

**SECTION 5: INTERNAL AND EXTERNAL BUILDING ELEMENTS**  
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## 5.1 INTRODUCTION

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This section of the Design Standards provides details of the University's minimum requirements for internal and external Building Elements. Note that some building elements are necessarily referenced in other sections such as Hydraulic Services, Health and Safety etc. The Project consultants are required to produce their own specification incorporating the following information and submit all design and documentation for review prior to tendering or any works commencing on site.

All building developments must be consistent with the University's maintenance practices, procedures and requirements. A safety in design methodology must be used.

The materials specified must reflect low maintenance considerations. All building elements must be readily accessible for maintenance and repair.

A finishes and fixtures schedule (with samples) is to be presented to the University Project Manager for approval. Sample boards etc must be submitted time to allow for an extensive approval process and to provide sufficient time for changes to be easily incorporated into the design documentation.

## 5.2 GENERAL REQUIREMENTS

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### 5.2.1 *General Building External Elements*

- All building works shall fully comply with these Design Standards. Section 2, Health and Safety, of the Design Standards contains the OHS related requirements of many building elements. Designers and consultants are to pay particular attention to this Section.
- Refer to Design Standards Section 4, Structural and Civil for additional requirements relating to the design of structural building elements.
- Façade materials shall be durable and easily maintained.
- Anti-graffiti protection shall be applied to ground level external surfaces.
- External walls shall be brick, concrete or full height glazing and be respectful to the local built environment, including any heritage requirements;
- Façade staining shall be avoided by careful design and detailing to shed water clear of the building, lower projections and pathways. Parapet capping and window framing shall be designed to ensure façade staining is avoided.
- Windows should be well shaded, provide good views and maximise natural light without causing glare discomfort to occupants.
- If the building is not fully air-conditioned, windows should be openable for cross ventilation. The size of window openings must eliminate the risk of access through the window.
- The chosen façade materials should have thermal resistance to keep excess heat out during summer and insulate effectively in winter. Refer to the NCC for minimum requirements;
- Façade systems, shading systems and glazing shall conform to the requirements of the Building Code of Australia (BCA);
- The placing of protruding building services and equipment on building façades and rooftops shall be avoided or shielded from view.

#### **Brickwork**

- Brickwork shall be designed to prevent the problems associated with brick growth.
- Provision of adequate control joints in all masonry walls shall be included. Joints shall be thoroughly sealed to prevent water ingress.

#### ***Walls and Expansion Joints***

- Care shall be taken to ensure that there are sufficient control joints in all wall materials to avoid cracking due to shrinkage and expansion of the material, movement of the supporting structures under wind and other effects or unequal settlement. Any movement joints in the structure behind are to be carried through the cladding.

- Adequate weathering shall be provided for all copings, sills and at heads to openings.

#### **Aluminium Composite and Expanded Polystyrene Panelling**

- The use of Aluminium Composite Panelling (ACP) as a façade material is not supported.
- If the design team proposes to use ACP on a building facade, its use shall be subject to approval in writing of the University's insurer.
- In addition, the proposed use of ACP material must be supported by written evidence of compliance with the latest edition of AS 5113 Fire Propagation Testing and Classification of External Walls of Buildings, other relevant Australian Standards, NCC requirements, relevant Ministerial Guidelines and a detailed risk assessment as part of the Safety in Design review.
- Expanded Polystyrene products or other foam plastic insulated external wall material must not be used.

### **5.2.2 Roofing**

- Minimum roof pitches shall be avoided. Roof pitches of less than 3 degrees are not acceptable.
- All roof spaces shall be well ventilated and have adequate, permanent, fixed access provided. Roof spaces shall be sufficiently lit to enable the roof space to be safely traversed 24 hours a day.
- Roof and roof drainage systems shall be designed to accommodate the storm event detailed in the Hydraulic Services section of the Design Standards.
- Dissimilar metals are not to be used in roofing installations.
- The chemical reaction of aluminium in contact with other metals in an exposed situation shall be avoided.
- Light coloured roofing and cladding should be utilised to minimise heat absorption.
- Refer to Design Standards: Structural and Civil, Section 4 for additional requirements for design of structural elements.
- There shall be close collaboration with the consultant team and the University of Melbourne Project Manager to ensure that roofs comply with AS 3500, the Design Standards and project specific requirements.

#### **Roof Access**

- Roof access door/hatches including ladder/stair access shall be secured utilising either electronic access control, or auditable electronic key and lock system (EKA Cyberlock). Refer to Design Standards Section 13: Security for additional requirements.
- The method of proposed roof and facade access shall be discussed with the University's Project Manager at an early stage of the design work. Roof access safety systems are to comply with relevant Australian Standards.
- Lift access shall be provided where roof top plant space is proposed.
- Access to the roof shall allow for ease of maintenance and replacement of roof mounted plant and equipment.
- Where required for maintenance/cleaning and general access, provide a compliant roof access safety system.
- The roof safety system shall include the appropriate combinations of components including horizontal safety cable, anchorage points or other fall restraint devices via proprietary roof walkway and safety systems.
- Prior of the issuing of the certificate of practical completion, the building contractor is to appoint an independent certifier to certify compliance of the roof access safety system with the relevant Australia standards. The University's Project Manager will provide the names of the approved certifiers.

### **Roof Membranes**

Shall be three-layer membrane systems comprising of

- Floating separation backed membrane
- 3mm middle sheet fibre glass
- 4.5mm reinforced UV stable mineral chip cap sheet
- Allow 10% extra for laps and wastage
- All torch applied
- Allow for vents each 50m<sup>2</sup>

Installation shall incorporate recommended surface preparation ensuring that the surface shall be free from sealant, loose aggregate and other contaminates.

