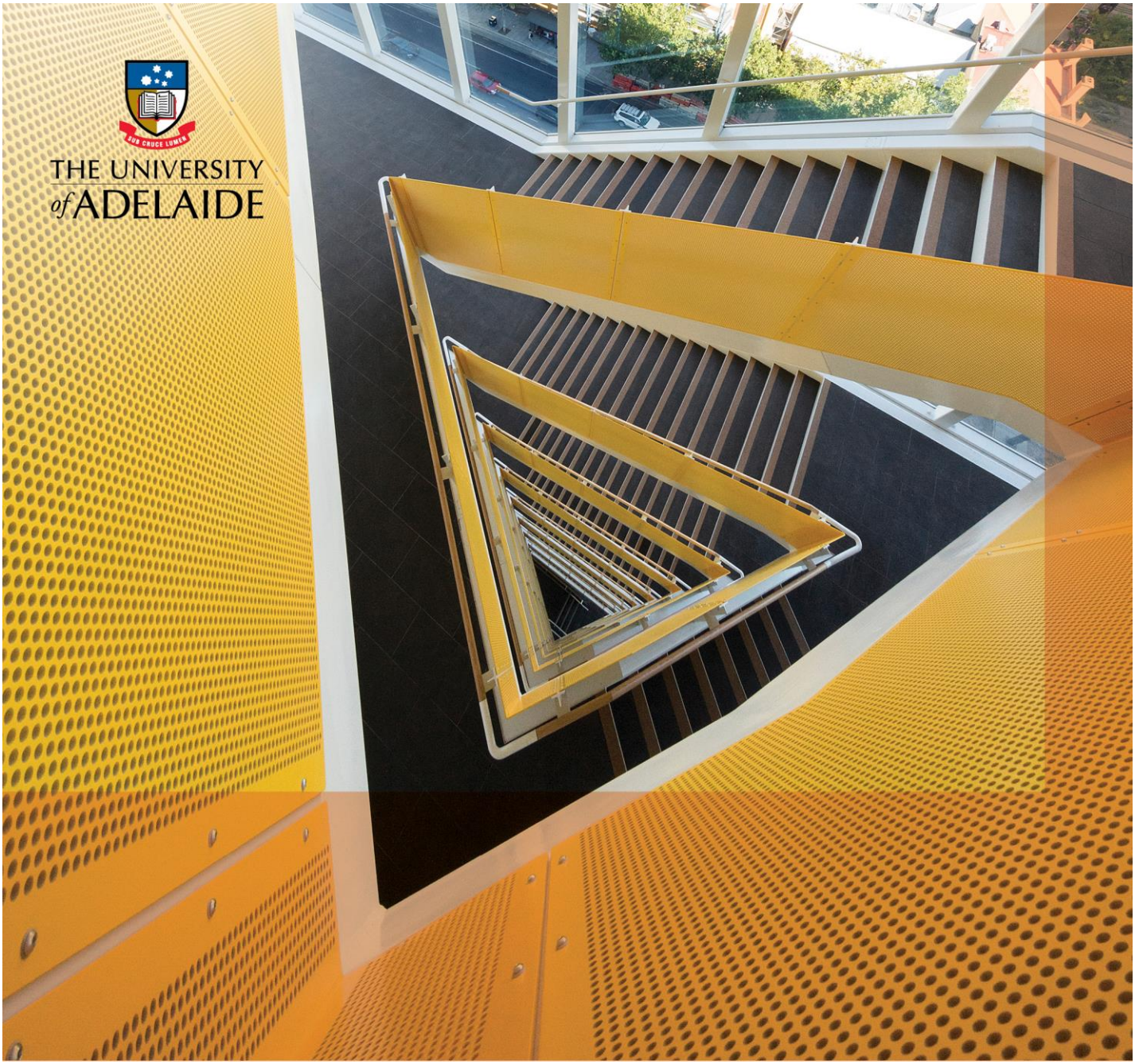


DESIGN STANDARD

G. Fire Services

adelaide.edu.au

seek LIGHT

Contents

Revision log

Current issue

G. Fire Services - UoA Design Standards. FINAL Version 4 August 2018.

Previous issues

Version	Authors	Description	Revision	Date
1.0	John Edge, UoA Service Delivery, UoA	G. Fire Services - UoA Design Standards	DRAFT Version 1	December 2017
2.0	John Edge, UoA Service Delivery, UoA / GHD	G. Fire Services - UoA Design Standards	DRAFT Version 2	December 2017
3.0	GHD	G. Fire Services - UoA Design Standards	DRAFT Version 3	March 2018
4.0	Vicki Jacobs, Capital Project Delivery, UoA / GHD	G. Fire Services - UoA Design Standards	FINAL Version 3	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

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
AV	Audio Visual
BCA	Building Code of Australia
BMCS	Building Management and Control Systems
CCA	Building Code of Australia
CM	Campus Management
CPD	University of Adelaide- Capital Projects Delivery
DDA	Disability Discrimination Act
DFES	Department of Fire and Emergency Services

