SECTION 14

DOORS, HARDWARE AND LOCKS

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Version	Date	Authors	Summary of Changes
P1	09/05/14	WA	Preliminary Issue for review
2	19/8/14		Issue to web
	05/05/15	Manager, Infrastructure Services	Updated with Manager, Security comments and cross referenced with other sections
V3	16/07/18	Manager, Infrastructure Services	2018 general review update

14.0 DOORS, HARDWARE AND LOCKS

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.

14.1 Approvals Required during Design

Approval shall be obtained from the Deputy Director – Planning and Development in SD for the:

- Use of edge strips on internal timber doors,
- Use of door grilles, and
- Use of Roller Doors.

Approval shall be obtained from the Deputy Director – Planning and Development in DD for the:

- Keying, including the keying schedule, key coding and the number of individual keys to be issued ready for DD.

Approval shall be obtained from the Manager, Security in SD for:

- Electromagnetic locks other than Lockwood 3570 Series Electric Mortice dead latches, and
- Any Heavy Duty Power Transfer Hinges.

Approval shall be obtained from the Manager, Security in DD for:

- The use of dead bolting locks, Lockwood 3540 series

14.2 Doors Generally

Doorway location and clearances to comply with Australian Standards to permit access for people with a disability.

Construction and assembly of doors shall comply with applicable Australian Standards.

Glazing in doors shall comply with AS 1288 and AS/NZS 2208 as applicable.

Double action swing doors shall not be used.

Narrow lock stiles shall not be used with electric locks.

14.3 Entrance Doors

All building entry doors shall be glazed doors.

All new buildings will include at least one electronically accessed controlled door and all perimeter doors will be electronically monitored by reed switch. This door or doors shall also be linked into the Electronic Access Control system. (Refer to Section 15 for details of Electronic Access Control systems).

In existing buildings where electronic access control systems are not utilised, the main entry doors should be secured with a Mortice dead latching lock.

Sliding doorsets are preferred for all main automatic exit/entry doors. Automatic sliding doors shall be DORMA BWN EZY-FIT EL301 Series with belt drive, a class 3 duty cycle rating in accordance with AS 4085, electric open sliding door system, Fail Safe integrated with the Access Control system and fire alarm, an automatic reset, BWN electric motor locking system, and battery backup. It shall comply with the ability to be manually locked and remain secure in the event of a power outage lasting several days, by installing a Mortice dead latching lock.

Automatic sliding doors shall not be the frameless glass type. Framed automatic sliding glass doors shall be glazed with glass, thickness to comply with AS1288.

Electromagnetic locks and double action swing entrance doors shall not be used with entrance doors.

14.4 Fire Doors

Fire doors shall be provided to satisfy the requirements of the NCC.

Fire doors shall comply with AS1905.1 and generally shall be paint finished. Minimum thickness: 45mm.

Provide glazed viewing panel to each door (except where electromagnetic hold-open devices are fitted) and provide signage required under the BCA. Glazing to viewing panel shall be not less than 6.38mm thick laminated glass. Viewing panel size shall be nominally 600h x 100w, located within 200mm of the opening door stile and with the bottom edge at 1000mm AFFL.

Fire Doors must be installed and certified by a "qualified person" as defined by the Queensland Fire Contractors Board and as licensed by the BSA. Provide certification of compliance in Operating Manual - refer Section 34 and details in engineering services sections of these Design Guidelines.

Maintenance of fire doors shall be specified in accordance with AS 1851.7.

14.5 Smoke Doors

Smoke Doors shall be provided to satisfy the requirements of the NCC.

14.6 External Doors

All external doors except in fire stairwells and plant rooms, shall be Aluminium framed (anodised or powder coated), fully glazed, and triple hinged (opening outwards).

External doors shall be fitted with appropriate Pull signs and Push signs. Two leaf door sets will have the fixed leaf secured by flush bolts top and bottom on the lock edge of the frame. Two leaf doors should be signed on the normally opening leaf only.

Provide a suitable head flashing to external doors, where it is exposed to weather. Note Raven RP67 is the preferred flashing where applicable.

Perimeter doors should be illuminated for safety and security purposes during the hours of darkness as per requirements in Section 15 and 25 of these design guidelines.

14.7 Emergency Exits

Emergency exists forming part of the perimeter of the building should have the following characteristics:

- Single leaf solid core door, hung to open out
- Fitted with approved hinge bolts
- If connected to the access control system to allow monitoring of doors then the electric locks should be wired into the building fire panel to allow fail safe operation of the doors in a fire alarm situation.
- Fitted with a door-closing mechanism
- No furniture should exist exterior to the door except a blocker plate.

