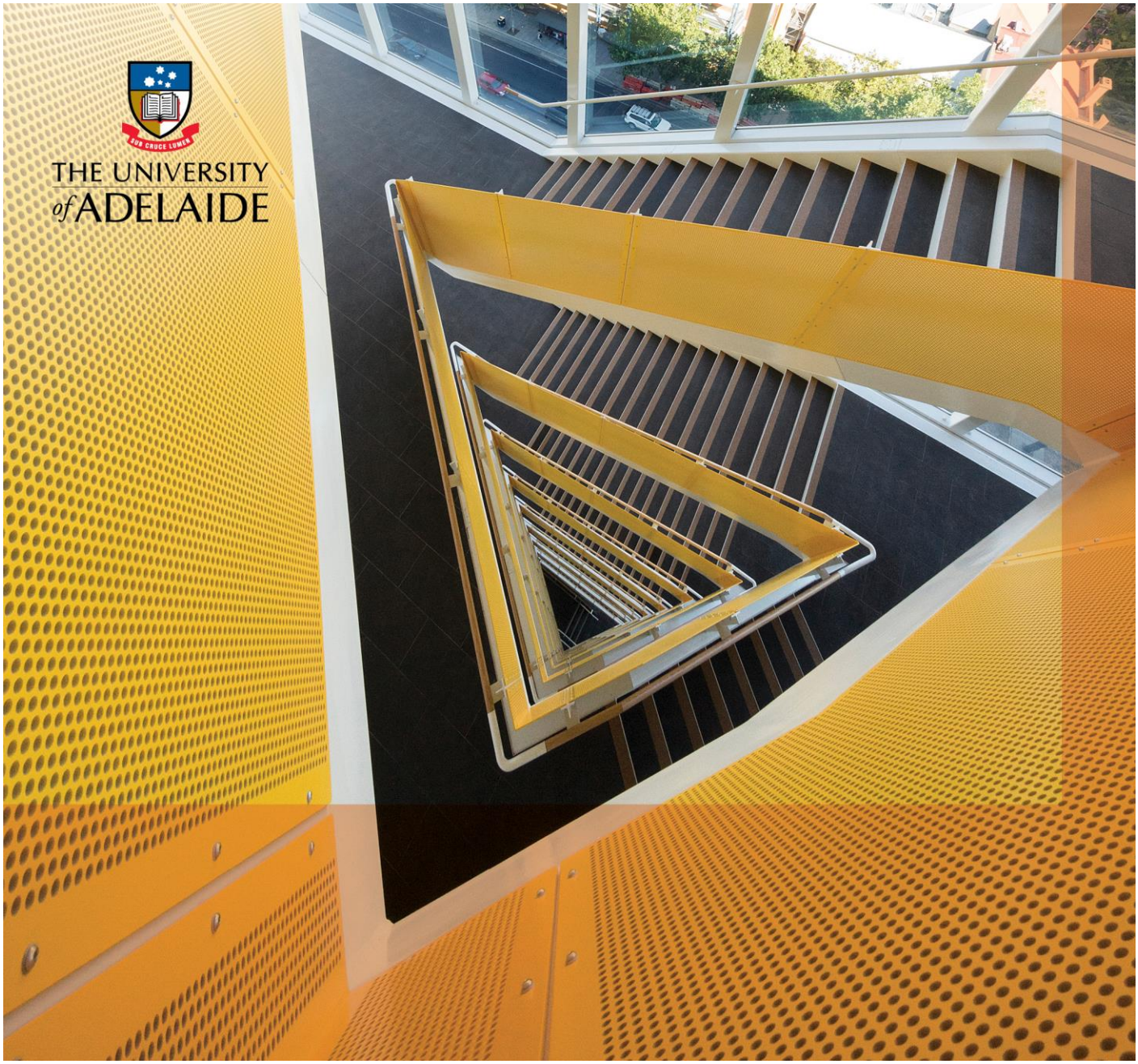

DESIGN STANDARD

I. Vertical Transport

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Contents

Revision log

Current issue

I. Vertical Transport - UoA Design Standards. FINAL Version 4. August 2018.

Previous issues

Version	Authors	Description	Revision	Date
1.0	Whitfield Rose on behalf of UoA Service Delivery	I. Vertical Transport - UoA Design Standards.	DRAFT Version 1	December 2017
2.0	Whitfield Rose on behalf of UoA Service Delivery	I. Vertical Transport - UoA Design Standards.	DRAFT Version 2	December 2017
3.0	GHD	I. Vertical Transport - UoA Design Standards.	DRAFT Version 3	March 2018.
4.0	Vicki Jacobs, Capital Project Delivery, UoA / GHD	I. Vertical Transport - UoA Design Standards.	FINAL Version 4	August 2018

List of revised items

Version	Authors	Revised items	Date

Revision management

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

Endorsement body

Director of Infrastructure

Owner

Capital Projects Delivery

Contact person

Associate Director, Capital Project Delivery

Authors and acknowledgements

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

Abbreviations

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

1. Introduction

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

1.1 Purpose of the document

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

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

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

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

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

1.2 Structure of UoA Design Standards

I. Vertical Transport Design Standard (this document) is a part of the UoA Design Standards suite of documents (the Standards).

