

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

28.0 VERTICAL TRANSPORT

28.1 INTENT OF THE JAMES COOK UNIVERSITY DESIGN GUIDELINES

James Cook University was established to pursue and encourage study and research, especially in subjects of importance to the people of the tropics. James Cook University is Queensland's second oldest university and through its research, graduates and industry links, is a major driver of economic growth and social change in northern Queensland.

Staff and students of JCU use its unique locations to conduct nationally significant and internationally-recognised research in areas such as marine sciences, biodiversity, tropical ecology and environments, global warming, tourism and in tropical medicine and public health care in underserved populations. Its network of specialist centres, institutes and research stations span a wide geographic area from marine islands to the outback and the students come from many backgrounds, promoting a rich cultural and experiential diversity on campus.

These design guidelines are the minimum acceptable standard and have been developed to ensure that projects delivered by JCU comply with the University's vision, are appropriate for the unique tropical environments and incorporate the lessons learnt from previous projects. The Deputy Director – Planning and Development is responsible to ensure these Design Guidelines achieve the best design outcomes for JCU.

28.2 COMPLIANCE AND APPROVALS

28.2.1 Compliance Requirements

All design and works are to comply with the latest versions of all Australian National, Queensland State, legislation and standards, as well as local council/authority requirements. Further details are provided in Section 28.5.

All other sections of these Guidelines are to be read for completeness as this document has been developed as a section of a suite of documents.

Where there is a discrepancy between requirements, legislation and regulation to take precedent over these Guidelines.

28.2.2 Non-Conformance Approvals

All project team members (for example Consultants, D&C Contractors, Principal Consultants, Internal/External project managers, subcontractors etc.) are responsible for delivering the project in accordance with the project brief, these guidelines, user group information and other contractual documents.

Where there are sound engineering reasons to deviate from these documents, a written non-conformance request is to be submitted to the Deputy Director – Planning and Development via the JCU Project Manager.

This could apply when the project involve aspects, scope, technologies, locations or other applications that are not specifically briefed or covered by the Design Guidelines, the non-conformance request will include clear information on:

- Technical Aspect that is not covered
- A range of options to address the issue
- Time and costs implications for each option
- Effect of the aspect on the design and on other trades

- Effects on users, maintenance, access, life of plant, energy efficiency, cost
- Effects on future re-allocation of the space / system etc.
- Recommended solution to the issue

A Non-Conformance register is to be maintained by the Consultant and the details of each request plus the outcome are to be recorded.

Before departures in design intent are approved for the successful consulting engineer, detailed energy modelling against the NABERS' scheme shall be required. Departures shall prove there is an advantage to JCU in terms of energy savings and operating cost savings.

28.2.3 Design Approvals

Irrespective of directions received from JCU, the Consultant remains fully responsible for the design solution developed.

All designs done for and on behalf of JCU require RPEQ certification, unless approved by the Manager, Infrastructure Services.

Form 15 Design Certification is to be obtained.

28.2.4 NCC Version to Apply

Confirm with JCU's Project Manager which version of the National Construction Code (NCC) that is applicable to the works.

28.3 DESIGN PROCESS REQUIREMENTS

28.3.1 Roles and Responsibilities

JCU does not wish to be separated from the design process, regardless of whether the project is traditionally delivered, delivered through Managing Contractor, D&C contractor or other.

28.3.1.1 Traditional Delivery

Where traditional delivery is chosen, the framework may be through a Principal Consultant (such as an Architect or Project Manager), or direct to JCU.

The Principal Consultant is to arrange workshops with the JCU Deputy Director – Planning and Development, Manager, Infrastructure Services, Manager, Asset Strategy and Maintenance and other technical staff as directed by these managers from initiation of schematic design.

28.3.1.2 Managing Contractor Framework

Arrange workshops and information issues throughout the design process with the JCU Deputy Director – Planning and Development, Manager, Infrastructure Services, Manager, Asset Strategy and Maintenance and other technical staff as directed by these managers (through the Managing Contractor and JCU's Project Manager).

