



# CAPITAL WORKS & FACILITIES

## Architectural Design Standards

V15.0

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Register of Revisions - Status of UWS Design Guidelines

Date	Version	Description	Author	Checked
03-07-09	0-1	Foreword and Acknowledgement	I Pearson	
03-07-09	0-0	Register of Revisions	I Pearson	
03-07-09	0-1	Table of Contents	I Pearson	
27-04-09	0-0	Introduction	I Pearson	
27-04-09	0-0	Planning and Design Controls	I Pearson	
27-04-09	0-0	Environmental Sustainability	I Pearson	
03-07-09	0-1	Building Fabric	I Pearson	
03-07-09	0-1	Building Services Design	I Pearson	
27-04-09	0-0	External Works and Landscaping	I Pearson	
27-04-09	0-0	Signage	I Pearson	
03-07-09	0-1	Appendices	I Pearson	
23-08-11	V 02	Revised Appendices, edit and incorporate additional material	I Pearson	
25-03-2013	V03	Revised to edit and incorporate new material	I Pearson	
31-05-2013	V03.1	Added paint finishes	I Pearson	
20-08-2013	V13.2	Renamed version, revised writing surfaces, ceilings, added wall trim, revised floors + finishes, cross referenced skirtings	I Pearson	
07-11-2013	V13.3	Added visual indicators	I Pearson	
03-12-2013	V13.4	Minor amendments to Part 4.3 and 4.10.5, added Part 5.6.4 and Part 6.2	I Pearson	
07-07-2014	V14			
22-08-14	V14.1	Minor amendments to Part 4.3.8; Part 4.10.2; Part 5.5	A Roy	T Gardner
06-03-15	V15.0	Added requirements for insulation, termite control, window hardware, low VOCs, translucent film to glazed partitions, approved automatic door operating system manufacturers, ceiling access panel locations, writing surfaces / white boards / notice boards, meeting rooms / video conferencing rooms, approved vertical transportation systems manufacturers, telecommunications services, waterproof membranes to external stairs. Appendix A added.	A Roy	

Version 03

Date	Copy No.	Reviewer	Issued By	Endorsed
	1	John Bonanno		

No. Issued for Review Version 3 – DRAFT 1

Date	Copy No.	Reviewer	Issued By	Returned with comments
28-03-13	1	Adam Byrne	IP	
28-03-13	2	Glenn Cooper	IP	29-03-2013
28-03-13	3	Alex Grochowski	IP	02-04-2013
28-03-13	4	Charles Vella	IP	08-04-2013
28-03-13	5	Neil Hogan	IP	28-03-2013
28-03-13	6	Roger Attwater	IP	02-04-2013
	Original	Yuen YIP / Control Copy	IP	

## Version 02

Date	Copy No.	Reviewer	Issued By	Endorsed
	1	John Bonanno		

## No. Issued for Review Version 2 – DRAFT 2

Date	Copy No.	Reviewer	Issued By	Returned with comments
17-06-2011	1	Adam Byrne	IP	
17-06-2011	2	Glenn Cooper	IP	
17-06-2011	3	Alex Grochowski	IP	
17-06-2011	4	Charles Vella	IP	
17-06-2011	5	Neil Hogan	IP	
17-06-2011	6	Roger Attwater	IP	
17-06-2011	7	Rob Lockie	IP	
17-06-2011	Original	Yuen YIP / Control Copy	IP	29-6-11

## No. Issued for Review Version 2 – DRAFT 1

Date	Copy No.	Reviewer	Issued By	Returned with comments
11-02-11	1	Adam Byrne	IP	G Cooper 28-01-11
11-02-11	2	Alex Grochowski	IP	
11-02-11	3	Aswant Prasad	IP	
11-02-11	4	Charles Vella	IP	
11-02-11	5	Franz Sugar		
11-02-11	6	Jo Ballard	IP	
11-02-11	7	Neil Hogan	IP	
11-02-11	8	Peter Blunden	IP	
11-02-11	9	Roger Attwater	IP	23-02-11
11-02-11	10	Rob Lockie	IP	25-02-11
11-02-11	11	Steve Norris-Smith	IP	
11-02-11	12	Simon Kearns	IP	
11-02-11	Original	Yuen YIP / Control Copy	IP	

## Version 0-1 (Final)

Date	Copy No.	Reviewer	Issued By	Endorsed
29-04-09	1	John Bonanno	IP	
03-07-09	1	John Bonanno	IP	



## FOREWORD

The University of Western Sydney (UWS) has a large and diverse property portfolio spread over six campuses with distinct individual characteristics. Decisions to refurbish, extend or construct new buildings pose unique challenges for both Professional Consultants and University staff, Academics and Administrators. This situation is made more demanding as University projects often have to be designed and built under extremely tight time and cost constraints.

These Standards have been prepared to assist Professional Consultants in the design and documentation of UWS Projects. They provide direction and guidance in regard to the University's requirements. The Standards will enable Consultants to more efficiently translate UWS requirements into acceptable design solutions.

The Standards are not intended to replace the level of initiative, competence and care expected of Consultants in the performance of their duties. Consultants are encouraged to carefully consider the merits of the Design Standards in the context of the needs of individual projects. If a Consultant considers a requirement is not appropriate and that a more suitable solution is available, proposals to this effect should be raised for consideration by the UWS. In the absence of express written approval for a deviation from these Standards, UWS will however assume that the requirements contained in the Design Standards have been fully addressed and incorporated in the proposed Design Solution and Specifications.

Any queries in regard to these Standards or UWS requirements on any project should be directed to the relevant Capital Works & Facilities Project Team.

We trust that you will find the Standards of assistance in the execution of your professional duties on UWS projects.

John Bonanno,  
Director  
Capital Works & Facilities Unit

## ACKNOWLEDGEMENT

UWS acknowledges with thanks the assistance and contribution of a number of other universities, institutions, statutory authorities and individuals in the preparation of these UWS Architectural Design Standards. Their generous provision of reference material greatly simplified the task of producing this document. In particular, the assistance of the following parties is acknowledged:

- Griffith University
- University of Sydney
- The University of Technology, Sydney



# 1 INTRODUCTION

The University of Western Sydney has six campuses located in the Greater Western Sydney: Bankstown campus, Nirimba Education Precinct (Blacktown campus), Campbelltown campus, Hawkesbury campus, Parramatta campus and Westmead precinct, and Penrith campus.

Each campus has their own unique site and built environment characteristics that dictate development, e.g. Parramatta and Hawkesbury campuses contain heritage assets that need to be conserved, restored for adaptive reuse and maintained in accordance with the UWS Heritage Asset Maintenance Strategies for those sites.

## 1.1 Purpose of this document

These UWS Architectural Design Standards (Standards) and procedures describe the University of Western Sydney's **mandatory** and **minimum** requirements for the design and construction of its buildings and facilities.

Throughout the sections of this document, 'mandatory' requirements will be clearly identified and defined, otherwise any requirement is a guideline only.

## 1.2 Use of this document

These Standards are applicable to all capital works projects related to new buildings including internal fit outs, and alterations and additions to existing buildings.

The provision of these Standards by UWS should in no circumstances be construed as relieving any Consultant of the duty of care owed to UWS by the Consultant.

This document does not relieve any consultant or contractor commissioned by or contracted to the University or its appointed Construction Managers from the preparation of comprehensive specifications for inclusion in tender or construction documentation. While the information contained in relevant sections of the Standards may be reproduced within those specifications, no part of this document may be used as a substitute for those specifications.

These Standards must be read in conjunction with the Project Brief and any project specific design requirements provided by UWS. Where requirements of the Project Brief appear to be in conflict with any requirement in these Guidelines, the consultant or contractor must clarify the apparent ambiguity with the relevant UWS Project Manager and CW&F Project Team before proceeding.

## 1.3 Interpretations and definitions

### 1.3.1 Abbreviations

The following abbreviations are used throughout this document:

ADS	UWS Architectural Design Standards (Standards)
AS	Australian Standard
ASCC	Australian Safety and Compensation Council
AV	Audio Visual
BCA	Building Code of Australia (part of NCC Series)
CMP	Conservation Management Plan
CW&F	Capital Works and Facilities
D&C	Design and Construct
DECCW	Dept of Environment, Climate Change & Water (NSW)
DDA	Disability Discrimination Act
FDB	Functional Design Brief
HAMS	Heritage Asset Management Strategy
IT	Information Technology
NCC	National Construction Code

OH&S	Occupational Health and Safety
OULC	Office of University Legal Counsel
SA	Standards Australia
UWS	University of Western Sydney

### **1.3.2 Language**

For consistency of language an action that is mandatory are described by words 'must', 'shall', and 'should'; and where discretion is allowed, actions are described by the words 'may', 'prefer' and 'preference'.

### **1.3.3 Superintendent**

The term 'Superintendent' where used throughout this document shall mean Capital Works and Facilities Project Manager responsible for management of Consultants, Contractors and general management of the project as the nominated representative of the University.

### **1.3.4 CW&F Project Team**

The term 'CW&F Project Team' where used throughout this document shall mean Capital Works and Facilities Project Manager in conjunction with the design representative from Strategy Asset Planning and CW&F Project Planning Services Project Architect/Designer.

This Team is responsible for design decisions and approval of proposed alternative design solutions related to the project.

### **1.3.5 Consultant**

The term 'Consultant' where used throughout this document shall mean any Architect, Engineer, Surveyor, Quantity Surveyor and any other individual or firm providing its services either appointed directly under an Agreement with the university, or employed by a 'Contractor' appointed by the University to undertake design and construction management of a project.

It is '**mandatory**' for any Architect or Architectural Entity delivering architectural services to provide details of the Nominated Architect and registration with the NSW Architects Registration Board.

### **1.3.6 Consultancy Brief**

The documentation issued by the University to the Consultant to describe the requirements of the University for the services to be provided by the Consultant, This may incorporate the Project Brief.

### **1.3.7 Contractor**

The term 'Contractor' where used throughout this document shall mean either the Contractor appointed after competitive tendering for 'Traditional' Lump Sum Fixed Price Contracts, or the Design & Construct (D&C) Manager appointed for 'Non Traditional' design and construction management Contracts.

### **1.3.8 Educational Brief**

The documentation issued by the University to describe the requirements of the University related to the educational environment and desired outcomes aligned to the stated UWS Mission and Vision.

### **1.3.9 Development Brief**

The documentation issued by the University to describe the viability of the Project in funding terms.

### **1.3.10 Project Brief**

The documentation issued by the University to describe the requirements of the University for the Project.



#### **1.3.11 Mandatory requirement**

Where a requirement has been stated as '**mandatory**', generally no alternative designs, specifications, materials, manufacturers or systems will be considered by the University, and the requirement is to be incorporated into the design, documentation and construction without variation.

Consultants or contractors may offer alternative solutions to these requirements for consideration and analysis by the Director, Capital Works and Facilities.

#### **1.3.12 UWS Standards requirement**

If a requirement has not been stated as '**mandatory**', the University may consider alternative designs, specifications, materials, manufacturers or systems that satisfy the minimum standards for that requirement as stated in this document.

#### **1.3.13 Departures from the Requirements of this Document**

Departures from these Design Standards & Procedures, if allowed, must be confirmed in writing by the Director, Capital Works and Facilities, or the Superintendent's Representative under the Contract. Any departure made without such confirmation, which is incorporated into the design or construction of a project, shall be rectified at no cost to University of Western Sydney.

#### **1.3.14 Equal and Approved**

Whenever a brand or manufacturer's name appears in this document, an alternative brand or manufacturer will only be permitted if that brand or manufacturer can satisfy all the requirements stated in this document, the drawings and specifications.

It is '**mandatory**' that such approval be sought and received in writing from the CW&F Project Team before incorporating such alternatives into the design and documents for the project. Any alternative must be installed strictly in accordance with the manufacturer's printed instructions.

Alternatives not so approved will be removed and replaced with complying materials, plant or equipment at no cost to the University.

#### **1.3.15 Legislation**

The University operates under the University of Western Sydney Act and its subordinate statutes, rules and regulations. Penalties for offences under the Act are enforceable under New South Wales Law.

In addition to any monetary penalties which may be imposed under legislation, or any Conditions of Contract, persons who wilfully disregard the requirements for care and maintenance of the campus, will be liable to removal from the campus.



## 2 PLANNING AND DESIGN CONTROLS

### 2.1 Introduction to UWS Campuses

Each of the six UWS campuses has their own unique site and built environment characteristics. New development is to be in character and complement the existing built environment. Refer to UWS Campus Maps [http://www.uws.edu.au/campuses\\_structure/cas/campuses](http://www.uws.edu.au/campuses_structure/cas/campuses)

#### **Bankstown Campus**

The Bankstown Campus is located on Bullecourt Avenue, Milperra in an urban setting and is in close proximity to major transport links to Sydney Airport, Sydney Central Business District, Parramatta and Liverpool.

The size of the Campus is 23.4 hectares of which several hectares in the north-east corner are protected woodlands. It shares boundaries with Mount St Joseph Milperra Catholic Girls High School in the southeast, Milperra Reserve in the northwest, and the M5 motorway in the south. Light industrial and commercial developments are located to the northern and eastern side of the Campus, with residential development along its western boundary.

The campus has a distinct 'college' environment comprising a definite 'core' of two-storey buildings with internal courtyard spaces. Built forms decrease in density as one moves away from the 'core'. Generally, the buildings' external fabric comprises face brickwork, concrete frame structure, and corrugated metal roofing either behind parapets or terminating in eaves gutters. External landscaping includes on-ground car parking, sporting ovals and some thematic landscaping between buildings.

In 2009, a Bankstown campus masterplan was completed by Conybeare Morrison International Pty Ltd.

#### **Campbelltown Campus**

The Campbelltown Campus is a site of approximately 160ha located close to Macarthur Square, within walking distance from Macarthur Railway Station on the south-western railway line located east of the campus, the Southern Freeway (Hume Highway F5) to the west and Narellan Road to the north. Its southern boundary is shared with property owned by Landcom for future residential development. Main access to the campus is from Narellan Road. It is shared with access to TAFE located to the eastern side of the campus.

In 2008, a Development Control Plan for the campus, together with a Campbelltown Campus Master Plan was submitted for approval by Campbelltown City Council.<sup>1</sup>

The University of Western Sydney DCP 2008 is available for viewing on

<http://www.campbelltown.nsw.gov.au/default.asp?iDocID=5057&iNavCatID=929&iSubCatID=1544>

Rolling hills, a series of lakes and a tightly planned campus distinguishes this site. The two-storey academic buildings to the north-east of the site serve as a core of the campus with the main buildings erected in a single phase of construction c 1980s of a single character and design language developed by Philip Cox, Richardson Architects. These buildings' external fabric consists primarily of face brickwork with concrete framed structures and metal roofing behind parapets. In 2008, a new School of Medicine building designed by Lyons Architects was completed. Located in the north-eastern corner of the site, its architecture is in a more contemporary style using a mixture of materials such as face brickwork, glass, concrete panels, composite panel cladding, structural steel and metal roofing. Additional contemporary multi-storey student residential accommodation designed by HASSELL was completed in 2010.

#### **Hawkesbury Campus**

The Hawkesbury campus is located in the south eastern part of Richmond in the flood-prone Hawkesbury River Valley north-west of Sydney. It has significant street frontages to Blacktown (Richmond) Road, Londonderry Road and the Driftway within a peri-urban rural character. The main entrance gates are located at the intersection of College and Bourke streets. Secondary vehicular access to the site is available from Blacktown Road and Londonderry Road.

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<sup>1</sup> The Campbelltown Campus Master Plan and resultant Development Control Plan for the site were prepared by Cox Richardson and approved by Campbelltown City Council in 2010.

Its past as the Hawkesbury Agricultural College carries significant history of pastoral practices dating from 1876.

The size of the campus is 1300ha and contains remnants of Cumberland Plains bushland along its southern boundary from Yarramundi Paddock in the west to Clarendon Paddocks in the east. Approximately 400 hectares of remnant vegetation has been identified by NSW DECCW as 'priority conservation lands', encompassing Cumberland Plain ecological communities and critically endangered Shale Plain vegetation associations.

Hawkesbury campus has a distinct character of a 'working campus' with stockyards, growing sheds and surrounding paddocks that illustrate activities and studies within the University. The development on campus reinforces the 'rural village' character with the campus divided into distinct zones of individual streetscapes and characteristics covering a substantial number of buildings representing late 1800s architecture interspersed with 20<sup>th</sup> Century weatherboard cottages including built landscapes that have been deemed to be of significant heritage. More recently built structures have been erected in harmony with their surroundings. The campus also includes the River Farm situated on the banks of the Hawkesbury River north of Richmond,

A campus masterplan has been prepared by Jackson Teece.

### **Nirimba Education Precinct – Blacktown Campus**

The UWS campus is located within the Nirimba Education Precinct at Quakers Hill in western Sydney which includes the co-educational senior secondary providers of Terra Sancta College (Catholic) and Wyndham College (Government) to the east, and TAFE Nirimba College to the north-west of UWS facilities. The Education Precinct (on the former naval base HMAS Nirimba) was opened in 1995.

Immediately adjoining the Precinct on its western boundary is Quakers Road providing access to semi-rural properties. Residential properties are located on the southern boundary. The Precinct is accessible from Eastern Road that comes off Quakers Hill Parkway to the south-east of the campus. It is located in close proximity to major transport routes of the M7 motorway and Blacktown Road that link the campus with the Sydney Central Business District and Penrith.

Generally, the University's buildings' external fabric consists of face brickwork, exposed concrete frames and spandrels, metal roofing and parapets. External landscaping includes on-ground car parking, both formal and informal landscaping between and surrounding buildings.

UWS College is the main occupant of this campus, supplemented by student accommodation managed by UWS Residential Colleges.

### **Parramatta Campus and Westmead Precinct**

While UWS currently has a presence in Westmead Precinct, it does not form part of these Design Standards.

The Parramatta campus is located in Rydalmere and comprises two sites divided by Victoria Road, a major transport link between Parramatta and the Sydney Central Business District. A shuttle bus operates between the two sites during university semesters.

The site is subject to a Master Plan prepared under the planning provisions of State Environmental Planning Policy No 56 Sydney Harbour Foreshores and Tributaries (SEPP 56) and Sydney Regional Environmental Plan No. 28 - Parramatta (SREP 28).<sup>2</sup> A Parramatta South Campus Conservation Master Plan and more detailed Parramatta Campus Master Plan have been submitted to Parramatta City Council.<sup>3</sup>

Parramatta North campus located north of Victoria Road currently houses student accommodation completed in 2009 and the School of Natural Science. It is bounded on the east by James Ruse Drive, residential properties to the north and west. Main vehicular and pedestrian access is from Pemberton Street. The main teaching and administration buildings' external fabric is face brickwork with concrete frame structure and metal roofing behind parapets. External landscaping is informal in nature.

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<sup>2</sup> Draft Master Plan June 2004 was prepared by Tanner Architects and subsequently adopted by Parramatta City Council as the legislative planning document governing Parramatta (South) Campus. NOTE: SEPP 56 Sydney Harbour Foreshores and Tributaries was repealed by SEPP (Major Projects) Amendment (Luna Park Site) Policy 2005.

<sup>3</sup> Parramatta South Conservation Management Plan 2008 and Parramatta Campus Masterplan 2008 prepared by Conybeare Morrison International

Parramatta South Campus is located south of Victoria Road on the site previously known as Rydalmere Psychiatric Hospital. The site was developed in several distinct historical phases, each phase containing a group of buildings with their own character, 'streetscape' and landscape precincts. These phases and precincts are described in detail in the UWS Parramatta South Campus Conservation Management Plan and supplemented by the Heritage Asset Management Strategy for Parramatta South Campus<sup>4</sup>. The built environment is characterised by the predominant external fabric of face brickwork on sandstone foundation walls, verandahs with turned timber posts and corrugated metal roofing. New contemporary style infill buildings have been designed and constructed in sympathy with the heritage fabric.

The historical phases referred to are:

#### Female Orphan School (1810-1850)

From its beginnings as a land grant to Surgeon Thomas Arndell known as Arthur's Hill (1791-1792) for cultivation and subsequently resumed, by 1810 the site had been selected as the location of a new orphan institute. The construction of the Female Orphan School was completed in 1818 with subsequent East and West Wing extensions commenced in 1820 with additional kitchen and stores constructed during 1829. Main vehicular access was from Orphan School Lane (now James Ruse Drive), terminating in a loop laid out on the upper slopes of the hill (unlikely to have been the current carriage loop that was probably created during major works in the area in the 1970s). During the 1830s and 1840s, the surrounds were improved though visual additions such as ornamental flower gardens, shrubs and trees.

#### Protestant Orphan School (1850-1887)

In 1850, a Male Orphanage School was amalgamated with the Female Orphan School. Although they shared the same site, the two schools remained separate and the facilities such as bathrooms, dining rooms, school rooms and playgrounds were all replicated and duly separated.

A hospital was added to the site in 1854, with a new kitchen constructed c.1868 and by 1870, a meat shed was added. An extensive program of additions and renovations was carried out during 1870 with the hospital gaining a verandah and a new bathroom, while a 'new' dining room, boys' bathroom and laundry were added in the west wing. Two shelter sheds were moved to enable the construction of a new school building described in 1877 as a 'model' building. The Master's residence may have been built at this time. These extensive structural works and other improvements to the east and west wings were complemented by improvements made to the landscape. By 1870, a circular carriage loop and gravel drive had been constructed in the foreground of the main entrance. A forty bed dormitory was constructed on the south-west corner of the western wing in 1882.

