report

After one seasonal cycle of operation, an independent building services performance review must be carried out and report prepared. Refer to the Manager, Sustainability for details. This may be carried out internally, or by an external consultant. Requirements of the Post-Occupancy Building Services Performance Report will be established by the Manager of Sustainability.

2.11 Manufacturer specifications

All installation must be carried out in accordance with manufacturer specifications and data sheets to ensure product performance over its intended life and so as not to invalidate any warranties.

2.12 Sustainable design

The adoption of environmentally sustainable building philosophies must be considered a primary objective of all projects, regardless of size. Opportunity to implement responsible design and construction solutions must be considered as a matter of course during every phase of the project. Project specific sustainability initiatives and targets must be identified in the Project Brief along with associated reporting obligations relating to both:

a. the requirement for the designer to certify/ rate/ measure the proposed design solution prior to construction; and

b. the requirement for the designer to include physical equipment and processes for measuring the performance of the building throughout its life- cycle (refer Vol Metering and monitoring).

In the absence of the identification of project- specific sustainability targets, and in addition to sustainability considerations covered in the relevant Volumes, the following must be incorporated in all architectural and engineering services designs.

2.12.1 Energy demand and thermal comfort

To minimise energy demand and improve thermal comfort in buildings, the following must be considered:

a. Use of basements and underground parking areas and labyrinths to pre-cool intake fresh air in mechanical systems if viable and where excessive dehumidification is not required.

b. High levels of thermal insulation to roof, floors and walls.

c. Reflectance of external building materials.

d. Thermal and solar performance of glazing.

e. External shading of north, east and west facing windows and walls.

f. Building orientation and massing.

g. Design glazing to achieve optimal day lighting and solar heat gain and to minimise the need for mechanical heating or cooling.

h. Appropriate design for temperature, air velocity, fresh air ventilation rates, relative humidity for different functional spaces as required by C. Mechanical Services Design Standard.

2.12.2 Use of natural daylight

a. Design façades and windows to maximise natural daylight in usable floor areas and incorporate use of sky lights, light wells and internal atriums or courtyards where appropriate.

b. Avoid overshadowing and visual intrusion onto adjoining sites.

c. Design buildings to avoid undesirable glare impacts on pedestrians, motorists, people using open spaces and those in other buildings.

d. Minimise the impact of night lighting on adjacent sites and buildings.

2.12.3 Indoor environmental quality

a. Provide appropriate lighting to suit the use of the space in accordance with E. Electrical Design Standard. Record the as-designed lighting levels and controls per functional space within the post-construction As-built documentation package.

b. Use materials, fittings and furnishings with low-VOC content i.e. paints, adhesives, sealants, carpets, timber products and furniture to avoid and minimise off-gassing impacts on building occupants' health.

c. Design to minimise unacceptable noise.

d. Utilise natural cross ventilation of habitable rooms and corridors to minimize the requirement for mechanical air conditioning.

2.12.4 Energy efficiency

a. Electrical appliances with the highest Australian Government Energy Star Ratings must be used for the relevant capacity ranges of appliances. These appliances include but are not limited to refrigerators, freezers, clothes dryers, dishwashers, electric hot water boilers, televisions, computer monitors and air-conditioning units.

b. Preference must be given to locally manufactured products where multiple products have the highest energy rating.

c. Electrical equipment, including specialised laboratory equipment not covered by Energy Star Rating Scheme must include energy efficiency as part of the selection criteria and have controls to prevent unnecessary energy consumption.

d. All buildings must provide utility meters to monitor, electricity, gas and water in accordance with C. Mechanical Services Design Standard, D. Electrical Services Design Standard, F. Hydraulic Services Design Standard, and L. Metering and Monitoring Design Standard:

— Energy efficient lighting and lighting controls must be provided to meet minimum illumination requirements in accordance with the D. Electrical Services Design Standard.

— Buildings must incorporate technology to reduce peak power demand, i.e. use of thermal storage for cooling and heating, power factor correction devices, etc.

— Roof design must maximise orientation to the northwest to northeast to optimise potential for installing roof top solar energy systems.

2.12.5 Water use

a. Water sub-metering must be provided to monitor large water consuming processes in accordance with F. Hydraulic Services Design Standard and L. Metering and Monitoring Design Standard.

b. All sanitary fixtures and tap ware must achieve WELS ratings specified in F. Hydraulic Services Design Standard.

c. Rainwater harvesting and reuse (toilets, cooling towers, fire test water and landscape irrigation) must be considered for all projects and applied where feasible. Ensure system design allows for future upgrade and expansion. Opportunities to integrate 'demonstrator' education must be explored. Refer also to F. Hydraulic Services Design Standard.

2.12.6 Water sensitive urban design

University campuses must implement water sensitive urban design principles by:

a. Reducing potable water demand through water efficient appliances, hydraulic standard.

b. Capturing rainwater for beneficial reuse including irrigation, cooling water and toilet flushing.

c. Minimising wastewater generation and treatment of wastewater to a standard suitable for effluent re-use and or release to receiving waters.

d. Passively treating urban stormwater using bio-filtration and wetlands systems to meet water quality objectives for reuse and or discharge to surface waters.

e. Using stormwater in the urban landscape to maximise the visual and recreation amenity of developments.

f. Grey water must not be reused where expensive wastewater treatment involving significant inputs of energy, chemicals and high maintenance is required.

2.12.7 Materials

a. Materials must be selected to meet sustainability requirements specified in Section 12 of B. Architecture and Building Design Standard (this document).

b. Selection of construction materials must consider 'cradle-to-grave' environmental impacts which look at impacts associated with raw materials extraction, manufacture, use and re-use potential and disposal.

c. Preference must be given to construction materials with recycled content and reused materials where practical.

d. Life cycle costing principles must be considered in selection of materials and systems. This includes capital, operations and maintenance, and disposal costs.

e. Use recycled and recyclable content in building materials, where fit-for-purpose from a durability and performance perspective.

f. Use suitable demolition materials for on-site fill.

g. Rainforest timber and timber from Australian high conservation forests must not be used.

h. Consider appropriate design detailing for engineered products to avoid any off-gassing potential from volatile compounds used in manufacture.

2.12.8 Noise mitigation

a. During the planning process isolate noise generating activities to avoid impact on sensitive receptors and quiet activities.

b. Protect all occupied spaces from noise pollution from external and internal sources.

c. Plant and equipment located on roofs must have acoustic treatment if they generate excessive noise.

d. Plant locations and noisy equipment must be designed and situated to avoid noise impacts on sensitive receptors and local residents.

e. Minimise noise emitted from external equipment such as fans, air-conditioners, compressors, and from other noise generating sources.

f. Minimise noise transmission within multiple occupancy buildings.

2.12.9 Construction and demolition waste

Building contractors and designers must provide infrastructure for recovery of building, construction and demolition materials to minimise waste disposal to landfill. They must:

a. Prepare and implement a materials recycling and waste management plan in the construction phase for all construction and demolition waste as part of the project environmental management plan.

b. Identify the range of materials that will be collected for recycling and describe procedures, management practices and reporting.

c. Formally apply dimensional co-ordination where it will practically assist the efficiency of material use, preference for modular components and materials supplied in set sizes or dimensions.

d. Consider ease of disassembly and recycling of construction materials and components at the time of refurbishment or completion of a facility's life.

e. Ensure project planning, specification and programming for the recovery, storage and transfer of reusable materials from demolition works including their transport from site to recycling and re-use facilities.

f. Implement procedures for disposal or recycling of hazardous materials at properly licensed facilities.

2.13 Durability, economy and flexibility

The University's goal is to achieve the optimal balance between capital and operating costs, whilst providing occupants a high level of environmental quality and service throughout the lifetime of each building. A whole-of-life asset value-for-money solution must be sought.

The University's building elements, services and external spaces must be:

- Cost-effective to operate and maintain.
- Designed with consideration of capital as well as operating expenditure in mind.
- Robust and durable.
- Easily and safely cleaned and maintained.
- Standardised to minimise individual specialisation and customisation.
- Flexible in the design to allow for expansion or adaption to new uses.
- Designed with built-in flexibility of space, plant and equipment to reasonably accommodate future uses.

2.14 Building compartmentation and sealing

Building fire compartments (existing and proposed) must be clearly identified within the contract documentation package and within the post-construction package. All penetrations through the barrier must be fire treated. Provide motorized dampers connected to the fire alarm system for any fixed open louvers such as at elevator shafts. Provide damper and controls to all air intakes/ exhausts.

Building envelopes must be designed and constructed with a continuous air barrier to control air leakage into, or out of, the conditioned space. Clearly identify all air barrier components on construction documents and detail the joints, and penetrations of the air barrier. The air barrier must be durable to last the anticipated service life of the assembly. Do not install lighting fixtures with ventilation holes through the air barrier.

3. Technical requirements

This section outlines the specific technical requirements for K. Documentation UoA Design Standards. This section relates to documentation produced during the pre- construction, construction and post- construction phases. Documentation, as it is referred to in this Volume, refers to all types of project specific documentation including:

- Drawings
- Reports
- Surveys (including photographic surveys)
- Specifications
- Schedules
- Room Data Sheets
- Supporting Documentation
- As-built documentation
- Builders Manuals
- Technical Disciple and O&M Manuals

This section must be read in conjunction with Vol. A Project Process Checklist. Particular attention must be given to obligations relating to:

- Communication with, and distribution of documentation to UoA stakeholders, including but not limited to UoA Systems and Business Improvement Team (UoA SBI Team); and
- Documentation and certification obligations at milestone checkpoints throughout the project.

This section is broken into two parts:

- Clause 3.1-3.7 UoA documentation conventions
  - Applicable to documentation produced during all phases of the project
- Clause 3.5- 3. 37 Post- construction documentation Room Data Schedules:
  - Room Data Sheets
  - Asset/ Equipment Register
  - Post- construction Documentation
  - As-built documentation
  - Space Charging Base Floor plans
  - As- Built (record) documentation
  - Builders Manual
  - Occupation and Maintenance manuals
  - Discipline Asset types

3.1 UoA documentation conventions

3.1.1 Document transmittal

Unless previously agreed with the UoA Project Manager, issue of correspondence (to and from the University), and transmittal of documentation (of all types, and during all phases of the project) must be via Aconex. If Aconex is not in use for the project, email transmittal is acceptable.

