02 – Architectural Requirements

Version	Date	Authors	Summary of Changes
1.1	4 February 2009	Alec Gray	Section numbering altered.
1.2	5 February 2012	Solomon Elijah	Section and Numbering amended
1.3	4 March 2012	Solomon Elijah	Roofing, Roof Safety & Sealing amended.
1.4	10 October 2012	Barry Hughes	Added section 3.4 Cleaning
1.5	15 January 2013	Ben Crossling	Amended various sections and updated Project Lead references
1.6	31 January 2013	Solomon Elijah	Added Clause 3.3.2.10 & added a paragraph to Clause 3.4
2.0	05 February 2016	Neill Daly	General Revision
2.1	09 March 2017	Neill Daly	Ergonomic specifications & FFE amended
2.2	26 May 2017	Neill Daly	Automated External Defibrillators added

Introduction

02.01 The Campus and Buildings Requirements Manual (the CBRM, the Requirements or the Manual) documents the minimum design and construction requirements for new, refurbishment or repurposed building works, landscapes and engineering/infrastructure projects on buildings, facilities and campuses of the Australian National University (the ANU or the University). The Requirements are prepared for the direction of a Consultant, Designer or Project Manager in the preparation of project specific documentation and in the delivery of project works.

02.02 Notwithstanding any Consultant's particular discipline or area of responsibility, each Consultant and/or designer shall consider the document in its entirety. The complete CBRM consists of the following Sections which may be referred to within this Section:

Campus and Building Requirements Manual	
Section 01	General Requirements
Section 02	Architectural Requirements
Section 03	Roads, Car Parking & Civil Works
Section 04	Soft Landscaping
Section 05	Roofing, Roof Fabric & Roof Safety
Section 06	Building Management Systems
Section 07	Electrical Services
Section 08	Fire Protection Systems
Section 09	Hydraulic Systems
Section 10	Mechanical Services
Section 11	Lifts, Cranes & Vertical Transportation Systems
Section 12	Security, CCTV & Access Control

Planning Principles

02.03 The Acton Campus Master Plan 2030 is built around a number of key themes. Rather than focus on specific projects, these themes set out interrelating areas, process and rules which will guide future development. The key themes are:

- Academic intent
- Functional elements
- Campus structure
- Built form
- Heritage
- Landscape
- Transport and movement
- Infrastructure
- A living campus

- Sustainability and the environment

02.04 Further information on the requirements and principles are laid out in the Acton Campus Master Plan 2030 document.

Community

02.05 Provision of common areas for social interaction is an important component of social sustainability. In the context of an academic institution, it serves as an opportunity for cross pollination of ideas from related and disparate disciplines.

External Teaching Space

02.06 Teaching outside of conventional classrooms can be an effective method to alter students' learning patterns and perception of subject matter, irrespective of whether the environs are directly related to the subject matter being conveyed. Effective external teaching spaces require careful consideration of landscape topology, vegetation, egress patterns, noise sources and sound barriers (both architectural and vegetative) in the locality. The use of natural ventilation, and therefore the likelihood of noise from the external teaching space coupling back into the building must also be considered. Consequently it will not always be possible to include this initiative in all works.

Recreation Areas

02.07 Building social capital is important for organisation cohesion and optimal interaction between individuals. Consequently areas in which this occurs are an important component of the utility of a building to an organisation. Areas such as tea rooms, common rooms, barbeque areas and external seating areas are critical to enabling staff to relax, host functions and build relationships with personnel that are not directly related to their daily duties. If considered late in the design process the recreational areas are typically poorly utilised due to inappropriate placement (e.g. BBQ facility on the south side of the building). The placement of these areas should be considered early in the design process to optimally integrate with building usage patterns.

Transport

02.08 Whilst transport infrastructure is typically delivered as a campus-wide service there are several features that can be integrated into individual buildings that assist in the adoption of alternative transport options.

Provision for Electric Vehicles

02.09 In order to facilitate the uptake of electric vehicles it is important to incorporate the requirements in current planning. This has two distinct components. Provision of suitable electrical infrastructure to car parks to enable future creation of charge points; and provision of car parking spaces with charge points.

02.010 New capital works projects, regardless if civil and parking works are included, are to include provision within the switchboard for future installation of charge points.

02.011 As required within certain projects, an electric vehicle charge point may be required to be supplied, installed and commissioned as part of that project.

Cyclist Facilities

02.012 Secure bicycle storage is to be provided within the building footprint at the rate of:

- 10% of the peak number of students using the building at any one time (75% occupancy); and
- 10% of the building staff.

02.013 In addition to the bike storage facilities, suitable change rooms, showers and lockers must be provided as follows:

- Lockers must be provided at the rate of 10% of the building staff and be of adequate size to hang work clothing; and
- Showers and associated changing space must be provided at the rate of 2% of the building staff, with the minimum of 1 unisex shower per stand-alone building. This shower must not be used for compliance as a disabled access shower and must also be accessible for use by students.

Telecommuting and Videoconferencing

02.014 To reduce staff and student travel suitable tele/videoconferencing facilities must be provided.

02.015 IT infrastructure must be capable of supporting multiple staff members using a single user videoconferencing tool such as Skype, with provision of at least one meeting room per 500m^2 of building area capable of enabling a group of minimum 8 users to engage in video conferencing.

Daylight

02.016 Natural daylight has been demonstrated through numerous studies to provide substantial productivity and wellbeing benefits to building occupants. To ensure the comfort and wellbeing of staff and students in ANU buildings a minimum of 70% of the floor area of all offices, laboratories, teaching spaces (non-lecture theatre) and informal gathering spaces (e.g. tea rooms) must achieve a Daylight Factor >2.0%, achieved at desk-height level (720 mm AFFL (above finished floor level)).

02.017 Spaces which have a specific use that preclude the provision of daylight (e.g. Laboratories that utilise Class 3a, 3b or 4 lasers) need not comply with this initiative.

Shading

02.018 To avoid discomfort from direct glare and unwanted heat gain building facades must be designed such that for 80% of the working day (8:00 a.m. to 6:00 p.m.) there is no direct sun entry.

External Views

02.019 External views have demonstrated to play a significant role in occupant wellbeing by reducing eye strain and also providing psychological benefits. To meet this requirement:

02.020 Greater than 60% of work spaces* must have a compliant external view. Compliant external views are defined as:

- A direct line of sight to a buildings external line of glazing less than or equal to 8.0 m to the outdoors, or into an adequately sized and day-lit atrium.
- Line of sight must be greater than a 45 degree angle of incidence on vision glazing.
- No object greater than 1.5 m in height that will obscure the view.
- For an atrium to be considered as providing an external view the atrium must be naturally lit, and every dimension of the atrium must exceed 8.0 m.

* Work spaces are defined as spaces where staff or students typically spend 4 hours or more on any one day. Some work spaces in which the work to be performed precludes external views (e.g. Laboratory which utilises Class 3a, 3b or 4 Lasers).

Materials

Generally

Warranty

02.021 All building fabric, building elements and structural works are to have the minimum workmanship warranty as required by current legislation unless higher standards are specified within the various sections of the Manual.

Specific Design Requirements

Local Sourcing

02.022 To support local industries and to also minimise carbon emissions from transport all projects are to source materials from local sources where available and fit for purpose. Imported goods are only allowed if they provide a functional benefit to the building that cannot be sourced locally.

02.023 The maximum distances materials can be sourced from are provided in the table below.

Material Type	Example	Maximum Distance
Heavy weight and high density	Cement, sand, aggregate, steel, masonry, stone, tiles	500 km
Medium weight and medium density	Glass, timber, aluminium, carpet, plasterboard, furniture, electronic goods	1000 km
Light weight and low-density	Plastics, insulation, ceiling tiles, fabrics	2000 km

Approximate distances in km (by surface transport) to major Australian cities are as follows – Wollongong 250, Sydney 290, Albury/Wodonga 340, Newcastle 440, Melbourne 660, Brisbane 1200, Adelaide 1200, Hobart 1400, Perth 3700, Darwin 4000.

Selection of materials

02.024 Finishes are to be selected to minimise future maintenance. Paint finish to external walls will not be accepted unless approved by the Principal's Representative (the Principal or the Principal's Project Manager).

02.025 All materials shall be selected for their likely availability and colour consistency over a 20 year period.

Colours

02.026 In certain areas it may be useful to introduce primary colours to highlight features of the buildings. Approval for colour schemes is required from the Principal's Representative.

Campus and Building Waste

02.027 The ANU has an Environmental Management Plan (EMP) endorsed by the Vice Chancellor. The EMP outlines requirements for all ANU staff and students to reduce waste to landfill, financial costs and reduce our carbon footprint in accordance with best environmental practice. Inclusive are designs which ensure good sanitary control and elimination of offensive odours and vectors. The University recognises good waste and recycling facilities for its buildings as essential for maximising opportunities to reduce, reuse and recycle resources on campus. Effective waste and recycling practices and design will reduce life cycle costing to new and existing buildings, reduce unsightly bins in car parks and building entrance ways and reduce the likelihood of bad odours and vermin.