Where no cove is present on stairs, cove shall be installed prior to membrane application

### **Guttering and Downpipes**

- Full and appropriate calculations shall be undertaken to establish roof drainage requirements and the capacity of the design to properly discharge rainwater and to incorporate fail-safe design practice.
- Internal downpipes shall be oversized, with no sharp twists and turns;
- The design should avoid box/internal gutters and internal downpipes. If unavoidable, these shall:
  - Be appropriately detailed to eliminate the risk of blockage and flooding
  - Include visible overflows
  - Have overflows which discharge conspicuously in the event of blockage.
  - Ensure that the overflow is not directed to main downpipe
  - For maintenance purposes a minimum width of 450mm and a minimum depth of 150mm are suggested.
  - Be fully accessible for cleaning.
- Box gutters and downpipes and other inaccessible components such as valley gutters shall be constructed from either stainless steel, copper, or zinc. Dissimilar metals must not make contact with each other.
- All rain heads at the top of downpipes shall have provision for overflows.
- All gutters shall be fixed independently of roof decking and over-flashings, with adequate expansion joints.
- Regardless of design calculations, gutters shall have a minimum depth of 90mm with a minimum of 25mm freeboard.
- All box gutter sumps shall be fitted with removable galvanised mesh type leaf guards across the full area. Sumps are to be a minimum of 450mm by 450mm by 150 mm deep.
- Shoes of downpipes shall have a 100mm screwed IO access point above the shoe, when connected directly to a stormwater drain. Downpipe shoes over pits shall discharge 80mm above a grating of the pit. All rain heads shall be accessible.
- Eaves gutters are to be run into large, external downpipes of minimum 150mm diameter through rain heads.
- Downpipes shall be detailed to discharge over collector pits at ground level, each incorporating a leaf trap and grate at ground/surface level. The grate level is to be at least 75mm above any garden mulch. For cleaning purposes, a minimum clear space of 80mm is to be allowed between the bottom of downpipes and the grate.

- Internal downpipes within ducts shall be sanitary plumbing class UPVC or HDPE. When PVC is used it should be in accordance with [The Best Practice Guidelines for PVC in the Built Environment](#) as per the Green Building Council of Australia.
- Downpipes shall not be cast into concrete columns but shall be enclosed in a suitable duct with inspection openings.
- To avoid damage, downpipes shall be located in protected areas away from heavy pedestrian or vehicular traffic. Where downpipes in vehicular areas are unavoidable, permanent bump protection is required.

### **5.2.3 Windows, Glazing and Window Cleaning**

When designing glazed openings, the benefits of natural lighting and ventilation shall be weighed against solar and thermal loads. The design shall demonstrate adequate consideration of the following:

- Careful attention to the problem of noise in high winds, water proofing, thermal and structural movement, the impact on energy consumption and security.
- Sun control techniques (including internal and external shading devices and control of glare).
- Maximised use of natural light.
- Designed in accordance with the BCA and the required thermal resistance required for external glazing.
- Provision for shading of glazed areas from early October to early March.

#### **Windows**

- Design of operable windows shall eliminate any risk of climbing or falling. Implement the advice described in the [ABCB Advisory Note 2013-1 Protection of Openable Windows](#) (August 2016 revision) with consideration that the University is a child friendly workplace.
- The location of operable windows above or adjacent to trafficable areas should be avoided.
- Windows in high traffic and vandal-prone areas shall be impact resistant or otherwise protected.
- Fitted screens shall protect operable windows from the ingress of insects and should be easily accessible for removal and cleaning.
- Window design shall incorporate robust and reinforced commercial framing suites hardware and finishes selected for durability and environmental considerations.
- Enhanced solutions such as increased glass thickness, double glazing and tinting shall be incorporated to reduce noise, sun glare, and heat gain and loss as appropriate.
- Where specified, sashes shall be either sliding or double hung.
- All external windows shall incorporate glare control blinds unless approved. Refer to Section 5.2.10 Blinds for additional requirements.
- Where skylights, light shelves, atria or clerestories have been incorporated, adequate and appropriate maintenance plans and facilities are to be included.
- Aluminium windows shall be etched prior to anodising. The required thickness of anodising shall be specified in microns and approved by the University's Project Manager.
- Powder coated window frames may also be used where the colour has been approved.
- Prior to practical completion, training and induction relevant to the operation of any motorised or manual facade access systems, is to be provided to nominated University staff and/or contractors.

## **Glazing**

- Glass fitted to windows and doors shall comply with the relevant Australian Standards.
- Glazing shall be specified based on environmental and acoustic considerations.
- A risk management approach for glazing of high activity and other risk exposures (e.g. Childcare Centre's and sporting facilities) shall be carried out in accordance with AS1288.
- Consideration shall be given to the WorkSafe safety alert [Victoria 'Use of Glass in Workplaces Providing Early Childhood Education and Care Services'](#) safety alert issued in August 2017.
- Laminated glass is the preferred minimum requirement for installations. Float glass shall not be used.
- Toughened laminated glass is to be used in all high risk areas as deemed appropriate after carrying out a risk assessment.

## **Glazing Decals**

- Decals to full height glazing in teaching spaces shall be provided to meet minimum statutory requirements. Obscuring the view into teaching spaces with film or decal is not acceptable.
- Decals or film to offices are to ensure that some transparency is maintained to all enclosed spaces. Opaque film is not acceptable to any area.
- Print on clear film or laser cut decals are acceptable.
- Refer to the University's Signage Guidelines for additional signage requirements. These are located on the University's Design Standards web page.