During the 1870s, the integration of orphans into the community and subsequent legislation of the State Children Relief Act and creation of its State Children's Relief Board in 1882 with a mandate to foster children within the community had by 1886 reduced the number of children left in the combined orphanage. In 1888, the site was transferred to the Department of Lunacy. The former school then became the Parramatta Branch Hospital for the Insane.

#### Rydalmere Psychiatric Hospital (1888-1989)

By 1891, the site was granted independent status and renamed Rydalmere Hospital for the Insane. In 1895, a new boat shed and landing stage together with a Chief Attendant's Cottage located in its vicinity was constructed.

In 1895, the first female patients were admitted and housed in new purpose built wards constructed away from the former orphanage buildings. A number of alterations and additions to the orphanage building and Drill Master's residence ensued in 1905-1906, with premises and services upgraded following the First World War.

Additions to the Master's residence and Chief Attendant's cottage including extensive remodelling of the infirmary were carried out in 1926 with further additions to the Infirmary in 1938. During the 1950s and 1960s, further additions and alterations were made to some buildings, considerably changing their form and appearance.

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<sup>4</sup> HAMS December 2008 prepared by Conybeare Morrison International, endorsed by NSW Heritage Council in February 2009.

By the 1970s, development in medicines and changing philosophies in the care of psychiatric patients emphasised community integration rather than segregation. Following the Richmond report in early 1980s resulted in the progressive closure of Rydalmere Psychiatric Hospital between 1985 and 1989.

#### University of Western Sydney (1993-present)

In March 1998, the Parramatta Campus of the University of Western Sydney opened its classrooms to students. The former psychiatric hospital buildings were adapted to the new use and an award winning restoration of the Female Orphan School was carried out by Tanner and Associates in 2004. New services and new buildings have been erected since including the Ian and Nancy Turbott Auditorium, Whitlam Library and more recently, a new Teaching Building was completed in 2007 and a new Multi Purpose Building in late 2009. Conservation and adaptive reuse of heritage buildings on the campus are on-going.

#### **Penrith Campus**

Penrith campus is over 200 hectares in size comprising three precincts: Kingswood, Werrington North and Werrington South. The campus is located off Great Western Highway and is in the vicinity of the M4 motorway linking Penrith at the foot of the Blue Mountains to Sydney. The three sites are served by a University sponsored bus route linked to Kingswood Railway Station.

A Penrith Campus Masterplan for Kingswood and Werrington South sites was completed in 2008 and adopted by Penrith City Council in 2010.<sup>5</sup>

#### Werrington North

The site is bounded by the Great Western Highway to its south, Cobham Remand Centre to the east, a railway corridor to the north, and residential dwellings to its west. Main vehicular access is from The Great Western Highway. Pedestrian access is provided through the site from Werrington Railway Station located to the north-east of the site. A bridge over Great Western Highway provides direct pedestrian and vehicular access to Werrington South campus.

Generally, the cottages and administration buildings appear to have been erected c. 1950s-1960s with the exception of buildings AA (Werrington Park House) and AD (Administration) and consist of face brickwork, and tiled roofing. Buildings are widely spaced apart providing an impression of a semi-rural setting.

Building AD was more recently commissioned c.2000 and consists of exposed off form concrete structural elements with concrete block infill panels and metal roofing behind parapets.

While Building AA (Frogmore House) has been altered and extended over many years, it is still a heritage significant building subject to Heritage Asset Management Strategy provisions<sup>6</sup>. Significant landscaping lines the main entrance road leading to a circular drive in front of building AA, with additional informal landscaping around Building AD that includes a small lake.

#### Werrington South

The site has frontage to and is located south of the Great Western Highway. Its western boundary adjoins TAFE, a private residence and O'Connell Street that also runs along the University's southern boundary. Residential development adjoins the east boundary. Main access to the site is from The Great Western Highway, while secondary vehicular and pedestrian access is provided from the overhead bridge from Werrington North and O'Connell Street in the south-east corner of the site.

Some original houses are still occupied as residential and academic accommodation, with major teaching buildings on the site ostensibly erected from mid 1990s to early 2000s. External fabric varies from face or bagged brickwork, precast concrete panels, composite panel and corrugated metal cladding, expressed concrete and steel framed structures and metal roofing behind parapets or discharging into eaves gutters. The condition of original dwellings varies. Minimal landscaping other than a formal entrance courtyard to the Library (Building BA) has been undertaken, with the contemporary buildings forming the main elements on the site.

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<sup>5</sup> Penrith (Kingswood and Werrington South) Campus Masterplan 2008 prepared by Conybeare Morrison International

<sup>6</sup> HAMS for Hawkesbury and Penrith (Werrington North) Campuses December 2008 prepared by Conybeare Morrison International and endorsed by the NSW Heritage Council in February 2009.

## Kingswood

The site is bounded by Second Avenue to the north, O'Connell Street to the east, and adjoins a proposed residential development site to the south, and existing residences to the west. Main pedestrian and vehicular access to the site is from Second Avenue, with secondary access available from O'Connell Street. The latter is often used to connect Kingswood to Werrington South campuses.

John Flack Avenue which runs north-south from Second Avenue has been identified on the campus masterplan as a major axis and is designated as a future 'University Mall' for this precinct. Buildings run parallel with, and to the west of this avenue.

Aside from some original weatherboard cottages on the site, development of main teaching facilities and administrative accommodation on Kingwood site occurred in phases of constructions c. mid 1960s – early 1970s. Majority of buildings are constructed using off-form concrete framed structures with waffle slabs, face brickwork infill panels with metal deck roofing behind parapets. A number of more recent buildings completed in 2007-2008 are constructed in face brickwork with corrugated metal roofs. Major refurbishments of existing buildings were commenced in 2008 and are on-going. A new leisure centre using more contemporary materials and new multi-storey residential accommodation for students was completed in 2010, with more new works planned for 2012.

## **2.2 Campus Planning Controls**

### **2.2.1 General design considerations**

It is a major objective of the University to fulfil its Mission and Vision for the University by providing learning environments that reflect its goals.

In support of a key element of the University's strategic plan involving building a network of campuses, sites and centres to realise its vision for learning, research and community engagement in Greater Western Sydney, it is focussing on strategies that create superior student learning experiences including implementation of flexible and innovative learning techniques supported by appropriate settings and learning environments.

The overall design objective is to establish and pursue a construction or refurbishment solution that complies with the project brief and satisfies all requirements and objectives.

Design of buildings and internal spaces must allow for maximum flexibility adaptable to various uses to minimise future costs of reconfiguration.

### **2.2.2 Campus Master Plans**

The UWS campus development program includes the preparation of a new master plan to aid the planning and development for each campus. The purpose of each master plan is to provide a structured framework for development on the campus.

Potential building development is an essential element of these Master Plans, and they indicate where buildings may be built and where buildings should not be built on all campuses. Departures from these Master Plans will only be allowed in exceptional circumstances with University Board of Trustees approval.

Campus Master Plans have been completed for Campbelltown, Parramatta, and Penrith (Kingswood and Werrington North sites) campuses with consultancies for Bankstown and Hawkesbury campuses to be completed and endorsed in the near future.

Copies of Master Plans for Parramatta campus, Penrith campus, and Campbelltown campus are available upon request from the CW&F Project Manager.

### **2.2.3 Landscape Master Plans and Guidelines**

A Landscape Master Plan and Guidelines<sup>7</sup> have been developed for all campuses to identify 'out of character' landscape elements, and provide contextual guidance for landscape elements and planting to suit each campus location and character.

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<sup>7</sup> Landscape Master Plans and Guidelines Vol 1 and Vol 2 - 2008 prepared by Francis-Jones Morehen Thorp (fjmt)

These include conceptual landscape guidelines and elements to address design issues as well as operational and maintenance issues such as paving, shade, dealing with services relocation and outdoor furniture. See UWS Landscape Master Plan.

#### **2.2.4 Heritage Assets**

The University has a number of buildings and landscapes of heritage significance listed on the Parramatta (South) Campus Conservation Management Plan and HAMS, and on the HAMS document for Hawkesbury-Penrith Campuses. In addition, other buildings of heritage significance are identified in the Conservation Management Plan for Hawkesbury campus (DRAFT).

##### **2.2.4.1 Conservation Management Plans (CMP)**

The University has a policy to maintain and conserve its heritage buildings listed in conservation management plans for the various campuses. The CMP is to provide design and adaptive reuse guidance of the University's heritage assets on this campus. Thematic Conservation Management Plans and or Studies for the distinct historical phases will be undertaken progressively over a period of time. The Conservation Management Plans for Parramatta Campus and Female Orphan School can be viewed at CW&F.

A Conservation Management Plan has been developed for the Hawkesbury Campus by Noel Bell Ridley Smith and Partners (NBRS+P). It is available from CW&F upon request.

##### **2.2.4.2 Landscape Management Plan (LMP)**

A LMP was prepared for Parramatta (South) campus identifying major landscapes of heritage significance. The Parramatta Campus Rydalmere Landscape Management Plan provides a philosophical basis for future work and established landscape and management principles deriving for the statement of significance to inform all future work.

Design of surrounding landscape to buildings on this campus shall be guided by both the Landscape Master Plan and the Landscape Management Plan.

See UWS Landscape Master Plan for Volumes 1 and 2. The Parramatta Campus Rydalmere Landscape Management Plan can be viewed at CW&F upon request.

##### **2.2.4.3 New Work**

Construction needs to take into account requirements and priorities at the levels of heritage significance within the appropriate Conservation Management Plan.

##### **2.2.4.4 Heritage Asset Management Strategy (HAMS)**

In conjunction with the Conservation Management Plans, UWS prepared HAMS for Parramatta South Campus, Hawkesbury and Penrith (Werrington North) Campuses, and maintains a register of heritage items that it is responsible for or occupies, known as the *Section 170 Register*.

Projects that are carried out in the vicinity of, or within heritage buildings or precincts must take into consideration the recommendations set out by the respective HAMS documents. HAMS documents related to Parramatta Campus, Hawkesbury and Penrith campuses are available by request from CW&F.

#### **2.2.5 Environmental Management System (EMS)**

As a signatory to the Talloires Declaration, UWS has a clear obligation to plan and implement actions for a more sustainable future. As such, UWS is committed to minimising impacts of its activities on the environment and conserving and continually improving the natural, built and social environment of its campuses.

The EMS comprises an Environmental Management Policy, Environmental Management Plan and associated documents. Applications of these will assist the University in its due diligence in relation to statutory environmental requirements as well as supporting broad ranging sustainability initiatives.

As well as the EMS, the UWS Sustainable Strategy comprises a Greening UWS initiative for sustainable practices including water and energy saving projects throughout all campuses.



For UWS Environmental Management Plan and related documents including UWS Sustainability Strategy and Greening UWS Action Plan, see

<http://policies.uws.edu.au/download.php?id=364>

It is **'mandatory'** for the Design Consultant or Contractor to submit a brief Environmental Management Plan for review by CW&F Project Team, which succinctly describes actions to address the following issues:

- Water conservation and avoidance of pollution discharges;
- Best practice waste management and resource recovery;
- Use, storage and disposal of hazardous goods and materials;
- Impacts on native ecological communities;
- Environmental awareness and training for contractors; and
- Environmental management systems of contractors.

Where required by the Relevant Environmental Rating Tool, Contractors must hold valid ISO 14001 Environmental Management System accreditation prior to and throughout the project.

### 2.2.6 Whole of Life Considerations

It is imperative to ensure that all facilities constructed incorporate sustainability, life cycle costs and maintainability in their design.

Design and installations must embrace and make adequate provisions for:

- Servicing and maintenance
- Removal and replacement of plant equipment
- Durability
- Energy and water minimisation and conservation
- Access for people with disabilities
- Flexibility of use/re-use

Designs which opt for minimising capital cost at the expense of on-going maintenance, energy and operating costs will be rejected by UWS. Such design will be rectified at the expense of the Consultant or Contractor as the case may be.

### 2.2.7 Waste Minimisation and Recycling

#### Buildings and Existing infrastructure

Assess thoroughly as first option, both the opportunities to reuse existing facilities and the long-term viability of new facility proposals.

Assess the heritage significance of the proposed sites and implement preservation or risk education programs where appropriate. Ensure that sites of heritage significance as listed in the Conservation Management Plans and HAMS documents are appropriately managed. Restore and reuse such items wherever possible. Where demolition of buildings is required and approved by the relevant authorities, individual items of heritage significance are to be saved and made available for public view.

Where an Environmental Rating tool, such as Green Star or NABERS is utilised, these should be used as a reference for specific waste and recycling targets.

#### Construction Waste

UWS requires that the amount of construction waste going to land fill is minimised, and resources are conserved through avoidance, reuse and recycling.

These principles shall be incorporated into the design through careful material selection and dimensioning to utilise standard material sizes in building fabric and fittings.

A waste management plan shall be submitted by the Design Consultant or Contractor for the review of CW&F Project Manager.

## 2.2.8 Hazardous Waste and Dangerous Goods Management

Compliance with all legislative and UWS requirements to minimise environmental risks related to the use, storage, and disposal of hazardous materials and dangerous goods shall be incorporated into the design and documentation of a project.

Removal and disposal of hazardous substances shall be in accordance with Australian Standards and guidelines issued by WorkSafe NSW and the Australian Safety and Compensation Council.

It is **'mandatory'** for the Design Consultant or Contractor to refer to the UWS Asbestos Management Plan when dealing with removal of asbestos containing materials.

### Importation of material onto UWS sites

All recycled or organic material brought onto UWS Sites must be certified for purity and source to ensure that no hazardous materials are contained therein.

It is **'mandatory'** for the Design Consultant or Contractor to submit a schedule of materials to be brought onto the site and their certification for source and purity for review by CW&F Project Manager.

## 2.2.9 Space Requirements

In accordance with UWS Space Management Policy, standards for space planning have been developed to be used for reconfiguration of existing buildings or for new building projects.

The referenced space standards, which have been benchmarked against Tertiary Education Facilities Managers Association (TEFMA) data for the same or similar uses of space, should be used as a guide and may in some instances need to be modified to suit particular applications and circumstances. The space allocations reflect the functions for which a space can be used.

Refer to Section 2.5.3 UWS Space Standards.

## 2.3 Statutory Compliance and Approvals

### 2.3.1 Statutory Compliance

All work on UWS buildings must be designed, constructed and maintained to comply with the current requirements of all relevant State and Commonwealth legislation. This includes the Building Code of Australia, all applicable Local Government Ordinances, and other Statutory Authorities relevant to the Project to ensure that the Project is not delayed.

### 2.3.2 Approvals and Certifications

Unless otherwise agreed in writing, the responsibility for obtaining all the required Statutory, Local Authority approvals, and Certifications shall remain with the Consultants or Contractors appointed by UWS.

Where facilities accommodate equipment with radiation emissions, it is **'mandatory'** to obtain approval from the UWS Radiation Safety Officer prior to proceeding with the Project.

### 2.3.3 Australian Standards

Wherever an Australian Standard exists in relation to any matter pertaining to the design, construction or maintenance of the facility, the current Australian Standards and Codes of Practice are taken as the minimum standard required by UWS for the Project. Higher standards may be required in some instances, and assumptions as to acceptable standards should not be made without consulting the CW&F Project Team.

### 2.3.4 Building Code of Australia

Design, construction and maintenance of the facility shall comply with the provisions of the Building Code of Australia.

### 2.3.5 Sustainability and Environmental Compliance

All work conducted on UWS buildings must be in line with relevant State and Commonwealth environmental legislation including the Protection of the Environment Operations Act 1997

(POEO Act). The POEO Act is the main piece of NSW environmental legislation covering water, land, air and noise pollution and waste management.

The design, specification and construction of projects shall also meet sustainability compliance as required by the NCC, DECCW, Commonwealth Dept of the Environment, Water, Heritage and the Arts and relevant Australian Standards.

### 2.3.6 Disability Discrimination Act

The UWS Disability Policy, consistent with the requirements of the Disability Discrimination Act 1992, adopts as a basic standard for all UWS developments both new and alterations, the current version of Access to Premises Standards

Design of site layout and buildings shall provide for universal access and facilities for people with disabilities in compliance with BCA, Disability (Access to Premises – Buildings) Standards, relevant Australian Standards including AS1428.1 and AS1428.2. Alternative solutions to these requirements may be sought from the CW&F Project Team only under extenuating circumstances.

### 2.3.7 Occupational Health and Safety

Design of buildings, interior layouts including fitments, furniture and equipment shall comply with safe design requirements as set out in the Australian Safety and Compensation Council *Guidance on the Principles of Safe Design for Work* and WorkCover NSW publications '*Workplace Amenities: Code of Practice*' and '*Safe Design of Buildings and Structures*'.

UWS has an OH&S Policy supported by UWS OH&S Guidelines and Procedures. It is '**mandatory**' for Contractors and personnel who are to work on UWS campuses to undertake necessary induction and training as prescribed by CW&F and UWS procedures prior to commencing work on site.

Handling, management and removal of hazardous waste and materials shall be in accordance with WorkCover NSW guidelines and statutory requirements, and Australian Safety and Compensation Council Codes of Practice.

## 2.4 Proprietary Products

UWS refers to some proprietary products or product brand names in these guidelines in the interest of performance, continuity and efficiency of maintenance. Alternative products may be specified by Consultants with prior approval from the CW&F Project Team.

UWS has a preference for products distributed or manufactured locally (including New Zealand) from local and sustainable/renewable material or resources by Australian owned companies. UWS may accept solutions using re-used/recycled products or materials or those with post consumer recycling content of at least 20% following consultation with CW&F Project Team.

## 2.5 Urban Design

### 2.5.1 Flexibility

Buildings shall be designed to maximise flexibility for internal layouts and uses. Load bearing walls and structural elements shall be minimized and restricted to areas such as the building core for stairwells, lift shafts and toilets. All other internal walls and partitions shall be non-load bearing and able to be readily removed and altered at minimum cost.

### 2.5.2 Space Management Policy

The UWS Space Management Policy address effective planning, management and control of accommodation and space as key components for the University's strategic planning and operational effectiveness.

This policy applies to all university space, including space that is used by Colleges, Administrative Units and Entities, and covers the assignment and control of such space. A separate UWS Timetabling Policy defines the categorisation of teaching space.

For UWS Space Management Policy, see

<http://policies.uws.edu.au/download.php?id=00157&vid=1&t=p>

The Policy aims to:

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- support the University's vision and mission;
- meet the workspace requirements of administrative units, academic units and associated entities;
- allow flexibility for the development of new initiatives and enable the University to respond quickly to market opportunities;
- provide a framework for the regular review of the University's space needs and the use of its physical assets, and
- form a basis for procedures to be followed in relation to the assignment of space and the relocation of staff.

### 2.5.3 UWS Space Standards

In support of the UWS Space Management Policy, a document was prepared outlining the UWS space entitlement standards, to be used for reconfiguration of existing buildings or for new building projects. These standards should be used as a guideline and may in some instances need to be modified to suit particular applications and circumstances.

The University has determined that no staff member can be allocated the use of two designated offices. Staff members who have responsibilities on several campuses must nominate their base campus where an office will be allocated for their use.

At other campuses these staff may use a "hot office" or shared facility in an area designated by their Unit for that purpose.

It is **mandatory** for the Consultant to refer to the UWS Space Standards for the design of office fit-outs and teaching spaces.

See UWS Space Standards and associated UWS Indoor Furniture Standards.

### 2.5.4 Sustainability and Design

The aim of these guidelines is to ensure that the future development of UWS campuses and all stages of projects inclusive of planning, design, external works, new buildings and refurbishment works including furniture and equipment selections shall be based on environmentally sustainable principles.

Within the available financial resources for projects, UWS encourages innovative design solutions that contribute towards sustainable development or achieve environmental benefits that could be benchmarked against a sustainability rating tool for educational facilities such as Green Building Council Australia (GBCA) Green Star rating system for design and the National Australian Built Environment Rating System (NABERS) incorporating the previously known Australian Building Greenhouse Rating (ABGR) system for measuring the performance of sustainable design.

In order to achieve environmentally sustainable design (ESD) approaches for construction of new buildings and the refurbishment of existing buildings, the University seeks to achieve a minimum 5 Green Star rating for new buildings and for all refurbishment projects, a minimum 4 Green Star rating.

The University may seek formal Green Star accreditation for selected projects.

Where discrepancy occurs between Environmental Rating Tools and UWS Standards, clarification from UWS CW&F Project Team must be sought.

### 2.5.5 Heritage Buildings and Assets

Design and construction in heritage buildings shall be in accordance with the stated heritage significance and directions in the relevant campus and building Conservation Management Plans and Heritage Asset Management Strategies.

### 2.5.6 Build-ability

Building design and services establishment/installation are only to be considered if they are feasible, applicable, practical, and simply constructed ("build-able").

### 2.5.7 Maintainability

As part of whole-of-life considerations, the selection of materials and design details should facilitate building longevity, should be easily maintained and cost effective. Consultants should achieve a balance between cost effectiveness and longevity of materials, fixtures and fittings.

Design and installation of building services, equipment and assets must enable clear and safe access to enable plant and utilities to be maintained throughout their life-span. Major plant must be located to enable replacement of components or equipment without building modification.

### 2.5.8 Disassembly

UWS encourages designs that are capable of being dis-assembled to minimise the embodied energy and resources associated with demolition.