02.028 All ANU projects are required to consider recycling and waste collection and removal. Waste collection and removal is required to meet the requirements of the Cleaning, Waste and Recycling unit within Facilities and Services. General principles for building waste are to be applied to any design and project activity. The ANU expects building occupant and user awareness of several elements in the campus and building waste cycle. With the building occupants and users are to:

- self-sort; paper, cardboard, co-mingled and general waste; and
- access centralised stations located within the building; located in kitchens, common areas and/or resources areas. Individual staff bins are not required.

02.029 Projects are to comply with the conditions (where appropriate) of the ACT Development Control Code for Best Practice Waste Management through the production of a *Waste and Recycling Management Plan*.

02.030 A whole of (new) building is required to have the centralised station provision for paper, cardboard, co-mingled and general waste of which an approach might be a single location per floor, or approximate workgroup and the like. The provision of paper recycling should only be co-located with printers and office resources.

02.031 As provided for in specific project briefs where a project is of an adequate scale a dedicated Public Waste and Recycling Station is to be provided. Separate to occupiable areas attached or freestanding from the building collection of recyclable waste is to be provided and:

- are separate from, but adjacent to, a General Waste Facility;
- provide a clearly marked, sign-posted, convenient, level and guaranteed access route; and
- are sufficiently sized to accommodate the storage equipment for the following recyclables (where produced), as a minimum:
    - Cardboard;
    - Paper;
    - Comingled;
    - Polystyrene;
    - Metals;
    - Pallets;
    - Used cooking oil; and
    - Organic (compost) materials.

02.032 Adjacency of a Public Waste and Recycling Station to a General Waste Facility will assist in addressing the waste management principles and contribute to enhanced campus waste management. A General Waste Facility is to be a size which allows for all waste and recycling bins required for building occupancy. The structure should include a roller door or open side for waste removalist access and side door for people access. Restricted access doors will reduce illegal dumping and vandalism. A General Waste Facility will meet the following basic parameters:

- The room/s for storing waste and recycling must be located in a position that is safe and convenient for both users and waste collection staff.
- Collection vehicles must be able to service the development efficiently and effectively, with limited need to reverse.
- If height clearance proposed is less than 3.8 m, confirm the waste provider can adequately and safely access the station.
- A suitable refuse collection point must be nominated where waste loading operations can occur on a level surface away from pedestrian and cycle ways, gradients and vehicle ramps.
- The path for wheeling bins between a central waste storage point and the collection vehicle must be level and free of steps or kerbs. The maximum travel distance between the storage point and the collection point for bins is:
    - 10 m – for bins including 240 L, 660 L and 1000 L mobile garbage bins.
    - 3 m – for both 1500 L and 2000 L bulk/skip bins.
- Where collection vehicles are required to drive into a building to collect waste or recycling, adequate vehicle clearance is required. Access to a collection point within a building must enable all collection vehicles to both enter and exit the premises in a forward direction.
- Signage: ‘No parking – fines apply” to be placed on the waste removalist access area either on door or to the side of access area. Appropriately painted roadway at front to prohibit parking and allow waste removalist access 24 hours. Inside facility appropriate signage above each bin for maximum recycling and waste management.
- Wall Protection: Where bulk/skip bins on wheels are to be housed bunding on the floor and/or protection strips at the height that bins may damage walls are required.

- Aesthetics: Placed at any point on the site which allows appropriate vehicular and user access, and for maintenance and servicing. Enclosure design to consider immediate site and context. There is no requirement for the structure to be visually pronounced.
- Drainage: A centre drain to sewer is required.
- Water and Lighting: Hose tap to be included to allow for cleaning of structure and appropriate lighting at entrance points as this structure will be accessed 24 hours.

Hazardous Materials

02.033 Consultants are to refer to the Hazardous Materials register for each building, site or precinct for use as a guide only to determine the likely presence of hazardous materials. For projects taking place within existing building stock, or a brownfield site, a comprehensive hazardous materials survey must be carried out on the project site, as defined by the relevant Environmental and Work Health and Safety (WHS) legislation; and whenever asbestos, lead or PCBs are found, they are removed in accordance with the following standards:

Asbestos	WHS legislation and relevant environmental legislation
Lead	*AS 4361 Guide to Lead Paint Management*
PCBs	ANZECC Polychlorinated Biphenyls Management Plan

Volatile Organic Compounds

02.034 Consultants preparing specifications are required to restrict paint, sealant and adhesive products to those that comply with the limits specified in this section. They are also required have product specific data sheet or MSDS which states the Total VOC (TVOC) content and test method used to determine the stated TVOC value.

Paints

02.035 Specified paint finishes are to be suitable for the intended material and location as referenced in *AS 2311 Guide to the painting of buildings*. The application of paint finishes are to be in accordance with AS 2311 and manufacturers specifications.

02.036 Any paint applied on-site, must meet the TVOC content limits outlined in Table 1.

02.037 TVOC values should reflect the final product as mixed and ready to use, inclusive of tints. Numerous paint suppliers do not comply with manufacturer recommendations on tints and consequently tints applied must be clearly documented.

Product Type/Sub Category	Maximum TVOC content
Walls and ceilings - interior gloss	75
Walls and ceilings - interior semi-gloss	16
Walls and ceilings - interior low sheen	16
Walls and ceilings - interior flat washable	16
Ceilings - interior flat	14
Trim - gloss, semi-gloss, satin, varnishes and wood stains	75
Timber and binding primers	30
Latex primer for galvanized iron and zincalume	60

Interior latex undercoat	65
Interior sealer	65
One and two pack performance coatings for floors	140
Walls and ceilings – exterior gloss	75
Walls and ceilings – exterior semi-gloss	70
Walls and ceilings – exterior low sheen	50
Any solvent-based coatings whose purpose is not covered in table	200

Table 1: TVOC limits allowed for paint products

Adhesives and Sealants

Any adhesive and sealant product(s) used in an internal application, and applied on-site, must meet the TVOC Content Limits outlined in Table 2. This includes both exposed and concealed applications.

Product Type	Maximum TVOC content
Indoor carpet adhesive	50
Carpet pad adhesive	50
Wood flooring and Laminate adhesive	100
Rubber flooring adhesive	60
Sub-floor adhesive	50
Ceramic tile adhesive	65
Cove base adhesive	50
Dry Wall and Panel adhesive	50
Multipurpose construction adhesive	70
Structural glazing adhesive	100
Architectural sealants	250

Table 2: TVOC limits allowed for adhesive and sealant products

02.038 Formaldehyde Minimisation

02.039 Formaldehyde is a common VOC found in most engineered wood products (e.g. Medium Density Fibreboard (MDF) and chipboard). To reduce the off-gassing of formaldehyde within buildings all engineered wood products must be low formaldehyde class E0 or better. This is required for all joinery, storage, doors and any other product that contains engineered wood products.

02.040 PVC Avoidance

02.041 The use of PVC is to be avoided wherever possible. Specifications must state this as a general principle, and specifically wherever possible. Common building and infrastructure services which utilise products that contain PVC and their alternatives are:

Service	Use	Alternative
Electrical	Cable insulation	Low Smoke Zero Halogen (LSZH) products.
	Conduit	HDPE, metal
Hydraulic	Pipes and connectors	HDPE, copper, XLPE
Mechanical	HVAC accessories (e.g. AC drip trays)	HDPE, metal
Interiors	Carpet, Furniture components	Sustainability furniture standards avoid usage.

Where PVC is to be used, PVC should be selected that complies with the 'Best Practice Guidelines for Lifecycle of PVC Building Products'.

Cladding

External wall materials

02.042 External walls shall be of materials selected to suit the location of the building and to conform with:

- the existing structure; and
- surrounding buildings; or
- the creation of a specific design feature.

Concrete

02.043 Consideration should be given to external walls and the likelihood of pattern staining.

02.044 Water and weather marks down the wall face should be minimised.

Render

02.045 In-situ or pre-cast concrete panels, bricks or masonry are not to be rendered unless works of a minor nature are required to match existing and the like.

Timber

02.046 When using timber sheet, manufactured or board product, the design, including fixings and details are to comply with the manufacturer's specifications.

02.047 All board products will be appropriately sealed on all six faces/edges.

Metal cladding

02.048 Where metal cladding is specified, future maintenance issues, such as access to the external wall cavity, are to be considered.

02.049 Systems applied directionally, that require 'peeling' the building from one end to the other, are to be avoided.

Concrete

General

02.050 Types, locations colours and finishes of exposed concrete shall be confirmed with the Principal's Representative.

02.051 Applied or painted finishes to pre-cast and tilt-up panels will not be accepted, panels may be colour treated during fabrication.

02.052 The Green Building Council of Australia has considered the use and various substitutes available for concrete in buildings. Designers are to review the Green Building Council of Australia documentation for guidance on the provision of the most efficient way to reduce greenhouse gas emissions.

02.053 Where clay brick is used, to reduce the embodied energy of the brick, a minimum of 50% of the bricks used in the project must be:

- Post-consumer recycled;
- Extruded with at least a 30% reduction in mass; or
- Produced in a manufacturing process that reduces carbon intensity (e.g. kilns co-fired with landfill gas)

Specific Design Parameters

Floor slab design

02.054 Floor slabs shall be designed for the most economical construction and flexibility of use with due consideration to long-term deflections and the need to provide for penetrations both initially and during the course of the building's life.