The Deputy Director – Planning and Development shall provide a specific design brief in the early briefing stages of the project for buildings which have an elevated security requirement.

14.8 External Timber Doors

All timber external doors shall be blockboard solid core construction, external grade and sheeted with 4mm A bond select grade ply and shall be faced both sides with 0.9mm 304 No 4 stainless steel sheet, adhesive fixed. Edge finish with mitered channel fabricated of matching sheet (nom 20mm x door width) with stainless steel countersunk screw fixing into door edge, all round and lapping over stainless steel facings.

14.9 External and Internal Aluminium-Framed Glazed Doors

All full height glass doors must have a permanent marking positioned in accordance with standards. Aluminium finish may be either anodised or powdercoated. Anodising shall not be less than 20 microns anodise to both doors and frames.

Powdercoat shall be of a quality commensurate with the application and shall be equivalent to DULUX Duratec (Line Number 900) or better. Warranty: to achieve a manufacturer's warranty for film integrity and for colour of a minimum of ten years. (Where bright colours are used, Duratec LX or Fluoroset FP may be required to achieve warranty requirements.)

Aluminium doors larger than standard size must have accompanying hinges, closers and the like designed to prevent movement and misalignment. Preference shall be given for one single door leaf with side light. The top rail of aluminium doors shall be of a size to fit the door closer.

14.10 Internal Timber Doors

All timber internal doors shall be blockboard solid core construction, not less than 40mm thick and sheeted with 4mm A bond select grade ply. Edge strips are only to be specified when design requires it for special areas e.g. when using clear finish to door, by approval JCU Estate Directorate, Deputy Director, Planning and Development in DD. Timber doors shall be painted with a high quality gloss acrylic system. Paint extent shall include top and bottom edges.

Door sizes shall generally be of a standard size not less than 2,040 x 920 unless nominated otherwise or required to be larger for particular purposes or to meet statutory requirements.

Doors generally shall have a glazed viewing panel with not less than 6.38mm thick laminated glass. Viewing Panel size shall be nominally 600h x 150w, located within 200mm of the opening door stile and with the bottom edge at 1,000mm AFFL. Viewing panels to laboratory doors shall comply with the requirements of AS/NZS 2982.1. Refer also Section 37 Special Requirements for Laboratories.

All plant rooms, seminar, laboratory and other doors as required by the Space Description Forms shall be minimum one leaf construction 1,020mm wide and shall open outwards taking care not to swing across paths of travel. Doors to cleaners' rooms, service ducts and small storage cupboards shall also open outwards.

In new buildings, air grilles shall be installed only in toilet and air lock doors, and if the extruded aluminium type, shall be fixed with concealed screw fixings on the inside. The use of door grilles in refurbishment work projects will only be permitted with the approval of JCU Estate Directorate, Deputy Director, Planning and Development during SD.

Note: Disabled toilet doors are not to have an air grille in the door.

Doors to sanitary compartments for people with disabilities shall comply with AS 1428.1 and shall open outward. Refer also Kick Plates in this section.

14.11 Door Frames

Steel doorframes should be of a solid, robust construction, resistant to bowing when lateral force is fire or sound-rating requirements.

Minimum frame metal thickness is 1.1mm.

Frames for exterior and fire doors to be 1.6mm

Factory finish:

- Internal Locations will be Zincanneal
- All external doors will be Galvabond

Aluminium doorframes to be provided when part of a proprietary glazing partition or shop-front system.

Door frames shall be sufficiently rigid to avoid distortion by the door weight or the twisting action of the door closer. This is to include double studding to both sides of door frames in addition to any manufacturer’s installation instructions.

14.12 Keying System

All keying is to be confirmed by JCU Estate Directorate, Deputy Director, Planning and Development, including the keying schedule, key coding and the number of individual keys to be issued at DD.

Only master keying shall be used. Maison keying will not be approved.

Construction cylinders will be used during construction of any new buildings or alteration works.

At practical completion of the construction and before handover to the University, the construction cylinders shall be removed and replaced with barrels and keys to the University Restricted series.