Abbreviations continued

DTS	Deemed to Satisfy
DVC	Digital Voice Command
ELV	Extra Low Voltage
FIP	Fire Indicator Panel
FRL	Fire Resistance Level
FSER	Fire Safety Engineering Report
GWI	Galvanised Wrought Iron
IT	Information Technology
LED	Light Emitting Diode
NCC	National Construction Code
OSH	Occupational Safety and Health
SEPP	State Environmental Planning Legislation
SiD	Safety in Design
UBBL	Uniform Building By Law
UoA	University of Adelaide
UOA	the University of Western Australia
VLAN	Virtual Local Area Network
WHS	Work, Health and Safety

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
- 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

G. Fire Services 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 (this document)
- H. Security Services
- I. Vertical Transport
- J. External Works
- K. Documentation
- 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 Design Standard.

Each volume within the Standards 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
Project Brief	The strategic brief detailing project scope and objectives, developed at the project feasibility and initiation phase, from which the Return Brief shall be developed.
Return Brief	The detailed design brief prepared by the Design Team and signed off by the Project Stakeholder/s prior to commencement of Concept Design

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 A. Project Process 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

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:

- Value management (VM) session; followed by
- 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:

1. Meets the requirements of the Design Standard
2. 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:

- The requirement for the designer to certify/ rate/ measure the proposed design solution prior to construction; and
- 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 G. Fire Services UoA Design Standards.

3.1 Fire safety services scope

Fire safety services covered in this document include:

- Detection and occupant warning system
- Fire hydrant
- Fire hose reel
- Fire sprinklers
- Fire Deluge
- Specialised firefighting system (Gaseous Flooding)
- Fire Foam Suppression
- Single and Double interlock assemblies
- Dry Fire Sprinkler
- Fire extinguishers
- Fire doors
- Smoke detection (inclusive of aspiring smoke detectors)
- Smoke doors
- Fire and smoke dampers
- Smoke seals
- Smoke exhaust
- Fire services interface

3.2 Standards and codes

All designers are required to confirm compliance to the standards and justify with written evidence for any proposed deviations to the standards. Additionally, all proposed deviations (regarded as engineering solutions) shall be to the satisfaction of AHJ (authority having jurisdiction) and the first fire respondent (in this case SAMFS South Australian Metropolitan Fire Service).

All fire safety works shall comply with current Statutory Regulations, Australian Standards, Supply Authority regulations and any other Authority having jurisdiction over the works or portion of the Works. Examples of these are:

- Australian Standards
- Telecommunications Cabling Provider Rules 2000 (as amended)
- Regulations and requirements of the local Supply Authority
- Building Code of Australia
- Department of Fire & Emergency Services (DFES)
- Any other regulations that apply directly or indirectly to such installations in the locations.

Where Australian Standards and Codes do not exist, the relevant International Standard or Code shall apply.

Where conflict arises between this document and any of the applicable Acts, Codes or Standards, the highest standard of materials and workmanship shall prevail.

A list of references is provided in the References section of this document.

3.3 NCC compliance

Under the current legislation, buildings shall comply with the requirements of the National Construction Code (NCC) either via the Deemed to Satisfy (DTS) Provisions or on a performance basis via Performance Solutions.

A number of buildings on the campus are subjected to previous Performance Solutions. Prior to undertaking design, construction or maintenance, check with UOA to ascertain if there are any Alternative Solutions applicable to the building. Where Alternative Solutions are present, ensure a UOA approved fire engineer is consulted (via UOA) to ensure there are no implications on the previously approved Solutions.

Where the building is a DTS compliant building, ensure fire safety systems comply fully with the CCA and referenced standards.

Older buildings are likely to comply only with DTS Provisions of an earlier version of the CCA or the Uniform Building By Law (UBBL). Where works are undertaken in the building, ensure system is upgraded as far as practicable to comply with current DTS requirements and standards. Where this is not practical, liaise with UOA approved fire engineers to address issues on a performance basis (i.e. Alternative Solutions) as appropriate.

Where a building design involves Alternative Solutions, a copy of the Fire Safety Engineering Report (FSER) shall be handed over to UOA for record. All FSERs shall clearly outline the following in a separate section to the main section of the report:

1. Specific Non-compliance
2. Fire safety strategies
3. Specific maintenance and Management In Use requirements

Requirements from the FSER which requires specific fire system design which is over and above CCA requirements shall be clearly outlined for coordination with services consultants.

3.4 Baseline data

In accordance with AS 1851, base line data for all fire safety systems shall be clearly documented in the As-Built documentation. The information shall be used as a basis for all maintenance works in accordance with recommendations outlined in AS 1851.

3.5 New or replaced equipment

Where new equipment is installed or replaced, ensure information is provided to UOA for update of the maintenance and asset register (i.e., Maximo database). This shall include operation and maintenance manual and as-built drawings. Consult with UOA regarding the format of the asset register required.