Floor slab provisions

02.055 Make provision for vertical duct penetrations for infrastructure. Appropriate fire isolation must be provided between building levels.

Floor loads

02.056 Floor loads for special areas, e.g. library stacks, shall be determined following appropriate consultation. Provision shall be made for the installation of compact shelving units in areas specifically nominated by the brief.

02.057 Safe live load plates are to be provided on each floor as a part of each newly created floor, whether it be for a new building or a building extension. Plates are required in a conspicuous location indicating the maximum live load for which the floor on that storey has been designed.

Steel

General

02.058 All structural steel used is to be produced by a responsible steel maker, which is defined as a company which complies with both of the following initiatives:

- The steel making facilities where the steel for the project is being sourced have a currently valid ISO 14001 Environmental Management System (EMS) in place. Valid ISO 14001 Environmental Management System (EMS) certificates must be provided from the steel making facilities where the structural and/or reinforcing steels in the project were produced; and
- The steel maker supplying the steel is a member of the World Steel Association's (WSA) Climate Action Programme (CAP). A current CAP certificate from the WSA, confirming that the steel maker is a member of the CAP, must be provided. Certificates are valid for a period of two years and must be current at the time that the project purchases the steel

Specific Design Parameters

Galvanising

02.059 All exterior exposed ferrous material structural elements are to be hot-dipped galvanised after fabrication. Applied cold-galvanised paint systems are not acceptable, unless approved by the Principal's Representative.

Primer

02.060 Steel shall have at least one shop applied primer coat.

Masonry

General

02.061 Approval of concrete masonry units and brick exposed to view will be on the basis of compatibility in colour and texture with existing exterior building materials on campus.

02.062 The Consultant shall provide samples in order to obtain approval.

Specific Design Parameters

Internal walls

02.063 Internal load-bearing block or brick walls will be not be accepted, unless specifically required and approved by the Principal's Representative. Lift shafts, service shafts, fire rated elements and the like are excluded from this general ruling.

Block masonry

02.064 Block masonry produced for an individual project shall be from the same production run.

Wall design

02.065 Careful consideration will be given by the Consultant to design of walls, with regard to cavity wall construction, flashing details, control joints, mortar joint details and wall materials.

Coatings and finishes

02.066 Because of their inherent maintenance and renewal problems, the use of protective waterproofing agents, applied coatings and painted finishes will not be accepted. If accepted, the final paint coatings shall be verified with the use of admixtures in the mortar joints.

Light steel framing

General

02.067 A single proprietary system is to be used. Double timber studs are to be detailed around all doorways and openings.

Timber framing and timber products

Specific Design Parameters

02.068 Timber material must be fit for purpose and design, with consideration given to long term maintenance and intended final finishes.

Product sourcing

02.069 All timber products are to be either post-consumer recycled timber or Forest Stewardship Council/Australian Forestry Standard (FSC/AFS) certified. Timber can only qualify as post-consumer recycled timber if it has previously been used as part of a product or structure which has since been disassembled.

Composite wood products, laminates and veneers

Cut edges

02.070 Any cut edges are to be sealed with an appropriate clear/coloured water based sealant prior to fabrication.

Acoustic and thermal insulation

General

02.071 The thermal performance of a building envelope has a significant and ongoing impact on energy use and user comfort. Investment in improving the building envelope beyond minimum compliance will provide long term benefits.

02.072 Acoustics: Particular attention shall be paid to acoustics and noise transmission.

02.073 Partitions shall be filled with acoustic batts and/or double sheeted on one or both sides as necessary to achieve the necessary sound transmission loss between spaces.

02.074 Mastic sealants to be applied to all surface junctions to maintain the sound transmission rating.

02.075 Details of intersection of partitions and external windows shall ensure the sound transmission coefficient is maintained at that intersection equivalent to the remainder of the partition.

02.076 To ensure adequate sound insulation, partitions shall extend from floor slab to underside of slab above if possible or acoustic ceiling insulation shall be detailed.

02.077 The majority of energy leaving a building envelope is via conditioned air leaking through the building fabric. Sealing the building consequently provides a significant increase in performance and therefore must be a high priority for design. Vapour should still be allowed to diffuse in and out of the structure to minimise condensation risks.

02.078 To ensure that appropriate building sealing is undertaken all major projects are required to undergo pressure testing during the building commissioning phase.

Insulation Ozone Depleting Potential (ODP)

02.079 All insulation must be zero ODP in manufacture and composition.

Thermal requirements

All buildings and campuses within the ACT are to be classed according to the National Construction Code (NCC), Climate Zone 7. The ANU requires on its Acton campus the building fabric thermal performance exceeds Climate Zone 7 for new and major building projects. Requirements for minor refurbishment projects are to be assessed individually.

Building Envelope Surface	Minimum Total R value
Floor (slab on ground)	2.0
Floor (elevated, open)	3.5
Roof and Ceiling	4.8
Wall (external)	3.8

Acoustic requirements

02.080 Acoustic requirements will be the subject of project specific briefs. As a minimum the requirements of the NCC for building fabric and infrastructure shall be met.

Weighted sound reduction index

02.081 The applicable weighted sound reduction index (RW) shall be selected to enable the proper functions of the occupancy of the rooms.

Limit noise transference

02.082 The provision of airlocks to limit noise transference should be considered.

02.083 Alternatively, solid core doors and acoustic rated frames and fittings, or where required, acoustic rated grilles, are to be considered.

Sound lagging

02.084 Internal waste water pipes are to be provided with sound lag material.

Acoustic requirements for non-plant equipment

02.085 Where non-plant equipment is to be designed and specified within a project, consideration should be given to the noise generated by this equipment. Potential ambient and structural borne noise issues, and specific WHS requirements, may determine that acoustic attenuation is required on equipment.

02.086 Plant equipment is that which is required to run systems and services for the building's overall operation. Non-plant equipment is that which is specific (or a fixed or mobile tool) to aid an activity, function or research which takes place in a room/area. On provision of this information to the Principal's Representative, direction will be provided.

02.087 Where required, post construction, some statutory workplace testing may be sought to ensure acoustic compliance of this equipment.

Internal walls, partitions and finishes

General

02.088 The design of walls/partitions must include consideration of the following:

- Acoustic attenuation;
- Light weight design to facilitate demounting; and
- Partitions/walls adjacent to main corridors shall have a lining treatment on the corridor side that can resist abrasion.

Flexibility

02.089 Buildings shall be designed to be as flexible as possible. Internal load bearing walls shall be minimised and restricted to areas such as the building core for stairwells, lift shaft and toilets. All other internal walls and partitions shall be non-load bearing and fully demountable within the limits of economical design.

Materials

02.090 Partitions and internal walls may be of plasterboard on light steel or timber framing, painted or unpainted concrete masonry, or equivalent, as required by the application.

Skirtings

02.091 Black vinyl skirtings of a minimum 100 mm height shall be provided to all internal partitions irrespective of type except where:

- metal skirting duct is used;
- walls are tiled; or
- other floor finishes are turned up walls.

Steps, stairs and ramps

General

02.092 Contrasting coloured stair nosings are required to aid all stair users both ascending and descending. Illuminated contrasting strips are required in all new external stairs and must be result in a flush fitting.

02.093 Open risers are not acceptable.

02.094 Single steps are not acceptable. The size of treads and risers must be consistent in any flight and in any area.

Goings and riser sizes

02.095 The NCC sets out goings and riser size ranges, *AS 1428 Design for access and mobility* further restricts this range.

02.096 Steps with ramped treads between risers are not acceptable.

Safe access to and from steps and stairs

02.097 Users entering and/or leaving steps and stairs directly from or into adjacent circulation spaces can lead to collision problems. Adequate passing space is to be provided.

Requirement to ensure safety under stairs

02.098 Stairs that are not filled underneath are a collision hazard for all users, particularly cane users. Cane users following a wall edge get confused if their cane goes underneath a stair. Open under-crofts also cause cleaning and maintenance problems.

02.099 They should generally be avoided but if that is not possible, mitigation strategies are to be considered.

Protrusion of handrails and steps into circulation area

02.0100 The top and bottom treads of stairs, or handrails, must not protrude into circulation spaces. The first risers should be well set back from the clear circulation space.

External stairs, stairwells and ramps.

02.0101 For all external handrails, fully welded stainless steel handrails are preferred. Other materials may be accepted with approval from the Principal's Representative.

02.0102 Landscape steps are to be a minimum of 300 x 150 mm (tread x riser) and are to comply with the NCC.

Ramps

02.0103 Definitions to be applied to both internal and external walkways, ramps and other slopes.

Type	Gradient	Maximum length
Kerb ramp	Gradient maximum 1:8	maximum length 1520 mm
Ramp (landings may be provided at these intervals)	Gradient 1:14 → 1:19	maximum length 9.0 m
Walkway	Gradient 1:20 → 1:33	maximum length 15.0 m >1:32 maximum length 25.0 m = 1:33

(landings may be provided at these intervals)

Other	Gradient less than 1:33	No maximum length

Handrails

02.0104 For vertical level changes greater than 600 mm, but less than 1000 mm, seek direction from the Principal's Representative to determine the requirements for a fully compliant handrail/balustrade. In fire egress stairwells, hot-dip galvanised handrails will be installed, proprietary systems may be specified.