### 2.5.9 Design for People with Disabilities

The University shall conform to all requirements of the BCA in new construction, and for alterations or refurbishments shall endeavour to meet the spirit of the DDA in all its undertakings where existing fabric makes compliance practicable.

Design of new buildings or refurbishment and external walkways should be in accordance with AS 1428.1 *Design for Access and Mobility* supplemented by AS1428.2 *Enhanced and additional Requirements – Buildings and facilities* and should enhance universal access without impacting on existing access for the disabled to existing spaces.

Each building shall contain at least one unisex toilet for people with disabilities unless directed otherwise by CW&F.

Universal access for people with disabilities should be provided to the main entry points and to all levels of a building where practicable in compliance with the Disability (Access to Premises – Buildings) Standards.

Hearing augmentation listening systems to aid hearing-impaired people should be included in teaching spaces, meeting rooms and public performance spaces that are provided with a sound amplification system. Acceptable types of listening systems, coverage of area and signage shall comply with AS1428.2. Refer to Part 5.6 Audio Visual Services for details of applications.

UWS has carried out a disability access audits for accessible pathways, public domain and buildings on Bankstown, Campbelltown, Hawkesbury, Nirimba Education Precinct (Blacktown), Parramatta and Penrith campuses. Any works related to the public domain and audited buildings including their immediate surroundings, must refer to the Disability Audit Reports available through the CW&F Project Manager.

### 2.5.10 Acoustic Requirements

Design and location of buildings on the site shall take into consideration and minimise impact from sources of local noise pollution such as traffic, industry and entertainment venues.

Design objectives of acceptable sound levels in internal spaces according to occupancy/activity shall be in accordance with Table 1 of AS/NZS 2107 *Acoustics - Recommended Design Sound Levels and Reverberation Times for Building Interiors*. Reference shall also be made to AS/NZS 1269 Part 2: *Occupational Noise Management – Noise Control Management*.

Site and building layout shall be designed to separate noise generating activities from quiet activities and minimise noise transmission from space to space in multiple-occupancy buildings.

Noise emitted from external equipment such as air-conditioning, ventilation, compressors and other noise generating sources shall be minimised and placement shall not intrude upon spaces requiring quiet noise levels.

For all air-conditioning, ventilating and other mechanical services installations, a report prepared by an Acoustic Consultant shall be provided to verify the noise ratings of all internal and external spaces adjacent to the installation and that they are within acceptable design levels.

### 2.5.11 Crime Prevention

All buildings, car parks, walkways, bicycle paths and their immediate environs shall be designed taking into consideration Crime Prevention Through Environmental Design (CPTED) concepts

and strategies to achieve a positive working and learning environment, whilst reducing the opportunity for crimes against University property, staff and students.

CPTED four key strategies aim to create the perception or reality of capable guardianship. They are:

*Territorial Re-enforcement* uses actual and symbolic boundary markers, spatial legibility and environmental cues to 'connect' people with space, to encourage communal responsibility for public areas and facilities, and to communicate to people where they should/not be and what activities are appropriate.

*Surveillance* assists people to feel safe when they can see and interact with others, particularly people connected with that space. The building layout should provide visual transparency and permeability, orientation and location, strategic use of design, landscaping and lighting of well-planned, well-designed and well-used space provides natural surveillance. Technical/mechanical or formal/organised surveillance is achieved through placement of equipment such as CCTV and tactical positioning of guardians e.g. supervisors or security personnel.

*Access control* restricts, channels and encourages people and vehicles into, out of, and around the campus and can be achieved by using physical and symbolic barriers. Tactical use of landforms, waterways features, design measures including building configuration, way-finding, desire-lines and formal/informal pathways are important crime prevention measures.

*Space/activity management* involves the formal supervision, control and care of the buildings and campus. All space, even well-planned and well-designed areas need to be effectively used and maintained to maximize campus community safety.

CPTED strategies require that a building and the activity it generates not only be considered in isolation, but also in relation to other buildings and activities that occur within the site and overall crime risks.

Consultants shall familiarise themselves with the application of CPTED concept and strategies or engage the services of a specialist consultant to ensure that their designs meet the intent of these guidelines.

In addition to the above, UWS is implementing a video surveillance strategic masterplan for all campuses. The Designer or Design Consultant shall obtain written approval for all CCTV and Emergency Contact Points from UWS Campus Safety and Security for the number and location of CCTV cameras and or Emergency Contact Points to be incorporated into the project. Further approval shall be obtained from UWS Campus Safety and Security prior to placement and installation.

Refer also to 4.3 External Walls and Windows for security requirements related to new residential development.

### 2.5.12 Building and Room Identification

UWS has an alpha and/or numeric system for identification of buildings on each campus and related room numbers for each floor level.

It is '**mandatory**' that the Designer or Design Consultant shall provide a soft copy of the final approved design and layout signed off by the stakeholder(s) in AutoCAD DWG format to the CW&F Project Manager for issuance of building number and room numbers to be used prior to commencing tender documentation.

### 2.5.13 As-built documentation and Manuals

It is '**mandatory**' for the Architect / Design Consultant and the Contractor to provide the following documentation of the architectural and building services works as installed or as built:

- CD containing electronic copy of drawings in DWG format and PDF format;
- Hard copies of drawings;
- Operation and maintenance manual comprising brochures and manufacturer's written instructions for maintenance and operation of equipment;
- Warranties as applicable.

All required DWG files shall be sent as compressed ZIP files created via the AutoCAD eTransmit process to the CW&F Project Manager for transmittal to CW&F Technical Systems.

Number of copies:

- two ring-bound folders each containing hard copies of the above
- one CD Rom containing all DWG and PDF format of the documents contained in the ring-bound folder

All submitted material shall be clearly .labelled to indicate:

Contractor:

Project Code/Number:

Project Name:

Campus:

Building ID:

Date CD is written and Date of Issue for Operation & Maintenance Manuals

**Cross reference:** Also refer to Contract Conditions of Particular Application for the relevant construction contract document for requirements.





## 3 ENVIRONMENTAL SUSTAINABILITY

### 3.1 General

The aim of these guidelines is to provide performance objectives to ensure that the future development of UWS campuses and all stages of building projects inclusive of master planning; urban design; external works; new buildings and refurbishment works including furniture and equipment selections shall be based on environmentally sustainable principles.

UWS is also required to comply with all relevant Commonwealth, state and local government laws, including a range of interrelated environmental regulatory requirements and guidelines.

An overarching UWS Sustainability Strategy comprises the statutory provisions within the UWS Environmental Management System and the Greening UWS initiative encompassing the aspirational aspects of the University's commitment and position on sustainability.

For UWS Sustainability Strategy, see

<http://policies.uws.edu.au/download.php?id=346&i=00216&v=1>

These guidelines shall be reviewed and amended to adopt new practices as they are developed and at the time amendments are made to statutory regulations.

### 3.2 Environmental Management Policy

As a signatory to the Talloires Declaration, UWS has a clear obligation to plan and implement actions for a more sustainable future.

Together with the implementation of an Environmental Management System, the Policy's purpose is to explain the University's overarching environmental objectives and expectations provide a clear sustainability framework to conduct its business activities and explain the potential risks associated with environmental mismanagement.

For Environmental Management Policy and EMP, see

<http://policies.uws.edu.au/masterlist.php#e>.

The UWS Environmental Management Plan (EMP) together with the Environmental Management Policy, Environmental Management System Manual and Environmental Management Procedures forms part of the UWS Environmental Management System (EMS).

The design, selection of materials and building services systems must meet BCA and other related environmental legislative requirements.

Within the available financial resources for projects, UWS encourages innovative design solutions that contribute towards sustainable development or achieve environmental benefits that could be benchmarked against a sustainability rating tool for educational facilities such as Green Building Council Australia (GBCA) Green Star rating system for design and the National Australian Built Environment Rating System (NABERS) incorporating the previously known Australian Building Greenhouse Rating (ABGR) system for measuring the performance of sustainable design.

### 3.3 Environmental Management Plan

The UWS Environmental Management Plan outlines programs of actions which have been identified as part of the UWS Environment Management System. These are required as part of the due diligence and compliance with environmental legislation and regulations. A complementary program of actions which reflect broader aspirational objectives relating to sustainability are outlined in a similar format in the Interim Greening UWS Action Plan that includes the following programs with each objective below having identified actions, key performance indicators, timeframes and responsibilities:

- Energy Conservation
- Water Conservation Management
- General Waste Minimisation and Recycling
- Hazardous Waste and Dangerous Goods Management
- Remnant Bushland and Biodiversity Management

- Promotion of Environmental and Sustainability Awareness
- Contractor and Lessee Environmental Impacts
- For Greening UWS Action Plan – Interim, see <http://policies.uws.edu.au/view.current.php?id=00228>.

### 3.4 Environment Management

Consideration shall be given to the appropriateness of alternatives to development such as the 'no development' option and non structural alternatives.

Where appropriate, as part of integrated environmental, safety/OH&S management plans evaluate site and local ecosystems incorporating water saving management systems and site audits as outlined in Section 2.2.5.

A pilot energy Smart Metering and Energy Reduction Project is being trialled at Hawkesbury campus, and assessments are being prepared for a Greenhouse and Energy Report. Implications of these initiatives for Design Consultants and Contractors will be identified and communicated.

For projects over **\$20,000** the Contractor is responsible to prepare and adopt Environmental Management Plans through all phases of the project.

For projects over **\$5M** the Contractor is responsible to prepare and adopt Waste Management Plan for the construction process. Local councils also have criteria establishing when Waste Management Plans are required.

### 3.5 Energy Conservation

Energy consumption shall be minimised by careful use of passive solar design, selection of fittings/appliances and optimising engineering design. The objective is to eliminate waste and to improve efficiency of energy use, seeking to reduce its energy consumption by a 10% improvement in consumption per Equivalent Full-time Students Unit (EFTSU) over three years.

The methods which will be adopted to achieve these objectives shall be determined within the financial limitations of the University and with regard to the likely savings to be achieved.

### 3.6 Water Conservation and Management

Designs shall incorporate the relevant technologies to develop and implement strategies to minimise potable and general water consumption and ensure surface water discharges from UWS campuses is monitored, assessed and managed with respect to environmental values in ANZECC (2000) Guidelines.

Waste water and sewage shall be disposed of in accordance with legislative requirements, and where appropriate and within financial limitations of the project, rainwater capture for reuse in toilet flushing together with stormwater harvesting and water recycling for irrigation of landscape and gardens shall be considered.

A UWS Water Saving Action Plan has been developed to meet regulatory compliance to reduce water consumption on UWS Penrith and Hawkesbury campuses. A performance specification has been developed to guide Design Consultants in their selection of sanitary fittings and fittings.

See UWS Water Saving Performance Specification (DRAFT)

### 3.7 Biodiversity Management

UWS has existing Cumberland Plain communities on all campuses, some of which contain endangered species listed under the NSW Threatened Species Legislation. Works impacting upon Cumberland Plain remnants require additional approvals through local government authorities and DECCW.

Existing appropriate landscape features, including those of heritage significance, shall be preserved where possible as a first option.

The physical viability of natural ecosystems shall be preserved and protected by ensuring systems are retained intact, uninterrupted and unified. Wildlife corridors shall be maintained or

provided between fragmented ecosystems in cooperation with neighbouring properties. The widest possible range of indigenous plant and animal communities, in appropriate habitats, shall be established where practicable and financially viable to restore the site to its potential diversity of species.

Maintenance of biodiversity shall be supported with site remediation activities such as regeneration and revegetation. Natural habitats shall be protected from adverse effects of settlement such as stormwater run-off, erosion, and invasion by exotic species.

Use of chemicals (pesticides, herbicides and fertilisers) shall be minimised, and water quality of adjacent environments shall be protected during construction by effective erosion and run-off controls.

### **3.8 Environmental and Sustainability Awareness**

The design of buildings and interior fit-outs shall consider and incorporate sustainability measures as appropriate for 'best practice' performance able to be evaluated by sustainability rating tools such as set out in the rating tools for Education facilities available from GBCA Green Star and NABERS.

Use of passive solar design shall be a first preference in dealing with the energy efficient and overall sustainability performance of a building.

Materials shall be selected for the following properties:

- High recycled content
- Reused products and materials where approved by CW&F Project Team
- Locally/regionally produced
- Made from renewable agricultural by-products in preference to petroleum based products
- Sustainable timber resourced from plantation or managed forests
- PVC minimisation
- Ability to be reused, recycled, or are biodegradable
- Minimum maintenance
- Maximum durability based on anticipated life of interior construction, equipment, finishes and furnishings

UWS has a preference for products to be sourced from eco/sustainability certifying organisations such as EcoSpecifier, Good Environmental Choice Australia (GECA) and related mutual recognition partner organisations as appropriate.

Hardwood timber shall be sourced from Australian Forestry Standard (AFS) certified forests. All other timber including waste wood materials such as particle boards, fibre boards and edge-glued panels shall be sourced from sustainable forestry or other renewable resources.

DO NOT use any endangered Rainforest species in UWS projects.

### **3.9 Contractor Environmental Impacts**

Contractors, their representatives and subcontractors shall conduct their activities in an environmentally responsible manner, consistent with environmental, safety and OH&S considerations as part of integrated risk management and in compliance with relevant legislation.

## 4 BUILDING FABRIC

Cross reference

This part to be read in conjunction with:

- Part 2 Urban Planning and Design Controls
- Part 3 Environmental Sustainability

This part may be reviewed against sustainability performance rating tools for Education facilities such as GBCA Green Star or NABERS.

### 4.1 BUILDING STRUCTURE

#### 4.1.1 Generally

The design of the University's new buildings shall incorporate flexibility for future changes in internal layout and use. Structural design principles or methodologies shall combine both flexibility and economy.

For work in and on heritage buildings, refer to Section 2 part 2.5 Urban Design.

#### 4.1.2 Floor to floor height

Floor to floor height of new buildings shall match adjacent buildings if appropriate, and should allow for sufficient ceiling space for the reticulation of services.

UWS preferred minimum ceiling height in offices and habitable rooms of residential buildings to be 2700mm; ceiling height in other spaces such as teaching facilities, laboratories and sports facilities as required by function.

#### 4.1.3 Weather tightness

Design and detailing of new work or alterations and extensions to UWS buildings including penetrations through building fabric shall provide adequate protection from rain, hail, wind, and dust intrusion. Sealants shall not be used as a primary barrier.

#### 4.1.4 Fire rating

Penetrations of any fire rated building element shall maintain the fire rating of the material being penetrated (i.e. sealant or treatment shall comply with the designed fire rating).

#### 4.1.5 Exposed Concrete

For waterproofing and to prevent deterioration due to exposure to the environment, hydrostatic pressure, puncturing, delamination, damage from backfilling and the like, the concrete mix shall contain the appropriate proprietary additive manufactured by XYPEX Chemical Corporation or equal approved by CW&F Project Manager.

#### 4.1.6 Insulation

Where specified for thermal efficiency in a project, it is '**mandatory**' for insulation board products made from foam plastics to be encased by a close fitting fire barrier material (such as concrete, cement render or plaster board), and the foam plastic board shall be certified 'Grade 1' when tested to AS/ISO 9705 Room Corner Test.

## 4.2 FLOORS AND FLOOR FINISHES

This section shall be read in conjunction with the remainder of these guidelines as applicable.

### 4.2.1 Floors

#### 4.2.1.1 Design

Floor slabs shall be designed for the most economical construction and flexibility of use, with due considerations for long-term deflection, provision for penetrations both initially and for the life of the building. Inclusion of conduits for services shall be considered at the early design phase.

#### 4.2.1.2 Floor Loads

The structure should be designed for floor loadings of appropriate uses in accordance with the Australian Standards AS1170.

Existing floor loading shall be verified where change of use increases population densities or compactus loading is required.

#### 4.2.1.3 Compactus shelving

Where a compactus is required in general office areas, it shall be located where the structure can support such loads, or located in other areas of specified loading as nominated by the brief.

#### 4.2.1.4 Termite Control

Anti-termite treatment shall be provided to all new building work, and where possible, to existing buildings undergoing substantial renovations. All workmanship and materials shall conform to the requirements of AS3660.1 and AS3660.2 for the protection of new and existing buildings from subterranean termites.

UWS uses the following method or combination of methods of termite protection management to suit the building project and conditions:

- **Chemical barriers:** Australian Pesticides and Veterinary Medicines Authority (APVMA) approved chemicals only shall be used to treat the ground prior to start of construction, or where physical barriers are not possible. Chemically treated sealants such as Term-Seal or equivalent shall be used to seal cracks in existing buildings or where new concrete slabs abut existing concrete slabs.
- **Physical barriers:** physical barriers such as ant caps or termite shields shall be used for raised or suspended timber floors. Stainless steel mesh such as Termimesh shall be used under new concrete floor slabs with penetrations suitably sealed with a termite barrier in accordance with manufacturer's written instructions. Finely crushed granite such as Granitguard shall only be used in brick cavity walls. New concrete slabs on ground shall be designed and installed to AS 2870 to prevent cracks and voids forming passages for termites. An exposed edge is mandatory to provide visual surveillance of termite activity. Where a new slab abuts an existing slab, termite resistant materials shall be used to prevent passages for termites between the two slabs.
- **Termite resistant materials:** Some materials are resistant to attack by termites such as concrete, brick, steel and termite resistance timbers listed in AS 3660.1.

The Design Consultant shall ensure minimising risk of termite attack through appropriate design of the building, selection of materials, suitable drainage and ventilation under and around the building, and landscaping.

A lockable access hatch shall be provided to enable inspection of under floor areas.

#### 4.2.1.5 Membrane

All internal ground slabs shall have an effective membrane complying with the appropriate Australian Standards turned up at the perimeter and all joints taped in accordance with good building practice.

Floors, walls and lift pits shall be fully tanked where below ground or subject to hydrostatic pressure. Adequate provision of relief of hydrostatic pressure shall be provided wherever required.

#### **4.2.1.6 Floor penetrations**

All floor penetrations and associated service pipes shall be sealed to control noise and water penetration. Such penetrations shall also be suitably sealed and treated to match required fire rating of the floor where applicable.

Adequate falls to the floor waste shall be allowed for in the design of all wet areas (i.e. laboratories, toilets and shower rooms, plant rooms, laundries, tunnels etc.). Where appropriate, a perimeter kerb shall be installed to contain spillages and flooding.

#### **4.2.1.7 Finish**

Where the concrete slab is to form the substrate finish for resilient floor covering such as vinyl or sports flooring, the slab shall be prepared in accordance with flooring manufacturer's printed instructions.

#### **4.2.2 Floor finishes**

Where an Environmental Rating tool such as Green Star or NABERS is utilised, these should be used as a reference for specific emissions and flooring requirements.

Generally, a metal separation strip shall be installed where a junction between dissimilar floor finishes occurs.

DO NOT use linoleum flooring.

#### **4.2.2.1 Carpet**

Generally, loop pile modular tile carpet shall be used in all UWS buildings.

Only modular tile carpets with low TVOC levels are acceptable. This level shall not exceed 0.5mg/sq metre/hr and any indoor carpet adhesive shall not exceed 50mg/sq metre/hr.

Carpet which is able to be recycled and whose manufacturer has reduced the life cycle impacts of the carpet in its manufacture and distribution, is desirable.

For meeting rooms, loop pile modular carpet tiles with integral acoustic cushion backing equivalent to Ontera 'Envibond' backing shall be used.

UWS requires locally produced modular carpet tiles manufactured by Ontera Modular Carpets Pty Ltd.

Broadloom carpet may only be permitted in particular limited applications and shall be adhesive fixed to double bonded underlay equivalent to 'Airstep' by Bridgestone Australia. VOC level of the underlay must not exceed 0.5mg/sq metre/hour. A decision about the use of Broadloom carpet shall not be made without prior written approval from CW&F Project Team. NOTE: CW&F Project Architect to arrange for carpet performance testing by Manager, Cleaning and Waste Management Services prior to approval.

#### **4.2.2.2 Vinyl**

Sheet vinyl shall only be used in areas noted in the Room Data Sheets and selection shall be approved by UWS prior to documentation phase.

UWS has a preference for low maintenance resilient flooring by Polyflor Australia Pty Ltd and Tarkett Australia Pty Ltd.

Adhesives used in fixing sheet vinyl shall be solvent free and compatible with the vinyl selected.

All joints shall be welded.

Vinyl to wet areas such as cleaners' rooms, common rooms at server counters, and isolated basins shall be an approved non-slip vinyl covered up the walls to a height of 150mm. Slip resistance for all vinyl flooring shall comply with the Introductory Guide HB 197:1999 published by CSIRO and Standards Australia.

Approved anti-static vinyl shall be installed in all areas subject to electricity discharge such as computer rooms, bio-boxes etc. For anti-static requirements refer also to UWS Telecommunications Standards.

#### **4.2.2.3 Seamless Flooring**

Polyurethane seamless flooring shall be applied in all science laboratories where damage to floor finishes is likely due to spillage of water, chemicals or other materials likely to be used in laboratory classes or research spaces. The seamless flooring shall be covered up all walls, plinths and service pipes to a height of 150mm. The polyurethane material must be UV stabilized.

Slip and chemical resistant vinyl may be used in laboratories only if the material is suitable for the application and manufacturer's warranties are provided.

#### **4.2.2.4 Ceramic Tile**

All floors in toilets, showers and airlocks shall be finished in first quality ceramic tiles, as approved by CW&F Project Team.

