# Design Standards for DETE Facilities

Version: 3.0

The Department of Education, Training and Employment (DETE) delivers and maintains educational facilities for people of all ages, from children to adults, and from a diverse range of social, economic and cultural backgrounds. DETE educational facilities include schools, early childhood centres and kindergarten services across Queensland. This asset base is constantly upgraded and improved to continue to deliver quality learning facilities for state education.

The Design Standards for DETE Facilities have been developed, in consultation with a number of stakeholders, to assist design consultants and delivery professionals in the design and delivery of inclusive, safe, healthy and environmentally sustainable educational facilities which provide optimum functionality for the users and the flexibility to adapt over time to modern pedagogies. The Design Standards detail key educational facility design requirements which support the Department's aim in delivering high quality, fit for purpose and future focused educational facilities.



An electronic copy of this document is available on the Department of Education, Training and Employment's website at http://deta.qld.gov.au/corporate/design-standards/design-standards-dete-facilities.html

# Document Version Control

| Version | Date | Changes |
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| 3.0 | 25.09.2014 | This document supersedes the following documents:<br>• *Section 1: Introduction* – Version 2.0<br>• *Section 2: General Design Principles and Standards* – Version 2.0<br>• *Section 3: Ecologically Sustainable Development Standards* – Version 2.0<br>• *Section 4: Site Infrastructure Design Standards* – Version 2.0<br>• *Section 5: Building Design Standards* – Version 2.0<br>• *Section 6: Project Delivery Process* – Version 1.03<br>***Note:*** Section 3 and Section 6, as listed above, have been removed from the current *Design Standards for DETE Facilities* document. Any relevant information from the superseded *Section 3: Ecologically Sustainable Development Standards* – Version 2.0 will be found in this revised document. Also note that *Section 3: Site Infrastructure Standards* and *Section 4: Building Design Standards* of this document are currently under review for future revisions. |
| 3.0 | 25.09.2014 | *Section 1 Introduction* – General amendments to content and contains updated references to the latest DETE Strategic Plan 2014-18. |
| 3.0 | 25.09.2014 | *Section 2 General Design Principles and Standards* – General amendments to content and references. Other amendments include:<br>• *Section 2.1.2 Relevant Australian Standards* - Addition of a list of relevant Australian Standards which featured throughout the previous versions (Sections 1 to 6 which are superseded as noted above).<br>• *Section 2.1.3 Other Relevant Links* - Addition of a list of relevant links.<br>• *Section 2.12 Historic, Cultural and Archaeological Sites* – Additional references to Conservation Management Plans and conserving places of cultural significance.<br>• *Section 2.14 Disaster Mitigation* – Amended section, links and references. |
| 3.0 | 25.09.2014 | *Section 3 Site Infrastructure Design Standards* – General amendments to content and references. Other amendments include:<br>• *Section 3.1.4 Environmental Assessment and Survey Requirements* - Section revised.<br>• *Section 3.1.5 Geotechnical and Soil Survey* – Additional notes re asbestos management.<br>• *Section 3.1.7 Site Stormwater Management* – Updated State Planning Policy.<br>• *Section 3.1.8 Site Zoning* – Change to the maximum external sound level for classrooms which is now detailed in *Section 4.9 Acoustic Performance*.<br>• *Section 3.2.1 General* – The additional requirement for water control valves in the main supply to each building.<br>• *Section 3.2.2 Water Supply* – The additional requirement for the provision of Local Authority acceptance when submitting documentation for plumbing and drainage approval; change to the maximum domestic water main pressure.<br>• *Section 3.2.3 Water Supply for Fire Services* – Multiple amendments and new inclusions within the Section, including additional requirements for fire hydrants and pipework.<br>• *Section 3.2.5 Stormwater Drainage* – Amendment to the minimum pipe cover depths, and, the requirements for flush grates.<br>• *Section 3.2.6 Sewerage Drainage* – The requirement for the provision of inspection chambers as part of the trunk main.<br>• *Section 3.3.4.3 Internal Service Roads* – The requirement for flexible road pavements to be designed in accordance with the Brisbane City Council Flexible Pavement specification for civil engineering work.<br>• *Section 3.5.1 Landscape Design Principles* – Updated principles and notes on tree retention.<br>• *Section 3.6.1 Entry Structures* – The addition of a reference to a fact sheet |

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| | | for Electronic Variable Message Signs (VMS) at schools.<br>• *Section 3.6.7 Other signage elements* – The additional requirement that Asbestos Warning Signage must be installed and maintained in all DETE facilities where the BEMIR asbestos environmental status is assumed, confirmed or unknown.<br>• *Section 3.10.3 Play Structures* – The requirement to consider lifecycle costing and maintenance requirements for play structures. New references to fitness equipment. |
| 3.0 | 25.09.2014 | *Section 4 Building Design Standards* – General amendments to content and references. Other amendments include:<br>• *Section 4 – Multiple amendments:* The *Queensland Government – Design and Fit-out Guide for State Food Business* has been repealed and designers are now referred to the document titled *Food premises: Design, construction and fit-out guide* available on the Local Government Toolbox website (link provided in *Section 2.1*).<br>• *Section 4.1.7Amenities* – Removed requirement for natural lighting via a skylight.<br>• *Section 4.1.8 Modification and Demolition* – The addition of the requirement to comply with the DETE Asbestos Management – policy, plan and guidelines.<br>• *Section 4.3.4.2 Toilet Partitions* – Amendments to wall height.<br>• *Section 4.3.6.2 Roof Safety Fall Systems* – Amendments to DETE requirements.<br>• *Section 4.3.8 Doors* – Minimum single leaf door width to be 920mm.<br>• *Section 4.3.8.9 Operable and Concertina Doors* – Amendments to the minimum Rw rating between classrooms for operable walls and concertina doors, and, to the acceptable method for the mechanism at the bottom of each pair of panels to control flexing and accidental movement.<br>• *Section 4.4.1 Flooring* – Amendments to the criteria and requirements for carpet tiles and broadloom carpets. Amendments also to special flooring and skirtings.<br>• *Section 4.4.4 Paint Finishes* – The addition of the application requirements for external painting (solvent borne and water based paints) and internal painting (solvent borne and water based paints).<br>• *Section 4.5 Roof-Water, Run-Off and Collection* – Amendments have been made across the section (i.e. all sub-sections for gutters, down-pipes and storage tanks). Note the requirement for the designer to provide on the plans all calculations for the sizing and spacing's of the gutters and downpipes. Note also the amendments to overflow outlets on storage tanks.<br>• *Section 4.8.4 Ceiling and Wall Fans* – Amendments to the ceiling fan minimum requirements and the controllers.<br>• *Section 4.8.9 Natural Lighting* – Note that all designs which include roof penetrations must be approved by DETE.<br>• *Section 4.9.1 Planning for acoustic control* – Where the requirement for a noise engineering report is warranted, a suitably qualified acoustic professional is to be engaged to provide the report.<br>• *Section 4.9.2 Acoustic Isolation* – Amendment to the minimum weighted sound reduction index (Rw) in the high isolation and moderate isolation categories from adjoining rooms.<br>• *Section 4.9.3 Acoustic Absorption* –The amendment to the maximum traffic noise in classrooms allowable: '*Traffic noise in classrooms should not exceed 48 dB(A) L10 (1hr) when measured or calculated (in the centre of the room) as an indoor level, during school hours*.' This supersedes the previous requirements from *Section 3.1.8 Site Zoning* which stated: '*Noise sources - maximum external sound level for classrooms is 60dB(A) correlating to 150 metres distance from rail line or 100 metres from major arterial road*.'<br>• *Section 4.10.7 Lighting: General* – Lighting shall be surface mounted in |

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| | | learning environments as a preference over recessed lighting.<br>• *Section 4.10.10 Emergency Lighting* – Section has been revised.<br>• *Section 4.12.5 Fire Services* – Multiple amendments and new inclusions within the Section, including: the note that Fire Hose Reels are **NOT** to be provided to classrooms and associated corridors in accordance with Clause E1.4 (a) of the National Construction Code; Fire Detection Systems; and, Occupant Warning Systems.<br>• *Section 4.12.7 Lift Services* – Section has been revised.<br>• *Section 4.13 Plumbing Fixtures* – The requirement for the plumbing fixtures and fittings to meet the needs of the facility whilst minimising excessive potable water consumption.<br>• *Section 4.14.1.2 Compact laminate* – Amendments to the requirements for compact laminate bench tops, and, to the acceptable laminate products, colours and finishes. |

# Table of Contents

# 1 Introduction

## 1.1 Background and Intent

The Department of Education, Training and Employment (DETE) delivers and maintains educational facilities for people of all ages, from children to adults, and from a diverse range of social, economic and cultural backgrounds. DETE educational facilities include schools, early childhood centres and kindergarten services across Queensland. This asset base is constantly upgraded and improved to enable DETE to continue to deliver quality learning facilities for State education.

The Design Standards for DETE Facilities have been developed, in consultation with a number of stakeholders, to assist design consultants and delivery professionals in the design and delivery of inclusive, safe, healthy and environmentally sustainable educational facilities which provide optimum functionality for the users and the flexibility to adapt over time to modern pedagogies. The Design Standards for DETE Facilities, which forms part of a suite of briefing documents, details key educational facility design requirements which support the Department's aim in delivering high quality, fit for purpose and future focused educational facilities. The Design Standards are not intended to limit design professionals' creativity and innovation in the design of DETE facilities, and, are to be read as the minimum standard which may be exceeded at DETE's request or where deemed necessary. The Design Standards apply to the design of new facilities and the redevelopment and maintenance of existing DETE facilities.

All design and delivery consultants working on DETE Facilities must ensure that all relevant Legislation, Regulations, the National Construction Code, Local Government Laws, and Australian Standards have been complied with in the design and construction of DETE facilities. Further, consultants must ensure that all other Policy, Codes, Standards, Procedures, Guidelines and Specifications that are relevant to each project are complied with. In addition to the these requirements, consultants are required to comply with the Design Standards for DETE Facilities which sets the framework for a consistent approach to the delivery of fit for purpose, innovative and cost effective educational facilities.

## 1.2 Overview of the Design Standards

The complete suite of documents which comprise the Design Standards for DETE facilities are found on the DETE website (http://deta.qld.gov.au/corporate/design-standards/design-standards-dete-facilities.html). This document, Design Standards for DETE Facilities, can be summarised as follows:

- *Section 1 Introduction* – This section provides the background and intent of the Design Standards for DETE Facilities, an overview of the suite of documents which comprise the Design Standards, DETE's strategic intent in relation to DETE facilities, and, concepts in relation to achieving learning spaces for the future. This section also outlines how the Design Standards are to be applied to the design and delivery of DETE facilities.
- *Section 2 General Design Principles and Standards* - This section provides an overview of the broader contextual issues related to items such as compliance with Legislation and other Regulations, Codes, Standards and Policies that must be considered in the design and delivery of DETE facilities. Other considerations include cultural significance, environmentally sustainable design, energy efficiency, community use, aesthetics, value for money, disability access, health and safety, disaster mitigation and technology.
- *Section 3 Site Infrastructure Design Standards* - This section provides an overview of the site specific planning elements in relation (but not limited) to master planning concepts, site

analysis and survey requirements, capacity of site infrastructure including services, environmental assessment and survey requirements, site circulation and functionality, climatic assessment and building orientation, site zoning and building separation.

- *Section 4 Building Design Standards* - Provides an overview of the building specific requirements through an entire school site, from structural requirements to internal and external finishes, health and safety, thermal performance and acoustic requirements, services requirements and fixtures and fit-out requirements.

Other documents which comprise the Design Standards include:

- Master Planning
- Landscape Design Requirements
- Landscape Management for Education Queensland Schools
- Schools Standard Air-Conditioning Specification
- Guide Notes for Schools Tenderers and Installers
- Security Design Requirements
- School Electronic Security Systems
- Security Fencing Specification
- Alarm System Monitoring
- Network Infrastructure Procedures and Standards – Part A and Part B

## 1.3 Strategic Intent

The Queensland Government's vision for public education, contained in DETE's *Strategic Plan 2014-18*, is *'Inspiring Minds. Creating Opportunities. Shaping Queensland's future.*' The Department aims to prepare Queenslanders with the knowledge, skills and confidence to participate effectively in the community and the economy. DETE, through the design and delivery of inclusive, safe, healthy and environmentally sustainable educational facilities which provide optimum functionality for the users and the flexibility to adapt over time to modern pedagogies, provides the infrastructure to enable the Department's vision. The Department's aim is to consistently deliver high quality, fit for purpose and future focused educational facilities across Queensland. The Design Standards support the aim and objectives of DETE's vision through the design and delivery of infrastructure to a consistent, high quality standard. Further, the Design Standards support the Department's commitment to the DETE Disability Service Plan 2014-16.

## 1.4 Achieving Learning Spaces for the Future

The primary function of a learning space is to stimulate and inspire learning whilst ensuring the health, safety and comfort of all users. Learning is not a spectator sport. Students do not learn just by sitting in a classroom listening to teachers, memorising pre-packaged assignments, and providing answers. Students must talk about what they are learning, write about it, relate it to past experiences, and apply it to their daily lives. They must make what they learn part of themselves.

DETE supports an active learning model of instruction. Active learning is the process whereby learners are actively engaged in the learning process, rather than passively absorbing lectures. Active learning involves reading, writing, discussion, and engagement in solving problems, analysis, synthesis, practice and evaluation. Active learning engages a greater range of students in effective learning and builds community through collaborative discussion within the classroom between students and teachers.

In order to support active learning, the learning space must complement instruction activities. An active learning environment provides three fundamental rights for all students:

- Students should be able to see anything that is presented visually;
- Students should be able to hear anything that is presented audibly, free from noise and distortion; and,
- Students should be comfortable in their learning environment. Comfort indicators include: adequate air flow, optimum room temperature and the provision of fit for purpose furniture.

All learning environments must meet these fundamental requirements before meeting any other needs or desires.

Other key learning space design requirements include:

- Learning space designs must provide access for all to enable participation for students of all abilities and to promote the potential of all learners. Accessibility allows all learners to participate in learning with equal access to resources and also provides opportunity for learning to be personalised to cater for individual learning needs.
- Learning space designs must foster collaboration, enable cooperation and build community collectiveness by creating opportunities for students to engage in group work for problem solving and brainstorming. The collaborative environment enables students and teachers to connect both physically and virtually to the wider community through the creation of local, national and global networks.
- Learning space designs need to be sufficiently flexible to support both current and evolving pedagogies by enabling the spaces to be easily reconfigured to accommodate a diverse range of learning activities including one-on-one teaching, group work situations and self-paced learning within the same space.

As far as practicable, learning spaces are to be future proofed by enabling the internal spaces to be easily modified to change its function while still ensuring health, safety and amenity within the structure. Current and future users of the space can create a sense of space by altering the internal fitout.

## 1.5 Application of the Design Standards

The Design Standards for DETE Facilities are to be observed in the delivery of all DETE facility projects, in conjunction with ensuring all designs are compliant with the current version of the Legislation, Regulations, subordinate Legislation, the National Construction Code, Local Government Laws, and Australian Standards Policy, Codes, Standards, Local Government By-Laws and project specific briefing documents. Briefing documents will generally consist of the following:

- Education (Services) Brief describing the educational requirements for the new facility (where applicable)
- Project Facilities Brief, specific room data sheets, and site specific plan (where applicable)
- Relationship Diagrams and Space Allocation Schedules

The Department of Education, Training and Employment's *Design Standards for DETE Facilities* form part of the project documentation issued when tendering for design and delivery consultancies, and, at tender for construction of DETE facilities (including Minor and Medium Works, Maintenance and Design and Construct projects) in conjunction with specific project documentation such as schematic design drawings, specifications and room data sheets. The Design Standards may be used as planning guidelines however the principal purpose is to establish minimum/ mandatory quality standards for inclusion in tender/ contract documentation.

The application of documentation shall apply in the following order of precedence where a conflict arises:

- Australian Government Legislation and Regulations including the National Construction Code (Building Code of Australia)

- Queensland Government Legislation and Regulations
- Queensland Government policy and Department of Education, Training and Employment policy
- Relevant Australian Standard Codes
- *Design Standards for DETE Facilities – (this document)*
- Approved project drawings (Schematic Drawings or Tender Drawings)
- Approved project Specification
- Approved project Room Data Sheets or Space Data Sheets
- Other DETE Guideline and Standards referenced in this document
- Relevant International Standard Codes
- Manufacturers written recommendations

The classification of DETE facilities, as per the requirements of the National Construction Code, will be determined by a suitably qualified Building Surveyor.

# 2 General Design Principles and Standards

## 2.1 Compliance with Mandatory Design Requirements: Legislation, Regulations, the National Construction Code, Local Government Laws and the Australian Standards

- All design and delivery consultants working on DETE Facilities must ensure that all relevant Legislation, Regulations, the National Construction Code (NCC) (the NCC comprises the Building Code of Australia (BCA), Volume One and Two; and the Plumbing Code of Australia (PCA), as Volume Three)), Local Government Laws, and Australian Standards have been complied with in the design and construction of DETE facilities. Further, consultants must ensure that all other Policy, Codes, such as the Queensland Development Code, Standards, Procedures, Guidelines and Specifications that are relevant to each project are complied with.
- Adopt the principles of all relevant non-mandatory design requirements, such as the Queensland Development Code's non-mandatory standards, as a best practice approach to the design of DETE Facilities.
- In addition to the these requirements, consultants are required to comply with the Design Standards for DETE Facilities which sets the framework for a consistent approach to the delivery of fit for purpose, innovative and cost effective educational facilities.

### 2.1.1 Relevant Legislation, Regulations and Policies

Note that it is the responsibility of all design and delivery consultants working on DETE Facilities to ensure that all relevant Legislation, Regulations and Policies are met in the design and construction of DETE facilities. A list of Legislation, which may apply to projects within DETE facilities and the design requirements listed in this document, is provided for consideration and is not to be considered exhaustive:

- *Aboriginal Cultural Heritage Act 2003* (Qld) and the *Torres Strait Islander Cultural Heritage Act 2003* (Qld)
- *Anti-Discrimination Act 1991* (Qld)
- *Building Act 1975* (Qld)
- *Building Fire Safety Regulation 2008* (Building Act 1975 & Fire and Emergency Services Act 1990)
- *Coastal Protection and Management Act 1995*
- *Disability Discrimination Act 1992* (Cmlth) (and amendments 2009)
- *Disability (Access to Premises – Buildings) Standards 2010* http://www.comlaw.gov.au/Details/F2011C00214
- *Disability Standards for Education 2005* (Cwlth) http://www.comlaw.gov.au/Details/F2005L00767
- *Disability Standards for Accessible Public Transport*
- *Disability Services Act 2006 (Qld)*
- *Electrical Safety Act 2002 (Qld)*
- *Environment Protection Act 1994* (Qld)
- *Fire and Rescue Service Act 1990* (Qld)
- *Nature Conservation Act 1992* (Qld)
- *Plumbing and Drainage Act 2002* (Qld)
- *Queensland Food Act 2006*
- *Queensland Food Production (Safety) Act 2000*
- *Queensland Industry Participation Act 2011* (Qld)
- *Queensland Heritage Act 1992* (Qld)

- *Sustainable Planning Act 2009* (Qld)
- *Waste Reduction and Recycling Act 2011*
- *Water Act 2000*
- *Water Supply (Safety and Reliability) Act 2008*
- *Wet Tropics World Heritage Protection and Management Act 1993*
- *Work Health and Safety Act 2011* (Qld)

- National Construction Code
  http://www.abcb.gov.au/about-the-national-construction-code
- Capital Works Management Framework
  http://www.hpw.qld.gov.au/SiteCollectionDocuments/CWMF.pdf
- *State Planning Policy* and associated guidelines – guidance material, including guidelines, fact sheets and other materials, is available for five categories: liveable communities and housing; economic growth; environment and heritage; safety and resilience to hazards; and infrastructure.
  http://www.dsdip.qld.gov.au/about-planning/state-planning-policy.html
- Guidelines about Environmental Assessment and Public Consultation Procedures for Designating Land for Community Infrastructure
  http://www.dsdip.qld.gov.au/resources/ipa/infrastructure/guidelines/061130-guidelines.pdf
- Charter for Local Content
  http://www.dsdip.qld.gov.au/resources/charter-for-local-content.html
- Queensland Government Building and Construction Training Policy
  http://training.qld.gov.au/industry/queensland-government-building-and-construction-training-policy.html
- State Supported Community Infrastructure Policy for Koala Conservation (CI Policy)
  http://www.ehp.qld.gov.au/wildlife/koalas/legislation/index.html#state_government_supported_community_infrastructure
- *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act)
  http://www.environment.gov.au/epbc/index.html
- Queensland Code of Practice for the Building and Construction Industry
  http://www.justice.qld.gov.au/fair-and-safe-work/industrial-relations/codes-of-practice-and-guidelines/queensland-code-of-practice-for-the-building-and-construction-industry
- Queensland Development Code parts referenced in legislation – mandatory parts – current sections
  http://www.hpw.qld.gov.au/construction/BuildingPlumbing/Building/BuildingLawsCodes/QueenslandDevelopmentCode/Pages/QueenslandDevelopmentCodeCurrentParts.aspx

### 2.1.2 Relevant Australian Standards

Note that it is the responsibility of all design and delivery consultants working on DETE Facilities to ensure that all relevant Australian Standards are met in the design and construction of DETE facilities. A list of Australian Standards, which may apply to projects within DETE facilities and the design requirements listed in this document, is provided for consideration and is not to be considered exhaustive:

- *AS ISO 354-2006 Acoustics - Measurement of sound absorption in a reverberation room*
- *AS/NZS ISO 717.1:2004 Acoustics - Rating of sound insulation in buildings and of building elements - Airborne sound insulation*
- *AS 1074-1989 Steel tubes and tubulars for ordinary service*
- *AS/NZS 1158 Set:2010 Lighting for roads and public spaces - set of Standards*
- *AS 1170.2:2011 Structural Design Actions – Wind action*
- *AS 1288:2006 Glass in Buildings – Selection and installation*

- *AS 1318-1985 Use of colour for the marking of physical hazards and the identification of certain equipment in industry (known as the SAA Industrial Safety Colour Code)*
- *AS 1319 Safety Signs for the Occupational Environment*
- *AS 1345-1995 Identification of the contents of pipes, conduits and ducts*
- *AS 1397-2011 Continuous hot-dipped metallic coated steel sheet and strip – Coatings of zinc and zinc alloyed with aluminium and magnesium*
- *AS 1428: 2010 Design for access and mobility: Part 1 to Part 5*
- *AS 1627.0:1997 Metal finishing – Preparation and pretreatment of surfaces – Method selection guide*
- *AS 1668 The use of ventilation and airconditioning in buildings – set of Standards*
- *AS 1670 Fire detection, warning, control and intercom systems – set of Standards*
- *AS 1680 Interior Lighting - set of Standards (including AS/NZS1680.2.3:2008 Interior and workplace lighting – Specific applications – Educational and training facilities)*
- *AS 1735 Lifts, escalators and moving walks (SAA Lift Code)*
- *AS/NZS 1768:2007 Lightning protection*
- *AS 1851-2012 Routine service of fire protection systems and equipment*
- *AS/NZS 1859.1:2004 Reconstituted wood-based panels - Specifications – Particleboard*
- *AS/NZS 1859.2:2004 Reconstituted wood-based panels - Specifications - Dry-processed fibreboard*
- *AS 1891.4: 2009: Industrial fall-arrest systems and devices – Selection, use and maintenance*
- *AS 1926 Swimming Pool Safety - set of Standards.*
- *AS 1905.1: 2005 Components for the protection of openings in fire-resistant walls – Fire-resistant doorsets*
- *AS 1905.2: 2005 Components for the protection of openings in fire-resistant walls – Fire resistant roller shutters*
- *AS/NZS 1935.1:1998 Acoustics - Determination of sound absorption coefficient and impedance in impedance tubes - Method using standing wave ratio*
- *AS 1940-2004 The storage and handling of flammable and combustible liquids*
- *AS 2001.3.4 Methods of test for textiles - Chemical tests - Determination of solvent extractable matter*
- *AS 2021-2000 Acoustics – Aircraft noise intrusion – Building siting and construction*
- *AS/NZS 2107:200 Acoustics – Recommended design sound levels and reverberation times for building interiors*
- *AS/NZS 2111.15:1996 Textile floor coverings - Tests and measurements - Determination of tuft withdrawal force*
- *AS/NZS 2243.10:2004 Safety in laboratories - Storage of chemicals*
- *AS 2293 Emergency escape lighting and exit signs – set of Standards*
- *AS/NZS 2311:2009 Guide to the painting of buildings*
- *AS/NZS 2312:2002 Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings*
- *AS/NZS 2243.1:2005 Safety in laboratories*
- *AS/NZS 2243.10:2004 Safety in laboratories - Storage of chemicals*
- *AS 2419 Fire hydrant installations*
- *AS/NZS 2455.1 Textile floor coverings – Installation practice – General*
- *AS/NZS 2455.2 Textile floor coverings – Installation practice – Carpet tiles*
- *AS/NZS 2648.1:1995 Underground marking tape – Non-detectable tape*
- *AS 2670 Evaluation of human exposure to whole-body vibration – General requirements*
- *AS 2700S:1996 (B21): Colour Standards for General Purpose – Ultramarine (*see *Section 3.6.8 Heritage Signage)*
- *AS/NZS 2728:2013 Prefinished / prepainted sheet metal products for interior / exterior building applications – Performance requirements*