28.3.1.3 Communication Arrangements

All communication with JCU is to be via the JCU Project Manager. Minutes of any design review meetings etc. are to be provided to all participants via the JCU Project Manager.

28.3.2 Interfaces with Other Disciplines

Ensure that all works necessary for the complete installation and successful operation are advised to other consultants and specified as interface with other engineering disciplines, professions or specialists.

Ensure that information required to accurately design the services is obtained from other consultants as required. Additional information is available in section 28.5.3.

28.3.3 Schematic Design (SD) Report / Design Review

The Schematic Design (SD) report will give a high level understanding to University of the requirements for the project.

28.3.3.1 Report Content

- The drawing numbers and revisions the SD report is based upon e.g. Architectural, As Installed drawings etc.
- A detailed list of the scope of works for the project
- A detailed list of the applicable standards, regulations and local authority requirements that the project has to conform to
- Where existing plant is being utilised, whether this plant is being used, replaced, refurbished etc. with indication of associated issues and costs.
- A high level description of the method of servicing the various spaces in the project
- List of Ecological Sustainable Development (ESD) opportunities
- Non-Conformance Register listing any deviations from Legislation, Standards, Codes, Guidelines or Project Brief.
- List of Assumptions, Boundaries (battery limits or tie-in points) and Specific Exclusions
- Preliminary Lift shaft and lift car sizes
- Preliminary Lift pit and overrun dimensions
- Preliminary Motor sizes
- Lift traffic analysis
- Estimated services consumptions (electrical, etc.)
- Proposed Drawing Register and Deliverables List
- Layout drawings showing any interfaces with existing services and structures including proposed services corridors.
- Investment Decision Report including Cost (Capex and Opex) and Schedule estimates, Lifecycle costs and indicating any areas of risk to the project delivery. This document to be resubmitted based on feedback from the SD review and approved by the JCU Deputy Director – Planning and Development prior to commencement of Detailed Design.
- Where option analysis was included, a recommendation on the option to take forward with supporting information/decision criteria.
- Outcomes and recommendations for safety in design, and design risk assessment workshops particularly responding to (or addressing) design elements which will limit liability under mould issues in HVAC systems, temperature control and upper limit humidity control
- List of proposed design development activities/milestone schedule and deliverables

28.3.3.2 Submission Format

This information is to be submitted to the JCU Project Manager as an A4 colour PDF file with A3 drawing attachments, in hard and electronic format. The Consultant may be requested to deliver a presentation (in person or via VC) to JCU stakeholders and decision

makers.

28.3.3.3 Design Review

Submit SD drawings / report and non-conformance register to JCU's Project Manager in full size hard copies (1) and on CD for a full design review in accordance with the project schedule, allow a minimum of 2 weeks for design review.

Inform the JCU's Project Manager as soon as possible if the drawings are going to be delayed for any reason.

Following receipt of the design review comments from JCU, respond formally with

- Acknowledgement that changes will be actioned, and
- List any areas where the design review comments require additional discussion and proposed manner of resolution.

28.3.4 Developed Design (DD) Report / Design Review

The DD report will provide more detail on the design for the accepted option and design approaches.

28.3.4.1 Report Content

- Full return brief for the services
- The drawing numbers and revisions the DD report is based upon e.g. Architectural, As Installed drawings etc.
- Provide detailed information of all existing site services, their re-use, refurbishment, relocation or removal
- Detail on design approach for each type of system / area etc.
- In each case options investigated, reasons or supporting information for design choices,
- Detail on loads and consumptions to existing services
- Detail on special measures for spaces with additional requirements (eg PC2, PC3, laboratories etc)
- ESD Opportunities Register
- Updated Non-Conformance Register listing any deviations from codes, standards, legislation, guidelines or project brief.
- Updated Assumptions, Boundaries (battery limits or tie-in points) and Specific Exclusions
- Final Lift shaft and lift car sizes
- Final Lift pit and overrun dimensions project
- Final Lift car details
- Detailed equipment layouts including dimensions for all access doors/hatches and showing provision to remove/maintain all items in excess of 50kg.
- Drawing Register and Deliverables list
- All IFC drawings and design calculations
- Updated and finalised Investment Decision Report including Cost (Capex and Opex) and Schedule estimates, Lifecycle costs and indicating any areas of risk to the project delivery. This document to be resubmitted based on feedback from the DD review and approved by the JCU Deputy Director – Planning and Development prior to commencement of Construction.
- Updated outcomes and recommendations for safety in design, and design risk assessment workshops particularly responding to (or addressing) design elements which will limit liability under mould issues in HVAC systems, temperature control and upper limit humidity control