Floor tiles to toilet and shower areas shall be to required slip resistance of AS/NZS 4586 and HB197:1999 and laid with matching grout, appropriate caulked expansion joints as required and finish level with adjacent finishes. Epoxy grout shall be used in commercial food preparation areas.

#### **4.2.2.5 Raised Access Floors**

Where required by the brief, a grid-less raised access flooring system shall be installed as approved by CW&F Project Team.

Flat back 150mm high prefinished black metal skirting shall be used at the floor perimeter.

#### **4.2.2.6 Plant Room Floors**

Concrete floors to Plant Rooms, Lift Motor Rooms and accessible Service Cupboards shall have a wood-float finish.

Floors to Accessible Service Cupboards located in buildings with timber floors shall be the existing timber floor.

#### **4.2.2.7 Car Park Floors**

Concrete floors to car parks shall be sealed unless otherwise noted in Project Brief or advised by CW&F Project Team.

#### **4.2.2.8 Stair Nosing, Trim and Threshold**

To edges of stairs, thresholds and edges of tiers and steps in Lecture Theatrettes and auditoria metal stair nosing and or trim shall be provided. Stair nosing or trim shall be of a slip resistant design and include a 50mm-75mm strip of contrast colour to floor finish in compliance with AS1428.1.

UWS requires proprietary stair nosing with contrast strip insert. Select profile to suit floor and tread finishes. Use concealed or countersunk fixings.

UWS preferred proprietary item: Sure Tread Stair Nosings Pty Ltd  
(<http://www.stairnosings.com.au/>)

An approved tapering anodized aluminium threshold shall be installed at all external doors.

To accessible thresholds, provide threshold ramp in compliance with BCA and AS1428.1

#### **4.2.2.9 Door Mats**

Door mats shall be provided at normal access doors at ground level to the building on the inside of the door. Entrance mats shall be slip resistant and of durable UV stabilized anti-static

polypropylene material, finish flush with surface of adjacent flooring and be of contrasting colour.

UWS has a preference for 'Waterhog' mats by The General Mat Company (Tel: 1800 625 388); W.O.M.B.A.T modular carpet from Ontera Modular Carpets (<http://www.ontera.com.au/>) .

Recessed commercial quality entrance mats with UWS approval only. External door mats shall be provided in appropriately sized mat wells and be capable of being removed for cleaning purposes.

Colour and patterns of all floor finishes shall be selected in consultation with CW&F Project Team and approved by UWS prior to tender documentation.

#### **4.2.3 Skirtings**

For types of skirting, refer to 4.5 INTERNAL WALLS, PARTITIONS AND FINISHES Clause 4.5.7 Skirting.

#### **4.2.4 Sealants**

Sealants shall be selected for their application and shall be colour matched to the finished surface.

Sealants shall have minimum VOC emissions not exceeding requirements of the South Coast Air Quality District Rule 1168.

#### **4.2.5 Adhesives**

Adhesives shall be selected for their application and shall have minimum VOC emissions.

Adhesives shall have minimum VOC emissions not exceeding requirements of the South Coast Air Quality District Rule 1168.



## 4.3 EXTERNAL WALLS AND WINDOWS

### 4.3.1 Generally

The materials and texture of external walls shall be approved by UWS at the preliminary sketch design stage.

It is a ‘**mandatory**’ requirement that all walls shall be waterproof.

### 4.3.2 Materials

Materials should as far as possible be selected to match existing forms of construction where existing buildings are being refurbished. Material selection shall be compatible with proposed finishes and facilitate future expansion or upgrading. All forms of construction should be approved by UWS at an early stage to ensure that the emerging design reflects materials and systems acceptable to UWS.

### 4.3.3 Finishes

Finishes which minimize future maintenance shall be specified. It is UWS’ preference that brickwork is not painted or cement rendered. If external walls are to be rendered, water resistant cement render applications shall be used. Applied finishes such as those equal to Granosite Coating Systems or Dulux Acratex systems may be used to obtain the required texture and colouring, but only if other methods are unachievable.

Concrete finishes shall be minimum Class 3 concrete finish and highly visible feature building elements shall be Class 2 concrete finish properly vibrated to minimise air pockets.

Metal rainwater goods and roofing generally to be finished in Colorbond. Generally, downpipes shall discharge into down-pipe stormwater pits as shown on UWS Hydraulic Services Design Standard details. Paint finish to trims, downpipes, etc. may be used in specific areas, subject to approval by CW&F Project Team.

All proposed finishes must be approved in writing by CW&F Project Team and UWS at an early stage of the design process.

### 4.3.4 Colours

Colour schemes for work in Heritage buildings of moderate to high significance must be appropriate to the period of original construction of the building.

All proposed colour schemes are to be submitted to UWS for formal approval by UWS Project Control Group prior to inclusion in the final specifications.

### 4.3.5 Construction

Poured in-situ concrete, ‘panel lift’ or pre-fabricated external walls and/or elements shall be designed with particular care and consideration given to the possible future effects of insufficient reinforcement cover, shrinkage and cracking leading to corrosion of reinforcements and eventual spalling of concrete. All such designs will be critically examined and structural guarantees are required. Galvanizing to structural reinforcement shall be considered in locations exposed to salt water or chemical attack.

Exposed concrete finish and colour control must meet the satisfaction of UWS, otherwise such surfaces shall be rendered or receive another acceptable applied finish at no cost to the University.

### 4.3.6 Windows

All external windows shall be of a commercial quality suitable for **commercial application** and designed in accordance with relevant codes. All frames shall be aluminium unless fitted to heritage buildings, in which case frames shall be in timber. For purposes of design, Terrain Category 2.5 must be used as a minimum or as required by certifying Structural Engineer.

UWS has a preference for commercial quality aluminium frames designed with thermal breaks for sustainability and durability.

Use of louvre windows shall be approved by CW&F Project Team at an early stage of the design process.

Where natural ventilation is required for habitable space or where mixed mode ventilation system requires natural ventilation openings, a minimum aggregate direct ventilation opening shall be provided in accordance with BCA provisions and AS1668 Part 4: Natural Ventilation in Buildings. Provision of openable windows shall be subject to approval from CW&F Project Team.

All aluminium shall be anodized or powder coated. All exposed screw fixings, rivets, trims, and cut edges etc. shall be of similar material and coloured to match frame. The minimum thickness of anodizing shall be not less than 20 microns. Use inert materials to prevent direct contact between incompatible metals, and between chemically treated timber and aluminium or coated steel.

The cavities between the inner and outer walls are to be suitably flashed and the cavities closed with the wall material and not aluminium angles. Appropriate drainage (and where required, insulation) of window sections and spandrels shall be provided.

The required window system shall be designed in accordance with Section 2.5.10 Acoustic Requirements where the building, space or room is adjacent to an incompatible noise source.

Aluminium windows shall be installed in accordance with AS2048 Code of Practice for Installation and Maintenance of Aluminium Windows in Buildings.

Full height glazed windows and doors shall be fitted with 75mm high solid vinyl strip visual indicators to AS1428.1. Centreline of the strip shall be at 1000mm above finished floor level. Colour shall be selected to suit architectural surroundings.

Icon or shapes on visual indicator strips are NOT permitted

#### 4.3.6.1 **Window Hardware**

All windows shall be fitted with mechanical locks. Key locks are not required.

#### 4.3.7 **Sun control**

Sun shading including external sun control devices and screening shall be provided as required by the project to minimize the life cycle costs of air conditioning and building façade systems including soft furnishings such as blinds or curtains.

Where external metal louvers or sun control film is applied, care is to be taken with selection of type of louvre or film as metal content in shade structures and metallic film interferes with internal and external Wi-Fi transmission. UWS has a preference to use applied film that does not contain metallic particles.

If windows require blinds for sun control or privacy, these must be specified for supply and installation under the building contract.

Requirements for blinds including operability (whether static, manual or motorised control) are to be clarified at an early design stage with CW&F Project Team to ensure that the window frame and reveal detailing is compatible with optimum sun control or screening system.

DO NOT use venetian blinds or vertical blinds.

See also Section 4.8 Ceilings - Recessed Pelmet.

#### 4.3.8 **Security and insect screens**

Provision of screens in Bushfire prone areas designated on UWS campuses shall be in accordance with AS 3959 Construction of Buildings in Bushfire Prone Areas.

### Student Residences

Generally, all opening windows in new residential buildings shall be provided with aluminium framed mesh insect screens.

Where insect screens are required to be provided to heritage significant buildings, these shall be designed to be in keeping with the fenestrations and window frame material.

To all ground floor windows and glazed doors in new residences, provide Crimsafe® Security System stainless steel mesh screens. Where alternative egress is required, provide emergency exit features to the Crimsafe® Security screens.

### Other buildings

Provide security and insect screens where required by the design brief. UWS has a preference for installation of insect screens to openable windows.

#### **4.3.9 Window cleaning**

UWS has a preference for all external surfaces of glass to be easily accessible for cleaning from the inside. Where necessary, allow for safety hooks and runners. Details shall be discussed with CW&F Project Team.

#### **4.3.10 Sealants**

Sealants shall be selected for their application and shall be colour matched to the finished surface.

DO NOT use sealants as the primary waterproofing barrier.
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#### **4.3.11 External protection**

Where external fabric of buildings including fire protection systems, valves, switchboards, mechanical plant and pipes are liable to vehicle damage, bollard protection shall be provided.

Where building facade or other freestanding structures such as on ground signage structures are located adjacent to turf areas, a 200mm wide buffer with concrete or brick edging shall be provided in accordance with details in UWS Landscape and External Works Standards.

## 4.4 ROOFS

All roofs and roof plumbing and drainage shall comply with AS/NZS 3500, NSW Code of Practice for Plumbing and Drainage, other relevant Australian Standards.

### 4.4.1 Roof Types and Materials

Pitched roofs shall be provided to all buildings as far as practicable and be compatible with the character of the particular campus.

Minimum pitch shall be two degrees (2°) above the Manufacturer's minimum pitch recommendation and an appropriate safety margin provided to suit prevailing conditions. All roofing materials employed shall be compatible to avoid electrolysis.

DO NOT use membrane type, trafficable roofs. Where *already installed* (existing), provide protective metal deck roofing. Where it is *proposed* to be installed, obtain written approval from CW&F Project Team during the design phase of the project.

### 4.4.2 Roof flashings

Roof flashings shall be designed to minimize reliance on and use of sealants, and shall be fabricated and installed in accordance with the roofing material manufacturer's written instructions. All fixing types are to be in accordance with the roofing material manufacturer's written instructions.

Flashings to penetrations for roof access hatches, skylights and service penetrations shall incorporate a soaker flashing which must extend to the roof ridge whenever possible. Flashings to all roof penetrations must be designed to minimise the collection of leaves and debris. All box gutters shall have flashings taken up over the bottom purlin and folded down into the gutter.

Avoid chemical reaction of metals interfacing with other metals in any exposed situation. Provide inert material to separate dissimilar metals.

DO NOT use Dektite flashings on flat roofs without upstream flashings.

### 4.4.3 Gutters and Downpipes

It is **mandatory** to refer to UWS Hydraulic Services Design Standards for standard downpipe details and pits.

Eaves gutters shall be used in preference to box gutters and shall be of a self cleaning profile where possible.

DO NOT use high fronted eaves gutters, i.e. where the front face is higher than the roof at the inside face of the gutter.

Consideration may be given to design of buildings with no gutters to allow rain water runoff into prepared drains to minimise maintenance, OH&S and fire risk.

Internal and box gutter design shall be considered only as a last resort option, but if included, shall be in marine grade stainless steel and clearly demonstrate the inclusion of controlled overflow. Necessary joints shall be first class quality in design and workmanship, with inspection opening provided for cleaning. For maintenance purposes, a minimum width of 450mm and a minimum depth of 200mm are required and shall be able to withstand loads of maintenance personnel.

All gutters shall be fitted with hail and leaf guards to prevent blocking during storms. Guard system to CW&F Project Team's approval.Box gutters, gutters, rainwater heads and downpipes

shall be fabricated from stainless steel, 'Colorbond', copper, zinc or uPVC. All gutters must be accessible for maintenance.

Overflow relief pipes shall be provided to all roofs, rainwater heads and gutters as a safeguard against flooding caused by downpipe or drain blockages. Overflows shall discharge clear of building lines and pedestrian footways. Discharge from overflows shall be visible and horizontal outlets shall discharge a minimum of 150mm from the face of the building or fascia. Overflows shall be designed so that the combined clear outlet area of the overflow exceeds the clear outlet area of downpipes serving the gutter, and positioned to minimise flooding into the building or damage to the building in the event of gutter flooding.

Where located internally, the downpipe shall be insulated for noise attenuation to acoustic requirements of the space(s). The downpipes shall not be connected directly to the drain, but shall discharge over a stormwater sump designed to prevent leaves and debris from entering the drains.

DO NOT build downpipes into walls or columns.

Where downpipes are located externally and potentially subject to vehicular damage, protection shall be provided to ensure that the downpipe remains fully operational.

DO NOT connect external downpipes direct to storm water lines in ground.

Fit external downpipes with a foot bend and terminate above a sink stone or stormwater pit to standard UWS detail to discharge into grated stormwater pit to avoid lawn mower damage. Refer to UWS Hydraulic Services Design Standards for detail.

Rainwater heads shall be provided where potential water damage to the interior of the building could occur during storms.

#### 4.4.4 Roof Access and Roof Safety

UWS has a preference to eliminate the risk of fall by avoiding location of plant and equipment on roofs.

Where this cannot be avoided and the roof or other areas of height are to be accessed on a regular basis, then design of proper safe access, provision of equipment platforms and associated walkways and handrails are considered as a first and better option than fall-restraint safety systems.

If access to the roof is minimal then a physical restraint system is the most cost effective solution.

It is **mandatory** for the Design Consultant to submit the new or refurbished/altered roof plan and a cross section through the building for assessment by the CW&F Project Team who will decide whether a height safety system is required or if the roof design falls into the UWS Risk Management category.

A fall-restraint safety system shall be installed, complete with anchorage points or cable supports mechanically attached to the roof structure including safe access to the roof and signage, CW&F bar coded and certification of completion. Selection of such a system shall be carried out in consultation with CW&F Project Team.

Where new extensions to existing buildings are constructed and the existing building already has a roof safety system installed, the existing system shall be extended to comply with the code and roof safety for the whole building and re-certified.

Designers have obligations under the Occupational Health and Safety Act and design of buildings and structure must be in compliance with Part 4.3, division 6, clauses 56-61 of the *Occupational Health and Safety Regulation 2001*

## 4.5 INTERNAL WALLS, PARTITIONS AND FINISHES

### 4.5.1 Flexibility

Buildings must be designed to be as flexible as possible internally. Load bearing walls shall be minimized and restricted to areas such as the building core for stairwells, lift shafts and toilets. All other internal walls and partitions shall be non-load bearing and able to be readily removed and altered at minimum cost.

### 4.5.2 Materials

**Generally** – Only plasterboards, adhesives, compounds and plasters with low Volatile Organic Compound (VOC) content shall be used. Where an Environmental Rating Tool such as Green Star or NABERS is utilised, these should be used as a reference for specific VOC emissions limits (for example, all Gyprock® products meet the requirements of the Green Building Council of Australia (GBCA) specification).

Where new or existing masonry walls are to be rendered, metal external corner trims shall be employed to protect external corners from damage.

Partitions and internal walls may be plasterboard on metal stud, or equivalent as required by the application.

Impact resistant plasterboard shall be used in high traffic areas susceptible to damage. Metal external corner trim in stainless steel or clear anodised aluminium shall be used for external corners for added protection.

Security plasterboard shall be used in enclosures requiring high security such as exam paper stores.

Fibre cement lining equivalent to 'Villaboard' shall be used in wet areas.

Partitions shall be designed and installed to comply with the current Australian Standard '*Code of Practice for the Erection and Fixing of Fibrous Plaster Products*'. Where appropriate, the design of partitions and openings in partitions shall also comply with the requirements of Australian Standard '*Components for the Protection of Openings in Fire Resistant Walls*'.

All partition walls shall be fitted with insulation material of appropriate acoustic and thermal properties to meet Project Brief requirements.

UWS has a preference for insulation materials used in the works for thermal and acoustic properties to have zero Ozone Depletion Potential (ODP) in both manufacture and composition. Design, selection and the installation of insulation and vapour barriers must prevent occurrence of condensation.

### 4.5.3 Operable Walls

Where there is a requirement to open up adjacent similar spaces into a larger space, e.g. seminar rooms, this shall be achieved by the use of operable walls.

Where appropriate, operable wall panels may be finished in whiteboard or writable surfaces.

The acoustic performance of the operable wall panels and baffle wall over in ceiling space shall be equal to that of a fixed partition between the spaces in accordance with the acoustic requirements of Section 2.5.10 Acoustic Requirements.

### 4.5.4 Glazed Partitions and View Panels

Glazed view panels shall be provided in internal partitions to provide surveillance or transmission of natural light. Size and location of view panel to comply with AS1428 Design for Access and Mobility Part 1 and Part 2.

All academic and general offices shall have a 300mm wide glazed sidelight beside the door to match door height.

All glazed partitions and panels shall be installed in anodised or powder coat finish aluminium frame to the full perimeter. Stiffening shall be provided to panels abutting door frames to ensure that the door frame does not twist and prevent lock from latching.

All glazing shall be selected and installed in accordance with Australian Standards and Codes of Practice.

Glazed partitions shall be designed in accordance with the requirements of Section 2.5.10 Acoustic Requirements.

Applied translucent and or security film may be applied to glazed panels as required to suit particular situations as directed by UWS. Translucent film to glazed panels shall start 600mm above floor level, stop no higher than 1800mm above floor level, and incorporate clear vision gaps – refer to Appendix A for minimum requirements.

75mm high solid vinyl visual indicator strips shall be installed in compliance with AS1428.1. Centreline of the strip shall be at 1000mm above finished floor level. Colour shall be selected to suit architectural surroundings.

Icon or shapes on visual indicator strips or in translucent film are NOT permitted

Curtains or blinds shall not be installed to internal glass walls or panels except in exceptional circumstances approved by the Director, CW&F.

#### 4.5.5 Fire rated walls

Certified proprietary fire rated wall systems shall be used where required by NCC. All service penetrations and joints to abutting surfaces shall be treated to achieve the same fire resistance level as the wall.

#### 4.5.6 Acoustic Performance

All internal walls and partitions shall be designed in accordance with the requirements of Section 2.5.10 Acoustic Requirements.

Partitions to be insulated and or double sheeted on one or both sides as necessary to achieve the required sound transmission loss between spaces. Details at junction between partitions and external windows shall ensure sound insulation is maintained at that intersection equivalent to that of the remainder of the partition.

Partitions shall extend from the floor slab to underside of slab above when the partition is required to have a sound rating of Rw41 (STC 43) or higher. Substitute details such as the installation of loaded vinyl sound baffles (e.g. wave bar) or polyester baffle solutions in ceiling spaces may be permitted in lieu of extending partitions to underside of the floor slab over in special circumstances as approved by UWS. Such baffles are to be extended in the horizontal plane for minimum of 1000mm to either side of the wall. For partitions required to have a sound rating index (Rw) of between 30-40, loaded vinyl sound baffles shall not be used if they will be penetrated by service pipes during installation or in the future.

All penetrations in partitions shall be appropriately sealed and ductwork appropriately sound attenuated to maintain the required sound rating.

Hydraulic Services including those located in ducts and cupboards shall be suitably sound attenuated to provide required acoustic performance of adjoining teaching, meeting and office spaces.

#### 4.5.7 Skirting

##### 4.5.7.1 Vinyl Skirtings

Featheredged black vinyl skirtings of 150mm height shall be provided to all internal partitions irrespective of type except where metal skirting duct is used, where walls are tiles, where timber skirtings are used in heritage buildings or where other floor finishes are turned up walls.

Painted skirtings are **not permitted** in any areas.

##### 4.5.7.2 Aluminium Skirtings

Where approved, aluminium skirtings may be used. Where used in conjunction with ducted skirtings within a room, it shall be 150mm high, black powder coat finish or to match colour of ducted skirting.

#### 4.5.7.3 Timber skirtings

Timber skirtings are only permitted in heritage significant buildings and where to be replaced shall be of similar material and profile to the original timber.

#### 4.5.7.4 Ducted Skirtings

Where a skirting duct is to be installed, such duct shall be equivalent to 'Moduline' aluminium, black powder coat finish skirting comprising at least 2 channels, not less than 50mm wide x 150mm high and Cat 6 compliant with the top channel reserved for Telecommunications cabling.

For location and number of outlets per room, refer also to **UWS Telecommunications Design Standards**.

#### 4.5.8 Toilet and Shower Areas

Cross reference: Section 4.6.3 Hardware.

Walls in toilet and shower areas including airlocks shall be finished in first quality ceramic tiles:

Student facilities: full height floor to ceiling

Staff facilities: skirting tile to airlocks and toilet facilities; full height floor to ceiling in shower areas.

Design and Installation of ceramic tiles shall be in accordance with the current Australian Standard for 'Ceramic Tiles'.

Vertical and horizontal corner joints in wall tiling shall be grouted with suitable and matching colour flexible sealant.

Tile edge protection:

- external corners shall be protected using flat anodised aluminium trims
- exposed edge of tiles in vertical and or horizontal plane where partial tiling is employed shall be protected using proprietary 10mm exposed edge clear natural anodised aluminium edge angle trim securely adhesive fixed to finish flush with tiled surfaces.