3.1.2 Project information

In accordance with industry convention, project information must be identified on all documentation, including:

- Project Name (and UoA project number, if available)
- Document author
- Document issue

3.1.3 Document code

Documentation produced during ALL phases of the project, must be identified by way of a code in accordance with industry convention, and in accordance with mandatory UoA coding conventions for identification of facilities, as outlined in this clause.

Documentation coding must follow a logical sequence and include the following information as a minimum:

- Discipline (e.g. "A"- Architectural, "H"- Hydraulic, "E"- Electrical)
- Campus and Building Number (e.g. "NT21" - North Terrace campus, building No 21))
- Floor Number (e.g. "GN"- ground floor)
- Drawing/ Document Number (in accordance with industry convention)
- Drawing Revision (including description of revision)
- Document issue information

The following issue information must appear on all documentation:

- Revision (character A/B/C)
- The date of revision/ issue;
- Status of the documentation as it relates to the project delivery phases identified in UoA Vol A Checklist; and
- Purpose of issue

For example:

- Rev A- Date- Concept Design- for approval
- Rev A- Date- Design Development- for approval
- Rev A- Date- Contract Documentation 50% Complete- for approval
- Rev A- Date- Contract Documentation 100% Complete- for approval
- Rev A- Date- For Tender
- Rev A- Date- For Construction
- Rev A- Date- As Built- for approval
- Rev A- Date- As-Built

3.1.4 Stakeholder signoff

In accordance with Volume A Project Process Checklist and parts 1 and 2 of this document, throughout the project delivery process, milestone documentation issues must be reviewed and signed off by UoA and stakeholders, prior to proceeding to the next phase, or in the case of the final post- construction milestone, prior to the approval of payment of the final consultants invoice.

When a document is issued for UoA stakeholder approval, for example at a mandatory milestone checkpoint, the method for recording that approval may be by way of either:

1. A sign-off schedule located on, or appended to the document. Refer to Section 4. Schedules of this document for Sign-off templates; or for smaller projects; OR
2. Written correspondence confirming the document code and issue information as described above.

Refer to clause 3.4.3 of this Volume, for further discussion about post- construction documentation certification.

3.1.5 Numbering and naming of facilities

All campuses/sites, buildings, levels, rooms and spaces where the University of Adelaide have occupancy, or have previously occupied, must be numbered and named in accordance with this Standard. This includes accommodation that is new, deleted, retained, re-assigned to a new user, subdivided, or modified. This also includes spaces within leased accommodation (for example in hospitals), however in this instance base-building numbering and naming conventions may take precedence over UoA conventions as directed by UoA SBI.

Review and written approval by UoA SBI, of campus, building, level and room/space numbering must occur prior to moving into the Tender or Contract Documentation Phase of the project, to ensure compliance with this Standard.

3.1.6 Site/ campus code

The campus/ site code and name code follows a logical two alpha system. For example:

- NT North Terrace
- RW Roseworthy
- WT Waite
- TB Thebarton

3.1.7 Building code

The building code is made up of the Campus/Site Code (2 alpha system), followed by the building number (typically 2, or in the case of Roseworthy 3, numbers). For example:

- NT20 North Terrace- Building 20 (The Braggs)
- RW017 Roseworthy Campus- Building 017 (College Hall)
- WT74 Waite Campus- Building 74 (Waite Building)

3.1.8 Floor code

The floor code convention follows the 2 alpha OR 2 numeric conventions. For example:

- BA Basement
- GN Ground
- Level 1 (can vary – building specific)
- Level 2 (can vary – building specific)

3.1.9 Room / space numbering and naming

All rooms, spaces between rooms (for example circulation spaces), external spaces and interstitial spaces must be numbered and named in accordance with this Standard. Both number and name must appear on documentation.

Typically, numbering should start from the main entrance to each floor, and follow a logical sequence, in a clockwise direction. For example, the first space would be the entrance corridor or foyer (01), and the second would be the first room to the left (02). When subdivision of existing spaces occurs, the subdivided space may take on an alpha suffix (a01) as directed by UoA SBI.

Room naming follows the Go8 Data Dictionary Standard. The name is allocated based on the generic description of the space type, followed by the specific description, for example "Office- PHD" or "Laboratory- Laser ". Where a specific description does not exist, the generic description is used alone, for example "kitchen", "utility", or "compactus".

To assist end-users to interpret documentation, where space permits, both number and name must appear on documentation, for example "02-Office-PHD".

3.1.10 Unique Room Identifier (Loccode)

It is critical that the numbering conventions outlined in this Standard are adhered to, because it is from these numbers (Campus Code- Building Code- Floor Level Code- Room Number) that a unique identifier or "Loccode" similar to a bar code is generated for each room, for example NT-NT05-04-207. This "Loccode" is used to identify the room and its attributes in the UoA Data Base "Archibus". Attributes include such things as condition, assets, people, room type, occupancy, capacity, space charging. Tracking of these attributes forms the basis for the development of management and maintenance strategies across all infrastructure facilities at the University.

3.2 Space data scheduling

All documents relating to habitable rooms/ spaces (e.g. architectural drawings) issued during the Contract Documentation Phase of the project or later (and preferably as early as possible during the project) must include space data. The space data must accurately reflect the proposal at that time and be updated as subsequent versions of that drawing are issued. Space data must be communicated as either a table on the drawing, or as an attached sheet (with appropriate document labelling in accordance with clauses above).

Refer to 4. Schedules of this Standard for a template example of a space data schedule, and to clauses below for further explanation of minimum requirements.

3.2.1 Area

The areas listed below are generally defined by the use of a closed CAD polyline in the drawing model. Refer to 4. Schedules for UoA specific definitions and mandatory method of measurement, noting that the method outlined differs from that used in the commercial sector.

- UFA – Usable Floor Area (within a room)
- GFA – Gross Floor Area (per floor)
- GBA – Gross Building Area (per floor)
- NLA – Usable Floor Area (per floor)

3.2.2 Capacity

Maximum capacity of each new and modified space must be provided for all new and modified spaces. Capacity is based on the as-designed solution, taking into account all technical disciplines (e.g. services loading, fire and life safety provisions, amenities provisions etc.). This is not necessarily the same as "occupancy". Minimum information required includes:

- UFA (refer 3.2.1 clause above)
- As-designed space type classification (BCA/ NCC) and m2/ person (where applicable)
- Maximum capacity (people)

3.2.3 Occupancy

Proposed occupancy information must be provided for all new and modified space. This is not the same as maximum capacity (refer clause 3.2.2 of this Volume). Occupancy information must include (where applicable or available):

- Number of proposed occupants for the space;
- Details (Faculty/ School/ Discipline/ Group) of the existing occupant and to where they are moving (Building/ Room);
- Details (Faculty/ School/ Discipline Group) of the proposed occupant and from where they have moved (Building/ Room);
- Name and full time equivalent (FTE) status of staff member.

Refer to Section 4. Schedules - UoA Space Charging Structure for further detail. <UoA to provide this content for the schedule.>

3.3 Room data sheets

Room data sheets are required to be produced as part of the contract documentation (for- construction) package, for all construction projects, with the exception being those projects that are very simple, involve a single discipline, or deemed as exempt by the Associate Director, Capital Projects Delivery.

Refer to Section 4. Schedules for a Room Data Sheet example template. The Room Data Sheet and Space Data Schedule may be combined, however if this is the case, the document must be formatted to ensure easy retrieval of archival Space Data by UoA staff at the completion of the project.

3.4 Asset/ equipment register

The University maintains Asset and Equipment Registers that record both removed/ demolished items and new items. The existing schedule must be issued by the UoA Project Manager to Consultants at the commencement of the project (as required) as a reference. Amendments to the registers must be proposed as part of the design and documentation process by the Consultant. Allocation of equipment and asset numbers will made by Service Delivery for inclusion in the project documentation. Refer relevant Volume of the Standard for asset labelling requirements as they relate to the various technical disciplines.

Refer 4. Schedules for Asset Register template. Update of the master asset/ equipment registers will be made by the UoA based on the post-construction documentation package containing the as-built information.

3.4.1 Asset identification and labelling

Refer to respective technical discipline UoA Design Standards for asset identification and labelling requirements.

3.5 Post- construction documentation

3.5.1 Purpose of documentation

The University of Adelaide maintains records of all owned and occupied facilities. It is critical that the University maintain accurate and detailed documentation of as-built conditions, accordance with this Volume of the Standards, for the following reasons:

- To track, and charge occupants for "live" space usage (the current live space utilisation data base includes in excess of 930 buildings and 24,700 rooms/ spaces);
- To track and manage utilisation and booking of spaces to ensure optimum efficiency;
- To establish lessons- learned and continually improve the quality of building stock on campus and the process of project delivery;
- To manage and maintain building stock;
- To ensure a readily accessible indexed data base of existing conditions documents for use in planning future projects.

3.5.2 Timing of mandatory post- construction documentation

The following post- construction documentation must be produced by the consultant and contractor team and issued to the Project Manager:

- Two months prior to practical completion:
  - Draft milestone post-construction documentation package (builders manual containing operation and maintenance manuals and as-built documents);
- At practical completion the following documentation must be issued by the consultant/ contractor team:
  - Space charging base floor plans (refer clause 3.6 of this Volume);

- 90% complete draft of the Builders Manual (clause 3.8), containing Operation and Maintenance Manuals (clause 3.9) and As-built documentation (clause 3.7).