- Finalised recommendations for preventative maintenance and list of critical spares on proposed equipment
- Risk Matrix for design methodology (i.e. n+1 where necessary)
- Areas of risk to the project during construction and commissioning
- List of construction activities/milestone schedule and deliverables, including construction and commissioning hold point/inspection/witness/approvals.

28.3.4.2 Submission Format

This information is to be submitted to the JCU Project Manager as an A4 colour PDF file with A3 drawing attachments, in hard and electronic format. The Consultant may be requested to deliver a presentation (in person or via VC) to JCU stakeholders and decision makers.

28.3.4.3 Supporting Documentation

- Maximum 1:100 Mechanical services Floor Plans.
- Maximum 1:50 inserts on Floor and Roof plans
- Maximum 1:50 Details

28.3.4.4 Design Review

Submit DD drawings / report and non-conformance register to JCU's Project Manager in full size hard copies (1) and on CD for a full design review in accordance with the project schedule, allow a minimum of 2 weeks for design review.

Inform the JCU's Project Manager as soon as possible if the drawings are going to be delayed for any reason.

Following receipt of the design review comments from JCU, respond formally with

- Acknowledgement that changes will be actioned, and
- List any areas where the design review comments require additional discussion and proposed manner of resolution.

28.3.4.5 Developed Design JCU RPEQ Certification Schedule

This table shall be completed by the DD Design Engineer as below, or as modified by the Manager, Infrastructure Services, and submitted for confirmation.

Project		_____
Project Number		_____
Date		_____
Company		_____
RPEQ Design Engineer		_____
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		
Schematic Design & Report Approved	YES / NO	_____
JCU lift numbering and address for registering the lift issued	YES / NO	_____
Does the SD Report include Life Cycle Costing	YES / NO	_____
Developed Design & Report Approved	YES / NO	_____
Construction Documentation Approved	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	_____

28.3.5 Construction Contract Document Requirements

28.3.5.1 Specification Requirements

A concise, project specific specification shall be produced that

- Clearly identifies the scope of works
- Clearly identifies the project nature
- Clearly identifies Interfaces with other disciplines
- Calls into effect the requirements of codes, standards, legislation etc.
- Calls into effect the requirements of these guidelines
- Does not contain excessive or spurious references to unrelated projects or unrequired works.
- Includes all performance requirements

- Includes schedules of all equipment requirements, capacities etc.
- Requires relevant price breakup information from the contractor
- Requires contractor confirmation of equipment, scope, documentation etc.
- Calls up required service, maintenance details etc. in an acceptable Operating and Maintenance Manual format complete with preventative maintenance schedules.

28.3.5.2 Drawing and Documentation requirements

Both Issued for Tender (IFT) and Issued for Construction (IFC) drawing and documentation will be required.

Drawings shall conform to section 34. Ensure:

- Use JCU Title block and include JCU Drawing Number (obtain from JCU Drawing register)
- All fonts and colours to be legible at A3 print colour or black and white
- Use Australian English throughout all documents
- Clearly identify the scope of works
- Are clear and legible and easily read
- Provide sections, elevations and the like to indicate heights, etc. Generally a minimum of two sections shall be provided for any project to enable the contractor to determine the work heights, co-ordination etc.
- Provide details for specific items such as Finishes, call points, indicator lamps, landing calls, control panels, etc.
- Include ventilation details

28.3.5.3 Number of Copies

Unless briefed / agreed otherwise, the contract documents shall be provided in electronic (.pdf and native) format and in hard copy as follows:

- Three full sized hardcopies of all drawings
- Three bound copies of specifications in A4

28.3.6 Handover Requirements

28.3.6.1 Requirements for Commissioning

All vertical transport equipment shall be commissioned and signed off by the Manufacturer or their approved representative.

