RMIT UNIVERSITY

Property Services

Design Standard

Volume Seven Vertical Transport Systems

Issue 7 2015

August 2015

RMIT University

Design Standards – Volume Seven

Vertical Transport Systems

August 2015

Version Control

This document will be updated and re-issues to reflect approved change to content, and is subject to version control. The version record and status is documented below

Document Change History [1]:

Version	Date	Author	Comments
7.0	31/07/2015	Philippa Charlton	Complete review of standards

Owner

The overall responsibility for these standards resides with RMIT University Property Services

Review

This Document is reviewed every two years

[1] Printed copies of this document are considered uncontrolled and may not reflect the most recent revision

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1. Introduction

1.1 Background

This document details the minimum RMIT design requirements for hydraulic systems. It forms part of the suite of RMIT Design Standards set out below. Additional volumes may be added as developed with all volumes being available on the RMIT Property Services Design Standards web page.

- Volume One Introduction
- Volume Two Architecture and Planning
- Volume Three Electrical Systems
- Volume Four Fire Protection Systems
- Volume Five Hydraulic Systems
- Volume Six Mechanical HVAC Systems
- Volume Seven Vertical Transportation Systems
- Volume Eight Building Management Systems
- Volume Nine Electronic Security
- Volume Ten Communications
- Volume Eleven Audio Visual
- Design Standards Checklist

This document should be read in conjunction with *Volume One - Introduction,* which provides context on the organisational and governance arrangements that apply to the design and construction of new facilities and describes the key principles that underpin the requirements of the Standards:

- Safety
- Accessibility
- Innovation
- Student Experience
- Maintainability and Serviceability
- Modularity and Standardisation
- Reliability
- Compatibility
- Sustainability
- Heritage
- Life Cycle
- Precinct Wide Solutions

1.2 Purpose

The purpose of this brief is to set out the minimum requirements for the design of vertical transport systems. The aim is to achieve the maximum possible consistency and standardisation across the vertical transport systems on the RMIT University campuses.

Any design aspects not specifically addressed by this brief shall be identified by the consultant during the design process and shall be brought to RMIT University's attention for resolution.

1.3 Demonstrating Compliance with the Standards

Designers are required to confirm compliance and justify any proposed deviations by completing the Design Standards Checklist.

All deviations must be approved by RMIT prior to commencing design. Unless a robust justification is provided for deviations from the Standards, it is unlikely that approval will be given. Design Standards compliance is achieved through completion of the Design Standards Checklist and endorsement by RMIT of any proposed non- compliances.

2. Vertical Transportation Systems Design Standards

2.1 Type of Equipment

2.1.1	There is a preference for escalators to be used for bulk people movement within RMIT buildings.
2.1.2	Where escalators are installed, sufficient lifts (and at least one) shall be provided in addition to satisfy DDA and RMIT requirements.
2.1.3	Goods lift facilities shall be provided for buildings over 3 levels and for all buildings containing laboratories. Goods lifts (or one of the normal service lifts) shall be extended to service the roof level where roof plant and equipment is installed.
2.1.4	The lift car shall be sized taking into account the size required to adequately service plant spare parts to the roof level.
2.1.5	All lift installations shall contain at least one lift capable of carrying a standard stretcher.

2.2 Design Capacity

2.2.1	The building population and design parameters to be used as a basis for the design of RMIT vertical transportation installations shall be: • Population = total number of lecture theatre seats plus one person for every other 12 m2. • Handling capacity for a 5 minute peak shall be > 12 % of the population. • Average waiting interval; 35 seconds. • Loading capacity 70%.
2.2.2	The Vertical Transportation specification shall require tenderers to include a 12 month free maintenance period, commencing from the Date of Practical Completion (or last unit completion whichever is the later) in the contractor's contract.
2.2.3	Equipment providers are encouraged to offer energy efficient, low environmental impact equipment.
2.2.4	Lift controllers shall incorporate a limit that when car load reaches or exceeds 80% the car is to travel to destination levels without accepting further car calls or making further loading stops.

2.3 Power Supply

2.3.1	A separate cabled supply is to be provided to each lift directly from the Main Switchboard.
2.3.2	Local supply splitter boards are to be avoided.
2.3.3	All lifts and escalators are to be connected to the local standby power supply where one is installed.
2.3.4	Where there is no local generator, lifts are to be provided with local standby batteries arranged to “home” the lift cars on loss of mains power.