- Within three (3) months after practical completion the following documents must be issued by the consultant/ contractor team to the Project Manager, for UoA review and approval:
- 100% complete Builders Manual (refer clause 3.8 of this document), containing:
  - Operation and Maintenance Manuals (refer 3.9 of this document);
  - As-built documentation (including drawings and specifications, refer clause 3.7 of this document); and
  - Written certification of compliance of the milestone package with the Standards (refer clause 3.5.4 of this document)

3.5.3 Document format

Format of post- construction documentation must be as follows:

- Drawings must be transmitted in both PDF and editable drawings formats (*.dwg) Autodesk Autocad 2016.
- All 3D drawings must be issued with a corresponding 2D drawing.
- Text documents must be transmitted in both an indexed PDF and Microsoft Word (*.doc) format. Documents must have pages consecutively numbered and have footers identifying the document date, author and file name.
- Spreadsheet documents must be transmitted in both PDF and Microsoft excel (*.xls or*.csv) format.
- Unless previously agreed with the UoA Project Manager, issue of correspondence (to and from the University), and transmittal of documentation (of all types, and during all phases of the project) must be via Aconex.

3.5.4 Certification of compliance

In accordance with Volume A. Project Process Checklist, as soon as possible after practical completion, consultants and contractors must produce a milestone post-construction documentation package, and issue to the Project Manager for UoA review and approval. This applies for all projects regardless of size, including new works, additions and modifications. The milestone package must include the following:

- Post- construction documentation package in accordance with this section of the Standard;
- Written certification that the milestone documentation package meets the requirements of the Standards, with particular attention going to mandatory checklists located in Section 4. Schedules of this volume, and the other technical volumes of the Standard. Compliance certification must include a comprehensive, justified list of departures. Refer to 4. Schedules of this Volume for certification template.
- Written certification that the milestone documentation package, meets all the requirements of Project Brief, along with a comprehensive, justified list of departures, in accordance with part 1 and 2 of this Volume. Refer to 4. Schedules of this Volume for certification template.

The package must be reviewed and approved by the UoA Project Manager in the first instance and then issued to the relevant discipline specific technical UoA staff member, and the UoA SBI team for secondary review. Unlike approval of documentation packages during pre-construction and construction phases, (where comments arising from the reviews can typically be addressed during the next project delivery phase), documents that are identified at the post-construction phase of the project as non- conforming with this Volume of the Standards, will be immediately rejected and returned to the document author for correction. Authorisation of payment of final invoices will not be granted until conforming post-construction documentation is achieved.

3.6 Space charging base floor plans

At the time of Practical Completion (or occupation), the consultant must provide Architectural floor plans (only), with numbered workstations, furniture layouts and space data scheduling (in accordance with this Volume) to the UoA SBI team via the Project Manager, to enable immediate update of the space- charging data base as soon as possible after occupation occurs. This is essential for live tracking and charging of occupants for space usage. This is not the same as "As-built" documentation which is described in the following clauses.

3.7 As- built (record) documentation

As-built documentation (including drawings, specifications, schedules and other supporting documentation) for each technical discipline must be produced by the consultant/ contractor team as soon as possible after the project handover phase for all projects.

The as- built documentation is an integral part of the operation and maintenance manual (refer Clause 3.6 in this Volume) produced as part of the post- construction documentation set. The As built documentation must be certified as compliant with the Standard (this document) as part of the certification process outlined in clause 2.4 and 3.3.4 of this Volume.

The As-built documentation must meet the following requirements:

- Documentation must be an accurate reflection of the "as built" project at the time of practical completion. This includes all information contained in the "for construction" contract documentation package (including existing, modified and new elements) as well as any revisions, contract variations and instructions that occurred during the construction period. Changes that occur during the

construction period must be fully incorporated into the drawings and specification and must not be appended as a separate document or register (unless it is an item that is deemed by the Project Manger as not critical to the archive record). It is critical that all information pertaining to the construction of University facilities is easily retrievable without the need to search though construction correspondence. The Consultant must allow time and resources to carry out these changes during the course of the construction period to ensure "as- built" documentation is available immediately, or very soon after, the achievement of practical completion.

- Documentation must meet all requirements of this Volume and must in particular not exclude the UoA documentation conventions outlined in clause 3.1 of this Volume (including, but not limited to, updating the purpose of issue to "As-built" status);
- Architectural and Engineering Services documentation must follow industry standard for the scale and type of project. Refer to relevant Volume of the Standard for discipline specific documentation information. Minimum requirements for As-built documentation based on discipline/ asset type are listed below:

3.7.1 All Disciplines

- Demolition plans and demolition schedule including updated Asset/ Equipment Register (refer clause 3.4 of this documents)

3.7.2 Architectural

- Existing, demolished, modified and new conditions for all building elements
- Clearly dimensioned and labelled plans and elevations showing Walls, Doors, Windows and all fixed furniture including variations incurred during construction.
- Site plan of new building location in relation to existing buildings and all general site works.
- Finishes schedules showing installed materials, type and colours.
- Numbered workstations on floor plans with associated scheduling
- Coded chairs types on floor plans with associated scheduling

3.7.3 External Works

- Site set-out including dimensioned offsets to existing buildings or structures;
- Existing and proposed external finished floor levels;
- Existing and new physical structures and elements within the external environment.

3.7.4 Structural

- Clear and detailed drawings identifying the work to be done
- Structural calculations.
- Static Floor loadings on all floor plans

3.7.5 Civil & Underground Services

- Invert levels and depth of all services from finished surface level.
- Construction material. E.g. Class 12 uPVC

3.7.6 Electrical

- Ceiling plans showing all lighting fittings and type
- Major cable sub-routes to sub-boards
- Major cable tray routes
- Distribution board numbers
- Circuit number, IPA stud numbers
- Circuit sizes, 10A, 15A, 3 phase etc.
- Accessories, type of outlet, isolator, dedicated equipment outlet, etc.

3.7.7 Hydraulics/ plumbing

- Waste, soil, vent and stormwater locations, routes, materials and sizes.
- Condensate drain/s material and size.
- Details of all existing and new waste alterations

3.7.8 Mechanical

- Dimensions and set-out of plant and equipment
- Duct layouts, outlet positions and air quantities.
- Control locations and set points.
- Power circuiting and services schematics.

3.7.9 Communications

- Cable routes, outlet type and location, and IPA number.

3.7.10 Security

- Identify areas of protection and associated device
- Schematic control diagrams

3.8 Builder's manual

The builder's manual forms part of the post- construction documentation package and is mandatory for all projects. A significant component of the builders manual, is the operation and maintenance manuals (refer 3.7 of this volume) that are specific to each discipline and typically, but not always prepared, by the relevant consultant.

The builder's manual, must be accompanied by:

- A certificate of compliance of compliance in accordance with 3.3.4 Certification of compliance of this volume, provided by the author/ authors of the document. Compliance relates to all Volumes of the Standard (and in particular this Volume) and compliance with the Project Brief.
- Completed checklists as required by each technical discipline.

3.8.1 Cover page

The O&M manuals must have a cover page containing the following information as a minimum. Refer to Section 4 of this Volume for template cover. Ensure that document and facility labelling complies with UoA documentation conventions outlined in this Volume.

- Project Name (in accordance with UoA Documentation Conventions for facility labelling in this Volume)
- Project Description
- Project location
- Project Number (UoA reference)
- Consultant Team
- Builder and Subcontractors
- Consultant Team
- Date of Practical Completion

3.8.2 Contents Page

The builder's manual must have a contents page containing the following information as a minimum. Refer to section 4 of this volume for template cover page. Refer to clauses to follow for additional information:

1. Certification of Compliance with UoA Design Standards and the Project Brief (refer clause 3.3.4 of this Volume)
2. Finishes Schedules, manufactures details, maintenance (incl. cleaning) requirements and supplier details
3. Warranties
4. Training records
5. Hazardous material testing and removal records (register if appropriate)
6. DA, Form 2's, Builders Statement
7. Certificates of Compliance (where a full discipline manual is not warranted)
8. Register of Asset Types - Refer 3.8 of this Volume
9. Register of As Built Documentation (combined for all asset types)
10. Builders Manual Attachments:
11. As-built documentation for all disciplines (refer Clause 3.4.1 As built documentation of this document)

12. Combined Asset Register (refer clause 3.1 of this document) as a spreadsheet.

3.9 Operation and Maintenance Manuals

The operation and maintenance (O&M) manual forms part of the post- construction documentation package for all projects. It is typically prepared by the appropriate consultant for each of the technical disciplines/ asset types and inserted into the overarching Builders Manual. The author of the document must have the relevant experience in the operation and maintenance of the installation.

Integral to the O&M Manual is the as-built documentation (drawings), (refer clause 3.5), which must be prepared and certified by the relevant consultant for each technical discipline/ asset type.

The O&M manual specific to each discipline/ asset type, must be accompanied by:

- A certificate of compliance of compliance with the UoA Standards (and in particular this document) and The Brief, in accordance with 3.3.4 Certification of compliance of this volume.
- Completed checklists as required by each technical discipline/ asset type.

For very simple projects, with prior permission from the Project Manager, the Contractor may prepare a combined Builders/ O&M Manual, however in this instance the Contactor is also responsible for preparing and certifying the As-built documentation.

The content must be technically accurate at the time of installation. Manuals must provide concise descriptions, technical details, operating and maintenance instructions and schedules, commissioning records, log books, principles of operation, method of operation and other information as necessary to enable the on-going operation and maintenance of the fabric, services, plant and equipment.

The operation and maintenance manual for each asset type must have the same cover page coordinated by the Contractor. Refer Section 4. Schedules for example template.

Document and facility labelling must be in accordance with UoA documentation conventions outlined in this Volume.

3.9.1 Cover Page

The O&M manuals must have a cover page containing the following information as a minimum. Refer to Section 4 of this Volume for template cover. Ensure that document and facility labelling complies with UoA documentation conventions outlined in this Volume.