- Handrail to wall clearance of greater than 50 mm is required to avoid jamming hands or fingers.
- Handrails must be continuous if a landing is less than 4.0 m long or the landing is not straight.
- Handrails must not encroach into a circulation space.
- Handrails are to have a minimum 100 mm turndown at both ends.
- Handrails are to be continuous with no vertical sections.

Tactile ground surface indicators (TGSI's)

02.0105 Drawings are to clearly indicate the location and contrast colour for all TSGIs.

Doors, hatches and door hardware

Generally

Door openings

02.0106 A minimum clear opening of 900W x 2100H mm is required. In the case of double swing doors one leaf must meet the requirements. In the case of auto doors the total opening must meet the requirements. In rooms accessed by loose equipment, trolleys and other items, offset type hinges are required to increase the size of the opening, these doors are also to be fitted with a skirting plate to protect the door face.

Door construction

02.0107 These doors must generally be of solid core construction, and of minimum thickness of 38 mm, unless requested otherwise.

Door closers

02.0108 Surface mounted door closers are required.

Door maintenance requirements

02.0109 Recessed sliding doors require access panels for future maintenance where the door cannot be accessed through other means.

02.0110 Mechanical door systems shall have sufficient room for future maintenance and for replacing worn out parts.

Aluminium doors in shopfront systems

02.0111 These must be wide-stile type to suit standard backset door hardware; narrow-stile doors will not be accepted; the bottom rail is to be specified as a deep section.

02.0112 Exterior doors and jambs

- Exterior doors
  - aluminium and glass; or
  - marine-grade ply
- Jambs
  - galvanised steel
  - aluminium

Exterior door access operator switches

02.0113 Must be weatherproof.

Door finishes

02.0114 **Interior:** Wood doors shall be finished in polyurethane non-water based product, tops and bottoms must be sealed.

02.0115 **Exterior:** Paint is to be oil based.

Visual definition to main building access

02.0116 Give definition to main access doors by using contrasting glass or doorframes, approved glass markings or by differentiating the ground plane.

Access toilet doors

02.0117 All access toilet doors are to have electronic opening and closing activated by control panels as detailed below. Generally, as per *Dorma Privacy Door System*. All text style, sizing, braille and signage to be to applicable standards and codes. Locate panels in appropriate locations. Indicator lamps to be 25 mm.

02.0118 Override unlock key switch (to be located in the lower left of the External Panel) is to match automatic door keying, refer to Section.12 Security, CCTV & Access Control.

02.0119 Plates to use polycarbonate membrane that is vandal resistant, UV stabilised and antigraffiti coated. External panel dimensions to be approximately 230W x 210H mm and internal panel approximately 230W x 265H mm.

02.0120 Function to be:

- When vacant (door closed, *Vacant* lamps on) external *Push to Open* button will open the door.

- Once inside internal *Push To Lock* button will close the door, lock it, disable the external *Push To Open* button and illuminate the *Occupied* lamp.
- To exit internal *Push To Open* button is pressed, door unlocked and opened.

02.0121 After a suitable time door to close automatically, *Occupied* lamp to turn off and *Vacant* lamps on.

02.0122 Access toilet signage to be provided adjacent door, must include braille and indicate door opening relative to signage (LH or RH). Electronic door lock to be Mortice as per electronic locks section of this document.

02.0123 Duress Alarm and button panel to also be provided within Access Toilet, refer to Section.12 Security, CCTV & Access Control.

Specific Design Parameters

Door swing

02.0124 Doors protruding into spaces and not opening flat to a wall are collision hazards, particularly when approached end on. If at all possible, doors should be designed to open against a wall or fixed furniture.

02.0125 Doors that are designed to be latched open must open flat against a wall.

Clear space at sides

02.0126 Wheelchair users, and many other users, have difficulty negotiating doorways unless clear space is provided around the door.

02.0127 Ensure the opening clear-space provisions are met. Check the doorway assuming user is approaching in every possible direction, design for the most clearance in all cases.

Encroachments into doorway clear space

02.0128 Encroachments into clear space are often overlooked or in-filled with items such as fire hose reels cupboards.

02.0129 Ensure any fixture such as fire services, columns or plumbing fittings do not reduce the full clear space. Ensure the design allows for the placement of loose items such as bins, so they are not placed in the clear area.

Doorframes and frameless doors

02.0130 All frameless doors must have the edges identified so that they can be visually located.

Double swing doors

02.0131 Double swing doors are not acceptable unless they are held open (such as a fire door) or one of the two doors is normally latched open. In the latter case, the opening leaf of a double door should comply with all other door requirements including minimum width.

Airlocks

02.0132 Airlocks are to be as large as is practicable. If the door is of solid construction, viewing panels are required.

Fire-rated doors

02.0133 Generally sliding smoke doors and mechanisms will not be acceptable due to maintenance requirements and cost.

02.0134 The following are required in addition to components required for regulatory compliance:

- hinges – minimum of 3;
- smoke seals – double doors require a seal system;
- door closers – to take into account extra weight of door; and
- magnetic door holders – including a door press to release switch.

Sound retardant doors

02.0135 The requirements for sound retardant doors will be as detailed by the specific project brief.

Veneers

02.0136 Face veneers shall be select premium-grade.

02.0137 It is preferred that faces be 'matched' for grain direction and colour uniformity. When used in an external location, marine-grade veneers are to be specified.

Finish

02.0138 Transparent finished wood doors shall have tops and bottoms sealed with enamel sealer appropriate for exterior application immediately after trimming. It is preferred that clear or stained doors will be finished at the factory.

02.0139 Wood doors scheduled for paint finish shall be paint-grade.

02.0140 Door hinges are not to be painted.

Door stops

02.0141 Provide a skirting-mounted cushion door stop or if inappropriate, an aluminium/rubber door stop to each door not fitted with a door closer and wherever else the door may strike a wall (alternatively refer to coat hooks below).

02.0142 Do not install door stops at less than 50% of door.

Threshold plates

02.0143 Only proprietary threshold plates and seals are permitted and these must have a rise of no more than 5 mm and be specifically designed as accessible plates.

Coat hooks

02.0144 One coat hook is to be provided to every door to individual offices, at nominally 1800 mm (AFFL).

02.0145 Combined hat and coat hook with integral rubber door stop.

02.0146 Material: zinc alloy cast

02.0147 Finish: satin chrome

Hinges

02.0148 All external doors are to be fitted with a minimum of three stainless steel fixed pin hinges.

Viewing holes

02.0149 View holes are not acceptable.

View panels

02.0150 Where a solid door occurs in the following locations, these doors are to be fitted with a view panel (normal or fire rated door):

- in a major thoroughfare (fire doors included);
- corridor and corridor junctions;
- meeting and seminar rooms; and
- all wet laboratories (including research facilities).

Revolving doors and turnstiles

02.0151 Revolving doors and turnstiles are not acceptable.

Power actuated swing or sliding door finishes

02.0152 Casing colour to be powder-coated aluminium, APO grey or black.

Fire door controls

02.0153 The unit should be suitable for installation on fire doors.

02.0154 Specific requirements for auto door operation are detailed in Section.12 Security, CCTV & Access Control.

Security

02.0155 Compatible with relevant campus electric locking systems as advised by IPC.

02.0156 Internally a four-position mode switch to select the following functions,

02.0157 Auto/Exit/Open/Lock. Keyed mode and emergency exit switches are to be provided.

Automatic door exit controls

02.0158 Afterhours exit buttons are to be clearly placed at consistent accessible heights and locations. The button is to be mounted far enough away so wheel chair users can access without having to worry that the door will impede their travel. The button must be of a colour that contrasts with the background.

Door hardware and furniture

02.0159 In refurbishment projects, styles of hardware shall be consistent with existing fittings within a building. Hardware should be selected from the 'standard' range offered by suppliers as nominated in the Requirements and replacement components should be available off the shelf.

Handle type

02.0160 Lever handles are required in all situations.

Handle positioning

02.0161 Lever handles must not be closer than 40 mm to the door stop or jamb or any jamb moulding.

Positioning of Locks and Hardware on Doors

02.0162 Fitting of electromagnetic locks to the head region of a door assembly shall only be allowed if central height fitting cannot be achieved.

Cupboards or Cabinets with expensive or attractive equipment

02.0163 Shall be constructed of a metal framework with covering panels that will not allow unauthorised entry. The metal framework is to be rigid in construction and be securely bolted to the floor of the room. All concealed hinges to equipment cupboard doors shall be bolted through the panel with smooth heads on the outer side and lock nuts on the inside. The second leaf of the hinge shall be welded or bolted to the metal framework of the cupboard.

Doors with electric locking devices

Closers

02.0164 All doors fitted with electric locking/latching devices must have door closers installed to provide an aid in the lock down process.