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

- A. Project Process Checklist
- B. Building and Architecture
- C. Mechanical Services
- D. Electrical Services
- E. Communication Services
- F. Hydraulic Services
- G. Fire Services
- H. Security Services
- I. Vertical Transport (this document)
- 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

1.3 Related documents and legislation

1.3.1 Document

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

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

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

1.3.2 Relevant legislation

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

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

1.4 Definitions

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

Must	Indicates that a statement is mandatory
Should/ shall	Indicates a recommendation
May/ can	Indicates the existence of an option
The Standard/s	The University of Adelaide Design Standards
Project Manager	University of Adelaide staff member responsible for delivering the building project
Project Brief	The strategic brief detailing project scope and objectives, developed at the project feasibility and initiation phase, from which the Return Brief shall be developed.
Return Brief	The detailed design brief prepared by the Design Team and signed off by the Project Stakeholder/s prior to commencement of Concept Design

2. General requirements

This section outlines:

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

2.1 Project specific information

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

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

2.1.1 The project brief

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

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

- The Strategic Project Brief is typically developed by the University during the feasibility phase of the project. This brief reflects outcomes of the strategic project investigations. The Strategic Project Brief must be interrogated and verified by the Project Delivery Unit, Project Manager and key strategic stakeholders, prior to proceeding to the next Detailed Briefing Phase of the project delivery process. It is from this verified Strategic Brief, that the consultants brief will be developed.

The Strategic Project Brief must:

- Identify project- specific sustainability targets, over and above the Standards, and associated reporting obligations;
- identify proposed project budget and funding source. This must include:
- Capital Budget (separated into construction and university costs), and
- Operating Budget (reflecting project- specific sustainability targets);
- identify other strategic targets associated with the project;
- identify list of known Stakeholders with a preliminary engagement plan developed. This includes identification of key stakeholders with whom sign-off approvals obligations will sit. Refer below Clause 2.4 Certification of Compliance with the Standard;
- identify general spatial and operational requirements of the end users;
- identify decanting and relocations proposals associated with works;
- identify a list of further investigations that are required (e.g. Heritage, DDA etc.);
- identify an indicative project program for the delivery of works;
- identify strategic risks associated with the project (Refer Clause 2.7 Risk Register);
- communicate any safety in design risks identified to date (Refer Clause 2.8 Safety in Design);
- The Return Brief (also referred to as Project Brief) is typically prepared by the Consultant at the end of the detailed briefing phase, during which intensive stakeholder consultation has occurred. The Project Brief must be signed-off by key stakeholders prior to proceeding to the next Concept Design Phase of the project delivery process. It is against the signed- off Return Brief (also typically referred to as Project Brief), that the mandatory, milestone, compliance certifications will be measured. (Refer to clause 2.4 Certification of compliance, in this document). For very simple projects, compliance may be measured against the Strategic Project Brief, or equivalent, provided it meets all mandatory due diligence obligations, related to the development of a brief, listed in A – Project Process Checklist.

The Return Brief must:

- Meet the obligations of the Strategic Project Brief (including, but not limited to budget and sustainability targets);
- identify detailed operational and spatial requirements of the end users;
- include room data sheets for complex projects (refer to Vol. A Checklist for clarification).

2.2 Discrepancies

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

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

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

2.3 Departures

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

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

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

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

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

2.4 Certification of compliance

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

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

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

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

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

2.4.1 Frequency of certification

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

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

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

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

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

2.4.2 Additional certification requirements

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

2.5 Project procurement process

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

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

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

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

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

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

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

2.6 Value management

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 I. Vertical Transport UoA Design Standards

3.1 General requirements for lifts

Lifts must be safe, reliable, durable, efficient, cost-effective to maintain, and comply with all SA and national relevant codes and AS/NZS. The University requires:

- Lifts to be of an 'open architecture' design in relation to software and maintainable by multiple local lift maintenance contractors other than the original manufacturer
- Lifts to be flexible and versatile in operation
- Lifts of the exact same componentry to have a proven 5 year local history of reliability
- Copy of registered software or test tool with embedded software for the specific lift installation provided.

3.1.1 Lift performance

Passenger lifts to meet the requirements of handling capacity and waiting time, depending on the lift's expected usage and the building type, as defined by the latest version of the Transportation Systems in Buildings Guide "D", Chartered Institute of Building Services Engineers (CIBSE).

The passenger lift/s must achieve the fastest floor-to-floor performance possible without unduly affecting the quality of the lift car ride. The following performance parameters must not be exceeded:

a. Passenger lifts to meet the requirements of handling capacity and waiting time, depending on the lift's expected usage and the building type, as defined by the latest version of the Transportation Systems in Buildings Guide "D", Chartered Institute of Building Services Engineers (CIBSE)

b. Lifts to meet the requirements for use by persons with disabilities as defined AS/NZS and current building codes

c. Provision for safe handling of hazardous goods

d. Lifts installed in potentially explosive areas to be appropriately certified for that area

e. Lifts directly exposed to "non-standard" operating conditions or any other adverse condition to be appropriately protected, designed, detailed and constructed

f. Maximum acceleration rate of 1.0 m/s2

g. Maximum deceleration rate of 1.0 m/s2

h. Maximum jerk rate of 1.5 m/s3

i. Maximum lateral and vertical movement 15 milli-g (10Hz filtered A95)

j. Rated lift car speed +/- 5% (up/down, full/no load)

k. Floor levelling accuracy +/- 6mm under all load conditions

l. Noise levels in a lift car in motion at must not exceed 55db(A) taken in the middle of the lift car at approximately 1 metre above the floor

m. Door operation noise must not be more than 60 db(A)

n. Lift car fan noise levels must not be more than 60 db(A)

o. Lift Car Lighting must comply with AS/NZS 1735.12:1999 Clause 10 and have a minimum of 100 lux

p. Lift Car Emergency Lighting must comply with AS/NZS 1735.2:2001 Clause 23.25.2.9 and have of a minimum of 20 lux on each control panel.

To reduce noise and vibration, lift equipment such as hoisting machines, controller, and if appropriate, switchgear, sheave, guide shoes, door mechanism and rope hitch must be mounted on appropriate isolating pads or mountings.