- Project name
- Project description
- Project location
- Project Number (UoA reference)
- Contractors Project reference (if applicable)
- Consultant Team
- Builder and Subcontractors
- Date of Practical Completion
- Numbered list of discipline manuals with relevant discipline highlighted

3.9.2 Contents

The O&M manuals must have a contents page containing the following information as a minimum. Refer to section 4 of this volume for template cover page. Refer to clauses to follow for additional information:

1. UoA Design Standard and Project Brief Certification of Compliance (refer clause 3.3.4 of this Volume)
2. Project description
3. Directory of contacts
4. Equipment details and manufacturers technical data
5. Essential Services Provisions
6. Maintenance Information
7. Certificates, Guarantees and Warranties
8. Training records
9. Commissioning Data
10. Service records
11. As Built Documentation register

12. Asset Register
13. Discipline Manual Attachments:
    i. As-built documentation (in accordance with clause 3.4.1 of this Volume)
    ii. Asset register (as a spreadsheet)

3.9.3 Project description

The project description includes a general description of the installation to provide a general understanding of the installation and its operation, followed by a technical description of each system of the installation, written to ensure that it can be clearly understood by persons not familiar with the installation.

3.9.4 Directory of contacts

The directory of contacts must be specific to the discipline manual, including company and supplier details.

3.9.5 Equipment details and manufacturers technical data

Depending on the type of project, technical details of equipment may include the following:

- Performance data- technical description of the functionality details and mode of operation of each system provided.
- Installation and dismantling instructions.
- Operating instructions including:
  - Safe starting, operating and shutting-down procedures for the equipment installed;
  - Control sequences and flow diagrams for the systems installed;
  - Legends for colour-coded services if not provided elsewhere;
  - Schedules of the parameter settings of each protective device, including fixed and adjustable circuit breakers, protective relays, adjustable photoelectric switches, pressure switches, and any other control and monitoring device, as established during commissioning and maintenance;
  - Where no manufacturer literature is available, a concise description of the operation procedure must be provided.

3.9.6 Schedule of spares and consumables

At practical completion, the Contractor must provide 2 complete sets of any special tools and portable indicating instruments necessary for operation and maintenance of equipment, together with suitable means of identifying, storing and securing the tools and instruments.

The schedule of spares and consumables must include:

- The manufacturers name, address and telephone number, catalogue number, name and address of the local distributor, and the expected replacement frequency; and
- Consumable items (oil, grease, belts, bearings) to be used during servicing
- Imported equipment including country of origin and importer details;
- Tools and testing equipment:
  - Special, non-generic tools and instruments that are not commercially available for the operation, maintenance and dismantling or assembly of the plant and equipment must be scheduled in the manuals, along with instructions for use and maintenance.

3.9.7 Essential Services Provisions

All commissioning and testing/inspecting data relating to the Essential Safety Provisions must be provided progressively throughout the construction process, and again at the time of handover of the manuals.

The ESP provisions that must be covered includes, but is not limited to:

- Structural Fire Protection and Compartmentation
- Access to fire appliances
- Signs
- Clearance for large isolated buildings
- Occupancy Hazards

The following information must be provided:

- A schedule of the frequency of the required or recommended maintenance, testing or inspection for each type of equipment classified as Essential Safety Provision.

- A separate schedule for each type of Essential Safety Provision equipment including:
  - The type of equipment;
  - A unique identification label attached to each piece of equipment;
  - The location of the equipment, including building number and/or name, level number and/or name, room number and/or name and any other information required for prompt and unequivocal identification;
  - The type of inspection and maintenance required;
  - Space is to be left in order to enable the recording of results of each inspection, with sufficient spare space for not less than two years;
  - Space is to be left for comments on each inspection;
  - Space for the recording of the date and time of each inspection, the name, title, address and signature of the person performing each inspection.
- Drawings identifying those units of plant that are either added or deleted.

Only the record of tests and inspections of the Essential Safety Provisions as required by the South Australian Development Act 1993, Ministers Specification SA 76 and various Australian Standards and Codes of Practice must be included.

All technical data and maintenance instructions for the Essential Safety Provisions must be recorded in the relevant section of the Operating and Maintenance Manual must be included and must not to be repeated elsewhere in the Operating and Maintenance Manual. Data may be supplemented elsewhere as necessary to ensure that all systems are comprehensively serviced and maintained.

Within 1 month after the date of practical completion, the Principal Consultant must submit to the Project Manager a schedule of spare parts necessary for maintenance of the installation.

3.9.8 Maintenance Information

As a minimum the following is required:

- Maintenance instructions
  - Emergency procedures, including telephone numbers for emergency services, and procedures for fault-finding;
  - Procedures and tasks associated with preventative (routine) maintenance;
  - Step by step procedures for safe trouble shooting, disassembly, repair and reassembly, cleaning, alignment, inspection and adjustment.
- Maintenance schedules
  - Refer to Section 4 - of this document for example schedules. A separate schedule for each type of equipment must be produced, including the following:
  - Frequency of required, recommended and preventative maintenance, testing or inspection for each type of equipment, other than those classified as Essential Safety Provision.

3.9.9 Certificates, guarantees and warranties

The following must be provided:

- All manufacturers warranties and guarantees;
- All certificates from authorities and certificates of compliance must be provided. Where, in agreement with the Project Manager, no manuals will be submitted, these certificates will be presented to the Contractor for inclusion in the Contractor's Manual; and
- Manufacturer's approval of the installing contractor, where product warranty is conditional on the approval of the installing contractor.

3.9.10 Training records

To enable end-user training, the manual must include information about the training that is required for each asset group or piece of equipment and for the project generally. The following must be included as a minimum:

- Maximum number of persons to be trained at one time
- Time to be spent in training
- Number and duration of training sessions to be held
- Anticipated training dates
- Names of the contractor personnel to be involved in training.

Immediately after practical completion, the contractor and specialist sub-contractors must:

- Provide the services of qualified staff to explain and demonstrate to the relevant UoA staff members (as identified by the Project Manager) the purpose, function, operation and maintenance of the installations.
- Record this training with in the operation and maintenance manual for used as the basis for future training on the system.

In addition to this, the following specialist information relating to the various asset type/ disciplines must be included in the manual.

3.9.11 Safe operating procedures (SOP)

The manual (end-user building guide) must record outcomes of the Safety in Design Risk Assessment. This may include Safe Operating Procedures (SOP) that have been developed during the project delivery process. Ensure that the SOP's are incorporated into the End-User Building User Guide and safety inductions.

3.9.12 Cultural awareness training

For projects that have implemented Indigenous heritage initiatives into the design and construction of the building, the manual must include records of the building- user cultural awareness training. Refer Volume B, Building and Architecture clause 3.3.7 for further information. This training and associated manual record, may occur after the manuals are submitted, and may be managed by UoA Project Manager, however space in the manual must be allowed for the documentation to be inserted.

3.9.13 Building user guide

For complicated or large projects, a separate Building-User Guide may be required. This guide would typically be produced by the UoA Project Manager and would be used as a resource during end-user training. It is made up of technical information taken from the manual that is relevant to the end-user/s.

3.9.14 Commissioning data

Project hand over inspection and testing plans (ITPs) must be developed by the consultant/contractor to allow the system to be handed over to the University. Detailed testing and commissioning records must be provided for each system and each component, taking into account the requirements of the Standards. All such records must be witnessed and verified by the UoA-appointed project consultant/ designer.

The following must be included:

- Record of test results.
- Record of commissioning data.

For all new buildings, or where the Project Brief requires it, an independent commissioning agent not involved with the design or construction of the project must be engaged. If this is the case, outcomes of that testing and commissioning must be incorporated into the manual.

3.9.15 Service records

3.9.16 As Built Documentation register

A numbered list of drawings and specification documentation.

Refer to clause 3.5 of this Volume for As-built documentation requirements. Certification of compliance (of the O&M Manual) with the UoA Design Standards, is required in order for UoA approval to be granted for payment of final invoice. Compliance cannot be achieved without the As-built documentation component.

3.9.17 Asset/ Equipment Register

Refer to clause 3.1 of this volume for details, and Section 4. Schedules for asset/ equipment register template.

3.10 Discipline/ Asset Types

Assets identified within the builders / O&M manual must be identified based on discipline/ types and must be aligned with industry standards. Depending on the project complexity, asset types traditionally grouped together, such as Architectural elements or landscape elements, may be contained in one O&M manual. Special information specific to the asset type, and in addition to the information outlined in clause 3.9 above is listed below. Refer also to discipline specific volumes of the Standard for additional special requirements.

1. Roofing
2. Windows and Curtain Walls
3. Doors and hatches
4. Door and window hardware
5. Glazing and internal glazed partitions
6. Classing and waterproofing
7. Finishes and furniture

8. Internal walls and partitions
9. Operable walls
10. Metal fixtures
11. Signage
12. Planting
13. Irrigation
14. Paving
15. Urban elements
16. Electrical Services
17. Telecommunications Services
18. Security services
19. Fire Compartmentation
20. Air handling systems
21. Fire signs and emergency lighting
22. Automatic fire detection alarm and EWIS fire equipment
23. Fire stopping
24. Hydraulic services
25. Vertical transportation
26. Pest control

3.11 Roofing

Special information over and above items listed in clause 3.9 of this Volume, that must be included in the roofing manual, is detailed below.

- Manufacturer's recommendations relating to the maintenance of the roofing system. This may include:
  - Frequency of inspection of roof systems and materials
  - Recommended methods of access to the roof
  - Issues surrounding maintenance to downpipes and gutters
  - Recommended methods of inspection
  - Recommended methods of cleaning
  - Repair issues and,
  - Scheduled replacement period of each material used

- Special information needed
  - Quantity of each roofing material type.
  - Replacement cost per square metre, including demolition, access cost, disposal cost of each material type
  - Walkway systems - drawings
- Warranty
  - Provide a manufacture and installation warranty for the roofing and roof drainage, against any effect or failure which may occur during the warranty period arising out of any fault of the system, workmanship fabrication, fixing or quality of materials used.
  - The Warrantor's liability must include cost of removal and replacement of defective materials, making good any leakage staining or other damage to the building caused by any such defect in or failure, and any defect in or failure of the joints or edge sealing and any defects or failure caused by any inherent property of the roof and roof lights.
  - Refer Volume B. Building and Architecture for warranty periods
  - Check schedule: Metal deck roofing installation warranty: 20 years Metal deck roofing material warranty: 20 years <UoA to confirm roofing schedule content.>

3.12 Windows and curtain walls

Special information over and above items listed in clause 3.9 of this Volume, that must be included in the windows and curtain walls manual, is detailed below.