3.6 Fire detection system

3.6.1 General

The existing detection system serving the overall UOA campus currently consists of a mixture of brands and is of different capabilities. The intent in the long run is to have a standardised system throughout each building on the campus. This will in turn provide the benefit of a more standardised maintenance approach and the ability for the site wide panels to be networked.

The following is a summary of the various brands and types of systems currently installed on the campus.

Table 1 - Existing Fire Detection Systems at UoA

Brand	System Type
Notifier	• Currently the main brand installed • Mixture of addressable and conventional systems • Oldest panel dating back to 2000 (15 years) • Some system are DVC ready but a number of system are not
Siemens	• Currently only installed in 3 buildings • No information available for this system • System is likely to be addressable
Simplex	• Currently only installed in 2 buildings • No information available for this system • System is likely to be addressable
Vigilant	• Currently only installed in 5 buildings • No information available for this system
Ampac	• Currently only installed in 3 buildings • No information available for this system but likely to be conventional system
FFE	• Currently only installed in 5 buildings • No information available for this system but likely to be conventional system

A summary of the fire detection systems currently installed (as of August 2016) is detailed in Appendix A of this document.

The university is in the process of working towards a networked FDCIE and EWIS (Emergency Warder Intercon System), therefore consideration must be given to allow for the ability of existing panels to interface with all systems. It is noted here vast majority of FDCIEs are Ampac Fire Finders, whereas EWIS panels are Vigilant QE90. All new panels will require a minimum of 30% spare capacity for future expansion, network capable and backwards compatibility.

North Terrace, Roseworthy and Waite campuses: All FDCIE / EWIS alarms and faults are signalled through to the Fire Brigade via a single ROMTECK Concentrator and therefore FIP's and EWIS panels on these 3 sites will be capable of communicating with the concentrator. Additionally, all alarms and faults will need to be relayed to security via the SIPAS system.

All other sites shall signal direct through to the Fire Brigade and Security's SIPAS system

UoA's requirement is to have all new and replaced systems installed as Notifier. This is to allow a site wide high level interface. All new FDCIEs must allow for connection to UoA V-LAN site network.

Where refurbishment works occur, ensure existing zone plans are updated to reflect any changes.

All detectors are to be selected and located in a manner which allows easy access for maintenance. All new fire panels must be able to provide 130% of the projects requirements.

All thermal or smoke detectors placed within concealed spaces must be provided with a remote indicator.

Automated closing of fire or smoke doors shall only occur from alarm within the respective zones.

Cabling systems for Fire Detection and Alarms systems, smoke control and the like should be separate from other ELV cabling. Naming protocols, routing and containment for this cabling should be installed to the same standard as, and coordinated with, the requirements for Communications Systems. Refer UoA Design and Construction Standards – Communications Services.

3.6.2 Occupant warning system (OWS)

The occupant warning system currently installed on the campus provides only localised warning within each building. However, a number of newer systems have been installed with the capability to interlink all systems to allow a campus wide evacuation strategy should the need arise. The capability involves inclusion of a site wide digital voice command (DVC) function to fulfil this requirement.

The full capability of the existing system is currently not realised as the system will need to be networked and a front end terminal will need to be installed within the campus security control room for control of individual panels. However, all new systems shall allow for this capability.

The Occupant Warning System should be coordinated with the other communications sound systems, such as AV, public address and IT. Wiring should be separate from the other communications systems.

All new OWS systems have 30% spare capacity, or 130% of the project's requirements.

Consideration must be given to the location of OWS speakers, they shall be clear from WIP phones to allow clear communication during an emergency event (i.e., during transmission of alert and evacuation tones).

3.6.3 System interface

A fire interface matrix shall be provided for all projects to ensure that connections between services are clearly outlined. Examples of these include:

- Mechanical system fire mode operation.
- Electric door lock release (where required).
- Emergency warning and intercommunication system.
- Fire or smoke curtains

In cases where there are Alternative Solutions, requirements from the Fire Safety Engineering Report (FSER) shall be accounted for in the system interface with a clear reference to the specific FSER.

Where the fire detection systems interface with other building systems ensure the new systems accommodate these interconnections and maintain reliable modes of operation.

3.6.4 Direct Brigade Alarm (DBA)

The fire detection system is to be linked into the DFES monitoring system where required or unless otherwise advised.

Liaise with DFES regarding the modification of the existing monitoring systems and pay any associated costs.

3.7 Block Plans

Fire Detection Control and Indication Equipment (FIP) must be supplied with 2 off copies of the block plans (wet and dry systems). This shall be part of an interim measure where the installing contractor will be required to replace these block plans with the university of Adelaide's drawings.

If any engineered solutions have taken place for a specific project these must be consolidated and placed within the panel housing.

In some circumstances detectors that do not trigger a fire alarm but carry a fire control function shall be part of the block plans.