02.0165 Doors with closers shall comply with AS 1428. The maximum opening force is to be 20 N.

Lock and Keying requirements

02.0166 A master keying system shall be specified to permit the opening of the main entrance doors by all individual room door keys, unless otherwise advised.

02.0167 The ANU has standardised its keying system and hierarchy. Consultants shall ensure that the keying system specified complements other systems in use and shall be referred to the Principal's Representative prior to supply.

02.0168 An ANU authorised Locksmith is required to prepare the keys and locking systems of the Project.

02.0169 Magnetic key card locks may be used in cases of limited multiple access.

02.0170 The system shall be designed to allow a grand master key to open all doors in the building, except the plant rooms, the lift motor room and the fire services cupboard. Locks on service doors shall be as follows:

Cleaners Room	Keyed to grand master key only and dedicated "cleaners key". This removes the external doors and any restricted internal areas from the access by the cleaner.
Plant Rooms and Service Ducts	Lockset shall be cylinder mortise type selected from Lockwood 3570 series to suit the existing keying system operated by ANU Facilities and Services.
Fire Safety Equipment	As required by the Emergencies Act 2004 (ACT), ACT Fire and Rescue or ordinance.
External Access Doors	Shall be provided with electronic access control. A minimum of one external door must be provided with a key override and shall be keyed to the External Doors keying system for the location and building. All external doors are to be provided with secondary locking devices keyed to the External Door keying system for the location and building
Automatic Doors	Control key switches shall be keyed to the Automatic Doors keying system for the location and building.
Equipment cupboards and cabinets	Cupboards and cabinets that are to contain expensive or attractive equipment are to be fitted with locks to doors and panels. These shall be of the security deadlock variety, similar to a Lockwood 303 Single Cylinder Deadlock, keyed to the relevant University system.
Services cupboards, hatches, panels	Service cupboards, hatches and panels for general, electrical, hydraulic and mechanical services including distribution switchboards are to be keyed to the Maintenance keying system for that location. Cupboards containing fire indicator panels are not to be fitted with locks.
Fire Services	Fire indicator panel, sprinkler valve box and booster enclosures are to be keyed to nnn key.
Maintenance Areas	The following areas shall be keyed to the Maintenance keying system for the location.

	- Roofs - Plant rooms - Utilities enclosures - Valves/Hydraulics Cages - Lift Maintenance and Motor Rooms - High voltage equipment and assets
Security System Cupboards / Rooms	The Gallagher Security Controller cabinets predominantly are supplied with a key barrel. Locks can be installed to suit master key provided to ANU Security
Communication rooms	Communications rooms are managed by ANU Information Technology Services (ITS) and are keyed to a specific system

Windows and Glazing

General

02.0171 Windows are to be designed in accordance with all relevant codes. The use of double-glazing or low-E glass coupled with thermally broken metal frames should be considered in all projects.

02.0172 Particular attention should be given to construction, location and sizing of windows to minimise heat energy transfer to and from the building in conjunction with efficient use of day lighting.

02.0173 Timber windows are not acceptable unless to match existing, for example in a project with heritage overlays and implications. Aluminium window construction shall be specified. All workable and movable parts shall be compatible non-ferrous metal. Specify standard powder-coat or anodise colours.

Windows

02.0174 All exterior windows shall be non-operable. All interior window sills shall be sloped, and all windows shall be sealed to ensure ease of cleaning and decontamination. Window systems shall use energy efficient glass. Consistent visual appearance on the exterior of the building shall be maintained by the type of window treatment selected. Appearance, function, heat gain, and loss air filtration, safety, structural requirements, suitability for the environment, operation and maintenance experience shall be considered.

02.0175 Window treatments shall meet all functional and aesthetic needs and standards. Light tight treatments shall be provided in all spaces that require room darkening based on program needs, such as conference rooms and laboratories that may need to be darkened. If windows are provided in nonhuman primate areas, the room shall be capable of becoming light tight, accomplished through the use of adjustable shutters, blackout shades, or blackout panels. Integral devices within the window air space are preferred.

02.0176 Fenestration shall be designed considering relevant Australian Standards, heating, ventilation, and air-conditioning requirements, aesthetic appearance, and the comfort of all users of the facility. Window design and construction should be based on the standards, guidelines.

Glazing

02.0177 Glazing for windows, door glazed panel, skylights and curtain walls shall meet the requirements for energy conservation identified in CBRM. All glazing designs should be evaluated for aesthetics, building function, energy conservation goals, shading characteristics, light transmittance, thermal characteristics, and reflectance. Low emissivity (Low-E) insulating glass shall be used unless other glazing types are shown to be more cost effective. Care must be taken to evaluate each building elevation individually. Glass sizes and thickness shall be based on wind loading and thermal conditions of the geographic area where the building is located.

02.0178 Glazing for Impact Safety

02.0179 Because of the size and shape of glazing in some locations, glass panels may be mistaken for a means of entry or exit and therefore may be subject to human impact. The requirements of *AS 1288 Glass in Buildings* shall be followed.

Window furnishings

Curtains and blinds

02.0180 Curtains and blinds are generally required in offices and centrally managed learning spaces and are to be supplied and fitted under the project. Provision shall be made in the project for adequate battens, pelmets and the like to allow fixing.

02.0181 Vertical venetian blinds are not acceptable.

Fly screens

02.0182 If fly screens are required by legislation the mesh must be stainless steel. The screens should form part of the window system and be easily removed from the inside for cleaning.

Thermal performance of windows, exterior doors, glazed panels, and skylights

02.0183 The use of glass shall be carefully studied in relation to energy conservation goals and building function. All new windows, glazed exterior doors, glazed panels and skylights shall be double glazed with a continuous thermal break. Condensation should not be apparent on glass when the indoor design temperature is 22C at 30% relative humidity. All windows, glazed exterior doors, glazed panels and skylights will have energy performance rating factors as evaluated in accordance with the NCC and relevant standards.

Provisions for Window Cleaning

02.0184 The need for window cleaning and maintenance, including replacement of glazing shall be considered during design. Provisions for window cleaning equipment must be included in the design for all facilities.

Ceilings

General

02.0185 Ceiling systems are to be selected based on their suitability for the function of the applicable area. Generally, suspended two way exposed grid ceilings systems with drop in tiles of a plasticised plasterboard type are preferred. Inaccessible or difficult to access ceiling systems shall not be specified other than to areas that have no ceiling access requirements.

02.0186 Ceilings are to be provided in all occupied and occupiable areas of a building.

02.0187 Ceiling fixtures: Where fixtures or fittings such as light fittings and thermal alarms are to be mounted on tiles, approved backing pieces shall be provided.

02.0188 Light fittings and other fittings not capable of being supported by the suspension system shall be suspended from the structural frame.

02.0189 System ceilings comprising exposed aluminium or timber slats are not to be used.

02.0190 Adequate access shall be made for lighting where ceiling heights are above 2.4 m, particularly in lecture theatres and laboratories, to allow servicing and maintenance activities to be carried out.

02.0191 Ceiling spaces will have a minimum of 300 mm clear within the ceiling soffit above.

02.0192 Unless otherwise stated, ceilings are not required to be provided in:

- Plant and Equipment Rooms
- Switchboards Rooms
- PABX/ Communcations Rooms
- Workshops

Suspended ceilings

02.0193 Ceiling systems shall generally be a two-way grid exposed T-bar of pre-painted aluminium with 1200 x 600 mm module. Ceiling tiles shall only be mineral fibre or plasterboard.

02.0194 Plasterboard ceilings on proprietary metal channels shall be provided with ceiling access hatches, where required.

Ceiling access hatches

02.0195 Where a fitted plasterboard ceiling is designed and specified, ceiling access hatches are to be provided.

02.0196 Lift out mineral fibre ceiling tiles are not acceptable as access hatches.

02.0197 Safe access to the hatch is to be accommodated in the design.

02.0198 The minimum size is to be 600 x 450 mm.

02.0199 All ceiling access hatches are to be non-hinged ‘drop-in’ type, designed to carry weights associated with accessing the ceiling space and trafficable ceiling spaces.

02.0200 Every ceiling or separated ceiling compartment is to have a ceiling access panel.

02.0201 Generally, the location of these panels is to be in a public part of the building, placing the panels within individual offices should be avoided.

02.0202 Placement of the panels should occur:

- adjacent to major ceiling mounted mechanical equipment, including fire dampers, other major ceiling plant, valves; and/or
- adjacent to ceiling enclosed audio-visual equipment (the Principal's Representative is to acquire the ANU ITS detailed audio visual requirements).

Floors

General

02.0203 Traffic patterns, use of the space and maintenance requirements must be considered in the selection of floor coverings.

02.0204 Trim, transition strips and floor mouldings shall have a bevelled-type design.

02.0205 Adhesive used for flooring shall be compatible with the product and approved by the manufacturer.

02.0206 Adhesives used shall be low in off-gassing.

Design Guidance

- Some floor surfaces in particular areas may be unsuitable. It is important that materials, including composite, surface texture, and colour are provided, to the University, at the design phase, to ensure their functionality in regards to cleaning.
- Floor covering should flow through the building in quantity. Any isolated areas will increase cleaning costs.
- Carpeted areas bordering wet areas (kitchens, toilets) will quickly incur staining as wet area are mopped regularly. This needs to be designed out.
- Consider extending resilient floor finishes up wall surface beyond 100 mm.
- Communications rooms generally: flooring to be anti-static vinyl.
- Cleaners cupboards generally: flooring to be resilient.
- Wet laboratories generally: flooring to be resilient.