## **Window Cleaning**

- Ease of and safe access for the cleaning (internal & external) and maintenance of windows is a very important requirement in the design and shall be thoroughly addressed during the design process.
- Buildings that are three or more floors in height should include a fixed building access system for maintenance and cleaning of external facades;
- Where a Building Maintenance Unit (BMU) is to be used for external window cleaning, appropriate docking or fixing devices are to be provided on the exterior of the building.

### **5.2.4 Doors, Door Hardware and Keying**

- Doors are to be sized to suit the maximum widths required for the purpose of the space. Consideration is to be given to peak demand times in teaching spaces, Australian Standards (AS1428) and DDA access requirements.
- All doors to teaching and learning spaces are to have clear vision panels to allow visual connection and safe opening.
- Timber doors are to be of solid core construction, hollow core doors are not acceptable.
- Doorways and openings are to have dimensions that allow equipment to be removed or reinstalled. The method of changing/maintaining the largest item in any room (including plant rooms) is to be considered when selecting the size of door openings.
- All doors shall be furnished with restrainers, door stops, door closers etc as appropriate to prevent impact damage to adjacent surfaces.
- Door stops shall not be located in close proximity to the hinge. Where floor mounted door stops are likely to create a trip hazard when fixed in the normal location beneath the door handle, a door stay is to be used instead, fixed to the head of the door.
- Any door fixings to lightweight metal shall be provided with backing plates for support.
- Typically, doors shall be designed with lever style handles.

- Oversize doors are to be detailed to include sufficient hinges and hardware to ensure ease of operation and durability is achieved.
- In areas prone to vandalism or high student usage, handles and mechanism shall be sufficiently robust to withstand vandalism, abuse and the effects of frequent use.
- Door frames are to be aluminium or steel and to be fitted with a double rebate to allow for future alterations.
- Doors shall be located adjacent to walls to provide a definite door stop and thus avoid hinge stress damage due to over extension by the action of wind or users.
- Doors are to be robust and suitable for the intended purpose of the space. High traffic areas are to have automatic sliding doors.
- Doors shall have the equivalent acoustic and/or fire performance of the wall in which they are built.
- Highly customised doors and door frames are to be avoided. Non approved door hardware is not to be used.
- Double acting doors are to be detailed to prevent binding between the leaves. If not double acting, double doors shall have rebated stiles, or equivalent metal stop to inactive leaf.
- Access and security controls are to be integrated into doors and frames where required. Refer to Design Standard Section 13, Security for additional requirements.
- Any motorised roller doors are to be fitted with sensors.

***External Doors:***

- The number of external doors to buildings is to be kept to a minimum. They shall have door furniture that enables the doors to be self-locking.
- External, open out, swing doors with 3570/3770 series lock or equal and approved equivalent locks shall have a 'Blocker" fitted to prevent tampering with locks.
- Glass doors shall be clearly marked, such that they are visible to all users of the building, with push/pull or sliding signs and include an intermediate safety bar.
- Where exposed to the weather, anodised aluminium doors and frames with laminated safety glass is preferred. As a minimum, doors are to have a 200mm mid-rail for Lockwood 3500 series lock or equal and approved equivalent;
- Doors are to be hung using threshold pivot set with Dorma RTS85, or equal and approved equivalent, transom mounted concealed overhead closers;
- Doors in public areas shall have glazing panels or glazed door sidelights;
- Fire-rated doors to be metal sheeted mineral core with pressed metal frame and hardware and are to be factory fitted and assembled. If necessary, a viewing panel shall be installed. Minimum size of 600mm (H) x 100mm (W) and 1000mm (AFFL).
- Doors are to comply with AS 1905.1
- Hold open devices to be fitted in high traffic areas;
- Non-fire-rated external doors, are to be metal sheeted mineral core with pressed metal frame, factory fitted assembly.
- Doors shall be sufficiently recessed into foyers to protect from prevailing wind pressure and rain or shall be weather protected with canopies.
- Airlocks shall be sized to permit the safe closing of doors, allowing each set to close before the next is opened.
- Timber doors shall be solid core faced with painted waterproof 4mm, A-Bond ply and pre-primed solid top, bottom and edge strips.
- Aluminium doors shall be constructed:

- From a commercial grade section and have a solid bottom panel
- With pivot type hinges complete with floor springs and concealed head closers.
- Weatherproof seals shall be fitted to the bottoms and edges of all external doors and to the meeting stiles of double doors.
- Doorways shall be designed with no step at the threshold. Where at risk to weather ingress, weather seals and small aperture drainage grates shall be incorporated.
- External swing back of doors to be metal clad to both sides with full perimeter channel fixed with countersunk steel screws. If door is to be unpainted then it must be stainless steel with stainless steel fixings.
- Power to automatic sliding doors at building entrance(s) shall be key switch operated and should have key override switch compliant with Design Standards Section 13, Security requirements.
- Where security access control systems are to be installed an approved electronic lock and mounting position is to be provided. Refer Design Standard Section 13: Security for additional requirements.
- Where applicable, power to automatic sliding doors is to be interfaced in a fail-safe manner, to be activated in an unlocked but not opened position in case of a fire alarm signal from the Fire Indicator Panel. Refer Design Standard Section 8, Fire Protection and Detection Services for additional requirements.
- Doors in main circulation areas and high traffic areas are to be automatic sliding doors.
- Revolving doors are to turn in a clockwise direction.

***Smoke and Fire Doors:***

- External fire doors to be faced on both sides with metal sheeted adhesive, fixed with fabricated perimeter channel of the same material. Countersunk stainless-steel screw fixed through edge.
- Refer to Design Standard Section 8: Fire Protection and Detection Services for additional requirements.