Partition walls shall be graffiti resistant proprietary brand cubicle system with compact laminate panels in selected finish and supported clear off the floor on stainless steel foot assemblies complete with stainless steel fixing brackets, fixings and cubicle hardware. Indicator bolts shall be sliding type equivalent in quality to Metlam Australia XCEL Slide Lock, satin chrome finish.

#### 4.5.9 Other Wet Areas

Where sink units, cleaner's sinks, tea making facilities or hand basins are specified, splashbacks must be provided.

Splashbacks shall extend a minimum of 400mm above the fixture, to the bottom of the fixture and minimum 200mm past each side or full return to depth of basin / sink unit against side walls. All substrate material must be water resistant.

#### 4.5.10 Security

For security purposes, all corridor partitions shall extend to the underside of slabs or roofing and be sheeted at least on one side above the ceiling line. Ducts penetrating such walls shall be provided internally with maximum 50mm square grid security mesh.

Special areas such as Stores to hold examination papers, or graduation paraphernalia requiring a secure enclosure, the walls shall extend to the underside of slabs or roofing and be sheeted on both sides above the ceiling line. Alternatively a security ceiling shall be provided to the overall secure enclosure.

Cross reference: Section 5.8 Electronic Security Alarm and Access Control.

#### 4.5.11 Services

Services shall be located in service ducts easily accessible through lockable doors. Proposed routes of service pipes are to be approved by UWS. No piped services are to be built into partitions and walls without prior approval from UWS.



#### **4.5.12 Sealants**

Sealants shall be selected appropriate for their application, and shall be colour matched to adjacent finished surface. UWS has a preference for sealants with zero VOC emissions or levels of VOCs not exceeding the requirements of the South Coast Air Quality District Rule 1168.

#### **4.5.13 Expansion Joints**

All control and expansion joints are to be caulked with approved sealants to prevent water penetration. UWS has a preference for sealants with no VOC emissions or levels of VOCs below 420g/L.

#### **4.5.14 Painting**

Refer to Section 4.9 – Painting and Other Finishes.

## 4.6 DOORS AND HARDWARE

### 4.6.1 Generally

Door width openings shall comply with AS1428 – 2009 Design for Access and Mobility - Part 1: General Requirements for Access – New building work in all new buildings , and whenever practicable in existing buildings.

### 4.6.2 Door types

#### 4.6.2.1 Aluminium Framed and Glazed Doors

All aluminium framed and glazed doors shall be of a quality suitable for **commercial application** and designed in accordance with relevant codes. Aluminium frames and doors shall be anodized to no less than 20 microns or in powder coat finish. All exposed screw fixings, rivets, trims, and cut edges etc. shall be of similar material and coloured to match frame. Use inert materials to prevent direct contact between incompatible metals.

UWS has a preference for commercial quality aluminium frames with thermal breaks for external applications only.

Door stiles shall be of sufficient width to enable operation of door handle and locking device without injury to operator.

Sliding doors shall be used for all main entry/exit doors fitted with an automatic opening and closing device including a 'Fail Safe' feature integrated into the electronic access control system and fire alarm with automatic reset and electronic locking system.

UWS has a preference for single door leaf with sidelight rather than pair of doors. Double action swing doors are not permitted.

#### 4.6.2.2 External Doors

All doors in the external building façade other than entrance doors, such as to plant rooms, service ducts, fire egress etc. shall be of solid core construction with marine grade plywood facing both sides, and edged stripped all around with hardwood. Anodised aluminium louvre infill panels shall be installed as appropriate for the application.

Solid timber doors shall not be used unless they are fully protected from the weather by building overhangs and the like.

Timber faced doors including top and bottom edges shall be finished with an approved full gloss enamel paint system.

All external doors shall be fitted with seals as necessary to prevent ingress of water, dust and insects into the building. Louvre panels in external doors shall be fitted with insect screens.

#### 4.6.2.3 Internal Doors

Internal doors other than aluminium glazed doors, shall be minimum 35mm thick solid core doors or constructed for sound attenuation appropriate to the acoustic requirements of the space(s), finished for painting unless otherwise required by CW&F Project Team.

UWS has a preference for the provision of a 300mm wide glazed sidelight of same height as the door adjacent to the door where practicable.

Shatter proof viewing panels shall be provided in laboratory doors (solid core type) including fire doors (where allowed) to comply with requirements of AS2982.1 Laboratory design and construction.

All internal doors of specified acoustic requirements shall be installed complete with all necessary seals and hardware.

#### 4.6.2.4 Fire Doors and Smoke Doors

Fire doors and smoke doors shall be provided to satisfy the requirements of the BCA, and shall be finished as previously nominated for external or internal doors.

Where fire doors and or smoke doors are used to provide access to and from spaces which experience high levels of traffic, the doors shall be held open by magnetic hold-open devices interlinked with the Fire Alarm system.

#### **4.6.3 Door Frames**

All doors other than aluminium doors shall be hung in one piece fully welded metal door frames which shall fully wrap around sheet wall linings to both framed partitions and masonry walls where wall thickness permits. All metal frames shall be securely fixed into the wall or partition opening, fully grouted where located in masonry walls or acoustically sealed to the partition.

Aluminium door frames shall be sufficiently rigid to avoid distortion by the door weight or the twisting action of the door closer.

Generally the number of hinges per leaf shall suit the application and weight of the door. Doors with leaves greater than 1000mm or greater in width shall have four hinges.

#### **4.6.4 Hardware**

##### **4.6.4.1 Door furniture**

Door furniture shall be commercial grade equal to Lockwood 930 Series key in lever handles in satin chrome (SC) finish and offset D handles surface mounted to aluminium doors, unless located in heritage buildings where door furniture shall be appropriate to the heritage significance of the building. Departure from these criteria shall be subject to approval from CW&F Project Team.

Push / pull plates and handles shall be stainless steel. All plates shall be glued and screwed with stainless steel countersunk head screws.

All doors to toilet and shower cubicles shall be fitted with privacy indicator snib locks in satin chrome finish.

##### **4.6.4.2 Door closers**

Door closers of commercial quality to be provided to entrance doors, external doors, internal doors from general office space to public corridors, lecture theatre doors and doors to all teaching spaces, plant rooms, toilets, airlocks and fire doors. Closers shall be surface mounted, and shall not be mounted on the outside face of the door leaf.

Door closers shall comply with the requirements of AS1428.1 for access for people with disabilities.

UWS has a preference for the following door closers:

Main entry doors: Dorma TS93 door closer with slide action or KABA 1026CSS door closer with 9001ST slide track.

Low traffic doors: Dorma TS92 door closer or KABA 9025CSSS door closer with 9001ST slide track.

Alternative selections shall be submitted for written approval by the CW&F Project Team and UWS Campus Safety and Security.

##### **4.6.4.3 Hinges**

Except for aluminium doors, all hinges shall be stainless steel butt hinges, screw-fixed to door leaves and frames with stainless steel screws. Hinges shall be left un-painted.

Aluminium doors shall be fitted with aluminium hinges.

Generally, hinges shall be loose pin butt hinges. Outward opening doors shall have fixed pins hinges except for doors to accessible toilets for people with disabilities which shall be fitted with stainless steel lift off hinges.

Solid core doors up to 2100mm high shall be supported by three (3) hinges.

Solid core doors over 2100mm high shall be supported on four (4) hinges or more depending on total height of door..

#### 4.6.4.4 Accessories

Some of the items listed below shall be selected from the UWS Fittings Standards.

Electro-magnetic hold open devices shall be provided to all fire doors in high traffic areas and all fire stairs used for circulation, and as required by CW&F Project Manager. These shall be activated by the Fire Alarm system, and be mounted at 1800mm above finished floor level near the leading edge of the door.

Where fitted to external doors, Electro-magnetic hold-open devices shall be linked to the electronic access control system for time controlled lock-down of the building.

Kick plates, where required, e.g. toilets or where damage from traffic is anticipated, shall be in satin stainless steel screw fixed with countersunk head screws. Where timber doors are subject to excessive damage from trolleys etc., stainless steel kick plates shall be provided and extend to the top of the door furniture.

Door stops of commercial grade quality equal to Lockwood or Dalco shall be provided where any door may strike a wall, in a position that will allow full access clear of door furniture.

Security door viewers shall be provided where no viewing panel or side light to doors have been provided to teaching spaces, meeting rooms, and other specialist spaces.

Cabin hooks shall be provided to doors not fitted with door closers as required by Designer or Design Consultant.

Coat/robe hooks shall be provided to the back of doors in offices, bathrooms and toilets, student residential bedrooms and toilet/shower cubicles in satin chrome finish.

Acoustic seals where required to be fitted to the bottom edge of the door, shall be surface mounted to the face of the door.

Where heavy duty acoustic seals are required, details shall be provided by an acoustic consultant for the approval of CW&F Project Team.

Weather seals to external doors shall be heavy duty automatic door bottom seals equal to Raven, selected as suitable for their application unless the seals form part of an aluminium door assembly.

#### 4.6.4.5 Automatic door operating system

The operating mechanism to automatic opening doors shall be a proprietary electric sliding door system as approved by CW&F Project Manager. Automatic swing door systems shall be avoided where possible, and shall not be installed without approval from CW&F Project Team. The System shall be fitted with a 'Fail Safe' feature integrated into the electronic access control system and fire alarm, with automatic reset and electric motor locking system.

A battery backup system on the drive motor for the automatic doors shall be supplied to give a minimum of 2 hours continuous use after power failure.

Only UWS approved automatic door operating system manufacturers are to be used. Do not use alternative brands.

UWS approved automatic door operating system manufacturers:

- Besam (Assa Abloy)
- Dorma
- Kone

#### 4.6.5 Locking Systems

##### 4.6.5.1 Locks

Cross reference: Section 5.7 Electronic Security Alarm and Access Control for details of electronic locking systems.

Generally

Mortice locks shall be used for internal doors. Final cylinders shall be KABA Expert unless otherwise advised.

Narrow backset mortice locks shall be used for aluminium framed doors, such as KABA MS2 lock or Lockwood equivalent.

Locks shall generally be commercial grade equal to Lockwood 930 Series key in lever locksets except where nominated otherwise, with construction cylinders. Final keying to be on KABA Expert cylinders compatible with the University's grand master keying system unless otherwise advised by UWS Campus Safety and Security. Locks shall be mounted so that strike is 1000mm above finished floor level. No locks shall be mounted in the bottom rail of doors.

Locking devices such as drop bolts, pad bolts, hasp and staple bolts are not permitted in egress doors unless approved by CW&F Project Manager.

Automatic panic bolts shall be fitted where required in compliance with BCA provisions. Where exit doors are double leafed, a rim lock or other type of lock on the second leaf shall be fitted so that when the panic bolt is released on the first leaf, both leaves open freely in the direction of egress.

#### **4.6.5.2 Electronic Access Control System**

Where electronic locks are installed, any required card readers shall be located between 900mm and 1100mm above floor level to be accessible by people with disabilities.

For technical details, refer to UWS Electronic Security System Installation Specification.

#### **4.6.5.3 Keying System and Keys**

A Grand Master Keying system shall be used. Maison keying will not be allowed unless required for student accommodation.

A lock/hardware schedule shall be prepared by the Architect in consultation with the CW&F Project Manager to meet UWS and the user client's requirements.

It is **mandatory** for the final cylinders to be installed by a UWS approved locksmith.

Construction cylinders shall be used during construction of any new buildings which shall be removed at practical completion when final barrels for key locks will be installed. New locksets to be compatible with existing campus key lock system.

In alteration works, UWS shall arrange for removal and storage of all security lock barrels to doors affected by alterations prior to commencement of construction. Construction cylinders shall be used to secure the site. Upon completion of construction, the Contractor shall arrange for the UWS approved locksmith to remove construction cylinders and install final cylinders for the key locks and keying of the premises, including updating the UWS Lock Schedule and delivery of final keys to UWS Campus Security.

The standard number of keys to be cut is to be set out in the UWS Lock Schedule and all keys shall be stamped with a continuous numbering system for that campus by the lock cylinder supplier. These numbers are to be entered on the Lock Schedule.

#### **4.6.5.4 Electric strikes**

Where access control systems are used, or where doors are to be alarmed and monitored, electric strikes shall be KABA, PADDE ES2000 or FHS equivalent.

## 4.7 STAIRCASES AND RAMPS

All requirements in this section are '**mandatory**'

Cross reference: Floors and Floor Finishes.

### 4.7.1 Generally

Internal and external stairs and ramps shall comply in all respects with the requirements of the BCA and AS1428 Part 1: *General Requirements for Access - New Buildings*. Wherever economically possible and feasible, the provisions of AS1428 Part 2: *Enhanced and Additional Requirements – Building and Facilities* shall apply.

The use of ramps internally as a means of interconnecting floors is not an acceptable alternative to providing a lift.

Tread widths and riser height shall comply with the requirements of AS1428.2 and BCA, with treads a minimum of 280mm wide.

Heritage buildings are exempt from these general requirements where stairs, balustrades and handrails shall be designed and installed appropriate to the heritage significance as stated in the Conservation Management Plans and Heritage Asset Management Strategy documents.

### 4.7.2 Balustrades

All balustrades to stairs, except fire stairs, ramps and level changes shall be in SAE 316 stainless steel with safety glass panel inserts to UWS typical design details. Balustrades to fire stairs not used for general circulation shall be galvanised steel with paint finish. Proposed materials and finishes shall be discussed with CW&F Project Team.

Alternative designs of balustrades proposed shall be reviewed by CW&F Project Team and shall only be used subject to written UWS Executive approval.

### 4.7.3 Internal stairs

A general circulation stair shall be provided to access all floor levels of the building to minimise use of lifts, and may be a fire isolated stair provided that all access doors are controlled with magnetic hold open devices connected to the fire alarm system. The following are to be considered in the design and placement of circulation stairs:

Placement of stairs to maximise visibility and use;

Finishes to stair treads, risers and landings except for fire stairs shall be carpet tiles and walls shall be rendered or impact resistant lining with painted finish;

Comply with BCA and AS1428.1 for new building work, and wherever practicable in existing buildings;

Design of stairs to encourage social interaction where possible;

Design of stairs to act, where appropriate, as natural ventilation shafts;

Stairs shall be provided with natural light where possible.

### 4.7.4 Fire Isolated Stairs

Fire isolated stairs shall be provided as required by the BCA. These may be internal fully enclosed stairs, or open framed stairs external to the building.

Fire isolated stairs that are not general access stairs, shall have an integral non-slip finish to the treads and landings, with a contrast colour painted or adhered nosing strip to AS1428.1 compliance on both tread and landing edges.

### 4.7.5 External Stairs and Ramps

See PART 6 EXTERNAL WORKS AND LANDSCAPING

#### **4.7.6 Stair nosings**

Provide stair nosings of size and contrast colour to treads and landings in compliance with AS1428.1.

Refer to Section 4.2.2.8 Stair Nosing, Trim and Threshold for details.

#### **4.7.7 Tactile Ground Surface Indicators (TGSi)**

Tactile ground surface indicators shall be provided to primary circulation areas to AS1428.4.

UWS has a preference for drilled, glued and pinned TGSi in stainless steel finish. Ceramic TGSi in paving or tiled floors in new buildings and rubber mat type TGSi for existing floors may be used subject to approval by CW&F Project Team.

DO NOT use PVC glued TGSi

## 4.8 CEILINGS

### 4.8.1 Ceiling Height and Ceiling Space

In general, the minimum acceptable ceiling height for teaching spaces and offices is 2700mm. For wet areas and corridors, ceiling height may be reduced to 2400mm. Minimum ceiling height for plant rooms including lift machine rooms to comply with BCA and Australian Standards.

UWS has a preference for the clearance between the top of the ceiling system and the underside of any slab or beams to be not less than 600mm in new buildings to allow for in ceiling plant and services reticulation.

In existing buildings where the floor levels and structure do not allow this ceiling height or ceiling space, written approval shall be obtained from CW&F Project Team.

### 4.8.2 Suspended ceilings

Suspended ceilings shall be provided in all occupied areas of the building unless noted otherwise in the Brief, or where in existing buildings, suspended ceilings are deemed inappropriate by CW&F Project Team. Design of suspended ceilings shall be in accordance with AS2785 *Suspended Ceilings, Design and Installation* and *Suspended Ceilings, Recessed Luminaries and Air Diffusers – Interface requirements for physical compatibility*.

### 4.8.3 Ceiling Types

Suspended ceilings: Unless otherwise requested, ceiling systems shall be a two-way pre-finished suspended 'T-bar' metal grid system with shadow line wall angles.

Ceiling tiles shall be mineral fibre, fine fissured, 99% humidity resistant with square edge. The acoustic properties of the tiles shall be considered in relation to the acoustic requirements of the space(s). Where plasterboard ceiling tiles are used, they shall be 13mm prefinished plasterboard tiles.

Set flush plasterboard ceilings: generally, unless fire rated ceilings are required, 13mm thick plasterboard lining shall be used.

Screw fixed set plasterboard ceilings and bulkheads shall be provided with an adequate number of access panels for maintenance and removal of equipment and services installations.

This type of ceiling should be avoided unless required for specific purposes.

Acoustic ceilings: where applicable, perforated acoustic plasterboard, timber or laminated acoustic panels shall be used. Black acoustic backing fabric shall be used.

Fire rated or fire resistant ceilings: certified proprietary ceiling systems to the fire resistance level shall be used as required by BCA.

Wet areas: only proprietary water-resistant fibre cement such as Villaboard or moisture resistant plasterboard tiles or linings shall be used.

NOTE: UWS has a preference for flush ceilings in wet areas unless significant access to services above ceiling is required, in which case grid ceiling may be used.

DO NOT use fibreglass ceiling tiles in wet areas.

### 4.8.4 Heritage Ceilings

Where ripple iron ceilings are located in heritage significant buildings, care shall be taken to minimise damage to the existing ceiling. In circumstances where replacement of severely damaged ceiling is required, such ceiling within a single space may be replaced with Lysaght Mini Orb profile or equivalent painted to match existing ceiling.

Where acoustic ceiling is required, perforated Lysaght Mini Orb profile with acoustic insulation and black acoustic fabric may be used.



#### 4.8.5 Ceiling Fixtures

Where ceiling mounted fixtures or fittings such as light fittings, speakers, smoke detectors and the like are to be mounted on the ceiling tiles or ceiling, approved backing pieces shall be provided to span the full width of the tile to provide bearing on the ceiling grid or ceiling supporting frame.

Adequate structural support on the structure above the ceiling shall be provided for the fixing of heavy equipment such as video monitors and projection equipment.

#### 4.8.6 Plant Room Ceilings

No ceilings are required for Plant Rooms and Lift Motor Rooms unless required for a specific purpose.

All concrete slab soffits over Plant Rooms, Lift Motor Rooms and accessible Service Cupboards shall be painted.

#### 4.8.7 Eaves Soffit Linings

Soffit linings shall be in pre-finished materials such as 'Colorbond' profiled metal sheeting such as Lysaght Mini Orb or metal faced cladding systems.

DO NOT use set fibre cement soffit linings to external areas

#### 4.8.8 Access to Ceiling or Roof Space

Wherever access is required to the ceiling to service, remove or replace equipment, the ceiling shall be designed for easy removal including removal of suspended grid system. In flush ceilings, access panels shall be an approved proprietary hinged metal panel with concealed frame for a flush set finish and 'touch and open' lock, opening downward.

DO NOT use lift out panels. These are not acceptable.

Size of access panel shall be suitable for functional requirement.

UWS has a preference for location of ceiling access panels to be located in corridors and open areas to minimise disturbance to occupants in offices and teaching spaces.

Where access to a serviceable ceiling/roof space or roof access is required and the height of ceiling exceeds 2400mm, the access panel shall be fitted with a commercial grade aluminium folding ladder.

Where the access panel is located in a fire resistant or acoustic ceiling, the access panel shall match the required performance rating of surrounding ceiling.

#### 4.8.9 Pelmets

Recessed pelmets shall be provided to all perimeter windows and wherever else required by the design to allow installation of curtains. Pelmets shall be recessed in ceiling, formed from 1mm 'Colorbond' pre-finished metal sheet (or equal approved) and a minimum 100mm deep x 150mm wide.

Timber drop pelmets may be considered under special circumstances with the approval of CW&F Project Team.

Pelmets are not required where roller blinds are used.

#### 4.8.10 Cornices

Generally, shadow line bead profiles equivalent to Rondo P50 shall be used.

UWS has a preference for stepped cornices in new student residential buildings.

## 4.9 PAINTING AND OTHER FINISHES

### 4.9.1 Generally

All internal surfaces including those in Plant Rooms, Lift Motor Rooms and Service Cupboards, but excluding face brickwork or face blockwork, and inaccessible ducts, shall be painted unless noted otherwise.

Exposed ductwork and exposed pipes in habitable and public (including student and performing) spaces shall be painted.

Refer to Section 4.3 External Walls and Windows for Applied Finishes to external façade surfaces.

Cross Reference: Refer to UWS Engineering Services Design Standards for painting of ductwork and pipe-work within specific disciplines.

### 4.9.2 Paint Finishes, Materials

**Generally** – Only non-toxic paints or '*premium lines*' with low or zero VOC emissions shall be used.

Low VOC emissions equate to non-flat paints having a Total VOC (TVOC) content of less than 75g/l and flat paints less than 50g/L.

For external and internal trim including window and window frame, doors and door frame finishes, use traditional solvent based enamel paints equal to Dulux Super Enamel High Gloss having Total VOC (TVOC) content of less than 425g/L. The use of all other paints shall be approved by CW&F Project Team.