Stock

02.0207 In some projects there may be a requirement to include in the specification an allowance for an additional spare supplies of each floor covering used, which the University will hold in stock. The amount is to be agreed in discussion with the Principal's Representative.

Joints

02.0208 Between dissimilar floor finishes. Shape is to be specified in the brief.

02.0209 Foyers and service counters: visual indicators in foyers

02.0210 To assist visually impaired people, routes through foyers to reception desks are to be clearly defined using contrasting colour or differently textured floor finishes, such as resilient finishes against carpet.

02.0211

Colours

02.0212 Colour of all floor finishes shall form part of the overall colour scheme for the building and shall be selected in consultation with the Principal's Representative.

02.0213 Consideration should be given to the specification of darker hues and colours in high traffic areas and wet areas where non-clip finishes are required.

Floor finishes

Terrazzo

02.0214 Renovation of terrazzo floors or of adjacent areas shall protect existing terrazzo from damage. Patching of existing terrazzo shall be carefully completed with matching aggregate and cement, or with the use of 'transition' strips between the existing and new installation.

Specific Design Parameters

02.0215 Exterior terrazzo is not acceptable.

02.0216 The Consultant shall consider expansion joint design and placement in coordination with structural movement of the building.

Tiles

02.0217 Where a 'non-slip' finish is required, floor tiles are not acceptable, and an appropriate slip-resistant vinyl shall be specified.

02.0218 Grouts shall be selected for long-term service and cleanability, as well as for flex and tensile strength.

02.0219 Floor drain design shall be coordinated with tiling layout, and the tile shall be cut neatly around the floor drain.

Timber floors

02.0220 Due to its inherent high maintenance needs, timber flooring is not recommended for use in facilities, with the exception of gymnasium floors or special performing-arts areas.

02.0221 Protection of timber floors

02.0222 In renovation projects involving buildings with wood flooring, the floors shall be protected from damage during works.

Specific Design Parameters

02.0223 Where a timber floor is required, the substructure and type of finish seal are to be appropriate for future intended use. Expansion and contraction of the wood in different temperatures and humidity must be allowed for.

02.0224 The timber selected must yield long-term service and relatively low maintenance.

02.0225 Moisture containment and vapour barriers must be provided if required in concrete slab substrate areas and over crawl spaces.

02.0226 Pine is not acceptable.

Carpet

02.0227 The manufacturer environmental performance and life cycle costs of carpet are complex and investigated in detail by 3rd party certification organisations. Consequently Sustainability defines and will periodically review the 3rd party accreditation for carpet procurement. The current required certification required is one or more of the following:

- Carpet Institute of Australia Limited, Environmental Certification Scheme (ECS) v1.2
- ECS Level 4 accreditation required
- GECA 50-2011 v2 - 'Carpets'
- GreenTag GreenRate v3.1 Level A

Broadloom carpet

02.0228 Unless agreed to by the Principal's Representative, broadloom carpets are not acceptable.

Carpet tile

- ACCS grading: commercial heavy duty and stairs
- anti-static warranty: minimum 10 years
- wear warranty: minimum 10 years
- dimensional stability warranty: minimum 10 years
- to be selected from manufacturers standard range
- to be coloured from solution dyed nylon
- to be direct stuck to a suitably prepared substrate in accordance with the manufacturer's instructions
- non-solvent based adhesives are to be used.

02.0229 Consideration should be given to both recycling salvaged carpet tiles, and the use of recycled carpet tiles.

Entrance mats (walk-off matting – where required)

02.0230 Generally entrance mats shall be purpose made matting, laid inside the entrance doors extending 6.0 m from the threshold.

02.0231 The use of entrance mats should be considered in the context of a transition zone.

02.0232 Where a building has a (weather) protected lead-up path, the requirement for the matting may be reduced.

02.0233 Where heavy soiling is probable e.g. entrances for trades or agricultural practical areas, the matting are may be extended.

02.0234 Architectural entrance features may be provided with a contrasting colour. Luminance contrast of floor coverings is to be considered at all major building entry ways.

02.0235 Slab recesses to accommodate entrance mats should be avoided where possible.

Specific Design Parameters

02.0236 Entrance matting should not impede people with disabilities (wheelchair users) and be specified according to the following criteria:

- Consideration of a modular carpet tile manufactured for walk-off areas
- non-slip surface;
- wearability and service life (no rotting or mildew);
- ability to clean foot traffic on textured nylon or polypropylene surfaces without 'tracking';
- replacement of parts;
- colour fastness of 'coloured' mats;
- drying capability of mats;
- drainage of recessed area;
- maintenance and cleaning of recessed areas and mat;
- stability of the mat system (no 'rattling' of slats when walked upon); and
- fire resistance.

02.0237 Tripping hazards are not acceptable.

Vinyl

02.0238 Slip-resilient flooring is to be specified with the proposed material to be reviewed by the Principal's Representative.

02.0239 The use of inconsistent materials or finishes for different zones or functional areas complicates navigation for all users. Introduce different floor textures to indicate particular areas or important changes of function.

Specific Design Parameters

02.0240 All vinyl is to be fit for purpose. In addition it must be:

- homogenous;
- anti-static in areas subject to static electricity discharge and specialty areas;
- fixed to the floor using adhesives in accordance with the manufacturer's instructions;
- welded as per the manufacturer's instructions;
- coved 100/150 mm up wall (where integrated in wet areas), or 100/150 mm black PVC skirting; and
- no sealing of the product shall be required to be undertaken.

02.0241 Note: pencil coving is not acceptable.

Linoleum

02.0242 The specification of linoleum may be considered on certain projects. The specific project requirements for non-slip areas and acoustic should be considered with the environmental profile of the project and the ongoing maintenance and cleaning requirements of the product.

02.0243 Only those products rated as commercial heavy duty should be considered.

02.0244 No sealing of the product shall be required to be undertaken.

Rubber

02.0245 The specification of rubber may be considered on certain projects. The specific project requirements for non-slip areas and acoustic should be considered with the environmental profile of the project and the ongoing maintenance and cleaning requirements of the product.

02.0246 Only those products rated as commercial heavy duty should be considered.

02.0247 No sealing of the product shall be required to be undertaken.

Joinery

General

02.0248 Cabinets and countertops should be designed in such a way that they are easily disassembled and moved for re-use.

02.0249 All joinery units are to have backs.

02.0250 Particleboard is not permitted for use in any joinery application, including cabinets and countertops.

02.0251 All joinery is to be designed with minimal joints and concealed nails and fasteners.

02.0252 Where adjustable wall shelving is to be specified, confirm with the user the expected loads prior to specifying.

02.0253 Refer to Doors, hatches and door hardware for interior timber door and door finish hardware requirements.

02.0254 All joinery must comply with the Sustainability requirements of *Sustainable Timber* and *Formaldehyde Minimisation*. In addition all joinery must be designed such that it can be easily disassembled for reuse, recycling or re-processing. The disassembly requirement is:

- Joinery must be readily disassembled, using non-specialist tools, into elemental components for re-use, recycling or re-processing (e.g. mechanically fixed, not glued).
- Each joinery item must enable at least 75% (by mass) to be readily disassembled

02.0255 Minimum requirements for kitchens/kitchenettes/tea rooms

- space for a refrigerator – size to be determined
- cupboard and benchtop space, including doors and drawer units
- space/shelf for a microwave
- stainless steel sink and at least one integral drainer
- sufficient bench space and power outlets for appliances, e.g. microwave, kettle, toasting ovens

02.0256 Joinery minimum requirements

Element	Requirement
Countertops	32 mm nominal, moisture resistant (MR) MDF in wet areas Where any finish is applied to the outside face, the underside shall be sealed to prevent warping or distortion of the board product It is preferred that no melamine surfaced high-pressure decorative laminate seams are located within nominally 600 mm of sink edge Timber veneers in wet areas are not acceptable
Edging	Countertops should not be melamine pre-finished material Doors and drawers are to have post-formed or ABS edging Open/exposed shelf edge is to have ABS edging, or timber where a veneer is specified Shelving with cupboards is to have melamine edging All edges are to be finished
Carcass	Carcass ends and divisions 16 mm melamine MDF
Drawer carcass	Proprietary drawer systems should be considered in all cases Minimum 12 mm melamine MDF
Drawer front	To match remaining joinery, minimum 16 mm MDF
Drawer bottoms	4 mm ply
Drawer slide mechanisms	For all drawers, proprietary item ball bearing runners are to be specified, with the capability to carry the anticipated loading Proprietary items of a commercial grade or whole unit, shall be specified to enable future renovations, disassembly and re-use. Drawer slide mechanism must have 30 kg weight capacity
Doors	18 mm nominal MDF Where any finish is applied to the outside face, the inside shall be sealed to prevent warping or distortion of the board product