***Internal Doors:***

- May be anodised aluminium as for external.
- Timber doors shall be solid-core with a minimum thickness of 42mm. Finish to suit. i.e. clear finish, prime coated hardboard for gloss paint, plastic laminate to wet areas;
- All doors to have timber edge strips to top and two sides. If required viewing panels should be installed;
- Vision panels to be a minimum of 600mm (H) x 100mm (W) and 1000mm (AFFL).
- Internal fire-rated doors to be as for external with finish to suit installation;
- Framed timber doors to be minimum thickness of 42mm with top rail and stiles 120mm wide;
- Middle and bottom rail to be 190mm wide;
- Aluminium doors shall not to be narrow style but full size to accommodate 3570/3770 series primary lock i.e. Lockwood.
- All two-way doors shall include vision panels.
- Glass doors shall be marked appropriately:

***Door Frames:***

- All external door frames are to be anodised aluminium or pressed steel. Pressed steel to be 1.6mm thick and zinc coated, rebated, fully welded and reinforced and back plated for 3no. 100x75mm hinges, lock strike and door closer. 2no. rubber buffers are to be fitted to the lock side. All to be shop primed and installed to manufacturer's recommendations;



- Pressed steel is preferred for internal door frames. When in timber they are to be 32mm minimum thickness kiln dried hardwood for the full width of the wall.

#### ***Door Locks and Hardware Schedule:***

- For refurbishments projects, the existing door hardware and cylinders remain the property of the University of Melbourne and, prior to demolition they must be removed and delivered to the Security office.
- For refurbishment projects, furniture and hardware selection shall ensure a consistent approach to all door locks and hardware selection and eliminate the use of non – approved items.
- All locks shall be keyed in accordance with the University's Master Keying system
- A complete lock and hardware schedule with floor plans (including master keying) shall be prepared by the Principal Consultant in conjunction with the University's Project Manager, the University Security Manager and the user department.
- The final room numbering system must be established before the lock schedule and floor plans are finalised.
- All automatic door controls, control locks to lifts and roller grilles shall be as per the University's Master Key System.
- Correct strike plates and strike boxes shall be specified for all frames.
- Where possible, directory and notice boards shall be keyed alike.
- All door furniture shall be specified to have sealed finishes that will not corrode or tarnish.
- For all double doors, the inactive leaf is to be specified to be fitted with top and bottom flush bolts to the leading edge. Where door exceed 2100mm (H) extended flush bolts are to be specified.
- All fixing and locking hardware for industrial doors are to be specified to be fitted to the inside of the door, where practicable.
- Roller shutter type doors are to be specified to be secured internally at both ends of the bottom rail with appropriate key systems.
- Where the building entry/exit doors, plant room doors, fire escape doors and other selected internal and external doors are to be provided with electric door strikes, metal mortar guard protection boxes are to be provided as a component of the door frames, with pre-drilled crop outs provided for future strike plates as part of the manufactured door frames, compatible to receive the electronic door latch. Similarly, the doors are to be pre-prepared to receive the non-strike component of the door hardware.
- Dependent upon the final locking configuration and the hardware selected for access control, there may be a requirement for a cylinder and mortice deadlock for separate physical locking and additional hardware if required for an electronic access control system.
- Each copy of a key (including original keys) shall be stamped with a copy number.
- The relevant electrical supply authority will provide special lock cylinders for high tension electrical substations where applicable.
- All external and internal fire hose/hose reel cabinets shall be fitted with D handles and roller catches only with 90 or 180 degrees hold-open arms and chains. Doors to cabinets are painted and sign written to comply with the latest relevant Australian Standard, in consultation with the University of Melbourne Project Manager.

#### ***Door Hardware Specification***

All hardware is to be Lockwood brand and have a satin chrome finish.

#### ***Door Furniture:***

Lockwood 1800 Series square end furniture with 70 Series lever handle.

**Locks:**

- All locks shall be Lockwood 3572 or 3772 Series, Satin chrome finished and installed at 1000mm above finished floor level. No locks are to be installed in the bottom rail of doors. The inside handle shall be free at all times.

**Cylinders:**

All cylinders shall be Lockwood 570 cylinders. All new cylinders shall be keyed to the University Master Key System.

**Push plates and handles:**

Shall be made of stainless steel material.

**Door closers:**

Door closers can be selected from the following approved products:

- Dorma TS 73 for inward opening doors.
- Dorma TS 83 for outward opening doors.
- Dorma TS 92 and TS 93 are approved for use in public areas only.

The project specification is to include a requirement that all doors are adjusted to meet DDA force limit requirements prior to practical completion.

**Kick plates:**

- Provide 200mm x 0.9mm satin stainless steel, aluminium or vinyl kick plates that are fitted to the full width of the door in areas such as teaching and office spaces, bathroom facilities or back of house.
- For doors in high impact areas, (e.g. areas where trolleys are used) research facilities or laboratories, kick plates to 1000mm (H) shall be installed to the full width of the door, be durable and easily cleaned. Stainless steel is the preferred material for these applications.

**Panic bolts:**

- Dalco 1791 or Lockwood 791, or equal and approved equivalent.

**Lockable bolts:**

- Where a lockable bolt is specified an ADI-5004 shall be used. At the bottom of the door, a lockable bolt no shorter than 300 mm shall be used. At the top of the door bolts should be no shorter than 500mm and be a panic bolt or lockable bolt if required. Bolts should be easily operable by a person of average height.

**Blocker plates:**

- Where a blocker plate is specified, an ADI or other University approved blocker plate shall be installed.