All internal block plans shall be engraved Traffolyte situated adjacent to FDCIEs and Sub-FDCIES. All external block plans shall be etched in on a metal plate and situated within the fire booster cabinet.

Block plans must indicate all fire zones, WIP locations, isolation valves, exits, and all fire equipment locations and a standardised "YOU ARE HERE" symbol.

3.8 Fire hydrant and fire hose reel system

3.8.1 Hydrant

The entire installation to be installed is to comply with AS 2419.1 and tested to the requirements of DFES. Within the Crawley site, UOA utilises irrigation water for the hydrant water supply. This system is in place for hydrants for the Reid Library, Business School, Barry J Marshall Library and the Indian Ocean Marine Research Centre. Any new development on the Crawley site requiring a hydrant service shall connect to the irrigation network where practical. This removes the requirement for firefighting tanks. Fire booster pumps will still be required. It is noted here campus system will be required to be activated for testing purposes.

Prior to the commissioning of a new fire system, DFES is to be contacted and a booster test is to be organised. UoA Campus Management is to be made aware of the booster test to ensure testing is integrated with the fire/irrigation system.

External fire hydrants shall be supplied from campus mains water ring main unless required to be integrated to a building boosted system.

The builder / plumbing contractor shall be responsible for contacting DFES and UoA to organise a booster test and to coordinate the integration into the existing fire / irrigation systems.

External fire hydrants to be Galvin Engineering 65mm Sydney pattern type with top BIC coupling, red plastic protection cap and brass securing chain. Provide and install galvanised chain with heavy duty Lockwood type padlocks to hydrant wheels to prevent opening of hydrants by unauthorised persons. Hydrants shall be dual type mounted on a single 100 diameter steel riser and fixed to a GWl purpose made hydrant support frame concreted in-ground. Bollards to be provided as required and fitted with identification reflectors. Additionally, permanent pressure gauge shall be provided indicating water pressure (in kPa) at each hydrant.

Externally exposed fire hydrants must be fitted with anti-tamper devices to prevent vandalism or un-aided opening of the valve by member of the general public.

Internal fire hydrants to be Galvin Engineering 65mm Sydney pattern type with top BIC. Internal fire hydrant riser shall be provided with isolation valves to satisfactorily isolate the system floor by floor.

3.8.2 Fire hose reels

The system shall be compliant with AS 2441. Fire Hose Reels to be Galvin Engineering 36 metre swing fire hose reels with fixed water ways and swing guide arm.

Fire hose reels located within cupboards to be Galvin Engineering 36 metre swing fire hose reels with flexible water ways mounted on galvanised bolted down mounting post. Install GE-507040 wall mounted swing arm. Fire hose reels located on walls other than masonry are to be reinforced to be capable of withstanding a force of 1kN and in accordance with AS/NZS 1221.

On completion, fire hose reels are to be tagged as per AS 1851.1. As per AS 1851.2, fire hose reels are to be inspected and serviced at each 6 month intervals until end of defect liability. Records of such shall be forwarded to UoA.

3.8.3 Pipework and valves

All wet fire services mains and ring mains isolation valves shall be readily accessible via access panel or in-path valve boxes.

In ground fire service pipework and valves shall be as follows:

- 25 to 63 diameter inclusive - PE Auspex
- 100 diameters and over - ACUTEC PE PN16
- Valves 25 – 50 inclusive to be stainless stell ball, stem and handle.
- Valves 100mm or larger to be Norcast Rislan" nylon 11" coating as standard, with key head.

All valves to be located in 250 mm x 250 mm cast iron valve box painted white with "Fire" embossed in cover.

Secure bracketing must be provided 300mm either side of all rolled grooved couplings large than DN65 in diameter.

3.9 Sprinkler and drencher systems

3.9.1 General

Compliance is required with the following Australian standards:

- AS 1851 - Maintenance of Fire Protection Systems and Equipment
- AS 2118.1 - General
- AS 2118.2 - Drenchers
- AS 2118.3 - Deluge Systems
- AS 2118.4 - Residential

Automatic sprinkler system signals shall be connected to the UOA BMCS, with the following signals required to be provided, sprinkler alarm, sprinkler isolate, sprinkler pump, running, sprinkler pump fault, sprinkler pump low fuel level, sprinkler stop valve closed. Where a FDCIE is installed within the building these signals shall also be connected to the FDCIE and provided with individual LED indicators.

Where works are undertaken, ensure all on site documentation and equipment required by AS 2118.1 and AS 1851 are revised and/or provided to suit all system refurbishments and new works. This includes but is not limited to the provision of block plans, fire system interface diagram/matrix, pressure gauge schedules, water supply information, spare sprinklers and spanners.

The sprinkler control valves shall be located in a position accessible to responding Brigade appliances. Clear directions to the sprinkler control valve location shall be posted adjacent the FDCIE. A location plate indicating the position of the sprinkler control valves shall be installed on the outside of an external wall.

All sprinkler heads to be located in habitable areas of the University buildings shall be fast response unless deemed unsuitable for project specific requirements.

