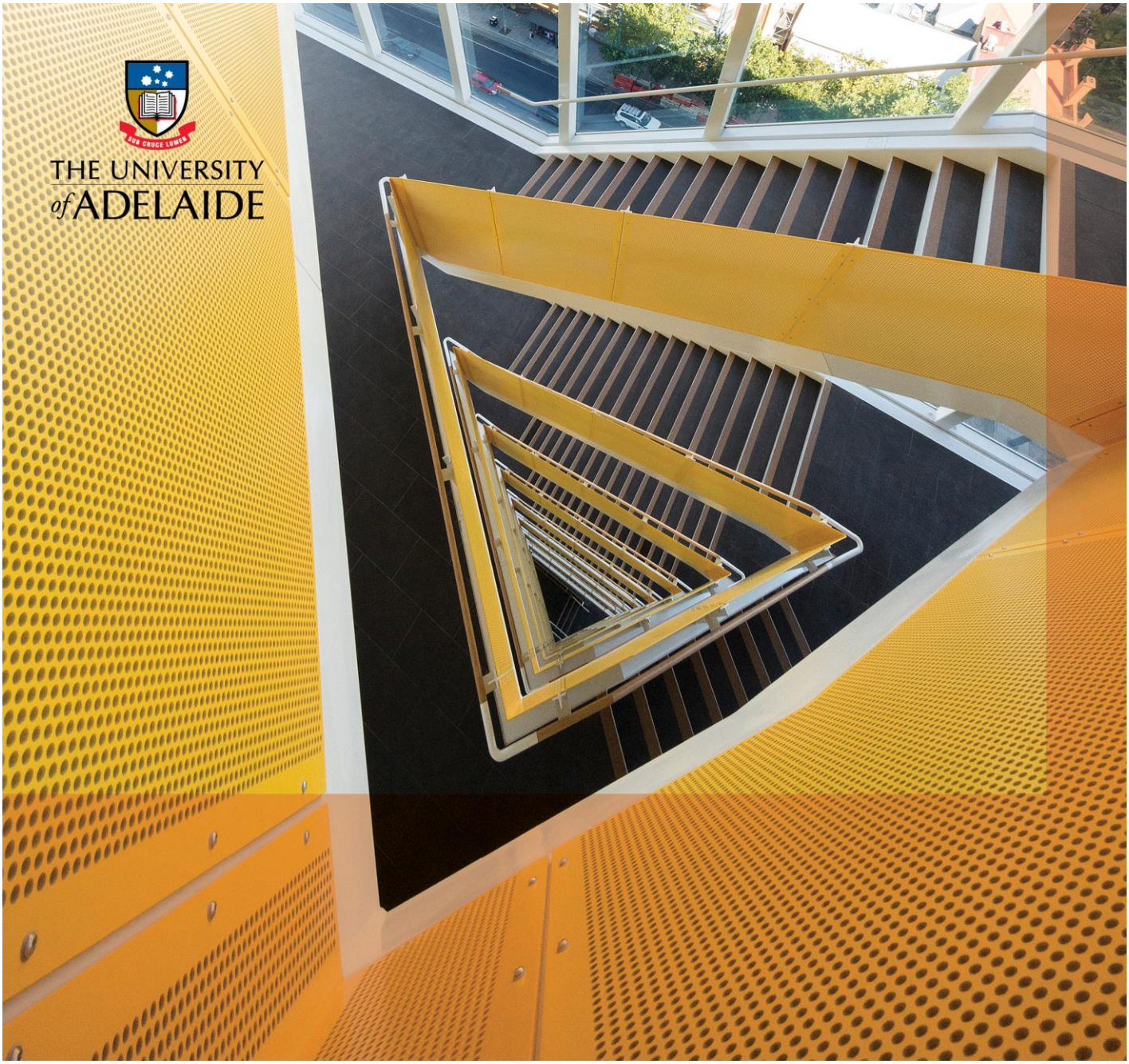


DESIGN STANDARD

B. Building and Architecture

adelaide.edu.au

seek LIGHT

Table of Contents

Revision log 8
Current issue 8
Previous issues 8
List of revised items 8
Revision management 8
Endorsement body 8
Owner 8
Contact person 8
Authors and acknowledgements 8
Abbreviations 9
1. Introduction 9
1.1 Purpose of the document 9
1.1.1 Structure of UoA Design Standards 9
1.2 Related documents and legislation 10
1.2.1 Documents 10
1.2.2 Relevant legislation 11
1.3 Definitions 11
2. General requirements 11
2.1 Project specific information 11
2.1.1 The project brief 11
2.2 Discrepancies 12
2.3 Departures 12
2.4 Certification of compliance 13
2.4.1 Frequency of certification 13
2.4.2 Additional certification requirements 13
2.5 Project procurement process 13
2.6 Value management 14
2.7 Risk Register 14
2.8 Safety in Design/ workplace health and safety 14
2.9 Independent building commissioning 15
2.10 Post-occupancy Building Services Performance Report 15
2.11 Manufacturer specifications 15
2.12 Sustainable design 15
2.12.1 Energy demand and thermal comfort 15
2.12.2 Use of natural daylight 15
2.12.3 Indoor environmental quality 15
2.12.4 Energy efficiency 16
2.12.5 Water use 16
2.12.6 Water sensitive urban design 16
2.12.7 Materials 16
2.12.8 Noise mitigation 17
2.12.9 Construction and demolition waste 17

2.13 Durability, economy and flexibility 17
2.14 Building compartmentation and sealing 17
3. Technical requirements 18
3.1 Early project planning and overarching design principles 18
3.2 Campus zones, axes and vistas 18
3.3 Siting 18
3.3.1 Relationship to surrounding spaces 18
3.3.2 Building heritage 18
3.3.3 Bushfire management and emergency response planning 19
3.3.4 Traffic and parking 19
3.3.5 Existing site conditions, services and infrastructure 19
3.3.6 Work in existing buildings 19
3.3.7 Indigenous heritage 19
Background 19
3.3.8 Opportunity projects 20
3.3.9 Design principles 20
3.3.10 Process strategies 21
3.3.11 Aboriginal heritage sites 21
3.3.12 Equity of access 22
3.3.13 Disability Discrimination Act 22
3.3.14 Design for good health 22
3.3.15 Entry and arrival 22
3.3.16 Functional zoning 22
3.3.17 Vertical transportation 23
3.3.18 Space allocation 23
3.3.19 Acoustics 23
3.3.20 Security 23
3.3.21 Rainwater harvesting 23
3.3.22 Early planning 23
3.4 Room planning – general 24
3.4.1 Central teaching areas (CTAs) 24
3.4.2 Offices 24
3.4.3 Meeting rooms 24
3.4.4 Lecture theatres 24
3.5 Room planning –amenities 25
3.5.1 Toilets 25
3.5.2 Toilet cubicles 25
3.5.3 Squat toilets 25
3.5.4 Showers 25
3.5.5 All-gender facilities 26
3.5.6 Tearooms 26
3.5.7 Baby change facility 26
3.5.8 Parent's room 26
3.5.9 Respite room 27

3.5.10 First aid room ... 27
3.5.11 Places for religious observation ... 28
3.6 Fixtures and fittings ... 28
3.6.1 Toilets ... 28
3.6.2 Urinals ... 28
3.6.3 Taps and shower heads ... 28
3.6.4 Hand dryer and paper towel dispenser ... 29
3.6.5 Toilet roll/ soap/ paper towel/ other dispensers ... 29
3.6.6 Drinking fountains ... 29
3.7 Bicycle parking ... 29
3.7.1 End-of-trip facilities ... 29
3.7.2 Provision of bike parking ... 29
3.7.3 Bike racks ... 29
3.7.4 Lock-up bike enclosures ... 29
3.7.5 Bicycle parking within a building ... 29
3.7.6 Safety and security ... 29
3.7.7 Location and clearances ... 30
3.7.8 Signage ... 30
3.8 Car parking ... 30
3.9 Room planning- operational spaces ... 30
3.9.1 Cleaners' room ... 30
3.9.2 Central cleaners' store ... 30
3.9.3 Communications room ... 30
3.9.4 Waste and recycling areas ... 30
3.9.5 Waste storage room ... 31
3.9.6 Maintenance store ... 31
3.9.7 Gardeners' store ... 31
3.10 Research space and laboratories ... 31
3.10.1 Laboratory types ... 31
3.10.2 Design guidelines ... 31
3.10.3 Energy consumption ... 32
3.10.4 Materials (walls, floor, benches) ... 32
3.10.5 Work bench design ... 32
3.10.6 Laboratory bench chairs ... 32
3.10.7 Benchtop services ... 32
3.10.8 Tapware ... 32
3.10.9 Bump guards ... 32
3.10.10 Fume cupboards ... 32
3.10.11 Safety stations ... 32
3.10.12 Ultra-cold 80/20 freezers ... 32
3.10.13 Cool rooms ... 33
3.10.14 Dangerous goods storage ... 33
3.10.15 Bio-safety cabinets ... 33
3.10.16 Duress alarms, emergency stop buttons and gas isolation valves ... 33

3.10.17 Power outlets 33
3.10.18 Gas cylinder storage 33
3.10.19 Trade waste 34
3.10.20 Contamination control: 34
3.10.21 Fixtures and fittings: 34
3.10.22 Wall-mounted telephones 34
3.10.23 AV IP TV systems 34
3.10.24 Gas detection sensors 34
3.10.25 Light-sensitive microscopy equipment rooms 34
3.11 Base building elements 34
3.11.1 Local sourcing 34
3.11.2 Hazardous materials 34
3.11.3 Non-combustible external fabric 35
3.11.4 Eco-preferred content 35
3.11.5 Designed for disassembly 35
3.11.6 Product stewardship 35
3.11.7 Modular in design 35
3.11.8 Durability 35
3.11.9 Manufacturer's environmental management system 35
3.11.10 Excavation 36
3.11.11 Waterproofing 36
3.11.12 Vermin 36
3.11.13 Structural design 36
3.11.14 Concrete 36
3.11.15 Bituminous membrane surfaces 37
3.11.16 Floor wastes 37
3.11.17 Expansion joints 37
3.11.18 Steel 37
3.11.19 Timber 37
3.11.20 PVC 37
3.11.21 External facade 37
3.11.22 Windows 37
3.11.23 Window treatments 38
3.11.24 Louvres 38
3.11.25 Roofs 38
3.11.26 Roof plumbing 38
3.11.27 Stairs 38
3.11.28 Internal partitions 39
3.11.29 Panel boards 39
3.11.30 Internal timber finishes 39
3.11.31 Internal concrete finishes 39
3.11.32 Skirting boards 39
3.11.33 Protection of finishes 39
3.11.34 Adhesives, fillers and sealants 39

3.11.35 Paints and coatings 39
3.11.36 Cleaning products 39
3.11.37 Carpet and carpet tiles 39
3.11.38 Resilient floorcoverings 40
3.11.39 Tiling and hard surfacing 40
3.11.40 Stair nosings and tactile indicators 40
3.11.41 Raised access floors 40
3.11.42 Door mats 40
3.11.43 Ceilings 40
3.11.44 Doors 41
3.11.45 Sliding doors 41
3.11.46 Door and window hardware 41
3.11.47 Exterior automatic doors 41
3.11.48 Glazed doors and partitions 41
3.11.49 Keying systems 42
3.11.50 Electronic access control 42
3.11.51 Handrails/balustrades 42
3.11.52 Tactile ground surface indicators (TGSI) 42
3.11.53 Signage 42
3.11.54 Building and room numbering 42
3.11.55 Material junctions 43
3.12 Furniture, fittings and equipment (FFE) 43
3.12.1 Furniture, fittings and foam products 43
3.12.2 Appliances 43
3.12.3 Joinery and fixed furniture 43
3.12.4 Reception counters 43
3.12.5 Loose furniture 43
3.12.6 Upholstery fabrics 43
3.12.7 Chairs 43
3.12.8 Workstation desks 44
3.12.9 Workstation screens 44
3.12.10 Mobile pedestals 44
3.12.11 Tables 44
3.12.12 Fixed shelving 44
3.12.13 Compactus 44
3.12.14 Whiteboards 44
3.12.15 AV equipment and projection screens 44
3.12.16 Storage 44
3.12.17 Artwork 44
3.13 Building services 45
3.13.1 Water recycling 45
3.13.2 Building services planning 45
3.13.3 Air intakes and grilles to plant areas 45
3.13.4 Plant rooms 46

3.13.5 Roof access 47
3.13.6 Rooftop solar energy systems 47
3.13.7 Mechanical, electrical, hydraulic and fire services 47
3.13.8 Hearing augmentation 47
3.13.9 Floor boxes 47
3.13.10 Door release buttons 47
3.13.11 Emergency break glass 47
4. Schedules 49
4.1 Certification standards 49
4.2 Warranties 50
4.3 Space guidelines 51
4.4 Miscellaneous fittings 52
4.5 Dispensable fittings 52

Revision log

Current issue

B. Building and Architecture – UoA Design Standard FINAL Version August 2018.

Previous issues

Version	Authors	Description	Revision	Date
1.0	Vicki Jacobs, Capital Projects Delivery, UoA	B. Building and Architecture – Design Standard	DRAFT Version 1	December 2017
2.0	Vicki Jacobs, Capital Projects Delivery, UoA / GHD	B. Building and Architecture – Design Standard	DRAFT Version 2	December 2017
3.0	Vicki Jacobs, Capital Projects Delivery, UoA	B. Building and Architecture – Design Standard	DRAFT Version 3	January 2017
4.0	Vicki Jacobs, Capital Projects Delivery, UoA / GHD	B. Building and Architecture – Design Standard	DRAFT Version 4	February 2017
5.0	Vicki Jacobs, Capital Projects Delivery, UoA/ GHD	B. Building and Architecture – Design Standard	FINAL	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

Associate 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 University of Adelaide staff, external consultants, contractors, and colleagues from other education institutions.

The University conveys its thanks to all parties who have participated in the development, assessment, and review of these Standards.

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

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.

1.1.1 Structure of UoA Design Standards

B. Building and Architecture 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 (this document)
- 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

- 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 within the Standards is structured into four parts:

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

1.2 Related documents and legislation

1.2.1 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

1.2.2 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)

1.3 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 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:

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 B. Building and Architecture Design Standards.

3.1 Early project planning and overarching design principles

During the earliest briefing and planning stages, a number of analyses must be carried out, and overarching design principles considered, as outlined below.

3.2 Campus zones, axes and vistas

The University of Adelaide Campus Masterplans highlight established and visionary zones/ precincts within the campus, based on:

- Building use
- Location
- Topography, etc.

In addition to this, existing and visionary axes of visual, historical and Indigenous significance are identified. These planning tools should be used to guide decisions surrounding siting and building form with the view to maintaining, enhancing or realizing the masterplan vision for the campus.