Where an Environmental Rating Tool such as Green Star or NABERS is utilised, these should be used as a reference for specific VOC emissions limits.

UWS has a preference for Wattyl i.d. (VOC <1g/L), Dulux Professional EnirO2 (VOC <1g/L untinted) or Dulux Wash & Wear (VOC < 5g/L untinted), being paints on NSW Government Contract 500.

Other brands / lines are generally not acceptable to UWS. Paints and / or colours from different manufacturers shall not be combined in a paint system.

Generally, paint finish shall be as follows unless otherwise required to suit use of space:

- Walls: Low Sheen or Satin finish.
- Internal timber work and trim including, but not limited to, skirting, architraves, frames, windows and doors: High Gloss finish.
- External timber elements including, but not limited to, barge boards, fascia boards, posts, sills, frames, windows and doors: High Gloss finish.
- Ceilings: Matt or Flat finish.

In high traffic areas such as corridors, lecture theatre aisles, high use public places, a hard wearing and easily cleaned paint finish shall be selected.

The proposed paint types shall be specified in the tender documents and shall not be changed without approval from CW&F Project Team.

**Reflectance levels** – Light colour internal finishes shall be utilised in order to minimise lighting power densities. Ceiling/wall/floor reflectance shall be at least 70% / 50% / 15% respectively.

DO NOT leave treated pine unpainted.

DO NOT provide clear finish to external timber elements.

### 4.9.3 Decorative Finishes

Where decorative wall finishes are used in foyers, waiting areas, lift lobbies and the like, they shall be durable, easily cleaned and impact damage resistant.

#### **4.9.4 Acoustic Finishes**

If fabric faced or other forms of acoustic treatment liable to damage is used on walls in lecture theatres or auditoria, it shall be either located above head level or suitably protected to avoid damage by traffic along side aisles.

## 4.10 FURNITURE AND FITTINGS

### 4.10.1 Generally

UWS has reviewed, tested and selected furniture and fittings to standardise them across all campuses. Design Consultants shall take into account the UWS Indoor Furniture Standards, UWS Bins and Outdoor Furniture Standards, and UWS Fittings Standards in selection and specification of all items of furniture and fittings. Where applicable, sustainable products have been identified to meet Green Star requirements. Alternative selections must be approved by the UWS Project Team prior to procurement.

Any chairs and other furniture specifics shall comply with WorkSafe NSW and AFRDI requirements and recommendations. Documentation by the suppliers to this effect shall be provided with supply.

Quality of furniture items and joinery fittings shall be detailed and finished to AS/NZS 4610 Furniture –School and Educational for table and storage furniture, or AS/NZS 4386 Domestic Kitchen Assemblies – Kitchen Units and AS/NZS 4387 Domestic Kitchen Assemblies, or as otherwise required in the briefing document.

UWS has a preference for 'UWS pre-loved' furniture dependent on available quantities of furniture types required. Where an Environmental Rating Tool or NABERS is utilised, these should be used as a reference for specific furniture requirements.

It is **mandatory** to read this Section 4.10 in conjunction with the UWS Hydraulic Services Design Standards and UWS Fittings Standards.

Refer to UWS Indoor Furniture Standards, UWS Bins and Outdoor Furniture Standards, and UWS Fittings Standards.

### 4.10.2 Writing Surfaces and Notice Boards

All writing surfaces, whiteboards and notice boards of a fixed type and those of sliding, rotating or special nature required in the project shall be installed under the Contract.

Design Consultants shall verify the specific requirements of individual users during the design development stage of the project.

#### Writing surfaces / white boards

Only UWS approved writing surfaces / white boards shall be used, as follows:

Supplier: Wilson & Gilkes (Ph 02 9914 0900)

Product: Gilkon Premium e3 Whiteboards – gloss finish porcelain enamel coated metal whiteboards in slimline reverse angle aluminium perimeter frame.

Sizes: Select from standard sizes (although custom sizes can be made if required – note roll width is max. 1200mm). Default height 1200mm. Widths 900, 1200, 1500, 1800, 2100, 2400, 3000, 3600.

Fixing: Generally mount with top edge of whiteboard 2100mm above floor. Fix whiteboards to substrate with concealed keyhole type fixings to the manufacturer's recommendations, so it will not fall off nor cause harm or injury. Do not adhesive fix.

Pen trays: To locations indicated on drawings (front of teaching spaces), provide compatible pen trays for the full length of the whiteboard.

Frame finish: White powdercoat. Other finishes also available.

DO NOT flush mount writable surfaces with the wall.

Refer to UWS Space Standards for location requirements of writing surfaces in specific room types such as teaching spaces, student common areas, and meeting rooms.

Refer to UWS Indoor Furniture Standards for mobile white boards. Where mobile white boards are required, the Design Consultant or Contractor shall confirm with CW&F whether these are to be provided under Contract, or as a furniture item supplied and installed by UWS.

### Notice boards

All notice boards shall be included in the Contract. Refer to UWS Indoor Furniture Standards for required noticeboard type, including colour and fixing method.

Unless specifically requested to the contrary, lockable noticeboards shall not be used.

Generally, mount bottom of notice boards at 900mm above finished floor level. Verify fixing heights prior to preparation of tender documentation.

#### 4.10.3 Bookshelves

The quantity of shelving to offices shall be in accordance with user requirements. Design Consultants shall verify such user requirements before finalising their documentation.

Where bookshelves are required and to be fixed to framed partitions, the studwork framing shall be reinforced to support the additional load.

Book shelving shall be fully adjustable. Heavy duty key hole stripping shall be fixed into studs to walls and partitions at 450mm centres with screws of 'Ramset' or Hilti' fixings. A quantity of spare shelves and brackets equivalent to 10% of the total shall be provided as part of the Contract.

Where applicable, all new shelving shall match existing shelving. Unless specified otherwise in the Project documentation, shelving shall be melamine finished low VOC emission medium density fibre board (MDF) with matching 2mm ABS vinyl edge strip all round, 300mm wide and of thickness to suit span to prevent deflection under loading. Variation to width shall only be permitted as agreed with CW&F Project Team.

Where freestanding 'bookcase' shelving units are required, the Design Consultant or Contractor shall confirm with CW&F whether these are to be provided under Contract, or as a furniture item supplied and installed by UWS.

#### 4.10.4 Directory Boards, Way Finding and Room Names

Provision shall be made in the design to allow space for information and directional signage including directory boards in lobbies and the like. The signage package shall be provided by the Architect/Design Consultant in line with the UWS Information Display Standards. Refer also to Section 7.1 Signage. Procurement of this signage package shall be as agreed with the CW&F Project Manager.

#### 4.10.5 Projection Screens / Surfaces

Projection surface – shall be painted Level 5 finish plasterboard lining to AS/NZS 2589 (i.e. skim coat) or lime plaster render (white set render) over cement rendered masonry surfaces. Unless advised otherwise by UWS Information Technology – Education Technology Services (ETS) paint in low sheen or satin finish, colour to match surrounding white walls.

Where specified in documentation, a proprietary paint suitable for projection shall be applied direct to smooth substrate surfaces. Proprietary item: Screen-Goo supplied by ETS

Retractable projection screens shall be installed only with written approval from CW&F Project Team and where walls are not suitable as a projection surface and shall be in a location that shall not interfere with concurrent use of the whiteboard.

DO NOT overlap Projection Screens or Surfaces and writable surfaces

Screen size, technical performance details and location shall be confirmed by CW&F in conjunction with UWS Information Technology – Education Technology Services

#### 4.10.6 Lecture Theatre and Teaching Space Fittings

All writing benches, presenter's desks, AV consoles, lecterns and fixed seating shall be supplied and installed under the Contract.

Seating – Selection of fixed benches and seating or fixed seating with writing tablet arms shall comply with current Australian Standards and shall be approved by CW&F.

Tiered teaching spaces - seats shall be selected from UWS Indoor Furniture Standards. Where space is very limited, an alternative fixed seat may be approved by UWS Project Team. A proprietary power rail shall be fitted to the seating. Unless otherwise noted, provide 'Duct-all' rails and securely fixed GPO outlets by Mainline Power Systems. Allow for one (1) GPO per three seats.

Computer Laboratories - Design of the layout in Computer Laboratories shall be flexible to suit various learning modes that enable individual and or collaborative group work.

People with disabilities – Provision shall be made to accommodate people with disabilities by allocating wheelchair spaces and seating for ambulant people with disabilities or of great girth. Writing benches or tablets shall be designed in accordance with AS1428.2. Provision shall also be made for at least two seats without writing tablets.

Lecterns – A fixed lectern/control console shall be provided on one side at the teaching wall. The design and position of the lectern shall be jointly clarified with CW&F Project Team and UWS Information Technology – Education Technology Services early in the design stage. The lectern shall include all controls required to efficiently operate the teaching facility. Finishes as selected by the Design Consultant.

Refer to UWS Audio Visual (AV) Specifications for technical information and Section 8.1 for UWS Furniture Guidelines.

Data Projector Support – Sufficient structural support shall be provided to ceiling mounted video/data projectors. Refer to UWS Information Technology-AV technical specifications for security requirements and data communications interface.

The location of the video/data projector shall be determined by screen size, make and model of equipment to be installed.

AV equipment control box – A fixed joinery item containing the AV equipment may be provided for each teaching room without a lectern and in meeting rooms. Design and location of the AV control box which may be incorporated into teaching/presenter's desk or bench shall be determined in consultation with Manager, UWS IT-Education Technology Services. Finishes shall be selected by the Design Consultant and approved by CW&F Project Team. Refer also to UWS Indoor Furniture Standards for standard details.

Acoustic panelling – The teaching spaces shall have the appropriate acoustic performance that may be achieved through use of acoustic panel designs, soft furnishings, angled wall/ceiling surfaces and the like to meet AS/NZS 2107 *Acoustics – Recommended design sound levels and reverberation times for building interiors*.

Refer to UWS Space Standards for additional requirements.

#### **4.10.7 Meeting Rooms and Video Conferencing Rooms**

Fit out of these rooms are subject to the requirements set out in the UWS Space Standards, and UWS Education Technology Services Standards.

#### **4.10.8 Laboratories (excluding Computer Laboratories)**

The construction of laboratory fitments shall be in accordance with requirements of AS/NZS 2982.1 *Laboratory Design and Construction – General Requirements* and other relevant Australian Standards for the class of laboratory, surface finishes, laboratory equipment and treatment of air contaminants.

All bench tops shall incorporate an integral drip mould. Material and colour for bench tops and under-bench units shall be approved by end users and CW&F Project Team. Generally, bench framing shall be in powder coated steel section framing. All bench legs shall be fitted with adjustable feet capable of being fixed to the floor.

Standoff splashbacks of same chemical resistant material as the bench top and minimum 350mm high shall be provided to all wall benches to accommodate services. Service spines enclosures and reagent shelves shall be of the same material as bench tops and splashbacks.

Reference shall be made to AS1428.1 for access between benches and AS1428.2 for height of benches, counters and reach distances for people with disabilities. Provision for people with

disabilities shall be made in accordance with the BCA and Disability (Access to Premises – Buildings) Standards.

Laboratory services outlets and controls shall be accessible above the bench top and away from potential hazard. The location and separation of services shall comply with applicable regulatory standards.

#### **4.10.9 Kitchens, Tea Preparation Areas and Laundries**

##### **4.10.9.1 Commercial Kitchens**

Fit out of commercial kitchen shall be to user requirements and AS4674 *Design, Construction and fit out of food premises*. Supply and installation of appliances for inclusion in the Contract shall be as directed by CW&F Project Manager.

##### **4.10.9.2 Common Room Kitchens**

Generally, fitout to Staff or Student Common Room kitchens shall include a sink and drainer, a microwave(s) and a commercial quality under sink boiling and filtered chilled water unit installed at the sink. Space for a dishwasher (staff facility only) and a refrigerator shall be provided.

Bench cupboard units, overhead cupboards, open shelving and serving counters shall be in laminate finish.

Splashbacks minimum 450mm high shall be provided to full length and return for the depth of the bench unit where applicable. Where colour-backed glass splashback is used, it shall be colour-backed ultra clear low iron safety glass panels to equal to Starphire glass by PPG.

Bench tops edges shall be finished in 2mm ABS edge strips, bull-nose or shark-nose edge profile, or a proprietary bench top equivalent to Laminex Squareform™.

##### **4.10.9.3 Tea Preparation Areas**

A tea preparation area shall be provided on each floor of a building, and contain a sink cupboard with sink, drainer and splashback, a microwave, a continuous boiling water unit over the sink, garbage bin storage below the sink, a hand rail and one set of drawers minimum 450mm wide with top utensil drawer and shall include space for a refrigerator.

##### **4.10.9.4 Laundries**

Laundries located in new student residential facilities shall have laundry tubs built into joinery.

Common facility laundries shall be fitted out with commercial quality washing machines and dryers suitable for connection to a payment system.

##### **4.10.10 Chilled Water Bottle Filling Stations**

Not less than one chilled water station with bottle filler and one additional bottle filler accessible to people with disabilities shall be provided per campus precinct as agreed with CW&F Project Team.

Refer also to Section 2.5.9 Design for People with Disabilities.

##### **4.10.11 Built-in Furniture**

UWS has a general preference for the use of 'non built-in' furniture for future flexibility. Use of built-in furniture shall be approved by CW&F Project Team at an early stage of the design, and shall allow for cable reticulation where required.

Built-in furniture such as cupboards and laboratory benches shall be supplied as part of the Contract. All built-in furniture shall have a recessed base finished in an approved colour satin finish laminate. Laboratory furniture shall comply with the relevant Australian Standard for the type of Laboratory usage.

All electronic/electrical equipment housed inside joinery units shall be adequately ventilated.

Wardrobes in bedrooms located in student residences shall have mirrored sliding doors, or where space permits, shall have doors with four hinges per door with a full length mirror on inside of one door leaf.

#### 4.10.12 Toilet fixtures

It is **mandatory** for this section to be read in conjunction with UWS Hydraulic Services Design Standards for standards, pipes, thermal mixing valves and the like, and UWS Fittings Standards for sanitary ware, tapware and fittings. Cubicles for People with Ambulant Disabilities (PAD) and Accessible Toilets shall be fitted out to AS1428.1.

The following fittings shall be provided in all toilets:

##### Air-locks or hand wash areas:

- Vanity bench unit or basin with full width mirror
- Soap dispenser over each basin
- Paper hand towel dispenser with integral waste receptacle for toilets used by staff.  
DO NOT install in student toilets.
- Electric hand dryer with auto beam for high use toilets - students and staff
- General power outlet adjacent to mirror

##### Parents' Room

- Proprietary fold down nappy changing table
- Paper hand towel dispenser
- Soap dispenser
- Disposal bin for soiled nappies
- Sink unless facility is provided in conjunction with toilet amenities

##### Toilet Cubicles and Urinals:

- Multiple toilet roll dispenser or jumbo roll dispenser for high use toilets - student and staff
- Coat hook in each cubicle
- Space for sanitary napkin disposal in toilets for female staff and students
- Stainless steel shelf above WC cisterns and in between urinals for placement of books, belongings etc. by persons using the facilities

##### Unisex toilet for people with disabilities to AS1428.1:

- Grab rails
- Back rest
- Grey toilet seat (no lid) to provide 30% luminance contrast to floor, pan and walls
- Mirror
- Hand basin
- Electric hand dryer
- Stainless steel shelf (unless Cube Extended basin is used)
- Multiple toilet roll holder or jumbo roll dispenser for high use toilets - student and staff
- Coat hook x 2
- Wall-mounted folding baby change table (Ground Floor only unless Parents Room has been located in the vicinity of this facility)
- For combined toilet/shower facility refer fittings for shower recess
- Duress alarm with visual alarm located externally and reset button or key in the toilet.  
Alarm to be linked to Insight security panel in Campus Security Office.

##### Cubicle for people with ambulant disabilities (PAD) to AS1428.1:

- Grab rails



- Toilet paper holder
- Coat hook x 1

Shower recess:

- Built-in soap holder to match wall tiles
- 2 x coat hooks
- Fixed bench seat minimum 600mm wide made from timber slats
- Folding bench seat to AS1428.1 for showers accessed by people with disabilities
- Grab rails to AS1428.1 for showers accessed by people with disabilities
- Shower screen door. NOTE: shower curtains are only permitted for showers accessed by people with disabilities.

Refer also to UWS Fittings Standards for schedule of sanitary fittings and fixtures, and tapware.

#### **4.10.13 Loose Furniture and Equipment**

Unless otherwise stated in the Brief, all loose furniture and equipment shall be supplied and installed by UWS under a separate contract to the main building contract.

UWS has a preference for the use of 'pre-loved' furniture dependent on available quantities of furniture types required. The Designer / Design Consultant shall obtain confirmation from the CW&F Project Team for items to be reused.

The following items of loose furniture will be provided by the University unless otherwise required in the Brief:

Desks / workstations	Mobile pedestals
Returns	Chairs (all types)
Bookcases	Lateral filing cabinets
Meeting/general purpose tables	Coffee tables
Filing cabinets	General purpose metal shelving
Stationery cupboards	Light desks
Screens (office)	Drafting tables
Laboratory stools	Hat and Coat cupboards/stands
Refrigerators (general use)	Dishwashers (general use)
Microwaves	Clocks
Projectors	Projection Screens

Equipment such as computers, typewriters, percolators, urns, cutlery/crockery, and scientific equipment will also be provided by the University unless otherwise stated in the Brief. Consultant design drawings shall clearly identify all furniture and equipment requirements.

The Design Consultant shall be responsible for the technical specification and selection of furniture types and finishes which shall be subject to approval by CW&F Project Manager prior to schedules being prepared. Items to be supplied by UWS and installed by Builder shall be clearly identified as agreed with CW&F Project Manager.

Schedules listing types, finishes and quantities required shall be produced and provided to CW&F Project Manager for timely purchase of items and placement by Practical Completion.

All other loose furniture shall be supplied under the Contract unless instructed otherwise by CW&F Project Manager. Adequate provision shall be made in the project budget for the provision of loose furniture provided by the University and required to furnish the new or refurbished spaces.

Where required by the Brief, the Contract shall include taking delivery of and placement of the furniture and fittings as the main Contractor's responsibility.

#### 4.10.14 Compactus

Compactus units incorporating shelving and or hanging rails and accessories as required by the User Client shall be supplied and installed under the Contract when required by the Brief. Consideration shall be given to structural design of the floor to support compactus storage units. Refer to UWS Indoor Furniture Standards for approved compactus systems and suppliers.

#### 4.10.15 Workstations

Workstations supplied under Contract shall have all required services including adequate lighting, power, data and telecommunication connections. Workstations shall comply with all current NSW WorkCover Authority requirements and recommendations, and shall be designed and installed in compliance with AS 3590.2 *Screen-based workstations – Workstation furniture*.

Workstations must be designed and installed in compliance with the following standards:

AS 2466 Guide to the Design of Microform Work Stations

AS 1680 Interior Lighting

AS 2713 Lighting and the Visual Environment for Screen Based Tasks

AS 3000 Electrical Installations – Buildings, Structure and Premises

AS 3080 Telecommunications Installations – Integrated

Telecommunications, Cabling Systems for Commercial Premises

AS 3084 Telecommunications Installations – Telecommunications, Pathways and Spaces for Commercial Buildings

Refer to UWS Indoor Furniture Standards for approved systems and suppliers.

#### 4.10.16 Specialist Furniture

In some areas such as Executive areas, areas requiring corporate image, Research Centres, Learning Centres/Libraries, research Laboratories, Cafes etc. 'specialist' furniture other than described previously may be required.

Selections shall be approved by CW&F Project Manager.

#### 4.10.17 Chairs

This clause is applicable to task chairs, visitor chairs, meeting chairs, seminar chairs, waiting chairs and the like. Chairs shall be selected in consultation with and to the approval of CW&F Project Team.

Chairs selected for general use shall be available for a minimum of five years so replacements can be purchased.

All office task chairs and chairs for computers shall be fully ergonomic gas lift chairs on castors; shall have adjustable backs, and seat and back tilt. Arms are not recommended. Where chair arms are provided, they are not to be upholstered. Ergonomic task chairs shall have a 'Furtech/AFRDI' Level 6 certificate of assessment.

Chairs with adjustable lumbar support to backs, adjustable arms and large seats and backs shall be supplied if required by individuals and confirmed by CW&F Project Team in conjunction with the UWS OHS Team.

Upholstery fabrics shall be suitable for 'heavy duty commercial' use and selected to disguise stains. Light colours are to be avoided. Patterns and or textures are preferable. Preference is to be given to fabrics where the fibre is produced from a recyclable or renewable resource. Fabrics shall be selected from the UWS approved range. Alternative fabric samples shall be submitted to UWS for testing and CW&F Project Team's approval

Refer to UWS Indoor Furniture Standards for approved chair types, fabrics and suppliers.

#### 4.10.18 Blinds and Curtains

Refer to Section 4.3.7 Sun Control and Section 4.8.10 Pelmetts.

#### **4.10.19 Works of Art**

In the public areas of the building and in all meeting rooms within the building, ensure the spaces are able to be used to display the University Art Collection. Liaison should occur at an early stage in the development of the plans with the UWS Curator to designate 'gallery' spaces.

The UWS Curator shall be consulted at an early stage of the project where UWS artworks are proposed or located. This is essential to ensure that adequate arrangements are made to place artworks appropriately and to protect and/or relocate any affected works.