3.12.1 Warranties

Refer to Volume B. Building and Architecture for warranty periods.

3.12.2 Warranty conditions

- Guarantee of performance: Where the warrantor is a subsidiary of another organisation, submit that organisation's guarantee of the performance of the warranty;
- Product warranties: Submit product warranties which are coextensive with or additional to the terms and warranty period of any manufacturer's published warranty, and do not derogate from any warranty implied by law;
- Adjustment of warranty period: Where any part of the work is required to be repaired or made good under a warranty, the warranty period:
  - Must not terminate until that part has been satisfactorily repaired or made good; and
  - In respect of that part, must recommence from the date of completion of the repair or making good.

3.12.3 Curtain wall warranty

- Warrant against service defects in design, materials and workmanship, including but not necessarily limited to the following:
- Failure to meet performance criteria, including the "acceptable performance criteria" of tests for resistance to wind load, water penetration, air infiltration and collapse
- Structural adhesive failure in either adhesion or cohesion
- Failure of caulking, flashing, or sealing to the building structure.
- Failure of seals which are inaccessible in the curtain wall system as installed in the building.
- Failure of glass or glazing units.
- Excessive deterioration of components and finishes caused by weathering.
- Spandrel glass volatilisation, caused by condensation of vapours trapped in shadow box spandrels.
- Defects consisting of unauthorised departures from the contract documents.

3.12.4 Organic film coating warranty

- Submit the paint manufacturer's warranty for the specified coating, including warranty conditions, if any, applying to conversion coating mass, dry film thickness of paint coatings, and number of coatings.

3.12.5 Joint product warranties:

Submit the following product warranties with, and as part of, the curtain wall warranty:

- Glass manufacturer's warranty.
- Toughened and heat strengthened glass warranty.
- Aluminium framing suite Manufacturer’s warranty including non- standard components i.e. frameless sash windows, if applicable.
- Aluminium finish applicator's warranty: An undertaking by the applicator of the finish to refinish or replace aluminium items where:
  - The finish cracks, peels, or shows pitting or corrosion, discernible from 1500 mm distance, resulting from atmospheric conditions normal for the environment of the installation;
  - When tested to AS/NZS 1580.481.1.2 a coloured finish discolours in service to a degree greater than 2 on the Rating Scale of Table
  - 1 of that standard, compared to an unweathered reference sample; or
  - A colour change in the coloured finish of either or both of any two adjacent sections results in a colour difference between them which exceeds the Rating Scale measure of the range of colour variation accepted in the contract approved colour sample range

3.12.6 As-built drawings

Site-glazed panels must be identified in As-built drawings.

3.12.7 Maintenance log book

Log book pages set up for recording maintenance procedures must be included in manuals. Provide pages sufficient in number to receive the entries for three years. Show examples of typical entries by recording maintenance procedures (such as cleaning) performed during the contract and defects liability periods.

3.12.8 Spares

At or before practical completion, deliver to the University the following materials required for future replacement or repairs, in protective packages, clearly identified:

- Components: The necessary components, including glass, panels, galvanised iron materials, beads and fasteners, to reinstate one glass panel of each type or size, for every hundred panels (or part thereof) of that type or size installed in the building.
- Paint: Where the aluminium components are to be pre-painted with high performance organic coatings or thermosetting powder coatings, spray cans containing air drying paint to match the colour of the pre-painted coating, at the rate of 1 litre to each 2000 m2 of gross curtain wall surface area.

3.13 Doors and hatches

Special information over and above items listed in clause 3.9 of this Volume, which must be included in the doors and hatches manual, is detailed below.

3.13.1 Roller Doors and Grilles

Provide maintenance details as per the schedules in Section 4 of this volume.

Submit the manufacturers published recommendations for use, care and maintenance of all roller doors.

3.13.2 Special information needed

Specify the anticipated useful life of each door type.

Specify replacement cost of each door type, depending upon size.

3.14 Door and window hardware

Special information over and above items listed in clause 3.9 of this Volume, that must be included in the doors and window hardware manual, is detailed below.

3.14.1 As-built hardware schedule

Submit an amended as-built schedule, prepared by the door hardware supplier showing changes to the contract door hardware schedule caused by:

- The approval of a hardware sample
- The acceptance of an equivalent to a specified proprietary item
- A contract variation to a door hardware requirement.

3.14.2 Key codes

Submit the lock manufacturers' record for the key coding system, showing each lock type, number and type of key supplied, key number for re-ordering and the name of the supplier.

3.14.3 Maintenance Manual

Submit the manufacturers published recommendations for use, care and maintenance. This includes details of automatic door controllers.

3.14.4 Special Information

- Replacement cost per unit
- Expected useful life, given normal wear and tear and regular maintenance.

3.15 Glazing

Special information over and above items listed in clause 3.9 of this Volume, that must be included in the glazing manual, is detailed below.

3.15.1 Warranties

Refer Volume B. Building and Architecture for warranty periods.

Submit a warranty, signed by the glazing subcontractor, undertaking to repair or replace any glass and glazing materials which, within the warranty period, become defective or prove unsuitable of the specified application, provided that the manufacturers recommendations for the material have been followed during the warranty period.

- Provide warranty against yellowing or other colour change, loss of strength, impact resistance and general deterioration for 10 years.
- Seraphic glass – warranty against scratching 10 years.
- Glass manufacturer's warranty: IGU units – see specification Coated glass units – see specification
- Toughened glass warranty – The manufacturer's warranty certifying that toughened glass supplied for use in curtain walls has been subjected to a heat soaking process which has converted at least 95% of the nickel sulphide content to the stable beta-phase.

3.16 Cladding

Special information over and above items listed in clause 3.9 of this Volume, which must be included in the Cladding Manual, is detailed below.

3.16.1 Warranties

Refer Volume B. Building and Architecture for warranty periods.

3.17 Waterproofing

Special information over and above items listed in clause 3.9 of this Volume, that must be included in the waterproofing manual, is detailed below.

3.17.1 Waterproofing Warranty

Refer Volume B. Building and Architecture for warranty periods.

Provide a warranty in respect of manufacture and installation of the waterproofing membrane against any and every effect or failure which may occur during the warranty period arising out of any fault of the system, workmanship fabrication, fixing or quality of materials used.

The Warrantor's liability shall include cost of removal and replacement of defective materials, making good any leakage staining or other damage to the building caused by any such defect in or failure, and any defect in or failure of the joints or edge sealing and any defects or failure caused by any inherent property of the waterproofing membrane.

- Waterproofing Warranty Period: Above slab membrane 25 years wet area waterproofing 10 years

3.17.2 Maintenance Manual

Submit recommendations from the manufacturer or supplier for the maintenance of the waterproofing membrane including, frequency of inspection and recommended methods of access, inspection, repair and replacement.

3.17.3 As built documentation

As built drawings must be prepared in conjunction with the membrane manufacturer, showing general plan set-outs and fully detailed installation junctions.

3.18 Finishes and furniture

Special information over and above items listed in clause 3.9 of this Volume, that must be included in the finishes and furniture manual, is detailed below.

The manual must contain the following sections (as relevant):

- Floor Finishes (Carpet, resilient finishes, ceramic tiles etc.)
- Door Mats
- Stair Nosings
- Tactile Indicators
- Internal and External Paint finishes
- Internal Furniture and Fabrics

3.18.1 Floor finishes

3.18.2 Maintenance

In the case of products containing wool ensure manufacturers recommendations are approved by the Australian Wool Corporation.

Provide the tile manufacturers recommendations for procedures to enable continued in-service compliance with the classes of slip resistance for walking surfaces specified in AS/NZS 4586.

3.18.3 Floor finish schedule

Submit a schedule, showing the rooms fitted out, quantity (sqm), floor covering name (proprietary badge), colour, manufacturer, estimated useful life (under normal wear and tear), cost per square metre to replace (including demolition and dumping costs),

Refer Section 4. Schedules of this document for an example Floor Finish Schedule.

3.18.4 External and internal painting

Refer to Section 4. Schedules of this document for example External and Internal Painting Schedule.

3.18.5 Internal Furniture and Fabrics

Submit manufacturer's recommendations for demounting and relocation.

Refer Vol. B Building and Architecture for warranty details for:

- Workstation warranties
- Submitting manufacturer's warranties against defective materials and workmanship for a period of 10 years.

3.19 Internal walls and partitions

Special information over and above items listed in clause 3.9 of this Volume, which must be included in the internal walls and partitions manual, is detailed below.

- Warranty
- Submit the installer's warranty against defective materials and workmanship for a minimum period of 12 months.
- Warrant dry wall partitions to be free from defects in materials and workmanship.
- Include instructions for demounting and relocating partitions where applicable.

3.19.1 Operable walls

Special information over and above items listed in clause 3.10 of this Volume, that must be included in the operable walls manual, is detailed below.

3.19.2 Warranty

Refer to Vol B. Building and Architecture for warranty details.

Submit the installer's warranty against defective materials and workmanship for a minimum period of 3 years.

3.20 Signage

Special information over and above items listed in clause 3.9 of this Volume, that must be included in the signage manual, is detailed below.

- Provide signage schedule for each unique sign type.

Refer to Section 4. Schedules of this document for example schedule.

3.21 Planting

Special information over and above items listed in clause 3.9 of this Volume, that must be included in the planting manual, is detailed below.

- Provide planting schedule including list of plants common name, botanical name and quantity.
- Submit the supplier's written statement certifying that:
  - plants are true to the required species and type, and are free from diseases, pests and weeds;
  - imported soil, fill material and mulch is as specified and is free from diseases, pests and weeds; and
  - recommendation for maintenance of plants

3.22 Irrigation

All elements of the irrigation system must be identified in contract documentation and submitted as part of the As-built documentation must include as a minimum the following information:

Sprinklers.