Detailed consideration of design opportunities and constraints relating to context, curtilage, view lines and view corridors must be made in the earliest design stages.

3.3 Siting

In the earliest stages of a building design, passive strategies must be employed to respond to environmental conditions, including orientation, solar access, prevailing winds, and seasonal and diurnal temperature changes. Architects and designers must maximise passive design elements and address other environmental factors to provide high levels of indoor environmental quality, thermal comfort, energy efficiency and minimise reliance on mechanical cooling and heating.

Building designers must also exploit topography, landscaping and microclimates for thermal regulation of interior spaces as well as use materials with high thermal mass and insulating capacity. Design performance and quality of the building mass, fabric, internal and external environments must be optimised to achieve high levels of thermal comfort to minimise demand for mechanical heating, ventilation and air conditioning.

Refer to section 2.12 Sustainable Design of this Standard for a list of sustainable features that must be incorporated into the architectural and engineering solution.

All buildings shall be orientated to maximise the potential for passive solar design. Sun shading shall be provided, as practical, to all windows to minimise reliance on mechanical cooling and heating and to avoid discomfort from direct glare.

Facades and windows shall be designed to maximise natural daylight within usable areas of the building. Skylights, light wells, internal atriums and courtyards shall be used to provide natural daylight and external views. Suitable weather protection shall be provided to all entrances.

3.3.1 Relationship to surrounding spaces

All new building or refurbishment work must respond to and enhance the primary function of surrounding buildings and public spaces between buildings. Internal building functions must be zoned to allow activation and interface with the public domain. Generally ground levels must be permeable and contain highly active functions such as social, learning/ teaching spaces.

Spaces between buildings and structures must be considered in their own right to provide a stimulating environment that is distinguishable, safe and accessible. Awnings and colonnades must be considered to protect pedestrians without creating barriers and obstacles.

Landscaping and outdoor space around and within buildings must enhance the University of Adelaide campus environment, identity, character and sense of place. Landscaping and water features must also be designed to improve thermal regulation and cross ventilation.

Open spaces within buildings must integrate with the architecture, compliment solar passive design elements and provide a variety of direct sunlight and filtered shade as a minimum whilst minimising external noise impacts. Courtyards must be strategically designed to enhance or create cross ventilation.

New buildings and major external refurbishments must be designed to enhance and compliment the surrounding environment and must minimise overshadowing, loss of privacy and adverse impacts on general amenity.

3.3.2 Building heritage

The University's policy is to maintain and conserve its heritage buildings, details of which are listed in The University of Adelaide Campus Conservation Management Plan. New buildings or additions must adhere to requirements of this plan and consider the impacts of alterations, insertions and new developments, on the heritage buildings and environs.

The University has also developed conservation management plans for specific heritage precincts, buildings, and structures. Architectural designs, insertions and interventions must comply with setbacks and heritage curtilages outlined in The University of Adelaide Campus Conservation Management Plan.

For all new buildings and additions, a Heritage Impact Statement must be submitted as part of the development application process.

3.3.3 Bushfire management and emergency response planning

It is the responsibility of the consultant to review and understand implications of the Bushfire Management Plan specific to the campus, as well as emergency response procedures as relevant to the project. Consultation with the Campus Manager may be required to understand obligations and strategies.

3.3.4 Traffic and parking

In considering vehicular circulation, a safe and inviting environment for pedestrians must be maintained on all campuses, as a priority. Vehicular access within pedestrian areas of the campus is not encouraged and must be limited to emergency, service and maintenance vehicles only. Vehicle roadways around buildings must be designed to minimise noise impacts on occupants. Wherever possible, vehicular access must be limited to after hours and car parking must be minimised directly adjacent to building facades.

Emergency vehicle routes and service delivery routes must be identified early in the design phase. Sweep path analysis must be completed on all emergency vehicle access routes with consideration given to likely vehicles and frequency of access.

Provision must be made for service and delivery vehicle access to all buildings, in an appropriate location. Special consideration must be given to access provisions for waste collection trucks servicing the buildings to ensure easy access, egress and manoeuvring. Provision of a loading dock may be required for larger projects and must include appropriate vehicle access to comply with AS2890.2 and headroom clearance to suit the expected vehicle types.

Parking within the building or within dedicated off-street car parking must comply with AS2890.1 and AS2890.6 for Accessible Parking provisions.

New development proposals must include a Traffic and Parking Impact Report including (but not limited to) issues relating to construction and post occupancy phases.

Refer to section 3.8 Car parking of this volume.

3.3.5 Existing site conditions, services and infrastructure

Early planning must include:

a. Review and assessment of the proposed location of the building (new or existing) with respect to existing services infrastructure capacities and condition (above and below ground) and easements in favour of utilities and Authorities.

b. A feature and level survey (for new buildings and extensions).

c. A dilapidation inspection of existing roads, services and building conditions.

d. Soil testing (for all new buildings and extensions).

3.3.6 Work in existing buildings

Building work planned for existing buildings provides both opportunity and obligation for compliance upgrading. All new work to existing buildings is to be designed to meet all current relevant statutory and code requirements, in addition to the mandatory UoA Design Standards. The scope of upgrading of existing buildings in which work is to be undertaken will be determined on a building-specific basis.

The design of works to occupied buildings should be mindful of the need for existing essential fire safety measures and the required egress of the building to remain fully functional during the construction period.

3.3.7 Indigenous heritage

Background

The University of Adelaide acknowledges that the Kaurna Peoples are the original custodians of the Adelaide Plains and the land on which the University's campuses at North Terrace, Waite, Thebarton and Roseworthy are built. We also acknowledge the historical impact of colonisation and its continuing effects.

The University is committed to the Council for Aboriginal Reconciliation vision of realising a 'united Australia which respects this land of ours; values the Aboriginal and Torres Strait Islander heritage; and provides justice and equity for all'.

The University has made a number of commitments to reconciliation as discussed in the following strategic documents:

- The University's Strategic Plan 2013 – 2023, Beacon of Enlightenment, which outlines the Universities commitment to equity and diversity where the rich cultures of Aboriginal and Torres Strait Islanders are taught, supported and celebrated.
- The Tarrkarri Tirrka Integrated Aboriginal and Torres Strait Islander Education Strategy 2013-2023, which outlines a University-wide approach to Indigenous Education. This strategy includes a commitment to increasing Indigenous cultural affirmation by:

- Raising the status and visibility of Indigenous cultures across all campuses.
- Collaborating with Aboriginal and Torres Strait Islander communities.
- Engaging Kaurna Elders through the Memorandum of Understanding Agreement.

- The University of Adelaide Statement of Reconciliation sets out the University's commitment to reconciliation with regard to relationships, respect, and opportunities. Contact the UoA Reconciliation Action Plan (RAP) Committee for further information.
- The University's Aboriginal and Torres Strait Islander Employment Strategy, which works within and alongside the Integrated Aboriginal and Torres Strait Islander Education Strategy, the University's Strategic Plan 2013 – 2023 Beacon of Enlightenment; and the University's Enterprise Agreement. The strategy aims to enhance Aboriginal and Torres Strait Islander employment outcomes at the University of Adelaide. This includes increasing employment opportunities, whilst promoting the retention and advancement of the University's current Aboriginal and Torres Strait Islander staff.

3.3.8 Opportunity projects

All projects must be designed and delivered with the above commitments and strategies in mind. Opportunities to apply the University's guiding principles for reconciliation may take the form of design solutions, or they may be process-driven.

During the earliest feasibility phase of the project, the Associate Director, Strategic Portfolio Management must identify 'opportunity projects' that, due to their type, scale, location, profile, unique characteristics, etc., offer particular potential to strategically explore and apply these strategies. For these projects, the Dean for Indigenous Research and Teaching must be identified as a stakeholder and must be consulted during every phase of the project delivery.

3.3.9 Design principles

Universities are place-based institutions, strongly associated with – and sharing a deep connection to – the places they inhabit. An opportunity exists to improve the lived experience of the culture of a place, by shaping the physical environment. The University's vision, as outlined in the University of Adelaide Masterplan 2016-2035, is to contribute to staff, students and visitors fostering:

- A deeper understanding, appreciation and knowledge of; and engagement with, Aboriginal and Torres Strait Islander cultures and knowledge systems.
- A deeper understanding, appreciation and knowledge of the historical significance of the land the University inhabits.

With these considerations in mind, the following guiding design principles must be applied to all projects:

- Create a strong address through the consideration of place and identity.
- Create a vibrant and engaging cultural campus that offers interpretation and programmed events through spaces that encourage curiosity, desire to learn and discovery.
- Promote a campus 'heart' that can be used for ceremonial and social/ collaborative activities.
- Encourage innovative, contemporary spaces that promote the evolution of learning through immersive learning and embedded learning opportunities.
- Respect the heritage and unique quality of each campus in the vision of the campus future, including the natural heritage.

For North Terrace Campus, particular consideration must be given to the following:

- The River Torrens as an important gathering place - Karrawirra Pari (red gum forest river).
- The cultural connection to the Parklands, Karrawirra 'river red gum forest', and the impact this has on campus identity.
- The significant cultural setting on North Terrace and the impact this has on campus identity.
- Opportunities to make connections to the city and wider community.
- The importance of the pedestrian experience and creation of high quality open space.

For Waite Campus, particular consideration must be given to:

- The unique natural and cultural landscape including the Arboretum, Yarrabilba Trail and indigenous tree settings.
- Opportunities to reinforce the existing legacy of indigenous and introduced plantings.
- The importance of the outdoor landscaped environment, and the impact this has on campus identity.

For Roseworthy Campus, particular consideration must be given to:

- The significance of the area formerly known as the Hundred of Mudla Wirra (a forest from where implements/ tools are taken) and impact on campus identity.
- Opportunities to reinforce the existing legacy of indigenous and introduced plantings.

3.3.10 Process strategies

The actions, consistent with the Reconciliation Action Plan, must be undertaken for all projects:

- Confirm with the Associate Director, Strategic Portfolio Management or DAP-equivalent whether:
  - A heritage assessment is required.
  - There is risk of locating Aboriginal heritage items during construction. Refer to clause 3.3.11 Aboriginal Heritage Sites below for further discussion.
- Ensure, in accordance with the University policy on Acknowledgement of the Kaurna People and their Land at Significant University Events, formal acknowledgement is made to the land and its traditional owners in the form of spoken introductions and the reproduced written transcripts of proceedings at all significant or public stakeholder gatherings. This includes stakeholder consultation sessions, occupant induction sessions and opening ceremonies for small projects.
- Ensure a Welcome to Kaurna Land is delivered by a representative of the Kaurna people, in lieu of the Acknowledgement, is undertaken at all opening ceremonies for larger or significant projects. Consult with the Dean of Indigenous Research and Education.
- Confirm with the Associate Director, Strategic Portfolio Management whether potential exists within the project scope to engage the Dean of Research and Indigenous Education as a design stakeholder.
- Ensure Aboriginal and Torres Strait Islander perspectives are meaningfully taken into account in the planning and decision making process of the University's capital works program and in particular that this engagement is used to inform the briefing an development of projects.
- Ensuring all opportunity projects, new developments, large/ complicated building upgrade/ extension projects, and significant outdoor projects (as identified by Associate Director, Strategic Portfolio Management), prepare an Indigenous Impact Statement. Please liaise with Dean of Indigenous Research and Education to fulfil this requirement.
- Consider opportunities, in accordance with the University's Acknowledgement of the Kaurna People and Their Land at Significant University Events Policy, to integrate an Acknowledgement statement plaque within the fabric of the building.
- Promote Aboriginal and Torres Strait Islander supplier diversity by liaising with the UoA Reconciliation Committee and the Dean of Indigenous Research and Education, to establish Indigenous procurement and employment opportunities relevant to the project.
- Incorporate cultural awareness training into building user induction to educate users about the significance of place and initiatives that have been implemented in the design and construction of the project. Refer to K. Documentation Design Standard for requirements relating to documenting training records within the building- user manuals.
- Incorporate a Welcome to Country and Acknowledgement of Country ceremony in the opening ceremony of the project, in accordance with the Acknowledgement of the Kaurna People and their Land at Significant University Events Policy.

3.3.11 Aboriginal heritage sites

Aboriginal cultural heritage in South Australia is protected under the Aboriginal Heritage Act 1988. This Act provides for the protection and preservation of Aboriginal sites, objects and human remains (including burials). It is illegal to damage, disturb or interfere with any Aboriginal site, object, or remains, without the authority of the Minister. If a site is to be disturbed, written authorisation must first be obtained from the Minister for Aboriginal Affairs under Section 23 of the Aboriginal Heritage Act, 1988.

It should be noted that sites can be found anywhere, even in areas farmed since settlement. Sites are highly likely to be found along the coast, rivers and by other water sources.

For all new building projects, at the earliest opportunity in the planning process, advice from the Minister for Aboriginal Affairs (through the DAP process or equivalent), should be sought, on the risk of impact to sites and the need for a heritage survey. At least three months should be allowed for the heritage survey process to be completed. Addressing this early in the planning process will enable alternative options to be considered if sites are found. The risk of construction impacts on Aboriginal heritage needs to be considered in the assessment of environmental impact and should be documented in the Planning Report, or Environmental Impact Statement.

In some locations, such as sites near water sources, there may be a strong likelihood that Aboriginal heritage sites will be present even though there is no cultural material on the surface. In these areas, where Section 23 Authorisation has been granted by the Minister, there may be a requirement for:

- Members of the Aboriginal community, usually assisted by an archaeologist, to monitor initial soil disturbance during construction ('a watching brief').
- Members of the design and construction team to be trained in the protocol surrounding Aboriginal heritage and discovery.

If suspected Aboriginal heritage items, including stone artefacts, hearths, or burials are located, any work affecting the site must stop. The Environmental Operations Unit and the Senior Cultural Heritage Officer of Division of State Aboriginal Affairs (DOSAA) should be contacted immediately. If human skeletal remains are found, these must immediately be reported to the nearest Police Station. If these remains are suspected to be of Aboriginal origin, DOSAA should also be advised.

3.3.12 Equity of access

The design of all buildings shall comply with the most current Australian Standard Disability (Access to Premises – Buildings) 1428.2. The refurbishment of existing, non-compliant buildings must be carried out in such a way as to reasonably optimise opportunities to make adjustments to the space, to make it compliant with the above standard.

3.3.13 Disability Discrimination Act

In accordance with the Commonwealth Disability Discrimination Act (1992) and the UoA Disability Action Plan 2014-2019, university services and facilities must be designed in such a way as to ensure that students and staff with disabilities can participate on the same basis as those without. The Act places an obligation on institutions to make reasonable adjustments to facilitate this participation, and makes discrimination on the basis of disability unlawful in a number of areas including physical access to buildings and facilities.