	All doors are to be provided with handles All doors are to be fitted with nominal 165 degree hinges
Splashbacks	All wet area installations are to have a splashback; where integrated the junction is to be post formed, with an MR.MDF substrate, extending to a height of at least 150 mm vertically behind the source, and extend at least 900 mm horizontally past the source
Kickrails	All joinery is to have a kick rail, recessed at least 40 mm
Shelving, exposed and in cabinets	Generally 18 mm MDF, 18 mm MR.MDF to underneath sink areas; shelving where possible to be adjustable Where shelving is equal to or greater than 900 mm in length, a stiffening member is to be applied to the underside of the shelf Where adjustable shelving is designed, only metal heavy-duty shelf plugs are to be supplied
Hardware	Plastic handles are not acceptable
Timber veneers	Grain in adjacent panels shall be matched as to direction, density and hue
Melamine surfaced high-pressure decorative laminate finishes	Colours to the approval of the Principal's Representative Product, gauge and surface finish to the approval of the Principal's Representative

Service counters

02.0257 Service counters must provide an access section for wheelchair or seated users on both sides of the counter.

02.0258 Wheelchair leg space is required at an access counter for both the staff member and the client.

Plumbing, kitchen and sanitary fittings

02.0259 Numbers of toilet facilities required are to be generated from the NCC. At least one toilet in each building must be an access toilet but final numbers are to be determined in consultation with the Principal's Representative.

Standard public/ staff/student toilets	All single toilets and multiple toilet facilities are to include the plumbing and hydraulic fitments listed in Section.09 Hydraulic Systems.
Walls	All walls are to be tiled floor to ceiling with ceramic wall tiles.
Partitions	Divisions, doors, frontals and nibs to be manufactured from purpose designed proprietary wet area partition system inclusive of all proprietary accessories for that system

	Cubicle dimensions are to be a minimum 900W x 1500D mm if a concealed cistern is used or 1800 mm deep for a wall mounted cistern, division panels minimum 1500 mm high, mounted 300 mm AFFL The minimum dimension for the partition frontals is nominally 150 mm wide. This then allows for a nominal door dimension of 750 mm Ceiling suspended with frontals attached to a steel beam in the ceiling via steel rods and brackets concealed within the frontal blades. If floor mounting is required, stainless steel legs are acceptable provided installed on top of the floor covering Painting is not acceptable Door hardware shall be hat/coat hook (incl. door stop), turn-bolt and indicator, satin chrome finish Hinges shall be safety lift off gravity hinges, clear anodised, set in hold open position
Hand towel dispensers	The ANU will provide standard wall mounted hand towel dispensers to be installed by the project Where a project is to install a wall-recessed hand towel dispenser, a product with a lockable integrated bin capable of dispensing *KLEENEX Optimum Towel (Code: 4456)* shall be specified
Toilet paper dispensers	The ANU will provide twin-roll wall/partition mounted hand towel dispensers to be installed by the project
Mirrors	A mirror with minimum dimensions of 400W x 1000H mm is required to each hand basin location The mirror is to be a fixed item; however must be capable of being removed for replacement
Soap dispensers	The ANU will provide soap dispensers to be installed by the project
Hand dryers	Where required, electric hand dryers are to supplement dispensed paper towel The specification of electric hand dryers should be in consultation with the Principal's Representative
Window mounted exhaust fans	Exhaust fans in windows are not acceptable

Kitchens, kitchenettes and tea rooms

02.0260 Accessible kitchens and student common rooms

02.0261 Kitchens do not have to comply with AS 1428 in its entirety but should have accessible components as directed by the Principal's Representative.

Benchtops

02.0262 Kitchen benchtops not to have timber edges.

White goods

02.0263 Provision of white goods to be discussed and agreed with the Principal's Representative.

Cleaner's cupboards

02.0264 All projects must make adequate provision for cleaner's cupboards.

Sinks	Purpose made proprietary item, ceramic or stainless steel with integral hinged stainless steel grate
Hose cock	Wall mounted hose cock located above the sink at a height to enable filling of buckets and the like
Wastes	Generally not required
Exhaust fans	Exhaust fans in windows are not acceptable Exhaust fan should preferably be switched with room lights or local switch and must exhaust to outside as per *AS 1668 The use of ventilation and airconditioning* in buildings requirements
Shelving	Provide a minimum of 1.2 lineal metres of shelving on adjustable wall mounted slats. Shelving material to be 18 mm MR.MDF ABS sealing to all edges
Power	Install 1x double GPO at 1200 mm AFFL

Domestic bathrooms

02.0265 If required the fittings are to be agreed with the Principal's Representative.

Loose furniture

Furniture Design

02.0266 The following risk-based planning principles apply to the matching of users to new workstation environments.

- Significant change to the workplace environment is to be guided by a risk assessment.
- A file record reflecting consultation and decisions will be kept by the ANU Injury Management Branch.

- Following the risk assessment, all requirements are to be documented with identified and credible risks to users will be given due weight in the assessment of new furniture and equipment.
- Workplace design, equipment and furniture should improve health and safety for employees; not introduce new hazards.
- The needs of the prospective occupants, users and stakeholders will be considered and detailed throughout an iterative design process. Workplace and furniture design should match the physical requirements and tasks of the users.
- Maximise the flexibility of workstation setups to allow reconfiguration in the future.

02.0267 Decisions on task furniture, or installations concerning significant ergonomic risk, will remain within ANU.

02.0268 The manufacturer environmental performance and life cycle costs of furniture are complex and beyond the scope of construction projects. Minimizing the environmental footprint of the product life cycle is investigated in detail by 3rd party certification organisations. In addition the footprint can be practically minimised by reusing furniture that would otherwise be sent to landfill or disassembly and subsequent recycling. Since 3rd party accreditation schemes periodically update their standards and new accreditation schemes are created Sustainability defines will periodically review the 3rd party accreditation for furniture procurement. The current required certification required is one or more of the following:

- Supplier of furniture to confirm >80% by mass of the furniture is reused; OR
- Furntech/AFRDI Standard 150, either level A or B;
- Good Environmental Choice Australia (GECA) 28-2011 v2 - 'Furniture and Fittings';
- GreenTag GreenRate v3.1 Level A.
- Furniture, fixtures and fitting from buildings which can be reused

02.0269 The ANU has established a furniture reuse program on campus. Consultants are required to notify the ANUgreen office prior to commencing refurbishments to allow ANUgreen to assess and remove any University property which is fit for reuse and deployment in other ANU offices.

High-Use Interactive Workstations

02.0270 Some new work area installations may be for high intensity work and may involve complex risk components. Control workstation environments for IT, security or constant counter interaction workplaces would usually fall into this category. In such circumstances:

- A clear consultative framework consistent with the guiding principles should be put in place at an early stage;
- Risk factors and complexity should be identified for assessment by specialist ergonomists prior to informed decisions being made.

Ergonomic Specifications

Desks

02.0271 Sit-stand Desk Specifications:

- Minimum height adjustability range of 650 to 1200 mm
- Electronic operation preferred to manual wind mechanism where single replacement desks are to be purchased.

Desktop

02.0272 Desktop should have rounded corners if the desk is directly adjacent to an access or egress point, neutral colour, non-reflective finish, and a smooth surface.

02.0273 Recommended thickness is >25 mm, maximum thickness 33 mm.

Height adjustment

02.0274 Adjustment mechanisms should be able to be operated by the desk user and not create manual handling risks. They should be reliable, designed to encourage use, accessible, and labelled to indicate clearly the controls for movement. Look for designs that are not prone to accidental operation or interfere with the leg access

02.0275 Fixed height desks, desks with adjustable keyboards or "technician adjusted" desks are not to be purchased as primary workstation desks.

02.0276 If the workstation is not adjustable, a wide step should be provided for shorter workers and the bench raised for taller workers. This bench raise would be a raised platform to sit on the bench for specific tasks for taller workers (e.g. microscopes, pipette use, laptop use), generally 850 to 900 mm AFFL, dependent on type of task to be performed.

Work Surface Area

02.0277 The work surface area should be adequate for tasks to be performed at the workstation, and accommodate all required equipment.

- For **sole tasks (computer work only),** the surface should have minimum dimensions of 1200 x 750 mm.
- For **mixed tasks (e.g. computer and clerical work)** the work surface should have minimum dimensions of 1500 x 750 mm.
- Large monitors may necessitate the need for larger space where a deeper desk may be required.
- Corner or split desks should measure 1800 x 1800 x 600 mm and should be finished with a 45° splay corner, rather than a squared corner and keyboard sleeve.

Leg Space

02.0278 Allow sufficient leg space under the work surface to allow free leg movement without obstruction from items such as CPU holders, drawer units, boxes, desk adjustment handles.