- Valve boxes.
- All pipework.
- Changes of direction of mainline.
- Intersection points of mainline.
- QCV's.
- Air Valves.

- Isolation valves
- Scour valves.
- Pressure Regulation Valves
- Cable paths.
- Any other significant items.
- Liaise with UoA Service delivery for labelling requirements specific to irrigation systems.

Special information over and above items listed in clause 3.9 of this Volume, which must be included in the irrigation manual as a minimum, is detailed below.

- A laminated irrigation schedule must be provided for inclusion in the grounds control cabinet.

3.23 Paving

Special information over and above items listed in clause 3.9 of this Volume, that must be included in the irrigation manual, is detailed below.

Provide the manufacturers recommendations for care and maintenance of the pavers, including details of:

- Cleaning, including recommended detergents and chemicals
- Repair techniques
  - Replacement schedule
- Inspection frequencies

Refer to Section 4. Schedules of this document for example of paving schedule.

3.24 Urban Elements

Special information over and above items listed in clause 3.9 of this Volume, that must be included in the Urban Elements Manual, includes a schedule of street furniture and urban elements as detailed in Section 4. Schedules 4 of this document.

3.25 Electrical Services

Special information over and above items listed in clause 3.9 of this Volume, that must be included in the Electrical Services manual, is detailed below. Refer also Volume D. Electrical Services for additional information.

Refer to Section 4. Schedules for example formatting of manual.

Colour coding??? Check

Electrical services: Orange.

3.26 Telecommunications services

Special information over and above items listed in clause 3.9 of this Volume, that must be included in the Telecommunications Services manual, is detailed below. Refer also Volume E. Communications Services for additional information.

Refer to Section 4. Schedules for example formatting of manual.

Colour coding??? Check

Telecomm services: light blue

3.27 Electronic Security and Access Control

Special information over and above items listed in clause 3.9 of this Volume, that must be included in the Electronic Security and Access Control manual, is detailed below. Refer also Volume E. Electrical Services for additional information.

Refer to Section 4. Schedules for example formatting of manual.

Colour coding??

Electronic security system: Blue.

3.28 Fire Compartmentation

The following special information over and above items listed in clause 3.9 of this Volume, must be included in the Fire Compartmentation manual. Refer also Volume G. Fire Services for additional information.

- General description of the fire compartmentation provisions and means of egress
- Drawings clearly delineating the fire compartments in accordance with 2.14 of this document.

- Schedule of inspections required in accordance with the BCA, AS 185, including:
  - maintenance of fire protection equipment and AS1905.1 Supplement 1
  - Components for protection of openings in fire resistant walls
  - Logbook for the maintenance of fire resistant door sets.

3.29 Air Handling Systems

The following special information, over and above items listed in clause 3.9 of this Volume, must be included in the Air Handling Systems Manual. Refer also Volume C. Mechanical Services for additional information

- General description of the fire mode operation of the air handling systems.
- Include a schedule of inspections required in accordance with the BCA, AS 1851 – maintenance of fire protection equipment.

3.30 Fire Signs and Emergency Lighting

The following special information over and above items listed in clause 3.9 of this Volume, must be included in the Fire Signs and Emergency Lighting Manual. Refer also Volume G. Fire Services and Volume D. Electrical Services for additional information.

- General description of the fire signs and emergency lighting installed provisions and means of egress
- Include a schedule of inspections required in accordance with the BCA, AS/NZS 2293.2- Emergency evacuation lighting for buildings

3.31 Automatic Fire Detection Alarm and EWIS

Special information over and above items listed in clause 3.9 of this Volume, that must be included in the Automatic Fire Detection Alarm and EWIS Manual, is detailed below. Refer also Volume XXX Fire Services UoA Standards for additional information

Provide separate sub-sections for the following:

- Automatic fire detection and alarm system, including FIP
- Emergency warning and intercommunication system, including Master Emergency Control panel
- Controls and alarms associated with the ESP and smoke management systems
- Electrical and controls systems
- Details of estimated economic useful life of all equipment

3.32 Fire Equipment

Special information over and above items listed in clause 3.9 of this Volume, that must be included in the Fire Equipment Manual, is detailed below. Refer also Volume G. Fire Services for additional information.

Provide separate sub-sections for the following:

- Automatic fire sprinkler system
- Fire hydrant system
- Portable fire extinguishers, blankets and signage
- Jacking pump, controllers etc.

3.33 Fire Stopping

Special information over and above items listed in clause 3.9 of this Volume, that must be included in the Fire Stopping Manual, is detailed below. Refer also Volume G. Fire Services for additional information.

3.33.1 Certificates of Compliance

- Submit evidence of compliance, in accordance with the recommendations of AS 4072.1 Appendix B.
- Submit a completed certification document for installed fire-stopped penetrations and control joints. Use form as per Figure B1 of AS 4072.1 Schedule
- Submit a schedule of installed fire-stopped penetrations and control joints. Use form as per Figure B2 of AS 4072.1

3.33.2 Manual format

Where the fire stopping materials are to be modified in-service, provide a manual with the following subsections:

- Fire stop mortars
- Formulated compound of incombustible fibres
- Fibre stuffing

- Fire-stop composite sheets
- Fire stop foams
- Fire stop putty
- Fire stop collars
- Fire stop pillows
- Labelling

3.34 Mechanical Services

Special information over and above items listed in clause 3.9 of this Volume, that must be included in the Mechanical Services Manual, is detailed below. Refer also Volume C. Mechanical Services for additional information.

Colour?? Check Blue

3.34.1 Manual format

Divide the manual into the following sub- sections as appropriate, to provide for quick reference to the various sections of the installation.

- Air conditioning services and ventilation systems
- Exhaust systems
- Fume cabinets
- Compressed air systems
- Reference to colour coding of pipe work reticulation systems
- Air diffusion and distribution systems
- Sump pumps
- Water treatment systems
- Building Management systems for all mechanical services
- Drawings
  - **Note: It is advisable to provide a separate Manual for the drawings, as it may be impractical to include drawings in the same folder as information.

3.35 Hydraulic services

Special information over and above items listed in clause 3.9 of this Volume, that must be included in the Hydraulic Services Manual, is detailed below. Refer also Volume F. Hydraulic Services for additional information.

3.35.1 Manual format

Divide the manual into the following sub- sections as appropriate, to provide for quick reference to the various sections of the installation:

- Pipework (soil stack risers and vents, trade waste risers and vents, waste pipework, graded drains)
- Fixtures and fittings including connection details
- Potable and non-potable water distribution
- Back-flow prevention devices
- Associated electrical and control systems

3.35.2 Additional information

Provide the following special information:

- Expected useful life of each piece of equipment, material
- Replacement cost of each item or cost per metre of each material used, including demolition, trenching, reinstatement, disposal.

3.36 Vertical transportation

Special information over and above items listed in clause 3.9 of this Volume, that must be included in the Vertical Transportation Manual, is detailed below. Refer also Volume I. Vertical Transportation for additional information.

3.36.1 Manual format

Divide the manual in the following sub- sections as required to provide for quick reference to the various sections of the installation:

- Lift equipment
- Lift well equipment
- Landing equipment
- Lift car and associated equipment
- Electrical end communications equipment
- Control systems
- Permanent guards and rails
- Interface with building access control system
- Lift shaft ventilation grilles
- Any painting, labelling or other identification issues associated with the above equipment
- Other associated work such as electrical interfaces, plumbing, control systems etc.

3.37 Pest control

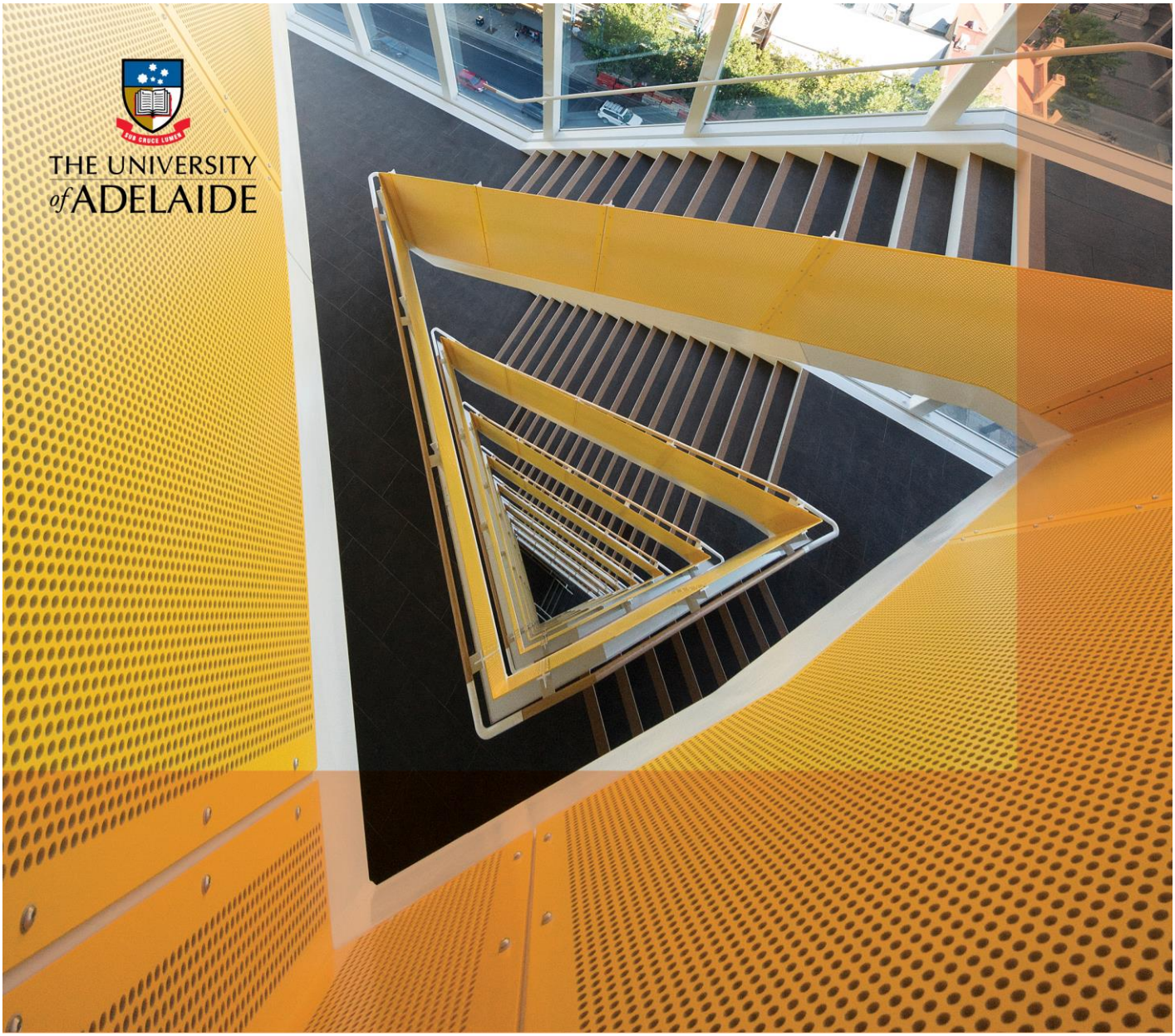
Special information over and above items listed in clause 3.9 of this Volume, that must be included in the Pest Control Manual, is detailed below. Refer also Volume <not sure which Standard(s) this should point to> for additional information. <UoA to confirm/ provide content.>

Provide schedule of all provisions for permanent pest control. Refer to Section 4. Schedules of this document, for example pest control schedule.