All flow switches downstream of the alarm check valves must include a solenoid to allow for remote testing. Additionally, these flow switches shall have a screw adjustable delay mechanism.

The designer must provide a clear schematic of all fire control valves, they must be tagged appropriately representing fire zone controls they operate in. This is in addition to the fire block plans.

The wet fire sprinkler system must be provided with a test and drain line. Consideration must be given to the location of test and drain line to enable safe disposal of fire water. Allow for a permanent hose connection fitting to allow for line testing.

A 240V power supply shall be suppled from the nearest distribution board for all new installations. However, consideration must be given to project specific electrical loads, where additional load maybe required for operation of fire equipment.

3.9.2 Water supplies

When designing and installing new fire sprinkler systems, or upgrading existing systems, the existing water supply pressure/flow shall be tested with results incorporated into design. It is imperative that the building hydrant demand is allowed in addition to the building sprinkler demand to ensure that both systems can operate simultaneously from the water supply provided to the building.

All fire services test water shall discharge into on site soak wells or back to storage tank when applicable.

Test drains, sumps and soak wells of appropriate size shall be provided to enable water flow testing.

3.10 Specialised extinguishing system

Some communications, data and electrical rooms may require specialised extinguishing system which is not addressed in the CCA. Where this is required by UoA to protect equipment, the design shall comply with relevant manufacturer's requirements. Prior to nominating the specific extinguishing system, consideration shall be given to budget, type of equipment, space constraints and maintenance costs.

Where a multi-point aspirated detection system is required to activate the system, the design shall comply with AS1670.1 and manufacturer's requirements.

3.11 Portable fire extinguishers

3.11.1 General

Portable fire extinguishers shall be selected, located and distributed in accordance with AS 2444. Dry powder extinguishers shall be provided unless specific risks (e.g., cooking oil fires) warrant a different type of extinguisher in the location of the hazard. All extinguishers shall be signed in accordance with AS 2444.

Extinguishers shall be sized to ensure they do not exceed 5kg in overall weight to ensure it is useable by majority of occupants.

3.12 Mechanical system

3.12.1 Smoke exhaust system

Smoke exhaust fans shall be selected and sized to comply with NCC Specification E2.2b requirements. Smoke baffles shall also be provided to comply with NCC requirements.

Where a performance based exhaust system is to be provided, a copy of the Fire Safety Engineering Report shall be provided to UoA for record purposes.

All non-essential mechanical system shall shut down in the event of fire.

In cases where magnetic hold open and release devices are to be utilised for doors (wall or floor mounted magnets), a manual release button must be provided mounted no higher than 1200mm on the adjacent wall.

3.13 Passive fire barriers

3.13.1 Fire and smoke barriers

All fire and smoke walls shall comply with CCA requirements and the relevant standards as follows:

- Fire wall – Comply with AS 1530.4 to achieve a FRL
- Smoke wall – Comply with AS 1530.1 as non-combustible
- Floors – Comply with AS 1530.4 to achieve a FRL

All services penetrations through a fire wall shall be sealed in accordance with CCA C3.15.

All services penetrations through a smoke wall shall be sealed with appropriate fire rated mastic seals.

The area of works shall be clearly labelled and marked with the following information:

- Standards the system is compliant with (i.e. AS 1530.4 and AS 4072.1)
- FRL of the system
- Name and contact details of the installer
- Installation date
- Reference number for the specific area
- Name and contact details of the manufacturer

The following figure is an example of the expected label.