3.1.2 Lift contractor requirements

Only a competent, well-established, lift contractor with at least 10 years local lift installation experience may install or modify lifts. The lift contractor must have proven and demonstrated experience and capability in installing and maintaining:

a. similar types and sizes of lifts operating in environments similar to the University;

b. lifts with the same control and drive systems operating at the University.

c. Use the same design of car and landing buttons

d. Use the same lift car visual display screens

e. Use Panachrome + 194 3D doorway protection

The lift contractor must comply fully with all local rules, regulations, codes and practices as well as gain approval (e.g. design registration) and certification from the local lift inspectorate e.g. Safework SA prior to the lifts being offered for tender.

The tender return documents must include a copy of the Design Registration Certificate issued by a recognised Safework SA Authority for each lift or type of lift proposed and a minimum of 4 local reference sites where the proposed lifts have been operating for at least 5 years must be provided for references and approval purposes.

Only contractors that can provide a comprehensive reference list of lifts of the same type, control systems and drive systems installed over the past 5 years may be considered for lift installation projects at the University. Prospective lift contractors must supply information in Attachment 1.

3.1.3 Lift equipment and serviceability

Non-proprietary lift equipment with a five year local track record of reliable performance and a ready supply of locally available spare parts from a range of lift companies must be used. Availability of all parts must be guaranteed for a minimum of 20 years. Lift equipment includes all parts of the entire lift installation, in particular the controller and its various parts including software and hardware and any equipment required for servicing of the lift equipment.

Where proprietary equipment is offered, the lift contractor must provide any proprietary equipment or components included in the proposal must be supplied complete with all and any proprietary or unique tools (i.e. manufactured only by the OEM supplier) required for the adjustment, removal or installation of such components.

Compliance with the above must include the provision of electronic test and software access tools required to allow the adjustment and resetting of any software parameters. These must be provided under the contract and must remain available as a spare part for purchase by any maintenance provider under instruction from the University of Adelaide, for a minimum period of 20 years from practical completion. Such tools must be free of any electronic locks, software controls or other systems intended to lock or prevent full use of the tool after a predetermined time period.

3.1.4 Lift types

All University lifts must be robust, durable and well-suited to intensive use. Only high efficiency AC gearless lifts with Variable Voltage Variable Frequency (VVVF) drives are permissible for new lift installations and full replacements. Geared machines with modern AC motors are acceptable for upgrades and modernisations after review and approval by the issuer of this standard.

The following lift types may be considered:

a. Conventional overhead lift motor room traction lifts;

b. Machine Room-Less (MRL) lifts.

c. Electro-Hydraulic lifts with variable speed control

Conventional overhead lift motor room traction lifts must be used for speeds exceeding 2.5m/s and must also be considered where a high rated load is required e.g. large goods lifts. MRL lifts may be considered for passenger lifts for speeds of 1.0m/s to 2.5m/s.

Lifts complying with AS/NZS 1735.14, AS/NZS1735.15 and AS/NZS 1735.16 must be key-restricted to limit access and use and clearly labelled "not for goods use".

The following lifts must not be used unless approved by the issuer of this standard:

a. Platform lifts meeting AS/NZS 1735.14 or 15 (for short rise very low use applications only)

b. Hydraulic lifts meeting AS/NZS 1735.14, AS/NZS 1735.15, AS/NZS 1735.16 and AS/NZS 1735.3

Lifts must be provided with regenerative drives where the rated speed and travel allows justifiable power generation and where no adverse power quality problems are likely. Any installation incorporating regenerative drives must also be provided with braking resistor banks to dissipate the regenerated power during periods of little or no grid demand.

The lift contractor must provide a 20 year whole-of-life cost analysis and present this to the issuer of this standard for review. The cost analysis must include an indicative cost breakdown of the whole-of- life costs showing plant, labour, power and material costs for the following items:

a. Capital Cost

b. Comprehensive maintenance.

3.1.5 Lift design

Designers must incorporate these general requirements into lift designs:

a. Lifts must be durable and easy to operate and maintain

b. Passenger lifts must have wide doors for ease of ingress and egress

c. Stretcher requirements of the BCA must be met where required

d. Where a dedicated goods lift is not being provided, a clear internal height of at least 3m must be provided in the lift car

e. Duty of the lifts must handle peak periods typically occurring at class/lecture changeover periods

f. A dedicated goods lift designed to the appropriate class detailed in AS/NZS1735 must be considered for buildings needing specialist goods movement. Class C goods lifts must be used for heavy loading conditions

g. Hazardous goods operating feature must be provided in at least 1 lift that operates in a laboratory, classroom or similar building

h. All lifts must be provided with an automatic rescue device to allow the lift to travel to the nearest floor and open its doors so passengers can exit if electrical mains power is lost

i. Access control provisions for possible future connection

j. BMS monitoring provisions for possible future connection

k. Access into the lift well pit/overrun must be provided

l. All MRL lifts must have a trap door in the lift car roof in compliance with AS1735.2-2001 Clause 23.14 (a)

m. Two-way lift shafting lighting switches must be provided at all landings, within the lift pit and on the car top.

3.1.6 Lift car details

Lift cars must comprise low maintenance and long term, durable finishes with scratch resistant, textured surfaces designed to minimise minor damage.