For all projects involving the provision of space that is accessible to staff, students or the public, it is the responsibility of the consultant team to familiarise themselves with DDA reports that may previously have been prepared for the campus/ building. Where no report exists or if the report is outdated, a DDA review must be carried out by the consultant team during the Design Development Phase. Depending on the size and complexity of the project this may involve the engagement of a specialist DDA consultant. For new building projects this must involve the engagement of a DDA consultant.

Compliant continuous paths of travel, with appropriate directional aids, from car park and set down locations to the main entry of the building must be provided. Where this is not possible due to the topography of the campus, advice from DDA Consultant must be sought.

For all projects involving the installation of new kerbs and gutters, or projects involving reinstatement of existing kerbs and gutters, introduce crossovers to maintain existing or proposed continuous paths of travel.

Pedestrian circulation and access paths need to consider varying degrees of traffic (arterial/ main/ secondary) and width must be sized accordingly.

Statutory and wayfinding signage in accordance with N. Signage and Wayfinding Design Standard must be installed to ensure equitable communication to all users.

3.3.14 Design for good health

The University of Adelaide's Healthy University Framework (taking into consideration the World Health Organisation's Healthy Workplace Model) consists of four key areas: Minds, Bodies, Places, Culture. With these four categories in mind, initiatives that will benefit health, wellbeing and the quality of our working life must be explored and prioritised. This may include design solutions that:

- Take advantage of environmental opportunities to promote healthy choices
- Encourage and enable active participation
- Support and educate staff and students.

Design outcomes that must be accommodated include:

- Easily accessible drinking fountains and bottle refill stations, refer to clause 3.6.6 Drinking Fountains of this volume
- Provision of visible stairs as the principal means of vertical travel for those who are able to climb stairs, refer to clause 3.11.27 Stairs of this volume
- Provision of flexible outdoor spaces for physical activity
- Provision of spaces that can be accessed equitably, refer to clause 3.3.1 Equity of Access of this volume
- Provision of spaces that are welcoming, safe and inclusive. Engagement with the Gender Equity and Diversity Committee (or delegate) must occur to establish specific issues of gender and cultural security associated with the project.

3.3.15 Entry and arrival

Public access must be limited to one entry point, if possible, to minimise security risks and provide control and passive surveillance. The point of entry must provide a visible identity and sense of arrival and place. The entry must include appropriate manned or unmanned reception and information and directory to provide wayfinding and orientation to the user.

3.3.16 Functional zoning

Generally the most highly utilised spaces, usually undergraduate areas, must be located at ground floor levels to reduce vertical circulation within the building.

Stairs must be promoted as the primary means of vertical transportation. Refer to clause 3.3.17 Vertical transportation of this volume.

Internal space planning must allow for flexibility and reconfiguration. Design of fitout elements must allow for easy disassembly and redeployment and should avoid fixed fitout elements where possible.

Shared facilities such as toilets, change rooms, kitchens, tea points and waste/ recycling zones must be located in accessible locations in or adjacent common areas.

External service zones must be located to minimise adverse impact on other functions within the building, or neighbouring buildings, while providing adequate easy access for servicing and maintenance. Plant areas and plant rooms must be located to facilitate maintenance access and must be visibly screened and acoustically treated to minimize noise impacts.

3.3.17 Vertical transportation

Stairs must be visible, and located in a prominent position near the building entrance on the principle path of travel, to promote physical activity. To the use of stairs as the primary form of vertical travel, wherever possible, stairs should not be enclosed within an opaque stairwell enclosure. Floors with compatible tenancies must be connected by open stairs wherever possible.

Lifts should be located close to stairs, in a less prominent but convenient position, as a secondary option for vertical transport. Lifts should be used primarily for vertical travel of four floors or more or for those not able to use stairs.

Vertical circulation provisions must be adequately sized and positioned to accommodate the movement of occupants, furniture and equipment through the building.

3.3.18 Space allocation

For guidelines on work space allocation based on academic and student position types, refer to Schedule- 4.3 Space Guidelines.

For guidelines on spatial allocation based on room types, refer to TEFMA Australasian Association of Higher Education Facilities Officers (AAPPA) guidelines for spatial allocation. For assistance applying the TEFMA (AAPPA) contact UoA Systems and Business Improvement, Senior Space Data Coordinator.

3.3.19 Acoustics

Careful consideration must be given to the proposed and potential use of all rooms and surrounding areas, with regards to acceptable levels of noise and vibration. During the Detailed Briefing Phase, assessment and classification of required levels of acoustic separation (low, medium or high) for all spaces, must be carried out by the consultant.

Corresponding proposed minimum sound reduction loss design criteria (dB) for those classifications must be established and communicated by the consultant to the project team. Classification and design criteria must be incorporated within the Return Brief for stakeholder sign-off.

All noisy activities and sources of vibration shall be located so as to minimise impact on other campus activities and separated appropriately to avoid transmission. Particular consideration needs to be given in areas where sensitive equipment is located.

3.3.20 Security

Secure zoning should be carefully considered to minimise the requirement for electronic access control. Refer to H. Security Services Design Standards.

3.3.21 Rainwater harvesting

All new building projects and extensions must adopt rainwater harvesting solutions for reuse in toilets, cooling towers, fire test water and landscape irrigation. All projects must consider opportunity for rainwater harvesting and reuse.

Ensure system design allows for future upgrade and expansion. Opportunities to integrate 'demonstrator' education must be explored. Provision for interconnection with other on-site storages and reticulation must be considered. An underground water harvesting reservoir may be required such that it captures and distributes the maximum amount of dispersed runoff rainwater. Pre-filtering of water to ensure that storage facilities do not become fouled by organic and other matter is essential and preferred to any post-storage treatment. Requirements for post-storage treatment will be determined on a case-by-case basis and will be dependent on the end use of the water.

3.3.22 Early planning

In addition to spatial requirements confirmed in the Brief, the designer must make adequate allowance for the functions listed below. These functions are often overlooked during early planning. Refer to clauses within this section for further details based on room type.

All new building projects must include provision for the following, whilst all building refurbishment projects must consider opportunity for provision of the following within the project scope where deficiency on campus exists:

- Building Manager's Office
- Fire Control Room and Plant Room(s), refer to G. Fire Services Design Standard
- Cleaners room
- Central Cleaners' Room
- Waste and Recycling Stations
- Waste Storage and Collection Space for building maintenance
- First Aid Room (new projects greater than 5000-m2)
- Accessible WC (with baby change facility)

- Grounds or Gardeners' Store
- Communications Equipment Rooms, refer to M. Audio Visual Design Standard for design parameters
- Lifts and Lift Motor Room – refer to I. Vertical Transport Design Standard for design parameters
- Baby Change Facility/ Parents Room

All-gender facilities:

- Respite room
- End-of-journey cycling facility
- Bike storage

3.4 Room planning – general

This section details minimum design requirements based on room types for general learning, teaching, office areas.

3.4.1 Central teaching areas (CTAs)

Teaching spaces shall reflect current teaching philosophy. Central teaching facilities shall be designed in a flexible manner so that they can be used by a variety of Departments and for examinations. Refer to M. Audio Visual Design Standard for requirement for standardised provision of power, data and audio visual services within teaching spaces.

3.4.2 Offices

Individual offices are to be avoided where possible in preference for open plan work spaces. Enclosed offices must only provide where high levels of privacy or confidentiality are required. Enclosed offices should be located so as to not negatively impact on the light and views of adjacent open plan areas.

Open plan offices are preferred as they provide:

- Ease of communication which enables knowledge sharing
- The ability to accommodate both individual and collaborative ways of working
- More adaptable use of space
- Better air circulation and light penetration
- More cost effective solutions in terms of both capital costs and maintenance costs
- Greater flexibility to accommodates organisation change

3.4.3 Meeting rooms

Meeting rooms shall be distributed throughout buildings. All meeting rooms shall be provided with audio visual services in accordance with M. Audio Visual Design Standard.

3.4.4 Lecture theatres

For lecture theatres refer to:

- M. Audio Visual Design Standard for presentation wall design criteria, lighting criteria, blackout capability, etc.
- D. Electrical Services Design Standard for lighting criteria including manual/ occupant detection controls of general lighting and aisle lighting etc.
- M. Audio Visual Design Standard for requirement for standardised provision of power, data and audio visual services within teaching spaces.
- 3.3.19 Acoustics of this Standard for noise reduction performance level design criteria. This may be addressed through room form, and finishes to floors, walls and ceilings.
- Refer to clause 3.13.8 Hearing augmentation in this volume.
- Refer to section 3.11 Base building elements in this volume for finishes requirements.
- Refer to section 3.3.12 Equity of Access in this volume.

For teaching spaces for up to 200 seats, allow space for 2 x wheelchairs, and 1 x additional space for each additional 100 seats or part thereof. Locate these spaces clear view of all presentation media.

Circulation and adjacent foyer waiting space must be of sufficient size to prevent overcrowding/ crushing as occupants depart and arrive. (Maximum changeover time 2½ minutes between lectures).

Doors must be positioned at or near the rear, or away from presentation areas such that latecomers minimise disruption to presentations.

Wayfinding signage must be provided to enable ease of access / egress and circulation to adjacent facilities, in consideration of the fact that the occupants may not be familiar with the room.

Secure storage must be provided sufficient for stackable tables, chairs and equipment.

Confirm requirements for catering facilities adjacent to lecture theatres at briefing stage.

3.5 Room planning –amenities

This section details minimum design requirements based on room type for amenities and associated facilities. Refer also to section 3.10.22 Fixtures and fittings of this volume.

3.5.1 Toilets

Toilet circulation areas must be provided with the following:

- Surfaces that allow for easy removal of graffiti. Tiled floor to ceiling walls are preferred. For tiled areas prone to graffiti consider the use of coloured grout
- Floors with appropriate slip resistance and darker colour. No light coloured floor tiles in high traffic areas are permitted
- Vanity bench and above bench mirror. No particle board laminates are permitted in wet area joiner
- Soap dispenser, located between each set of two basins mounted on tiled surface only
- Mounting to mirrors is not permitted. Confirm approved fixtures for dispensables
- Preference for hard-wired hand dryer
- GPO adjacent to the mirror
- Fixtures in accordance with F. Hydraulic Services Design Standard
- Refer also to clause 3.7.1 End-of-trip facilities in this volume for requirement for lockers and change areas.

3.5.2 Toilet cubicles

Each toilet cubicle must be provided with the following:

- Surfaces that allow for easy removal of graffiti
- Tiled floor
- High impact, wet-area compact laminate cubicle partition or fully waterproofed and tiled solid/ stud partition
- A door with privacy lock
- A coat hook
- A bag shelf (where space allows)
- Fixtures in accordance with F. Hydraulic Services Design Standard
- Toilet roll holder (jumbo type). Provide double toilet roll holder in wheelchair accessible toilets.
- Water efficient fixtures in accordance with F. Hydraulic Services Design Standard.

Refer to Schedule 4.2 Warranty periods for minimum warranty for washroom partition system.

3.5.3 Squat toilets

For all new or large building projects, and new amenities projects, consideration must be given to the necessity for the provisions of a proportion of 'squat' toilets, taking into account demographic of building users, and proximity of existing facilities already provided on campus.

If squat toilets are being provided, ensure an understanding of the implications for BCA compliance and Australian Standards compliance. Whether the installation is a new or retrofit project, ensure to consider the impact on the structural design of the slab in the early design phase.

3.5.4 Showers

Each shower must be provided with the following:

- Surfaces that allow for easy removal of graffiti. Tiled walls, floor to ceiling is preferred. For tiled areas prone to graffiti consider the use of coloured grout
- High impact, wet-area compact laminate cubicle partition, or fully waterproofed and tiled solid/ stud partition
- A cubicle (no communal showers are permitted)
- A dry area seat with adequate protection for user belongings from water spray

- A door with privacy lock
- Coat hooks (2)
- Fixtures in accordance with F. Hydraulic Services Design Standard

For all new building and new amenities projects, consideration must be given to the necessity for the requirement of an accessible shower, taking into account proximity of existing facilities already provided on campus. This may be combined in a toilet/ shower room.

Refer also to section 3.6 Bicycle Parking and clause 3.7.1 End of trip facilities of this volume.

3.5.5 All-gender facilities

Provision of all-gender facilities must be considered on a building-by-building basis taking into account proximity of existing facilities already provided on campus. Consultation must occur with the Gender Equity and Diversity Committee (or delegate) to determine potential requirement for all-gender facilities.

As a minimum, all new accessible toilets must be sign posted as all-gender facilities. All fit-out projects involving signage or amenities upgrades must allow for the provision of new signage to existing uni-sex accessible facilities, to re-label as all-gender.

3.5.6 Tearooms

Tearooms must be designed wherever possible to accommodate wheelchair users.

Where space permits, tearooms shall have the following facilities:

- Bench with portion under sink, designed (clearance and reach) to be accessible by wheelchair users. Refer to AS1428.2.
- Sink with drainer with hot and cold water
- Accessible hydraulic fixtures
- Combined boiling, chilled and filtered water unit. Kettle is acceptable for tearooms with low usage.
- Height of tap must consider the need to fill a water bottle.
- Cupboard and drawer storage including a cutlery drawer
- Space and power for a microwave
- Space and power for a fridge
- Space and services for a dishwasher (optional)
- Space for waste and recycling bins (refer Waste and Recycling)
- Space and power for other small appliances as required.
- Tea towel rack

3.5.7 Baby change facility

Provision of baby change facilities must be considered on a building-by-building basis taking into account proximity of existing parent facilities already provided on campus. The facility should be located on the ground floor or adjacent to the lift core for ease of access with a pram/ pusher. The facility must be an all-gender facility and appropriately signposted. Ideally the baby change facility should be installed within all-gender access toilet, (with appropriate signage) rather than being a stand-alone facility with duplication of services. Ensure any retrofit of an existing facility does not render the accessibility of the facility non-compliant.

A baby change facility must include:

- Change table
- Nappy disposal unit
- Hand wash basin with cold water
- Hand drying facilities
- Waste disposal

3.5.8 Parent's room

For all new building projects, consideration must be given to the necessity for a Parent's Room, taking into account proximity of existing Parent facilities already provided on campus. A Parent's Room is a dedicated space for the care of the children, provided where space permits, in lieu of a Baby Change Facility. This room must be all-gender and appropriately signposted. The function of a Parent's Room may be combined with that of a Respite Room (refer clause 3.3.7), provided adequate privacy is provided and access control is carefully considered. As a minimum, the following must be include in a Parent's Room:

- Easy opening/automated access door

- Baby changing table
- Chair for breastfeeding/ breast pumping that can be adjusted from fully upright to fully reclined, or multiple chairs of varying types
- Privacy curtain around breastfeeding chair
- 'In Use' sign inside room, next to curtain to indicate feeding chair is in use
- Worktable and workstation chair (for working on laptop whilst breast-feeding/ pumping)
- GPOs appropriately positioned to service breast pumping chairs and work table
- Basin with hot and cold water supply, TMV on hot water supply
- Baby food preparation area separate from changing area
- Hand drying facilities
- Waste disposal
- Stroller/pram parking area
- Toddler waiting/play area
- All-gender access toilet (or toilets in close proximity)

3.5.9 Respite room

For all new building projects, consideration must be given to the necessity for a respite room. The purpose of the facility is to provide a quiet rest space for staff and/or students. It may be used by staff or students who need to take medication or have time-out. Medication may be administered intravenously.