14.13 Locks

Except where otherwise scheduled:

- All doors shall have mechanical locks/latches installed.
- Mechanical locks/latches shall be Lockwood 3570 dead latching series.
- Locks shall be mounted such that the strike is 1,000mm above finished floor level except the indicator bolt to toilet entry doors where fitted.
- No locks are to be mounted in the bottom rails of doors.
- All locks shall have "X" type cams where possible to prevent over 90° key rotation and are not to employ anti-lock out (kick off) function.
- Where the mortice lock requires a dead-latch function, ensure that the appropriate strike plate is fitted and installed correctly. Refer Striker Plates in this section.
- Dead bolting locks, Lockwood 3540 series locks (non-lever locking, keyed both sides) shall only be used with written approval of the JCU Manager, Security during DD.
- Connection to the building Fire Alarm System will be dependent on specific application. As a general rule the controlled building front entry door shall be swipe in - entry reader only in order that it may fail secure. All other building external entry perimeter doors are to be reed switch monitored.
- Where electronic locks are installed, any required card readers shall be located so as to be accessible to people with disabilities, not closer than 1,000mm from the arc of the hinged door, not within 500mm of an internal corner and preferably on the latch side of the door. Card readers shall be located between 900mm and 1,300mm above the finished floor level.
- Where electric locking is required, the Lockwood 3570 Series Electric Mortice dead latches are to be used. In some circumstances, electromagnetic locks may be used with the approval of the JCU Manager, Security during SD, however, drop bolts, electric strikes and shear locks are not to be used, refer Section 15 Building Security.

14.14 Lock Applications for Individual Doors

Locks and lock furniture shall be LOCKWOOD Brand, unless otherwise approved.

Furniture finish shall be Satin Chrome Plated.

Application	Type
Stairs Locking	3572W-SP3572-5250 with 1801-70/1905-70
Stairs Ground Floor Exists	3572X with 1801-70/1905-70
Lecture & Seminar Rooms	3572W-SP3572-5250 with 1801-70/1905-70
Offices	3572WT cylinder and “X”cam with SP3570 - 5250 adaptor and 1801-70/1904-70 furniture
Duct Doors (non-fire rated)	211 Nightlatch
Duct doors (fire rated)	EFCO507
Mortice Privacy Latch to PWD Toilet	Lockwood lock LW3574EA SC with furniture LW1814/70SC and LW1939/70SC
Non Locking Door	Passage 3574 with 1805-70/1907-70
Sub Stations & Specified Areas	To be specified by JCU Manager, Infrastructure Services

Aluminium Glazed Entry (hinged)	3572X with 3570-2402/2452 Hold Back Cylinder to inside with 1800/1907-70
Small Roller Shutter	PL330N padlock keyed to ABLOY Protec
Larger Roller Doors	Perimeter wall roller shutter doors to be secured at the bottom of both sides with padlocks from the Abloy Protec range and/or electric key switched motorised doors
Electric Key Switched	'LOCK IT WELL" switches, as per application with ABLOY Protec profile
Electronic Access Controlled Locks	ASSA ABloy protec lock cylinders to JCU profile.
Display Cases (high security)	ABLOY Protec
Window Locks	LOCKWOOD 780/880 or equivalent all keyed alike, or an approved 'allen key" type, depending on application. Refer Section 7 Building Envelope
Toilet Partition Furniture	Refer to Section 9 Internal Walls, Partitions and Finishes

14.15 Door Closers

Provide surface mounted door closers to residential bedrooms, entrance doors, external doors, lecture theatre doors and doors to all teaching spaces, internal offices, toilets, air-locks, fire-doors and plant rooms.

Door closers shall generally be provided to the perimeters of all air-conditioned spaces. Provide delay action control closers where directed for disabled access.

Overhead surface-mounted type

- DORMA TS93B EN1 – 5 pull side mount
- DORMA TS93G EN1 – 5 push side mount
- DORMA TS93GSR RF – Hold open unit/ pair of doors

When mounting door closers in conjunction with acoustic seals, provide suitable mounting packers to keep the arm of the door closer clear of the seal. In all cases screws are not to penetrate glazing beads on acoustic seals.

NB: All outward opening doors shall have “G” Bodies and inward opening doors shall have “B” Bodies.

Where the security systems installed require doors to be automatically closed, ensure that the appropriate door closer types are fitted.

Prior to Practical Completion (and when mechanical systems are fully operational and balanced), door closers shall be adjusted so that spring strength is adjusted to lowest optimal setting for satisfactory closing action.

14.16 Hinges

Hinges generally shall be TRIO 304 grade satin stainless steel, fixed pin butt hinges, Cat. No. T717525FPSS or T710025FPSS. Hinges shall be left unpainted. All screw fixings shall be stainless steel.

Generally all door frames shall have a minimum of three hinges per leaf with the middle central between top and bottom hinges. Where a door is fitted with a closer a fourth hinge shall be installed approximately 200mm below the top hinge. Welded hinges are not acceptable.