- *AS/NZS 2890 Parking Facilities – set of Standards*
- *AS/NZS 2924.1:1998 High pressure decorative laminates - Sheets made from thermosetting resins - Classification and specifications*
- *AS 2941 Fixed fire protection installations – Pumpset Systems*
- *AS/NZS 2982: 2010 Laboratory Design and Construction*
- *AS 3000:2007 Electrical Installations*
- *AS/NZS 3100:2009 Approval and test specification - General requirements for electrical equipment*
- *AS/NZS 3500:2013 Plumbing and Drainage - set of Standards*
- *AS 3600:2009 Concrete structures*
- *AS 3660:2000: Termite management – set of Standards*
- *AS 3666-2011 Air-handling and water systems of buildings - set of Standards*
- *AS 3671-1989 Acoustics - Road traffic noise intrusion - Building siting and construction*
- *AS/NZS 3730 Guide to the properties of paint for buildings – set of Standards*
- *AS 3740:2010 Waterproofing of domestic wet areas*
- *AS 4145.2: 2008 Locksets and hardware for doors and windows – Mechanical locksets for doors and windows in buildings*
- *AS/NZS 4422 Playground surfaces – Specifications, requirements and testing methods*
- *AS/NZS 4486.1 Playgrounds and playground equipment – Development, installation, inspection, maintenance and operation*
- *AS 4586-2013 Slip resistance classification of new pedestrian surface materials*
- *AS 4674-2004 Construction and fit out of food premises*
- *AS/NZS 4680:2006 Hot-dip galvanized (zinc) coatings on fabricated ferrous articles*
- *AS 4685 Playground equipment – set of Standards*
- *AS 4775: 2007 Emergency eyewash and shower equipment*
- *AS/NZS 4782.1:2004 Double-capped fluorescent lamps - Performance specifications - General (IEC 60081:2000, MOD)*
- *AS/NZS ISO 9001:2008 Quality management systems - Requirements*
- *AS ISO 9239.1-2003 Reaction to fire tests for floor coverings – Determination of the burning behaviour using a radiant heat source*
- *AS/NZS ISO 14001:2004 Environmental management systems - Requirements with guidance for use*

***Note:*** The Australian Standards listed here may have been superseded or have subsequent amendments.

### 2.1.3 Other Relevant Links

Other Government Policies, Codes, Standards and Guidelines which should be considered:

- Design Standards for DETE Facilities – the complete suite of documents are available from: http://deta.qld.gov.au/corporate/design-standards/design-standards-dete-facilities.html
  - Including: Master Planning, Landscape Design Requirements, Landscape Management for Education Queensland Schools, Schools Standard Air-Conditioning Specification, Guide Notes for Schools Tenderers and Installers, Security Design Requirements, School Electronic Security Systems, Security Fencing Specification, Alarm System Monitoring, Network Infrastructure Procedures and Standards – Part A and Part B.
- Queensland Government Asbestos Management Policy for its Assets http://hpw.govnet.qld.gov.au/asbestos/Pages/default.aspx
- DETE Asbestos Management – policy, plan and guidelines http://education.qld.gov.au/asbestos/asbestos-management.html
- DETE Policy for the management of asbestos-containing materials in DETE Facilities http://education.qld.gov.au/asbestos/policy.html

- DETE Working on Department of Education, Training and Employment (DETE) Facilities http://education.qld.gov.au/asbestos/service-providers-and-contractors/index.html
- DETE Health and Safety Policies and Procedures http://education.qld.gov.au/health/safety/index.html
- Queensland Fire and Emergency Services (QFES) (formerly the Queensland Fire and Rescue Service (QFRS)) has a statewide web-based portal for the electronic lodgement of applications for Referral Agency Advice under the *Sustainable Planning Act 2009* https://www.fire.qld.gov.au/
- Queensland Poisons Information Centre http://www.health.qld.gov.au/poisonsinformationcentre/default.asp
- Coastal Hazard Area maps are available on the Department of Environment and Heritage Protection's (EHP) website at: www.ehp.qld.gov.au.
- Adapting to Climate Change http://ehp.qld.gov.au/climatechange/adaptation.html
- State Government Supported Community Infrastructure Koala Conservation Policy http://www.ehp.qld.gov.au/wildlife/koalas/legislation/index.html
- *Food premises: Design, construction and fit-out guide* – available from the Local Government Toolbox website http://www.lgtoolbox.qld.gov.au/BrisbaneCC/EH/FoodBusinessFixed/Pages/OverviewLanding.aspx
- *Australia New Zealand Food Standards Code* http://www.foodstandards.gov.au/code/Pages/default.aspx
- Protecting Queensland heritage https://www.ehp.qld.gov.au/heritage/heritage-in-qld/protecting-heritage.html
- Australia ICOMOS - *Burra Charter* and Practice Notes http://australia.icomos.org/publications/burra-charter-practice-notes/
- *Crime Prevention through Environmental Design: Guidelines for Queensland* (CPTED) http://www.police.qld.gov.au/programs/cscp/safetyPublic/
- Department of State Development, Infrastructure and Planning (DSDIP) – State Planning Policy http://www.dlgp.qld.gov.au
- *Mitigating the Impact of Natural Disasters on Government Buildings* available on the Department of Housing and Public Works website http://www.hpw.qld.gov.au/FacilitiesManagement/BuildingFrameworks/SAMF/Pages/Guidelines.aspx
- *Australian Paint Approval Scheme* (APAS) and the *Painting Contractor's Certification Program* (PCCP): For the list of products that comply and the list of contractors with the required accreditation see the Department of Housing and Public Works website: http://www.hpw.qld.gov.au/construction/WHS/HealthyBuildings/Pages/Resources.aspx & www.apas.gov.au
- Department of Environment and Heritage Protection – the department administers of 25 legislative Acts to manage the health of the environment, to protect Queensland's unique ecosystems and to identify and conserve the state's built heritage http://www.ehp.qld.gov.au/ & http://www.ehp.qld.gov.au/licences-permits/business-industry/index.html
- Department of Transport and Main Roads *Safe School Travel* requirements, including school transport routes, planning for safe transport infrastructure at schools and road advertising http://www.tmr.qld.gov.au/Safety/School-road-safety/Safe-school-travel-safest.aspx
- Brisbane City Council Reference Specifications for Civil Engineering Work: Flexible Pavements in *S150 Roadworks* http://www.brisbane.qld.gov.au/planning-building/planning-guidelines-and-tools/reference-specifications

- Queensland Poisons Information Centre: Plants and mushrooms (fungi) poisonous to people in Queensland http://www.health.qld.gov.au/poisonsinformationcentre/default.asp
- National Emergency Risk Assessment Guidelines (NERAG) http://www.disaster.qld.gov.au/Disaster-resources/Documents/NERAG-National_Emergency_Risk_Assessment_Guidelines_2010.pdf
- Corporate identity and state emblems booklet http://www.premiers.qld.gov.au/publications/categories/guides/corp-identity-emblems.aspx

## 2.2 Site Selection

- Where options are available for new building sites, the following issues should be considered:
  - Site context
  - Layout of building to promote enhanced campus amenity and security through design
  - Local Authority planning schemes
  - State Planning policies and constraints
  - All Cultural and Indigenous Heritage sites
  - Topography (slope/contours and water catchment)
  - Soil conditions (rock or requirements for pre-loading)
  - Existing environment, including flora and fauna
  - Visual assessment, shadow and sun lighting analysis
  - Orientation and microclimate
  - Natural hazards and climatic risks
  - Man-made hazards and risks
  - External noise sources (refer also to *Section 3.1.4 Environmental Assessment and Survey Requirements* and *Section 4.9 Acoustic Performance)*
  - Available access from residential areas within the school's catchment
  - Access onto and within the site for both vehicles and pedestrians including access for people with disabilities, and, effects on traffic flow for surrounding area
  - Q100 and overland flow
  - Proximity to local residences
  - Proximity of other Early Childhood Educational Centres (ECEC)
  - Proximity of inappropriate adult commercial and retail premises
  - Available infrastructure and services e.g. stormwater, sewerage, water supply, electrical power supply, gas supply, and telecommunications
  - All potential project sites shall be assessed to determine whether the site is located on land subject to a Native Title claim, an Indigenous Land Use Agreement (ILUA) or located within or adjacent to Aboriginal and Torres Strait Islander land reserves and Aboriginal Land Act freehold (see also *Section 3.1.4 Environmental Assessment and Survey Requirements)*
  - A survey of archaeological and/or cultural significance areas by a qualified archaeologist or a representative of the traditional owners for the development of a Cultural Heritage Management Plan and/or Cultural Heritage Agreement is to be undertaken as necessary (see *Section 3.1.4 Environmental Assessment and Survey Requirements)*
- The following steps must be undertaken for each project site:
  - A Town Planning Report will be prepared for each project. For more detail on Town Planning Reports see *Section 3.1.4 Environmental Assessment and Survey Requirements*.
  - An Environmental Checklist Report will be prepared, as required (refer to the Town Planning Report). For more detail on Environmental Checklist Reports see *Section 3.1.4 Environmental Assessment and Survey Requirements*.
  - A standard cadastral survey to be undertaken by an accredited cadastral surveyor to identify and mark with vandal resistant markers all property boundaries, with road frontages surveys to extend to include the total road reserve width.

- A contour and detail survey shall be undertaken by a registered surveyor including but not limited to the following:
  - Site contours including topographical features e.g. ridges, hills, valleys, rock outcrops
  - Drainage lines (including all pipe sizes and invert levels at all gullies and manholes) watersheds, overland flow paths, bodies of water, springs, swamps, and flood levels
  - Location of existing and proposed services external to the site
  - Specified trees and all trees greater than 100mm diameter, cultivated vegetation, plant communities, non-vegetated areas
  - Existing buildings, existing services and other structures e.g. fences, walls, culverts, roads, tracks, mines and wells

## 2.3 Future Site Development

- Site planning shall take into account the following:
  - Refer also to *Section 2.2 Site Selection*
  - Existing site capacity and the future site requirements
  - Points of access to future zones of the site, including construction access
  - Disturbance to occupants of existing facilities
  - Circulation patterns and disability access requirements – vehicular, cycling and pedestrian
  - Environmental considerations, as listed in *Section 2.2 Site Selection* and *Section 3.1.4 Environmental Assessment and Survey Requirements*
  - Extension of existing services or the requirement for new or upgraded services
  - Requirement for earthworks for future stages
- DETE's preference is to construct whole buildings which are partly fitted out in the early stages of the site development as opposed to constructing part buildings.
- Avoid duplication and/or redundancy of facilities and services provided in earlier stages.
- Master planning and future site development (including, but not limited to):
  - Where a Master Plan for a school campus exists, project steering committees shall consider the new building in that context
  - Where no Master Plan exists, project steering committees shall consider completing a Master Plan of the site and project implications on the long term planning for the campus. Refer to the DETE Master Planning document (see also *Section 2.1*).
  - Ensure that new buildings enhance rather than detract from the legibility of the campus with coherent navigation cues through the site using clear and obvious architectural techniques

## 2.4 Flexibility and Functionality

- Design shall maximise the use of various spaces for multiple purposes where practical.
- Minimise the use of internal load-bearing walls to allow for future flexibility.
- Consider the location of services and access panels to allow for future modifications.
- Provide maximum flexibility in learning spaces to allow for class, group and individual learning activities.
- Allow for line of sight visual supervision of internal and adjacent external spaces (veranda or external shade areas).

## 2.5 Technology

- Ensure that the following mandatory standards are complied with:
  - ***The Department of Education, Training and Employment Network Infrastructure Procedures and Standards (DNIPS)***. *DNIPS Part A* and *DNIPS Part B* form part of the suite of Design Standards for DETE Facilities documents (see also *Section 2.1*) which are

available at http://deta.qld.gov.au/corporate/design-standards/design-standards-dete-facilities.html

- Allow maximum flexibility in location and installation of cabling, equipment and other services to allow for:
  - Future changes in technology and expansion of services
  - Ease of connection and disconnection

## 2.6 Facility Types and Sizes

- Demographic information and the school Enrolment Management Plan will determine the following:
  - Anticipated peak numbers of students in local catchment area over time
  - Sustainable numbers of students in local catchment area over time
  - Specialist program demand, where applicable
- Permanent facilities will generally be provided for 75% of the long term projected numbers.
- ECEC facility types, sizes and locations are determined by demand and local demographics.

## 2.7 Aesthetics

- See also *Section 4.1.2 Image*.
- Establish a unique physical identity considering the following:
  - Architectural language of the existing structures within the facility and neighbouring the facility, for example, heritage architecture and places
  - Existing landscape and context, including topography, flora and fauna
  - Functionality of spaces, both internally and externally
- Features of importance:
  - Appropriate scale and proportions
  - Colour selection
  - Coherent and clear circulation paths
  - Street identity and egress, both pedestrian and vehicular
  - Safe selection of forms and materials
  - Longevity and maintenance reduction through intelligent design and material selection
- Use of conventional architectural solutions and devices are preferred, subject to site constraints.
- Signage location and scale. Refer also to *Section 3.6 Way Finding and Signage*.

## 2.8 Value for Money

- Facility design and construction should ensure that the overall project is cost effective. Initial capital costs should be balanced with ongoing maintenance and operation costs to minimise whole of life costs.
- The provision of educational facilities which provide optimum functionality for the users and the flexibility to adapt over time to modern pedagogies.
- General considerations:
  - Provision of regular building shapes and simple roof forms
  - Volume of internal spaces to reflect scale of users and purpose of facility
  - Grouping of buildings to minimise circulation requirements and planning to ensure that circulation space within buildings is within scheduled allowances
  - Grouping of areas requiring specialised services/ services coordination services, such as mechanical, hydraulic, electrical, and ICT services

  - Building locations are to consider the Master Plan and aspirations for campus amenity balanced against the economies of servicing. This includes consideration of site access points and existing services.
  - Design structures to suit site conditions, for example, slopes and rock
  - Fit for purpose, quality, and sustainability
- Materials and Finishes:
  - Material and finishes to be robust, durable yet easily maintained
  - Materials and finishes used should be modest, in keeping with an educational environment and fit for purpose
- Fit-out, Furniture and Equipment:
  - Fit-out, furniture and equipment used should be fit for purpose robust, durable and modest, in keeping with an educational environment

## 2.9 Environmentally Sustainable Design and Energy Efficiency

- The Commonwealth and State Governments are committed to delivering best-practice environmentally sustainable facilities for new and substantially refurbished public buildings. Reducing the Department's environmental footprint and delivering sustainable work and learning environments are key factors in the delivery of better infrastructure by DETE to meet whole-of-government objectives.
- Incorporate, where possible, the following sustainability principles:
  - Minimise the use of energy and water, and the generation of waste, both in the construction and operation of facilities
  - Consider whole-of-life costs when comparing design options
  - Locate, orientate and design buildings to optimise environmental advantages and reduce heat gains and losses through passive design principles
  - Incorporate energy efficient technologies for services and equipment
  - Incorporate water saving, harvesting and recycling systems, as required by the Local Authority
  - Plan and develop sites in a manner that minimises undue disturbance of the existing site and its associated environmental values
  - Reduce waste and improve recycling, both during construction and in operation
  - Consider the quality of the indoor environment for staff and student health, wellbeing and learning by maximising ventilation, providing access to daylight and views, and reducing hazardous substances such as volatile organic compounds and formaldehyde
  - Choose building systems, finishes, furnishings and equipment that are affordable, sustainable and minimise the overall lifecycle costs, including recurrent and replacement costs
  - Utilise low-maintenance building forms, construction techniques and materials
  - Choose materials from sustainable sources
  - Consider the role of the facility and its landscaping as a learning resource for environmental education
- The appropriate level of environmental impact assessment is to be undertaken for the design of new facilities and the redevelopment and maintenance of existing DETE facilities. The assessment is to be documented for each project and the method of documentation may range from a simple checklist of items to a complex Project Environmental Management Plan (EMP) depending on the scale of the project. The objective of any environmental impact assessment should be to not only manage impacts but to investigate opportunities to enhance the environmental values of the DETE facility. Please note:
  - Environmental Checklist Reports will be prepared as required (refer to the Town Planning Report).

- A Project Environmental Management Plan (EMP) will be prepared with each Environmental Checklist Report.

For more detail on Town Planning Reports, Environmental Checklist Reports and Project Environmental Management Plans refer to *Section 3.1.4 Environmental Assessment and Survey Requirements*.

## 2.10 Health and Safety

- The health and safety of all staff, students, visitors and other users must be a primary consideration in the design and development of an educational precinct to minimise risks, including but not limited to:
  - Safety of the educational external environment - For example, access for emergency services to physical structures, security, lighting, electrical, dust, noise, pedestrian and traffic planning, landscaping, natural hazards (such as ponds), playgrounds and outdoor areas, working at heights, and the built environment (such as buildings, structures and other infrastructure at the school site)
  - Safety of the internal environment - For example, indoor air quality, noise, lighting, water quality, storage of chemicals and hazardous substances, gas stoves, art kilns, backflow prevention, mechanical and electrical machinery
  - Work Environment - For example, slips, trips and fall risks along path of travel, floors, and footpaths, ventilation in all environments, lighting for safe access, freedom from obstructions, and entrapments (see also *Section 4*)
  - Noise - Acoustic performance (see also *Section 4.9 Acoustic Performance*)
  - Plant **-** For example, gas stoves, art kilns, mechanical, hydraulic and electrical equipment (see also *Section 4*).
  - Electrical - Provide Residual Current Device (RCD) protection to all Socket Power outlets (see also *Section 4*)
  - Hazardous Substances - For example, dangerous goods, chemicals, fume cupboards, eye wash, and dust (see also *Section 4*)
  - Manual Handling -
    - *Resources* - Locations and circulation spaces of and within store rooms in relation to the functional space, the size and weight of the materials stored, appropriate and adequate storage solutions and any mechanical lifting devices, trolleys or similar devices required for the movement of educational resources, movement of cleaning equipment, and the disposal of materials
    - *Personnel* - Mechanical aids, such as hoists, which require adequate circulation space at each end of the lifting sequence
- Select finishes such as paints, carpets, adhesives, insulation and furniture systems to minimise sources of volatile organic compounds and formaldehyde.
- Consider the cleaning, maintenance and durability of all materials and particularly the manufacturers' requirement to use cleaning agents for specified materials which may be hazardous.
- Consider cleaning equipment and avoid ones which may be expensive or complicated to operate.
- Consider access to all areas for cleaning and maintenance.
- Minimise the use of building materials, landscape materials and plants that are known to be likely causes of allergic reactions or asthma attacks.
- Reduce possible trip hazards from changes in level of paths, grates, field inlets and other protrusions. Refer to Legislation and relevant Australian Standards for the construction tolerances for abutment of surfaces for floor or ground surfaces on continuous paths of travel and circulation spaces.
- Signage and tactile indicators to meet Legislation and the Australian Standards.

- Ensure the workplace health and safety requirements of all site users around the construction zone during the construction of new buildings or the refurbishment of existing facilities. In particular:
  - Access to and within buildings, car parks and sports facilities
  - Access to and within amenities and change facilities
  - Adequate storage of educational resources
  - Scheduling of site materials deliveries, crane usage, pneumatic power tool usage and similar devices to minimise noise, dust and inconvenience
- Refer to DETE's Health and Safety Policies and Procedures at http://education.qld.gov.au/health/safety/index.html
- Refer to DETE's Asbestos Management - *Policy for the management of asbestos-containing materials in DETE Facilities* at http://education.qld.gov.au/asbestos/policy.html

## 2.11 Disability Access, Inclusivity and Equity

- Inclusive education ensures that schools are supportive and engaging places for all school community members. It builds communities that value, celebrate and respond to diversity. It is underpinned by respectful relationships between learners and school community members. It is supported by collaborative relationships with parents and communities through communication, learning partnerships, participation and consultative decision-making.
- Inclusive education means that every day in every classroom, every state school student is learning and achieving in a safe, supportive, inclusive and disciplined learning environment. It is necessary to allow for variations in learning abilities as well as physical abilities. As with mobility impairments, cognitive and sensory impairments present challenges to designers to eliminate barriers and create accessible and non-threatening learning environments. The focus of the learning environment is inclusion, which extends to the external areas of the site. Designs are to exceed the relevant requirements of the National Construction Code where this will allow increased participation in learning by persons with special needs who may reasonably be expected to gain a long term benefit from such participation.
- The design of the building/s is to provide for all individuals who have a valid need to use the building/s: enabling effective use of the facilities and access without additional assistance.
- All new facilities and building refurbishment projects briefed are to comply with the access requirements in the current *Disability (Access to Premises – Buildings) Standard 2010*. Refer also to *Section 2.1*.
- The design is to cater for the needs of people as individuals, including all staff and students who may have special needs. Inclusivity in the building design is not restricted to wheelchair users but includes:
  - People with a disability
  - People of Aboriginal and Torres Strait Islander descent
  - People with Special Education requirements
  - At risk groups
- For projects, generally, endeavour to provide the same opportunities and choices for staff and students with a disability that persons without a disability enjoy, through the following:
  - Care must be taken that a person with a disability should not be denied the convenient use of any functions that the school offers;
  - Preference is for single storey slab on ground construction to enable full access for people with a disability; and
  - When a passenger lift is provided in a building required to be accessible, it must be suitable for use by people with a disability. Refer also to *Section 2.1* and *Section 4.12.7 Lift Services*.
- All students are to have access to education that leads to learning outcomes consistent with their potential.

## 2.12 Historic, Cultural and Archaeological Sites

- Refer also to *Section 3.1.4 Environmental Assessment and Survey Requirements*.
- For the design and development of new facilities, redevelopment and/or maintenance of existing DETE facilities with heritage significance, the project outcome/s must be in line with the Conservation Management Plan (CMP) for the DETE facility. Where development, redevelopment or maintenance is required to meet Departmental goals and is contrary to the CMP, then the CMP is to be revisited with public consultation. Where development or redevelopment is required and a CMP does not exist, a CMP is to be developed as part of the planning for the development or redevelopment for the school site.
- The *Queensland Heritage Act 1992* provides for the conservation of Queensland's cultural heritage for the benefit of the community and future generations through a number of measures, including the establishment of the Queensland Heritage Council, maintaining the Queensland heritage register and mandating local government entities across Queensland maintain local heritage registers.
- Observe the principles and procedures of the Burra Charter which has been adopted by the Queensland Heritage Council as the best practice for managing and conserving places of cultural significance in Queensland. All works within DETE facilities, where places of cultural significance exist or are suspected, should aim to:
  - Preserve all unique and significant built environment elements
  - Take a cautious approach to change
  - Minimise removal of, and damage to, existing building fabric of heritage value
  - Design new facilities adjacent to culturally significant places and buildings considering the unique identity and setting
  - Be aware of any existing policies for managing the culturally significant place or develop a policy if required
  - Understand the management requirements of a culturally significant place
- Undertake any consultation as per the requirements of the current *Queensland Heritage Act* with respect to proposed change/s.
- Ensure suitably qualified heritage consultants are engaged to provide advice, where necessary.
- Note that, in addition to buildings, the site itself or portions of the site may include vegetation which forms the context for culturally significant buildings. All aspects of cultural significance require consultation and management throughout the design and delivery process to ensure any change is appropriate to the setting.
- Consideration should be given to existing school buildings which often have heritage and cultural value without being formally recognised by the Queensland heritage register or local heritage registers. Modifications to these existing buildings shall be in line with best practice in the industry, treated as if they are of significant heritage and cultural value regardless of formal status, and must be able to withstand scrutiny for the sequence of investigations, decisions and actions taken.

## 2.13 Behaviour Management/ Security

- All buildings, car parks, walkways, bicycle paths and their immediate environments shall be designed to incorporate the *Crime Prevention through Environmental Design: Guidelines for Queensland* (CPTED) concepts and strategies to achieve a positive working and learning environment whilst reducing the opportunity for crimes against property, staff and students (see also *Section 2.1*).
- Design and adopt crime prevention measures through:
  - Natural and mechanical access control
  - Natural and mechanical surveillance
  - Territorial reinforcement

- Refer also to the *DETE Security Design Requirements* available on the DETE Design Standards website.

## 2.14 Disaster Mitigation

A detailed Environmental Checklist Report shall be undertaken to identify potential environmental issues which may require consideration and/or management for the proposed development (see *Section 3.1.4 Environmental Assessment and Survey Requirements* for details). The checklist is to assess what environmental conditions exist on-site and to identify potential environmental impacts of the proposed development. The Environmental Checklist Report shall make recommendations based on statutory obligations/ requirements under relevant State and Commonwealth legislation and industry best practice (including advice on permits, licences, approvals, offsets). The Environmental Checklist process will identify any risks which require expert advice to further analyse, evaluate, treat and monitor/ review the risk. This may include the requirement for a risk assessment following the National Emergency Risk Assessment Guidelines (NERAG) (refer also to *Section 2.1*).

Consider the outcomes of the Environmental Checklist, in terms of the risks identified, including the likelihood and potential consequences during site selection, school design and construction with particular regards to risks and statutory requirements associated with all potential hazards, including:

- State Planning Policies
- Bushfires
- Flooding
- Storm Surges
- Cyclones
- Landslides
- Hazmat (related nearby industry or storage)

Where educational facilities are located in an identified bushfire risk area consider, in conjunction with local Emergency Services representatives, the need for a suitable place/ area of safer refuge located on the school site.

Where practicable, schools should be located and designed to function effectively during and immediately after natural hazard events commensurate with the level of NERAG assessed risk. Designing a special purpose facility such as a Cyclone Shelter or Bushfire Safe Haven may be required. This should only be undertaken with the express written approval of DETE.