Commissioning must be carefully scheduled to enable the Contractor to have possession of the building for the period required.

Ensure that full commissioning is provided by the manufacturer – and commissioned/tested against these requirements, including speed, load, controls, alarms and all operative parameters.

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

28.3.6.2 Witnessing

Following commissioning, undertake a witness inspection of the operation. 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.

Rectify any defects identified. Should re-inspection be required, the cost of consultants reinspections will be deleted from the contract sum.

28.3.6.3 Records to be provided

Within 3 weeks of practical completion provide

- All commissioning data as finalised
- Defects lists signed out and complete
- Certification of any Fire Penetrations etc
- Commissioning sheets for all equipment

28.3.6.4 Defects Liability

The Defects Liability period shall be a minimum of 12 months from the date of Practical completion or acceptance of the systems by the Manager, Asset Strategy and Maintenance or representative. The Manager, Asset Strategy and Maintenance may require longer periods of warranty for key/critical equipment and this should be tested on a project specific basis.

During this period the contractor must attend to and rectify all faults, defects etc. at their cost including all parts, labour, commissioning and associated costs. Should an item repeatedly fail during this period, JCU may require warranty in relation to that item to apply from the date of latest repair / replacement.

28.3.6.5 Maintenance Requirements

All construction/ installation contracts shall allow for the performance of regular preventive maintenance of the works during the period of the defects liability period inclusive of all consumables.

Such maintenance shall be in accordance with the manufacturer's instructions and the requirements of the Work Health and Safety Act, Standards or other applicable regulations, legislation, or codes of practice.

AIRAH DA19 manual shall be the minimum maintenance provision/recording.

With respect to any mechanical or electrical service, fire alarms, hydraulic systems, lifts etc. maintenance shall be carried out not less frequently than monthly.

Life safety systems shall be maintained and recorded as a minimum to relevant requirements (e.g. AS1851)

Maintenance records to be forwarded to the Manager, Property Services/Cairns Operations, as appropriate, within 5 days of completion of maintenance.

28.3.6.6 Operating and Maintenance Manuals

Operating and maintenance manuals must be issued as Preliminary prior to Practical Completion. Any amendments must be made and manuals issued within three weeks of Practical completion. Manuals must include as a minimum:

- Concise English description of the installation as a whole
- Concise English description of the each system

- Concise English description of BMS system and controls,
- Concise English description of the Fire Mode Operation of systems
- Equipment list for all equipment and systems
- Supplier / Support list for all equipment
- Manufacturer's Literature for all mechanical equipment
- List of recommended critical spares
- List of Contractors and Subcontractors
- List of As-Constructed drawings
- All finalised commissioning data
- Form 16
- Recommended Service and Maintenance procedures
- Service and Maintenance Schedule
- Fault finding and reporting procedures
- Emergency Contacts
- Defects lists signed out and complete

Provide THREE hard copies of all manuals and "As Constructed" drawings plus electronic (.pdf and native) copies of all documents and drawings.

Consultants shall provide a statement that maintenance manuals and as constructed drawings are correct to the best of their knowledge.

28.3.6.7 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 Deputy Director – Planning and Development.

28.4 VERTICAL SERVICES DESIGN AND EQUIPMENT REQUIREMENTS

28.4.1 Design for project and future

A holistic approach shall be taken to any new or refurbishment design and the effect on the existing campus services and buildings shall be well understood.

All designs must consider how the project specific requirements and any additional areas served by systems serving the project areas will impact on possible future fitouts / reworking of the project area, and future expansion such as master plan items, items advised etc. These impacts are to be clearly articulated in the design documentation.