Generally, a picture hanging system by CURTRAX AUSTRALIA shall be used, that consists of a standard or mini track with stainless steel or clear non-stretch nylon lines; is of simple design, versatile, strong, and positive locking with special hooks (carrying capacity 14kg) including being vertically and horizontally adjustable.

#### **4.10.20 Outdoor furniture**

Generally, outdoor furniture includes, but is not limited to shade sails, barbecues, waste / recycling bins, tables, bench seats and chairs used externally to the buildings.

UWS approved selections are outlined in the UWS Bins and Outdoor Furniture Standards.

##### **Shade sails**

UWS has a preference for square or rectangular umbrella type shade sails.

DO NOT use triangular shade umbrellas.
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Refer to UWS Bins and Outdoor Furniture Standards for approved umbrella shade umbrellas.

## 5 BUILDING SERVICES DESIGN

### 5.1 Introduction

UWS has developed Engineering Services Design Standards that provides general parameters and performance criteria for building services utilised on its campuses.

The UWS Engineering Services Design Standards describes the University's **mandatory** and **minimum** requirements for the design and installation of engineering services in new buildings and engineering services infrastructure, as well as minimum requirements for each discipline applicable to alterations and additions to existing buildings. Throughout the sections of this document, 'mandatory' requirements will be clearly identified and defined.

Consultants and Contractors may propose alternatives to these requirements only when they are accompanied by supporting technical and financial viability documentation. Such alternative proposals shall be subject to approval from CW&F.

It is '**mandatory**' for this Part 5 of the Design Guidelines to be read in conjunction with The UWS Engineering Services Design Standards which **must** be read in conjunction with the UWS Telecommunications Standards and Audio Visual Specifications as well as the Consultancy Brief and the Project Brief.

See UWS Engineering Services Design Standards (combined) comprising the following sections:

- General Requirements
- Electrical Services Design Standards
- Hydraulic Services Design Standards
- Mechanical Services Design Standards
- BMS Guidelines

Refer also to UWS Telecommunications Standards – Structured Cabling, UWS Telecommunications Design Standards and UWS Education Technology Services Standards.

#### 5.1.1 Legislative Requirements

All engineering services shall be designed and installed in accordance with regulatory requirements of the NCC and relevant authorities, Australian Standards and Codes for best practice.

#### 5.1.2 Documentation

It is a '**mandatory**' requirement for as constructed drawings and other relevant documentation related to warranties, operation and maintenance manuals of plant and equipment to be provided to the CW&F Project Manager within 14 days of Practical Completion of the project.

Format of the required deliverables are stated in Part 2 Common Standards for Deliverables in the UWS Engineering Services Design Standards – General Requirements.

## **5.2 Mechanical Services**

### **5.2.1 New works**

Refer to UWS Engineering Services Design Standards - Mechanical Services for technical specifications.

### **5.2.2 Alterations and additions to existing buildings**

The Services Consultant or Contractor shall obtain detail information from the CW&F Project Manager about the mechanical services and air conditioning plant affected by the proposed works prior to commencing design development phase of the project.

Tender documentation shall include as part of the Technical Specification, a clause as follows:

“The Mechanical Contractor shall, prior to any alterations to the mechanical services and ducts, take air flow readings of all rooms and calculate heat loads and size the air handling unit for review by the CW&F Mechanical Engineering Technical Specialist, establish capacity and flow rates of chilled water and hot water to the air handling unit, and construct the alterations to achieve the design parameters required for the new layout.”

### **5.2.3 Generally**

DO NOT locate temperature thermostats next to heat loads

DO NOT install air conditioning systems without local after-hours switches

### **5.2.4 Design Conditions**

Due to the diverse locations of UWS campuses, external conditions vary substantially. The design conditions have been set out in Part 4 Mechanical Services in the UWS Engineering Services Design Standards.

### **5.2.5 Monitoring and Control**

Mechanical services systems in new buildings and new mechanical services systems in existing buildings shall be connected to the University's Building Management Systems (BMS).

Alterations and additions to existing plant and equipment in existing buildings are not required to be connected to the BMS unless the building has already been connected to the system.

Refer to UWS Engineering Services Design Standards for technical information on the University's BMS.

## 5.3 Electrical Services

### 5.3.1 General

This section outlines the University's minimum requirements for electrical services and shall be read in conjunction with Section 4.6 Doors and Hardware.

For teaching spaces and meeting rooms, refer also to UWS Education Technology Services Standards.

For telecommunications, refer to UWS Telecommunications Standards – Structured cabling, and UWS Telecommunications Design Standards.

For security, refer to UWS Electronic Security Systems Installation Specification.

### 5.3.2 Energy Efficiency

The Services Consultant shall identify energy saving measures through appropriate engineering solutions for 'best practice' performance Green Star rating of the building.

### 5.3.3 Flexibility of Design

The layout of light fittings and power outlets should allow flexibility such that spaces can be subdivided into separate spaces. UWS has a preference for the location of data and power outlets on the external walls or load bearing elements of the building to achieve this flexibility.

### 5.3.4 Lighting

#### Illuminance

Lighting intensities on the working plane shall be in accordance with the requirements of AS/NZS 1680 *Interior and Workplace Lighting*. Design and selection of the fittings shall be such that at the end of the life of the light fittings, it shall **not fall below** the lighting levels cited in AS 1680 for the relevant type of interior or activity, or as required by the UWS Electrical Services Design Standards.

Where different illumination levels are proposed by Consultants (to accommodate stakeholder's requirements) approval from CW&F Project Manager shall be sought prior to finalising the design.

For Green Star rated Design and As-built buildings, requirements of AS1680 for illuminance shall apply.

#### Exterior Lighting, Corridors and Foyer Lighting

Refer to UWS Landscape Design Guidelines Volume 2.

The Consultant shall review the switching and circuit arrangement and BMS control to provide an appropriate lighting/control strategy to allow staff and cleaning staff to operate the system out of hours for limited periods of time.

The Consultant shall give consideration to the circuit arrangement to ensure a staged lighting shut down. No space shall be placed in immediate darkness. Enough light shall be provided to allow safe and easy access to the after-hours lights switch.

External, corridor and foyer lighting shall be provided to operate during normal hours of darkness. This lighting shall be switched and controlled by the BMS.

#### Light Fittings:

Specification of light fittings shall be undertaken with reference to the following:

- Light fittings should be manufactured from Australian-made components and be approved by the Electricity Authority.
- Fluorescent fittings must incorporate power factor correction and be of switch start type complete with fuse terminal blocks and low loss ballasts
- Emergency and exit signs to comply with NCC and Australian Standards AS2293.1 as a minimum.

- All new exit signs associated shall be energy efficient LED type. Selection of any emergency lights or exit light fittings shall be of the plug in type configuration. Any lamp selection needs to be of a type that guarantees a minimum life of 10,000 hours and sized not less than 10 watts.

#### NOTE

DO NOT use T5 fluorescent lamps in rooms that are to be free of electrical noise.  
 DO NOT replace T8 fluorescent lamps with T5 ones if existing fittings are still good.  
 Replace lamps with low energy T8 fluorescent lamps.

### 5.3.5 Power

Power cabling + outlets shall be provided to suit layout.

Any GPO outlets associated with these works shall be protected by an earth leakage circuit breaker (ELCB) in accordance to Australian standards.

Unless stated otherwise in the Project Brief, as a minimum, two double general power outlets shall be allowed per ten square metres of net usable space. Double general power outlets shall be provided in all locations requiring general purpose outlets.

Along all corridors, laboratories, general offices, lecture theatres and at main stair landings, allowance for a general purpose outlet every 20m shall be made for cleaners' use.

Power outlets shall be fully coordinated and located in close proximity to proposed equipment and appliances to minimise extension lead runs.

### 5.3.6 Power Supply

Different campuses have different arrangements for the supply of electricity.

As part of the Greening UWS initiatives, solar panels have been installed on some campuses. The Services Consultant is to establish with CW&F whether power supply in part is to be derived from environmentally sustainable means such as solar or wind generated sources.

### 5.3.7 Vertical Transportation Systems

Refer to UWS Engineering Services Design Standards (ESDS) Electrical Services for details related to the various vertical transportation systems including but not limited to

- Stair lifts
- Access Platforms
- Passenger lifts
- Goods lifts

Only UWS approved vertical transportation manufacturers are to be used. Refer to UWS ESDS Electrical Services for approved manufacturers. Do not use alternative brands.

### 5.3.8 Table Boxes

Refer to UWS Electrical Services Design Standards for details related to the various types of table boxes and applications.

All table boxes shall finish flush with the surface of the table.

## 5.4 Hydraulic Services

### 5.4.1 General

This section outlines the University's minimum requirements for hydraulic services and shall be read in conjunction with UWS Hydraulic Services Standards and the UWS Water Saving Action Plan.

All water reticulation, sanitary plumbing, drainage and stormwater shall be designed in accordance with AS3500, the National Plumbing and Drainage Code. All systems shall also comply with all applicable local authority and statutory requirements.

All pipework shall be concealed where possible in accessible ducts and ceiling spaces. Where piping is concealed, adequate access for maintenance and inspection shall be provided.

Shut off valves for water supply shall be installed to all buildings and shall be noted on the services as-built drawings.

Stormwater drainage shall be connected to rainwater holding tanks where required by the Project Brief. See UWS Water Saving Performance Specification and UWS Hydraulic Services Standards.

### 5.4.2 Sanitary fixtures and fittings

A selection of approved sanitary fixtures and fittings has been made and are outlined in the UWS Fittings Standards.

#### Schedules

For consistency of performance and materials, sanitary fixtures and fittings including tapware shall be based on the performance requirements stated in the Specifications related to the UWS Water Saving Action Plan.

#### 5.4.2.1 Standard Sanitary Fittings

All sanitary fittings and fixtures shall be WELS compliant and 'White' unless noted otherwise, equal in performance and quality to proprietary products in the UWS Fittings Standards and compliant with regulatory authority requirements.

To ensure compatibility with fittings and fixtures across the campus, the University is standardising the following fittings which shall be specified. All taps shall be WELS compliant. The proprietary items are examples of preferred performance of fixtures.

#### 5.4.2.2 Standard Tapware

It is '**mandatory**' for all handles except hose cocks to be anti vandal, and all taps to be chrome plated brass, exposed flush pipes and brackets to be chrome plated finish.

Flow regulators shall be fitted to all tapware to minimise water consumption.

Departures from this Schedule shall only be made with the prior agreement of the CW&F Project Manager.

In Student Residences, isolate water supply for each unit.

#### Items to be avoided:

DO NOT install ceramic disks unless otherwise directed by CW&F Project Manager.

### 5.4.3 Existing drainage, waste and sewer lines

Where gradients of existing drainage, waste and sewer lines are less than recommended by manufacturer or other reduced water usage technology, suitable fittings shall be specified to minimise waste issues post occupation and use of the fittings, e.g. on Hawkesbury Campus.



#### 5.4.4 Water Pipes

##### NOTE

DO NOT cast water pipes directly into concrete without providing sleeves.

#### 5.4.5 Monitoring and control

It is '**mandatory**' for all submersible pumps and pumps critical to the function of the University to be linked to a BMS for monitoring purposes in case of failure. The Design Consultant or Contractor shall identify such items for review and approval by CW&F Project Manager and CW&F Technical Specialist – Hydraulic.

Refer to UWS Engineering Services Design Standards for section on BMS.

## 5.5 Telecommunications Services

### 5.5.1 General

A project specific Scope of Works for IT-communications may be prepared by UWS IT Services based on drawings provided by the Services Consultant. This scope of work document shall be referenced in the tender Specification and annexed to the Consultant's tender specification together with the current version of the UWS Telecommunications Standards – Structured Cabling Standards.

Where Scope of Works have been prepared by the consultant, it is '**mandatory**' to obtain approval of the documentation from UWS IT Services.

It is '**mandatory**' for the Services Consultant or Contractors to refer to the current version of the UWS Telecommunications Design Standards in conjunction with the UWS Telecommunications Structured Cabling Standards issued by UWS Information Technology unit.

The Telecommunications Design Standards contain information about minimum sizes for comms rooms and cupboards to enable access to front, rear and sides of cabinets, and vertical reticulation. It also sets out minimum requirements for number of data outlets to be provided in various spaces, e.g. offices, teaching spaces, meeting rooms, computer laboratories and the like.

All UWS data and telecommunications cabling installations including accessories shall be carried out by UWS authorised IT contractors. Equipment shall be obtained from UWS authorised IT suppliers.

Refer to UWS Telecommunications Design Standards and UWS Telecommunications Standards – Structured Cabling.

### 5.5.2 Location of Comms Rooms

Where possible, Comms Rooms shall be accessed from hallways/corridors/general circulation spaces such as staff lunch areas that are not a *required exit* as defined in the BCA.

Where access to a Comms Room containing main telecommunications distribution board or equipment for the building is from a *required exit*, the room shall be constructed to comply with BCA Clause D2.7 (d) (ii).

In a building fitted with fire suppression systems (sprinklers) or where located within a fire protected zone, a fire rated Comms room enclosure and doors shall be constructed in accordance with BCA and AS2118.1-1999 Clause 3.1.3 (c)(ii).

## 5.6 Audio Visual Services

### 5.6.1 General

A project specific Scope of Works for AV equipment will be prepared by UWS IT-Education Technology Services. This scope of work document shall be referenced in the tender Specification and annexed to the Consultant's tender specification together with the current version of the relevant UWS AV Teaching Room with Digital Media Specification.

It is '**mandatory**' for the Services Consultant or Contractors to refer to the current version of the Technical Specifications for Audio Visual Services issued by UWS Information Technology – Education Technology Services (UWS IT-ETS).

The Specifications include data telecommunications and security requirements for the AV equipment. NOTE: a dual data outlet shall be provided for the data projector location.

Any design requiring audio visual equipment must be coordinated with the Manager, UWS IT-ETS.

### 5.6.2 AV Specifications

General UWS specifications for audio visual and presentation equipment are provided in the following specifications:

- UWS AV Standards\_Standard FFT
- UWS AV Standards\_Collaborative FFT
- UWS AV Standards\_Collaborative + Smartboard FFT
- UWS AV Standards\_Theatre Teaching Space

### 5.6.3 AV Joinery

AV Joinery items are described in the following documents:

- for Collaborative Learning Spaces: Accessible Presenter desk – UWS Indoor Furniture Standards
- Lecterns for lecture theatre/auditoriums described in the AV specification
- for Meeting rooms and Videoconferencing rooms: Meeting room cupboard – UWS Indoor Furniture Standards

Joinery for AV control equipment in meeting rooms and science laboratories to be submitted to CW&F Project Team for approval.

Selection of finishes for all AV Joinery by CW&F Project Team.

### 5.6.4 Hearing augmentation

**Teaching spaces** (Collaborative Learning Spaces, Collaborative Computer Labs, Flat Floor Teaching Spaces, Collaborative Learning Theatres, Lecture Theatres):

A hearing induction loop shall be provided to all new/refurbished teaching spaces which contain amplified A/V, except where there is interference from an induction loop in an adjoining space (including above or below), in which case an infrared system shall be installed.

**Meeting rooms:**

Generally, meeting rooms on UWS campuses do not require hearing augmentation under the BCA. However, CW&F may determine the requirement of hearing augmentation in specific meeting rooms – advice shall be obtained from CW&F Project Team.

Where UWS intends to provide a hearing augmentation system in a meeting room for use by people with hearing impairment, it shall be an induction loop, except where there is interference from an adjoining space (including above or below), in which case an infrared system shall be installed.

Refer to UWS AV Standards for description of systems.

## 5.7 Fire and Emergency Warning Systems

### 5.7.1 Suppression Systems

#### Fire Hydrants, Fire Hose Reels

It is **mandatory** to refer to the UWS Hydraulic Services Standards for technical requirements and compliances.

Fire Hydrants, Fire Hose Reels, booster assemblies and pumps shall be provided in accordance with NCC requirements, Australian Standards and relevant authority regulations and Codes.

Installation of Fire Hose Reels shall be to AS 2441 *Installation of Fire Hose Reels*.

Hose reels located within Student and Public areas of the University shall be suitably enclosed to reduce vandalism.

#### Handheld Extinguishers and Fire Blankets

Provision of handheld extinguishers and fire blankets shall be in compliance with NCC requirements and shall be appropriate to the occupancy class and risk class as defined in AS 2444 *Portable Fire Extinguishers and Fire Blankets – Selection and Location*.

Consideration shall be given to types and quantities of chemicals stored and used in Laboratories.

- Gaseous systems
- Gaseous systems shall not be used without specific approval from CW&F.
- Sprinkler systems
- Sprinkler systems shall only be provided if required to satisfy NCC and relevant regulations.
- Dry sprinkler systems when required shall be installed in accordance with Australian Standards and relevant regulations and Codes.

### 5.7.2 Detection Systems

It is **mandatory** to refer to the UWS Fire Detection Guidelines for technical requirements and compliances.

Smoke detection systems in student residences shall be located to NCC requirements to minimise accidental activation of system.

#### Heritage buildings

In heritage buildings, the location of detectors shall be confirmed with the Superintendent and Heritage Architect prior to commencement of work.

All work shall be carried out to minimise damage to existing heritage fabric of ceilings and walls, and removable fixings shall be used.

DO NOT use expandable fixings in buildings of heritage significance.

### 5.7.3 Fire Indicator Panels

It is **mandatory** to refer to the UWS Fire Detection Guidelines for system, technical requirements and compliances.

#### Upgrades and replacements

All upgrades and replacements of fire detection systems/fire indicator panel shall be linked to Campus Security 'Insight' program. Colour graphics shall be updated at completion of works.

### 5.7.4 Building Occupant Warning Systems

It is **mandatory** to refer to the UWS Fire Detection Standards for system, technical requirements and compliances.

Building Occupant Warning Systems (BOWS) or Early Warning and Intercommunication Systems (EWIS) where required by BCA in new buildings shall be integrated with the campus system and shall comply with all current regulations.

In alterations and additions work, the BOWS or EWIS panel shall be fully re-commissioned in accordance to Australian standards and manufacturer's commissioning requirements.

A copy of the commissioning documents shall be provided to the CW&F Project Manager before any commissioning takes place on the BOWS or EWIS equipment.

## 5.8 Electronic Security and Access Control

It is '**mandatory**' for the Services Consultant or Contractor to refer to the current version of the UWS Electronic Security System Installation Specification (UWS Security Specification) issued by UWS Campus Safety and Security.

It is '**mandatory**' for the incumbent security network integrator (SNI) to be contracted as a nominated sub-contractor to disconnect and decommission any security equipment (i.e. access control, alarms, AV equipment alarms and CCTV) affected by the building works.

NOTE: The UWS SNI is the ONLY security integrator able to commission and program new / amended installations. Details of current SNI are available from UWS Capital Works and Facilities.

Refer to UWS Electronic Security System Installation Specification

### 5.8.1 System

The electronic security system is integrated to the UWS GIS Management System using GIS standard icons.

Objectives of the electronic security system are:

- To detect unauthorised access to nominated spaces within the campus or site
- To provide a first response security system (duress) to nominated spaces, positions or staff members
- To provide control of access to nominated spaces within the campus or site
- UWS has determined that a standardised approach, terms of the system type, architecture and design will be used to ensure that each campus operates in a similar manner, using similar technology with restricted, common sources for hardware, software, firmware and support.
- To provide notification for the university's research protection requirements
- To provide forensic evidence in the form of video surveillance images to nominated areas interfaced to the alarm system

### 5.8.2 Requirements

#### 5.8.2.1 General

This Section to be read in conjunction with Architectural Design Guidelines – Part 2 Planning and Design Controls

The following requirements apply:

- Reed switches preferred to be **concealed** where possible. For installation refer to the UWS Security Specification. Surface mounting only to UWS Campus Safety and Security approval.
- Latching duress buttons where nature of work presents higher risk than normal or is industry standard practice (e.g. Cashiers offices, safes, counselling offices where one-to-one interviews may take place – such as Head of School/Director).
- RF Duress buttons to be provided on a needs basis
- Mimic modules shall indicate areas armed or off
- Note clip in all cash drawers
- Vibration sensors on all safes
- Top hat screamers and strobe lights to be used internally
- External sirens in metal box with tamper switch and blue strobe
- Each entry and exit door to be monitored by reed switch and tongue monitor (where applicable to the door type)

- Each entry door including aluminium doors to be provided with access control by door strike or magnetic lock and fitted with a Request to Exit (REX) function to avoid false alarms. Access outside of normal operating hours shall be by card reader or key pad. Cable access to electric strikes shall be concealed / recessed in door jamb of single doors and recessed in non-active leaf of double doors. Where aluminium framed glazed doors are used, cable reticulation shall be through the door frame or mid-rail of the door.
- Each access door to be provided with either free handle door furniture or press switch to exit or similar device.
- Each building to be provided with external CCTV cameras covering nominated fields of view

### **5.8.2.2 Buildings**

#### Internal Common Space

Common internal circulation areas shall be monitored by movement detectors and provided with CCTV cameras covering each other and each direction.

#### General Office Spaces

Ground floor offices and above-ground-floor offices having easy access by door or window shall be monitored by movement detectors.

Doors leading to combined office areas leading from common circulation areas shall be provided with access control.

Doors to separate offices may also require access control depending on specific requirements.