Where emergency shelters are nominated on a school site:

- A Recommended Floor Level (RFL) of any shelter is 1:200 ARI (Average Recurrence Interval) is recommended
- At least one road access to remain passable for emergency evacuation up to Recommended Floor Level (RFL)

Refer also to *Mitigating the Impact of Natural Disasters on Government Buildings* available on the Department of Housing and Public Works website (see *Section 2.1*).

## 2.15 Community Use

- Consult with other Government Departments, the Local Authority, the School and local community groups to ensure that the facility provides a community orientated learning environment which is reflective of local character and responsive to local needs.

- Determine the need to allocate part of a new site for community use, such as an Early Childhood Education and Care Centre, After School Hours Care Centre, School Dental Health Facility or Sports Facility.
- Information regarding Community usage of DETE facilities (including ICT resources) can be provided by viewing Infrastructure Operations *Community Use of School Facilities Implementation guidelines*.
- Where a joint development of facilities is proposed on DETE sites, refer to the procedures outlined in Infrastructure Operations *Community Use of School Facilities Implementation guidelines*.

# 3 Site Infrastructure Design Standards

This section provides a range of design considerations, key concepts and design requirements which are to be applied in the design of new facilities and the redevelopment and maintenance of existing DETE facilities. Design consultants and delivery professionals must consider the needs of the client, the stakeholders and the end users when designing for DETE facilities.

## 3.1 Site Analysis and Planning

### 3.1.1 Site Planning Concepts

- Site identification and acquisition will be undertaken prior to commencement of site planning. The approved project brief will identify the educational service delivery requirements, will include the scope of site infrastructure and buildings, and specify the delivery timeline including staged development.
- Refer also to Master Planning for DETE facilities document (refer to *Section 2.1*).

### 3.1.2 Consultation with Local Authority and Service Providers

- Consultation with other State Authorities, the Local Authority, Transport Authorities, Community organisations and services providers shall prepare and investigate the following where appropriate:
  - Refer also to *Section 3.1.4 Environmental Assessment and Survey Requirements*
  - *Crime Prevention through Environmental Design: Guidelines for Queensland* (refer to *Section 2.1*)
  - Future local area planning and growth patterns
  - Sewerage and stormwater infrastructure and local capacity both current and future
  - Flood levels and effect of anticipated stormwater discharge and disposal
  - Electrical services and future requirements including siting of any future transformer
  - Gas services - piped service
  - Telephone/ data services
  - Flora and fauna identification. For example, the identification of tree preservation areas, koala habitat, noxious weeds, endangered species.
  - Water supply for domestic services, fire services and irrigation, including water supply pressure and flow tests
  - Proximity of industrial areas and green buffer zones
  - Proximity of commercial or retail premises and adult venues
  - Site contamination identification. For example, fire ants or asbestos.
  - Traffic study to determine the impact of the school on local traffic patterns, changes to road infrastructure, road widening, bus routes, location for site access points, bus set down areas and public parking. Traffic study to include pedestrian and cycle traffic patterns
  - Opportunities including suitable site locations for joint development of community facilities. For example, school hall, swimming pool, netball and tennis courts.
  - External infrastructure such as public vehicular pick-up and drop-off, bus set-down, public parking. For new schools a portion of the school site will generally be excised to the local authority and development costs will be shared between state and local authority in accordance with established protocol ratified by Cabinet.

### 3.1.3 Contour and Detail Survey

- A contour and detail survey shall be undertaken by a registered surveyor including, but not limited to, the following:

- Site boundaries and to 5000mm outside all site boundaries, where possible
- Road frontages to include the total road reserve
- Site contours including topographical features, such as ridges, hills, valleys and rock outcrops
- Drainage lines, including all pipe sizes and invert levels at all gullies and manholes, watersheds, overland flow paths, bodies of water, springs, swamps, and flood levels
- Existing and proposed services external to the site
- Specified trees and all trees greater than 100mm diameter, cultivated vegetation, plant communities, and non-vegetated areas. Also note any survey requirements from the Environmental Checklist Report (see *Section 3.1.4*).
- Existing buildings, existing services and other structures, such as fences, walls, culverts, roads, tracks, mines and wells
- Areas of archaeological or cultural significance as determined by investigations
- Refer also to *Section 2.1*

### 3.1.4 Environmental Assessment and Survey Requirements

#### *3.1.4.1 Town Planning Reports*

A Town Planning Report will be prepared for each project which will identify:

- Whether the project involves a material change of use or any other aspect of development
- Current planning scheme provisions and level of assessment if delivered under the *Integrated Development Assessment System* (IDAS)
- Whether an exemption applies for development under the *Sustainable Planning Regulation 2009*, Schedule 4
- Whether the proposal is 'community infrastructure' and may be designated by the Minister under Chapter 5 of the *Sustainable Planning Act 2009*
- What planning instruments and policies apply to the proposed development
- Whether an Environmental Checklist Report is required

#### *3.1.4.2 Environmental Checklist Reports*

- A detailed Environmental Checklist Report shall be undertaken to identify potential environmental issues which may require consideration and/or management for the proposed development. The checklist is to assess what environmental conditions exist on-site and to identify potential environmental impacts of the proposed development.
- The Environmental Checklist Report shall make recommendations based on statutory obligations/ requirements under relevant State and Commonwealth legislation and industry best practice (including advice on permits, licences, approvals, offsets).
- The Environmental Checklist Report shall be undertaken by a suitably qualified Environmental Specialist and as a minimum shall cover:
  - Site details including land tenure (including zoning under the local planning scheme and description of surrounding land uses)
  - Native Title Assessment
  - Cultural Heritage (indigenous and historic)
  - Overhead power lines and communications towers
  - Vistas and views/ scenic amenity
  - Pollution (including air, noise and light pollution)
  - Contamination
  - Hazardous Materials and Waste
  - Natural Hazards (including flood, storm surge, cyclone/ wind speed/ terrain category, earthquake, bushfire, subsidence, landslide)
  - Soils and Geology (including agricultural land, strategic cropping land, erosion risk and acid sulphate soils)
  - Services and Infrastructure (including sewer, water, stormwater, gas, telecommunications)

  - Site Access, Roads and Traffic
  - Hydrology and Stormwater
  - Flora and Fauna (including botanical identification, threatened and protected species, problem species and declared weeds, threatened and endangered species, wildlife corridors, habitat preservation and infestations such as mosquitos and fire ants)
  - Protected and Vulnerable Areas (including coastal protection and management; referable wetlands etc)
- The Environmental Checklist Report shall identify further studies/ investigations/ management plans needed to identify and manage the impacts of the development. For example:
  - Flood/ Hydrology Report
  - Stormwater Management Plan
  - Geotechnical Report
  - Acid Sulfate Soils Investigation
  - Erosion and Sediment Control Plan
  - Bushfire Hazard Assessment/ Management Plan
  - Ecological Assessment/ Flora and Fauna Survey
  - Koala Self Assessment and Management Plan (refer also to *Section 2.1*)
  - Heritage Report/ Conservation Plan
  - Services and Infrastructure Capacity Study
  - Traffic Impact Assessment/ Parking Study
  - Traffic Management Plan
  - Stage 1 Preliminary Site Investigation (contamination)
  - Cultural Heritage Survey/ Management Plan/ Agreement
  - Social Impact Assessment
- The Environmental Checklist Report shall include a Project Environmental Management Plan (EMP) that incorporates the environmental aspects, issues and recommendations that have been identified for the project. The management measures in the EMP should enable DETE to:
  - Manage environmental constraints identified for the site
  - Address statutory and environmental requirements for the proposed development
  - Meet their 'General Environmental Duty' under Section 319 of the *Environmental Protection Act 1994*, to not carry out any activity that causes or is likely to cause harm unless all reasonable and practical measures have been taken to prevent or minimise the harm

### 3.1.5 Geotechnical and Soil Survey

- A detailed geotechnical survey shall be undertaken by a Registered Civil Engineer specialising in geotechnology.
- The survey shall be undertaken after the establishment of the preferred building zone, to particularly identify the presence of rock or problem ground at levels which will affect footings of buildings.
- A detailed soils survey shall be undertaken by an agronomist or suitably qualified specialist soils scientist to test existing site topsoil and determine the feasibility of stripping, stockpiling and upgrading for later use in the site development. This report shall include soil make up and percentage of asbestos fibre content, soil properties, erosion risk and include all relevant data for road pavement design.
- Any existing asbestos in soil site management plan is to be made available to the specialist.
- If asbestos is detected in soils and no management plan is in place then a plan should be formulated.

### 3.1.6 Climatic Assessment

- A climatic assessment shall be undertaken in the design stage to determine macro and micro climatic conditions including the following:
  - Sun angles throughout the year

- Direction, intensity and frequency of prevailing winds and the shielding influences (trees, hills) including cyclone frequency and intensity
- Seasonal patterns of rainfall and likely local climatic influences
- Daily temperature range including the number of days exceeding comfort criteria possibly requiring mechanical cooling

- Consider ways to withstand climate change impacts, such as changes in temperature, rainfall, sea level and extreme weather events, through infrastructure design. Refer also to *Section 2.1*.

### 3.1.7 Site Stormwater Management

- Patterns of stormwater flow into and out of the site shall be controlled and maintained in accordance with Local Authority and statutory requirements. Peak stormwater discharge from the site shall not exceed the level existing prior to site development as determined in consultation with the Local Authority.
- A stormwater and flooding report is to be prepared for all new projects detailing how stormwater impacts are to be addressed in the design.
- For safety of students and staff and to reduce the likelihood of mosquito infestation, management of the volume of stormwater run-off from the site shall be in the form of short-term detention rather than long term retention storage.
- The quality of stormwater run-off and discharge from the site shall be managed in accordance with the *State Planning Policy (SPP) and the SPP – state interest guideline – Water quality.* Refer also to *Section 2.1*.

### 3.1.8 Site Zoning

- External influences affecting the location of the permanent building zone, relocatable building zones, parking and drop-off zone, sports facilities and play zones shall take into account:
  - Outcomes of site investigations and analysis derived from *Sections 3.1.2 to 3.1.7* above
  - Risks of natural events (see also *Section 2.14 Disaster Mitigation* and *Section 3.1.4 Environmental Assessment and Survey Requirements*)
  - Buildings platform level shall be above 1 in 100 Average Recurrence Interval (ARI) inundation level
  - Building floor level shall be 500mm above Q100 level, or otherwise as per local government minimum height requirements if higher
  - Overland stormwater flow paths shall be designed to ensure that water does not enter buildings in 1 in 50 years (ARI) rainfall intensity
  - Noise sources – refer to *Section 2.2 Site Selection, 3.1.4 Environmental Assessment and Survey Requirements, Section 4.1.9 Building Zone Planning, Section 4.9 Acoustic Performance*
  - Overhead Power Lines and Communications Towers - distance from major overhead power lines for classrooms is 100 metres (measured horizontally), unless briefed otherwise
  - Road frontages and site access points for vehicular and pedestrian access
  - Water, sewer, power and telecommunications connection points

### 3.1.9 Building Zone Planning

- Building orientation: To minimise solar heat gain in buildings, the preferred solution is to orient buildings with their long axis running east-west. Noting, however, in some situations it may be preferable to orient buildings to take advantage of prevailing breezes. For example, a north-easterly orientation may be more appropriate for coastal locations. If the preferred orientation is not used, it should be noted that:
  - The sun exclusion requirements set out in *Section 4.8.2 Shade* may be more difficult to achieve, particularly if there are windows with an Easterly or Westerly aspect
  - To meet the comfort conditions specified in *Section 4.8.1 Thermal Insulation*, additional thermal insulation may have to be used for wall areas facing East or West

- The location and detailed planning of the building zone shall be determined by the following:
  - Cut and fill operations and changes to the topology of the site are to be minimised
  - Balance of cut and fill earthworks for buildings in conjunction with earthworks for the recreation/ sports field zones to reduce the extent of retaining walls whilst achieving the maximum amount of useable site area
  - Orientation of buildings to maximise Environmentally Sustainable Design (ESD) Principles
  - Sports fields shall generally be located at a lower level than building zones to aid site drainage and staff supervision of students
- Functional sub zones within the building zone shall be in accordance with the project brief. For example, Public entry, Administration, Core Facilities Zone (Resource Centre, Central Hall, Canteen), Junior, Middle and Senior Learning zones.
- The identification and separation of functional sub zones shall be achieved by:
  - Colour and texture/ material definition of buildings, and external structures and signage
  - Landscape treatment and buffer zones of planting
  - Location of major and minor pedestrian access ways including covered walkways and secondary pathways
  - Internal Access Roads
  - Compliant disability access within and around the functional built zones
- Building separation shall take into account:
  - Noise disturbance from adjacent and opposite classrooms when windows are open for ventilation. Provide a minimum 10m clear distance between opposite open-able windows unless briefed otherwise. Refer also to *Section 4.9 Acoustic Performance*.
  - Need for adequate air circulation and cooling breezes
  - Glare from roofs into rooms in adjacent buildings
  - Functional use of spaces between buildings
  - Reducing the risk of fire transmission due to radiant heat from adjoining buildings
  - Requirement for emergency services vehicle access
- Buildings that have the potential to be used by community and sporting groups, such as Performing Arts/ Music/ Sports Centres or Sporting Fields, shall be:
  - Located close to parking areas used by the public
  - Located away from adjacent residential developments to reduce effect of noise generated, such as sports activities
  - Have adequate access lighting leading from parking areas to buildings to provide safe access
  - Provide Disability access to these buildings from public parking areas
- Relocatable and temporary building zones shall be:
  - Minimum 6 m wide clear site access from adjacent road access for installation and removal
  - Access to sewerage, water, electricity, gas, communication, stormwater services
  - Not to be located immediately adjacent to the main frontage or near the main entry to the school
  - Arranged in clusters and located adjacent to permanent learning blocks within appropriate education zones
  - Relocatable specialist learning facilities shall be located in close proximity to similar permanent specialist facilities
  - Provide a continuous accessible path of travel access to connect to adjacent buildings and permanent facilities
  - Orientate buildings with long side facing north where practicable
  - Minimise the height above ground of the floor level at entry points to minimise the extent of stairs and ramps
- Personal security shall be supported by the following design principles:

  - Refer to the DETE *Security Design Requirements* prepared by the School Security Section, Asset Maintenance Unit (see also *Section 2.1*)
  - Locate the building zone away from neighbouring shops, hotels and parks
  - Align buildings to provide clear lines of sight for surveillance by teachers and security officers
  - Minimise recesses in the external walls of buildings to eliminate hiding places
  - Landscaping which allows visual sightlines between 700mm and 2200mm high
  - Maximise extent of outdoor area that can be supervised from one location
  - Locate student toilets so that access can be easily supervised
  - Promote natural surveillance through CPTED concepts and strategies
- Platforms for all future buildings and site infrastructure shall be completed in stage one unless specifically briefed otherwise to enable:
  - Early start of construction for future stages
  - Minimisation of disturbance to occupants or neighbours
  - Preloading to achieve early subsoil compaction
  - Stabilisation of surrounding areas by turfing to prevent potential erosion and provide temporary play space
  - Implementation of sediment and erosion control measures

## 3.2 Site Services

### 3.2.1 General

- All design, materials, workmanship, testing and commissioning of site services shall comply with the latest revision of relevant Australian Standards and statutory requirements
- Existing site services shall be utilized and extended where possible.
- Consult with Local Authority to determine location and type of service connections and outlets from site required for compliance.
- Provide water control valves in the main supply to each building adjacent to that building in suitable pathboxes.
- Service provision in the initial stage of a new school site should provide for the total Master Plan development requirements.
- Allow additional capacity for future stages and for Parents and Citizens Association (P&C) and community funded projects.
- ECEC site connection to services infrastructure is to be provided, allowing independent connections or at least separate metering to school (including water, drainage, power, data, telecommunication, electronic security). Ensure separate metering by an approved Service Provider Meter is used to enable separate account to be established. Meters must be in a location accessible to the provider.

### 3.2.2 Water Supply

- Where town water is available from Local Authority supply:
  - Provide Local Authority acceptance of connection when submitting documentation for plumbing and drainage approval
  - Provide reticulated potable water to all plumbing fixtures in all permanent and relocatable buildings and to external hose cocks and to drinking fountains
  - Provide water reticulation for irrigation of landscape planting and for sports fields where provided by DETE
  - Provide backflow protection devices in accordance with statutory requirements
  - Water supply pressure shall be:

  - Water Main - Maximum – 700 kPa (Maximum pressure within buildings shall not exceed the relevant Australian Standard)
  - Water Main - Minimum - 200 kPa (Desirable: 275 kPa)
  - Provide site boosting if necessary to achieve minimum pressure
  - Pressure to fire mains as per Hydraulic Engineers report
- Where town water supply is not potable:
  - Provide suitable rainwater collection, tank storage, filtration, sterilisation and reticulation for potable water supply which will be used for drinking and hygiene purposes in accordance with Local and State Authority requirements
- Where town water supply is unavailable:
  - Provide rainwater collection, storage and reticulation system for sanitary fixtures, internal and external hose cocks
  - Where water treatment plants are located on school sites, ensure compliance with Environmental Protection Agency licence requirements, development of water management plans, regulated servicing, sampling and testing
  - Consider the use of stormwater storage for irrigation purposes

### 3.2.3 Water Supply for Fire Services

- Investigate the adequacy of the Local Council water supply, noting the flow rates at maximum and minimum pressures as established by the Council. Request a hydraulic model from the council. The water supply to the school must be thoroughly investigated with the supply authorities. Provide a report to DETE on the investigations conducted and the conclusions reached.
- Where town water is available from Local Authority supply:
  - Provide fire main to new sites and new buildings within existing sites
  - Design and install fire hydrant system to the relevant Local Authority requirements, Australian Standards and the National Construction Code. See also *Section 2.1*
  - Meter size and necessary bypassing arrangement shall be in accordance with Local Fire and Water Authority requirements
  - Provide fire hose reels as per the *Building Fire Safety Regulation 2008*, the relevant Australian Standards and the National Construction Code. See also *Section 2.1*
- Fire Main:
  - Provide a suitable fire main as a separate ring main of sufficient capacity in accordance with all relevant codes and standards
  - Provide booster to fire main only where site conditions prevent fire truck access to hydrants, and as required to conform to relevant codes and standards, or where water supply cannot meet demand of the fire protection system
  - Provide testable back flow prevention and metering devices on the fire main to comply with Local Authority requirements
  - All valves, gauges, switchboards, panels, switches and detectors shall be labelled
- Fire Hydrants:
  - The fire hydrant system shall be designed in accordance with all Regulations and Acts including: the *Building Act 1975*, the *Building Fire Safety Regulations 2008*, other relevant Australian Standards and the local authorities' requirements
  - Provide fire hydrant system to serve buildings as required by Queensland Fire and Emergency Service (QFES)
  - Provide vehicular access and hard standing for fire tenders to within 20 metres of hydrant points. Where this is impractical, consult with the relevant authority to develop workable solutions.
  - Hydrants shall be pillar type and located no closer than 10 metres to a building and not in defined student play areas or planting areas. Where internal Fire hydrants are required,

they shall be installed in cupboards. Where possible external hydrants shall be provided in lieu of internal hydrants.
  - Fire hydrant valves shall be protected with an approved tamper resistant device
  - Install 150mm galvanised steel concrete filled bollards to protect the hydrants from vehicular impact
  - Provide booster assembly to fire main only when required by the Australian Standard. Where practical, locate the fire hydrants so that it is within reach of a fire truck or provide suitable hard stands and access roadway to allow fire truck access to hydrants.
  - Provide pumps where the water supply cannot provide sufficient pressure for the fire hydrant system
  - The location of all system isolation valves and hydrant landing valves shall be indicated on an Australian Standard compliant block diagram mounted inside the booster cabinet, or in a cabinet located in prominent position near the front boundary of the site. A copy of the approved diagram shall be provided electronically to DETE for record. A laminated copy of the approved diagram shall be provided and stored in the emergency documents cabinet at the school. In addition to the information required in the Australian Standards, the diagram shall indicate the location of the most hydraulically disadvantaged hydrant/s. Refer also to *Section 2.1*.
  - The pipe work for the fire hydrant system shall be designed to suit the council water supply. The use of booster pumps should be avoided where possible. If the water supply main cannot meet the demand of the fire hydrant system then booster pumps shall be provided in accordance with the *Building Act 1975* and the relevant Australian Standard (see also *Section 2.1*).
- Where town water supply is unavailable:
  - Provide a storage tank and pump system with a capacity to meet the requirements with the relevant Fire Authority, supplied by a suitable source such as rainwater, bore spring water or imported water
- Where town water supply cannot provide required flow:
  - Provide a compartmented water storage tank or tanks, automatically filled, fitted with a low-level alarm with signal transmitted to the Fire Indicator Panel when level falls below 75% of the designed capacity
- Where bore water is used for fire fighting purposes provide water cooling systems in hot bore areas where applicable.
- The pump house or room shall be incorporated into a building. If this is impractical or uneconomical, the pump house shall be located away from the front entrance of the school.
- Where a break tank is required by the water supply authority to protect the supply mains, the requirements for two fire pumps shall be assessed by the project team and an alternate solution shall be prepared for the authorities to reduce the requirement to a single pump.
- The operation and the status of the pumps shall be monitored by the FIP where a FIP is available on site otherwise the status of the pumps shall be monitored by the security system.
- The access to the roof of the tanks and the hatch into the tanks must be locked.
- Tanks shall not be installed at the main entrance to the school without consultation with DETE.
- The diameter of the pump impellor shall not exceed 90% of the maximum allowable size, which can be fitted in to the pump casing. Pump system faults and pump operation shall be indicated on the FIP and MIMIC panels and at the security control station.
- Pipework and Valves:
  - All exposed pipe work shall run parallel with the building structures. Pipe work shall be installed as close to the underside of the slab and roof structure as possible
  - Exposed pipe work shall be galvanised steel. Painting of the galvanised pipe work in and around the pump room will not be required. Hydrant standpipe shall be painted with one undercoat and two gloss coats.

- Pipe work shall be medium grade tube to the relevant Australian Standard (see also *Section 2.1*). Pipe work for the hydrant and fire hose reel systems shall be galvanised or copper or stainless steel with back flow prevention devices in meeting the water supply authorities back flow prevention requirements. The design of the pipe work and the selection of the piping material shall be suitable for the environmental condition the pipe work will be subjected to.
- Existing pipe work shall be hydrostatically tested to verify its integrity. Report on the condition of the pipe work before commencing design work.
- Pipe work shall be identified in accordance with relevant Australian Standards (see also *Section 2.1*)
- Isolating valves shall be provided on each side of check valves to facilitate maintenance
- Directional plates shall be installed on concrete pads to indicate the type of service and the direction of the underground pipe work
- Underground pipe or service markers shall be fitted with trace wire

### 3.2.4 Recycled Water

- Refer also to *Section 4.5.3 Storage Tanks*.
- Storage may involve underground cellular tanks, above ground tanks or suitably fenced dams.
- Each site shall be assessed taking into account likely rainfall, cost, and minimum irrigation requirements (pipes, pumps and sprays) to maintain landscaping/ grassing.
- Where reticulated recycled water is available from the Local Authority:
  - Provide recycled water reticulation (purple pipe) for below ground irrigation of landscape planting and for sports fields where provided by DETE. Use of recycled water for toilet flushing, above ground irrigation and irrigation of food crops is only acceptable where the quality of the water is Class A+.
  - The provision of recycled water is to be in accordance with the *Water Supply (Safety and Reliability) Act 2008* administered by the Department of Energy and Water Supply.

### 3.2.5 Stormwater Drainage

- Provide a drainage system to suit the fully developed upstream catchment taking account of overland flows from adjacent properties.
- Provide a drainage system to all buildings, road works and car parking within the site, design to eliminate ponding or standing water.
- Provide sub-soil drainage connection points to landscaped areas, soft-fall under play structures, sandpits and all other necessary points.
- All drainage in the region of buildings and paved areas shall be by swales, spoon drains, kerb and channel and underground drains as appropriate, design shall be to eliminate ponding and avoid trip hazards.
- Design of the stormwater drainage system shall be based on methods outlined in in the relevant Australian Standards (see also *Section 2.1*) and the following minimum capacity requirements:
  - Building Zone: Piped drainage: 20 yr Average Recurrence Interval (ARI)
  - Building Zone: Overland flow: 100 yr ARI
  - Downstream: Piped drainage: 10 yr ARI
  - Pipe velocities at design flow:
    - Maximum: 3.6 m/sec (5.0 m/sec @ 50 yr ARI)
    - Minimum: 1.2 m/sec
  - Minimum ND (mm nominal diameter) pipe size:
    - Connection direct to downpipes: ND150
    - Downstream of any grated pit: ND150
    - Downstream of any side entry pit: ND300
  - Minimum pipe cover: 600mm roadways, 300mm elsewhere

  - Concrete pipes are to be a minimum of Class 3
- Collect all roof water from buildings and covered links and discharge to the stormwater system or tanks as briefed.
- Discharge stormwater to Local Authority system if possible or alternatively to suitable locations on site. Refer to the *State Planning Pollicy – state interest guideline: Water quality* (see also *Section 2.1*).
- Provide a non-scouring Oil and Sediment Interceptor Unit in the piped system immediately downstream of car park stormwater inlets.
- Provide overland flow paths as a back-up to reticulated system to cater for 100 year ARI.
- Avoid use of open channels.
- Design of overland flow shall be such that it avoids inundation of all pathway and lowset buildings.
- Avoid large volume water flows at gullies and end walls.
- Provide barriers at entrance and discharge points of large diameter pipes to prevent access by children.
- Flush grates shall have 0.9mm openings and secure fastenings. Use flush grates which have been designed to prevent high-heel, finger and toe entrapment, are slip resistant and are suitable for foot and wheelchair traffic.
- Field drains where crossed by paths or near assembly areas or covered links shall be fitted with flush grates suitable for foot and wheelchair traffic (use flush grates as specified above).
- End of grates at intersections of paths and verandas shall not create trip points.
- Pit covers shall be bolted down so that they cannot be removed easily.
- All stormwater civil designs are to be checked by a registered professional engineer of Queensland and the registration number is to be shown on the drawings.