3.1.7 Lift car finishes

The University has a design standard for lift car finishes. The finishes must comply with the following requirements:

a. Vandal-resistant and patterned stainless steel to side walls and lower half of rear wall

b. Aluminium-framed silver mirror to upper half of rear wall

c. Fixed white coloured laminated lift car ceiling

d. A single 600 mm long finished stainless steel hand rail to side of lift car under auxiliary car operating panel securely fixed to sustain heavy loads. No other hand rail is required

e. Quality LED lights as per the CPD Lighting Standard

f. Finished stainless steel car door, car front and skirting

g. Durable, long-wearing, sustainable and readily replaceable floor covering which is GECA- Certified or Eco-specifier certified

h. Car control panels - main and auxiliary must be stainless steel, satin finish and complying with AS/NZS 1735.12 and mounted in vertical alignment.

i. Car and landing buttons shall be commercially available "third party supplier" (DEWHURST) buttons that comply with AS/NZS1735.12 and with White/Blue Illumination and raised numerals with 'BRAILLE' lettering and audible registration. Lift company standard buttons are not acceptable.

j. Car and landing indicators must be commercially available "third party supplier" (PIXEL) items that comply with AS/NZS 1735.12. Generic lift company manufactured indictors are not acceptable;

k. The main entry level/street level landing button must be a Dewhurst 'JUMBO' type button

l. Goods lifts must have similar finishes with the addition of hardwood bump rails 300 mm x 20 mm thick with a durable environmentally friendly coating

m. Lift car mirror must be omitted from goods lifts

n. Special application goods lifts e.g. for chemicals, animals, etc. must use specific fit-for-purpose durable and resistant finishes to resist exposure damage, and flooring coved to prevent spillage from lift

o. Lift key switches and locks, including the lift machine room or landing control panel must comply with the University of Adelaide Key Register

p. The car lighting and ventilation fan shall turn on and off automatically.

3.1.8 Hazardous goods lift

All and any lift that may carry hazardous goods, e.g. liquid nitrogen, must had a fully compliant UoA hazardous goods feature installed, refer to Attachment 2.

The hazardous goods feature must be fully compliant so the every lift on campus with this feature can be provided with a user's manual and clear instruction on its use. The number of, signage on and operation of key switches shall be exactly the same as the UoA requirements detailed in Attachment 2.

3.1.9 Prevention of electromagnetic interference

Equipment likely to be incompatible with emission levels, harmonics and power quality requirements in the building e.g. light fittings, apparatus, appliances, wiring, etc must have electromagnetic interference filtering.

3.1.10 DDA requirements

The minimum facilities to meet the access needs of people with disabilities include the following:

a. Minimum 600mm long handrail located adjacent to the car operating panel in compliance with the requirements of AS/NZS 1735.12 and this standard

b. Floor dimensions not less than 1100mm wide x 1400mm deep from travels less than 12m and 1400mm wide x 1600mm deep for travels greater than 12m

c. Lift entrance protection system complying with AS/NZS 1735.12

d. Minimum clear door opening of 900mm wide in accordance with AS/NZS1735.12

e. Lighting in accordance with AS/NZS1735.12

f. Emergency lift car lighting must comply with AS 1735.2 – 2001 Clause 23.25.2.9. EN81 compliant lift car emergency lighting will not be accepted. In particular there must be a minimum of 20 lux on each control panel.

g. A hands free auto-dialing phone must be installed with the main car operating panel. The phone must be an "emFone" or equivalent. Proprietary systems will not be accepted. It must be hard wired in the lift machine room/area (not plug-in) to the 240V supply

h. Car operating panels designed to meet AS/NZS1735.12 requirements

i. Levelling accuracy of ± 6mm

j. Visible, tactile and audible information on landings and within the car

k. 3D full height lift door scanners.

3.1.11 Lift fixtures

The main control panel must have the lift car number, car load, the number of passengers and lift registration number engraved on the panel. A minimum 600 mm long hand rail for disabled use must be used. It must be tubular stainless steel, securely attached to the lift car wall and fully complying with AS/NZS 1735.12 as shown in the section drawing below.

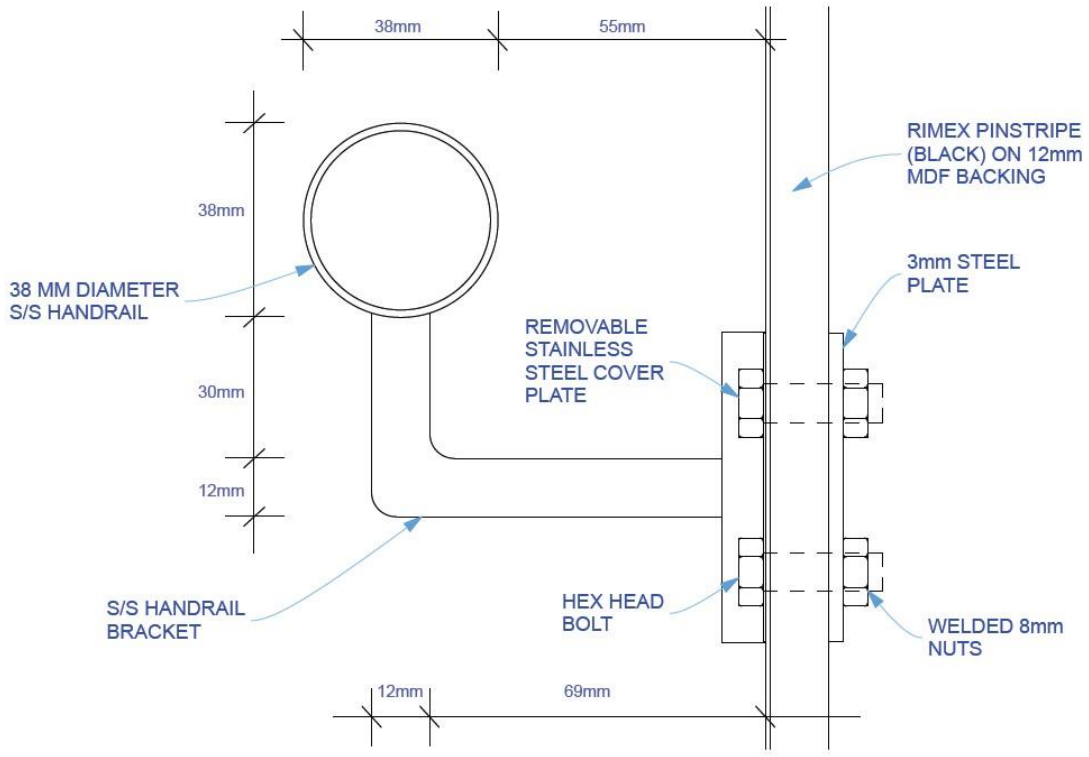


Figure 1 Typical handrail detail

The engraved emergency phone instruction shown below must be provided on the main car operating panel beside or below the button. It must be in white with a minimum font size equivalent to Arial 20 point.