This room differs to a first aid room in that there is no requirement for a trained occupational first-aider to monitor the use of the room. However, the function of the Respite Room may be combined with the first aid room provided adequate screening and privacy is provided to facilitate appropriate simultaneous use, or a temporary alternative is identified should the space be occupied.

The function of the room may also be combined with that of a quiet room (a small meeting room typically used by one or two people at a time, to discuss private matters/ make private telephone calls), or a parent's room, provided the facilities listed below are provided in the room. Access control must be carefully considered:

The respite room should include:

- Tea point (or be in close proximity to a tea point)
- Lie down space and seating area for one to two people
- Waste/ recycling station and sharps disposal bin
- Telephone

3.5.10 First aid room

For all new building projects, consideration must be given to the necessity for a first aid room. A consultative risk assessment may be required to determine the necessity of the room. In accordance with the Code of Practice – First Aid in the Workplace a first aid room must be provided if the risk assessment indicates that it would be difficult to administer appropriate first aid without the presence of the room.

When determining first aid requirements the following must be considered:

- Certain work environments have greater risks of injury and illness due to the nature of work being carried out and the nature of the hazards at the workplace; and
- The distance of the workplace from ambulance services, hospital and medical centres should be taken into account when determining first aid requirements.

Typically a first aid room is recommended for:

- Low risk workplaces with 200 workers or more
- High risk workplaces with 100 workers or more.

The contents of a first aid room should suit the hazards that are specific to the workplace. The room may consist of:

- First aid kit appropriate for the workplace
- Hygienic hand cleanser and disposable paper towels
- An examination couch with waterproof surface and disposable sheets, or comfortable recliner chair and visitor's chair.
- A cupboard for storage
- A container with disposable lining for soiled waste

- A container for the safe disposal of sharps
- A bowl or bucket (minimum two litre capacity)
- Electric power points
- A telephone and/or emergency call system
- The names and contact details of first aiders and emergency organisations.

A first aid room should:

- Be located within easy access to a sink with hot and cold water (where this is not provided in the room) and toilet facilities
- Offer privacy via screening or a door
- Be easily accessible to emergency services (minimum door width of 1 metre for stretcher access)
- Be well lit and ventilated
- Have an appropriate floor area
- Have an entrance that is clearly marked with first aid signage
- Be located and sized to allow easy access and movement of injured people who may need to be supported or moved by stretcher or wheelchair
- Be allocated to a trained occupational first aider, except where this room is part of a health centre or hospital

The function of the first aid room may be combined with that of a respite room, provided a temporary alternative is identified should the room be occupied.

3.5.11 Places for religious observation

For all new building projects, consideration must be given to the necessity for places for religious observation, taking into account demographic of UoA staff and students occupying the building, and proximity of existing facilities already provided on campus. A consultative process with the relevant representative bodies, must determine the most appropriate solution.

Places for religious observation may include:

- Prayer Rooms for large or small groups
- Segregated washing facilities associated with worship
- Quiet reflection spaces for large or small groups (inside or outside)
- Multi-purpose facility for mixed-faith worship
- Flexible bookable space.

3.6 Fixtures and fittings

Wherever possible, harvested or recycled water should be used for toilet flushing and other non-potable hydraulic installations.

All hydraulic fixtures and fittings must meet minimum water efficiencies, as measured using AS/NZS6400:2005 Water-efficient products-Rating as outlined in Schedule 4.1 Hydraulic fixtures and fittings of this volume.

Refer to Schedule 4.2 Warranty periods of this volume for minimum warranties for all sanitary ware fittings and accessories.

3.6.1 Toilets

Toilets must be dual flush with 4.5/3.0 L cistern. Ensure pans and cisterns are matched to provide maximum water efficiency (WELS 4-star or greater.)

No concealed serviceable fixings are permitted.

3.6.2 Urinals

Waterless urinals are not permitted. Fibreglass and plastic urinals are not permitted. Low flow urinal systems implementing (mains powered) sensors and timers and low-flush cisterns must be used. Wall hung units are preferred. Urinal system must have manual flush or smart demand operation with activation sensitivity field at the front of the urinal. Individual urinals are preferred.

3.6.3 Taps and shower heads

Push-to-actuate, spring-return basin taps, including flow restriction, must be used. Sensor taps (if fitted) must be programmed to switch off within 6 seconds.

Cold water-only plumbing is appropriate for the vast majority of hand washing facilities providing significant energy savings. Provide isolation valve to each fixture/service. Exceptions to this general rule may be required for workplace (as opposed to public) toilets where warm water hand washing may be a requirement.

Install flow restrictors and aerators on all taps to be retained (less than 5L/min) and shower heads to be retained (less than 9L/min).

In selecting fixtures, consideration must be given to water pressure and velocity requirements specific to the project.

3.6.4 Hand dryer and paper towel dispenser

Energy efficient hand dryers must be installed. Where space permits, do not mount downward blowing hand dryers above bench. Do not install high velocity downward blowing dryers directly onto painted wall surfaces without a protective backing plate Refer section 4.2 Warranties for minimum warranty period.

Noise isolation requirements of adjacent spaces must be addressed.

Paper towel dispensers must only be installed where energy efficient dryer is not viable due to noise sensitivity in adjacent spaces. An open-lid organic recycling bin must be positioned under all paper towel dispensers.

3.6.5 Toilet roll/ soap/ paper towel/ other dispensers

For details of all fittings dispensing consumables (e.g. toilet rolls, paper towels, soap) refer Schedule in Section 4 of this document. Prior to specifying, refer also to Service Delivery for clarification of allocation of responsibility for supply and installation of the fittings. Typically all dispensers for refurbishment projects are supplied to the project, but not installed, by the UoA Service Delivery. For soap, confirm also suitability of soap for water type (hot/ cold).

3.6.6 Drinking fountains

Combined drinking fountains/ water refill stations must be installed wherever possible to discourage the use of disposable bottled water. Contact Environmental Project Officer for specification details and alternative funding opportunities.

3.7 Bicycle parking

3.7.1 End-of-trip facilities

End-of-trip facilities including toilets, showers, lockers and change rooms, must be provided for people who use active transport (cyclists, walkers and runners). Provision of end of trip facilities must be considered on a building-by-building basis taking into account proximity of existing facilities already provided on campus.

Where possible showers and lockers should be within close proximity to bicycle parking. Where possible, locate showering facilities in open access areas, e.g. student-accessible areas. Toilets do not count as changing facilities, unless there is sufficient private space and lockers.

Secure lockers must be vented and adequately sized to accommodate normal work clothing. Preferably provide separate male and female changing/ shower facilities. If this is not possible, provide individual all-gender shower/ changing facilities.

3.7.2 Provision of bike parking

Bike parking and secure covered and protected storage must be considered on a building-by-building basis taking into account proximity of existing facilities provided on campus. Positioning of bike parks must take into account the masterplan campus vision to establish an interconnected network of unbroken bike routes across the campus.

3.7.3 Bike racks

Bike rails and bicycle racks must be visible, well lit, protected from weather and meet requirements of class 3 (secure) parking facilities of AS2890.3. Bike racks should be designed so that the front and rear wheel/ frame can be locked to the rack. The rack must not damage the bike. It must be possible to combine the stands in various ways without creating a messy appearance. Painted bike racks must be avoided as they are prone to damage requiring ongoing maintenance.

3.7.4 Lock-up bike enclosures

Secure, covered and protected parking can be achieved through walled enclosure within a building or an external lock-up cage. The aesthetics of all bicycle parking facilities must be carefully considered in the context of surrounding environs. Construction must be of low-maintenance materials that are complementary to surrounding finishes. Enclosure/ cage designs must meet Class 2 medium security of the AS/NZS 2890.3 standard. Fencing must be either of mesh or see-through design to allow for passive surveillance. For external cages, the roof must provide adequate protection from the elements and be adequately drained.

3.7.5 Bicycle parking within a building

Cyclists must be able to access the bicycle parking area via the ground level without having to dismount for stairs. If the area is not on ground level then a ramp or lift access must be provided.

3.7.6 Safety and security

Bicycle parking should be situated where there is active and passive surveillance, i.e. people passing by and where possible, people overlooking the facilities. The entrance should have a self-closing, self- locking door. Doors or gates must be fitted with the University electronic proximity card access system. All bicycle parking facilities used at night must be well lit to minimize theft and vandalism, to reduce pedestrian hazard and for the safety of the cyclists. To ensure energy efficiency, LED lighting with PIR movement sensors must be installed.

3.7.7 Location and clearances

To encourage use, bicycle parking should be as close as possible to the building it is serving, however for the safety of pedestrians and bike users, bike parking should be kept clear of:

- Entrances/exits of buildings
- Pedestrian concentrations
- Opening car doors
- Vehicle circulation paths
- Attachments for blinds or awnings
- Access covers set in the pavement
- Other street furniture, loading zones, public transport stops and pedestrian crossings.

3.7.8 Signage

Way finding signage in accordance with N. Signage and Wayfinding Design Standard must be provided to direct cyclists to bicycle parking facilities, and to end-of-trip facilities.

3.8 Car parking

Generally, parking must be provided to comply with the requirements of Australian Standards for off-street parking. The following specific requirements must be provided over and above the standards:

- Clarify project specific head clearance requirements
- Provide clear line marking to define pedestrian circulation areas
- Provide adequate lighting and surveillance as required to ensure the safety of building occupants
- Provide wheel stops and kerbs to protect assets, pathways and pedestrians
- Provide bollards and barriers as required to protect assets and pedestrians
- Provide signage to comply with Australian Standards and N. Signage and Wayfinding Design Standard
- Provide electrical and data services for appropriately place ticketing machines
- Provide electrical and security provisions for entry and exit control in accordance with the UoA H. Security Services Design Standard
- Provide energy efficient lighting and controls in accordance with D. Electrical Services Standard.

3.9 Room planning- operational spaces

3.9.1 Cleaners' room

One small cleaner's room must be provided on each floor of a building. This room is for the storage of cleaning materials, chemicals and consumables. The room must be lockable and contain a cleaner's sink with grate, hot water (preferable), cold water (minimum, if hot water is available in close proximity), isolation valve to each fixture, shelving, wall hooks and a power point, floor drainage and appropriate floor falls. Refer also to clause 3.8.2 Central cleaners' store in this volume.

3.9.2 Central cleaners' store

One central cleaners' store room of 20 - 30m2 must be provided in every building. For multi- level buildings it must be located close to the lifts. The room has the same requirements as the small cleaners' room, however it is adequately sized to be able to accommodate large equipment such as floor buffers, auto scrubbers, multiple cleaners' trolleys and bulk consumables. Consult with Service Delivery for project specific briefing requirements.

3.9.3 Communications room

Refer to E. Communication Services Standard for communications room requirements.

3.9.4 Waste and recycling areas

The University employs centralized waste and recycling stations throughout its campuses, referred to as the 'Kick Ya Bin' recycling program. Each station typically comprises four 60L Multi-sort bins: a yellow mixed recycling; a blue cardboard and paper; a green organic recycling (pedal type) and a red general waste bin (refer AS 4123.5-2008).

As a minimum, a red and yellow recycling station should be provided. Other recycling streams can be added based on occupant activity in the area. At no point should a bin be placed in a stand-alone position (with the exception of a blue paper/cardboard recycling bin near a printer).

Bin stations should be located conveniently in central locations and reflect the activity of the space i.e. kitchen. The consultant must consider the location and daily operation and servicing of recycling stations as part of the project design, and included in the project cost. Stations must service all functional area, including circulation spaces and common areas. Stations must be located no more than 30 metres walking distance away from any occupant.

In tearoom environments where floor space is limited, 7L organic caddies can be installed on benchtops instead of the 60L yellow bin. Individual office/desk waste bins must not be provided. All staff must also receive an under desk paper recycling box to empty into blue paper/cardboard bins. These boxes are provided at no cost by the University.

This program does not extend to lab environments (Schools and Faculties are to determine their individual laboratory waste and recycling needs and discuss with Project Manager).

3.9.5 Waste storage room

A waste storage room is required in all new buildings, and is preferred in existing buildings. This room must have appropriate impervious floor and wall finishes and must be provided with wash-down facilities including hot and cold water supplies and wastes. Provision must be made for a main waste recycling and general waste collection storage space sized to safely accommodate expected daily maximum quantities of waste and recyclables.

The main waste recycling and general waste collection storage room must include bin cleaning facilities and compactor as appropriate. Adequate and safe vehicle access, entry and egress provisions must be provided for movement and manoeuvring of heavy waste collection vehicles.

3.9.6 Maintenance store

Within each building, a maintenance store area of approximately 10-m2 must be provided for specific use by Building Services. Finishes to this store must be as for plant rooms. The function of this room may be combined with that of the waste storage room if deemed appropriate by Service Delivery- Maintenance. Consult with Service Delivery- Maintenance.

3.9.7 Gardeners' store

A room of 12-m2 in area must be provided at ground level with external access in each building. The room must have one GPO at a height of 1000mm, and cleaners' sink with 20mm cold water hose cock. The external door must have a clear opening width of 1000mm and must be outward opening.

The gardeners' store must be accessible by vehicle at grade.

A 50mm conduit from the floor level within the store to a suitably accessible external point must be provided.

Provision must be made for suitable storage of poisonous chemicals storage compliant with applicable safety and environmental design requirements.

3.10 Research space and laboratories

3.10.1 Laboratory types

Laboratories at UoA must be of the following types:

- Wet laboratories - which utilise, test and analyse chemicals, drugs or other biological matter
- Dry laboratories - which contain dry-stored materials, electronics and/or large instruments
- Clinical laboratories - which involve work with infectious agents, and typically require higher levels of containment
- Teaching laboratories abs - which require space for teaching equipment, and typically hold less instrumentation

Special guidelines apply for laboratories, animal facilities, insectaries and plant houses in which some molecular biology, genetic manipulation and some infectious agents may be used.

- Laboratories used for less hazardous recombinant DNA research require PC2 classification and no substantial design considerations are required
- PC3 classified laboratories involve a higher degree of design, while PC4 laboratories have the most stringent requirements
- PC2 and PC3 laboratories require inspection and approval by the UOA Institutional Biosafety Committee
- Laboratories classified as PC3 and PC4 require approval by the Office of the Gene Technology Regulator (OGTR)

3.10.2 Design guidelines

Where possible, laboratories are to be designed generically to allow for future change of use. Project-specific design requirements must be confirmed with the key stakeholders and approved as part of the return brief consultation process.