Application	Type
Fire and External Doors	Three (3) per leaf 100 x 100 x 2.5mm
Internal Doors	Three (3) per leaf 100 x 75 x 2.5mm
Aluminium Doors	Stainless steel ball-bearing interfold type, stainless steel screw fixed to frames and jambs
Heavy / Acoustic Doors	Three (3) per leaf 100 x 100 x 2.5mm stainless steel bearing hinge. TRIO Cat. No. T710025FPSSB
Extended Hinges	TRIO "Super" series wide throw butt hinges, as required.
All doors requiring access control	Heavy Duty Power Transfer Hinges – provide details at early SD design stage to JCU Manager, Security for approval.

14.17 Bolts

Application	Type
Barrel Bolts	DALCO 1751 x 150mm with floor ferrules
Flush Bolts (Standard 2040 door height aluminium framed glazed doors only - except where acoustic seals fitted)	EFCO841 x 150mm
Automatic Flush Bolts (two pairs of fire doors)	LOCKWOOD FOH00149
Fire Bolt (two pairs of fire doors)	LOCKWOOD 8530 - 102
Skeleton Bolts (Door ht 2100 and over)	DALCO 791 x 200mm to 600mm as required

14.18 Panic Bars

DORMA AD7000 Series ("bar" type).

14.19 Electro Magnetic Hold-Open Devices

Electromagnetic hold-open devices as required shall be DORMA type, be provided to all fire doors in high traffic areas which shall be activated by the Building Fire Alarm System and mounted at 1,800mm above finished floor level near the leading edge of the door.

14.20 Selectors

LOCKWOOD A3000 x 230mm, fit to door pairs which are fitted with electro magnetic hold-open devices.

14.21 Kick Plates

Kick plates are required in the following locations: toilet doors, teaching spaces, circulation spaces and stairs (where no hold-open provision is provided) and plant rooms.

Kick plates shall be 150mm high x nominal full door width, 0.9mm thick 304 No 4 satin stainless steel, glued and screw fixed with stainless steel raised head screws to both sides of each door.

Where timber doors are subject to excessive damage from trolleys or similar impacts, and to doors to sanitary compartments for people with disabilities (PWD), the stainless steel kick plates shall extend to a height of 600mm above the floor level. Verify requirement for door protection with respect to trolleys with JCU Project Manager during SD.

Ensure that kick plates and fixings are so manufactured and installed to provide smooth surfaces and edges, with no sharp edges or protrusions.

14.22 Door Stops

To any door where the door may strike a wall, provide an Aluminium and rubber door stop, floor (LOCKWOOD A250SC) /or wall (LOCKWOOD A350SC) mounted, in a position that will allow full access clear of door furniture.

14.23 Coat Hooks

Provide a coat hook on the inside of every enclosed office door (where possible).

14.24 Door Holdback

Door holdbacks shall be provided, as required, to doors without door closers. Fitting shall be Trio Magnetic Door Stop 75mm R12.

14.25 Security Door Viewer

Doors, other than glazed doors to lecture theatres, computer rooms, seminar rooms, meeting rooms and other specialist spaces shall be provided with a glazed viewing panel

14.26 Videoconferencing, Acoustic and Smoke Seals

Where acoustic seals are required to the bottom edge of a door leaf, the seal shall be surface mounted type and not rebated into the face of the door, and threshold fitted across opening. Provide RAVEN door seals, selected to suit the particular application.

For videoconferencing facilities, unless otherwise specified in Section 36, entry and exit doors should be made of solid wood. Rubber door sweeps should be installed. Doors into the space should similarly have a minimum STC (Sound Transmission Class) rating of 45 to 55.

14.27 Push Plates and Pull Handles (Toilets and Airlocks)

Provide on 1.6mm satin stainless steel push plate (300mm w x 500mm h) fixed with countersunk stainless steel screws. To pull side, fit EFCO 136 SCP 200mm "D" handle mounted 100mm above lowest edge of plate.

Mount plate to opening edge of door with lowest edge 900mm AFFL. Provide engraved "PULL" to push plates with pull handles. Refer Section 17 Signage for details of text size, location and colour of infill.

14.28 Strike Shield (Blocker) Plates

External building perimeter fire exit doors and external building perimeter plant room doors to be fitted with brushed stainless steel, concealed fixed blocker plates covering access to the lock tongue and striker plate.

14.29 Striker Plates

Dead latch striker plates are to be used for mortice dead latches. Correct hanging of the doors is critical for the proper functioning of the lock. All striker plates are to be installed in accordance with the manufacturer's instructions. Welded striker plates are not acceptable. Verify after installation that the required dead latching function has been met.

14.30 Roller Doors

Shall only be provided if approved by JCU Estate Directorate, Deputy Director, Planning and Development during SD for purposes as outlined in Section 15 of these design guidelines.