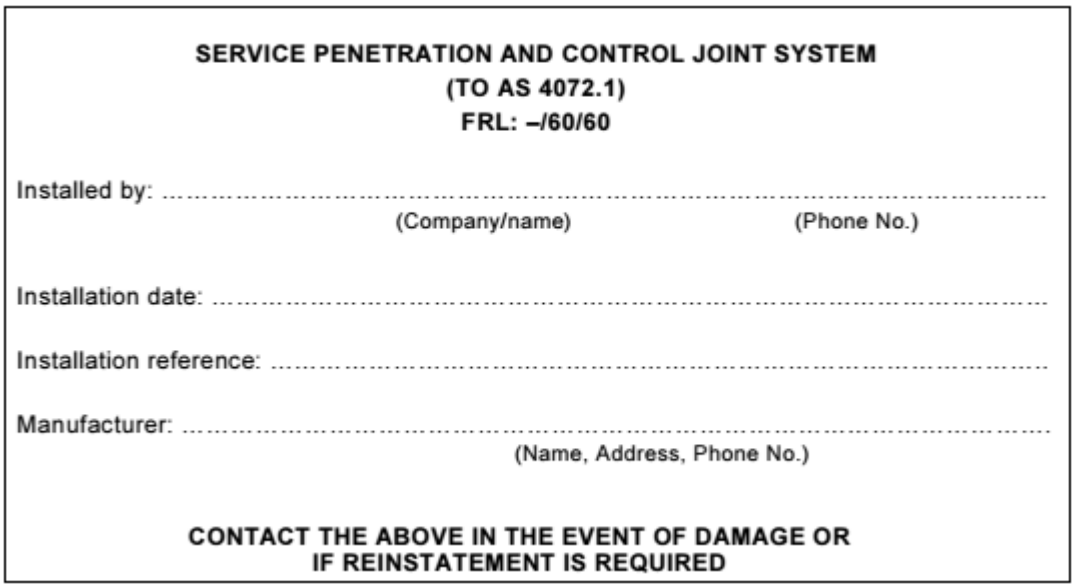


Figure 1 - Service Penetration Label

3.13.2 Documentation

Upon completion of the works, the area of works shall be inspected to ensure satisfactory completion. The Contractor is required to provide documentation as per AS 4072.1 as follows:

- The system used is identical with the tested specimen; AND
- The system has been correctly installed in accordance with the manufacturer's specification

In addition to the above documentation, the Contractor shall provide a record of each installation which outlines the following information as noted in AS 4072.1:

- Name, address and contact details of installation company
- Date of final inspection
- Description of system
- Identification of the position of the installation on a drawing
- Photo

3.13.3 Fire dampers

Fire dampers shall be constructed and installed to meet all requirements of AS 1682 and AS 1668. Manufacturer certification of compliance is required.

The free area of any fire damper shall not be less than 85% of the adjoining duct area. Where necessary the duct size shall be increased above the nominal airway size of the adjoining ductwork to accommodate the fire damper and access openings in the duct to enable the fusible link to be replaced and the damper operation checked.

Fire dampers shall not be used for air volume control.

Fire dampers in stud walls, which have not been tested when assembled in that type of wall, shall be independently supported from the soffit of the floor above. Fire damper supports shall be contained within the thickness of the stud wall. Welding these supports to the fire damper is not acceptable.

All dampers above ceiling shall be clearly labelled on the ceiling via a tag or via other means appropriate to UoA.

Dampers shall be located in an accessible location to allow testing and maintenance.

3.13.4 Smoke dampers

Air volume control dampers used for smoke control shall comply with the requirements of AS/NZS 1668.1.

All dampers above ceiling shall be clearly labelled on the ceiling via a tag or via other means appropriate to UoA.

Dampers shall be located in an accessible location to allow testing and maintenance.

3.13.5 Fire doors

Fire doors shall be manufactured and installed in accordance with AS1905.1. Doors shall be tagged on the door frame and door leaf as required under AS1905.1.

Where existing fire doors in refurbishment type projects are not tagged, they shall be core tested to verify fire resistance level (FRL) or where this is not possible, the door and frame shall be replaced.

3.13.6 Smoke doors

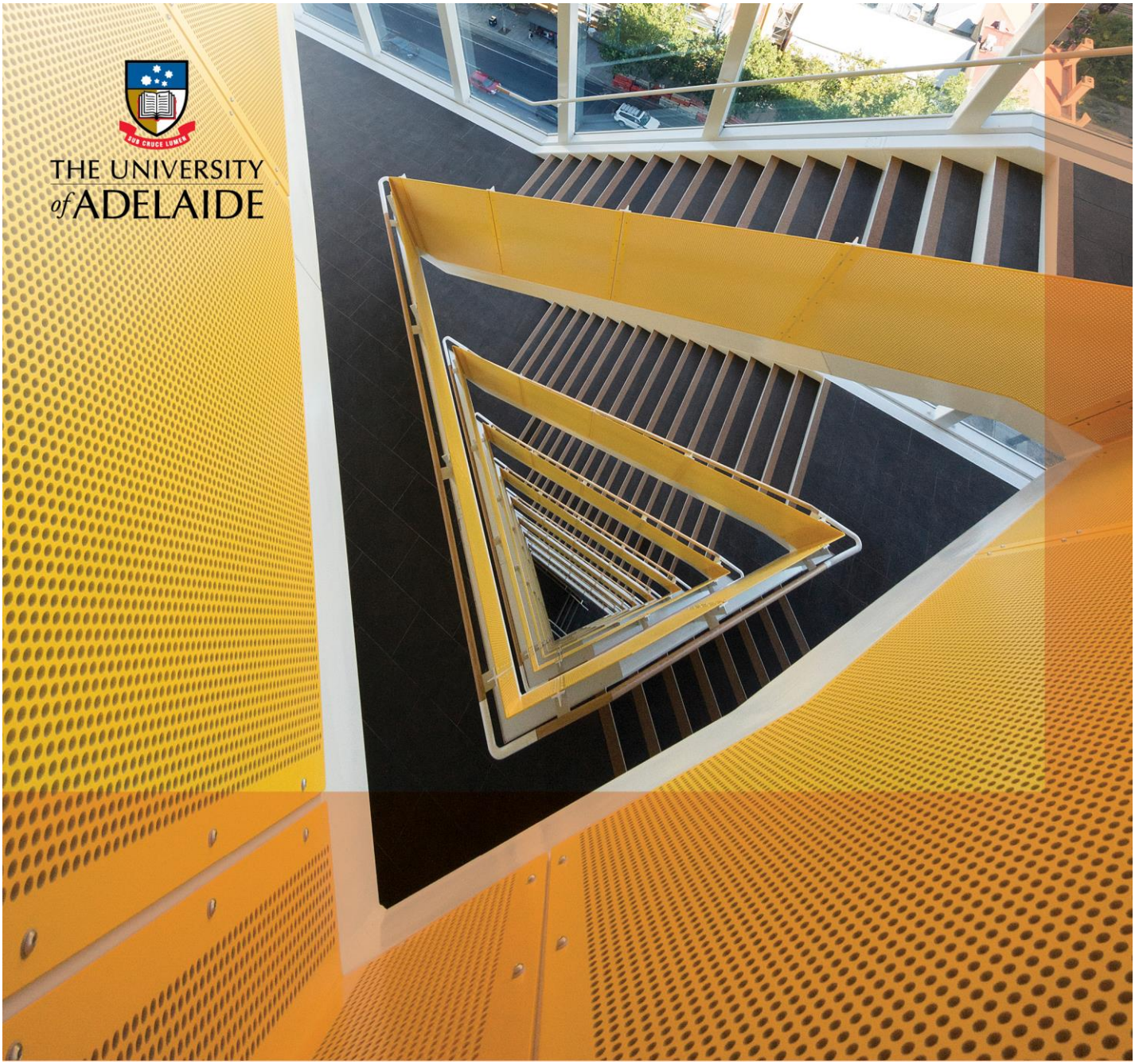
Smoke doors shall be compliant with CCA requirements to be at least 35 mm solid core. Smoke seals shall be at least medium temperature seals able to withstand temperatures of up to 200oC.