The Return Brief must address elements and associated design criteria including (but not limited to) those listed below.

3.10.3 Energy consumption

All opportunities to minimise energy consumption must be explored. These include but are not limited to: fume cupboard design and specification (VAV are preferred), minimisation of tempered air supply to fume hoods, HVAC design, cool and hot room location and design and lighting design consideration that must be addressed.

3.10.4 Materials (walls, floor, benches)

- Consider requirements for cleaning and associated potential mechanical damage from equipment and chemicals proposed to be used for cleaning; and
- Consider suitability for project specific activities including requirement for resistance to damage from chemicals, impact or temperature variation. Testing of chemicals may be required.

3.10.5 Work bench design

- Island benches are preferred.
- Ensure modular benchtops are fixed together securely with under-bench fasteners, so as to prevent bumping out of alignment.
- Ensure benchtop is positioned at a height so as to allow clearance for under bench equipment (e.g. fridges), but so as not to exceed height limit. This may likely require the front member of the support frame to be recessed into the benchtop.
- Consideration must be made for the provision of adjustable or varied height workspaces and associated shelving to accommodate a percentage of wheelchair users and range of motion.

3.10.6 Laboratory bench chairs

- Ensure chairs are compatible with project specific laboratory PC2/3/4 classification.
- Ensure chairs glides are compatible with floor finish.

3.10.7 Benchtop services

- Ensure flexibility in the provision and position of services at laboratory benches.
- Establish brief for full range of services required. This may include vacuum, Nitrogen, CO2, 15 Amp power and General Amp power supply.
- Overhead reticulation of services is preferred.

3.10.8 Tapware

- Ensure tapware specified, and in particular fitting material, is compatible with requirement for water quality.

3.10.9 Bump guards

- Ensure consistency of approach throughout building with regard to type, location (all high impact-risk locations) and installation (height above ground).

3.10.10 Fume cupboards

- Ensure maintenance requirements (including frequency obligations) are considered in early in design phase to establish appropriate location for cupboard
- No ganging of fume cupboards permitted
- Clarify early in design process whether there is a requirement for spill trough to be plumbed into main drain.

3.10.11 Safety stations

- Safety stations must be located at the entrance to each main laboratory, or laboratory complex.
- The safety shower and actuating mechanisms, must be positioned such that the approach is unimpeded
- Emergency eye washes must be permanently fixed aerated type, which can be foot operated without using hands
- Provision must be made to drain or restrain any excess water from these devices.
- Consider that floor drain may not be required for Emergency Showers where manual spill procedures can be put in place basins and sinks

3.10.12 Ultra-cold 80/20 freezers

- Carefully consider placement of freezers (and other heat generating devices) taking into consideration the following:
  - Length, width, height of freezer
  - Door swing of freezer (full 180 degree?)

- Hot air discharge and cool air intake locations

- Install Epindorf as standard
- Ensure the provision of a low-level security alarm from freezer to the University's SIPASS security system. Note current UoA policy does not require high level monirotiring of internal freezer temperatures however this may change in the future
- Ensure the provision of essential power supply to each freezer (separate circuits for each freezer)
- Consider if the users require liquid CO2 or N2 backup (N+1 reduncancy) to maintain internal temperature conditions in the event of an extended power outage
- Ensure the freezer equipment power plug type is confirmed and matched with the proposed general power outlet. Do not install round pin power supply plug (change plug on freezer if necessary)
- Ensure general power point type prevents the accidental unplugging of the plug (i.e. consider captive / screw type fitting on both GPO and freezer if appropriate)
- Ensure power supply behind ultra-cold freezers is installed at an appropriate height so as to allow freezer to be pulled out from the wall for maintenance, without having to disconnect the freezer;
- Ensure the room in which the freezer(s) are to be installed are appropriately conditioned / ventilated to prevent the build-up of hot spots within the room and overheating of freezers. Ensure high temperature alarms are sent by the BMS to the SIPASS security system

3.10.13 Cool rooms

- Clarify power supply requirements within room with end users – may require benchtop equipment to run in cool room environment
- Clarify and document requirement for shelving within room. Coordinate shelving design with location of power supply outlets
- Install door hold open alarm with appropriate delay to prevent nuisance activation
- Ensure outside air provision to cool room is controllable to prevent condensation build up on floors/surfaces (floors creates a trip hazard)

3.10.14 Dangerous goods storage

- Where dangerous goods are to be stored, a Dangerous Goods Consultant must be engaged to provide advice on the storage of dangerous goods within the facility.
- It is recommended that any dangerous goods cabinets be ordered, installed and authorized for compliance through UoA Capital Projects Delivery. End-users are not permitted to manage this process as this may lead to incorrect cabinets being installed.
- Corrosive cabinets may require mechanical ventilation depending on volume of dangerous goods.
- Excessive volumes of dangerous goods may trigger requirement for intrinsically safe electrical fixtures which will come at significant additional cost in the short and long term (maintenance). Users are to be encouraged to keep minimal volumes of dangerous goods where possible to mitigate such requirements.

3.10.15 Bio-safety cabinets

- Install LaminaFlo as standard.
- Consider length, height, width and associated location of power outlet and any other service
- Consider position of air discharge outlet, which could be either side or top and affect on location of the laminar flow hood
- All laminar flow hoods and biosafety cabinets must be certified as fully complaint with Australian Standards to ensure user safety
- Consider if a stand will come with the cabinet or if a stand or bench will need to be provided with the cabinet

3.10.16 Duress alarms, emergency stop buttons and gas isolation valves

- Consider requirement and appropriate position of emergency buttons and alarms.
- Review buttons and alarm types used elsewhere on campus prior to specifying buttons and alarms.
- Where duress alarm is required at entrance to laboratory, install with reinstatement of power activated by controlled lockout process as standard.

3.10.17 Power outlets

Provide residual current devices to all power outlets.

3.10.18 Gas cylinder storage

- Store must be located in a loading bay or discrete area away from main entry, with one or more sides open to the atmosphere
- Ensure segregation is provided with the necessary separation of particular gases, and means of securing cylinders against falling

- Safe guard from external accidental damage and provide protection against sunlight

3.10.19 Trade waste

Laboratory effluent, chemical residues from equipment and glassware cleaning, autoclave and centrifuge drainage, should be discharged to sewer via approved trade waste treatment apparatus in compliance with the University's various Trade Waste Agreements with the relevant Water Authority.

3.10.20 Contamination control:

Consider:

- Safe disposal of gaseous waste including destination of exhaust
- Radioactive waste
- Cross contamination at dispensing, preparing and counting areas
- Disposal of other project specific contaminants

3.10.21 Fixtures and fittings:

Confirm:

- Requirement for coat hook placement to avoid cross- contamination
- Whether soap dispensers are required adjacent to all/ any basins
- Confirm the appropriate dispenser type with Service Delivery- Maintenance. Refer to clause 3.6.5 Toilet roll/ soap/ paper towel and other dispensers in this volume

3.10.22 Wall-mounted telephones

Seek confirmation from UoA Technical Services regarding type of handset to be installed and mounting details specific to that handset.

3.10.23 AV IP TV systems

Refer M. Audio Visual Design Standard and seek confirmation from UoA Technical Services regarding specification of IP TV System for standard and specialist spaces.

3.10.24 Gas detection sensors

Confirm university specific requirement (over and above mandatory requirement) for installation of sensors above floor level.

3.10.25 Light-sensitive microscopy equipment rooms

Where PC2 cleanable blackout dividers are required, ensure divides meet the following criteria:

- Easy to operate by one occupant.
- Do not encroach on space.
- Are compact and secure when stored in the open position.
- Do not negatively impact airflow in room.
- Install mechanical outlets and ducting (specification and positon), that do not negatively impact airflow around equipment.
- Install fully dimmable lights that can be dimmed to off position (1 lux).
- Do not install auto light sensors.
- Ensure controls for all lighting and 'Room in Use' signage, is located in room where equipment is located. This may/ may not be next to the entrance door.

3.11 Base building elements

3.11.1 Local sourcing

Wherever possible, materials and services should be sourced locally.

Project solutions should contribute to and support the expansion of regional products and services and, wherever possible, support Indigenous procurement initiatives recognised by the University. Refer to clause 3.3.7 Indigenous Heritage of this volume for Indigenous procurement and employment obligations.

3.11.2 Hazardous materials

Building materials must not contain any of the following materials or chemicals:

- Asbestos

- Cadmium
- Chlorinated polythylene and chlorosulfonated polyethylene
- Chloroflurocarbons (CFCs)
- Chloroprene (neoprene)
- Formaldehyde
- Halogenated flame retardants
- Hydrochloroflurocarbons (HCFCs)
- Lead
- Mercury
- Petrochemical fertilisers and pesticides
- Phthalates
- Wood treatments containing creosote, arsenic or pentachlorophenol

3.11.3 Non-combustible external fabric

External walls must be constructed from only non-combustible materials. Appropriate evidence to support such construction must be supplied. No combustible materials are permitted without explicit endorsement from the University.

In the event that combustible materials are proposed in the design and/or construction of an external wall, this must be disclosed as a departure at the earliest possible Design Phase and accompanied with the appropriate fire safety and risk engineering justification. Approval to proceed must be granted by the University prior to proceeding with the proposal.

3.11.4 Eco-preferred content

All building products used must have an eco- preferred content of greater than 20% by mass. This can include reused content, GBCA recognised third party verified content or independently verified recycled content.

3.11.5 Designed for disassembly

At least 50% (by mass) of all products used in the building, must be able to be readily disassembled with the use of non-specialised tools, to allow parts to be separated into elemental components for reuse, recycling or reprocessing.

3.11.6 Product stewardship

Manufacturers of all products and materials used in the building, must be contractually obliged to take back the product at the end of its service life for reuse, recycling or reprocessing.

3.11.7 Modular in design

All products used in the building (unless stipulated in the technical Standard or required as part of project specific brief), must be manufactured with standard dimensions or designs that enable the product to be rearranged, fitted or stacked together in various configurations, enabling the product to be adjusted, parts to be replaced and making it easier to reuse.

3.11.8 Durability

All selections must be made with regards to quality and durability of the selected material and equipment. All base building products used must have a manufacturer's warranty of more than 15 years, unless otherwise stipulated in the Standard under the relevant technical section.

3.11.9 Manufacturer’s environmental management system

Manufacturers of all products and materials used in the building must have a ISO 14001:2004 certified Environmental Management System that, as a minimum, includes the following components:

- An environmental policy.
- An environmental aspects analysis and/or identification and ranking of the environmental risks.
- Environmental objectives and targets.
- Monitoring of environmental impact criteria.
- Environmental auditing.
- Reporting of environmental performance.
- A review (undertaken as least annually) of the EMS and its components.

- Details of the relevant environmental roles and responsibilities of staff.
- Details of the environmental training of staff.

The EMS must also include detailed information on the following:

- Waste minimisation – whether or not the waste disposal and recycling rates of all waste generated from the product manufacturing process are measured, reviewed and reported no less than once every three months.
- Energy – whether or not the energy consumption of the product manufacturing process is measured, reviewed and reported no less than once every three months.
- Emissions – whether or not the gas and liquid emissions from the process are measured, reviewed and reported no less than once every three months.
- Materialsm – whether or not product material inputs including packaging are measured, reviewed and reported no less than once every three months.

3.11.10 Excavation

All topsoil must be separated from the construction site and protected from degradation for reuse at the completion of the project. There must be no net change in the volume of topsoil on the site.

3.11.11 Waterproofing

Refer to Schedule 4.2 Warranties of this volume for minimum warranty period for waterproofing of slab membranes and waterproofing of wet areas.

3.11.12 Vermin

All cavities/apertures must be sealed/closed off such that all vermin are prevented from entering. Wherever possible façade detailing must avoid ledges or protrusions, such that birds are discouraged from roosting.

Anti-termite treatment must be provided to all new buildings and building extensions. Refer to Schedule 4.12 Warranties of this volume for minimum warranty period. All workmanship and materials must conform to the requirements of the Australian Standard for protection of buildings from subterranean termites with the following considerations:

- Physical barriers must be provided in preference to chemical treatments requiring cyclic applications.
- Minimise disruption to adjacent building users where treatment is required.+
- All tree roots which have been exposed during excavation, including stumps, logs and other timber must be fully excavated and removed from the building site.

3.11.13 Structural design

Load bearing elements (columns and structural walls) must, without compromising the structural integrity of the building, be kept to a minimum to provide flexibility in space planning.

Floor systems, and especially long span floors, must be designed to control vibrations induced by activities anticipated within the building, including occupant footfall, and from other building elements and services. Floor systems shall be designed to ensure that the serviceability of the structure is not adversely affected by such sources of vibration.

Design for live loading must be carried out with consideration of economical construction and flexibility of use in mind. Floor loads in excess of Australian Standards will be supported in recognition of project specific operational requirements including such things as:

- Flexibility of the space and long-term use.
- Need for penetrations both initially and during the life cycle of the building.
- Compactus areas, libraries (and shelf height), lecture theatres, plant rooms etc.

Provide adequate protection to structure on corners and exposed edges, particularly in areas susceptible to high volumes of people and damage from trolleys and the like.

3.11.14 Concrete

Reduce the quantity of resource-intensive Portland cement by 30% by substituting it with industrial waste products such as fly-ash, or oversized aggregate. At least 30% of all aggregates used for structural purposes must be recycled (Class 1 RCA in accordance with:

- 60% for in-situ concrete.
- 40% for precast concrete.
- 30% for stressed concrete.

Concrete not installed accordance with the project specification, or otherwise determined defective must be removed from the site and replaced by the Contractor at no expense to the University.

3.11.15 Bituminous membrane surfaces

A graded screed, or appropriate falls in the surface of suspended pavement and roof slabs must be provided to ensure that the applied bituminous membrane surface retains required fall upon completion. Drainage outlet levels must be set to provide a relief point for seepage at the membrane level, as well as the normal run off at granolithic level.

Refer to Schedule 4.2 Warranties for minimum warranty for waterproofing slab membranes.

3.11.16 Floor wastes

Locate floor wastes under the basin to limit 'roll away' for a person using a wheelchair.

3.11.17 Expansion joints

Ensure that:

- Adequate expansion joints are specified, and provided in the structural design of brickwork, blockwork, stonework and concrete etc.
- Joints are continued through the surface finish where the finish requires it.