28.4.2 Design for Tropical Areas

JCU's campuses are located in a tropical environment. All designs must specifically deter the growth of mould. Particular care is required to ensure necessary measures are taken to prevent the formation of condensate on external or internal surfaces such as air conditioning units, pipework, ductwork, registers, ceilings, walls, windows etc.

The design team shall work together to minimise moisture migration into buildings which can lead to adverse effects and lower energy efficiency of air conditioning system. Provide advice to other

members of the design team regarding the location and requirement for vapour barriers, insulation requirements for building elements relating to the vertical transport requirements.

Shafts shall be waterproof with adequate ventilation.

28.4.3 Design for Cyclone Prone Areas

JCU's campuses are located in a cyclone prone environment. Particular care is required to ensure necessary measures are taken to ensure that all plant, equipment etc. (particularly external plant) is securely fixed, of suitably rated cyclone area construction and constructed in a manner to withstand such events.

28.4.4 Corrosion Prevention and Protection

JCU campuses are generally located in coastal areas. The prevention of corrosion must be considered in the design. Plant should be located under cover in plantrooms. Exposed plant should be avoided (except external condensing units, chillers and the like where included in the design).

External exhausts etc. should be constructed of non-corroding elements (PVC / Stainless steel etc.). Fixings should be stainless steel. Dissimilar metals should be electrically separated.

Pay particular attention to elements such as switchboards, control panels etc. which should be stainless steel where exposed to weather.

Identify additional service recommendations to mitigate or minimise corrosion where the particulars of the installation may produce corrosion in the installation.

28.4.5 Equipment Quality and Support

All equipment and components shall have a proven track record of operation in Queensland and be of high quality and reliability, readily available, with a Queensland based agent for service / spare parts, with sufficient stock of spares to support JCU's operation.

Critical Spares requirements shall be listed in Operating and Maintenance Manuals.

28.4.6 Design for Maintenance

Ongoing service and maintenance must be facilitated in the installation. Measures at least will provide minimum service access spaces, easily workable arrangements, clear unencumbered walkways of minimum 1200mm.

In all cases mandatory clear access for electrical switchboards and the like is to be provided.

Where roof areas must be accessed for maintenance, suitable stairs, walkways, railings, fall protection measures etc. are to be provided. Take reasonable steps to minimise the amount of equipment etc. requiring servicing from roof areas. Roof mounted supply and exhaust fans are not permitted.

28.4.7 Arrangement of Services

Take particular care with arrangement of services and ensure full co-ordination of the project. A particular requirement is the separation of mechanical services from electrical services.

28.4.8 Safety in Design

Safety in design must be incorporated into the design of all new plant, buildings etc. In addition to legislated and briefed requirements, work closely with JCU Project Manager and keep the Deputy

Director – Planning and Development and Manager, Asset Strategy and Maintenance fully informed of installation, service and maintenance and access requirements.

Particular care must be taken to ensure that safe installation and service is inherent in the design. Generally any requirement for the use of Personal Protective Equipment (PPE) or protective measures (fall restraint systems etc.) should be avoided by design.

28.4.9 Noise & Vibration Control

Prior to finalising the design, provide an overall strategy for vibration isolation to all equipment with moving parts to the Deputy Director – Planning and Development for review and approval.

28.4.10 Lift Motor Room

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

28.4.11 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.

28.4.12 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 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 Deputy Director – Planning and Development for specialist lifting applications (loading docks etc) – and not passenger duty.

28.4.12.1 Transport calculations

Provide traffic calculation for all lifts incorporated. Liaise closely with the Architect and 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 Deputy Director – Planning and Development for approval.

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

28.4.12.2 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 $\pm 6\text{mm}$

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.

28.4.12.3 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

28.4.12.4 Lift Loading

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

28.4.12.5 Lift Car Size

Lift car size shall be suitable for persons with disabilities AS1428.2 to allow sufficient circulation space for a 180deg 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.

28.4.12.6 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.

28.4.12.7 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.

28.4.12.8 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.

28.4.12.9 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.

28.4.12.10 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.

28.4.12.11 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.

28.4.12.12 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.

28.4.12.13 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

28.4.12.14 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.

28.4.12.15 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.