All smoke doors shall be labelled either via door tag or signage on the door.

3.13.7 Fire and smoke curtains

As fire and smoke curtains are not a Deemed to Satisfy (DTS) method of protecting openings in buildings under current NCC requirements, they shall be confirmed for use by a fire safety engineer. Justification to allow its use shall be outlined in a Fire Safety Engineering Report.

Location of fire and smoke curtains shall be clearly indicated via signage to ensure it is not obstructed from closing.



SCHEDULES

G. Fire Services

4. Checklist for project team

Activity	Responsibility	Stakeholder(s)	Timeframe
Determine if the building or area of works has previous Performance Solutions.	**Services consultants**	**CM (Engineering Services) / CM (Building Operations)**	**Gate 2 Feasibility**
Consult with UOA approved Fire Engineer to ascertain impact on previous solutions.	**Services consultants**	**CM (Engineering Services) / CM (Building Operations)**	**Gate 2 Feasibility**
Determine if an upgrade to current Australian Standards is required for works in existing buildings.	**Services consultants**	**CM (Capital Works)**	**Gate 2 Feasibility**
If not possible to comply, consult with UOA approved fire engineer to ascertain possible Performance Solutions.	**Services consultants**	**CM (Engineering Services)**	**Gate 2 Feasibility**
Provide baseline data for all fire safety systems to UOA	**Services consultants / Contractor**	**CM (Engineering Services) / CM (Building Operations)**	**Gate 3 Planning**
Fire Engineering Where Alternative Solutions are prepared, ensure a copy of FSER is provided to UOA for record.	**Contractor**	**CM (Building Operations)**	**Gate 5 Construction**
Fire Engineering Ensure FSER clearly outlines information in a separate section outlining list of non-compliances, fire safety strategies, maintenance requirements and Management in Use requirements	**Contractor**	**CM (Building Operations)**	**Gate 5 Construction**
Detection System Ensure detection system is Notifier panel with network capability	**Services consultants / Contractor**	**CM (Building Operations)**	**Gate 3 Planning**
Detection System Ensure interface to all existing systems has been retained	**Services consultants / Contractor**	**CM (Building Operations) / CM (Security)**	**Gate 3 Planning**
Detection System Ensure system been programmed to interface with other fire safety system including: Mechanical system shut down Secured doors unlocked Occupant warning system activated Fire/smoke curtains closing Smoke fans or vents activating.	**Services consultants / Contractor**	**CM (Building Operations) / CM (Security)**	**Gate 3 Planning**
Occupant Warning System Ensure system has been provided with a digital voice command (DVC) capability.	**Services consultants / Contractor**	**CM (Building Operations) / CM (Security)**	**Gate 3 Planning**
Fire Hydrant System Ensure system is compliant with AS 2419.1.	**Services Consultant / Contractor**		**Gate 3 Planning**