**Hinges**

- Fit 3 No. 100x 76mm stainless steel heavy duty hinges to each leaf for doors less than 2040mm tall. For doors greater than 2040mm in height additional hinges will be required.
- Fixed pin type hinges to external doors.
- Quick-fix type hinges must not be used.

**Door seals**

- "Raven" type to suit application, or approved equivalent.
- Door seals shall be provided to external doors to comply with the BCA.

**External Key Over-Ride Keys Switch**

Where key over-ride switches are required, Lock It Well "Auto Series" shall be used, keyed to the University's external master key system. The installer shall obtain cylinders from the University prior to installation of the key switches. Keys for testing shall be provided by the University.

### **Internal Key Over-Ride Keys Switch**

Where key over-ride switches are required, Lock It Well “Auto Series” shall be used, keyed to the University’s external master key system. The installer shall obtain cylinders from the University prior to installation of the key switches. Keys for testing shall be provided by the University.

#### **Lock Schedule:**

- For clarity all locks are specified right hand.
- Part numbers do not include master keyed cylinders which shall be supplied by the University.
- All external and internal fire hose cabinets and fire hose shall be fitted with ‘D’ handles and roller catch only.
- Locking for Fire Panels and Early Warning Intercom Systems shall be keyed to CL003 locks.

### **5.2.5 Summary of Door Types, Door Hardware and Keying**

<b>LOCATION</b>	<b>LOCK TYPE</b>	<b>EXTERNAL</b>	<b>INTERNAL</b>
Main Entry	Lockwood 3572SC/3772SC NO CYL	Lockwood 1801/70 SC, Opened by key at all times. External handle always rigid.	Lockwood 1905/70 SC Opened by handle at all times.
Exit – Fire Door Exit – Via Stair Well	Lockwood 3572SC/ 3772SC NO CYL	Lockwood 1805/70 SC, Handle is always rigid.	Lockwood 1905/70 SC, Opened by handle at all times.
Academic Offices General Staff Offices Conference Rooms	Lockwood 3572SC/3772SC NO CYL.	Lockwood 1801/70 SC. Opened by key at all times. Opened by handle except when handle is made inoperative by turn knob from inside.	Lockwood 1904/70 SC. Opened by handle at all times. Turn knob locks or unlocks external handle.

LOCATION	LOCK TYPE	EXTERNAL	INTERNAL
Lecture Theatres/ Seminar Rooms Laboratories Plant Rooms Main Electrical Switchboards Roofs Comms Rooms Lift Motor Rooms	Lockwood 3572SC/3772SC NO CYL.	Lockwood 1801/70 SC.  Key locks or unlocks outside handle.	Lockwood 1905/70 SC.  Opened by handle at all times.
Service Panels Cupboards	Lockwood 100 Nightlatch  NO CYL.	Lockwood  Opened by key at all times.	Lockwood  Opened by handle at all times.
Lecterns AV Cupboards Drawers	Lockwood 693ASC NO CYL, or equal and approved equivalent.	Opened by key at all times.	
Over-ride Key Switch	Lock-it-well Auto Series Key Switch	<i>See Section 13: Security</i>	<i>See Section 13: Security</i>

Handles are to be rigid if doors are electric strike

### **Keys**

- Services location areas (e.g. plant rooms, roof areas, service tunnels, electrical switchboard rooms and lift motor rooms) shall be respectively keyed alike according to type. Each type shall be coded to the University's Master Key System.
- Keys will be provided to the end user by the University.

### **Ordering and Installation**

- The University shall specify keying for all lock cylinders to be fitted.

### **Practical Completion**

- The Consultant, Contractor and the University Project Manager shall check the function and operation of all doors, locks and keys prior to practical completion.
- At the completion of the installation of fire rated doors and frames, a Certificate of Compliance and Log Book in accordance with AS 1905 is to be submitted to the University's Project Manager.

### **5.2.6 Internal Walls & Partitions**

Internal walls shall be lined with 13mm plasterboard.

Internal walls surrounding meeting rooms and offices where minimum noise penetration is required, either 50mm or 75mm polyester batts shall be incorporated into the wall. Boral 'Sound Stop' 13mm plasterboard, or approved equivalent shall be used.

In areas of high foot traffic where stud walls are used, Villaboard or high impact plasterboard is to be installed to a height not less than 1200mm.

Walls are to be durable construction with a hard wearing, easily cleaned finish.

- Villaboard or equivalent is to be used in wet areas.
- Corner protection provided to high impact external wall corners.
- Construction is to be suitable for accepting secure fixture of joinery items such as benches, TV screens, shelves (accounting for heavy book loadings), noticeboards, whiteboards, etc. additional noggins are to be included where required.
- Horizontal (dust collecting) surfaces are to be minimised.
- Glazing partition framing to be proprietary commercial aluminium sections suitable for the intended purpose.
- Frames are to have a powder coated or anodised finish.

#### **Skirting**

- MDF materials are not to be used for skirting.
- Vinyl or timber skirting to be used where applicable.

#### **5.2.7 Ceilings**

- Ceilings shall be designed to ensure safe access to all ceiling services and lighting from within the space. Special consideration must be given to accessing services in stairwells.
- Internal ceiling mounted equipment shall be provided through accessible ceiling tiles or hatches. Equipment located in trafficable ceiling spaces shall have stair access.
- All internal ceilings are to be of the 'Independent Grid' style, using standard size tiles as found throughout the University.
- Ceilings shall be highly durable, and easy to clean.
- Ceiling heights shall be a minimum of 2.4m
- Fixed ceilings are to be avoided unless required for specific areas, written approval must be obtained from the University of Melbourne Project Manager. If approved, any internal fixed ceiling shall be of 10mm plasterboard.
- Ceiling access panels are to be located and sized to facilitate easy access, removal or repair of any equipment located above the access panels.
- Ceiling access panels are to be Trafalgar - Access metal flush panel with a cam lock.
- All fittings attached to a ceiling or ceiling supporting structure are to be subjected to a pull test to ensure that it is safely secured.