### 3.2.6 Sewerage Drainage

- Connect to Local Authority system where available and adopt Local Authority standards for connection. Provide Local Authority acceptance of connection when submitting documentation for plumbing and drainage approval.
- If required, allow for pumping stations and rising main.
- Where Local Authority connection is not available, dispose of effluent and sullage wastes shall be by one of the following methods:
  - Septic tank sullage and septic disposal systems. Provide heavy duty cover to septic tanks where accessible to children.
  - Holding tanks complete with alarm systems. Consult with Local Authority regarding requirements for access point. Provide min 1200mm high fenced enclosure to holding tanks complete with self closing, lockable gate (such as pool fencing or similar).
  - Installation of fenced onsite sewerage treatment plant and effluent disposal area (such as absorption/ transpiration trenches)
  - Where sewage pumps are installed, switchboard and over-capacity emergency light shall be adequately protected against vandalism and vehicle damage
  - All pump wells, septic tanks and holding tanks, where required, shall be fitted with robust ventilation stacks with mosquito proof cowls
  - Inspection chambers shall be provided where there are significant changes to levels within the lines
- Note under the *Environmental Protection Act* the requirement to apply for a licence to operate a waste disposal facility which is considered to be an environmentally relevant activity (ERA). Refer to the Department of Environment and Heritage Protection and also to *Section 2.1.*
- Pipes shall be located at a minimum depth to invert of:
  - 500mm under roadways
  - 100mm under concrete slabs

  - 300mm elsewhere to comply with the relevant Australian Standards for plumbing and drainage
- Provide Sewer Inspection chambers at junctions of major drainage runs and at maximum 60m intervals.
- Provide overflow relief gully on each building to maximise protection against blocked sewers.
- Provide inspection chambers as part of the trunk main. Inspection openings are to be at a maximum of 60m intervals, and, where possible, incorporate these chambers at major branches, at connections to amenities blocks, and adjacent to the connection to the sewer if there is no Local Authority chamber at the connection.

### 3.2.7 Electrical

- Refer also to *Section 4.8 Thermal Performance, Ventilation, Cooling and Heating.*
- The Local Supply Authority has the responsibility to supply electricity to the site. The Supply Authority is to be contacted as early as possible in the design phase to confirm network capacity.
- When new or refurbishment work is undertaken in an existing site, and mains, sub-mains or switchboard replacement is necessary, these services shall be sized to accommodate an additional 25% spare space and electrical capacity for future growth.
- New services on Greenfield sites shall similarly be sized for 25% spare capacity, as above.
- Where new cable pathways, conduits, ducts, and the like are necessary, spare capacity shall be in the form of additional empty pathways for future growth.
- Provide telecommunications cabling, ducting facilities and bell systems, public address systems, fire alarms systems as appropriate to the site and location.
- Underground PVC cable conduits for enclosure of HV cables shall be installed with a minimum depth of 750mm from the top of the conduit to the finished surface level and shall be identified by orange maker tape as per the relevant Australian Standards.
- Underground PVC cable conduits for enclosure of LV cables shall be installed with a minimum depth of 600mm from the top of the conduit to the finished surface level and shall be identified by orange marker tape as per the relevant Australian Standards. Provide transformer provision as deemed necessary by the Local Supply Authority. Locate transformer to be accessible by service vehicle (medium to large truck) and central to the main load areas (areas of high power usage).
- Locate the transformer in a safe enclosure preferably adjacent to the main switchboard. The enclosure should be of size nominally 4800mm wide x 5000mm deep or to a design approved by the Local Supply Authority.
- No other underground services shall be within the transformer enclosure area.
- Main Switchboard shall be located in separate room or a weatherproof external structure adjacent to transformer and as near as practical to high load concentration. Also consider the economic balance of costs depending on direction and location of the supply to the school.
- Main switchboard room should be of sufficient size and have direct access to exterior of the building via a weather protected outward opening vandal resistant stainless steel door.
- Location and layout of main switchboard room shall comply with current Australian Standards.

### 3.2.8 Electronic Site Security

- Refer to the DETE *Security Design Requirements for* Electronic Security (see *Section 2.1*).

### 3.2.9 Access and Security Lighting

- Provide security and access lighting at intervals and locations to satisfy requirements as briefed to the following:
  - Street pedestrian entry, internal roads and car parks
  - Major pedestrian paths and covered links
  - Building perimeters and entries

  - Steps, ramps and gathering places
  - Areas identified as high risk of vandalism (refer to the DETE *Security Design Requirements*/ see *Section 2.1)*
- Security and access lighting shall be:
  - Compliant with relevant Australian Standards
  - High efficient light sources – either T5 fluorescent (or equivalent) for building perimeter and walkways or mercury vapour (HID) (or equivalent) for building perimeter
  - LED lighting or Metal Halide lighting (or equivalent) to car park perimeter and roadways
  - Vandal resistant
  - Time switch, photo-electric cell in series, with a manual override switch in parallel, to be centralised in the Administration Office

## 3.3 Vehicular Access and Parking

### 3.3.1 Road Access and Traffic Planning

- Undertake a traffic survey for new sites to determine external road layout and suitable location of access points, parking, and set-down areas in consultation with Local Authority, relevant Transport Authorities and local bus companies.
- Pedestrian safety is paramount with vehicular access and any cycle paths on the site to be clearly segregated from pedestrian traffic.
- All planning for safe infrastructure at schools is to be designed in accordance with the State safe school travel requirements, including *Safe transport infrastructure at schools – technical guideline* and *Road advertising – Electronic Variable Message Signs at schools*, available from the Department of Transport and Main Roads website. Refer also to *Section 2.1*.
- Road access, set down and parking areas adjacent to the roadside and associated accessible paths of travel shall be designed to facilitate land excision to the Local Authority. All designs are to comply with the Local Authority requirements.
- Allow for the following:
  - Good sight lines and traffic path qualities are required. Traffic paths to take into account bus set-down bays and quick car drop-off zones.
  - Street lighting, landscaping and pavements to Local Authority standards
  - Traffic paths should not conflict with pedestrian or cycle routes
  - Bus set down is to be separated from car set-down area
  - Cycle paths (nom 2000mm wide) to be separate from pedestrian pathways
  - Provide safety measures such as appropriate speed restrictions, pedestrian crossings, road signage
  - Where possible provide more than one vehicular access point onto the site
- All road works designs are to be checked by a Registered Professional Engineer of Queensland and the registration number is to be shown on all drawings.
- Documentation for road infrastructure to be constructed outside the school site is to be provided only with DETE approval (apart from Industrial Crossings to Local Authority requirements).

### 3.3.2 Bus Parking and Turnaround

- Extent and direction of approach of bus traffic will influence the location of the bus set-down area and any necessary turn-around.
- Determine public and private bus service requirements in consultation with Local Authority, local bus service providers and school transportation officer at the relevant Regional Department of Transport.
- Allow for covered passenger waiting area within the school site close to the bus set-down boundary.

- Wherever practicable, provide shade to the covered passenger waiting area between the hours of 2:00 and 4:00 p.m. taking into account seasonal shade angles while maintaining safe and visible bus set-down areas.
- Separate bus set-down area from flow of through traffic and car set down areas.
- Consider the length, height and turning circle of buses particularly low floor buses in the layout and design of bus set-down area.

### 3.3.3 Public Parking and Drop-Off/Set-down areas

- Refer to the relevant Australian Standards for information regarding required design features. Refer also to *Section 2.1*.
- Ensure the design meets the design standards which are stipulated by the Queensland Department of Transport and Main Roads or the Local Government Authority, relevant to the project location.
- Provide public parking and set-down for both cars and buses including all associated infrastructure such as lighting, traffic calming and signage. Consult with Local Authority regarding the design, extent and location and linkage to neighbourhood road infrastructure.
- In relation to school sites, determine extent of land to be excised from the site to the Local Authority and extent of site boundary fencing. For new schools, set-down and public car park spaces will generally be excised in favour of the local authority as public road.
- The number of public parking spaces shall be as follows as a minimum unless briefed otherwise:
  - For school sites, 13% of total student numbers plus 10% of year 12 students
  - For ECEC sites refer to facilities brief provided:
    - For kindergartens provide a minimum of 16 for double and 8 for single dedicated car parking spaces. The car park is to include a disability compliant space which meets the Australian Standards, the Local Authority's regulations. If the school has ample existing on-site or on-street parking that can be allocated to the kindergarten, this facility may be used, provided it does not compromise the integrity of school parking requirements.
  - For all sites, 2% of all car park spaces to be PWD parking as a minimum in accordance with relevant Legislation, Regulations, Codes and Standards
  - For large sites, public parking areas shall be located where possible in more than one zone to relieve traffic congestion at peak times and to be in close proximity to learning zones (for example, P-6, 7-9 and 10-12)
  - Clearly signpost all vehicular access and car parking modules for visitors, staff, students and service vehicles

### 3.3.4 On-site Parking and Access Roads

- On-site parking areas shall not impede emergency vehicle access.
- Staff parking areas should consist of circulation roadways between linked parking modules with layout appropriate to the site and providing good sight lines.
- Kerbside parallel parking and angle parking should be kept to a minimum and is not desirable on Principal Roads within the internal service road network.
- Locate bicycle storage area in a suitable location providing appropriate access to the internal road system and security for the facility.
- Consideration should be given to the provision of motor bike parking wherever a full length or width car park space is not feasible.
- Car parking spaces suitable only for small vehicles should be kept to a minimum or used for motor bike parking.
- Blind aisle car parking modules are prohibited.
- Car park modules longer than 100m in length shall have traffic calming devices such as speed humps placed along the aisle.

- Provide for safe pedestrian movement from all car park spaces into the main pedestrian walkway network and the continuous accessible path of travel which negates any need to walk through the parking module or along the circulation roadway.
- Pedestrian crossings on internal service roads or in the car park modules are not required to be covered.
- Pedestrian crossings should be ideally located in the middle of the car park module. Where aisle lengths are in excess of 100m, locate the pedestrian crossing near traffic calming devices.
- Where a paved pathway is behind the kerb of the parking space, wheel stops must be used to ensure that vehicles do not overhang the end of the space and intrude on the width of the pathway.
- Delivery areas and waste collection points must be clearly defined and vehicle turning templates developed to confirm access.

#### *3.3.4.1 Visitor Parking*

- Provide visitor parking as follows as a minimum unless briefed otherwise:
  - P-6 schools: 10 spaces including one PWD parking space
  - 7-12 schools: 15 spaces including one PWD parking space
  - P-12 schools: 20 spaces including two PWD parking spaces
- Location shall be close to and in view of Administration building or Security office.
- Where Special Education facilities are co-located on the school site, provide appropriately sized bus parking in close proximity to the main building, with an access pathway from the building to the parking bay in accordance with relevant Australian Standards and Codes.
- Car park spaces for people with disabilities and delivery persons are to be available close to entries to the building/s and clearly signposted. A ramp or paved walkway shall be provided between each parking space for people with disabilities and the continuous accessible path of travel to the entrance to the building and ensure design meets all relevant Australian Standards.

#### *3.3.4.2 Student and General Parking*

- Locate and group student and general car park areas and roadway access points away from the bus set-down area.
- Where practicable, co-locate staff and student car park modules to create flexibility and enable overflow parking spaces.
- Student and general car parking areas are to be arranged so that they are capable of being segregated, regulated, and charged for. The segregation must be flexible e.g. it may be necessary to reserve more space for visitors on days when an event is being hosted at the site.
- Total numbers of student and general parking spaces should be provided in consideration of the availability of public transport to the site and the number of students and official users of the site requiring on-site parking.
- Car parking solutions that relies heavily on the availability of on-street kerbside parking should not be considered.

#### *3.3.4.3 Internal Service Roads*

- Internal Services Roads are classified as:
  - Principal Roads carrying the major site traffic flows, carrying heavy traffic (buses), or emergency vehicles
  - Secondary Roads primarily intended to provide access between Principal Roads and buildings or car parks. These roads do not normally provide for through traffic.
  - Minor Roads primarily for service access to specific buildings or areas
- Classification will depend on traffic volume, wheel loads, or location on site, and may change as traffic patterns are altered by future building works.

- Internal roads including access to visitor parking areas shall have the following minimum specifications unless particular site conditions determine otherwise:
  - Principal road width shall be 6 metres (kerb lip to kerb lip) to allow for two-way traffic, or 4 metres wide for one-way traffic, with footpath width 1.2 metres if applicable
  - Secondary and Minor Roads' width shall be not less than 4.8 metres (kerb lip to kerb lip) to allow for two-way traffic, or 3.6 metres wide for one-way traffic, with footpath width 1.2 metres
  - Principal Road to have vertical clearance of 4.2 metres to cater for largest fire truck
  - Any delivery point requiring a loading dock shall be located on the Principal Road
  - All regular vehicular delivery points, such as, main store, fuel store, gas store, canteen, are to be located on Principal or Secondary Roads
  - Traffic calming devices shall be used to control vehicular speeds within the campus road system
  - Concrete mountable roll-over kerbs and ramps shall be in accordance with the relevant Australian Standards. Refer also to *Section 2.1*.
  - Inside kerb radii of minimum 6.0 metres
  - Internal service road termination with a turning circle of nom 9.25 metre radius kerb to kerb, to avoid reversing by delivery trucks and emergency vehicles
  - Provide suitable roadway/s and hardstand/s areas with turning circle, clearance height and width for emergency vehicles. The roadway/s and hardstand/s shall meet the requirements of the QFES. Coordinate the road network with the fire hydrant designer to minimise the provision of attack hydrants and to ensure the relationship between the hardstands and the hydrants complies with the fire hydrant standards.
  - Road design solutions must consider increases of pavement thicknesses by the use of an appropriate sub-base where test results indicate the use of thicker pavements are required and where sustained heavy loadings occur, such as, waste collection areas and emergency vehicle standing areas
  - Locate all internal roads and road elements clear of the eaves or overhangs of buildings.
  - Main vehicular and bikeway entry gates where briefed shall be inwardly opening with sufficient width for two-way traffic and not located near pedestrian gates
  - Roadways shall have adequate cross fall for overland flow of stormwater
  - Traffic control and calming devices, such as painted crossings and speed bumps, to all pedestrian crossing points
  - Separate pedestrian circulation and service vehicle traffic
  - Service roads shall be on the site periphery so that pedestrian paths are not bisected by roads. Where road access intrusion into the pedestrian areas speed control measures and defined marked crossings shall be provided.
  - Service road access points at the site boundary shall be located in relation to external and internal vehicle parking/ set-down areas to take into account:
    - Conflict of traffic flows and access to parking
    - Clear sight lines
    - Gradient of slope
    - Within easy surveillance of staff
  - Ensure blue raised reflective markers or 'cats eyes' are installed into the roadway surface opposite the locations of fire hydrants and boosters for easy identification for emergency vehicles
  - Flexible road pavements are to be designed in accordance with the Brisbane City Council Flexible Pavement specification for civil engineering work (refer also to *Section 2.1*)
  - Flexible pavements are to be designed for a 20 year lifespan while rigid pavements are to be designed for a 40 year lifespan
  - Sub-soil drains are to be provided under the kerb and channel on both sides of the road. Sub-soil drains are to be connected to the storm water system at a structure

#### *3.3.4.4 Visiting Van Site*

- Allowance shall be made for suitable trafficable all weather site access, turning and parking for a double unit (two chair surgery) Dental Caravan Clinic towed by a truck, trade training truck, mobile library or similar visiting services.
- Access via school oval or similar grassed areas is not acceptable.
- Provide a suitable concrete slab located adjacent to the access road of a minimum size 10m x 4m. The nominal size of a double unit caravan is 9.9m long x 2.4m wide.
- Preference is for dental caravan slab to be located as a widened section of internal service road to allow ease of parking and to be away from the main school frontage. Locate where practicable near a covered shade area to allow for students waiting, in reasonable proximity to Administration or Classroom block for supervision.
- The slab for the van wheels shall be level while the van parking area can slope up to nom 1:33 lengthwise with due consideration to the level at the entry steps.
- Location shall not be adjacent to classroom windows because of possible noise from the van air conditioners.
- Plan for the location of entry doors which are located on nearside of the van, with steps extending approx. 800mm and awnings over 1500mm.
- Provide a path access along the entry side.
- Provide the following services:
  - 25mm Hose Cock
  - 32 amp, 240 volt, single phase, waterproof and lockable double power outlet mounted at 1600mm high on a pole with power suspended high above the ground between power source and caravan
  - 32 amp, 415 volt, three phase, waterproof and lockable 5 pin power outlet mounted at 1600mm high on a pole with power suspended high above the ground between power source and caravan
  - Phone and data services cabling, as appropriate for the site
  - Provide suitable gully trap/s inlet to sewerage drainage system sufficient for two chair dental van and/ or trade van with a screw cap sealed cover

#### *3.3.4.5 Service Vehicle Access*

- Provide vehicular truck access for the following:
  - Garbage bin storage enclosure
  - Delivery access to Administration, Canteen and Bulk storage areas
  - Refer to *Section 3.3.4.3 Internal Service Roads* for fire truck access requirements. Ensure fire truck access to hydrants, booster assembly and to main sports oval.
  - Service and maintenance access to buildings
  - Gas and compressed air cylinder delivery
  - Silt, paint and grease trap inspection and maintenance
  - Truck access to sports ovals and sports equipment storage
  - Mowing equipment access to all turfed areas
- In addition to those above, provide the following:
  - Delivery access to Manual Arts Construction Courts and storage areas
  - Delivery access to Performing Arts back of stage areas / loading dock
  - Delivery access to Hospitality and Food Sciences storage areas
  - Delivery access for Sanitary and Nappy Bin services
  - Access to Student Centre (Sports Hall) and associated parking

#### *3.3.4.6 Cycle Paths*

- Identify in consultation with Local Authority, any existing or planned cycle path network within the local community outside the educational facility site.

- Provide designated cycle paths of a minimum of 1800 mm wide within the educational facility site to link external cycle paths to the bicycle parking areas.
- Refer to *Section 3.9.6 Bicycle Storage* for bicycle parking area requirements.

## 3.4 Pedestrian Access and Circulation

For all pedestrian access and circulation requirements, refer also to *Section 2.1 Compliance with Mandatory Design Requirements: Legislation, Regulations, the National Construction Code, Local Government Laws and the Australian Standards*.

### 3.4.1 Access for People with Disabilities

- Access to all DETE buildings, including relocatable buildings and major sporting facilities, shall comply with the relevant legislative requirements, the National Construction Code, and relevant Australian Standards, including*, the Disability Discrimination Act 1992, Disability Services Act 2006, Disability Standards for Education 2005,* the *Disability (Access to Premises – Buildings) Standard 2010 and the Disability Standards for Accessible Public Transport.*
- Advice from a disability access consultant with expertise in the compliance requirements outlined in *Section 2.1* (as noted above) shall be provided to support any proposed solution, if required.
- Provisions for access and facilities for people with disabilities should be integrated, in almost all cases, with those for the able-bodied, thus minimising feelings of segregation that may otherwise be experienced. Particular attention shall be paid to toilet facilities, lifts, door sizes and swings, floor finishes, handrails, services, access and parking.
- Lift access shall be provided where specifically briefed or required to comply with access provisions. Refer also to *Section 4.12.7 Lift Services.*
- To support information access and enquiries by parents and the public, hearing augmentation systems shall be provided at reception counters in the Administration Block and Resource Centre and other areas where briefed.

### 3.4.2 Neighbourhood Pedestrian Access Paths

- Ensure that site pathways link to neighbourhood pedestrian access points.

### 3.4.3 Bus and Car Waiting Areas

- Provide pavement nominal 4 metre width at the frontage of the site adjacent to car and bus set down areas for student pick-up and set-down.
- Provide student queuing space within the school site.

### 3.4.4 Covered Walkways

- Provide covered walkways linking all buildings on site to meet the following requirements:
  - Width of link is to reflect the anticipated pedestrian traffic concentration, with particular attention to adequate width of main circulation spines (**nominal width** of link to be 3600mm/ **minimum width** of link to be 2400mm)
  - Major pedestrian circulation paths shall be separate from buildings to avoid noise and disturbance
  - Truncate corners or provide physical barriers to all internal junctions of linked paths or at link/ veranda junctions to reduce wear on planting areas and turfing
  - To minimise the number of columns that students need to avoid, covered walkways shall have minimum 4800mm spacing between support columns (along length of covered walkway), except where briefed otherwise
  - Columns located at intersections between covered walkways shall be set back minimum 1200mm from walkway corners

- Intersections between covered walkways shall have a truncated concrete infill to minimise landscape damage when pedestrians cut the corners
- Ensure that junctions between links, changes in level of link roofs and between link roofs and roofs of buildings are weatherproof
- Covered walkway design shall provide maximum weather protection, particularly at changes of level. Generally, **maximum height** at link edge to be 2400mm above floor level. *Note*: exposed or upper level links may require extension of eaves or side screens for weather protection.
- **Minimum height** to underside of link framing or to light fittings over path of travel shall be 2100mm
- Covered walkway design must consider length of detours required to keep dry during inclement weather
- Roof water shall be directed via gutters and downpipes to the stormwater system
- Rainwater guttering and downpipes shall be free of jagged edges or ends and of sufficient strength to resist damage by students. Downpipe brackets shall minimise climbing opportunities.
- Framing, roof sheeting and gutters shall be designed to prevent students swinging on frames
- Framing shall be designed to deter birds from roosting
- Fall roof sheeting across links to deter skateboard use
- Covered walkways shall not impede vehicular access to buildings for fire and maintenance
- Covered walkway framing shall be hot dipped galvanised and left unpainted
- Provide screening to prevent unauthorised access to building or link roofs from adjacent higher level walkways or building verandas, or from adjacent structures such as bag racks or sunscreens

- Where required, provide covered skyways to link multi story buildings where such buildings are adjacent to each other, as approved by DETE.

### 3.4.5 On-Site Minor Paths, Ramps and Steps

#### *3.4.5.1 Paths*

- All paths joints and edges shall be free from significant lips or raised edges that may cause tripping.
- Provide a distinctive and identifiable pathway leading from the main pedestrian gate to the main public entry point of the Administration area.
- Minimum width of paths shall be 1500mm.
- Generally pathways shall be unique colour or have physical border such as landscaping or barrier fencing.
- Path corners and junctions subject to short cut routes (desire lines) shall be truncated with hard paving or have physical barriers to prevent landscape damage.

#### *3.4.5.2 Ramps*

- Slope of ramps shall be in accordance with relevant access codes.
- Minimise the need for handrails by reducing gradient of ramps to achieve acceptable walkway gradients of ≤1:20, where possible.
- Provide tactile indicators where required in accordance with relevant disabled access codes which are integrated with concrete pathways or steps. Stick-on tactile indicators are not acceptable.
- Enclose under ramps to prevent unauthorised access unless overland flow, flood issues or other topographical constraints dictate otherwise. The design is to restrict access by appropriate methods, wherever possible.

#### *3.4.5.3 Steps*

- All steps (internal and external) shall be uniform throughout the flights and, where possible, throughout school.
- Steps shall have non-slip surface.
- Steps shall not have open risers.
- Going of steps shall be preferably 300mm but where this is not possible, 270mm as a minimum.
- Step dimensions shall comply with statutory requirements. In addition 'riser' height shall be maximum 175mm. For P-6 schools the preferable height of the riser is 150mm.
- Provide minimum two (2) risers in each set of steps and maximum eight (8) risers.
- Provide tactile indicators to all steps integrated into concrete surface, in accordance with relevant disabled access Legislation, Australian Standards and Codes.
- Enclose under steps or stairs to prevent unauthorised access.
- Provide 45-50mm diameter handrails and balustrades at a height of 865 -1000mm from the nosing of the tread to the top of the handrail.
- Provide painted contrast non-slip edge strips 25mm wide to all steps or stairs and avoid the use of plastic nosing.

### 3.4.6 Handrails and Balustrades

- Provide handrails to all ramps to comply with relevant Australian Standards, Legislation and Codes.
- Provide handrails to all steps as follows:
  - Steps up to 2000mm wide and less than 900mm high shall have minimum of one (downhill) side
  - Where height of steps is more than 900mm provide handrails to both sides
  - Provide an additional centre handrail when more than 2000mm wide
  - Provide handrails at heights as required by the National Construction Code
  - Provide barrier rails to the sides of links or paths where student access is to be restricted, such as over open drainage channels or adjacent to steep embankments
  - Handrails shall be stainless steel or hot dipped galvanised steel and unpainted for long term durability
  - Handrails shall be constructed and fixed so that there is no obstruction to the passage of a hand along the rail allowing the gripping surface of handrails to be continuous
  - The end of the handrail shall be extended parallel to the surface below for a minimum of 300mm. The end shall be continuous rail, turned down 100mm or be returned fully to the end post or wall face. In P-6 schools with no on-site Special Education facilities, the end of the rail shall be turned down into the ground.
  - Provide tactile domed buttons on all handrails at 140-160mm from the end of the horizontal surface at the beginning and end of the handrail
  - Ensure that handrail support fixings and connections are of sufficient strength to prevent damage by students
  - The clearance between the handrail and the adjacent wall surface or other obstruction shall be not less than 50mm
  - Handrails shall not rotate within their fittings
- Balustrades:
  - Provide balustrades to comply with relevant Australian Standards, Legislation and Codes
  - Balustrades on the first or upper floors of buildings and walkways shall be minimum 1100mm high
  - Provide 45-50mm diameter balustrades at 1100 mm high to top of retaining walls over 800mm high in student accessible areas
  - Design top rail to deter students from sitting on balustrades (i.e. by avoiding flat surface) and design balustrade infill to deter climbing

  - All balustrades shall be hot dipped galvanised steel and unpainted
  - Ensure that balustrade support fixings and connections are of sufficient strength to prevent damage by students
- Screens:
  - Where access is possible to adjacent roofs of buildings or links from student accessible locations, provide suitable barrier screening
- Kerb rails shall be installed where required to comply with relevant codes and standards.
- Where handrails are combined with balustrading, the preference is for both elements to be stainless steel.