Figure 2 Emergency phone instruction detail

Protective curtains must be supplied for one lift (and interchangeable for the other lifts if more than one lift is installed). They must be hung on internal brackets (not hooks) supplied and installed by the lift contractor and stored in the lift machine room or other space nominated by CPD.

3.1.12 Lift phone final distribution point (FDP)

For effective maintenance of the lift phone line, the University requires a demarcation point between the lift technician and the telephone technician, installed in the top passenger lift lobby where both trades can readily access it. The design philosophy and details for this distributor, called the Lift FDP, are given in the University of Adelaide Communications Cabling Standard.

For new lifts, the designer of the lift shaft must ensure requirements for the Lift FDP are reflected in all relevant documentation packages. Architectural approval must be obtained for the appearance of the enclosure, any penetrations for conduits must be documented by the structural engineer, and the electrical designer must include the voice grade cable from the main distribution frame (MDF) to the Lift FDP on the communications cabling schematic. It may be necessary to form a recess in the concrete of the lift shaft to accommodate the enclosure elegantly.

Where existing lifts are being refurbished, a Lift FDP must be installed if not already present, and the voice grade cable to the MDF must be re-run. Old arrangements such as an existing FDP in the lift motor room, or a connection from a general independent distribution frame (IDF) or FDP, do not comply with the current requirement for a dedicated Lift FDP. To fit a Lift FDP to an existing lift shaft, a surface-mounted enclosure with surface-mounted conduits is usually necessary.

3.1.13 Building control maintenance system monitoring

The lift system shall incorporate a high level connection via an OPC output to the University's Independent Lift Monitoring System (IRMP) and shall provide the following functions as a minimum requirement:

a. Lift fail to start
b. Lift on Fire Service
c. Alarm button pressed
d. Stop button pressed
e. Lift on Independent Service
f. Hazardous Good Service
g. Lift position
h. Direction of travel
i. Doors open/closed
j. Load-weighing
k. Power status
l. Car calls
m. Landing calls.

The lift contractor must supply and install all cable and conduit between terminal strips in an interface box adjacent to the lift machine room, in the machine room, or in the top floor lift lobby, and the lift controller for the transfer of signals between the systems.

3.1.14 Energy efficiency

Best practice energy efficiency features must be incorporated into lifts, including but not limited to:

- Use of quality LED luminaires according to the CPD lighting Standard;
- The lift controller must incorporate a standby power feature allowing shut of power to all car lights, car indicators and lift control panels etc. to reduce standby energy consumption. The period of inactivity before standby mode is activated must be initially set to 2 minutes

and be easily adjustable on site between 2 and 15 minutes. The standby power feature must not be activated when the lift is in a special operation mode (exclusive, fire, etc) or if the lift is in a failed start or fault condition;

- Variable frequency AC permanent magnet motor drives;
- Drives must have a regenerative capability where the rated speed and travel provide justifiable power generation. This is preferable for lifts with a rated speed of up to 2.5 m/s and mandatory for lift of higher speed.

3.1.15 Associated requirements

All lifts must include these requirements:

- If fitted with roller guides, spring tension rollers guides with a minimum diameter of at least 150 mm;
- If fitted with slipper guides, have effective devices to safely contain any oil from the guide rails and prevent oil draining onto the lift pit floor, guides and brackets, under the lift car or on to the lift car;
- Lift car access control reader, including all wiring between the lift car and a point near the lift machine room or lift controller;
- A lift car CCTV camera, including all wiring (including 240 Volt supply) between the lift car and a point near the lift machine room or lift controller. The camera must comply with relevant requirements in the CPD Security Services Standard;
    a. 300 mm x 300 mm x 300 mm dry sump with a chequer plate steel cover. The sump must not interfere with the lift equipment or personnel. The pit floor must be graded to the sump;
    b. Mains supply cables must not have any interposing switches or circuit breakers installed between the lift main switch in the building's main switch board and the lift circuit breaker in the lift machine room or control cabinet;
    c. All cabling (including low voltage and shaft lighting) in the lift machine room, , lift pit, top of car, etc. must be mechanically protected in rigid conduit (flexible conduit must not be used except on movable or vibration affected equipment) or ducting or some other protection as approved by the issuer of this Standard;
    d. Stick-on labels must not be used in the lift car or landings. All lift car and landing signage must be engraved.

3.1.16 Maintenance

Requirements for independent and supported maintenance are provided below.

Independent maintainability

All new lift equipment must be repaired, serviced and maintained, in accordance with the minimum requirements of:

- Designers
- Suppliers
- Manufacturers
- Installers
- Operation and Maintenance Manuals.

The lift contractor must provide any proprietary equipment or components included in the proposal and must be supplied complete with all and any proprietary or unique tools (i.e. manufactured only by the OEM supplier) required for the adjustment, removal or installation of such components. This includes but is not limited to the following.

a. External devices such as test and diagnostic tools
b. Spare parts
c. Tools
d. Instruments
e. Codes
f. Passwords
g. Smart cards
h. Flash cards
i. Sequential memory
j. Keys
k. Locks
l. Cards
m. Reactivation sequences

n. Software

o. Information and intellectual property.