#### **5.2.8 Floors**

##### **General**

- All floor penetrations and associated service pipes are to be fully sealed with flexible material to control water penetration between levels, fire separation between compartments and act as a vermin barrier.
- Suspended floors, which are required to support plant or equipment that will induce vibrations, are to be assessed by a suitably qualified and experienced specialist.
- New floors are to be assessed by a suitably qualified and experienced specialist to establish the risk of footfall vibrations.

- Change rooms, cleaner's facilities, kitchens, plant rooms and lift motor rooms shall incorporate grated floor wastes.

#### **Floor coverings**

- Heavy duty and hard wearing modular carpet tile is the preferred floor covering for general offices, teaching spaces and seminar rooms. Interface Flor 500mm x 500mm is the University approved carpet tile.
- Broadloom carpet floor finishes are not to be used. If there are circumstances which require the use of broadloom carpet, it must be approved by the University Project Manager. If approved for use, carpet shall not be of a direct stick variety to avoid future delamination issues.
- All floor coverings and floor underlay materials shall be compliant with regards to fire rating as appropriate for the respective area and acoustic performance.
- Floor covering selection shall be fit for purpose for the respective area.
- Vinyl flooring with coved edging to be used in all wet areas and laboratories.
- Where approved for use, vinyl and ceramic floor tiles shall provide the required slip resistance for the intended purpose.

#### **5.2.9 Painting**

- Where possible all paints should be water-based acrylic, of a wash and wear type that have a low odour content and a low VOC content.
- Minimum coating requirement shall comprise of 1x sealer coat and 2x topcoat as a minimum. Any additional manufacturer's product sheets/specifications must also be complied with.
- All paint products shall be durable and easily cleanable. Where appropriate the selection of paint should consider mould protection.
- For external applications anti-graffiti protection is to be provided to ground level surfaces
- For internal walls and partitions (except bathrooms, kitchens, change rooms and wet areas), a low sheen paint finish is preferred.
- For kitchens, bathrooms, change rooms and other wet areas, a high performance flat finish is preferred.
- For ceilings, a non-reflective, flat acrylic paint finish is preferred.
- Other specialist applications may require specific paint finishes that are fit for purpose.
- As part of the project handover requirements a schedule is to be provided of the paint supplier and colours for all painted surfaces.

#### **5.2.10 Furniture, Fixtures and Fittings**

##### **General**

Information on the design of teaching spaces, in particular lecture theatres, can be found in:

- Design Standard Section 2, Occupational Health and Safety

##### **Lecture Theatre Seating**

- Seating material shall be durable, stain resistant and scotch guard protected. Seating spares are to be readily available and locally sourced.

- Seating style and design is to be consistent with other lecture theatre seating throughout the University.
- Tabloids are to be of robust construction.
- Seat coverings are to be easily removable for cleaning and repair.
- Plastic moulded lecture theatre seating is not acceptable.
- Any seat numbering shall be sufficiently large to be easily read in a dimmed lighting environment.
- A minimum of 5% spares are to be provided as part of project works.

#### **Wall Fitments and Shelving**

- All shelving must be robust, stable and well secured. Shelf height shall not exceed 2400mm. All shelving exceeding 1800mm must be fixed to a wall.
- Shelving should be designed so books can be stored one deep.
- There should be no sharp edges or corners on shelving or wall fitments. Timber or laminate finishes are preferable.
- All shelving must be labelled with maximum load limit signs.
- Adjustable metal strip shelving is not to be specified
- Refer to Design Standard Section 2, Occupational Health and Safety for additional requirements.

#### **Blinds**

Depending on the design requirements and window orientations, the following window furnishings may be used:

- Slimline or micro Venetians;
- Holland blinds, including chain driven roller blinds or approved equivalent;
- Block out blind systems;
- Sheer blinds (anti-glare / see through blinds);
- Tinted or laminated coatings on authorisation of the University of Melbourne Project Manager.

All window furnishing specifications are to comply with the following criteria:

- Internal blinds are to control glare and radiant heat; however, they should not be used as a substitute for adequate external solar control devices.
- Blinds and blind racks must be durable, be easily adjustable and be provided complete with guide rails and associated fixings.
- Block-out and sheer blinds shall incorporate stain protection, anti-microbial properties and anti-bacterial properties. They shall meet all BCA requirements regarding fire hazard etc. properties.
- Installation of blinds shall allow for ease of removal and replacement of all parts. Blinds are not to be fixed to plaster board. All fixings are to be secured into wood or masonry.
- Furniture layouts shall be designed to ensure that the safe and efficient operation of blinds is not compromised.
- All external windows shall have blinds installed, concealed within pelmets or other building elements where possible so that when open they do not obstruct the view to outside.

- Blind fabrics in areas requiring black-out capacity shall be block-out type. Fabrics to external window shall be glare control types where block out is not required.
- Protection buffers are to be installed when floor to ceiling blinds are used.
- Motorised blinds and controllers shall incorporate appropriate electrical and thermal overload protections and 'time-out' functionality to shut down the motor after a nominated period of time.
- Motorised blinds shall incorporate wireless operational/control technology to eliminate multiple cabling requirements and enable easy integration with any proposed AV type modifications.
- Motors shall have a minimum guarantee period of five years. They shall be easily programmable and reconfigurable, without the need for rewiring.
- Curtains and drapes may be considered in special applications only, the University's Project Manager approval of any curtain applications and specification must be obtained.
- Window film maybe applied to certain windows to improve solar insulation. The selected film must be colour stable, scratch resistant, be suitable for the glass type and have minimum warranty period of 10 years.