2.4 Lifts

2.4.1	All control equipment, drives and access control panels shall be housed in enclosed dust-proof cabinets.
2.4.2	Door protection shall consist of multi scan door detectors which continually scan the lift entrance.

2.4.3	All Keying for lifts within RMIT University Buildings and/or Property shall be keyed to the University's restricted keying systems on either Lockwood Status Six or Lockwood TWIN. Specific keying requirements shall be referred to RMIT University Locksmiths. Key Switch Locks shall be a TBs item as specified by RMIT University. The contractor shall make provision for installation of such items in their tender price. All keying for Fire Services shall use 420.FS switches. All other switches are to be 420.L. Lock details are to be included in the tender.
2.4.4	All indicators shall be long-life, back lit, LED type, in a size and colour that provides ease of reading.
2.4.5	Landing buttons shall be Stainless Steel Vandal-Proof, Braille (DUPAR, or equal University-approved), and conform to AS1735 part 12. They shall be dual illuminated (red should not be used as an indication colour).
2.4.6	Touch panel based controls shall be offered as an option.
2.4.7	Each level is to be correctly labelled according to the University's room numbering system.
2.4.8	Door frames shall be finished stainless steel design.
2.4.9	All lift pits shall be provided with a sump and flush cover.
2.4.10	Street level or main entrance level shall be incorporated into labelling for call buttons.
2.4.11	If initially commissioned as Contractor's lifts, all units must undergo a second lift inspection prior to handover.
2.4.12	Should the contractor use the lifts prior to the Date of Practical Completion, the contractor shall be responsible for obtaining all necessary permit and approvals, protection of the lift installation, and any necessary making good up to the Date of Practical Completion.
2.4.13	The Lift Contractor shall notify the Project Architect, the Consulting Engineer and the Maintenance Manager one week prior to the final test.
2.4.14	All lift installations shall be provided with a Design-Com Technologies monitoring system
2.4.15	Auto dial telephones are to be connected to direct dial RMIT Security or as agreed with The Manager, Security Branch, RMIT University. All lift cars shall be fitted with functioning emergency telephones: emFone LX hands free autodialling emergency communication system. Provide cable connection to RMIT campus system.
2.4.16	Emergency Telephone station locations shall include as a minimum: • Main station in machine room (or adjacent to controller) • Top of lift car • Lift car interior • Lift pit
2.4.17	The emFone system shall be set up with the emFone Remote Phone Monitoring System to provide automatic testing of emergency phones and automatic reporting of faults and malfunctions.
2.4.18	Provide evidence of Safety in Design process covering provision of machine guards on moving parts and signage to satisfy Worksafe requirements.
2.4.19	Provide lift pit access ladder (or swing out stair) and shaft lighting to satisfy Worksafe and AS/NZS requirements.
2.4.20	Lift cars shall be designed with longevity, robustness and anti-vandal characteristics as the prime objective.
2.4.21	Car lighting shall be LED based and shall provide a minimum of 100 lux at the threshold of the lift and 20 lux under mains failure condition.
2.4.22	Emergency lighting shall be included in the design of the lift car lighting.
2.4.23	Car position indicator shall be an integral part of the control panel, shall be hinged, shall be LED based and indicate car location and direction of travel.

2.4.24	The control panel shall contain an exclusive key switch regulating ON, OFF and PARK facilities.
2.4.25	Provision shall be made for tactile lift buttons with Arabic numerals.
2.4.26	Car operating panel call buttons shall be dual illuminated the same as for landing buttons.
2.4.27	Doors shall be centre-parting, with electronic motor control.
2.4.28	Lift and counterweight guides shall be roller guides.
2.4.29	Lifts to contain visual and audible alarms.
2.4.30	One set of full height protection blankets shall be provided. The blankets shall be clearly labelled with the building number and the lift number where the lift has been designated as a services or goods lift. The blankets shall be designed for easy installation and removal.
2.4.31	RMIT require stretcher lift car to be 1400mm Wide X 2100 Deep with a 1000mm clear door opening.
2.4.32	Lift shafts and cars shall be equipped with space and cabling to accept internal CCTV cameras and access control readers.
2.4.33	Lift shafts and cars shall be equipped with cabling and internal 20” flat panel displays.
2.4.34	Flat panel displays shall be equipped and cabled to RMIT networked venue booking system.
2.4.35	Fit handrails to car tops.