#### Teaching Spaces (including Flat Floor, Theatres and Laboratories)

Entry and exit doors off teaching spaces shall be provided with reed switch and tongue monitor (REX).

Entry doors of teaching spaces shall be provided with access control including card reader.

Teaching spaces shall be monitored by movement detectors

#### Building Communications Room (IT Facilities)

Security to all communications rooms / cupboards shall be in accordance with UWS Telecommunications Design Standards requirements.

#### Special Requirements

Additional requirements apply to specific spaces and items of equipment, such as AV equipment. Those requirements will be indicated either within the Project Brief or in subsequent briefing of the appointed Consultant.

## 5.9 CCTV System

### 5.9.1 General

Where a CCTV System is required in the Project Brief, for the technical specification of equipment, installation and operation it is **“mandatory”** for the Consultant or Contractor to refer to the Video Management System section of the UWS Electronic Security System Installation Specification issued by UWS Campus Safety & Security.

NOTE: CCTV cameras require 1 x in-ceiling data outlet. External cameras shall be located under eaves where possible.

See UWS Electronic Security System Installation Specification



## 6 EXTERNAL WORKS AND LANDSCAPING

### 6.1 General

A UWS Landscape Master Plan has been developed for UWS campuses. It articulates a detailed understanding of the landscape character of each campus setting and provides guidance and principles to be implemented as recommendations for future landscape works.

The document comprises two volumes.

Volume 1 outlines the process undertaken, strategic approach and considerations made that informs the future landscape works and landscape management

Volume 2 contains the Landscape Design Guidelines applicable to each of the six campuses.

It is **'mandatory'** for this Part 6 of the Design Guidelines to be read in conjunction with the UWS Landscape Master Plan and UWS Landscape and External Works Standards which shall guide the requirements in the Consultancy Brief and the Project Brief.

A Master Plant List has been included in the UWS Landscape and External Works Standards for selection of plants based on UWS experience.

The Design Consultant shall allow for the preparation of landscape plans, technical specification and planting schedules in accordance with the landscaping parameters set out in the landscape master plans. Consultation shall be carried out with the Manager, CW&F Grounds & Environment as arranged by CW&F Project Manager prior to completion of tender documentation.

See UWS Landscape Master Plan Volumes 1 and 2; and UWS Landscape and External Works Standards.

### 6.2 Landscape and Construction Material

Landscape and construction materials brought onto UWS campuses must be free of contaminants, as reflected in appropriate certification, statement of source and purity, or knowledge of source by supplier. Supply from known suppliers is preferred.

Recycled concrete, aggregates and dusts are not to be brought onto campuses.

### 6.3 Preparation of Site and Soil

#### 6.3.1 Weed eradication

Weed eradication shall be carried out by environmentally acceptable methods.

#### 6.3.2 Top soil

Top soil shall be imported to the site unless the topsoil type can be provided from material recovered from the site. Design Consultant shall specify placement, consolidation and depth.

Where top soil is impacted by the construction works, this top soil shall be separate and protected from degradation, erosion or mixing with fill or waste to retain its productivity and be reused on the site. There should be no net change in volume of top soil on site.

### 6.4 Turfing

Turf shall be obtained from a specialist grower of cultivated turf, and shall be free of weeds and other foreign matter.

Turf shall be 'Kikuyu' or Buffalo soft leaf 'Matilda' unless otherwise specified for a particular location.

## 6.5 Mulching

Generally, 10mm high grade pine bark mulching shall be spread on garden beds to depth of 75mm, and to surrounds of trees or plants shall be spread to 750mm diameter.

Mulch shall be placed clear of plant stems, and raked to an even surface to finish flush with the surrounding finished levels.

## 6.6 Irrigation System for Gardens

The irrigation system for garden beds and gardens shall be in accordance with the UWS Irrigation System Specification for the appropriate water supply.

See

UWS Irrigation System Non-potable Water Specification Details

UWS Irrigation System Potable Water Specification Details

## 6.7 Paving Units

Generally, UWS has a preference for all paving units to be laid on crusher dust on minimum 75mm thick reinforced concrete base-course complete with control joints to suit type of traffic, isolation and expansion joints where abutting rigid structures to permit movement of the slab.

## 6.8 Tactile Ground Surface Indicators

Tactile ground surface indicators shall be provided to hard paved areas and paths in primary access locations accordance with the provisions of AS/NZS 1428 Part 4: *Tactile Indicators*.

UWS has a preference for glued and pinned TGSi in stainless steel finish. Ceramic TGSi in paving may be used subject to approval by CW&F Project Manager.

DO NOT use PVC glued TGSi

## 6.9 Asphalt Pavements

Asphalt pavements shall be applied to a tack coating of bituminous emulsion spray to the recommendations of AS 2734, laid over a firm base-course free of surface water, oils, greasers, retarders, loose material and dust. Thickness of base-course shall be to suit purpose and proposed traffic use. Asphalt mixing, laying and compaction to AS2734.

Surface finish shall be dense, smooth, and free of roller marks and loose material.

## 6.10 Edging

Edging to garden beds shall be formed in concrete to UWS standard profile details or shall have brick edging details to UWS approval.

DO NOT use timber edging of any kind to garden beds, paths and the like.

## 6.11 Treated Timber

DO NOT use treated timber logs or profiles for retaining walls, decking or decorative features.

## 6.12 Planting

UWS has a preference for native, water tolerant planting. While the Landscape Masterplan Volume 2 document cites selections for plants for each campus, UWS will provide campus specific lists of preferred plants for each project.

The following must be taken into consideration when making plant selections:

DO NOT use Cumberland Plain native vegetation on Hawkesbury, Penrith, Bankstown and Campbelltown campuses.

DO NOT use native grasses to avoid attracting snakes into the landscaped areas.

Fire resistant planting must be selected for areas prone to bushfire risk, especially on Hawkesbury campus.

## 6.13 Water features

Water features may be incorporated into the landscape design, but must feature flowing water to avoid mosquito breeding environments to eliminate risk of mosquito borne viruses, affecting the campus community.

DO NOT include still water features / ponds unless other measures are implemented to reduce incidence of mosquito breeding environments, especially on Hawkesbury campus.

## 6.14 Outdoor furniture

Cross reference: see UWS Bins and Outdoor Furniture Standards.

## 6.15 Masonry walls

Prominently located walls shall be designed to discourage skate-boarding abuse, and may include interference stainless steel strips embedded into the walls.

## 6.16 Screen walls

Proprietary metal slat walls shall be provided to screen plant and equipment located external to the building. Aluminium slat system shall comprise nominal 75mm slats on 1800mm high metal framing. Maximum 15mm gap between slats and maximum 5mm between bottom slat and slab/finished ground level where possible unless otherwise approved by CW&F Project Team.

Height of screen wall shall be commensurate with the size of plant to be shielded from view. Where wall is over 1800mm high, gate latch must be always free from inside, key locked from outside.

Location of screen walls shall avoid intersecting with windows or doors.

Proprietary system: UWS has a preference for GramLine SmartSlat and MetalART Industries Supaslat™ systems.

Colour of screen to be sympathetic to the building and surrounding environment.

## 6.17 Stairs

External stairs shall incorporate a waterproof membrane behind treads and risers to prevent leaching of lime/salts caused by hydraulic pressure on the mortar and other stair materials.

## 7 SIGNAGE

### 7.1 General

The Architect / Design Consultant shall be responsible for preparing a schedule including specifications for all statutory signage, building identification, wayfinding, room number signage and other environmental/space graphics unless identified otherwise in the project brief.

It is **mandatory** to use the UWS Information Display Standard to schedule external wayfinding signage; internal way finding signage; building signage and associated room signage.

Developed in consultation with the UWS Visual Identity Manual, it aims to provide clear, consistent, effective campus wayfinding.

## 8 MISCELLANEOUS

### 8.1 Generally

It is **'mandatory'** for this Part 8 of the Design Guidelines to be read in conjunction with the requirements in the Consultancy Brief and the Project Brief.

### 8.2 Furniture

UWS has developed UWS Standards that provide general parameters and performance criteria for the provision of fixed and loose (including outdoor) furniture, appliances and fittings on its campuses.

The Design Consultant shall allow for the preparation of furniture layouts and schedules in accordance with the design parameters set out in the UWS Space Guidelines.

It is **'mandatory'** for the Design Consultant to use the UWS template to prepare the furniture and fittings schedule.

Cross reference:           UWS Indoor Furniture Standards  
                                  UWS Bins + Outdoor Furniture Standards  
                                  UWS Fittings Standards (incorporating Sanitary Fittings + Tapware)

### 8.3 Appliances and Fittings

This section to be read in conjunction with UWS Hydraulic Services Design Standards and UWS Fittings Standards.

UWS has general performance criteria for the provision of whitegoods and washroom fittings for residential and general accommodation on its campuses in its UWS Fittings Standards.

The Design Consultant shall allow for the preparation of the Schedules for appliances and fittings in accordance with the design parameters set out in the Standards.

Appliances shall be sourced from the 278 Contract Guide for Electrical & Gas Appliances and Presentation Equipment prepared by NSW Government Procurement – Government Services.

See UWS Hydraulic Services Design Standards and NSW Government Procurement Contract 278.

## 9 REFERENCED UWS POLICIES, MAPS AND GUIDELINES

Document	Document Control / Status	Responsibility
UWS Campus Maps	Current, ongoing.  Available from <a href="http://www.uws.edu.au/campuses_structure/cas/campuses">http://www.uws.edu.au/campuses_structure/cas/campuses</a>	CW&F Technical Systems
UWS Engineering Services Design Standards (ESDS)  Consists of the following:	Engineering Services Design Standards (combined) available from shared CW&F drive <a href="\\ad.uws.edu.au\dfshare\CWF\Infrastructure\Capital Works\Guidelines and Manuals\Engineering Services Design Standards combined\Current ESDG combined PDF">\\ad.uws.edu.au\dfshare\CWF\Infrastructure\Capital Works\Guidelines and Manuals\Engineering Services Design Standards combined\Current ESDG combined PDF</a>	CW&F PPS
General Requirements	This section MUST ACCOMPANY any Discipline services Design Standards if the combined engineering services design standards document is not issued.  Also available separately from <a href="\\ad.uws.edu.au\dfshare\CWF\Infrastructure\Capital Works\Guidelines and Manuals\Engineering Services Design Standards combined\General Requirements\Current Guidelines PDF">\\ad.uws.edu.au\dfshare\CWF\Infrastructure\Capital Works\Guidelines and Manuals\Engineering Services Design Standards combined\General Requirements\Current Guidelines PDF</a>	CW&F PPS
Electrical Services	Electrical Services Design Standards  Stand-alone section incorporating lighting, power, and Vertical Transportation Systems sections.  General Requirements and Electrical Services Design Standards available from <a href="\\ad.uws.edu.au\dfshare\CWF\Infrastructure\Capital Works\Guidelines and Manuals\Electrical Guidelines\Current Guidelines PDF">\\ad.uws.edu.au\dfshare\CWF\Infrastructure\Capital Works\Guidelines and Manuals\Electrical Guidelines\Current Guidelines PDF</a>	CW&F PPS
Hydraulic Services	Hydraulic Services Design Standards  Available from shared CW&F drive <a href="\\ad.uws.edu.au\dfshare\CWF\Infrastructure\Capital Works\Guidelines and Manuals\Hydraulic Guidelines\Current Guidelines PDF">\\ad.uws.edu.au\dfshare\CWF\Infrastructure\Capital Works\Guidelines and Manuals\Hydraulic Guidelines\Current Guidelines PDF</a>	CW&F PPS
Mechanical Services	Mechanical Services Design Standards  General Requirements and Mechanical Services Design Standards available from <a href="\\ad.uws.edu.au\dfshare\CWF\Infrastructure\Capital Works\Guidelines and Manuals\Mechanical Guidelines\Current Guidelines PDF">\\ad.uws.edu.au\dfshare\CWF\Infrastructure\Capital Works\Guidelines and Manuals\Mechanical Guidelines\Current Guidelines PDF</a>	CW&F PPS
Building Monitoring and Control System	BMCS Design and Installation Standards  This document is related to Mechanical Services Design Standards and should be appended to that document.  Available from shared CW&F drive <a href="\\ad.uws.edu.au\dfshare\CWF\Infrastructure\Capital Works\Guidelines and Manuals\BMS\Current Guidelines PDF">\\ad.uws.edu.au\dfshare\CWF\Infrastructure\Capital Works\Guidelines and Manuals\BMS\Current Guidelines PDF</a>	CW&F PPS
UWS Electronic Security System Installation Specification	UWS Electronic Security System Installation Specification. Available from shared CW&F drive <a href="\\ad.uws.edu.au\dfshare\CWF\Infrastructure\Capital Works\Guidelines and Manuals\Security Guidelines\Current Guidelines PDF">\\ad.uws.edu.au\dfshare\CWF\Infrastructure\Capital Works\Guidelines and Manuals\Security Guidelines\Current Guidelines PDF</a>	Campus Safety & Security

Document	Document Control / Status	Responsibility
UWS Telecommunication Design Standards	Available from shared CW&F drive <a href="\\ad.uws.edu.au\dfshare\CWF\Infrastructure\Capital Works\Guidelines and Manuals\IT-Telecommunications\Current Guidelines PDF">\\ad.uws.edu.au\dfshare\CWF\Infrastructure\Capital Works\Guidelines and Manuals\IT-Telecommunications\Current Guidelines PDF</a>	IT Facilities
UWS Telecommunication Standards – Structured Cabling	Available from shared CW&F drive <a href="\\ad.uws.edu.au\dfshare\CWF\Infrastructure\Capital Works\Guidelines and Manuals\IT-Telecommunications\Current Guidelines PDF">\\ad.uws.edu.au\dfshare\CWF\Infrastructure\Capital Works\Guidelines and Manuals\IT-Telecommunications\Current Guidelines PDF</a>	IT Facilities
UWS IT-Education Technology Services Standards – Meeting Room (Video Conference ready)	Available from shared CW&F drive <a href="\\ad.uws.edu.au\dfshare\CWF\Infrastructure\Capital Works\Guidelines and Manuals\ETS-Audio Visual (AV)\Current Guidelines PDF">\\ad.uws.edu.au\dfshare\CWF\Infrastructure\Capital Works\Guidelines and Manuals\ETS-Audio Visual (AV)\Current Guidelines PDF</a>	IT-Education Technology Services
UWS AV Standards - Standard FFT	Revised version to be issued	IT-Education Technology Services
UWS AV Standards – Collaborative FFT	Revised version to be issued	IT-Education Technology Services
UWS AV Standards – Collaborative + Smartboard FFT	Revised version to be issued	IT-Education Technology Services
UWS AV Standards – Theatre Teaching Space	Revised version to be issued	IT-Education Technology Services
UWS Environmental Management System	Current on UWS DDS Policy Website	CW&F Environment and Risk
UWS Environmental Management Plan	Current on UWS DDS Policy Website	CW&F Environment and Risk
Greening UWS Action Plan	Current on UWS DDS Policy Website	CW&F Environment and Risk
UWS Water Saving Performance Specification	Dated March 18, 2008	CW&F Environment and Risk
UWS Landscape Master Plan	September 2008. Available on shared CW&F drive <a href="\\ad.uws.edu.au\dfshare\CWF\Infrastructure\Capital Works\Guidelines and Manuals\Landscape Guidelines\Current Guidelines PDF">\\ad.uws.edu.au\dfshare\CWF\Infrastructure\Capital Works\Guidelines and Manuals\Landscape Guidelines\Current Guidelines PDF</a>	CW&F Environment and Risk
UWS Landscape Master Plans and Guidelines Volume 1	Finalised in content. Available on shared CW&F drive <a href="\\ad.uws.edu.au\dfshare\CWF\Infrastructure\Capital Works\Guidelines and Manuals\Landscape Guidelines\Current Guidelines PDF">\\ad.uws.edu.au\dfshare\CWF\Infrastructure\Capital Works\Guidelines and Manuals\Landscape Guidelines\Current Guidelines PDF</a>	CW&F Environment and Risk
UWS Landscape Design Guidelines Volume 2	Finalised in content. Available on shared CW&F drive <a href="\\ad.uws.edu.au\dfshare\CWF\Infrastructure\Capital Works\Guidelines and Manuals\Landscape Guidelines\Current Guidelines PDF">\\ad.uws.edu.au\dfshare\CWF\Infrastructure\Capital Works\Guidelines and Manuals\Landscape Guidelines\Current Guidelines PDF</a>	CW&F Environment and Risk
UWS Irrigation System Non-potable Water Specification	Available from shared CW&F drive <a href="\\ad.uws.edu.au\dfshare\CWF\Infrastructure\Capital Works\Guidelines and Manuals\Landscape">\\ad.uws.edu.au\dfshare\CWF\Infrastructure\Capital Works\Guidelines and Manuals\Landscape</a>	CW&F Grounds

Document	Document Control / Status	Responsibility
	<a href="#">Guidelines\Current Guidelines PDF</a>	
UWS Irrigation System Potable Water Specification	Available from shared CW&F drive <a href="#">\\ad.uws.edu.au\dfshare\CWF\Infrastructure\Capital Works\Guidelines and Manuals\Landscape Guidelines\Current Guidelines PDF</a>	CW&F Grounds
UWS Landscape and External Works Standards (Includes Master Plant List)	Available from shared CW&F drive <a href="#">\\ad.uws.edu.au\dfshare\CWF\Infrastructure\Capital Works\Guidelines and Manuals\Landscape Guidelines\Current Guidelines PDF</a>	CW&F Environment and Risk
UWS Space Standards	Available from shared CW&F drive <a href="#">\\ad.uws.edu.au\dfshare\CWF\Infrastructure\Capital Works\Guidelines and Manuals\Space Planning Guidelines\Current Guidelines PDF</a>	CW&F PPS & SAP
UWS Indoor Furniture Standards	Available from shared CW&F drive <a href="#">\\ad.uws.edu.au\dfshare\CWF\Infrastructure\Capital Works\Guidelines and Manuals\Furniture + Fitments Standards\Current Guidelines PDF</a>	CW&F PPS
UWS Bins and Outdoor Furniture Standards	Available from shared CW&F drive <a href="#">\\ad.uws.edu.au\dfshare\CWF\Infrastructure\Capital Works\Guidelines and Manuals\Furniture + Fitments Standards\Current Guidelines PDF</a>	CW&F PPS
UWS Fittings Standards	Incorporating sanitary ware, tap ware, appliances and fittings.  Available from shared CW&F drive <a href="#">\\ad.uws.edu.au\dfshare\CWF\Infrastructure\Capital Works\Guidelines and Manuals\Furniture + Fitments Standards\Current Guidelines PDF</a>	CW&F PPS
UWS Information Display Standards	Incorporating graphics, signage, and wayfinding requirements.  Available on shared CW&F drive <a href="#">\\ad.uws.edu.au\dfshare\CWF\Infrastructure\Capital Works\Guidelines and Manuals\Signage Guidelines\Current Guidelines PDF</a>	CW&F PPS
CW&F created drawings – CAD Manual	CW&F CAD Manual <b>MUST</b> be read and used in conjunction CW&F CAD Templates and CTB files.  CAD manual and shortcuts to CTB Files and Templates available from shared CW&F drive <a href="#">\\ad.uws.edu.au\dfshare\CWF\Infrastructure\Capital Works\Guidelines and Manuals\CAD Guidelines\Current Guidelines PDF</a>	CW&F PPS
Traffic & Parking Policy	Current on DDS Policy web site. PDF not available	Campus Safety & Security
Heritage documents	Conservation Management Plans and Heritage Asset Management Strategies for Hawkesbury, Parramatta, and Penrith campuses  Available from shared CW&F shared drive: <a href="#">\\ad.uws.edu.au\dfshare\CWF\Infrastructure\Capital Works\Guidelines and Manuals\Heritage CMP + HAMS</a>	CW&F SAP
Conservation Management Plan for	June 2000	CW&F SAP & Maintenance



Document	Document Control / Status	Responsibility
FOS  Precinct Conservation Management Plan for Parramatta (South) campus	Endorsed by NSW Heritage Council July 2000  November 2007  Endorsed by Parramatta City Council and NSW Heritage Council 2008  Both documents available from CW&F shared drive <a href="\\ad.uws.edu.au\dfshare\CWF\Infrastructure\Capital Works\Guidelines and Manuals\Heritage CMP + HAMS\Current CMP - PDF">\\ad.uws.edu.au\dfshare\CWF\Infrastructure\Capital Works\Guidelines and Manuals\Heritage CMP + HAMS\Current CMP - PDF</a>	

Document	Document Control / Status	Responsibility
Parramatta Campus Rydalmere Landscape Management Plan  (CAB Consulting)	Viewing on request to CW&F and at CW&F Office only	CW&F SAP

Document	Document Control / Status	Responsibility
HAMS Parramatta (South) campus and Hawkesbury-Penrith campuses	December 2008  Endorsed by NSW Heritage Council  Available on CW&F shared drive <a href="\\ad.uws.edu.au\dfshare\CWF\Infrastructure\Capital Works\Guidelines and Manuals\Heritage CMP + HAMS\Current HAMS - PDF">\\ad.uws.edu.au\dfshare\CWF\Infrastructure\Capital Works\Guidelines and Manuals\Heritage CMP + HAMS\Current HAMS - PDF</a>	CW&F SAP & Maintenance
HAMS Movable Heritage	In Progress	RAMS CW&F liaison for and coordination only

## Appendix A

1. Requirements for translucent film to glazed partitions. Refer Section 4.5.4.