3.38 Assets and equipment

<Definition of assets and equipment per Defence definition>

- Asset: Any system or equipment integral to the operation of a space/building/capability that requires regular testing and maintenance (e.g. Switchboards, air-conditioning plant, doors).
- Equipment: Any item or plant that is used in the operation of a space/building/capability that is a consumable product (e.g. lights, chairs, bins)



SCHEDULES

K. Documentation

4. Schedules

4.1 Certification of Compliance with UoA Design Standards and Project Brief

The below templates (or equivalent) must be used to certify compliance with the UoA Design Standards, and Project Brief and disclose any departures for approval.

Project details and schedule of documentation

Project details UoA Project Number (Aconex/ Other)	*e.g. 1234*
Project Name Campus Building Name and Number Location (level and room)	*Amenities Upgrade* *North Terrace (NT)* *Big Building (21)* *Ground (GN) Room 12*
UoA Design Standard technical discipline volume/s certified, including revision *e.g. - UoA Design Standard Volume B Building and Architecture, Rev B;* *- UoA Design Standard Volume F, Hydraulic Services, Rev B*	
Project delivery phase/ purpose of issue (refer UoA Vol A Project Delivery Checklist for phase names) *Contract Documentation 50% Complete / mandatory milestone checkpoint*	
Certification submission date *09/10/2018*	
Schedule of documentation to be certified - *1234- A- NT21- GN12- WD01 – Floor Plan- Rev D- 08/10/2018- Contract Documentation 50% Complete- for approval;* - *1234- A- NT21- GN12- WD02 – Internal Elevations- Rev B- 08/10/2018- Contract Documentation 50% Complete- for approval;* - *1234- A- NT21- GN12- Architectural Specification- Rev C- 08/10/2018- Contract Documentation 50% Complete- for approval;* - *1234- A- NT21- GN12- Room Data Sheets- Rev D- 08/10/2018- Contract Documentation 50% Complete- for approval.* /	

Figure 1. <UoA to insert name>

Statement of compliance and Schedule of departures/ clarifications

Statement of compliance The documentation listed above, complies with all clauses, of all Volumes, of the UoA Design Standards, and with the Project Brief, with the exception of the departures/ clarifications listed below. Exceptions are submitted here for consideration and shall not be adopted until approval is received.	
Signature of certifying person (consultant/ contractor) *A.N. Architect*	Date *08/10/2018*
Contact details of certifying consultant/ contractor *Architects RUs Consultants* *A. Architect (Project Architect)* *Phone number* *Email*	

UoA Design Standard technical discipline Volume, to which departure/ clarification refers
e.g. UoA Design Standard Volume B Building and Architecture, Rev B

Clause	Description	Departure from Standard *and justification*	Approval of A.D. Capital Projects Delivery *signature or email and date*	Approval of Director Infrastructure *signature or email and date*	Status *and direction/ notes*
3.4.5	*Hand dryer and paper towel dispenser*	*Paper towel dispenser proposed in lieu of hand dryer.* *Value management proposal.* *Cost comparison attached.*	*Denied* *(on advice from UoA technical representative)* *Email 10/10/2018*	*N/A* *(denied by A.D).*	*Denied* *Alternative VM options to be investigated*

UoA Project Brief, including revision/ date reference to which departure/ clarification refers
e.g. Return Brief, approved 08/08/2018

Clause/ Reference	Description	Departure from Brief *and justification*	Approval of A.D. Capital Projects Delivery *and date*	Approval of Director Infrastructure *and date*	Status *and direction/ notes*
BR.01	*First aid room*	*Consultative risk assessment identified first aid room is not required.* *Outcomes of assessment attached.*	*Approved* *A.D. Cpd.* *10/10/2018*	*Approved* *D. Infrastrucure* *17/10/18*	*Approved* *Proceed to next phase*
BR.12	*Cooling tower*	*Deletion of cooling tower.* *Value Management proposal.* *Alternative proposal and order of cost attached*	*Approved* *(on advice from UoA technical representative)* *A.D. Cpd.* *10/10/2018*	*Denied* *(alternative proposal failing to meet strategic requirements)* *Email 17/10/2018*	*Denied* *Cooling tower required.* *Alternative VM and funding options to be investigated (during next phase)*

Figure 2. <UoA to insert name>

4.2 Stakeholder approval

The below template (or equivalent written documentation) must be used to record approval of stakeholders at mandatory checkpoints (refer Vol A Project Delivery Checklist). Stakeholders may be:

- UoA need to list stakeholders

Stakeholder approval	
Project Details	
UoA Project Number (Aconex/ Other)	e.g. 1234
Project Name	Amenities Upgrade
Campus	North Terrace (NT)
Building Name and Number	Big Building (21)
Location (level and room)	Ground (GN) Room 12
Project delivery phase/ purpose of issue (refer Vol A Project Delivery Checklist for phase names) e.g. Contract Documentation 50% Complete / mandatory milestone checkpoint	
Schedule of certified documentation/ revision details (or reference to Aconex transmittal) • 1234- A- NT21- GN12- WD01 – Floor Plan- Rev D- 08/10/2018- Contract Documentation 50% Complete- for approval; • 1234- A- NT21- GN12- WD02 – Internal Elevations- Rev B- 08/10/2018- Contract Documentation 50% Complete- for approval; • 1234- A- NT21- GN12- Architectural Specification- Rev C- 08/10/2018- Contract Documentation 50% Complete- for approval; • 1234- A- NT21- GN12- Room Data Sheets- Rev D- 08/10/2018- Contract Documentation 50% Complete- for approval.	
Statement of approval The documentation listed above reflects discussions to date with clarifications/ comments follows	
Comments nil	
Stakeholder UoA Stakeholders may be: • UoA Technical Staff (ITS, Service Delivery, SBI Data Staff, CPD peer-reviewer etc) • End-Users • Other e.g. End-User Name, Title, School	
Stakeholder signature S.Holder	Date 10/10/2018

4.3 ESP Inspection Data

A schedule of the frequency and required or recommended maintenance, testing or inspection for each type of equipment classified as Essential Safety Provision. A separate schedule for each type of Essential Safety Provision equipment is required, including:

Information/data name	Definition of information
Location of the equipment.	Include building number and/or name, level number and/or name, room number and/or name and any other information required for prompt and unequivocal identification
Description of equipment	Describe the equipment
Unique identification label	To be attached to each piece of equipment
Inspection type	Weekly, monthly, 6 monthly, annual, 3 yearly etc.
Maintenance required	Description of maintenance tasks

Note:

Contractors must be aware of the annual requirement for inclusion of the Form 3 Certification regarding Emergency Egress (refer AS1851/SA76), and Exit/Emergency Lighting (AS2293/SA76).

Appendix 6 provides detail of the Form 3 proforma.

4.4 Maintenance Schedule- sample

A schedule of the frequency and required or recommended maintenance, testing or inspection for each type of equipment, other than those classified as Essential Safety Provision. Records to show:

Information/data name	Definition of information
Location of the equipment.	Include building number and/or name, level number and/or name, room number and/or name and any other information required for prompt and unequivocal identification
Description of equipment	Describe the equipment
Unique identification label	To be attached to each piece of equipment
Inspection type	Weekly, monthly, 6 monthly, annual, 3 yearly etc.
Maintenance required	Description of tasks
Inspection Results	Space to record results of each inspection, with sufficient spare space for not less than two years.
Comments on each inspection	Space for comments on each inspection
Inspection date	Space for the recording of the date and time of each inspection.
Inspector name, title, address	Name, title, address and signature of the person performing each inspection.

4.5 Maintenance frequencies- sample

<UoA to confirm/ provide introductory text/ instructions for schedule.>

Equipment description	Weekly	Monthly	Bi Monthly	Quarterly	6 Monthly	Annual
Equipment A	X	X	X	X	X	X
Equipment B		X		X		X
Equipment C		X		X		X
Equipment D			X		X	X
Equipment E		X				X
Equipment F		X				X

4.6 Maintenance schedule- sample

<4.6 has same name as 4.4 but different content. We suggest re-naming.>

<UoA to confirm/ provide introductory text/ instructions for schedule.>

Location (Bldg, level, room)												
Equipment description	January	February	March	April	May	June	July	August	September	October	November	December
Equipment A	B	B	B	B	B	B	B	B	B	B	B	B
Equipment B	C			C			C			C		
Equipment C	B	C	B	B	B	B	B					
Equipment D							A					

4.7 Maintenance tasks

<UoA to confirm/ provide introductory text/ instructions for schedule.>

THE UNIVERSITY OF ADELAIDE MAINTENANCE TASKS						
BUILDING ACCESS AND EGRESS		Service type				
Check and record in log book:		A	B	C	D	E
1	All doors should open freely without the use of a key. If an automatic-unlocking device has been approved, check that the door opens freely when the device is actuated.	▲	▲			
2	All hold-open devices operate correctly.	▲	▲			
3	Treads are stable and non-slip surfaces are in good condition.	▲		▲		
4	All handrails are in good repair.	▲		▲		
5	Obstructions above the rail which would tend to break a handhold.	▲		▲		
6	Handrail is continuous between stair landings.	▲		▲		
COMMENTS A = Annual, B = Monthly, C = 3 monthly, D = bi-monthly, E = Weekly ANY CONCERN REGARDING DISABILITY ACCESS & EGRESS - CHECK WITH THE APPROPRIATE AUTHORITY.						