Activity	Responsibility	Stakeholder(s)	Timeframe
Fire Hydrant Water Supply Coordinate with UOA to test fire / irrigation system.	**Services Consultant / Contractor**	**CM (Engineering Services) / CM (Building Operations)**	**Gate 3 Planning**
Fire Hose Reel System Ensure system complies fully with AS 2441.	**Services consultants / Contractor**		**Gate 3 Planning**
Fire Extinguisher Ensure dry powder provided unless risks require alternative extinguisher	**Services consultants / Contractor**	**CM (Engineering Services) / CM (Building Operations)**	**Gate 3 Planning**
Fire Extinguisher Ensure extinguishers are of appropriate weight not exceeding 5kg.	**Services consultants / Contractor**	**CM (Engineering Services) / CM (Building Operations)**	**Gate 3 Planning**
Mechanical Fire System Ensure smoke exhaust fans are selected and sized to comply with NCC Specification E2.2b requirements	**Services consultants / Contractor**		**Gate 3 Planning**
Passive Fire Barriers Ensure barrier complies with AS1530.4 for fire barriers or is considered non-combustible for smoke barriers.	**Services consultants / Contractor**		**Gate 3 Planning**
Fire / Smoke Walls Tag walls as per requirements outlined in this document.	**Contractor**	**CM (Building Operations)**	**Gate 5 Construction**
Fire / Smoke Doors Tag doors as required by AS1851. In relation to smoke doors, provide signage as appropriate.	**Contractor**	**CM (Building Operations)**	**Gate 5 Construction**
Fire / Smoke Doors Where secured during normal operation, ensure interface for door to fail open on alarm has been coordinated.	**Contractor**	**CM (Building Operations) / CM (Security)**	**Gate 5 Construction**
Fire & Smoke Curtains Ensure use of fire and smoke curtain is accompanied by fire safety engineer's FSER given it is not a compliant method to protect openings	**Services consultants / Contractor**		**Gate 3 Planning**
Fire / Smoke Curtain Ensure location of fire and smoke curtains is clearly indicated onsite	**Contractor**	**CM (Building Operations) / CM (Security)**	**Gate 5 Construction**

Appendix A – FDCIE Information

Building No.	Building Name	Make	Install Date
001	Central Chilled Water Plant	Ampac AB800	Unknown
102	Administration	Notifier	2012
103	Hackett Hall	Notifier	2015
104	Lawrence Wilson Art Gallery	Notifier	2007
106	Arts	Siemens	Unknown
107	University Club of Western Australia	Notifier	2007
108	Admin East (HR)	Ampac	Unknown
131	Recreation Centre	Notifier	2010
139	Reid Library	Notifier	2007
142	Music	Notifier	2000
143	Octagon Theatre	Vigilant	Unknown
144	Dolphin Theatre	Vigilant	Unknown
190	39 Fairway (Edward St)	Notifier	2009
210	Chemistry LT (Wills&Tatts)	Notifier	2007
211	Molecular & Chemical Sciences	Notifier	2007
222	Centre for Water Research	Vigilant	Unknown
223	Mathematics	Notifier	2010
224	Civil & Mechanical Engineering	Notifier	2010
225	Geography & Geology	Notifier	2006
226	Electrical & Electronic Engineering	Notifier	2014
235	GP3	Notifier	2011
241	Computer Science	FFE8070	Unknown
242	CO2 Building	Notifier	2014
245	Physics	Vigilant	Unknown
248	Child Study Centre - Kindergarten/Media	Notifier	2005
272	Robert Street	Notifier	2009
274	Irwin Street Building	FFE NFP	Unknown
329	Guild	Notifier	2012
338	Law	Notifier	2010
344	C-TEC	Notifier	2009
345	Curnow Bld	Notifier	2007
346	Physiology	Notifier	2009
347	Psychology	Siemens	Unknown
351	Economics and Commerce/	Notifier	2014
352	Social Science South East Wing	Amalgamated with Economics	2014
352	Social Science/ North	Amalgamated with Economics	2014

Building No.	Building Name	Make	Install Date
401	Agriculture Institute and North West Wing	Notifier	2012
402	Soil Science South East Wing	FFE	Unknown
405	Agriculture Central Wing and CRC	Notifier	2013
409	Botany and Biology	Cerberus	Unknown
410	Botany Annexe 1	Vigilant FO8	Unknown
412	Old Pharmacology	Vigilant FO8	Unknown
416	Large Animal Facility	Notifier	2014
420	Zoology Building	Notifier	2014
429	Glass Houses Service Building	Notifier	2009
432	Combined Workshop	Ampac	Unknown
441	Business School	Notifier	2009
444	Human Movement	Notifier	2005
446	Biological Sciences Library	Notifier	2010
656	Masonic Hall	Notifier	2013
658	Michael Building	Siemens	Unknown
661	Park Ave - Main Building	Notifier	2009
681	Architecture - Fine Arts Tower	FFE	Unknown
682	Education Building	FFE	Unknown
683	Nedlands - Music and Drama Building	Notifier	2010
684	Cafeteria	Notifier	2010
687	Clifton St Building	Notifier	2011
689	Child Care Center	Notifier	2011
4601	55 Broadway, Crawley	Chubb	1985