Compliance with the above must include the provision of electronic test and software access tools required to allow the adjustment and resetting of any software parameters. These must be provided under the contract and must remain available as a spare part for purchase by any maintenance provider under instruction from the University of Adelaide, for a minimum period of 20 years from practical completion. Such tools must be free of any electronic locks, software controls or other systems intended to lock or prevent full use of the tool after a predetermined time period.

Under no circumstance should must the University or its maintenance contractor be required to pay and/or enter into contractual arrangements with the designer, supplier, manufacturer or installer of the lift equipment in order to, perform repair, service or maintain the lift equipment.

3.1.17 Defects liability maintenance

A regular comprehensive maintenance and breakdown service must be provided during the Defects Liabilities Period (DLP). DLP maintenance must conform to the conditions and maintenance performance parameters set by the University of Adelaide's current campus wide maintenance agreement.

3.2 Shop drawings

The Contractor must submit the following shop drawings, document and samples for the approval of CPD Electrical Services Engineer prior to commencement of installation:

a. Proposed vertical transportation drawings (1:100 scale) and electrical schematic diagrams;

b. Short-circuit and Overcurrent protection calculations by POWERCAD with digital printouts and

c. Selection of switchgears;

d. Technical catalogue and documents for electrical installation, power and equipment;

e. Compliance certifications from accredited qualified Vertical Transportation Consulting Engineer;

f. Sample of all proposed electrical installation, power and equipment.

3.3 Safety in Design

The contractor must consider risk during the design. A design safety report must be submitted to the relevant CPD Project Manager for every design project. Contractors must confirm, so far as it is reasonable practicable (SFAIRP), that the structure is without risks to health and safety.

Design risks must be considered for the asset lifecycle covering construction, operational and maintenance, refurbishments and decommissioning.

The design safety report must include the following:

a. Description of design element;

b. Description of potential risks and hazards associated with the design element;

c. A low/medium/high risk assessment considering likelihood and consequence;

d. Proposed measures to eliminate risks where practicable;

e. Control measures to mitigate and manage design risks;

f. Nominating responsibilities for managing the design risks.

This may be provided as a design risk register where appropriate and must include results of any calculations, testing and analysis etc.

3.4 Commissioning

An independent commissioning agent deemed competent to inspect and test lifts or with Certificate of Competency issued by Worksafe or other such entity and not involved with the design or construction of the project must test, verify and certify that the lifts meet or exceed the required performance criteria of this standard. This will apply to transformational projects.

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

Detailed testing and commissioning records must be provided for critical lift systems and equipment as appropriate. All such records must be witnessed and verified by the project consultant/designer.

Minimum lift commissioning requirements are provided in following sections.

3.4.1 Testing and commissioning requirements

Detailed testing and commissioning requirements must be specified for each lift by the consultant/designer and include all statutory requirements. Testing and commissioning records must be provided for each lift and each component as appropriate. All such records must be witnessed and verified by the project consultant/designer.

3.4.2 Training

Training must be provided to the issuer of this standard and nominated user's after completion of the testing and commissioning. It must include the operation of the lift and its controls, keys and locks, cleaning of all finishes, operation in an emergency, hanging/cleaning/storage of protective curtains, etc.

3.4.3 Certification

A Safe-to-Operate Certificate must be provided prior to any lift going into service.

3.5 Documentation and records

On completion of the installation a complete set of as-installed documentation is to be provided to the issuer of this standard.

The following design documents must be provided:

a. Lift layouts
b. Lift car interiors
c. Lift landing entrances
d. Lift car and landing faceplate details
e. Lift labels, notices and signage
f. Project specifications check sheets for each major component detailing each lift plant and equipment item that needs to be checked, tested and verified during the installation process
g. CPD Project Design Certification Form, CPD-PROJ-F001
h. Return Brief defining the systems proposed and any deviations from this specification
i. Applications to Supply authorities, and their responses
j. Designer's statutory compliance certificates
k. Complete the Design & Construct checklist using the CPD Design & Construct Vertical Transportation Checklist Form (CPD-ENG-F009).

The following documents must be provided at practical completion:

1. Completed project specification check sheets for lift plant and equipment verified by the project consultant/designer, including the rectification of identified defects including:
   i. Ride quality results
   ii. Door open and close times
   iii. Door dwell times
   iv. Floor levelling accuracy
   v. Acceleration and deceleration rates
   vi. Jerk rate
   vii. Contract speed
   viii. Flight times (door open to door open) for one, two and four floor runs
2. Power consumption
3. Operation and maintenance manuals
4. Commissioning records
5. Product Manufacturer specific information
6. System schematics
7. Complete As-built workshop drawings
8. Electrical and wiring diagrams

9. Lift functionality and operation description
10. Plant registration documentation
11. Hazard and risk assessment provided by lift contactor
12. Work Cover registration
13. Installers Statutory certificates
14. Safe-to-Operate certification
15. Certificates of Electrical Safety

3.6 Operations

Consultants/designers must include detailed requirements for operation and maintenance manuals in the project specification. These include but are not limited to the lift system description, operation procedures, testing and commissioning records, maintenance instructions, product support information and recovery protocols for any computer related systems. Operation and maintenance manuals are to include instructions on how to use or apply tools, instruments, passwords, keys, cards, spare parts and intellectual property, etc. Contractors must provide these to the satisfaction of the consultant/designer. Providing a collection of manufacturers‟ brochures and catalogues is not acceptable.

Contractors must submit loose leaf log book designed for recording operational and maintenance activities including materials used, test results, comments for future maintenance actions and notes covering asset condition. Completed log book pages recording the operational and maintenance activities undertaken for Practical completion and during the defects liability period must also be provided.