2.5 Lift Machine Room

2.5.1	Provide split air conditioning system to lift machine room. Alternatively provide thermostat controlled filtered fresh air intake and exhaust system to lift machine room.
2.5.2	Provide a key-safe adjacent to the lift motor room entry door.
2.5.3	Finishes to walls, floor and ceiling shall be durable and painted in full gloss enamel for easy cleaning. The ceiling colour shall be painted white and walls off-white. Floors shall be sealed and receive 2 coats of grey coloured epoxy paving paint.
2.5.4	Provide a drawing layout table (approx. 1200 x 600mm), an appropriate rack to hang/store the drawings, and a wall mounted cupboard for spares.
2.5.5	Control and hoisting equipment shall be well lit by room lights, which shall be low glare types with protective wire guards. Lighting shall be positioned so that Maintenance Technicians are not working in their own shadow.
2.5.6	The control equipment shall be illuminated by emergency lighting.
2.5.7	Machine Roomless Lifts- the control cabinet shall be finished satin stainless steel.
2.5.8	Machine Roomless Lifts- the front cover of control panels shall have acoustic lining on the inside of the cover.
2.5.9	Machine Roomless Lifts- in the event a high temperature of or exceeding 40 degrees Celsius is registered in the machine area, automatic means shall be installed to prevent the lift from continuing to operate once it is at a floor level and the doors have opened.
2.5.10	Machine Roomless Lifts- where there is no capability to observe the lift machine and the over-speed governor operating from exterior control cabinet, closed circuit television viewing shall be provided to a screen in the controller for service staff viewing only with the camera(s) mounted in the lift well. (This would apply where a control cabinet is remotely located from the lift, where the movement of the lift for maintenance or service can be observed through an open landing door or by other means).
2.5.11	Machine Roomless Lifts- The governor shall be arranged such that there is no

	necessity to provide an access panel into the lift well for maintenance or resetting the unit. The equipment location shall be within the lift well with a resetting facility from the controller, top floor landing or the unit shall have the capability to reset itself by automatic means.
2.5.12	Provide shaft cooling where glass walled shafts are exposed to sunlight or external air temperature
2.5.13	No audible alarms are to be fitted local to the controller. Visible alarm indication plus remote alarming via the BMS only.

2.6 Escalators

2.6.1	Escalators shall be a minimum of 800 mm wide
2.6.2	Escalators shall be set to automatically slow and then stop when there is no traffic with automatic restart.
2.6.3	Provide a transparent cover to all local “STOP” buttons.
2.6.4	Fit local audible alarm that sounds as soon as the transparent cover is lifted.
2.6.5	Provision shall be made for remote resetting of nuisance “STOP” button activations.
2.6.6	Escalator landing and exiting levels shall be at least two steps long.
2.6.7	Escalator hand rails shall be internally illuminated
2.6.8	All escalator landing and exiting thresholds shall be CCTV monitored.
2.6.9	Escalator Trip settings are to be adjusted to accept greater than normal step increases in loads to accommodate large numbers of students suddenly entering an escalator.
2.6.10	Provision shall be made for remote resetting of nuisance “TRIP” button activations.
2.6.11	All escalator installations shall be provided with a Design-Com Technologies monitoring system

2.7 Lifts and Escalator BMS Monitoring

2.7.1	RMIT Strategy is based on receiving immediate notification of a fault via the Building Management System with the capability for RMIT to glean additional information via remote access to the affected system controller. Alarm conditions to be reported directly to RMIT via text message.
2.7.2	Provide labelled terminal strips located within the Controller panel to provide LV BMS signals.
2.7.3	Lift Signals are to include: • Lift common fault alarm • Lift machine room high temperature • Lift shaft high temperature • Lift on NORMAL/FIRE SERVICE • Lift on EXCLUSIVE SERVICE • Lift car alarm • Lift pit moisture sensor alarm. • Equipment area temperature sensor (machineroomless lifts)
2.7.4	Escalator signals are to include: • Escalator common fault alarm. • STOP button activated
2.7.5	VT Contractor is to supply and install Lift Monitoring System (LMS) encoders to each lift with connection to RMIT WAN at a CAT 6 cabled termination point installed adjacent to each controller.