SECTION 28

VERTICAL TRANSPORT

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Version	Date	Authors	Summary of Changes
1	9 April 2013	Multitech for JCU	First Edition
2	30 September 2013	Manager, Infrastructure Services	Revised with JCU comments
	10/03/15	Manager, Infrastructure Services	Cross referenced with new sections
V3	02/07/18	Manager, Infrastructure Services	2018 general review update

28.0 VERTICAL TRANSPORT

This document is a section of the James Cook University (JCU) Design Guidelines and is not to be read in isolation. Consultants and Contractors are required to comply with all sections of the JCU Design Guidelines.

28.1 Design Process Requirements

The consultant shall be held responsible / liable for ensuring that all works necessary for the complete installation and successful operation are included in the design and specifications. Specific deliverables are required at the end of each project stage, namely:

28.1.1 Approvals Required during Design

Approval shall be obtained from the JCU Estate Directorate, Deputy Director, Planning and Development in SD for the:

- Plant numbering sequence,
- A report recommending traffic calculations, agreed wait intervals, handling capacities, types, etc. of lifts for all lifts incorporated in the design,
- Manufacturer of the lift,
- Proposed use of hydraulic lifts, and the
- Relevant details especially the unique University lift numbering and address for registering the lift.

28.1.2 Site Infrastructure Connection Approvals

Not Applicable for this section.

28.1.3 Schematic Design (SD) Report / Design Review

Report Content in addition to requirements of Section 30:

- Preliminary Lift shaft and lift car sizes
- Preliminary Lift pit and overrun dimensions
- Preliminary Motor sizes
- Lift traffic analysis
- Estimated services consumptions (electrical, etc.)

28.1.4 Developed Design (DD) Report / Design Review

Report Content in addition to requirements of Section 30:

- Final Lift shaft and lift car sizes
- Final Lift pit and overrun dimensions project

- Final Lift car and motor details
- Estimated services consumptions (electrical, etc.)

The Developed Design JCU RPEQ Certification Schedule below shall be completed by the DD Design Engineer and submitted for confirmation.

Project Name:		
Project Number:		
Date		
Company		
RPEQ Design Engineer Name		
RPEQ Licence Number		
Shaft dimensions	mm	
Car dimensions	mm	
Pit and overrun dimensions	mm	
Maximum Lift Speed	m/s	
Operational Lift Speed	m/s	
Total number of persons in car	No. Off	
Total car rated mass	kg	
Total number of motors	No. Off	
Total number of gearboxes	No. Off	
Any other plant and equipment requiring routine inspections	No. Off	
Manager Asset Strategy and Maintenance		
JCU lift numbering and address for registering the lift issued	YES / NO	
Does the SD Report include Life Cycle Costing	YES / NO	
Registration of the Lift, Registration of the Lift Design, Installation approval with the Division of Workplace Health and Safety	YES / NO	
All specific design elements are included in the design	YES / NO	

28.1.5 Construction Contract Document Requirements

In addition to requirements of Section 30, include an updated Certification Schedule as per 28.1.4 completed by the CD RPEQ Design Engineer.

28.1.6 Handover Requirements

All vertical transport equipment shall be commissioned/tested against manufacturer and design requirements, including speed, load, controls, alarms and all operative parameters and signed off by the Manufacturer or their approved representative.

Provide Form 16 and any other certification required for the works.

Following commissioning, undertake a witness inspection of the installation, ensure that the Consulting Engineer and JCU Manager, Asset Strategy and Maintenance (or representative) are present.

As a minimum, prove to their satisfaction:

- Speed and load under operational and emergency conditions.
- All floor stops within tolerances.
- Operational and emergency controls and alarms are functional, where possible, prove operation by amending setpoints, etc. and observing operation.

Provide a signed out and complete defects lists to the JCU Project Manager at least 2 weeks prior to practical completion.

28.1.7 Lift Location

Lifts shall be located adjacent stairs etc. to facilitate emergency evacuations and encourage the use of stairs.

Consider the location lift shafts in relation to the building and surrounds.

Any lighting visible to outside (e.g. exposed lifts, glass walled shaft s etc.) shall be arranged so as not to attract insects.

28.1.8 Lift Motor Room

All lifts shall be the type that does not require a lift motor room above the shaft – LMR type.

28.2 Specific Design Requirements

Lifts are to be only of high commercial quality, durable and reliable, with ease of use, smooth ride in operation and landing. All lifts shall be microprocessor based control systems.

Manufacturer to be approved by the JCU Estate Directorate, Deputy Director, Planning and Development. Domestic type lifts are not to be used. Hydraulic lifts are not to be used except as approved by the JCU Estate Directorate, Deputy Director, Planning and Development for specialist lifting applications (loading docks etc) – and not passenger duty.

28.2.1 Transport calculations

Provide traffic calculation for all lifts incorporated. Liaise closely with the Architect and JCU Estate Directorate, Deputy Director, Planning and Development to agree wait intervals and handling capacities etc. A report recommending lift type, size, speed, capacity, number off etc is to be submitted to the JCU Estate Directorate, Deputy Director, Planning and Development for approval.

Student numbers during peak periods are not to be included when undertaking lift traffic analysis.

28.2.2 Performance Criteria

The performance of lifts shall meet the following as a minimum:

- Door opening time 2.5 to 3s
- Door closing time 3 to 3.5s
- Levelling accuracy ±6mm

Lifts shall have a minimum speed of 1m/s for up to 4 storeys and 1.5m/s for up to 8 storeys. The lift shall have the capacity of 120 minimum starts per hour.