### ***Ceiling Fans***

- Ceiling fans should be avoided where possible. If necessary or approved, installation of ceiling fans shall comply with the following criteria:
- The minimum height of ceiling fans, measured to the underside of fan blades, shall be 2.4 metres from the finished floor level.
- Ceiling fans shall be located such that they do not detract on the performance of installed lighting
- Ceiling fan on/off switches, speed control and direction of rotation shall be controlled from wall mounted switches located at or near entrance doors / points.
- Ceiling fans shall be located at a height to suit their performance capabilities ensuring that they are effective and clear of any other ceiling mounted elements.

#### **5.2.11 Cleaner's Room**

The typical requirement for cleaner's rooms is one per floor. However, 2 storey buildings may have one cleaner's room only if the building is fitted with a lift. Room size requirement is approximately 6 sqm and the room is to comprise:

Coved vinyl floor with floor grate

Lockable door with protection plate on door front

Cleaners sink with grate, splashback and taps with hose connections

Separate handbasin

Full height heavy duty shelving

Coat hooks and broom holders

Double gpo

Sufficient space to store a cleaner's trolley when the room is not in use.



### **5.2.12 Parenting (Lactation) Rooms**

Parenting Rooms are provided as a private space for parents to feed and change babies. Parenting rooms must not be co-located with toilet facilities. Parenting Rooms should however be located in close proximity to toilet amenities.

Min room size is 9 sqm

Lockable door with occupied indicator

HVAC provided

Mobile phone connectivity and Wi-Fi connection

Sound attenuation level high, acoustic privacy is required

General use bench (min size 450 mm deep by 700 mm long)

Baby change table

Small fridge

Storage cupboard for paper towels and cleaning supplies

Easily accessible double gpo

Accessible sink with gooseneck or kitchen type tap

Paper towel dispenser

Soap dispenser

Bin – general waste

Bin – nappies

Clothes hooks

Mirror

Comfortable upholstered chair (with arms)

Footrest

Space for a pram

### **5.2.13 Multi-Faith Rooms**

Consideration must be given to the necessity for places for religious observation, taking into account the demographic of staff and students occupying the building, and proximity of existing facilities already provided on campus. A consultative process with the relevant representative bodies, must be used to determine the most appropriate solution. Places for religious observation may include:

- Prayer Rooms for large or small groups
- Segregated washing facilities associated with worship
- Quiet reflection spaces for large or small groups (inside or outside)
- Multi-purpose facility for mixed-faith worship
- Cupboards and shoe storage racks

### **5.2.14 General Amenities**

The number of WCs, urinals and lavatory basins shall be based on the expected population of the building. The distribution of anticipated students by sex shall be advised

by the University Project Manager for the project. Refer also to the Building Code of Australia.

All gender toilets shall be provided in new buildings and for major refurbishment projects. The University requires these toilets be signed as All Gender and not as unisex. Note that approval from the project building surveyor will likely be necessary to achieve this requirement. This is to be arranged early in the design phase of the project.

For all new building and major refurbishment projects, the requirement for all gender toilets is not to be satisfied by using DDA toilets. The location and layout of all gender toilets must not create a security risk for any patrons using any proximate female toilet facilities.

Toilet paper and soap dispensers as detailed below. These will be supplied by the University however, the project documentation is to provide for the building contractor to install.

- Twin Mini Toilet Roll Dispenser      **TORK 472028**
- Foam Soap Dispenser                      **TORK 561500**

In DDA toilets the required dispenser is      **TORK 557000**

Rapid hand dryers are to be specified. The selected dryer is to have a low noise level and HEPA filter. Consideration is to be given to installing waterproof splash protection to walls.

Careful consideration is to be given to determining the appropriate number of hand dryers. This is especially relevant in the vicinity of teaching spaces given the difference between peak and non-peak times.

Paper towel dispensers are not to be installed in washrooms except in rare instances of particularly noise sensitive activity in adjacent areas. In such instances the paper towel dispensers (detailed below) will be supplied by the University but are to be installed by the building contractor. This same paper towel dispenser is to be used in other areas when a dispenser is required eg. kitchenettes etc.

- Slimline Handtowel Dispensers:      **TORK 551000**

Toilet cubicle door hinges shall allow for the ability to remove shut doors (cubicle occupied) in an emergency situation where the occupant becomes incapacitated. Indicator bolts shall be provided to all cubicle doors.

Urinals shall be wall hung porcelain units unless otherwise approved by the University's Project Manager.

In female toilets, a space shall be made available for sanitary disposal units. These are supplied and installed by the University's Cleaning Services Manager. These units are free standing.

A shelf shall be provided in the hand wash area on which to rest books or bags. Hooks and mirrors shall be provided.

A shower may be required in each building. This is to be discussed early in the design phase with the University's Project Manager.

### 5.2.15 Lockers

Dimensions and Sizing:

- As a minimum, lockers should be designed with adequate dimensions to accommodate a variety of items such as bags, books, laptops, and personal belongings.
- Consider varying locker sizes to cater to different storage needs.

- Consultation with end-users is critical to understand specific storage and functionality requirements (i.e. sport, medical/ laboratory, general).

Accessibility:

- Provide an appropriate number of wheelchair accessible to comply with accessibility codes and standards.
- Ensure that locker handles, latches, and locks are easy to operate for users with limited mobility.

Security:

- Incorporate sturdy locking mechanisms to prevent unauthorised access.
- Prioritise as follows for locking mechanisms/ access control.