3.11.18 Steel

At least 95% of all reinforcing bar and mesh meets or exceeds 500MPa strength grade, and at least 60% of all reinforcing steel is produced using energy-reducing processes in its manufacture (measured by average mass by steel maker annually). Reinforcing steel includes reinforcing bar and mesh used in concrete reinforcement in the building structure. This includes steel in situ, stressed, and pre-cast concrete applications.

60-90% of all steel, by mass, in the project must either have a post- consumer recycled content greater than 50% or is re-used.

Where at least 50% of the GFA is framed in structural steel, the building's structural requirements and integrity MUST be achieved using 20% less steel (by mass) than conventional steel materials.

3.11.19 Timber

At least 95% (by cost) of all timber used in the building and construction works must be certified by a forest certification scheme that meets the GBCA's 'Essential' criteria for forest certification, such as Australian Forest Standard (AFS) or Forest Stewardship Council (FSC); or is from a reused source; or is sourced from a combination of both.

Any certified timber used in the project supplied in accordance with the Chain of Custody (CoC) rules of the respective forest certification scheme (e.g. relevant CoC certificates or invoices including a relevant CoC code or serial number).

Refer to Schedule 4.2 Warranties for minimum warranty for internal and external timber wall panelling.

3.11.20 PVC

At least 90% of all common uses of PVC in the project must be either PVC products sourced from manufacturers which meet the Best Practice Guidelines for PVC in the Built Environment; OR products that do not contain PVC.

3.11.21 External facade

Façade materials selected must be robust and durable, resistant to mechanical damage and be low maintenance. Finishes that require regular maintenance i.e. painting, must be avoided. Base and plinth sections of walls must be resistant to resist physical wear from day to day activity such as hand trolley and skateboards collisions, and impacts and scuffing from maintenance equipment such as cleaning machines and mowers.

Consideration should be given to the use of clear graffiti coating. Upper section of walls must be low maintenance and resistant to degradation by weathering. Sealants are not to be the primary weather barrier.

In the design and specification of external fabric systems, finishes and lifecycle costs associated with manufacture, transport, erection, maintenance, replacement, demolition, disassembly or removal must be considered as equally critical as capital costs in the selection process.

Sufficient hard standing must be provided at base of building, such that it supports the weight of any vehicle / device required to clean, maintain, repair the building's exterior, and gives safe access to all parts of the façade.

3.11.22 Windows

All aluminium window framing must be commercial quality extrusion with the highest grade corrosion resistant powdercoat or anodized finish. The choice of extrusion should be based on future availability to allow later matching of profile for modification and replacement.

Windows must be designed and installed with mechanical means as the primary form of weatherproofing. Sealants are not to be used as the primary waterproofing barrier.

Windows should be easily accessible for cleaning. Windows that can be cleaned form the inside are preferred. Window sun-shading must be designed with offset from the window to ensure adequate clearance for cleaning and maintenance.

Provide room depths of less than 7 m, i.e. depth from window to opposing boundary/ wall. Ensure 80% of each room floor area enables occupants to see the sky from desk height (720mm AFFL). Provision must be made for window cleaning and maintenance, including the replacement of glazing. All windows must be installed in accordance with manufacturer requirements.

For openable windows above ground level:

Where openable sashes are installed provide a mechanical device such that the sashes cannot be opened to allow a 125 mm to pass between the sash and frame.

Where wide-openable sashes are installed, ensure safety rails and security measures are provided to comply with the BCA, such that a sphere no greater that 125mm can pass through between any security element.

Refer to Schedule 4.2 Warranties for external windows, curtain walling and glazing warranties.

3.11.23 Window treatments

External shading must be provided to all unprotected north, east and west facades. Solar film must be used only in locations where it cannot be vandalised or easily damaged and may be used only on glass for which the manufacturer will warrant performance.

In selection of internal window treatments, consideration must be given to both the external appearance of the building, and compatibility with other rooms on same level. Consideration must be given, based on the function of the room and the necessity to provide black out or brown out conditions.

3.11.24 Louvres

Provide motorized dampers connected to the fire alarm system for any fixed open louvers such as at elevator shafts.

Refer to Schedule 4.2 Warranties for minimum warranty period for louvre systems.

3.11.25 Roofs

Minimum roof pitches shall not be less than manufacturers' recommendations and are to allow an appropriate safety factor for the prevailing conditions. Roofs must be trafficable. Roofing design and selection of roofing material, gage and profile, must be compatible with the potential future requirement to install roof mounted, solar panels.

Penetration of the roof covering shall be avoided where possible. Locate required penetrations in areas of roofs that require minimum flashing details. Flashings shall be made of the same or similar material as the roof covering.

Silicone jointing must only be used when sandwiched between two surfaces by means of staggered, mechanical fixings. Silicone is not to be used as a gap filler.

Refer to Schedule 4.2 Warranties for metal deck roofing and installation warranty period.

3.11.26 Roof plumbing

Material selection and method of installation of all roofing elements, must take into consideration compatibility with adjacent materials, ease of installation and maintenance, accessibility, corrosion, acoustics and volume.

All roof plumbing must be oversized for ease of maintenance, and incorporate failsafe components to alleviate any chance of water ingress. Adequate inspection openings must be provided. All roof components must be subjected to testing before Practical Completion is awarded.

Eaves gutters in proximity to overhead trees, must be oversized and consideration must be given to ease of maintenance including adequate hardstand at ground level for ladders/ vehicles.

Box gutters must be adequately sized and supported to be trafficable for cleaning with a broom. Box gutters must have an in-built overflow with oversized capacity. Box gutters must be mechanically sealed. Overflows must be connected to a stormwater drainage system separate from the primary outlets;

Valley gutters must be adequately supported by valley boards running the entire length of the gutter. Valley gutters must be adequately sized to cater for leaf loading. Valley gutters must have lapped joints (no welded or sealed joints are permitted).

Syphonic drainage system is not preferred. Careful consideration of the whole of life cost analysis must be carried out, taking into consideration ongoing fragility (cleaning) expenses.

3.11.27 Stairs

As part of the University's commitment to health and wellbeing, students and staff should be encouraged to use stairs.

Stairs must be designed in accordance with the following:

- Take into account heavy use and adopt materials, finishes and components which enable economy of maintenance
- Adopt a non-scratching material for handrails
- Locate lighting that can be reached without the need for an elevated work platform or scaffold

3.11.28 Internal partitions

Internal walls must wherever possible be non-load bearing allowing for future planning flexibility. Internal must be designed to support imposed loads from shelving and the like. Internal walls must be designed to achieve the required acoustic and fire ratings.

3.11.29 Panel boards

All panel board products, including particle boards, edge glued panels, fibre cement boards, plasterboard, gypsum board, ceiling tiles, and boards made from plastics must comply with the Standard outlined in Schedule 4.1 Certification Standards of this volume.

3.11.30 Internal timber finishes

Refer to Schedule 4.2 Warranties of this volume for minimum warranty period for timber wall panelling.

3.11.31 Internal concrete finishes

Refer to Schedule 4.2 Warranties of this volume for minimum warranty period for all internal decorative concrete finishes including polished concrete.

3.11.32 Skirting boards

Skirtings must be:

- Provided to all areas including joinery
- Sized appropriately and consist of a robust, damage and stain resistant material

Painted skirtings are not permitted except where required to comply with heritage and conservation design requirements.

3.11.33 Protection of finishes

Adequate protection must be provided to finishes on corners and exposed edges, particularly in areas susceptible to high volumes of people and damage from trolleys, etc.

3.11.34 Adhesives, fillers and sealants

All general-purpose adhesives, fillers and joint sealants for building work and commercial manufacturing must comply with the Standard listed in Schedule 4.1 Certification standards of this volume.

3.11.35 Paints and coatings

All water-based architectural paints (interior and exterior), student and artists paints and other water-based coatings must comply with the the Standard listed in Schedule 4.1 Certification standards of this volume.

Washable low sheen/ semi-gloss/ satin paint must be used.

No high-sheen or matt paint is permitted.

Product and colour specifications must be provided to UoA as part of the as-built handover documentation.

Refer to Schedule 4.2 Warranties of this volume for minimum warranty periods for internal and external paint systems, powdercoating, and anodising.

3.11.36 Cleaning products

All cleaning products used in the construction of the building or required for the ongoing maintenance of the surfaces in the building, (including general purpose cleaners, sanitary cleaners , laundry detergents, hand-dishwashing detergents), must comply with the Standard listed in Schedule 4.1 Certification standards of this volume.

3.11.37 Carpet and carpet tiles

All natural fibre carpets such as wool; synthetic polymer fibre carpets comprising of nylon and nylon blends, olefin (polypropylene), polyester, acrylic and polyamide; and blends composed of materials that fit into the above fibre types must comply with the Standard listed in Schedule 4.1 Certification standards of this volume.

Carpet and carpet tiles shall be hardwearing and easy to clean. Colour must be flecked or patterned, so as to lessen visual impact of marks. Plain and light colours must be avoided in high traffic areas to lessen the visual impact of dust and debris and the potential for staining.

Loop pile, rubber backed carpet tiles are preferred over broadloom carpet. Carpet tiles must have integral rubber backing and be direct fixed to the substrate. Broadloom carpet must only be used in stepped and tiered auditoria or by exception. Where broadloom carpet is installed, carpet must be installed on heavy duty rubber underlay and installation must ensure carpet seams are guaranteed flat and ravel free for the life of the carpet. Where wool carpet is required (for example in high static areas), wool blend is preferred.

Refer to Schedule 4.2 Warranties of this volume for minimum warranty for all carpet installations.

3.11.38 Resilient floorcoverings

All floor coverings and carpet underlays that are laid on top of a foundation of concrete or wooded beams, and are not part of the building structure must comply with the Standard listed in Schedule 4.1 Certification standards of this volume.

- Resilient finishes (including vinyl and rubber) must be selected taking into account the following:
- Off-gassing (all floor finishes must have low TVOC emission levels)
- Slip resistance
- Chemical resistance (in laboratory settings this may involve sample testing of commonly used chemicals prior to installation)
- Cleaning requirements
- Resistance to staining
- Stability of material
- Acoustics
- Requirement for joint- weld installation (if welding is required, ensure understanding of which room types require joint-welding)
- Vinyl must not be specified in spaces where children are present for long periods of time due to off-gassing
- Finish must not induce glare from overhead lighting
- Plain and light colours must be avoided in high traffic areas to lessen the visual impact of dust and debris and the potential for staining
- For medium and high traffic areas, where high slip-resistance is required, material colour must be dark.

Refer to Schedule 4.2 Warranties of this volume for minimum warranty requirements for resilient floor covering installations.

3.11.39 Tiling and hard surfacing

All hard surfacing products that do not provide any structural function, must comply with the certification standard listed in Schedule 4.1 Certification standards in this volume.

Plain and light floor colours must be avoided in high traffic areas to lessen the visual impact of dust and debris and the potential for staining. For medium and high traffic floor areas, where high slip-resistance is required, floor material colour must be dark. Finish must not induce glare from overhead lighting.

Refer to Schedule 4.2 Warranties of this volume for minimum warranty requirements for wall and floor tiling.

Refer to J. External Works Design Standard for external pavers and bricks.

3.11.40 Stair nosings and tactile indicators

Refer to Schedule 4.2 Warranties of this volume for minimum warranties for stair nosings and tactile indicators.

3.11.41 Raised access floors

Refer to Schedule 4.2 Warranties of this volume for minimum warranty for raised access floors.

Refer also to M. Audio Visual Design Standard.

3.11.42 Door mats

Recessed doormats must be provided to all doors accessed from the outside of the building. Mats can be installed inside the building, or outside the building where weather protection is provided.

Mats must be adequately sized so as to extend the full width of the door as a minimum, and (where space permits) allow occupants to take two full steps on the mat surface, as a minimum. In order to achieve this, there may be a requirement to extend the mat past the door vestibule or airlock into the building. Ensure careful consideration of position and detailing of changes in floor finishes where matting extends into an open area.

Ensure the concrete recess in which the mat sits is constructed to the correct depth with no reliance on packing, to ensure even support and prevent buckling over time. Fully reversible matting is preferred.

Consult with Service Delivery-Maintenance to understand maintenance access requirements and other design considerations specific to the project.

Refer to Schedule 4.2 Warranties of this volume for minimum warranties for doormats.

3.11.43 Ceilings

Adequately sized access hatches must be installed to all non-accessible ceiling areas containing services. Safe access to the hatch must be accommodated in the design. Where possible, access hatches shall be provided within publicly accessible parts of the building.

Where ceiling tiles are provided, tile layout must be carefully coordinated to minimize tile cutting, wastage and non-standard sizing.

Refer also to clause 3.12.2. Building Services Planning of this volume.

Refer to Schedule 4.2 Warranties of this volume for minimum warranty for suspended ceilings and suspension systems.

3.11.44 Doors

All new doors in new openings must be designed to comply with AS1428.2 clearances. Where the project involves the reconfiguration of doors within existing fit outs, opportunities to improve compliance must be sought wherever reasonably possible, as part of the project brief.

Single leaf solid doors must be of solid core, FSC construction with painted, laminate or veneer finish as appropriate. Door stops must be provided as required to minimise damage to adjacent walls and furniture. Viewing panels must be provided where there is the possibility of a collision hazard. Door grilles shall not be used where acoustic privacy is required. Minimal compliant line decal shall be provided to all glass doors where collision is likely.

Refer to Schedule 4.2 Warranties of this volume for minimum warranty period for timber doors, aluminium framed doors, frameless glass doors, auto doors, roller shutters, roller and roller grilles.

3.11.45 Sliding doors

Sliding door mechanisms must be easily accessible for maintenance. Ensure a compliant door handle is provided in accordance with AS1428.2. Recessed finger grip handles are not permitted. "D" type pull/push handles must be used. Ensure minimum clearance of door handle to ensure there are no finger traps between door and door jamb in fully open or closed position. Ease of operation must be considered with regard to the weight of the door.

3.11.46 Door and window hardware

All doors must be provided with adequately sized kick-plates, push plates (where appropriate) and door stops. All external doors must be provided with door closers.

Ensure consistency of door furniture style across floor plate. "D" type lever handles are required for all swing doors. Provide good colour contrast of the handle to the door.

Refer to H. Security Services Design Standard.

3.11.47 Exterior automatic doors

Ensure components are durable, self-lubricating, designed for high usage, extreme weather conditions, ease of maintenance and adjustment, and can be sourced locally.

Bi-parting doors shall be installed where possible. Single leaf doors shall only be installed where it is not possible to accommodate bi-parting doors. Doors shall be keyed to UoA master system. Revolving automatic doors should be avoided.

Recess into building from line of main façade, provide protection from prevailing wind pressure when opened. If required provide canopies for further protection. Automatic doors in adequately sized air locks must, such that both sets of doors do not open simultaneously.