02.0279 Under desk: Knee clearance 450 mm deep, leg clearance 600 mm (at 150 mm AFFL), minimum width 800 mm.

Modesty Panels

02.0280 Where not next to a wall, workstations should have a modesty panel

02.0281 The panel should finish not less than 300 mm AFFL when the work surface is in its lowest position

02.0282 The panel should not interfere with workstation height adjustment.

Standing Height Benches

02.0283 Ideally these should be adjustable to suit a range of users.

Chairs

02.0284 Refer to the ANU Procurement Guidelines for chair sourcing and supply advice.

02.0285 Advice from the Principal's Representative must be sought regarding task chair suitability.

Task Chairs – Relevant Working Specifications

02.0286 Chairs must comply with Australian Standards and have Furntech/AFRDI 'blue tick' certification (minimum Level 5 certification).

02.0287 Fabric seat and back to be commercial extra heavy duty.

Arm Rests

02.0288 For most keying activities chairs should **not** have arm rests

Weight Rating

02.0289 The known user population profile will help determine ratios for heavier duty chairs.

02.0290 Weight rating to minimum 110 kg, however a range up to 135 kg may suit some populations. If 110 kg is chosen as the baseline, at least 10% of purchased pool should have a heavy duty kit for heavier weight rating.

High Chairs and Drafting Stools

02.0291 High chairs and drafting stools must comply with Australian Standards and have Furntech/AFRDI 'blue tick' certification (minimum Level 5 certification).

02.0292 Fabric seat and back (if used in office environment).

02.0293 Specific requirements for chairs/stools to be used in wet laboratory environments are:

a. No porous materials and fabrics are to be specified for chairs in laboratory environments.

b. Floor glides or wheels with brakes are to be installed.

02.0294 For high counter workstations/workbenches compressed seat height adjustability above the floor should be 540 to 730 mm.

02.0295 Where high chairs are used for extended periods a footstool should be provided.

Counters

- If the counter is also a screen based workstation there must be enough space for screen and associated equipment, including sufficient space for user to be positioned at a comfortable distance from the screen. A minimum desk depth of 800m is required.
- There should be a section of the desk where comfortable reach distances for the user and customer (with consideration to security requirements) are possible. This depth should be maximum 500 mm if sitting and 600 mm if standing.
- To accommodate both requirements of desk depth for screen and shorter depth for reach a corner curved desk design with computer positioned at the wider end is recommended.
- Roughly equal eye-level positions for operator and customer are necessary. If the client is standing and the staff member seated, neck injury may result for the staff member who will repeatedly extending their neck to see the customer.
- There should be an appropriate surface for customers (e.g. space for displaying or signing documents)
- On the customer side the counter should be not lower than 1020 mm and not higher than 1200 mm.
- Counters shall, in all feasible locations, be design with the inclusion of an electronic sit-to-stand workstation on the staff side.
- The design of a counter should be guided by the type of work and the duration of work to be conducted at the counter. Counters shall be designed to accommodate the following tasks:
    - Counter attendance for only short periods
    - Frequent absence from counter to perform other tasks
    - Tasks performed at the counter are brief and repetitious
    - Attendance at counter required for significant periods
    - The sequence of movements and durations of tasks requires operator to be seated; e.g. cashiers, booking clerks
    - Attendance at the counter required for varying periods
    - Lengthy tasks may be undertaken at the counter, but frequent absences are also required e.g. short term interviews and enquiries

ANU Historic Furniture

02.0296 The University has an extensive collection of custom built timber furniture designed by eminent Australian designer Frederick ‘Fred’ Ward and his counterparts in the ANU Design Section. Many of the early buildings on the campus including University House, Chancellery, R.G. Menzies Library, and John Curtin School of Medical Research (Wings A and B) had purpose built furniture designed to meet the décor at time of construction of the buildings. The furniture is however found all over the Acton Campus.

02.0297 There is a great volume (hundreds of pieces) of Fred Ward furniture currently in storage and thousands of pieces in use across the university as office, accommodation and occasional

furniture. Much of the furniture, while aesthetically pleasing, does not meet WHS and ergonomic standards required by ANU, however this furniture was recently assessed as a significant intact collection, and must be conserved under all circumstances.

02.0298 If any buildings are refurbished, consultation must be undertaken with the Principal's Representative on the use, disposal or restoration of any pieces of Fred Ward Furniture.

Appliances

02.0299 Many electrical appliances can be rated under the Energy Star rating system and include:

- Air-conditioners;
- Clothes dryers;
- Clothes washers;
- Dishwashers;
- Refrigerators/Freezers;
- Televisions.

Where such appliances are purchased they must achieve the within ½ a star the highest rating possible in their class (e.g. if the highest rating possible for a dishwasher was 4 stars all dishwashers purchased must be 3.5 stars and above).

Fixed furniture and equipment

General

02.0300 Furniture and fittings of a fixed type and those of sliding, rotating or special nature which generally occur in large lecture theatres shall be designed and installed under the project.

02.0301 Special requirements are set out in the brief or will be determined in conjunction with the Principal's Representative.

02.0302 The cost of notice boards in common areas and directory boards for major building entry points are to be included in the project.

02.0303 Where possible furnishings shall be loose fitted to enable the most flexible environment.

Built-in furniture

02.0304 All built-in furniture, cupboards and laboratory benches shall be supplied as part of the project. Details to be determined in conjunction with the Principal's Representative.

02.0305 Fixed furniture and equipment typically receives frequent use and shall be designed with this in mind. The Consultant should also consider mounting these items to walls and floors in order to achieve low maintenance.

02.0306 All items to have a factory finish, with no painting required.

Monitor Arms

- All monitors should remain on the adjustable stand provided by the manufacturer, unless there is insufficient space on the desk for the stand;
- Articulated arms have proved more reliable in user operation than cam-locking pole-mounted monitor arms, which involve manual handling risks;
- Significant purchases of monitor arms should be assessed from a manual handling viewpoint as well as from a sound engineering angle.

Fasteners

02.0307 Should generally be concealed.

02.0308 Exterior fasteners should be stainless steel 'vandal-proof type' or galvanised.

Bookshelves

02.0309 Generally built-in bookshelves are not acceptable. Free standing bookcases are preferred.

02.0310 Bookcases are to be a maximum height of 1.8 m.

Directory boards and room names

02.0311 Directory boards and direction systems will generally be inclusive of room numbers and names. The Principal's Representative will provide guidance on room numbering and naming on provision of labelled plans by the Consultant. Provision shall be made in the design to allow space for directory boards in lobbies and other public spaces as briefed.

Compact Shelving Units

02.0312 When specified in the brief, a compact shelving unit shall be installed but the load capability of the floor is to be determined during the design phase. Tracking is to be epoxied in place.

02.0313 Fixing tracks with mortar is not allowed.

Visual display/presentation boards

Whiteboards

02.0314 White porcelain-type boards, for use with felt-tipped markers.

02.0315 To have a continuous aluminium trim frame, and have a full width aluminium pen trough.

Pinboards

02.0316 The boards to have a continuous aluminium trim frame, or, where an entire wall is to be covered, the pin-board is to be stuck directly to the wall in place of the normal wall covering.

Blackboards

02.0317 Blackboards are no longer to be specified, unless required within the project brief.

Projection screens

02.0318 Projection screens for slides, overhead projection or film are to be provided as part of the project. The requirements of size and location shall be determined in conjunction with the Principal's Representative.

Colour, signage and lighting

02.0319 Signage and colours must comply with the University Signage Manual and protocols.

Colour

02.0320 Contrasting colour refers to the visibility of one feature against its background.

02.0321 Contrast does not necessarily require the use of bright colours. For luminance contrast refer to AS 1428.

Intensity

02.0322 Do not use red and green to provide contrast. Red and green have the same intensity value and do not provide good contrast for the blind and visually impaired people or for general users when the light levels are reduced.

02.0323 Where contrast is supplied as a visual clue for the non-sight impaired user, ensure colour selection takes into account the intensity value of each colour.

02.0324 Consultants will be expected to demonstrate that appropriate contrast colours are specified.

Highlighting elements

02.0325 Use contrasting colours on step nosings, and other elements that may pose a risk to visually impaired users.

Placement of signs

02.0326 Signs must be placed so they are visible but clear of circulation spaces.

Natural lighting

Do not locate viewing areas, such as teaching points, information counters or reception desks so that users need to look into glare induced by sun-facing windows.

First Aid Requirements

Automated External Defibrillator (AED)

02.0327 An AED be accessible from a Wall Cabinet within a buildings main entrance/lobby.

02.0328 An AED listed at a scheduled building, be accessible not only to the occupants of that building, but to anyone within a 150 metres radius of the building.

02.0329 An AED locality not be obscured by columns or plants.

02.0330 An AED shall be housed in a dedicated AED Wall Cabinet, with open door alarm necessary in raising awareness of an emergency situation.

02.0331 An AED shall be located at a convenient height for access and near eye level, no higher than 48 inches, best practice is 1200mm from bottom box to finish floor level).

02.0332 An AED shall be clearly marked and highly visible, to Include where necessary workplace signage to identify where the closest AED is as followed,

02.0333 The ANU preferred AED units is the ZOLL AED+ plus Semi Auto (With black carry bag), Red Cross Alarmed Cabinet, with one CPR-D-Padz and one Pedi-padz II in the cabinet.

02.0334 Signage to include 3D wall sign and 8.5”x11” wall mounted sign as minimum.