## 3.5 Landscaping

### 3.5.1 Landscape Design Principles

- Landscape design principles are referenced in *Landscape Design Requirements for DETE Facilities* for context, character, and design elements of inclusiveness, function, biodiversity and sustainability. General principles include:
  - Use of existing and native vegetation where possible
  - Protection and re-use of topsoil
  - Water conservation
  - Overland flow and stormwater management
  - Provision of natural shading
- Landscape design must consider on-site and local protected native fauna habitats.
- Retention of existing vegetation requires minimal clearing in conjunction with replacement of vegetation with endemic species, where possible. Vegetation corridors that are used by native fauna are to be preserved and enhanced. This may require consultation with adjacent land holders and community environmental groups to ensure that such corridors can remain (or are made) continuous over boundaries.
- Where site constraints limit the preservation of natural vegetation, native endemic species of appropriate dimensions are to be used in preference to exotic species.
- Existing vegetation shall be enhanced by complementary new planting that is native and endemic to the local area to assist natural native plant regeneration.
- Landscape work shall include restoration of barren or degraded areas to prevent soil erosion.
- All plants shall be of minimal maintenance type, and not require large quantities of water to maintain good form.
- Landscaping design shall take into account efficient maintenance and vandal resistance.
- External surfaces, fixtures and furniture shall be of high durability and be vandal resistant.
- Landscaping design shall not conflict with the functional requirements of student movement and access.
- Hard and soft landscaping shall not conflict with fire access requirements.
- All materials imported to site are to be certified free of fire ants and asbestos.
- **The use of copper chromium arsenic (CCA) treated timber for landscaping elements is <u>not</u> permitted** (walls, fences, decks, rails) (in accordance with Australian Pesticides and Veterinary Medicines Authority (APVMA) review March 2005).
- Mulch material including soil additives shall not contain peanut shell or other irritant materials.
- Poisonous plants shall not be used including those identified by the Queensland Poisons Information Centre that could cause serious illness in children who may eat them. Plants that must be avoided are listed on the Queensland Poisons Information Centre website. Refer also to *Section 2.1*.
- Plants that have the following characteristics shall be avoided:
  - Dangerous fruiting bodies and sap

  - Sharp spines or projections
  - Tendency to shed limbs or hazardous material
  - Tendency to drop flower causing a slip hazard on pathways
  - Likely to cause allergic reaction, irritability or cause health disorders (such as asthma)
  - Wind pollinated plant material
  - Likely to be highly flammable and create a fire hazard particularly when planted close to buildings
- Support stakes and star pickets shall have protective caps.
- Provide universal access to external areas in building zones with transition level differences in accordance with current Australian Standards and Codes.
- Reduce the risk of fire spreading by avoiding planting of trees (particularly natives) close to buildings.
- Provide adequate firebreaks (minimum 4 to 5 metres wide) in bushfire susceptible areas, particularly around the perimeter of the site.
- In cyclone-prone areas, retention of existing or planting of new large trees close to the building zone shall be avoided due to the potential damage that can occur from falling branches and trees.
- Trees shall be located so as not to encroach upon pathways or road access required for fire appliances.
- To avoid damage to building structures, trees should not be closer to the buildings than 1.5 times their mature height (excluding palm trees). For example, a 5 metre high tree should be planted no closer than 7.5 metres from any building.
- Cleared vegetation and disturbed ground shall be stabilised either by planting, turfing or mulching.
- Landscaping shall be maintained after construction (i.e. plant material, turfing) for a period of 13 weeks, unless briefed otherwise.
- Landscaping is not to impede good surveillance around paths, and is to maintain visual access between 700 and 2200mm above ground level.
- Planting design shall conform to CPTED principles (i.e. ensure visual access between 700mm and 2200mm above ground level). Refer also to the DETE *Security Design Requirements* (see *Section 2.1*).

### 3.5.2 Hard Landscaping & Fixtures

- Pavements other than to pathways, covered links and building aprons shall be anti-slip coloured concrete, or an appropriate alternative.
- Do not use exposed aggregate concrete around school buildings.
- Unit paving shall not be used to large areas due to problems in maintaining an even level over time. Unit paving should only be used as banding or edging to give a feature to concrete paving. Any unit paving shall be securely fixed.
- Loose gravel or loose rocks shall not be used as a surface treatment. Any pebble or stones shall be securely adhered to the surface.
- Large solar reflectors, such as hard paved areas, shall be located away from positions where their reflected sunlight could impose a heat load or a glare problem into school buildings or into neighbouring buildings.
- External fixtures and furniture shall have a high durability and be vandal resistant.
- Exposed edges of seats and walls shall be designed to reduce the likelihood of skateboard damage and, where required, provide skateboard deterrents.
- Capping blocks on retaining walls or seating shall be securely fixed with epoxy adhesive grout. Where capping blocks are unavailable, consider the use of domed concrete.

### 3.5.3 Soft Landscaping

- Plant species shall be selected that:
  - Require minimal maintenance
  - Require minimal water (drought tolerant species preferred)
- Plant species shall be chosen that will have a suitable lifespan (e.g. annuals, biannuals or herbaceous perennial species are not suitable for DETE facilities except where specifically requested).
- Plant species shall be selected to suit their location (light/ shade tolerances) and complement existing local vegetation. Preference is for Australian native plant material, where suitable.
- Plant species shall be selected to meet the general design intent and be in scale with the context when mature, in particular, tree and shrub species.
- Plant material is to be selected on the principle of value for money and be commonly available from the nursery industry.
- Plant species selection shall minimise the risk of root systems penetrating drainage lines.
- Tree species shall not be prone to 'branch or limb drop'.
- Shrub and groundcover planting areas:
  - Locate planting areas where there is too much shade for turf and battered banks where slope is exceeds maximum gradient for turf.
- Planting areas **shall not** be located in the following areas:
  - Under the rooflines or eaves of buildings
  - Under open stairs or ramps – provide hard paving in lieu
  - Against perimeter of buildings, to ensure visual termite inspection particularly of weepholes can be carried out
- Planting areas shall meet the following requirements:
  - Where planting areas are located near buildings they must be no closer than a minimum of 300mm from the building
  - Width of planting areas to be 1200mm minimum and 3600mm maximum
  - Cultivation nominally 300mm deep to break up subsoil and remove surface debris over 25mm diameter
  - Topsoil depth of nominally 300mm
  - Mulch depth of 100mm, free from wood slivers
  - Concrete edging between planting beds and turf
  - Planting area finished level including mulch shall be min 200mm below finished floor level
- Shrubs, climbers and ground covers in planting areas shall be:
  - 140mm diameter pot size minimum
- Mass planting ground covers, or revegetation mix of ground covers, shrubs and trees, shall be:
  - Tube stock or 125mm diameter pots
- Small trees in planting areas in Building Zones and in grasses areas shall have:
  - Location so that eventual canopy (at maturity) shall be a minimum of 2000mm away from the eaves line of buildings, shade structures and play structures
  - Minimum container size 45 litre
  - Stake with ties and provide weed control mat
  - Vandal resistant protector guards
- Feature/ large trees or trees planted specifically for shade shall have:
  - No tall forest species
  - Location so that eventual canopy (at maturity) shall be a minimum of 2000mm away from the eaves line of buildings, shade structures and play structures
  - Minimum container size 100 litre

  - Stake with ties and provide weed control mat
- Vandal resistant protector guards.
- All other trees planted in turfed areas or planting areas providing shade and/or screening shall have:
  - Minimum size 200mm diameter pots
  - Size and shape of holes to encourage root spread
  - Stakes
  - Weed control mats
- Turf:
  - All turfed areas with clay subgrade shall be designed and constructed to reduce the development of uneven surfaces through swelling and shrinkages
  - Species of turf used shall be suitable for application and able to withstand wear in a student environment. A minimum B grade of turf is to be used.
  - Grade of turf to sports fields shall to be as recommended by the Landscape Consultant in consultation with client
  - Cultivation depth min 150mm to break up subsoil and remove surface debris over 25mm diameter
  - Imported topsoil depth 100mm after settlement to grassed areas
  - Upgraded site stripped topsoil or imported topsoil of depth min 200mm (preferably 300mm) to sports fields and the planting of appropriate turf species for everyday use by students
  - Topdressing to maximum depth of 10mm
  - Slope to suit surface drainage (overland flow paths) and away from hard paving and buildings
  - Maximum slope of 1:4 (preferably 1:5) to cut/ fill batters, swales and berms
  - The finished surface level between turf and adjacent paths, walkways or hard paving shall be flush
  - Provide nominally 300mm concrete slab mowing strips immediately adjacent to the perimeter of buildings
- Soil and drainage profile for ovals and other turfed sporting surfaces shall be appropriate to maintaining a health and resilient grass cover and shall be appropriate to site conditions.

### 3.5.4 Irrigation

- Extent and type of irrigation system will be determined by availability of water supply and local water restrictions.
- Consideration shall be given to irrigation systems that cover large shade trees in cyclone prone areas where irrigation may encourage shallow rooting of the tree's roots.
- Allow for future stages of construction in the design of the irrigation system.
- The irrigation design shall incorporate the following:
  - Use of stored rainwater (tanks) for irrigation purposes particularly in areas where water restriction may apply
  - Turfed and planted areas to be irrigated separately in watering zones
  - Automatic control valves shall be located in pits in planting areas, not turfed areas or close to paths or road edges
  - Valves for sports fields shall be located along the outside edge of the playing area
  - Overspray in normal weather conditions shall not affect buildings, car park surfaces or pedestrian paths and covered walkways
  - Provide protection of irrigation control equipment from damage by weather, vandalism, damage and theft
  - Backflow prevention

  - Sprinklers systems to deter vandalism
  - Irrigation inspection covers should be designed to deter theft and vandalism
- Hose cocks not attached to buildings shall be mounted on bollards, and to prevent trip hazards or obstructions shall not be located in any path of travel.
- In building zones, place hose cocks a maximum of 30m apart.
- Provide concrete slab or hard paving under hose cock, or locate over field gully.
- Hose cocks shall have removable handles.

### 3.5.5 Surface and Subsoil Drainage

- Refer also to *Section 3.2.5 Stormwater Drainage*.
- Surface drainage and overland flow shall include the following:
  - Positive surface drainage away from buildings and the building zone
  - Field gullies shall be located away from heavily trafficked areas and shall have adequate drainage to eliminate free standing water
  - Provide flush grates field gullies within trafficked areas. Refer to *Section 3.2.5 Stormwater Drainage* for flush grate minimum requirements.
  - Overflow relief gullies on sewer lines shall allow overflow away from buildings
  - Where field gullies abut or are within garden beds, provide appropriate filter to ensure that mulch does not enter drainage system
- Subsoil drainage pipes shall be slotted polyethylene, wrapped in a filter membrane.
- Reduce low lying areas which cause free standing water to all areas of the grounds including oval and sports fields.

## 3.6 Way Finding and Signage

- Wherever practicable, all way finding and signage structures must be vandal proof while still maintaining the maximum readability.

### 3.6.1 Entry Structures

- The main street frontage of the facility shall be enhanced by landscaping and entry statement to provide a focal entry point for the facility with a path leading primarily to the Administration Block.
- Entry structure shall promote the image of the facility and include signage to identify the facility within the community.
- The entry structure and signage shall be powered to enable changeable message electronic signs to be provided at the school's expense. Refer to the general location and operation fact sheet for Electronic Variable Message Signs (VMS) at schools on the Department of Transport and Main Roads website: *Road advertising – Electronic Variable Message Signs at schools.* Refer also to *Section 2.1*.
- Entry signage shall include allowance for a 'P&C Meets Here' style sign to be adjacent to the school signage.

### 3.6.2 External Way Finding and Signage

- School Identification signage:
  - Locate at the main pedestrian entry point of the site, either incorporated into entry structure or free standing
  - Height shall be above adjacent boundary fencing and landscaping
  - Provide a secondary identification sign where there is an alternate major pedestrian access point to the school on a different site frontage
- ECEC Identification signage:

  - Provide one sign on main street fronts. For all other signage requirements refer to facilities brief for individual projects
- Other signage shall be provided:
  - Directional signage at focal positions throughout the site to promote ease of access to zones or buildings
  - Additional directional signage to Administration area where building sign is not visible from entry point
  - All necessary signage for access parking bays, including bay marking symbols and directional signage where appropriate
  - Appropriate restricted access signage to all vehicular entry points to the site
  - Restricted parking signage (e.g. for vehicle turning bays for school maintenance and fire emergency vehicles)
  - Allow for P&C funded school map signage, identifying building names and location
  - Signs advising after-hours access policy, grounds use policy, parking restrictions
  - Allow adequate site frontage for school funded message signboard
  - Allow location for school site map signage at main entry point
- Safety signage:
  - School Watch Program signage at the major entry points to the school
  - Speed restriction signs on all internal roads (10kph)
  - Warning signage on any pedestrian or cycle path crossing over internal roads
  - Restricted access signage to on-site hazards (e.g. pools, dams or detention basins, creeks, gas storage areas, electricity transformer areas)

### 3.6.3 Building Signage

- Individual buildings shall have external signs that are:
  - Easily read from all circulation paths
  - Located to identify the building entry
  - Generally indicative of the building function
  - Unique to each building
- Administration block:
  - Signage shall be visible from the common visitor entry point or provide additional directional signage
- Wording/ naming of signage shall be determined by the school in consultation with the community.
- Where signage is required for a new building on an existing site, the existing type and sequence of building identification shall be continued.
- Provide signage to all external storage facilities where hazardous or flammable materials are located.

### 3.6.4 Braille and Raised Tactile Signage

- Incorporate Braille and tactile signage complying with section D3.6 and specification D3.6 of the Building Code of Australia (NCC).
- Raised Tactile and Braille signs must be provided within new buildings/ developments to:
  - all room identification signage
  - all directional or way finding signage
  - all signage which identifies the building occupants such as directory boards, but excluding advertising and major badging (corporate identity) type signs
  - all sanitary facilities
  - all accessible spaces with a hearing augmentation system
  - all signage which identifies emergency exits and the location of these exits

- Locate the Raised Tactile components of signage to be between 1200mm and 1600mm above the ground or floor level.
- Where the amount of Raised Tactile information may make it difficult to locate the Braille 8mm below the Text, the Braille can be provided as a separate block between 1000mm and 1200mm above the ground or floor level. A Raised Semi Circular Braille locator must be used on the left margin horizontally aligned with the first line of Braille text.
- Use Building Code of Australia (NCC) Specification D3.6 for manufacturing and installation guidelines with the following qualifications:
  - Signs with single lines of characters must have the line of tactile characters not less than 1450mm and not higher than 1550mm above the floor or ground surface
  - All room signage must be positioned as described in 2(c)(i) of Specification D3.6
  - Sentence Case must be used for all Raised Tactile Text
  - Where graphics are used on a sign, text must also be used
  - A border around a sign is not required unless the sign background and the colour surface it is being mounted on or against do not achieve a minimum 30% luminance contrast
  - Braille arrows must be a solid block, the same dimensions as a Braille cell, not a series of dots. Braille arrows must be used wherever Raised Tactile Arrows are used in the text section of the sign.

#### *3.6.4.1 Raised Tactile and Braille Maps and Emergency Evacuation Plans*

- Incorporate Raised Tactile information and Braille text in campus maps and emergency evacuation floor and building plans either all-in-one plan or separately.
- Luminance contrast rules apply to every adjoining colour and surface in a Raised Tactile and Braille Map.
- Raised Tactile and Braille Maps must be located along the path of travel, within 2 metres of either the principal entry point to the property or the principal public entrance to the building and in other locations deemed appropriate by an accredited access consultant. These must be positioned within 1 metre of the continuous accessible path of travel on the left hand side as you approach the entry point. If this is not possible, locating on the right hand side is acceptable. The use of Tactile Ground Surface Indicators to assist in the location of Raised Tactile and Braille Maps must be considered.
- Raised Tactile and Braille Maps must be positioned between 1000mm and 1700mm above the ground or floor level and be mounted on an angle of no more than 30° from vertical to allow comfortable reading by touch.
- The minimum Sentence Case height for Raised Tactile and Braille Maps is 12mm.
- The minimum icon/graphic height of Raised Tactile pictograms on maps is 12mm.
- Each icon/graphic must be clearly definable from each other by touch.
- All the Raised Tactile information on the Map component must be described in a legend.
- The map component can be Raised Tactile only, however all information in the legend must include an explanation in Braille.
- Each separate Raised Element in a Raised Tactile Map must be unique either in shape, size, texture or colour, or a combination of any of these.
- The ‘You are here’ locator on a Raised Tactile Map must be the highest point on the map.
- Raised Tactile and Braille Maps must include the following information:
  - the locations of all toilet facilities;
  - the locations of all information points, which may include other Raised Tactile and Braille maps and Raised Tactile and Braille directional signs
  - the locations of all entry and exit points including emergency evacuation exits
  - the locations of all lifts, ramps and stairs on the continuous accessible path of travel
  - the locations of the principal areas of the buildings and/or the location of directory boards which identify the locations of the principal areas

- the locations of taxi, bus stops, and other public transport pickup/set down points within the boundaries of the campus
- the locations of other major features which are important to the safety or amenity of a person who has a Vision Impairment, such as telephone, and assistance points
- the paths of travel from the campus boundary, into and through the building and adjoining buildings where these are within the same campus boundary

(*Note:* where campuses or large buildings are being mapped it may be necessary to have a number of different maps with connections shown to each)

- As with Raised Tactile and Braille Signage, the surface of a Raised Tactile and Braille Map must be continuous and must resist removal through use, abuse, fair wear and tear.
- Each layer of the map must be consistent and built from the base up. For example:
  - Layer 1 = Buildings, Car Parks
  - Layer 2 = Roadways, pathways, paths of travel, features and facilities
  - Layer 3 = You are here
- The design of Raised Tactile and Braille Maps must be kept as simple as possible without omitting necessary detail.
- In all cases consult with the School Counsellor regarding the level of Braille signage required for any particular DETE facility.

#### *3.6.4.2 Sign Placement*

- Signage affixed to walls should be visible for both ambulant and non-ambulant people.
- Signage should ideally be positioned no lower than 1200mm above the surface of the finished floor and ideally reach no higher than 1700mm above the finished surface of the floor.
- Signage suspended from the ceiling should be a minimum of 2000mm above the finished surface of the floor. Signage projecting from the wall should be place so the bottom edge of the sign is 2000mm above the finished surface of the floor.

### 3.6.5 Texture, Styles and Colours

- Provide colour and texture in surface treatment of access paths, pavements, walls etc. to identify hierarchy of spaces and circulation:
  - Distinctive pathway leading from the main public entry point to the Administration Block to assist visitors and reduce the risk of unauthorised access to other parts of the site
  - Colour coded feature pathway junctions or signage to assist in way finding to particular building zones
- While School colours may be used to strengthen the corporate identity or buildings may be colour coded to identify specific areas or faculties, the contrast of the letter colour and the background must ensure readability.
- Under no circumstances should red, green or yellow letters be used on any red, green or yellow background as these are confusing to vision impaired persons.

#### *3.6.5.1 Typography*

- San serif typefaces only are to be used.
- Approved typefaces are Meta Normal, Meta Medium, Arial and Helvetica Medium.
- Do not use italics.
- Use Title Case or sentence case. Do not use block uppercase letters unless it is part of a logo.
- Spacing between letters and words should be balanced with the golden rule of:
  'The area between the letters needs to look the same'.

#### *3.6.5.2 Size of Typefaces*

- The size of typeface must consider the maximum distance from which the sign must be read, the speed of approach (passing traffic speed) and type of information to be provided.
- The height of the letters shall not be less than that given in the following table:

| Required viewing distance in metres | Minimum height of letters in millimetres |
|---|---|
| 2 | 6 |
| 4 | 12 |
| 6 | 20 |
| 8 | 25 |
| 12 | 40 |
| 15 | 50 |
| 25 | 80 |
| 35 | 100 |
| 40 | 130 |
| 50 | 150 |

- Letters on directional signs must be a minimum of 50mm in height.

#### *3.6.5.3 Use of International Symbols*

- Where international symbols exists, for example, symbols for wheelchair access, hearing amplification devices, male and female toilets, showers, phone, cafeteria, first aid, etc. use the symbol in all directional signage.
- When the international symbol for access is combined the other symbols it must be in the format of directional symbol then the international symbol for access then other symbols then information in words as depicted below configuration for a left direction.


### 3.6.6 Fire Evacuation Plans and Signage

- All emergency escape lighting and exit signage shall comply with the Building Fire Safety Regulations 2008, the Building Code of Australia (NCC) and all relevant Australian Standards.
- Provide Evacuation Plan Signage for all new buildings with the following requirements:
  - Sign to be at least 420mm x 594mm (A3) in size
  - Evacuation signage must be displayed at the entrance to each building and the main entry points of each floor of each building, e.g. near lifts and stairways
  - Evacuation signage to show Evacuation Diagram and Legend
  - Where the Assembly Area is off the map on a to-scale floor plan, the evacuation signage must also show a campus diagram showing the footprints of all major buildings and the Assembly Areas (by letter or number if more than one)
  - The Evacuation Diagram (floor plan) is to be at least 210mm x 297mm (A4) in size
  - The Evacuation Diagram to contain a to-scale floor plan of the level of the building and must be oriented to the direction of egress and the 'You are here' pointer
  - The Evacuation Diagram or Assembly Area map to clearly indicate North
  - The Evacuation Diagram must clearly show the evacuation path within a building with red arrow
  - The Evacuation Diagram must clearly show designated fire exits with the green and white 'moving person' pictogram (refer to the relevant Australian Standards)
  - The Evacuation Diagram or Assembly Area map must clearly show the evacuation path outside the buildings with a black arrow

- The Evacuation Diagram must clearly show the location of all Warden intercom points, manual call points, break glass alarms, emergency alarm initiating devices, first aid kits and fire indicator panels (if installed)
- The Evacuation Diagram must clearly show the location of all firefighting equipment such as hose reels, extinguishers (including type), fire blankets and fire hydrants
- The Evacuation Diagram must clearly show the location of all hazardous substances (by classification) and the location of spill kits appropriate to the hazardous substances
- The Evacuation Diagram must clearly show the 'You are here' pointer
- The 'You are here' pointer must be sentence case not block letters, san serif font, white letters on a red background, at least 50mm in height and the highest symbol on the map
- The Evacuation Diagram must show staging area for people with disabilities to assemble prior to evacuation
- The legend must show all the symbols, pictograms or abbreviations (i.e. FIP for Fire Indicator Panel) used in the Evacuation Diagram
- The Evacuation signage may be accompanied by Emergency Phone contact details or Emergency Procedures.

### 3.6.7 Other Signage Elements

- All Signage for DETE buildings to comply with the Queensland Government Corporate Identity and State Emblems Booklet and the Department of Education, Training and Employment Visual Style Guide with respect to use, position and size of logos.
- Except where the existing safety signage is not compliant with the Building Code of Australia, current policy, or other relevant Standards, existing signage is not required to be updated unless specified in the Design Brief.
- All signage (other than temporary signs) must be installed with screw or equivalent mechanical fixing. The use of double side adhesive tape for the installation of permanent signage is not acceptable.
- Emergency Stop button signage must be placed so that it is clearly visible from the floor of the workshop and from the entrance to the workshop.
- Hazardous substance signage must be placed at the entrance to the workshop or facility and also on the storage facility within the workshop.
- Asbestos Warning Signage must be installed and maintained in all DETE facilities where the BEMIR asbestos environmental status is assumed, confirmed or unknown.

#### *3.6.7.1 Direction and Location Signs*

- Near to the entrances of all campuses shall be a large information signboard.
- This sign shows a campus map and lists the buildings, paths and campus roads. Symbols should be used to depict sanitary facilities, parking zones, security or access points and public amenities such as public phones. The sign must contain a graphic site plan with a 'You are here' point.
- To promote ease of access and movement within the campus generally, provide the following:
  - Directional signage at focal positions throughout the site to promote ease of access to zones or buildings
  - Additional directional signage to Administration area where building sign is not visible from entry point
  - All necessary signage for accessible parking bays including directional signage where appropriate
  - Appropriate restricted access signage to all vehicular entry points to the site
  - Restricted parking signage (e.g. for vehicle turning bays for delivery, campus maintenance and emergency vehicles)
  - Allow for third party Registered Training Organisations' and Industry group's signage, identifying building names and location of such organisations within the campus

- Signs advising after hours security arrangements, ground use policy, and parking restrictions

#### *3.6.7.2 Building Identification Panel*

- Unless specified otherwise in the Design Brief, each individual building is to be signposted with internally illuminated building identification panel (in opaque white) with the building's identifying letter (in Black), supplied and installed as part of the contract.
- The building identification panel should be not less than 400mm x 400mm and placed at the main entrances of the building. Secondary entrances to the building should have a building identification sign of the same size and font as the main identification panel but is not required to be illuminated.
- Individual buildings should have external block signs that are:
  - Easily read from main circulation paths
  - Located to identify the building entry
  - Generally indicative of the building function
  - Unique to each building
- Administration block:
  - Signage to be visible from the common visitor entry point, or provide additional directional signage

#### *3.6.7.3 Internal Signage Systems*

- Internal signage shall comprise Modulex Messenger Interior systems (or equivalent system that lend itself easily to updating frequent changes of room function) to suit each of the following applications.
- The system principally comprises extruded aluminium and injection moulded plastic, in the specified Institute colours, with Arial text styles and colours as specified. Signage will typically be wall mounted, but may be suspended or projecting to suit particular applications.