<p><b>Short-term use</b> (i.e. student lockers whereby individuals access unassigned lockers for short-term use)</p>	<p>Adopt Gallagher swipe access control. Seek costing &amp; design coordination advice from UoM Security and ensure adequate allowances are budgeted for.</p>
<p><b>Long-term use</b> (i.e. lockers whereby individuals occupy or are assigned lockers for an extended period of time)</p>	<p>Consider utilising Gallagher swipe access control if budget permits.</p> <p>Otherwise adopt non-battery coded locking mechanism.</p>

- During the design phase, ensure that the end users are aware that University Security will not be able to support call-outs and/or access control associated requests for lockers with non-Gallagher access mechanisms. Master-keys etc will need to be managed by the Department or Faculty if non-Gallagher access control is adopted which will require development and adoption of an in-house management procedure.
- Note that the cost of providing Gallagher system controlled locker locks is high and the availability of sufficient project funding will need to be carefully considered,
- Do not use battery operated locking mechanisms due to issues associated with replacement of batteries, coordination of access to occupied lockers & privacy concerns.
- Always adopt hard-wired electrical mechanisms or mechanical (non-powered) locking mechanisms.
- Use durable materials for the locker construction to deter tampering and break-ins.
- Consult with UoM security to assess CCTV requirements within locker areas (particularly student lockers).

Ventilation:

- Provide adequate ventilation within lockers to prevent the accumulation of odours and moisture.
- Ventilation can be achieved through perforated doors, mesh panels, or other suitable methods.
- Additional ventilation may be required for specific storage requirements.

#### Materials and Durability:

- Use materials that are resistant to wear, corrosion, moisture, and damage over time.
- Consider materials that are easy to clean and maintain, especially in high-traffic areas.

#### User-Friendly Features:

- Consider hooks or shelves within the locker for organising smaller items.
- Incorporate shelves, compartments, or adjustable racks to maximise storage space and accommodate various items if warranted.

#### Safety Considerations:

- Sharp edges and corners are to be avoided in order to minimise the risk of injuries.
- Ensure locker layout does not compromise circulation, wayfinding & internal thoroughfares.
- Ensure adequate lighting & visibility is provided and existing lighting is reviewed/reconfigured when installing lockers within existing spaces to avoid shadowing.
- If under bench type lockers are used, these must be able to close safely and avoid potential user injury.
- Consult with the University's subject matter experts regarding safety (i.e. Safety In Design review process).

#### Aesthetics and Integration:

- Ensure locker design harmonises with the overall interior design of the facility.
- Consider customisable locker facades or colours to allow personalisation while maintaining a cohesive look.

#### Wayfinding and Signage:

- Implement clear signage to indicate locker locations, usage guidelines, and any special features (e.g., dedicated sections for specific departments or purposes).
- Provide numbering to lockers as required.

#### Maintenance and Cleaning:

- Design lockers with surfaces that are easy to clean and sanitise.

### **5.2.16 Toilet Fixtures & Fittings**

Caroma brand toilet suite and seats are preferred. Note the following specific requirements:

- Shall be of robust design suitable for the high level of use to be expected in a university environment
- Must be of make/supplier such that replacement units are able to be quickly sourced.
- Toilet seat fixings must be durable, have a sturdy fixing bracket and be proven to remain tight under extremely heavy use conditions
- Ambulant height pans are only to be installed in ambulant cubicles.

For toilet pans, install 'Zurn' flushers, or equal and approved equivalent, connected either to mains pressure or gravity fed flushing systems.

Consultants/contractors are required to provide dual flush valves for WC pans.

In wall cisterns are not preferred and approval to specify these must be obtained from the University Project Manager.

For urinals, install 'Zip Infrared Water Savers for Urinals,' or equal and approved equivalent. The infrared sensors shall be located over the urinal area and not in path of ingress/egress to avoid unnecessary flushing.

Toilet partitions shall be Efco EF5551.HOI SSS Partition set or approved equal.

Where possible, the University's preference is to not have door at the entry to washroom facility areas.

The Principal Consultant and Hydraulics Consultant shall discuss proposals based on the above guidelines with the University's Project Manager before commencing detailed design.

#### **5.2.17 Design Change Authorisation**

All requests for changes to the requirements of the Design Standards must be made on the modification request form (see the Design Standards web page). No design work is to proceed on the basis of the proposed modification until the modification request has been approved in writing.

A copy of all signed modification request forms, together with a schedule of all approved changes is required to be submitted as part of the project handover documentation.

#### **5.2.18 Maintenance, As Built Information, Warranties and Manuals**

The design consultant must ensure that the project documentation includes a requirement that all installations are provided with a 12-month defect liability period from the date of practical completion. During the defect liability period, all contractors must allow for all regulatory and manufacturer recommended scheduled maintenance requirements.

The University of Melbourne CAD Standards detail the formatting and submission requirements for as-built drawings, manuals and warranties. The CAD Standards can be found in the Associated Documents Section of the Design Standards web page.

Projects will not be considered as being completed until the handover of all as-built documentation, manuals and related documentation which will comprise all information necessary to enable the safe and efficient ongoing operation and maintenance of the works.

The principal consultant or contractor is to provide the following information:

- As-built documentation
- Operation and maintenance manuals
- Any certificates of compliance.
- Routine and preventative maintenance requirements and schedules.
- All guarantees and warranty information, together with a summary table.
- For equipment and other supply items, the name and contact details of the company from which the item was purchased, and the local supplier and service agent.

Draft documentation is to be provided 4 weeks prior to practical completion and final copy is to be provided no later than 4 weeks after practical completion.