4.8 Floor covering schedule

Building no., level no., room no(s)	Quantity (sqm)	Floor Covering name (proprietary badge)	Predominant colour(s)	Manufacturer	Estimated useful life (under normal wear and tear conditions)	Cost per square metre to replace (including demolition and dumping costs)

4.9 Asset register

<UoA to confirm/ provide introductory text/ instructions for schedule.>

<Excel doc>

4.10 Asset and equipment

Location	Type
All slab penetrations	Woven stainless steel mesh
All slab control joints and footing/slab joints	Woven stainless steel mesh
Building perimeters – where insufficient clearance between the slab edge and paving level	Woven stainless steel mesh

4.11 Form 3 certification

Form 3

Development Act 1993 Development Regulations 1993-Regulation 76(3a)

CERTIFICATE OF COMPLIANCE WITH MAINTENANCE PROCEDURES FOR ESSENTIAL SAFETY PROVISIONS

To the Municipal or District Council of ……

Reference: Address of building ……..…..

……

Name of owner:……..……...

This is to certify that maintenance and testing have been carried out in respect of each of the following essential safety provisions for the above building in accordance with the standards/codes/conditions of approval as specified in the schedule of essential safety provisions issued in respect of the building on

<Question for UoA: is there an image missing that should be inserted here?,>

Essential safety provisions	Standards/codes/conditions of approval
……	…….
……	…….
……	…….
……	…….
……	…….
……	…….
……	…….
……	…….
……	…….
……	…….
……	…….
……	…….

Signed…… Date……..

…….. (owner or manager of the building)

4.12 Post-construction documentation

	DESCRIPTION OF DOCUMENTATION PROVIDED	PROVIDED	UofA Check
1	As Built - Architectural Documentation		
2	As Built - Capacity Documentation		
3	As Built - Occupancy Documentation		
4	As Built - Space Documentation - UFA		
5	As Built - Space Documentation - GFA		
6	As Built - Space Documentation - GBA		
7	As Built - Space Documentation - NFA		
8	As Built – Structural Documentation		
9	As Built – Services: Mechanical Documentation		
10	As Built – Services: Hydraulic Documentation		
11	As Built – Services: Electrical Documentation		
12	As Built – Services: Fire Documentation		
13	As Built – Services: Vertical Transport Documentation		
14	As Built – Services: other Documentation		
15	As Built – Survey Documentation		
16	Operation and Maintenance Manuals – All Service Disciplines		
17	Operation and Maintenance Manuals – Architectural + Specification		

4.13 As- built documentation checklist

As-Built Documentation CHECKLIST					
Information providers may include external consultants, contractors etc., UoA Capital Projects & Service Delivery					
Document Type (Drawings, Manual, Photos, Report)	Item Number	Document Sub-Type	Requirements / Specification	Consultant Certification	UoA Approved
General	1.01	identification	Critical identification information needs to be included on cover or in the contents - revision, date, author, project location, drawing description, project number, discipline etc.		
General	1.02	scope	All documentation to include condition/ layout/ location information and identification for existing, demolition and new configuration.		
Drawings - CAD	2.01	xrefs	Drawings to have NO xref or external support files, all files to have xref bound		
Drawings - CAD	2.02	layers	All elements within the drawings to be BYLAYER for colour and line type.		
Drawings - CAD	2.03	transmittal	Transmittals of drawings should be done via 'electronic transmission' that includes all support files		
Drawings - CAD	2.04	blocks	All blocks to be created with BYLAYER colours and linetypes.		
Drawings - CAD	2.05	layouts	Layouts - one layout per drawing file (no multiple tabs)		

As-Built Documentation CHECKLIST					
Information providers may include external consultants, contractors etc., UoA Capital Projects & Service Delivery					
Document Type (Drawings, Manual, Photos, Report)	Item Number	Document Sub-Type	Requirements / Specification	Consultant Certification	UoA Approved
Drawings - CAD	2.06	cleanse	All drawings shall be purged and audited, free of errors and surplus information. Any unused drawings elements to be removed.		
Drawings - CAD	2.07	standards for printing	Only standard "A" or "B" sized paper sizes shall be used. (A0, A1, A2, A3, A4 or B1 only)		
Drawings - CAD	2.08	blocks	All blocks of the same type to be named the same		
Drawings - CAD	2.09	areas	All refurbishments - Provide a schedule of overall building areas. UFA, GBA, GFA and NLA. (where areas have been effected)		
Drawings - PDF	3.01	scale	All drawings to have 'sheet' size and scale included in the title block		
Drawings - PDF	3.02	scale	All pdf drawings to be printed at the same size as the title block (i.e. no scale to fit prints)		
Drawings - PDF	3.03	revisions	All drawings to have the date printed/revision included.		

As-Built Documentation CHECKLIST					
Information providers may include external consultants, contractors etc., UoA Capital Projects & Service Delivery					
Document Type (Drawings, Manual, Photos, Report)	Item Number	Document Sub-Type	Requirements / Specification	Consultant Certification	UoA Approved
Drawings - PDF	3.04	drawing numbers	A unique drawing number for every drawing/layout for every job		
Drawings - PDF	3.05	layers	All pdf drawings to have NO layers - i.e. a flattened pdf		
O&M Manuals	4.01	format	All Manuals to be issued as one 'combined' pdf (one file) - including drawings, catalogues		
O&M Manuals	4.02	attachment appendices	Only relevant drawings and schedules etc. to be included		
O&M Manuals	4.03	sections	Include all standard 18 sections of a manual - if a section is not required, grey it out in contents or state that it is not applicable		
Reports	5.01	format	All Reports to be issued as one 'combined' pdf (one file) - including drawings, appendix etc.		
Photos	6.01	identification	Clear description / schedule of contents in photo - i.e. building name/room number/aspect etc.		

As-Built Documentation CHECKLIST					
Information providers may include external consultants, contractors etc., UoA Capital Projects & Service Delivery					
Document Type (Drawings, Manual, Photos, Report)	Item Number	Document Sub-Type	Requirements / Specification	Consultant Certification	UoA Approved
Photos	6.02	file size	Provide hi-res and low-res version of each photo, where files size over 3MB		
As Built Documentation	7.01	services	Underground Services - UGS - all effected services - all rework, new and connections into existing services		
As Built Documentation	7.02	services	Fire Block Plans - FPB/ESP - all upgrades from project, all fire protection equipment with zone, loop, sensor		
As Built Documentation	7.03	services	Services - all upgrades from project		
Mark Ups	8.01	format	All mark ups of UofA Published drawings shall be completed on the current / latest revision of the drawing.		

4.14 External and internal painting schedule

LOCATION: Site, Building, Floor, Room

ELEMENT	PRODUCT TYPE	FINISH - COLOUR
External free standing walls		
External walls, shade structures		
External walls (general)		
External walls (feature)		
Internal walls (general)		
Internal walls (feature)		
Doors (including toilet partitions)		
Frames and stair balustrades		
Ceilings and bulkheads		
Floors (if painted)		
Concrete sealer		
Line marking		
Clear penetrative sealer		Clear
Other painted surfaces		

4.15 Internal furniture and fabrics

Submit manufacturer's warranties against defective materials and workmanship for a period of 10 years.

ELEMENT	PRODUCT TYPE	COLOUR	SIZE - QTY
Fabrics			
Fabrics General 1,2,3			
Fabrics Feature			
Pin board Fabrics			
Other			
Joinery Finishes			
Joinery Laminate 1, 2, 3			
Other			
Window Treatments			
Blinds 1, 2, 3			
Other			
Furniture			
Chairs 1, 2, 3			
Tables 1			
Other			

4.16 Signage schedule

Location	Building number, level number, room number. Note: When recording multiple signs of the same type, record building number and level number only.
Sign description	Words or symbols on sign (except for room numbers, where the words "Room Number" will suffice).
Number of signs	Quantity (if multiples of the same type)
Sign type	Directional, regulatory or interpretive. ** Note that if there is more than one type of the same sign in various locations, then these may be grouped together as one record, with the quantity recorded.
The University of Adelaide Specification	Reference to any sign specification number unique to THE UNIVERSITY OF ADELAIDE (Refer to The University of Adelaide Signage Manual)
Sign size	Height and width (mm).
Sign material	Steel, aluminium, PVC, polycarbonate etc.
Sign finish	Luminescent, gloss, etc.
Manufacturer	Name, address, phone number and other relevant contact details of manufacturer.
Supplier	Name, address, phone number and other relevant contact details of supplier.
Warranties	Type and term of warranties
Special Information	List of spare parts Special tools required

4.17 Paving schedule

Provide a paving schedule, outlining the following detail.

Precinct or Location	Paver Name	Paving type	Quantity	Colour and finish	Manufacturer

4.18 Urban elements schedule

Location	Street name, precinct
Type	BBQ, Bubbler, bench, table etc.
Quantity	Number (count)
Model No. or Name	Model number or name given by manufacturer or supplier
Special finishes	Varnish on timber, paint, natural etc.
Manufacturer	Name and contact details of manufacturer
Supplier Details	Name and contact details of supplier
Warranties	Type and duration of warranty (including valves)
Special treatments needed	Description of any special treatments needed for the equipment.
Comments	Any other information