Opening/closing components to be sensitive to obstructions, chain operated, capable of interfacing with fire alarm and evacuation system. Maintain a minimum 50 openings during power failure, and capable of detecting approaches at slower paces. For safety purposes, provide appropriately located sensors and decals. Doors must remain in an open position during normal hours when Fire Indicator Panel (FIP) is in alarm mode. In the case of a fire alarm signal from the Fire Indicator Panel, the power must be interfaced in a fail safe manner, such that doors are activated in an open position where applicable. In the case of a power failure sufficient power must be available, such that doors must be activated to an open position.

Refer also to G. Fire Services Design Standards and H. Security Services Design Standard.

Refer to Schedule 4.2 Warranties of this volume for minimum warranty period for auto doors.

3.11.48 Glazed doors and partitions

Wherever possible, glazed partitions and glazed doors must be installed in preference to solid partitions and doors. Solid doors in solid partitions are not permitted to occupied spaces. Where a solid door is installed, it must have a full height vision panel or a full height glazed partition adjacent, as a minimum.

Styles to aluminium framed glazed doors must be a minimum of 110 mm, allowing a greater back set for the lock to avoid the potential OHS hazard of operators catching their knuckle on the frame reveal.

Visual graphic indicators applied to glazed doors and partitions must be solid and continuous. Broken lines, symbols or words are not permitted unless they form part of larger environmental graphic application, in which case consultation with Gender Equity and Diversity Committee (or delegate) must occur as part of the Risk Assessment Process, to ensure obligations relating to equitable access for the visually impaired are met.

Refer to Schedule 4.2 Warranties of this volume for minimum warranty for internal glazed partitions.

3.11.49 Keying systems

Refer to H. Security Services Design Standard and consult with UoA Service Delivery- Security for electronic access control requirements and keying requirements.

All external doors must be electronically locked. All electronically locked doors must have key override. All locks must be grand master keyed to UoA master key system and restricted profile. All operable windows must be lockable on UoA master key system. All lifts must be on UoA master key system. All drop and strap bolts must be lockable on UoA master key system. All services plant rooms, cabinets, risers, etc. must be on the UoA master key system.

3.11.50 Electronic access control

Refer to H. Security Services Design Standard and consult with UoA Service Delivery- Security for electronic access control requirements.

Consultation with end-user and Service Delivery- Security must occur to clarify operational requirements for all doors to ensure door hardware is compatible. For example, where electronic access control is required on internal doors, for rooms with high flow of occupants, only large push pull plates are required. No locking cylinder or levers are required. Hold-open closers (requiring manual release at the end of the day) may also be required to aid movement of occupants.

3.11.51 Handrails/balustrades

Painted handrails must be avoided as they are prone to damage requiring ongoing maintenance.

Commentary must be sought from the Project HSW Representative during the mandatory Project Risk Assessment Workshop to confirm required height of balustrades and handrails, over and above mandatory minimum authority requirements. Particular attention must be given to high risk areas such as façade edge-scapes, escalators and balconies.

3.11.52 Tactile ground surface indicators (TGSI)

Tactile indicators must be installed as per the requirements of the Australian Standards. For any other TGSI applications, including directional installations, consult with an expert during the design stage to ensure:

- The application enhances access
- TGSIs are necessary, as other navigational cues do not provide sufficient information
- TGSI application does not give incorrect, superfluous or confusing information
- TGSI application does not create an additional hazard, particularly to people using wheeled mobility aids

Review of the campus/ building DDA masterplan and consultation with Gender, Equity and Diversity Committee (or delegate) must occur as part of the mandatory Project Risk Assessment process to establish most suitable solution.

3.11.53 Signage

Signage must be designed, wherever possible, to be reusable in the future.

Documentation for significant wayfinding elements, such as campus and building directories, must be recorded and filed in the same way as other UoA assets, as part of the project As-Built documentation package. Refer to K. Documentation Design Standard regarding 'Signage As-built' .

For fast tracked relocations projects, where occupants could potentially move in to premises before signage is installed, the signage consultant must make allowance for the production of temporary signage, based on the K. Documentation Design Standard and 'Temp signage templates' in the same volume.

- Refer to N. Signage and Wayfinding Design Standard for branding and wayfinding signage.
- Refer to K. Documentation Design Standard for asset labelling including building and room naming and numbering.
- Refer to NCC and Australian Standards for Statutory signage
- Refer to the relevant Australian Standards for operational and regulatory signage including Dangerous Goods, HAZCHEM and laboratory signage etc.
- Refer Australian Standards for traffic and parking control signage.

3.11.54 Building and room numbering

A standard method of building and room numbering is used throughout the University. This system of numbering must be used on all contract documentation and on room signs.

Refer to A. Project Process Checklist Design Standard and K. Documentation Design Standard for the procedure for engaging with Customer and Support Services- Senior Data Coordinator (Unispace) as a stakeholder to assign building and room numbers.

3.11.55 Material junctions

Junctions between dissimilar finishes must use brass or aluminium angles fixed to, or set into, the slab. Provision must be made for movement, construction and control joints to minimise cracking in structures and finishes.

3.12 Furniture, fittings and equipment (FFE)

3.12.1 Furniture, fittings and foam products

All furniture including office chairs, office desks and tables, couches, stools, bedroom furniture, white furniture, fittings, foam and foam mattresses, must comply with the standard listed in Schedule 4.1 Certification standards in this volume.

3.12.2 Appliances

All appliances must be tested and tagged by Campus Management prior to installation and operation. Refer to Schedule 4.1 Certification standards in this volume for further details.

3.12.3 Joinery and fixed furniture

Fixed furniture shall be avoided where possible to allow for future flexibility. Fixed furniture will only be required in some lecture theatres, laboratories, tea preparation areas and reception areas.

- All joinery units must have backs.
- No cam fittings shall be used. All furniture must be glued and screwed.
- Adjustable wall shelving shall be avoided. If wall shelving is required, then expected loads are to be confirmed.
- 18mm board must be used for shelves and 25mm board shall be used for benches. HMR board must be used in wet areas.
- Brass ferrules and pins must be used for adjustable shelves. Blum hinges are preferred.
- E0 (lowest formaldehyde emissions) board must be used.
- Refer to Schedule 4.2 Warranties for minimum warranty for joinery.
- Refer to Schedule 4.2 Warranties for minimum warranty for fixed furniture and equipment.

3.12.4 Reception counters

Reception counters must be designed to allow for use by a staff member with a disability, or for future modification to meet this criteria.

Reception counters must be accessible by a visiting person in a wheelchair.

Consultation with Gender Equity and Diversity Committee (or delegate) may be required to ensure obligations are met with regards to equity of access.

3.12.5 Loose furniture

Consultation with Strategic Project Management- Environmental Project Officer must occur to determine whether opportunity exists to utilise recycled furniture within the project.

All new loose furniture specified must comply with the certification standard in Schedule 4.1 Certification standards, outlined in this volume.

When selecting new loose furniture, preference should be given to local manufacturers and those with facility to provide ongoing after-sale service and parts. It is essential that careful consideration is given to lead times and the implications of extended storage periods in the process of ordering furniture. Furniture should be consistent across the floor plate of a building. Where possible, furniture should be interchangeable to allow for future flexibility.

For rooms with a flexible furniture arrangement, the Consultant must allow for the production of an A3 laminated drawing showing potential furniture layout/s within each room for display reference on the wall.

Refer to K. Documentation Design Standard and the flexible furniture layout template.

3.12.6 Upholstery fabrics

Plain and light colours must be avoided in high traffic areas to lessen the visual impact of dust and debris and the potential for staining.

All upholstery fabrics must be heavy duty commercial grade, stain resistant and durable with a minimum of 50,000 Martindale, and be fire resistant as required to meet the current codes.

3.12.7 Chairs

Wherever possible, chairs must be stackable. Task chairs must be fully adjustable (height, seat tilt back and forth, back height, back tilt). Lumber support and arms must be an option.

- Refer to Schedule 4.1 Certification standards in this volume for further details.

- Refer to Schedule 4.2 Warranties in this volume for further details.

3.12.8 Workstation desks

Standard modular workstations must be used to allow for long-term flexibility. Shared break-out tables or equivalent, may be utilized to provide additional space for collaboration.

Standard sizes for workstations are outlined in Schedule 4.1 Certification standards in this volume. Adjustable (sit/ stand) workstation desks must be installed wherever possible. Where adjustable stations are installed they must be fitted with a workstation spacer to ensure that finger-traps between desks, or between desk and cabinets are avoided when desk is being adjusted. Cam fittings must not be used. Modesty panels must be installed as required.

- Refer to Schedule 4.1 Certification standards in this volume for further details.
- Refer to Schedule 4.2 Warranties in this volume for further details.

3.12.9 Workstation screens

Workstation screens must be no more than 1350mm above floor level so as to maximise penetration of natural light and encourage collaboration. Acoustic requirements and performance shall be considered in the selection of the screen system.

3.12.10 Mobile pedestals

As a minimum, one mobile pedestal, or equivalent, must be provided per workstation. Pedestals must be lockable. 50mm dual wheel castors are preferred.

- Refer to Schedule 4.1 Certification standards in this volume for further details.
- Refer to Schedule 4.2 Warranties in this volume for further details.

3.12.11 Tables

In teaching spaces, preference is for folding tables on castors to enable flexibility of arrangement. Tables must be durable, easy to maintain and easily handled into multiple configurations.

3.12.12 Fixed shelving

Shelving must not be fixed to walls unless the wall has been designed specifically to allow for shelf loading.

3.12.13 Compactus

Compactus loading must be considered before installing any compactus shelving. Structural engineering advice is required.

The runner system of compactus shelving must not create a trip hazard.

3.12.14 Whiteboards

Porcelain whiteboards are preferred. Aluminium frames are preferred. All whiteboards must be easily cleaned.

3.12.15 AV equipment and projection screens

Refer to M. Audio Visual Design Standard for AV equipment and projection screen requirements.

3.12.16 Storage

Consultation with UoA Records Management must occur to assess the storage requirements of the end-user, such that records storage is rationalised.

3.12.17 Artwork

Opportunities for integration of artwork into the building fabric must be considered at Concept Design Phase.

Design considerations may include the following:

- Opportunity for integrating artwork into building fabric.
- Opportunities for displaying stand- alone artwork (wall/ floor/ other).
- Where stand- alone artwork is to be rotated over time, make allowance for adjustable fixing systems so as to minimises damage to wall finishes.
- Where artwork is floor mounted, ensure ground surface/ floor is capable of carrying the load without deflection and that fixing mechanism takes into account flooring composition and in-floor services. Establish in floor services requirements including power/ lighting.
- Lighting requirements generally.
- Understand medium- specific requirements for positioning e.g. requirement to avoid excessive ultraviolet light, vibration or dust.

- Understand surface preparation requirements e.g. mural or integrated artwork.
- Design citation plate and fixing.

Where existing artwork exists, consultation with UoA Records Management must occur to ensure safe removal and storage or relocation, prior to commencement of demolition and building works.

3.13 Building services

3.13.1 Water recycling

Opportunities for water harvesting and re-use in non-potable applications, must be adopted wherever possible. In order of preference, this may consist of:

- Rainwater harvested from roofs via down pipes.
- Harvested stormwater.
- Cooling water reuse or recirculation.
- Recycled water of the appropriate standard.

Water recycling systems must comply with State guidelines on alternative urban water supplies and reclaimed water.

All water harvesting and reuse systems must be remotely monitored and metered, preferably by central building automation system.

Refer to L. Metering and Monitoring Design Standard.

3.13.2 Building services planning

When considering an integrated approach to implementing building services, there must be no adverse impacts from one service on another. Services must be fully coordinated and grouped together in vertical or horizontal service zones within the building. All pipes must be positioned to allow access, particularly when in service risers / ducts. In no instances must any pipes be concealed behind other pipes.

Ceiling mounted services or exposed overhead services must be carefully coordinated to ensure a logical rhythm of visible services is achieved.

Where ceiling mounted services are not concealed, all disciplines must be carefully coordinated and represented on a master ceiling plan as part of the contract documentation set. The following must be achieved:

- A logical rhythm with rational grouping of services in neat layers on cable trays/ fixing/ suspension systems
- Finishes of all exposed components must be carefully considered. Pipes and fittings should be chromium plated, supported on chromium plated pillar clips, and fitted with chromium plated wall plates to cover entry points in walls, floors or ceilings
- Clearance for installation and maintenance is maintained
- Positioning of suspension points is not duplicated unnecessarily between service disciplines, and a regular and ordered visual rhythm is achieved
- Un-wanted shadowing of light fittings is avoided
- Australian Standards for suspension of services are adhered to with regards to such things as maximum suspended drop distance, and earthquake risk
- Painting of soffit may be necessary

Provision to upgrade, maintain and meet future needs of plant and services without major disruption or impact on the building fabric, must be incorporated in design. Grouping of overhead service within common areas is preferred to avoid disruption in occupied spaces, during maintenance.

Location of end-user interface outlets, and controls must be properly considered to allow for future flexibility and space changes. i.e. power point locations may be located in ducted skirting rather than in a fixed location on a wall. Details and position of all outlets must be captured in the Room Data Sheets, forming part of the Detailed Return Brief and all wall-mounted services must be shown and height above floor level identified on Internal Elevations as part of the Contract Documentation set.

Refer to the appropriate discipline Technical Standards for detail on design considerations; sizing of plant and equipment; clearance requirements; provision for spare capacity; provision for future connection; emergency operation provisions; controls. Building heritage guidelines must be complied with and may take precedence over the above requirements.

3.13.3 Air intakes and grilles to plant areas

Air intakes must be located in shaded or protected locations. Although there is a regulatory requirement for separation, prevailing winds and localised wind patterns must be considered to prevent odours returning through the penetrations. Air intakes must be located away from the following areas:

- High trafficable areas

- Near smoking zones
- Waste and gross pollutant pits and pump out positions
- Kitchen, general building exhausts and flues
- Cooling towers
- Fume cabinet exhaust
- Streets and car parking stations
- High temperature areas
- Malodorous areas
- Dangerous, hazardous or chemical storage areas

3.13.4 Plant rooms

Location and presentation of external plant and services must be considered as an integral part of the total design. Appearance or impact of plant on the surrounding open space and neighbouring buildings must be considered as well as access for maintenance or use.

Building plant must not be visible from the exterior, when viewed from ground, except where visibility of such plant might serve as an environmental learning resource to all building users or the university in general. Plant and equipment must be located in an enclosed plant room designed for the purpose. Roof mounted plant and equipment shall be avoided wherever possible.