#### *3.6.7.4 Building Directory Board*

- Inside each major building entrance, a Building Directory Board lists the main users of each floor. Generally signs are to be located in view of the lifts and main paths of traffic.
- See sample Building Directory board signs sample below:

| **A Block**<br>**Building Directory** | |
|---|---|
| 1 | Student Services, Administration |
| 2 | Learning Information Centre |
| 3 | Classrooms, Computer Laboratories |
| 4 | Teaching Staff Accommodation |
| | |

**Floor by Floor Listing**

| **A Block**<br>**Building Directory** | |
|---|---|
| Administration | 1 |
| Classrooms | 3 |
| Computer Laboratories | 3 |
| Learning Information Centre | 2 |
| Student Services | 1 |
| Teaching Staff Accommodation | 4 |
| | |

**Alphabetical listing of occupants**

- Building Directory Boards shall comprise:
  - 250mm H x 500mm W (wider may be agreed to) top header panel with block name and 'Building Directory'
  - Multiple level number panels, each 125mm H x 500mm W showing divisions, sections or receptions but not individuals
  - Bottom blank footer panel, 75h x 500w
  - In large buildings, a number of Building Directory boards may be required. The primary location is the main entrance foyer, and, in some cases, subsidiary entries should have additional signage to direct visitors to the main entrance.

### *3.6.7.5 Building Level Directory Board*

- Unless specified otherwise in the Design Brief, on each level a floor directory board provides a location plan, indicates room numbers of individual spaces, reception areas and the like, and provides directional information.
- Generally signs are to be located in view of the lifts and main paths of traffic.

| [insert floor plan graphic] | |
|---|---|
| **Block A Level 1** | |
| Enrolments A1.01 | ↑ |
| Administration Reception A1.05 | → |
| Student Counsellor A1.10 | ↑ |
| 🚹 🚺 ♿ ✚ | ↙ |
| 🚻 🍽 | ↘ |
| | |

- Level Directory Board shall comprise:
  - 250mm H x 500mm W top header panel with floor plan graphic (higher may be needed depending on the floor plan graphic
  - Single 125h x 500w panel with Building letter and Level number
  - Multiple room name/activity and room number with direction panels, each 75mm H x 500mm W

- Bottom blank panel 35mm H x 500mm W
- In large buildings, a number of Level Directory boards may be required with one at each level visible from the lift and another visible from the internal stairs.

#### *3.6.7.6 Room Signage*

- Each room has a standard room number. Numbers are to be checked with the Project Manager prior to installation.
- Name or function signs to all Service rooms (e.g. cleaners' cupboards, plant rooms, electrical risers, and to Administration spaces such as 'Director' and 'Student Counsellor').
- Ensure room signage has appropriate placement and fixings to inhibit vandalism.

#### *3.6.7.7 Hazard Identification Signage*

- Identify hazards within the site by providing the following areas:
  - Speed restriction signs on all internal roads (10kph)
  - Warning signage on any pedestrian or cycle path crossing over internal roads
  - Restricted access signage to on-site hazards (e.g. pools, dams or detention basins, creeks, gas storage areas, electricity transformer areas)
  - Provide fire egress signage (use 'moving person' signs on all new fittings)
  - Provide approved safety warning notices and operating procedures for gas stove lighting, art kiln firing, manual arts equipment and other potentially hazardous operations within associated practical learning areas
  - Provide a map within a lockable red fire box located near the main access of the site, identifying the campus building layout with building identification names/numbers, location of hazardous material stores, gas cylinders and fire fighting equipment together with phone numbers of campus security contact, grounds person, Facilities Manager etc. Lockable red fire box keyed to Queensland Fire and Rescue Service keying system.
  - Provide all Mandatory (blue and white), Danger (red, black and white), Warning (yellow) and Notice (white and blue) signs as appropriate for the room function or hazards on the door between 1200mm – 1700mm above the floor
  - Where more than two Mandatory, Danger, Warning and Notice signs are required, for example, the Mandatory sign displaying the types of personal protective equipment required, or hazardous substance signage, the signs should be displayed to the latch side of the door at 50mm from the architrave. If there is insufficient space on the latch side of the doorway, the hinge side of the doorway may be used provided the door is not latched back obscuring the signs.

#### *3.6.7.8 Other Standard signage*

- Wall signage such as for sanitary facilities, public amenities and people with disabilities signage (e.g. toilets, hearing augmentation) shall be:
  - 250mm H x 250mm W panel with appropriate pictogram and text
  - Other statutory signage for fire services and the like such as fire door, extinguisher and laboratory safety signage should be assessed and determined to suit the requirements of the project and compliance to statutory regulations.
  - Ideally any additional signage system should match the systems described above
  - Refer to the relevant Australian Standard/s. Refer also to *Section 2.1*.

### 3.6.8 Heritage Signage

- Buildings listed on the Queensland Heritage Register are required to install a Historical Marker and may commission interpretive signage to identify the historical significance of the site.
- Historical Markers contain basic information regarding the site such as building name and year established. They are blue oval shaped plaques with white lettering.

#### *3.6.8.1 Historical Marker*

- The markers are white lettering on the blue background specifically AS2700S-1996 (B21): Colour Standards for General Purpose – Ultramarine.
- The oval vitreous enamel plaques shall measure 300mmW x 240mmH.
- The Typeface of Times New Roman font is used as it is not too contemporary in style. The text is to be centred on the plaque. To enhance readability, block uppercase printing is not permitted.
- There is no requirement to include Braille in the Heritage Marker.
- The Queensland Heritage Markers contain:
  - The words 'Queensland Heritage' in Title Case Times New Roman 24pt font around the circumference at the top of the plaque
  - The identity of the property e.g. 'Queen Victoria Silver Jubilee Memorial Technical College' in Title Case Times New Roman 48pt font
  - 'Established' and the year in Times New Roman 24pt font
  - The Queensland State Badge (on a roundel Argent a Maltese Cross Azure surmounted with a Royal Crown) which must be located at the bottom of the oval and is 40mm in height
- Where it is not possible to provide the above information in the font sizes specified, the font size of the property identity shall be modified to fit the size of the marker.
- The back of the plaque shall have 4 lugs attached centrally (top, bottom and on both sides) 50mm from the edge of the face plate to allow the plaque to be fixed to a wall or mounting. The lugs are inserted into mortar joints or on rendered surfaces only - under no circumstances are they installed into old bricks or stonework. Unused lugs are to be cut off.
- The Historical Marker shall be placed to the left hand side of the main pedestrian entrance to the campus at a height of 1500mm above the ground.
- If the heritage listed building itself is the only appropriate mounting surface to affix the historical marker, permission must be sought from the Queensland Heritage Council on the appropriate form prior to affixing.

#### *3.6.8.2 Interpretive Historical Signage*

- Interpretive signage is used to promote the history and heritage of the building and the locality as well as provide an educational experience.
- Interpretation signage is optional and conveys educational material. The content of interpretive signage is the prerogative of the educational facility and must be approved by the Queensland Heritage Council prior to commissioning.
- Interpretive signs should:
  - Be attractive and informative with interesting text, maps, and illustrations
  - Be easy to follow and understand
  - Be weatherproof and vandal resistant
  - Blend sympathetically with the campus environment
- Where the building or campus forms part of a heritage trail, the campus interpretive signage should be consistent with the other buildings on the heritage trail. Where no other heritage interpretive signage is specified, the following should be used as a guide.
- Signs should generally be 900mm x 600mm.
- The materials used for exterior signs must be attractive and durable. The following factors affecting durability need to be considered in the choice of signage materials:
  - Moisture, sun and wind
  - Graffiti and vandalism
  - Long term maintenance requirements
  - Budget limitations
  - Life expectancy required
  - Cost benefits of the various materials

  - Graphics requirements including colour
- A number of materials are available for interpretive signs including:
  - Vitreous (porcelain) enamel
  - Two-pack or similar finish
  - Anodised aluminium (metal photo)
  - Etched metal
  - High impact acrylic
  - Digital prints
  - Cast metal
- If mounted in a covered Information Bay or affixed to a wall, the signs should be hung vertical and portrait format. The Information Bay must not create an entrapment hazard. Refer also to CPTED principles (see *Section 2.1*).
- Individual signs installed along pathways should be:
  - Positioned in landscape format
  - Angled at 40 degrees from the horizontal
  - Set low with the bottom of the sign 600 mm above the ground
  - Located directly in front of the feature to be interpreted
  - Braille must be included in the text
- Information Bays and individual signs should be placed to the left side of a pathway and have a dedicated concrete or paved area of at least 1000mm wide where people may stand to read the sign without creating a hazard to the flow of pedestrian traffic.
- Signs should also be located and positioned where their attention does not create a hazard or obscure a hazard. Surrounding vegetation or environmental effects such as sun glare should also not impact on the visibility, legibility and durability (fading of the text) of the sign information.
- When selecting or designing sign mounting systems they should:
  - Be constructed of long-life, low maintenance materials, e.g. hot-dipped galvanised steel or aluminium extrusions
  - Be finished in durable coatings – two-pack polyurethane is recommended
  - Be supplied in pieces for ease of transport
  - Easy to install with all required fixing materials supplied
  - Allow the easy removal of sign panels independently from the mounting structure for replacement or repair
  - Have theft-resistant fittings

#### *3.6.8.3 Other Specific Signage*

- Refer to the Design Brief to details of other signage, for example, plaques for attribution of artistic works and opening ceremony plaques.

## 3.7 Shade Structures

### 3.7.1 General Requirements

- Shade provision shall be either in the preferred form of permanent roofed structures, such as student covered areas and outdoor learning areas in accordance with the project brief, or in the form of light weight structures and shade trees.
- Light weight shade structures shall be designed to provide a minimum of 90% solar exclusion (e.g. 90% shade cloth) and shall be supported by suitably engineered structures.
- Consideration must be given when providing shade to lunch areas and general seating areas between 10:00 a.m. and 2:00 p.m. having regard to seasonal variation of sun angles.

### 3.7.2 Shade over Play Structures

- Provide adequately sized shade structure over permanent play structures such as climbing frames and sandpits, where students play for extended periods.
  - Provide shade protection between 9am and 3pm; and
  - Shade material to have a minimum of 90% UV protection.
- The use of shade trees to supplement provision of shade over play areas taking regard to distance from structures specified in *Section 3.5.3 Soft Landscaping* should be considered.

## 3.8 Fencing and Gates

### 3.8.1 Fencing

- At briefing stage, determine the extent of the property to be enclosed by fencing taking into account future grounds maintenance and initial cost.
- Style of fencing adopted to consider the climate, locality (especially regional facilities), topography and adjacent land use.
- Retain existing boundary fences where they are of equal or higher quality than the minimum standard and are located on correct survey boundary alignments.
- Negotiate with neighbours where existing fences are of a lesser quality or height than the minimum standard, or are not located on surveyed boundary alignments.
- Effective use of fencing to direct people towards safe places and travel points.
- Consider the use of fencing to restrict access to safe places (e.g. courtyards behind or between buildings) by unauthorised persons.
- Allow clear visual access by finishing fencing in dark colours to prevent glare.
- Refer to DETE *Security Design Requirements* for security design elements.
- Refer to the DETE *Fencing Specification School Security Program* for specifications on perimeter fencing and gate designs types, styles, and construction elements for all DETE properties:
  - Provide Security Fence Type 1 and matching gates to the main street frontage and other perimeter fencing as per the design Brief
  - Provide Security Fence Type 2 and matching gates to the rear and side of the property and other perimeter fencing as per the design Brief
  - Provide Security Fence Type 3 and matching gates to sporting fields and agricultural areas, swimming pools, holding tanks and high risk elements of the property such as creeks, dams and flood risk gullies
  - For large sites in rural areas, provide Security Fence Type 2 and matching gates to all perimeter fencing or seek approval for lower cost and more appropriate standard of fencing
- Provide 1200mm high pool type fencing (or approved non-climbing equivalent) to retaining walls where the fall exceeds 1200mm. See also *Section 2.1*.

#### *3.8.1.1 Location of Site Furniture and Play Equipment*

Planting treatments and other landscape treatments shall not provide the opportunity to enable breach of site and play area fencing. The design is to ensure that there is no reduction in effective heights of fences. The location of vegetation existing or new proposed species needs to be compliant with these requirements. Refer to diagrams contained within the *Queensland Development Code (MP – 3.4 Swimming Pool Barriers)* for further guidance on determining this aspect (see also *Section 2.1*).

### 3.8.2 Gates

- Vehicular and bikeway entry gates shall be inwardly opening with sufficient width for two way traffic.

- Sliding gates are to be installed only where the terrain does not allow for inwardly opening swing gates.
- All gates shall have secure pad bolt design to accept padlocks, keyed under the facilities master keying system.
- On the main entry vehicular access gates, provide two padlocks on the same chain, one padlock is to be standard Queensland Fire and Rescue Services lock.
- On Security Fence Type 3 gates to pools and dams in bushfire prone areas, provide two padlocks on the same chain, one padlock is to be standard Queensland Fire and Rescue Services lock.

## 3.9 Seating, External Furniture and Other Site Facilities

### 3.9.1 External Seating

- Construction of external seating to be generally as follows:
  - Seats and support framing shall be either clear anodised aluminium or powder coated steel unless specifically briefed or approved otherwise
  - Support framing shall generally be embedded in concrete footing, not bolted or bracketed to slab
  - Seats shall be minimum 300mm wide and a height to suit age of students
- Seating shall be arranged to encourage social interaction.
- Allow space within seating arrangements for wheelchair inclusivity.
- Seating shall be located to back onto walls, screens or planting beds to provide a visual or physical barrier behind seating.
- The use of CCA treated timber in any location on a DETE site is **not** permitted, especially in the construction of garden furniture, seats, decking and handrails (in accordance with Australian Pesticides and Veterinary Medicines Authority (APVMA) review March 2005).

#### *3.9.1.1 Seating: Outdoor Learning Areas and Shade Structures*

- Provide the following:
  - Nominally 12 linear metres of fixed seating to each Outdoor Learning area (Years P-6) or Shade structure (Years 7-12)
  - Seat height to suit age of students
  - Arrange in a U or L shape configuration to encourage social interaction
  - Allow space within seating arrangements for wheelchair inclusivity
  - Refer to the Design Brief for additional seating requirements

#### *3.9.1.2 Seating: External Social Seating*

- Provide social seating on the basis of 3 linear metres per 25 students.
- Allow space within seating arrangements to include wheelchair space in an inclusive setting.
- Locate external seating as part of landscape scheme including such as seating height retaining walls, raised garden beds.
- External seating shall be located to provide shade from 9:00 a.m. to 3:00 p.m. by shade structures or shade trees.
- Seating shall not be located in high risk locations such as adjacent to protective fencing on top of retaining walls.

### 3.9.2 Refuse Storage

- Provide a secure fenced bin enclosure located near canteen for location of (at least) four (4) wheelie refuse bins.

- Provide a lockable, roofed and fenced bin storage area nom 3.6m x 7.2m x 2.1m high for provided mobile refuse bins and industrial bins:
  - Design to suit local collection methods, size of containers (including general waste, co-mix recycling and paper recycling bins) and type of garbage collection trucks (refer Local Authority requirements)
  - Gate/s shall be of adequate size for access to industrial bins by collection trucks
  - Where a grease/oil interceptor is installed in the compound, ensure that any vent pipes are fitted with a mosquito proof cowl
  - Enclosure shall be located away from buildings and neighbouring properties, adjacent to the internal service road and with direct access by garbage trucks with adequate turning area
  - Provide water supply, spill bunding, sewer and stormwater drainage to control wash-down waste disposal in accordance with Local Authority requirements
  - Provide hose cock adjacent to enclosure for cleaning bins
- Refuse storage enclosures shall not be located near trafficable areas, or near paths of travel and egress from buildings.

### 3.9.3 Drinking Fountains

- Refer to *Section 4.13 Plumbing Fixtures* for details of drinking fountains.
- If there is only one drinking fountain provided on a building floor, it must comply with relevant Australian Standards and all other mandatory design requirements for access and mobility. Where more than one drinking fountain is provided on the floor, at least one must comply with the relevant Australian Standards.
- Locate drinking fountains in Student Covered Areas near classrooms, Multi-Purpose Covered Areas near Canteen, near Amenities and near access path to main Oval or Sports Field.
- Where required, provide drinking fountains on Ovals and Sports Fields in an appropriate location for hydraulic services but which does not to impede the flexibility of the oval or sports fields.
- Drinking fountains shall be mounted at a suitable fixing height for the age of the users.
- All fixings and components must deter theft and vandalism.

***Years P-6:***

- Provide one (1) individual wall hung drinking fountain per 25 students, located in groups of four (4) with one of the four (4) at a height suitable for wheelchair users.

***Years 7-12:***

- Provide minimum of one (1) individual wall hung drinking fountain per 50 students, located in groups of four (4) with one of the four at a height suitable for wheelchair users

### 3.9.4 Bollards

- Provide bollards either permanent or removable as required to prevent:
  - Possible damage by vehicles to building structure (e.g. near Manual Arts service vehicle access)
  - Encroachment of vehicles into paved courtyard areas from access roads while allowing emergency vehicle access
  - Use bollards to prevent unauthorised vehicular access to areas such ovals, playing courts and food courts, and where specified in the design Brief

### 3.9.5 Flagpoles

- Provide three (3) aluminium spar flagpoles, 6 metres in height.
- Locate adjacent to the Administration facility and visible from main pedestrian entry point to providing a focal point.

- Create open space around the flagpoles, preferably hard paved, for ceremonial activities and to allow for fold-down space.
- Flagpoles to be fold-down type and have lockable hoists.

### 3.9.6 Bicycle Storage

- Provide secure, roofed bike storage enclosures as briefed in separate locations in differing parts of the site dependent upon facilities size:
  - Provide hard paving access min 1800mm wide from cycle path network or roadway to bike rack areas
  - Gate and path access shall be separate from vehicular access and must not conflict with pedestrian and vehicular traffic
  - Provide pedestrian pathway a minimum of 1500mm wide from bike rack areas to closest building or covered walkway
- Numbers of bike racks shall be determined for each site in consultation with school.

## 3.10 External Sports Facilities

### 3.10.1 Ovals and Sports Fields

- Determine at briefing stage, the extent of the property to be enclosed by fencing taking into account future grounds maintenance and initial cost.
- Consider opportunities for joint usage with Local Authority and other Government or local sporting agencies.
- Sports fields shall have the following unless approved otherwise:
  - Orientation of direction of play shall be within 10º either side of North/South
  - Minimum grade of 1:120 for drainage and maximum grade of 1:80 with preference for two-way slope from ridge running either diagonally, lengthways or widthways dependent upon particular site conditions and reduction of extent of cut/fill
  - Drainage on and around ovals and sports fields shall be designed to satisfy 1 in 100 year (ARI) rainfall intensity (refer also *Section 3.5.5 Surface and Subsoil Drainage*)
  - Permanent pegging with 75mm x 50mm x 400mm long pegs driven 25mm below finished topsoil surface at locations to identify width, length and radii of ovals or running tracks, and corners of sports fields
  - On a sloping site, preferably to be located at a lower level than building zone to allow for adequate supervision
  - Turfed surface shall be an even surface free of trip hazards such as divots, bumps, and depressions to allow for risk free use by students (refer also *Section 3.5.3 Soft Landscaping*)
  - Sprinkler irrigation system if water supply is available and subsoil irrigation if recycled water is available (refer also *Section 3.5.4 Irrigation*)
  - Where possible, clear line of sight from school buildings to enable staff supervision
  - Where the preferred configuration as follows is not feasible, alternative layouts are to be investigated in conjunction with the school community and DETE

#### *3.10.1.1 Primary School: Years P-6:*

- Provide one Sports Field Type 1 unless specifically briefed otherwise, to include:
  - One Cricket oval with boundary of 46 metre radius (92 metre width) and 110 metre length
  - One Sports/football field 82 metres long x 55 metres wide located centrally within cricket oval
  - Extent of earthworks platform minimum 1 metre clear of cricket oval boundary
  - Maximise length for location of over-run to 100 metre running track on sports field (minimum length of over-run 10 metres)

#### *3.10.1.2 State High School: Years 7-12:*

- Provide one Sports Field Type C unless specifically briefed otherwise, to include:
  - Two sports/football fields each 115 metres long x 68.5 metres wide in north/south orientation spaced 14 metres apart
  - 400 metre eight (8) lane oval running track boundary of 55 metres external radius (110 metre width) and 165 metre length overlaying the sports fields
  - Internal radius of 8.5 metre wide running track shall be 46.5 metres
  - Locate running track so that sports field goal posts do not encroach on running area
  - Extent of earthworks platform minimum 2 metres clear of running track boundary and 5 metres clear of extents of sports fields whichever is the greater

#### *3.10.1.3 State Colleges: Years P-12 Schools*

- Provide one P-6 Sports Field (Type 1) and one State High School Sports Field (Type C) as above.

#### *3.10.1.4 Vehicular access:*

- Provide space for access for movement of heavy equipment and emergency vehicle access.
- Grounds/ Sports Equipment Store to be in close proximity and oval to have access for ride-on mower.
- Where possible locate external parking area in close proximity to public accessible sports facilities.

#### *3.10.1.5 Pedestrian access:*

- Provide PWD access paths min 1200mm wide at less than 1:20 slope from building zone.
- Provide turfed areas of battered bank, mounds or terraces for spectator viewing.
- Provide shade by landscaping trees or other shade cover to spectator areas and boundaries of oval/fields.

### 3.10.2 Multipurpose Court Platforms

- Provide level grassed platform/s for future school/ P & C development of multi-purpose courts.
- Opportunities for joint usage with Local Authority and community sporting organisations should be considered.
- Platforms shall be:
  - Located in close proximity to and with access from Grounds/ Sports Equipment Store
  - Easily accessible for afterhours community use
  - Turfed
  - Accessible by students with disabilities

#### *3.10.2.1 Primary Schools:*

- Provide one (1) double court platform (nominally 36.5 metres x 36.5 metres or for steep sites 72 metres x 18.5 metres).

#### *3.10.2.2 High Schools and P-12 schools:*

- Provide 2 double court platforms (each nominally 36.5 metres x 36.5 metres or equivalent for steep sites)
- In existing schools where existing courts are required to be relocated due to new construction, provision shall be made for replacement of any paved courts including platforms and appropriate surface finish, perimeter fencing, line marking, rebound wall, tennis nets, and basketball poles and rings.
- Ensure that all structures and equipment (e.g. play structures, basketball poles and hoops) comply with BCA requirements and have appropriate engineering certification.

- Refer to the DETE Standard for Basketball Structures
- These standards prescribe the minimum standard for materials, loadings and installation requirements, including mandatory warning signage to be provided.

### 3.10.3 Play Structures

- All play structures (including fitness equipment) shall comply with all relevant legislation, Codes and Australian Standards for playground surfaces, playgrounds and playground equipment, including the development, installation, inspection, maintenance and operation. See also *Section 2.1*.
- When selecting play structures, designers should consider:
  - Lifecycle costing (e.g. if re-certification is required then the school needs to approve the ongoing costs of the equipment)
  - Maintenance requirements (e.g. if regular inspections are required then determine what the costs of the maintenance would be)
- Locate play structures (including fitness equipment) and sandpits:
  - Away from roads, deep drains, potentially hazardous trees
  - Where easily supervised
  - On level ground
- Provide the following:
  - Designed to discourage climbing onto roof
  - Ensure that supports for shade structure are located outside required fall zones (refer below)
  - Subsoil drainage under soft fall and sandpit shall be piped to stormwater system and adequate overland flow paths to divert stormwater around play area
- Ensure that play structures do not create hazards:
  - Head, foot and finger entrapment
  - Unsuitable material use (splinters from timber, sharp edges, large link or unprotected chains)
  - Unacceptable types of equipment including all swing types, roundabouts, and flying foxes
  - **The use of CCA treated timber in the construction of play structures is not permitted** (in accordance with Australian Pesticides and Veterinary Medicines Authority (APVMA) review March 2005)
- Provide the following impact absorbing soft fall:
  - Impact absorbing soft fall material under and around play structures (including fitness equipment) with a fall height over 500mm to comply with statutory requirements and relevant Australian Standards and in accordance with Critical Fall Height tests provided by the supplier of the surfacing material
  - Preference is for a material which does not create dust
  - Loose material shall be contained with a defined edging finished flush with surrounding surface
  - Extent of impact absorbing material shall be determined by the fall zone of equipment used with a minimum of 2.5 metres measured from furthest extent of equipment

#### *3.10.3.1 Preparatory Play Areas*

- Sandpit shall be:
  - Located to allow for sand delivery access
  - Minimum 400mm depth of sand
  - Level paved area to at least one side
  - Preferably divided into two (2) levels to allow for a range of sand-play activities
  - Close access to double hose cock

- Fixed climbing structures shall be:
  - Multi-level platform units up to 1200mm high that are capable of accepting movable elements such as planks, ladders, ropes, or south facing slide
  - Guardrails for platforms at heights over 500mm with in filled panels under and appropriately sized handgrips
  - Linking structures located away from platform structure to allow for a range of movable elements (e.g. rope, clatter or log bridge, roman rings) to be linked together

#### *3.10.3.2 Junior Years 1-3*

- Provide as a minimum the following fixed play structures:
  - Multi-level platform units up to 1400mm high that are capable of accepting movable elements such as planks, ladders, ropes and slide
  - Guardrails for platforms at heights over 1200mm and appropriately sized handgrips
  - Linking structures located away from platform structure to allow for a range of movable elements (e.g. rope, clatter or log bridge, roman rings) to be linked together

#### *3.10.3.3 Junior Years 4-6*

- Allow space in Master Plan for future play structure suitable for years 4-6.