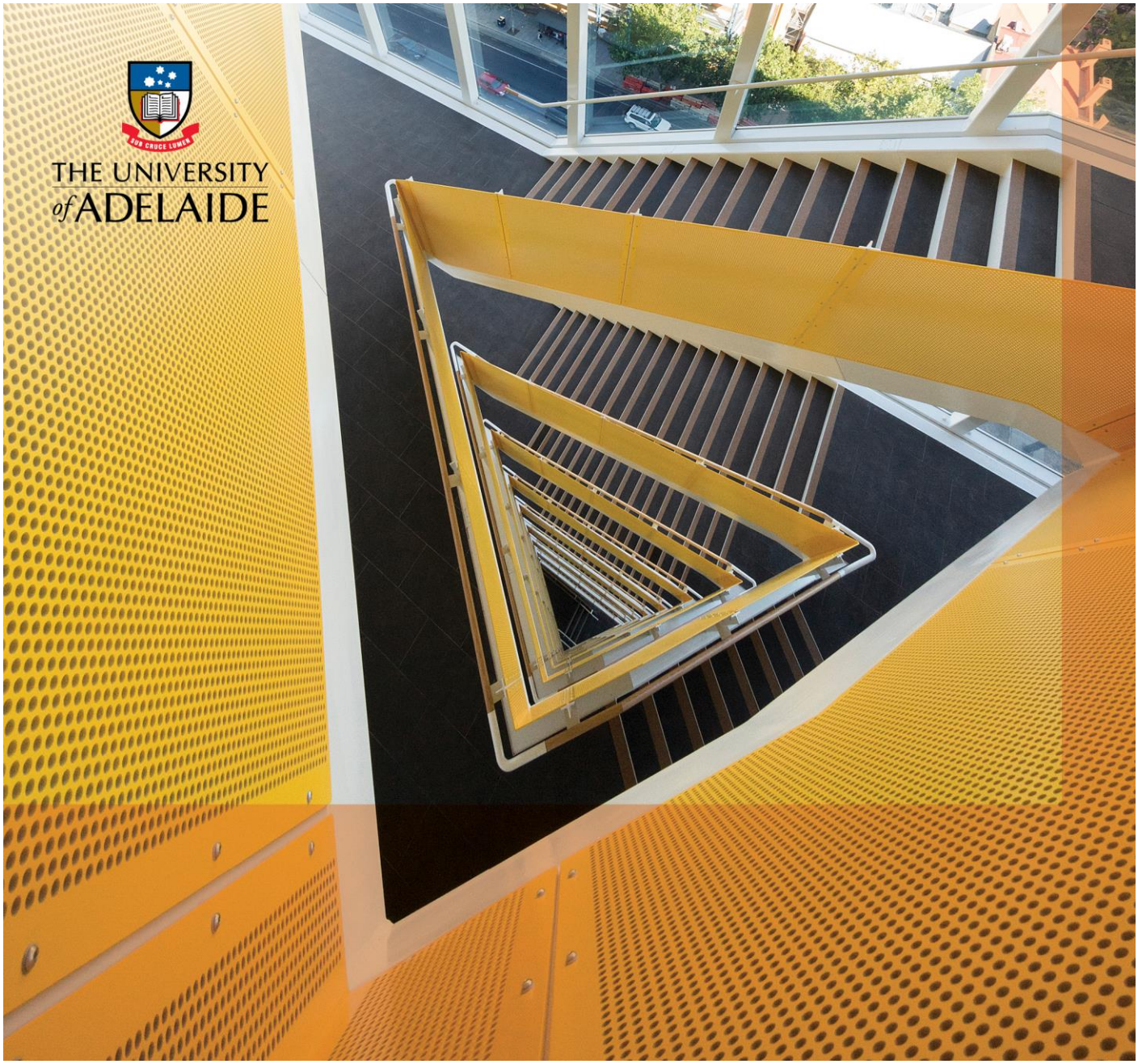
Facilities Maintenance must establish, document and implement procedures for lift plant and equipment operation and maintenance to ensure lifts are fit-for-purpose and provide secure, efficient, safe and reliable vertical transport.

3.7 Lift registration process

At the completion of any lift project and prior to handover of the lift to CPD the Lift Contractor must provide the CPD Project Manager with a partially completed Safework SA Plant Registration form including the technical information of the lift. The following process must be competed:

- CPD Project Manager will complete the Safework SA Plant Registration form including Details of the Applicant (CPD Director);
- Ifv required, CPD project manager will complete the payment of the registration for new and refurbished lifts;
- CPD Project Manager must log a service request to the CPD Lock Smith prior to PC to change over the project keys and lift bi-lock;
- At the completion of the lift installation the Lift Contractor must provide a Safe to Operate Certificate to the CPD Project Manager;
- CPD Project Manager must submit the completed Safework SA Plant Registration form to WorkCover, together with the “Safe to Operate‟ certificate and must pay the registration fee;
- WorkCover will issue a Certificate of Registration (6-8 weeks) to the Applicant. The Applicant will forward the Certificate of Registration to the Divisional Manager for Facilities Management and Services (FMS);
- The Divisional Manager for FMS or his delegate are responsible for the lift registrations;
- FMS must use a single birthday for all lift registrations (12 November) and register lifts annually. Some lifts may be registered earlier in the year but must be re-registered again on the 12 November;
- FMS must pay all appropriate ongoing fees for lift registrations once the first year has been paid by the relevant CPD Project Manager.

Once the registration is received, the CPD Project Manager will submit the registration to FMS as part of the PC handover.