28.2.3 Equipment Types

Buildings of 2-4 levels should be designed with LMR traction lifts.

Buildings over 4 levels should be provided with LMR gearless traction AC-VVVF lifts

28.2.4 Lift Loading

Unless briefed otherwise, or required by traffic studies or building use, lifts should be designed for a minimum duty of 1000 kg.

28.2.5 Lift Car Size

Lift car size shall be suitable for persons with disabilities AS1428.2 to allow sufficient circulation space for a180deg wheelchair turn.

Lifts that service three or more floors (or as required by the Building Certifier) shall be deemed an emergency lift and have horizontal stretcher provision.

Car size of goods lift to be sized according to largest transportable good as identified in space data for the building.

Car size of refurbished lifts or lifts retrofitted in existing buildings to be considered on case by case basis.

28.2.6 Lift Security

All lifts to be provided with facility to lock off or "shutdown". The lifts should also permit travel without persons in the lift where transporting hazardous substances.

Lifts shall be designed as Emergency Lifts only if required by code.

28.2.7 Car Ventilation

Each lift shall have a quiet exhaust fan to supplement natural ventilation, providing a minimum of 30 air changes per hour, and preferably by three phase motors.

28.2.8 Fire Precautions

All lift shafts shall be a minimum of two hour fire rating 120/120/120. Landing doors to have a minimum of 1 hour fire rating.

28.2.9 Lift Safety

All lift should be provided with a lift overload indicator both auditory and visual.

Additionally, the lift door safety shall be provided by both door edge pressure switches and 2D photoelectric sensors.

28.2.10 Lift Controls

Lift controls shall be suitable for all users including suitable location of controls, Braille and signage, spoken announcement etc.

After hours control shall be by swipe card linked to the University’s access control system.

Flush mounted key switches should be provided for operative and manual control and keyed to the University’s key system.

All lift controls shall be programmable and not subject to any software locks or require the use of proprietary access or programming tools.

28.2.11 Car Indicator Panels

Car indicator panels shall include every floor that is served by the lift and also a door open/close. The emergency car button shall be located with the indicator panel.

A 2 way keyswitch shall be also be provided – on/off.

28.2.12 Lift Pits and Wells

All lift pits shall be to solid earth in accordance with AS1735, kept dry at all times, with a 300mm square sump to a depth of 300mm minimum. Provide a drain from the sump to an external pump out pit suitable for a needle pump to pump out the lift pit. Provide float switches to provide a high level water alarms to be reticulated to Campus Security.

Consider the location, and where necessary provide water controlled sump pumps.

28.2.13 Return to Floor / Power Failure

All lifts shall be provided with return to nearest floor in case of power failure via a battery operated power supply. All lifts shall be connected to the generator support if one is provided in the building

28.2.14 Indication and Annunciation

Level indicators shall be provided on each landing. Direction indicators shall be provided at each landing and inside the lift car.

Voice annunciation shall be provided inside the lift car and a tone alert shall be provided at each landing.

28.2.15 Hall Indicators

Hall indicators shall be hairline stainless steel panels. Hall indicators shall show the direction of travel and the current location of the lift. Hall indicator panels shall be provided on every floor served by the lift.

The ground floor level is to be denoted as level ‘0’ – zero.

28.2.16 Emergency Phone

An emergency phone shall be provided in the lift car to allow emergency communication or calls from passengers in the lift. The phone shall be connected via dedicated telephone line to campus security (for Townsville campus) and lift company (for Cairns). The system shall have hands free automatic dialling upon activation of the call button.

Identification label to be clearly provided in lift car.

28.2.17 Car Interior

Car interiors shall be of a professional commercial satin finish No. 4 stainless steel finish on all sides, front and rear, with a full width mirror finish stainless steel (above handrail) on the rear wall. Dress panels shall be removable to enable the lift to be used as a goods lift when required. The car operating panel shall be hairline stainless steel.

Stainless steel rubbing rails shall be provided on the sides and rear wall and shall be removable type. Lift floor shall be rubber studded floor tiles.

28.2.18 Car Ceilings and Lighting

Ceilings to be drop ceiling type with perimeter recessed fluorescent or LED lighting. Perimeter indirect lighting systems are considered inadequate.

Suspended metal and acrylic grid ceiling diffusers shall only be used when the height is below 2300mm.

A lockable access hatch for outside recovery purposes built into ceiling of the lift.

28.2.19 Landing Doors

Finished stainless steel landing doors, centre opening, manufactured from 304 Stainless Steel Satin finish No 4.

28.2.20 Electrical Supply

All power supplies etc shall comply with AS3000. Submains shall be designed to not more than 3% voltage drop at full load operating condition in UP direction or 5% transient voltage drop on start of upwards travel.

Power for lift shaft and lift ventilation and/or air conditioning must be included in the design allowances.

28.3 Registration of Lift

Prior to putting the lift into operation the Contractor shall prepare and submit all required documentation to the Statutory Authority and pay all fees, and obtain Registration of the Lift, and Registration of the Lift Design, and Installation approval with the Division of Workplace Health and Safety.

The Contractor shall obtain the relevant details especially the unique University lift numbering and address for registering the lift from the JCU Estate Directorate, Deputy Director, Planning and Development.

28.4 Identification of Equipment / Services

Confirm the plant numbering sequence with JCU Estate Directorate, Deputy Director, Planning and Development prior to Contract Documentation. Prefix equipment with building number.

All items of equipment must be suitably identified with Traffolyte labels.