28.4.12.16 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.

28.4.12.17 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.

28.4.12.18 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.

28.4.12.19 Landing Doors

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

28.4.12.20 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.

28.4.13 Identification of Equipment / Services

Confirm the plant numbering sequence with JCU 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.

28.5 USEFUL INFORMATION

28.5.1 National and State Legislation / Standards / Codes

As a minimum, the latest revisions or version of

- National Construction Code (revision as determined above)
- All applicable standards
- Queensland Development Codes
- Environmental Protection Act, Regulations
- Work Health and Safety Act
- JCU requirements as the local electricity provider
- Disability Standards (Including Stretcher compliance)
- Queensland Development Codes
- Environmental Protection Act, Regulations
- QFRS

- These Design Guidelines
- JCU Policies and Procedures
- Any other regulation or local authority requirements applicable to the works

28.5.2 Discipline Specific Standards

AS1428.1	Design for access and mobility
AS1428.2	Design for access and mobility
AS1735	(all parts/standards) Lifts Code Set
AS 1775	Low voltage switchgear and control gear
AS 1851	Maintenance of fire protection systems and equipment
AS 3000	SAA Wiring Rules
AS 4041	Australian Standard Pressure Piping

Regardless of the above, any applicable standard is to be considered in the design. The term “AS” shall also refer to “AS/NZS”.

Any divergence from the above or other required provisions is to be listed on the Non-Conformance Register.

28.5.3 Interfaces

Further to 0 as a minimum:

28.5.3.1 General

Ensure that all works necessary for the complete installation and successful operation are arranged with other trades. Ensure also that information required to accurately design the lift services is obtained from other trades as required (e.g. architectural fire wall details)

28.5.3.2 Architectural Services

- Confirm travel numbers, travel time, population of buildings etc required.
- Confirm goods to be transported (hazardous substances or size of equipment to be transported for maintenance / replacement)
- Plant room sizing (plan and height)
- Lift shaft sizing (net and gross)
- Pit details
- Access requirements, swing areas for stretcher access and the like
- Door types, finishes
- Car finishes
- Control panel locations and finishes
- Alarm locations
- Car Control panel finishes
- Any louver requirements for shaft or equipment ventilation

28.5.3.3 Acoustic Engineering

- Noise / Sound details for motors, switchgear, hoists etc

28.5.3.4 Structural Engineering

- Dry and waterproof shaft required – provide dimensions
- Dynamic and static loads on lift shaft walls etc
- Pit dimensions including drainage sump
- Locations of penetrations and openings for doors, landing call stations, lift indicators, conduits required for control cabling, smoke testing or other
- Details on door track recesses, floor edge finishing recesses and the like

28.5.3.5 Electrical Engineering

- Electrical requirements (location and rating of submains)
- Comms requirement including emergency lift phone or intercom
- Lighting requirements for plantrooms, access ways, platforms, shafts etc
- General power requirements for plantrooms, access areas etc (e.g. SSO's)
- Any requirements for security access control
- Requirements for smoke detectors in lift shaft

28.5.3.6 Mechanical Engineering

- Requirements for ventilation or cooling of lift motor rooms / plant
- Requirements for lift shaft pressurisation in fire mode (if required)
- Details of any interface to BMS (eg status / faults etc)

28.5.3.7 Hydraulics Engineering

- Any lift pit / shaft drainage requirements

28.5.3.8 Hazardous Areas Design

If lifts are required to transport Flammable or explosive materials, a Hazardous Area Classification may be required which may impose requirements on the lift and associated electrical design.

- Should the lift be required to carry such materials, obtain the Hazardous Area Classification from the Deputy Director – Planning and Development and comply with the requirements contained therein.
- Review the Hazardous Area Classification for the space and address any hydraulic equipment Requirements e.g. location of electric hot water units
- Where required, arrange for electrical design for Hazardous Areas
- Where potentially flammable or explosive liquids, gases, vapours or dusts are advised, advise the Deputy Director – Planning and Development of such presence and confirm whether a Hazardous Area Classification is required