SCHEDULES

J. Vertical Transportation

4. Schedules

4.1 Lift contractor references

Building Address	Year Installed	Manufacturer	Client Name	Drive system	Control system	Maintenance Contractor

4.2 Hazardous good service

All landing button panels (LBP) for the goods lift will be provided with a three position key operated switch labelled "HAZARDOUS GOODS OPERATION" with the positions labelled as follows:

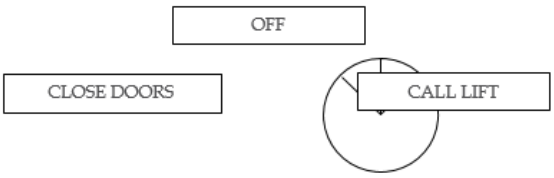


Figure 1. Hazardous Goods Operation Labels.

The lock will be spring return to the "OFF" position from both other positions.

In addition to normal switches, there will be a two position switch in the car operating panel (COP) labelled "HAZARDOUS GOODS OPERATION". The two positions will be labelled "OFF" and "ON" and the key can be withdrawn in either position.

The key switches in both the COP and the LOP will be of the Bi-Lock type.

- When the hazardous goods service (HGS) key switch is in the "OFF" position the designated lift will operate normally and where applicable as part of a lift group.
- The attendant turns the key switch in the landing operating panel (LOP) clockwise from the
- "OFF" to the "CALL LIFT" position.
- An in car announcement is made.
- "Please exit at the next stop, this lift is required for special service". Note, this audio announcement will repeat approximately every 10 seconds
- An illuminated flashing sign in the lift COP will light "Special service operation"
- Hall call response is inhibited
- The lift will travel to aSAer the next registered lift car call in its direction of travel, the doors will open, all other lift car calls will be cancelled and new lift car calls will not be accepted. All passengers are expected to leave the lift car. The doors will close and the lift travel directly to aSAer the HSG key switch. If the lift is idle it will immediately travel directly in aSAer to the HSG key switch.
- The lift will travel (non Stop) to the "calling" floor (at which the HGS switch is selected.)
- Open its doors.
- The lift will remain at that floor with the doors open.
- The attendant will remove the key switch from the landing fixture in the "OFF" position.
- The lift will remain "captive" in the HGS mode of operation for 60 seconds. If the process does not proceed to the next stage, the lift will return to normal service.)
- The HGS car operating panel (COP) key switch is turned to the "ON" position.
- The key is removed in the "ON" position.
- The goods are loaded.
- The key is inserted into the hall switch and turned counter clockwise to the "CLOSE DOORS"
- POSITION. The doors close and the key returns to the central "OFF" position and withdrawn.
- The attendant travels via other lift or stairs, to the " destination" floor.
- The attendant then turns the HGS key switch in the LOP to the "CALL LIFT" position at the "destination" floor.
- The lift travels to the "destination" floor.
- The doors open.
- The goods are removed.
- The key is removed from the "destination" landing HGS key switch.

- The COP HGS key switch is returned to the “OFF” position.
- The key is removed.
- The lift doorway scanners are fully operational before the doors close
- The lift returns to normal service.

The HGS mode of operation will not initiate if:

- The Hall or Car Fire Service is operated. (HFS & CFS)
- The lift is in Inspection mode. (INS)
- The lift is on Independent Service. (INDS)

Selection of the Hall Fire Service mode while the lift is on HGS will return the lift to a designated floor for unloading.

If the HFS mode is selected while the lift is on HGS, there will be an announcement in the lift car, advising the attendant (passenger) to abandon the use of the lift and exit the lift before the doors close and the lift returns to the designated floor.

4.3 Design and construct checklist for consultant (CPD-ENG-F009) Campus Infrastructure & Services

Design and Construct List

The following is a list of vertical transportation documents, which CPD require the building service consultant and contractors to provide as part of their package.

This is a guide for the consultant/contractor to ensure they meet minimum design components in all projects. These documents will be reviewed by the relevant CPD Services Engineer or their delegate during the design phases.

This list does not alleviate the building services consultant's responsibility to design to the online CPD Design standards.

Design Input - Provided by all Lift Services Consultants on all Projects		Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6		
Item Required	Detail of the Design Item to be Completed	Project Planning and Assessment	Approved Project Initiation	Design and Documentation	Tender	Construction	Post Construction and DLP	Compliance Achieved	Building Services Consultant Comments
Plan Layouts Drawings	Design drawings in Autocad (and Revit 3D model where applicable) format including plans and schematics.			x				Yes / No or N/A	
Lift System Performance Calculations	Provide the calculation using Elevate, or approved equal software, covering average Waiting Interval/times and Handling capacity.			x				Yes / No or N/A	
Specifications	Complete a lift specification for the project. Include all schedules for finishes, interiors, fixtures, spares etc.			x				Yes / No or N/A	
Supply of statutory design certifications and certification of compliance to the University standards and other relevant standards.	Complete the design certificate in line with the relevant standards and requirements.			x	x	x		Yes / No or N/A	
Safety in Design Documentation	Provide a Safety in Design document for review and approval by the Services Engineer.			x	x	x	x	Yes / No or N/A	

Design and Construct List

The following is a list of vertical transportation documents, which CPD require the building service consultant and contractors to provide as part of their package.

This is a guide for the consultant/contractor to ensure they meet minimum design components in all projects. These documents will be reviewed by the relevant CPD Services Engineer or their delegate during the design phases.

This list does not alleviate the building services consultant's responsibility to design to the online CPD Design standards.

Design Input - Provided by all Lift Services Consultants on all Projects		Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6		
Item Required	Detail of the Design Item to be Completed	Project Planning and Assessment	Approved Project Initiation	Design and Documentation	Tender	Construction	Post Construction and DLP	Compliance Achieved	Building Services Consultant Comments
Asset List	Proposed final asset list to be submitted for					x		Yes / No or N/A	
Inspection, testing and maintenance	Confirm all inspection, testing and preventive maintenance to be performed during DLP together with proposed dates when the tasks will be performed						x	Yes / No or N/A	