#### *3.10.3.4 Special Education Programs*

- Design of play environments will need to take into account the specific needs of Special Education program students and be flexible to suit as wide a range of users as possible.

### 3.10.4 Spill Out/Free Play Areas

- Provide a variety of suitable spaces between and around buildings for free play, with differing play spaces for age groups and behaviours.
- Provide level open turfed spaces for boisterous, unstructured play, in areas other than oval or sports fields and in close proximity to Junior classrooms. Ensure that these areas are unobstructed and not bisected by paths.
- Provide intimate sheltered spaces for quiet play and conversation.
- Allow for ‘spill-out’ space for active play (either turfed or hard paving) adjacent to Multi-Purpose Covered Areas.
- Consider supervision sight lines in location of play space.
- Locate play areas for young students to be located separate from middle and senior years areas.

### 3.10.5 School and Community Facilities

- With the exception of Ovals/ Sports Fields, court platform/s and Play Structures as outlined above, all other sports facilities (e.g. additional courts, grandstands) are generally funded as a school based or community initiative.
- Allow sufficient space in site planning for possible future development of community facilities.
- Allow flexibility in location of site services for future underground services of electricity, water, sewerage and fire services to be installed on ovals and sporting fields at a later date.

# 4 Building Design Standards

## 4.1 General Standards

### 4.1.1 Performance and Flexibility

- Buildings shall be functional, fit-for-purpose, comfortable, healthy, safe and environmentally sustainable to meet the intended use as outlined in the project brief.
- Buildings shall be designed to respond positively to their environment including climatic, social, cultural and environmental conditions.
- Buildings shall be designed to cater for their identified purpose yet be flexible and adaptable for changing uses both in the short and long term, taking into account the following:
  - Structural systems shall allow clear span spaces with minimum internal columns or structural walls, to facilitate future refurbishment or remodelling as needs change in the future
  - Services such as power, data, water and drainage shall be, wherever practicable, located on the perimeter of rooms in preference to in the centre to enable teachers and students to modify and customise learning spaces and to allow for future remodelling. Where power and data are required in the centre of a space, floor boxes shall be provided except where briefed otherwise.
  - Built-in furniture and fixtures shall be, wherever practicable, located on the perimeter of rooms

### 4.1.2 Image

#### *4.1.2.1 Image and Aesthetics*

- The design aesthetic of educational buildings shall incorporate a mix of innovation, functionality and cost effectiveness, to achieve a contemporary style tailored to each facility taking into account the local landscape, site topography and the character of the local community.
- Where specifically briefed, specific buildings shall have enhanced visual image and identity. Additional documentation, such as elevations or 3D images, of these buildings shall be provided for approval where required.

#### *4.1.2.2 Scale*

- The scale of buildings and fittings shall take into account the size of students, particularly in primary schools and Early Childhood Education Centres.
- A domestic scale is required for buildings for years Prep to year 3 to encourage a feeling of security and to assist the transition from home to school.
- High school buildings shall reflect a contemporary educational built environment that recognises and assists in the transition from school to tertiary education.

#### *4.1.2.3 Colour Scheme – External*

- External colour schemes shall be sympathetic to the surrounding environment/ streetscape and be compatible with existing building colour schemes where applicable.
- Use colour to identify zones or individual buildings and to assist in identifying travel routes through the site.

#### *4.1.2.4 Colour Scheme – Internal*

- Internal finishes for each area shall be consistent with the purpose of the space and be capable of being cleaned regularly.
- Internal colour schemes shall generally be light, neutral colours for large surfaces.

- Accent colours shall be used as approved after consultation with the client groups. Consultation will be needed to determine specific colour needs of students. Strong colours and patterns may be problematic for students with ASD whereas contrast is required for students with visual impairments.
- Colour schemes shall be used to assist in defining the identity of buildings and room functions and to assist in route/ path finding.
- Generally, all internal walls, including plant room walls, shall be painted. Face block walls in selected locations may be left unpainted.

#### *4.1.2.5 Colour for safety in Manual Arts, Trade Training Centres*

- Use safety colours as set out in the relevant Australian Standards.
- The interior walls and ceiling of Arc Welding Bays shall be painted non-reflective matt black.
- Safe work zones around machines where briefed shall be defined by yellow painted safety lines on the floor. Refer also to *Section 4.6.10 Machinery Safety.*

#### *4.1.2.6 Colours for safety enhancement generally*

- In covered play areas, large structural columns shall have high luminance contrast colour for visual prominence when children are playing.
- The edging to all steps shall have a slip resistant contrasting coloured nosing 20-25mm wide.

#### *4.1.2.7 Visual Transparency*

- Internal and external walls of all habitable rooms shall (except where specifically briefed otherwise) have glazed windows, viewing panels and door glazing to provide passive visual supervision and promote a visually transparent environment between spaces and to the external environment.
- To allow passive supervision of children while sitting on the floor, viewing panels in spaces for Years P to 3 shall have a sill height of between 400 to 800mm and a head height of minimum 1800mm.
- To allow passive supervision of children while sitting on chairs, viewing panels in spaces for Years 4 to 12 shall have sill height of 1000mm and a head height of minimum 1800mm.
- Viewing panels to laboratory doors shall comply with the relevant Australian Standard (see also *Section 2.1*).
- Where optional visual privacy is briefed as a requirement (such as for staff areas, offices, meeting and interview rooms) visual privacy shall be achieved by privacy blinds (Venetian or roller type screen/ blinds) on the inside face of view panels and windows.
- Where external sunscreens are required to prevent sun penetration through windows, they shall be designed so as not to obstruct horizontal view by of more than 50% of the viewable window area, unless briefed otherwise.

### 4.1.3 Construction and Protection

- Construction and structural systems shall be appropriate for particular site location and site conditions and risks of natural events (e.g. topography, soil conditions, flood, storm surge, cyclone/ wind speed/ terrain category, earthquake, bushfire, subsidence, landslide). A location risk assessment shall be applied to identify risk. Refer to the Department of Housing and Public Work's *Strategic Asset Management Framework*: *Mitigating the Impact of Natural Disasters on Government Buildings* (see also *Sections 2.1 Compliance with Mandatory Design Requirements: Legislation, Regulations, the National Construction Code, Local Government Laws* and the *Australian Standards, 2.14 Disaster Mitigation,* and *3.1.4 Environmental Assessment and Survey Requirements*).
- Where specifically briefed, nominated buildings shall be designed to function effectively during and immediately after natural hazard events and act as an emergency shelter for the community.

- The finished floor level of all habitable buildings, unless specifically briefed otherwise, shall be constructed to a minimum level of 500mm above Q100 flood level. Non-habitable buildings shall be constructed to a minimum level of 300mm above Q100 flood level.
- Construction and structural systems shall be suited to availability of local materials, construction techniques and available skills within local construction industry.
- Pest and vermin infiltration and infestation (i.e. birds, possums, termites, vermin and insects etc.) shall be prevented by approved physical or sealed chemical barriers, especially for shed type structures.
- Educational buildings shall be designed to resist wind loads in accordance with National Construction Code, Building Code of Australia, Part B, Clause B1.2 Table B1.2a Importance Levels of Buildings and Structures, Importance Level 3, unless specifically briefed otherwise.

## 4.1.4 Sustainability

### *4.1.4.1 Sustainability*

- Buildings shall be designed with due consideration of the following principles:
  - Passive design principles
  - Energy conservation
  - Water efficiency and water quality
  - Indoor environment quality
  - Waste minimisation and recycling
  - Sustainable materials
- Materials shall wherever possible have low embodied energy, be recyclable and sourced from local manufacturers.
- Preference shall be given to products with environmental certification complying with 'Green Tag', Good Environmental Choice Australia (GECA) or equivalent system.
- Unless briefed otherwise, the Construction Management Plan shall incorporate plans for drainage control, erosion control, sediment control and water quality outcomes consistent with the *State Planning Policy for Healthy Waters* (see also *Section 2.1*).

### *4.1.4.2 Life Cycle Durability*

- Building structure, fabric, materials, finishes, services and equipment shall be durable and have low maintenance life cycle characteristics in accordance with a recognised Life Cycle Assessment (LCA) tool e.g. Green Tag or similar.
- The usable life cycle performance of building structure, fabric, services, materials, finishes and equipment shall have an indicative life span (years) as follows:
  - Building structure – 80 years.
  - Building fabric (roof, cladding, windows etc.) – 25 years
  - Building fit-out – 25 years.
  - Services infrastructure – 25 – 80 years dependent upon accessibility and type of elements.
  - Relocatable buildings (allowing for multiple relocations) – 25 years.
  - Sporting facilities – 50 years.
  - Plant and machinery – 25 years (depending on the item).
- Exposed hot dipped galvanized steel elements subject to wear and tear by students (such as covered walkway columns) shall be left unpainted unless briefed otherwise.
- Handrails to external stairs, ramps and balustrades shall be a durable scratch resistant material (e.g. stainless steel or unpainted, hot dipped galvanised steel ) to resist wear and damage.

### *4.1.4.3 Corrosion Protection*

- Atmospheric/ Exposure classification for concrete shall comply with the relevant Australian Standards (see also *Section 2.1*) as follows:
  - In contact with ground – A2
  - Exterior above ground – B1

  - Interior – A1
- Atmospheric/ Exposure classification for structural steelwork shall comply with the relevant Australian Standards (see also *Section 2.1*) as follows:
  - Exterior (unlined external soffits and any area subject to condensation, contact with ground or rain water, or subject to crevice corrosion) – Moderate
  - Interior – Mild
- Base metal thickness of structural steel elements (excluding purlins and fascias) in an exterior environment – shall be a minimum of 3mm.
- Minimum corrosion protection to structural steelwork shall comply with the relevant Australian Standards (see also *Section 2.1*) as follows:
  - Exterior environments – Hot dipped galvanised
  - Interior environment – IP1 General Purpose Prime
  - Interior environment (subject to abrasive wear) – IP2 Special Purpose Primer
- External structural components shall be hot dip galvanised in whole components following fabrication and bolted on site. On-site welding of hot dip galvanised, exposed structural components shall not be permitted except where specifically approved otherwise.

## 4.1.5 Access and Circulation

### *4.1.5.1 Accessibility*

- Refer also to *Section 2.1 Compliance with Mandatory Design Requirements: Legislation, Regulations, the National Construction Code, Local Government Laws and the Australian Standards*.
- Each campus shall have a continuous accessible path of travel linking all habitable buildings with site access and parking facilities.
- Access to all DETE buildings, including relocatable buildings and major sporting facilities, shall comply with the relevant legislative requirements, the National Construction Code, and relevant Australian Standards, including, the *Disability Discrimination Act 1992*, *Disability Services Act 2006*, *Disability Standards for Education 2005*, the *Disability (Access to Premises – Buildings) Standard 2010* and the *Disability Standards for Accessible Public Transport*.
- Advice from a disability access consultant with expertise in the compliance requirements outlined in *Section 2.1* (as noted above) shall be provided to support any proposed solution, if required.
- Provisions for access and facilities for people with disabilities should be integrated, in almost all cases, with those for the able-bodied, thus minimising feelings of segregation that may otherwise be experienced. Particular attention shall be paid to toilet facilities, lifts, door sizes and swings, floor finishes, hand rails, services, access and parking.
- Lift access shall be provided where specifically briefed or required to comply with access provisions. Refer to *Section 4.12.6 Lift Services.*
- To support information access and enquiries by parents and the public, hearing augmentation systems shall be provided at reception counters in the Administration Block and Resource Centre and other areas where briefed.

### *4.1.5.2 Egress*

- Each campus shall have a continuous accessible path of travel linking all habitable buildings with site access and parking facilities.
- Building entrances shall normally be at ground level without steps or shall be accessible by way of ramps at the required gradient. Door threshold steps should ideally be avoided with the maximum permitted where necessary for weatherproofing being 20mm. Ramped access is to be provided wherever the necessary weatherproofing exceeds 5mm.
- All egress paths of travel and emergency lighting shall comply with statutory requirements.
- Entry doors to all classrooms shall open outwards to promote easy exit.

- Recess outswing doors into the classroom to avoid projecting into corridor circulation spaces.
- Sliding doors shall not be used as the main entry into rooms as they cannot be used for emergency evacuations as per the National Construction Code. Provide at least one *AS1428.1-2009: Design for access and mobility – General requirements for access – New building work* compliant swing door to all rooms.

#### *4.1.5.3 Emergency Egress*

- In rooms where potentially hazardous activities may occur (e.g. Science Labs, Food Kitchens, Catering Kitchens, Trade Training Centres, Workshops, etc.) or where briefed, provide a minimum of two (2) separate Building Code of Australia (NCC) compliant alternative paths of egress from the room for use as emergency evacuation routes.

#### *4.1.5.4 Other access/ egress issues*

- All external doors shall have a minimum 900mm deep continuous wet weather cover (such as a veranda roof, covered link or awning) at a height to provide effective rain protection and for the length of the door opening plus a minimum of 1000mm each side.
- A continuous accessible path of travel shall be provided for stretcher access to all first-aid / casualty/ sick rooms from the kerb of the nearest emergency vehicle parking bay which is compliant with relevant Australian Standards. This path of travel shall consider the widths of doors, circulation space, slope and cross fall of access pathways.
- In rooms where roller shutters or sliding doors are provided, an additional swing door shall be provided to ensure Building Code of Australia (NCC) compliant safe egress in an emergency.

### 4.1.6 Floor Area and Space Configurations

- Refer to specific space/ room floor area allocations as defined in each project brief.
- Floor area required in ECEC shall adhere to the formula specified in the Education and Care Services National Regulation.
- For typical spatial allocations, functional relationships and room data for office accommodation refer to the DETE *Master Planning* document (see also *Section 2.1*).

### 4.1.7 Amenities

- The number of sanitary fixtures for both students and staff shall be in accordance with statutory requirements (National Construction Code, Building Code of Australia, Part F, Table F2.3, Sanitary Facilities in Class 9b buildings) for the advised planned long term enrolment capacity of the whole educational campus as indicated in the Master Plan.
- To ensure personal privacy and to minimise bullying in schools, each student toilet cubicle shall have full height partitions between adjacent cubicles and full a height door (maximum 40mm gap under door and minimum door height 2040mm). The cubicle door shall be inward opening with lift off safety hinges and shall have an indicator latch that can be operated in an emergency from the outside.
- Each cubicle shall have impervious floor and wall finishes with sealed joints between wall and floor.
- Each cubicle shall have fixtures, fittings and services as briefed. Refer also to *Section 4.12.2 Water Supply, Section 4.13 Plumbing Fixtures* and *Section 4.14 Fit-out, Equipment.*
- Each cubicle shall have natural ventilation and a dedicated light fitting (switched from a staff accessible room such as the cleaner's store).
- Separate male and female groups of cubicles shall be located adjacent to corresponding male and female hand washing areas that are screened to provide after hours security and a degree of privacy yet enable passive supervision by staff from outside the block.
- Self-help toilet and shower cubicles shall comply with relevant Australian Standards (see also *Section 2.1*), unless a standard of enhanced accessibility is specifically briefed.

- Assisted toilet and shower cubicles shall comply generally with relevant Australian Standards (see also *Section 2.1*), but shall have increased circulation space each side of the toilet pan to enable assistance for either manual lifting or with a mechanical lifting device.
- Student amenities in Prep to year 1 shall take into consideration the height of young users when establishing the location and height of flush handles, wash basins and drinking fountains. *Note:* Standard height toilet pans shall be provided for all students from Prep to year 12. Junior size pans shall only be provided where specifically briefed for Prep aged children.
- Amenities for ECEC shall contain adequate, developmentally and age-appropriate toilet, washing and drying facilities and the location and design of the toilet, washing and drying facilities shall enable safe use and convenient access by the children.

### 4.1.8 Modification and Demolition

- Construction work involving disturbance, removal or demolition of any hazardous materials including smoke alarms etc. shall be in accordance with statutory requirements and DETE and DHPW policy. Refer to *Section 4.6.6 Health and Safety- Hazardous Substances.*
- Construction work involving disturbance, remove or demolition of asbestos shall be in accordance with the *Working on Department of Education, Training and Employment (DETE) Facilities* document and the DETE Asbestos Management – policy, plan and guidelines (see also *Section 2.1*).

### 4.1.9 Relocatable Buildings

- Refer to DETE standard arrangement for *Purchase of Relocatable Buildings* (PSA100233).
- Unless briefed otherwise, relocatable classroom buildings shall have the equivalent standard of accessibility, water, drainage, power, data, electronic security, evacuation / lock-down alarm, to that provided in permanent buildings.

### 4.1.10 Food Preparation Areas

#### *4.1.10.1 General*

- Food preparation areas in Canteen/ Tuckshops and Catering Kitchens (for teaching catering and hospitality to students in years 10 to 12), shall comply with '*Food premises: Design, construction and fit-out guide*' (see also *Section 2.1*).
- Food Kitchens (for the teaching food studies to students in years 7 to 9 only) are exempt from the above requirements, however, general design principles for food hygiene shall be adopted.

#### *4.1.10.2 Legislation, Food Safety Standards and Guidelines*

- Refer also to *Section 2.1 Compliance with Mandatory Design Requirements: Legislation, Regulations, the National Construction Code, Local Government Laws and the Australian Standards*.
- Designers of all food preparation areas must ensure the designs comply with all relevant duty of care provisions relating to food preparation, hygiene and safety standards.

#### *4.1.10.3 Food Facilities – Staff Kitchens and Kitchenettes*

- Ensure all campus food preparation areas (including staff kitchens/ kitchenettes and student kitchenettes) meet the key compliance objectives for food safety. Ensure food premises generally:
  - Are easy to clean and maintain
  - Have sufficient space, facilities and suitable equipment to store, heat or produce food safely
  - Are provided with services such as potable water, affective waste disposal and sufficient light and ventilation for food handling
  - Provide facilities for staff to maintain standards of hygiene and equipment cleanliness to protect against contamination
  - Are proofed against entry by and harbourage of pests

#### *4.1.10.4 Food Facilities – Cafeterias / Canteens / Tuckshops*

- Ensure facility design features for food preparation, packaging and storage effectively minimise the risk of supply or sale of unsafe food.
- Ensure fit-out provides for:
  - Access to an adequate water supply and to an effective waste disposal system
  - Dedicated food preparation sink to be installed in close proximity to where handling open food
  - Separate and easily accessible hand washing facilities for food handlers
  - Sufficient mechanical ventilation
  - Facility finishes and recessed lighting are designed to minimise the risk of contamination
  - Adequate clear space surrounding equipment and fittings to enable cleaning without moving equipment. Provide castors for major equipment.
  - Bench joints and surfaces are to be sealed to prevent contamination. Use of adjustable height shelving under benches is to be avoided.
  - Insect screens are to be provided to windows and doors
  - Appropriate storage facilities are required for food and also for garbage disposal
  - Each double socket power outlet must be wired to a separate electrical circuit

#### *4.1.10.5 Catering Facilities – Sports Hall/ Conference Catering / Performing Arts*

- Refer to the Room Data Sheets for specific information regarding food preparation, packaging and storage areas for public use facilities such as Sports Halls, Performing Arts Theatres or Conference Rooms.
- Where such facilities have been identified to cater for events or prepare food on site for sale during conferences, performances or similar, ensure full compliance with Food Premises requirements including the Food Safety Standards and relevant Australian Standards for the fit-out of food premises (see *Section 2.1*).

## 4.2 Substructure

### 4.2.1 Slab and Footings

- Generally single storey slab-on-ground construction shall be used where site conditions and briefed functional requirements allow such building platforms to be constructed economically. Access for persons with disabilities will be achieved more economically with single storey construction. Multi-storey and suspended floor construction may be appropriate where site constraints dictate.
- The design of the slab and footings shall take into account the following:
  - Stability of founding material and suitability of ground conditions
  - Estimation of any excavations in rock
  - Appropriate footing design for the nature of the building and the service function it is to perform
  - Suitability of excavated material for bulk fill
  - Minimise potential movement or settlement and susceptibility to damage of surrounding infrastructure
  - Site overland stormwater characteristics
- Where practicable, floor slabs and footings, including veranda slabs, shall be constructed with a single concrete pour to avoid joints.
- Provide physical termite protection at all penetrations and joints.
- Where slab edges are exposed provide continuous exposed edges of min 75mm high, for visual inspection for termite attack.

### 4.2.2 Suspended Floors

- Suspended slabs or raised substructures shall be used on the ground floor storey in the following situations:
  - Where geotechnical investigations recommend minimisation of ground disturbance such as excavations in rock
  - Where steep slope of the building zone cannot be formed economically into building platforms
  - In sensitive environmental areas where disturbance to natural ground is to be minimised
  - Where overland storm water flow or flood water risk is identified
- Ensure that areas under suspended slabs are stabilised and prevented from eroding.
- Surface drainage and falls shall be designed to ensure that water is diverted away from under slab areas.
- Tanking and seepage drainage shall be provided to retaining walls to prevent water penetration into lower or subfloor levels of buildings.

### 4.2.3 Services

- Allow for the following when determining sizes and location of underground services:
  - Future needs and capacity for expansion (e.g. water pipes, electrical cabling, air-conditioning duct work, data cabling) where briefed
  - Serviceability and access for maintenance
  - Minimise the number of trenches required during construction
  - Where possible locate service runs in close proximity and in similar directions
  - Future building platform levels
  - Actual finished landscape levels
- Location of all underground services shall be documented in the form of as-built drawings and provided to DETE at Practical Completion.

### 4.2.4 Access to under Floor Areas

- All permanent and relocatable buildings and structures, where there is insufficient head height in accordance with legislative requirements (including verandas, decks, stairs and tank stands) shall be enclosed for service access only, by secure screening and lockable gates (e.g. battens or mesh screening). Gates shall open outwards.
- Under floor areas of buildings where briefed to be used for storage shall have the underside of floors treated for fire rating as required by the Building Code of Australia (NCC), Fire Safety Regulations, and relevant Australian Standards (see also *Section 2.1*).
- To prevent unauthorised access to areas under buildings, enclose under floor areas, relocatable buildings, tank stands and external stairs with batten screening or equivalent where height above ground is sufficient to allow access. Ensure any crawl spaces are not accessible by native fauna, feral cats or other vermin.

### 4.2.5 Termite Control

- Anti-termite treatment shall be provided to all buildings. Depending on the application, either chemical or physical barriers to comply with relevant Australian Standards (see *Section 2.1*) to determine the most appropriate system.
- In new buildings the preference is for the use of non-chemical barriers. In existing buildings, the presence of chemical barriers may necessitate the retention of the chemical method of subterranean termite control.
- All tree roots which have been exposed during excavation, tree stumps, logs and timber shall be removed from the building site.
- All workmanship and materials shall conform to the requirements of the relevant code. Where chemical barriers are used, all necessary safety precautions shall be taken to protect workmen and others from accidental poisoning.

- On completion, certification in the form set out in the relevant Australian Standard shall be obtained and submitted to the DETE facility describing the method/s employed, locations of treatment and any limitations or precautions for the methods used.

## 4.3 Superstructure

### 4.3.1 Building Structural System

- The design of the superstructure shall:
  - Reflect the building plan and sub-structure;
  - Locate structural loads (columns and bracing walls) on the external wall line unless otherwise approved, to allow maximum design flexibility in room layout and for future adaptability
  - Enable roof cover to be constructed as soon as possible to reduce delays during wet construction periods
  - Have no sharp elements (e.g. exposed flanges) on structural elements which are exposed to student circulation areas
- All components shall be in accordance with relevant Australian Standards and the following structural criteria:
  - Floor live load – minimum 3 kPa
  - Floor dead load not supporting masonry walls – minimum 1 kPa for demountable partitions and services
  - Floor load for plant, lift, generator rooms, etc. – actual plant load or 5 kPa minimum
  - Floor load for compactus storage areas – actual load or 7.5 kPa minimum
- Comply with relevant Australian Standards for wind loads:
  - Structural Importance Multiplier – 1.0
  - Terrain Category – compatible with roughness of terrain for all approach directions, cyclone areas
  - Internal Pressure Coefficient – minimum +0.2 – 0.3
  - Internal walls and partitions shall resist all loads to which they might reasonably be subjected and the following:
    - Differential internal pressure co-efficient – minimum 0.25 kPa
    - Partition walls not to deflect more than height /300 under a pressure of 0.25 kPa
- Comply with relevant Australian Standards for earthquake loads and the following:
  - Masonry walls shall be anchored to the roof and floors which provide horizontal support
  - No unrestrained structural or non-structural masonry to be used
  - All structural and non-structural components, plant and equipment shall be mechanically secured for all applied directions of force including upwards

### 4.3.2 Floors

- Internal floors unless briefed otherwise, shall be structural concrete slab to the finished levels and fall as briefed.
- Concrete floors shall be in accordance with statutory requirements and relevant Australian Standards and shall have a Class A surface finish and a level tolerance of 3mm maximum deviation from a 3 metre straight edge in any direction, and have a moisture content suitable for application of floor finish as briefed.
- Provide falls in floors to floor wastes at minimum of 1:80 generally and 1:60 for accessible toilets and showers as per the relevant Australian Standards.
- External floors to verandas, covered walkways and paths shall have falls to direct surface water to the outside of the building and prevent ponding along the path of travel.
- Provide steps and ramps at doorways in accordance with statutory requirements and relevant Australian Standards.