The following requirements apply to enclosed plant rooms/ enclosures:

- Located at top or basement level of the building, where possible
- Locate close to most direct point of vehicular access, avoid extensive service road connections
- Provide acoustic treatment to allow for all-hours operation
- For multi storey buildings, provide goods lift access to the rooftop plant rooms
- A clear path of travel must be provided from the roof top plant room to the lift or stairways
- Plant rooms should be accessible from common areas to avoid disruption of occupied spaces
- Basement plant rooms must be designed to minimise the possibility of flooding. Provide an alarmed pump pit, discharging to sewer
- Ground level roller door and / or double door access must be provided
- Provision for lifting of equipment must be made in elevated plant rooms, for hatches and lifting equipment to facilitate conveyance of equipment to ground
- Full concrete plinths must be provided under all floor mounted equipment
- Floors must be graded to drain and provided with floor outlets and have 100 mm high coved upstands to the perimeter walls to permit washing down
- Floor finishes must be sealed against spillages and flooding with a seamless flooring coating system
- The acoustic performance criteria of Plant Rooms (measured under full load at maximum capacity) must be agreed in writing at the Return Brief approval stage. Plant Rooms performance must be measured with all equipment operating under full load
- Plant room signage must be installed to identify room function and notify restricted access
- The plant room must have floor grates (Use chrome plate on brass), water tap and double GPOs
- The main plant room must have a 3-phase power outlet and the light must be operated via wall switch
- All plant rooms must be fitted with visual warning equipment connected to the Emergency Warning Intercommunications System or Fire Indicator panel as appropriate, refer to G. Fire Services Design Standard.

Where enclosed plant rooms cannot be achieved, and approval has been granted for roof mounted plant; or where existing plant is located on a roof, the following requirements must be adhered to:

- The plant and equipment must be located so that the roof surface, materials and the plant are fully accessible for maintenance or replacement
- The rooftop plant is visually and acoustically screened to minimise visual and noise impacts on surrounding environments
- The plant and equipment are mounted on steel or aluminium platform structures elevated above the roof surface. A clear space of minimum 600 mm must be provided between the roof surface and the lowest part of the platform structure, or any item of equipment or reticulation suspended below the platform.
- Platforms must be designed by a suitably qualified structural engineer to consider proposed and likely future equipment loads.

3.13.5 Roof access

All buildings must be provided with safe and convenient access to the roof surface to facilitate maintenance, including gutter cleaning.

Fall prevention systems must be installed in accordance with the requirements of Worksafe SA Code of Practice for the Prevention of Falls and the relevant Australian Standards.

3.13.6 Rooftop solar energy systems

All new buildings must include rooftop solar energy systems (solar photovoltaic and solar hot water). All new buildings must be designed to maximise capacity for solar gain by applying the following roof criteria:

- Flat or oriented for maximum solar gain
- Free from overshadowing from surrounding buildings, structures, parapets, trees, and plant and equipment
- Free of plant and equipment
- Free of maintenance access ways

Refer also to clause 3.13.5 Roof Access of this volume.

3.13.7 Mechanical, electrical, hydraulic and fire services

Refer to C. Mechanical Services Design Standard, D. Electrical Services Design Standard, F. Hydraulic Services Design Standard, G. Fire Services Design Standard.

Refer to Schedule 4.2 Warranties of this volume for minimum warranty period for all mechanical, electrical, hydraulic and fire systems.

3.13.8 Hearing augmentation

Refer to E. Communications Services, for minimum requirement for hearing augmentation (and associated signage), based on room type.

For spaces requiring hearing augmentation, consultation with the Gender Equity and Diversity Committee (or delegate) must occur to establish additional obligations for provision of equitable facilities.

3.13.9 Floor boxes

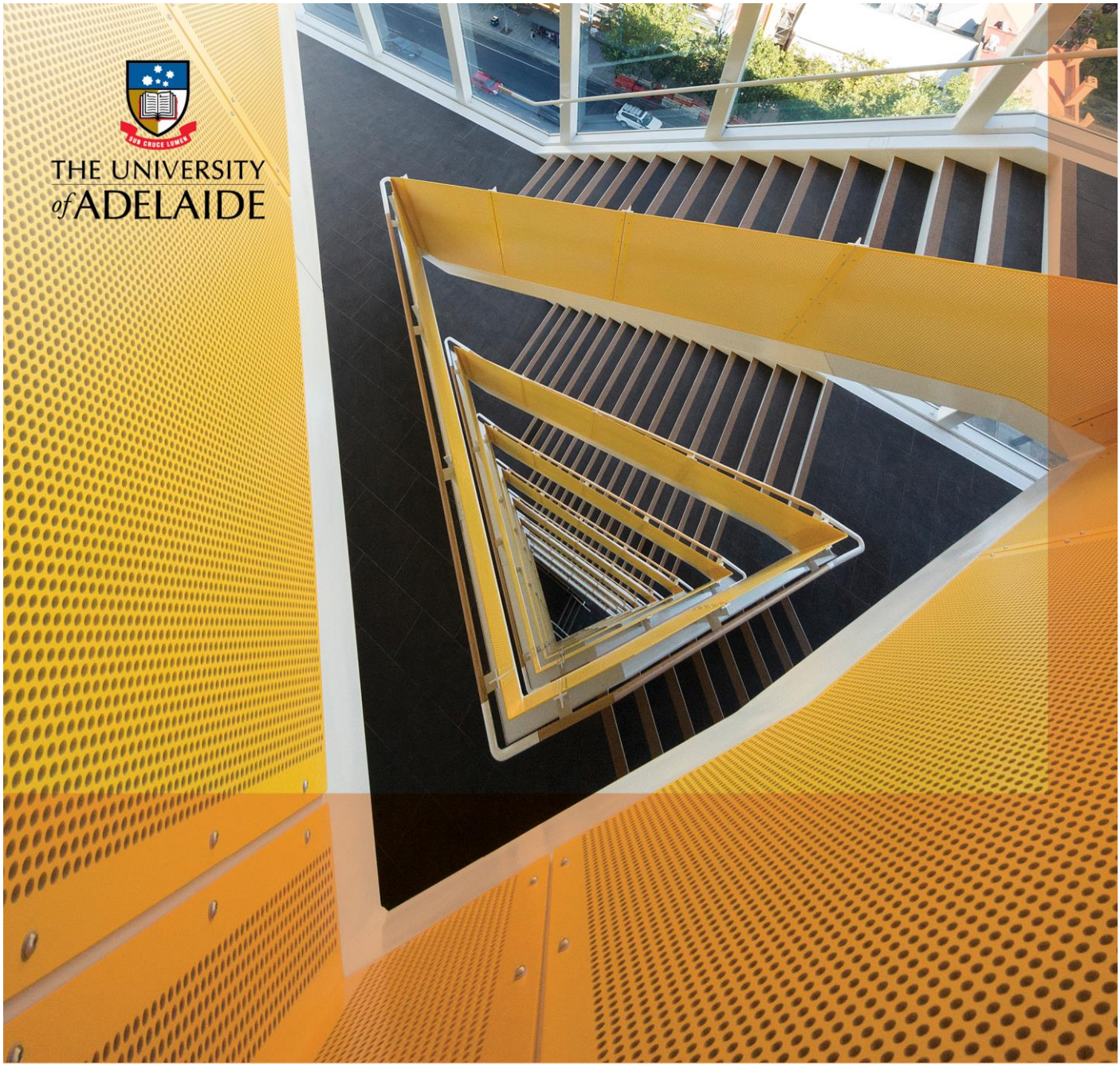
Install floor boxes in accordance with Schedule 4.4 Miscellaneous fittings.

3.13.10 Door release buttons

Install infra-red touchless door release dials in accordance with Schedule 4.4 Miscellaneous fittings. Manual release button fittings must not be specified.

3.13.11 Emergency break glass

Install resettable emergency break glass fittings in accordance with Schedule 4.4 Miscellaneous fittings. Disposable, non-resettable fittings must not be specified.



SCHEDULES

B. Building and Architecture

4. Schedules

4.1 Certification standards

Item	Details
Hydraulic fixtures and fittings	All hydraulic fixtures and fittings must have the following minimum water efficiencies, as measured using AS/NZS6400:2005 Water-efficient products-Rating and labelling as outlined below. • Toilets – 4 Star • Urinals – 5 Star • Taps – 5 Star • Showerheads – 3 Star
Toilets	• Toilets must be dual flush with 4.5/3.0 L cistern. • Ensure pans and cisterns are matched to provide maximum water efficiency (WELS 4-star or greater.) • No concealed serviceable fixings are permitted.
Panel board	GECA panel board (Level A) Standard. This includes a requirement that the product have GECA certification, or be recognised with a registered Product Certification Scheme (listed on the GBCA Website).
Adhesives, fillers and sealants	GECA Adhesives, Fillers and Sealants (Level A) Standard.
Paints and coatings	GECA Paints & Coatings, (Level A) Standard.
Cleaning products	GECA Cleaning products (Level A) Standard.
Carpet and carpet tiles	GECA Carpets (Level A) Standard. This includes a requirement that the product be recognized with a registered Product Certification Scheme (listed on the GBCA Website), for example the Carpet Institute of Australia Limited, Environmental Certification Scheme (ECS) v1.2.
Resilient floor coverings	GECA Floor Coverings (Level A) Standard. This includes but is not limited to wooden planks, rubber and vinyl. All resilient floor coverings must have GECA certification or be recognized with a registered Product Certification Scheme (listed on the GBCA Website)
Tiling and hard surfacing	GECA Hard Surfacing (Level A) Standard. This includes products for interior or exterior use, including but not limited to, natural stone, agglomerated stones, concrete paving units, terrazzo tiles, ceramic tiles, clay tiles and glass tiles.
Furniture, fittings and foam products	All furniture including office chairs, office desks and tables, couches, stools, bedroom furniture, white furniture, fittings, foam and foam mattresses, must comply with the GECA Furniture, Fittings and Foam (Level A) Standard. This Standard includes more stringent requirements for, for example VOC level emissions, than the Level B Standard. The Standard includes, but is not limited to, a requirement that the product have GECA certification, or be recognized with a registered Product Certification Scheme (listed on the GBCA Website)
Appliances	All energy-consuming appliances (fridges, TVs, computers, etc.) must be within one Star of the highest available rating under the Australian Government's "Energy Rating" labelling system at the time of purchase. All water-consuming appliances (dishwashers, etc) must be within one Star of the highest available rating under the Australian Government's Water Efficient Labelling Scheme (WELS) at the time of purchase.
Loose furniture	Australasian Furnishing Research and Development Institute, Sustainability Standard for Commercial Furniture - AFRDI Standard 150.
Workstation desks	Standard sizes for workstations are: • Office station: 1800 x 900mm plus return (if space permits) • Full time equivalent station: 1800 x 900mm • Hot desk/ HDR station:1200 x 900mm

4.2 Warranties

Item	Warranty Period (Years from Practical Completion)
Anodising	15 years
Carpet installations	15 years
Chairs	5 years
Doors	
• Solid core timber doors	5 years
• Aluminium framed glass	5 years
• Frameless glass doors	5 years
• Auto door operators	5 years
• Roller shutters, roller grilles	5 years
Electrical services	At least 12 months with extended warranty periods as offered by manufacturers for specific components of plant and equipment
External walling and cladding	Materials 15 years Workmanship 15 years
External windows, curtain walling and glazing	Materials 10 years Workmanship 15 years
Fire protection services	12 months
Fixed Furniture and Equipment (FFE)	12 months minimum other than any fabric to screens which must be 5 years
Fixed joinery	2 years
Floor finishes:	
• Door mats	5 years
• Stair nosing	5 years
• Tactile indicators	5 years
• Resilient finishes carpet tiles	5 years
• Carpet tiles	5 years
• Broadloom carpet.	5 years
Hand Dryer	5 years
Hydraulic services	12 months
Internal decorative concrete finishes – including polished concrete	10 years
Internal glazed screen partitions	15 years
Internal timber installations	5 years
Louvre systems	15 years
Mechanical services	At least 12 months with extended warranty periods as offered by manufacturers for specific components of plant and equipment
Metal deck roofing installation	20 years
Metal deck roofing material	20 years
Mobile pedestals	5 years
Painting	
• Internal paint system	5 years

Item	Warranty Period (Years from Practical Completion)
• External paint systems.	10 years
Powdercoating	15 years
Precast concrete panels	20 years
Raised access floors	10 years
Resilient floor covering installations	10 years
Sanitary ware, fittings, accessories and plumbing reticulation systems	5 years
Suspended ceilings and suspension system	5 years
Timber wall panelling – internal and external	15 years
Wall and floor tiling	5 years
Washroom partition systems	10 years
Waterproofing slab membranes	15 years
Waterproofing wet areas	5 years
Workstations	7 years

4.3 Space guidelines

Position	Type of Space	Pax	Work Point Allocation UFA (sqm)	Single or Shared Occupancy
Executive Dean	Office	1	15-18sqm	Single
Head of School (or equivalent)	Office	1	12sqm	Single
Senior Manager directly reporting to VC+P, DVCR, DVCA and COO	Office	1	12sqm	Single
Academic Staff A-E Limited to 10% of total numbers on the floor	Office	1-2	12sqm	Single or Shared
Academic Staff 90% of numbers on floor	Workstation	1	4sqm	Single
Professional Staff, including Managers	Workstation	1	4sqm	Single
Post Grad HDR students	Workstation	1	3-4sqm	Single /Shared
Post Grad HDC students	Nil	Nil	Nil	Nil

All areas stated above are maximum.

Meeting rooms, storage, tea points and copy areas and main circulation routes are excluded from the Work Point Allocation.

The above allocations table equates to a planning ratio of 10-11sqm of net leasable area (NLA).

4sqm zone allows for 1800mm x 1800mm area, containing 1800mm long straight or L-shaped desk.

4.4 Miscellaneous fittings

Position	Specification Details
Door release button	Infra-red touchless. SOCA Infrared Series or equal approved
Emergency Break Glass	Resettable type
Floor Box Limited to 10% of total numbers on the floor	ECD or equal approved

4.5 Dispensable fittings

Item	Specification details	Compatible and approved dispensable product
Paper Towel Dispenser	Code 70250 KC Aquarius Optimum Paper Towel Dispensers- Supplied by UoA Service Delivery, installed by contractor	4440 Kleenex compact hand towel 4455 Scott Optimum Hand Towel
Skin Care Dispensers	Code 69480 KC Aquarius Cassette Skin Care Dispensers. Supplied by UoA Service Delivery, installed by contractor	12552 Kleenex Moisturising Foam Soap
Jumbo Toilet Roll Dispenser within Access &/or Ambulant toilets	Code 70210 KC Aquarius Jumbo Roll Twin Dispensers. Supplied by UoA Service Delivery, installed by contractor	5748 Scott Compact Jumbo Roll 1 ply 25626 Scott Bathroom tissue 1 ply 4732 Kimberly Clark Toilet paper roll deluxe 2 ply
Toilet Roll Dispenser within Access &/or Ambulant toilets where hand railings restrict the fitting of the jumbo roll dispensers	Code 55700 Tork Dispenser Toilet Paper Roll Twin T4	