- Provide appropriate set-downs for specialist flooring systems (e.g. sports and dance floors) where briefed.
- Recessed mat wells shall not be provided, unless specifically briefed otherwise.
- Refer also to *Section 4.4 Internal Finishes.*

#### *4.3.2.1 Toilet and Shower areas*

- As these areas have the likelihood of being hosed down during cleaning, all toilet areas including airlocks and accessible toilets shall be deemed wet areas and are to be waterproofed to satisfy the requirements of the relevant Australian Standards (see also *Section 2.1*) for Category 1 wet areas.
- All wet areas are to have installed an approved impervious flooring using either copper or stainless steel tray, fibreglass reinforced acrylic membrane or purpose built base or flooring.
- The preferred design detail is a 50mm setdown floor slab to achieve a continuous floor level without thresholds at doorways. The setdown area is overlaid with the waterproofing membrane system and cementitious screed laid to falls. The membrane should turn up at the perimeters on to the fibre cement wall lining substrate.
- Refer to the relevant Australian Standards for indicative details.

#### *4.3.2.2 Access Floors*

- Access floors (where specified by the Room Data Sheets) shall be a 'Unistrut MK.25A' gridless system (or equal approved) as required for the room function. A 150mm high flat black PVC skirting is to be used.

#### *4.3.2.3 Floor Services Pits*

- Where services pits for power, water or compressed air (or similar) are incorporated in ground floor workshop areas, consideration needs to be given to drainage of these pits.

### 4.3.3 Walls – External

- Provide external wall cladding systems with the following characteristics:
  - Durable, graffiti resistant, easily cleaned, low maintenance and easily repaired if damaged
  - Impact and abrasion/ scuff resistant materials and finishes up to 1800mm above floor level
  - Acoustic performance as per the Building Code of Australia (NCC) and all relevant Australian Standards, to suit location (see also *Section 2.1* and *Section 4.9 Acoustic Performance*)
  - Thermal performance as per the Building Code of Australia (NCC), and all relevant Australian Standards to suit location and climate
  - Weatherproof
- All external wall material shall be capable of withstanding a student environment in addition to the regional climatic conditions.
- All external wall material must be cost effective and not compromise future maintenance and life cycle costs.
- Proposals for use of non-traditional and innovative wall solutions on each individual project shall be supported with proven evidence of suitability and cost effectiveness.
- Unpainted masonry (clay brick and coloured unpainted concrete block masonry) shall have an applied anti-graffiti finish treatment unless briefed otherwise.
- To minimise the locations for dust collection and bird roosting, external walls shall not have exposed horizontal ledges (other than window sills) wider than 30 mm.

### 4.3.4 Walls – Internal

#### *4.3.4.1 General*

- Refer also to *Section 4.4.2. Internal Wall Finishes.*

- Construction of internal walls and partitions shall be non-load bearing to enable removal and relocation for maximum flexibility of internal spaces.
- Ensure that internal walls are suitable for activities in the room/ building. Consider the following when determining wall construction and materials:
  - Long term durability and impact resistance
  - Low maintenance costs and capable of being cleaned and repaired if damaged
  - Appropriate level of insulation for acoustic and thermal purposes
  - Aesthetic appeal that is value for money
  - Availability of material locally
  - Ability of framing to support the fixing of sheet linings, fixed joinery and fixtures
  - Allow access for services and allow for future changes to services locations
- Wall sheeting of internal walls and partitions from floor level to 1800mm in all student accessible spaces shall be equal in impact/scuff resistance to 9mm fibre cement. *Note:* plasterboard is not acceptable in classrooms due to ease of damage to the surface.
- Wall sheeting in non-student accessible areas in schools and ECEC shall be equal in impact/ scuff resistance to 6mm fibre cement.
- Corner protection shall be provided to external corners of walls.
- Construction of internal walls and partitions shall comply with acoustic performance specified in the relevant Australian Standard for acoustics (see also *Section 2.1*) or a higher performance requirement, as briefed.
- Framing size and spacing shall be in accordance with manufacturers' recommendations for sheet lining fixing.
- Additional framing shall be provided where required to enable structural support for the fixing of joinery, fixtures and fittings.
- To prevent attack from corrosive kiln fumes, the walls of Art Kiln firing rooms shall be flush sheeted, fixed with stainless steel screws and all joints sealed.

#### *4.3.4.2 Toilet Partitions*

- Toilet partitions shall be either blockwork or a proprietary system with full height, dividing walls, front panels and doors constructed of minimum 10mm compact laminate with a scratch resistant, patterned, graffiti resistant finish on both faces and shall have a random patterned colour (no plain colours) that hides marks. Doors and walls to contrast in colour.
- Panels shall be joined with clear anodised aluminium channels.
- All fixings shall be vandal resistant, stainless steel, concealed fixings.
- Cubicle doors shall be mounted on three (3) lift off gravity safety hinges with 90 degree hold open and fixed with bolt through type, tamper proof fixings.
- Cubicle doors shall have suitable rebated or profiled overlapping jamb edges at junction with frontal panels to provide a visual privacy.

### 4.3.5 Ceilings

- Minimum height of ceiling in habitable rooms shall be 2700mm AFF (above the finished floor) (to allow for ceiling fans mounted at minimum 2400mm AFF) and sloping/raked ceilings shall be minimum 2400mm AFF at the lowest point.
- A raised height ceiling with clerestory and / or skylights shall be provided to allow greater volume and to achieve natural lighting and ventilation as follows:
  - Where necessary to meet the requirements of *Sections 4.8.2 Natural Ventilation* and *4.8.8 Natural Lighting*
  - In single storey buildings with rooms of 100 square metres or greater
- Minimum thermal insulation properties (in combination with roof insulation) shall be as briefed. Refer also to *Section 4.8 Thermal Performance*
- Ceiling systems shall comply with minimum acoustic absorption and transmission properties as briefed. Refer also to *Section 4.9 Acoustic Performance.*

- In food areas such as Canteens, Catering Kitchens, dining rooms and food stores, ceiling systems shall be sealed against dust and vermin and shall comply with '*Food premises: Design, construction and fit-out guide*' (see also *Section 2.1*), including flush mounted light fittings.
- All rooms shall be provided with access to the ceiling space to allow access to existing services and installation of additional services in the future.
- Ceiling in rooms smaller than 20 square metres, unless briefed otherwise, shall be fixed flush sheeted.
- Ceilings in rooms larger than 20 square metres, unless briefed otherwise, shall be suspended grid type ceiling with inset tiles and lighting (to provide access to ceiling space for services).
- Suspended grid and tile ceiling systems shall have the following minimum requirements unless briefed otherwise:
  - Proprietary manufactured
  - 30 year warranty against visible sagging, warping and corrosion
  - 1200 x 600 x 19mm thick tiles
  - RH99 sag resistance
  - Textured finish with scrub-able, scratch and soil resistant anti-mould surface
  - 0.90 light reflectance
  - Acoustic absorption minimum NRC 0.70
  - Square lay-in 24 mm grid
  - Minimum 60% recycled content
  - *Acceptable product – Armstrong Ultima or approved equivalent*
- Air-conditioned rooms shall have air inlet/ outlet registers that are compatible with the ceiling grid.
- To assist in achieving sound isolation between rooms as briefed, acoustic ceiling baffles shall be provided each side of wall partitions.
- To prevent attack from corrosive kiln fumes, the ceiling of Art Kiln firing rooms shall be flush sheeted, fixed with stainless steel screws and all joints sealed.

### 4.3.6 Roof

- Refer also to *Section 4.5 – Roof water run-off and Collection.*
- To achieve rain noise damping and assist thermal insulation of roofs over fully enclosed spaces, soffits, verandas and large open covered areas, blanket insulation of min R2.5 and with a vapour barrier shall be provided directly under the roof sheeting. Refer to *Section 4.8 Thermal Performance.*
- Unless specifically briefed otherwise, roofs over fully enclosed spaces, shall have a minimum slope of 10 degrees and over unenclosed spaces (e.g. covered play areas, covered walkways, verandas, outdoor learning areas etc.) shall have a minimum slope of 3 degrees.
- All susceptible openings into the roof space shall be provided with vermin and bird proofing.
- Framing under open roofed areas and covered links shall be flush against the underside of roof sheeting to prevent nesting and roosting of birds.
- Roof and veranda eaves shall have a minimum clearance of 2400mm AFF to reduce unauthorised roof access and vandalism.
- Roof eaves overhang shall be a minimum of 900mm wide unless briefed otherwise.
- The extent and location of roof eaves overhang and veranda shall be assessed for contribution to sun shading of windows. A combination of both overhang and external sunscreens shall be used to achieve the required sun exclusion. Refer also to *Section 4.8.1 Shade.*
- Roof system shall be pre-finished metal profiled sheeting, screw fixed to roof framing, unless briefed otherwise. Other roof systems (such as metal sheeted, rigid foam sandwich panels such as Ritek) shall only be used where specifically briefed or specified.

- The selection of light-coloured, reflective roof materials minimises heat ingress, which helps to improve thermal comfort and reduce energy consumption. Unless briefed otherwise roof sheeting shall comply with the following minimum requirements:
  - Material is to be minimum 0.48 mm base metal thickness, finish complying with *AS/NZS 2728:2013 Prefinished / prepainted sheet metal products for interior / exterior building applications – Performance requirements* type 4 and *AS 1397-2011 Continuous hot-dipped metallic coated steel sheet and strip – Coatings of zinc and zinc alloyed with aluminium and magnesium*, G550, AZ150. *Acceptable product - Colorbond 'Coolmax' or equal approved.*
  - Coatings shall be appropriate for corrosive atmospheric conditions and location (e.g. within 2 km of sea coastline use). *Acceptable product - 'Colorbond Ultra' or equal approved.*
  - Sheets shall be full length sheets with no end laps
  - All materials, finish, flashings and fixings shall be protected from the effects of galvanic corrosion
  - Bird proofing shall be provided to all sheeting edges / ends

#### *4.3.6.1 Roof Flashings*

- Roof flashings generally shall be designed to minimise the use of sealants and shall be fabricated and installed in accordance with the roof deck manufacturer's recommendations. The plumbing designer shall design and specify flashings necessary for roofing penetrations. Flashings, cappings and other items associated with the roofing shall be prefinished to match the decking. All fixing types are to be as recommended by the roof deck manufacturer. Under no circumstances shall plastic tap in fixings shall be used on any exposed section of roofing. All caulking and rivets shall match the colour of the roof and flashings.
- Where the ends of the roof sheeting are clearly visible above the eaves gutter, install a Colorbond angle to match the roof colour with the vertical leg positioned downwards and the other leg fixed to the top of the rib, spaced to allow water run-off.
- Flashings to penetrations for roof access hatches, skylights and the like shall incorporate a soaker flashing which shall extend to the roof ridge whenever possible. Flashings to all roof penetrations shall be designed to minimise the collection of leaves and debris.
- 'Decktite' flashings (or approved equivalent) are acceptable for penetrations. Where flashings abut walls, a double 'K' flashing (two piece) flashing is required.

#### *4.3.6.2 Roof Safety Fall Systems*

- Safe work and fall-prevention systems incorporating fixed roof anchor points and safety systems shall **not** be provided unless specifically approved by DETE. If approved these systems shall be installed in accordance with statutory requirements and relevant Australian Standards.

### 4.3.7 Windows, Glazing and Sky-lighting

#### *4.3.7.1 General*

- Window systems shall comply with relevant Australian Standards (see also *Section 2.1*).
- Window systems shall be proprietary aluminium systems of commercial quality, clear anodised finished unless briefed otherwise.
- The window system shall incorporate associated proprietary fixings, flashings, seals and hardware.
- Window systems shall be designed to meet the wind loading and impact resistance levels to suit the relevant location.
- Window systems shall achieve acoustic transmission rating for each room as briefed. Refer also to *Section 4.9 Acoustic Performance.*
- Window systems shall achieve physical security rating as briefed. Refer to the *DETE Security Design Requirements.*

- All window glass shall be aluminium section edge framed unless briefed otherwise.
- Ensure that the fixed section of all sliding windows is located adjacent to the latch side of doorways to prevent unauthorised entry.
- To achieve views and passive visual connection/ supervision, provide view panels in walls between rooms and in doors as briefed.
- To achieve natural ventilation as briefed, the extent of open-able windows (together with doors and open-able clerestory/ skylights) as a % of floor area, shall be as briefed. Refer to *Section 4.8.3 Natural Ventilation*.
- To achieve natural lighting, the extent of windows and skylights (clerestory windows or solar tube type skylights) as a % of floor area, shall be as briefed. Refer to *Section 4.8.8 Natural Lighting.*
- The standard window configuration in external walls of habitable rooms, unless briefed otherwise, shall extend from sill height 1000 mm above floor level, up to 2400 high with a transom at 2100 high (door head height).
- High level louvres at 2400mm or more above internal floor level (such as clerestory windows) shall be mechanically operated in banks via electric actuators with variable control switching.
- Double hung windows shall only be provided where specifically briefed and shall have fail-safe spring balances and locking mechanisms.
- Casement or hopper windows shall only be provided where specifically briefed and shall be located so as not to open into trafficable areas.
- School buildings located close to noise sources (such as main roads and railway lines) shall where specifically briefed have double glazing or thicker glass to achieve acoustic requirements.
- Tinted glazing shall be provided only where specifically briefed to achieve glare reduction and shall comply with relevant Australian Standards.
- Security screening where briefed shall be as specified in the DETE *Security Design Requirements* document (see also *Section 4.7 Security). Acceptable products - 'Crimsafe' high tensile stainless steel mesh with screw clamps or 'Clearshield' stainless steel perforated sheet or approved equivalent.*
- Where Crimsafe or any approved equivalent that reduces the amount of natural light penetration is fitted, consideration must be given to alternative natural light sources to comply with natural light requirements.
- Insect screens where briefed to open-able window panels (and doors) shall be woven stainless steel mesh or perforated stainless steel sheet screens, as above.
- In rooms located on two-storey levels and above, open-able windows that constitute a fall hazard shall be protected with a barrier screen of woven stainless steel mesh or perforated stainless steel sheet as above, unless briefed otherwise.

#### *4.3.7.2 Safety Glazing*

- Provide as mandatory safety glazing to high risk areas to prevent accidental breakage and injury as per the relevant Australian Standards (see also *Section 2.1*). Laminated safety glass is to be used in accordance with revised statutory requirements in all identified risk situations as detailed in the Standard, including the following situations:
  - All glass in doors panels or beside door panels to workshops
  - Glass to stairwells
  - All glazing within 5 metres of ovals, sportsgrounds or practice nets
  - For marked play courts, and glazing up to 2 metres from ground level
  - Up to 1000mm above height of window located seating
  - Other areas where high likelihood of human impact, including any existing glazing up to 1000mm from ground level

#### *4.3.7.3 Openable Window Design*

- Except where specified in the Design Brief, all nominated external windows shall be able to be opened either by sliding or pivot hinge windows of commercial quality, designed in accordance with all relevant codes.
- Not less than 10% of the window area shall be openable. Every room and every set of windows on the perimeter must have at least one openable window. Openability is to be provided for window cleaning and may be necessary for ventilation purposes in non-airconditioned spaces. Pivot hinge windows can open outwards or inwards. Outward opening pivot windows should not be used in locations in proximity to pedestrian circulation areas such as pathways, corridors and verandahs.
- All windows accessible from ground level and all air-conditioned spaces, irrespective of level, shall be factory fitted with window locks which comply with the requirements of *Section 4.3.8 Doors - Locks*.
- The design of the walls at window and door penetrations shall ensure that the cavities between the inner and outer walls are suitably flashed and the cavities are closed with the wall material and not aluminium angles.

### 4.3.8 Doors

#### *4.3.8.1 General*

- Door widths to achieve clear opening width.
- Door location and side clearance shall comply with building legislation for egress and access and with relevant Australian Standards (see also *Section 2.1*).
- The main external doors to all classrooms/ learning spaces in schools shall be a single leaf nominally 920mm wide outward opening swing door unless briefed otherwise. Other doors within the classroom shall also be 920mm wide unless briefed otherwise.
- The main entry doors to significant buildings, such as Administration, Performing Arts and similar buildings, shall be double leaf, with a minimum clear opening width of 1640mm, commercial quality, fully glazed, aluminium framed with appropriate hardware and door closers.
- Fully glazed doors and view panels in doors shall comply with relevant Australian Standards.
- Security screening where briefed shall be as specified in the DETE *Security Design Requirements* document (see also *Section 4.7 Security)*. *Acceptable products - 'Crimsafe' high tensile stainless steel mesh with screw clamps or 'Clearshield' stainless steel perforated sheet or approved equal fitted with anti tamper screws at 300mm centres.*
- Door systems being constructed in buildings in cyclone regions shall comply with relevant wind code loading for the area.

#### *4.3.8.2 Aluminium-framed Glazed Doors*

- Where specified, aluminium framed glazed doors for external and internal use shall have either anodised or powdercoated aluminium finish with a mid-rail not less than 200mm wide glazed with safety glass panels.
- Anodising shall not be less than 20 microns anodise to both doors and frames.
- Powdercoating shall be of a quality commensurate with the application and shall be equivalent to DULUX Duratec (Line Number 900).
- Warranty: to achieve a manufacturer's warranty for film integrity and for colour of a minimum of ten years. (Where bright colours are used, Duratec LX or Fluoroset FP may be required to achieve warranty requirements.)
- Aluminium doors larger than standard size must have accompanying hinges, closers and the like designed to prevent movement and misalignment. The top rail of aluminium doors shall be of a size to fit the door closer.
- Where electric locks are fitted, the door mid-rail should be used for cable access.

- Top rail of door leaf is to be fully enclosed to support the fitting of concealed reed switches, if required.

#### *4.3.8.3 Door Construction*

- Doors shall be capable of withstanding heavy and constant usage by students and sufficiently robust to provide physical security to the level briefed.
- External doors shall be weatherproof construction with weather seals.
- External doors shall be solid core except where briefed otherwise.
- Internal doors generally shall be cell core except where briefed to meet high acoustic requirements.
- Impact and scuff panels/plates for protection from wheelchair damage, shall be provided to doors in all accessible toilets.

#### *4.3.8.4 Viewing Panels*

- Classroom doors may have small glazed sections with not less than 6.38mm thick laminated glass which allows persons externally to view into a teaching space without disrupting learning and teaching. These are to allow persons on the outside to see which class is being conducted inside without disrupting the concentration of those on the inside.
- Viewing panels may occur between teaching areas and non-teaching areas for passive supervision.
- The alternative is for the wall to have the small glazed section on the hinged side of the door. The glazed section is to be of a size and location to enable a view of the room without compromising the security of the door in a lockdown situation. Where a viewing panel is inserted in the wall partition, door viewing panels are not required.
- Door viewing panel size shall be nominally 600h x 150w, located within 200mm of the door frame and with the bottom edge at 1000mm AFF.
- Viewing panels to laboratory doors shall comply with the requirements of relevant laboratory design and construction Australian Standards (see also *Section 2.1*).

#### *4.3.8.5 Gates*

- To ensure adequate ventilation and supervision by staff, gates to student amenities foyer and washbasin areas and other secure courtyards shall be 50% perforated metal sheet screening or similar to adjacent wall screening.
- Locks to gates shall comply with escape provisions of Building Code of Australia (NCC) and shall be open-able from the inside at all times. Provide a 600mm radius anti-tamper panel around the latch handle to prevent external access to the handle through the mesh when the gate is locked.
- Gates shall be provided with appropriate latch or bolt to allow holding and locking in the fully open position.

#### *4.3.8.6 Toilet Doors*

- To ensure visual privacy and effective ventilation, doors to student individual toilet cubicles shall be full height 2040 mm high and with a maximum of 40mm gap at the floor and have a ventilation panel above the door up to 2400mm high.
- Cubicle doors shall be inward opening with lift off hinges and shall have a privacy indicator latch that can be opened from the outside in an emergency.
- Ambulant toilets require outward swinging doors.

#### *4.3.8.7 Roller Doors/ Shutters*

- Roller shutters or doors to large stores, field stores, canteen servery areas etc. shall be interlocking slat type constructed to give maximum strength.
- Roller door guide tracks shall be heavy duty to prevent roller door being forced from track.

- Roller shutters shall have a reinforced bottom rail and have internal barrel bolts both sides for padlocking where a personnel door exists, or external barrel bolts where no personnel door is present.
- Roller shutters larger than 3600mmW x 2400mmH shall be chain operated. Electric motorised roller doors shall be provided only where specifically briefed.
- Roller shutters to tractor storage areas shall have a minimum clear opening height of 2400mmH to allow clearance for the tractor anti-roll cage.

#### *4.3.8.8 Special Doors*

- The door set for Category 'A' Security Store Room where briefed shall be a minimum of 1 hour fire rating and comply with relevant Australian Standards. Refer also to the DETE *Security Design Requirements* document (see also *Section 4.7 Security).*

#### *4.3.8.9 Operable and Concertina Doors*

- Operable folding panel walls and concertina doors where briefed shall have the following qualities:
  - Minimum rating of Rw 45 between classrooms including associated jamb seals, floor seals and head tracks to reduce noise transmission. Refer also to *Section 4.9: Acoustic Performance.*
  - Commercial quality construction, durable, low maintenance, with quality fixings, mechanisms and latches
  - Provide a mechanism at the bottom of each pair of panels to control flexing and accidental movement by students/staff. Acceptable methods include: barrel bolt floor fixings or retractable seal between the door and the floor.
  - Incorporate into the door panels where briefed, view panels, whiteboards, mirrors, pin-boards and penholders
  - Operable folding panel doors unless briefed otherwise shall be made up of separate pairs of panels hinged together to allow any combination of pairs of panels to be used
  - Operable walls where compliant access between rooms is required shall have one swing door end panel with access compliant lever handle

#### *4.3.8.10 Fire Doors*

- Fire doors shall comply with the relevant Australian Standard (see also *Section 2.1*) and generally shall be paint finished.

#### *4.3.8.11 Smoke Doors*

- Where required, smoke doors may be either solid timber or aluminium framed and glazed construction and shall satisfy the requirements of the National Construction Code (BCA) (Specification C3.4). If fitted with hold-open devices, a selector for sequencing closing must also be fitted. Fit smoke seals appropriate to the application.

#### *4.3.8.12 Door Frames*

- Door frames shall be steel or aluminium unless briefed otherwise.
- Door frames shall suit door location, door type and window system if applicable.
- Provide door closers to restrain door swings in areas that could cause a danger to students.

#### *4.3.8.13 Door Locks*

- Refer also to the DETE *Security Design Requirements* document (see also *Section 4.7 Security)*.
- Lockable doors, unless specifically briefed otherwise, shall be fitted with commercial quality, 6 pin cylinder mortise locks with deadlatch conforming to the relevant Australian Standard for mechanical locksets and hardware for doors and windows in buildings - level D3 durability and level S2 security. *Acceptable product – 'Lockwood 3572 Vestibule Lock' or equal approved.*

- Lockable doors, unless specifically briefed otherwise, shall have the external lever handle key lockable from the outside.
- The external handle shall be lockable from the inside by a snib.
- The internal lever handle shall allow opening from the inside at all times
- Keying system shall be a Grand Master Key (GMK) Restricted Key System and registered with an approved master locksmith. *Acceptable product – 'Lockwood Generation 6 system' or equal approved.*
- The keying plan for the entire school shall provide Grand Master Key, Master Key, Keyed-Alike and Keyed-to-Differ functionality as briefed with all keys stamped with appropriate alpha/ numeric coding.
- Special lock set for Category 'A' Security Store Room where briefed shall be a 4 point proprietary security lock. *Acceptable product – Rivers 4 point lock set or equal approved.*

#### *4.3.8.14 Door Furniture and Fittings*

- Door lock handles shall be lever handle, brushed stainless steel finish. *Acceptable product – 'Lockwood 202 Series Stainless Steel' furniture with 'Lever 90 handles' or approved equivalent.*
- Provide door stops to all internal and external doors. Door stops shall be vandal resistant and located so as not to create a trip hazard in trafficable areas.
- Provide vandal resistant door hold back devices to all external doors.
- Provide a minimum of 3 heavy duty fixed pin stainless steel hinges to suit weight and size of door to prevent sagging.
- Where doors are required to open 180 degrees provide wide throw or extended hinges.
- Provide flush bolts to the top and bottom of the secondary leaf of double leaf aluminium doors.
- Provide 'D' handles to sliding doors at not less than 60mm from the door jamb lining.
- Doors in rooms that are briefed to require air circulation (e.g. electrical cupboards and stores, data cupboards, air conditioned areas) shall have heavy duty and securely fixed metal louvre grilles.
- On all external outward opening doors provide an external striker/ latch cover plate. *Acceptable product – 'Boyd plate' or approved equivalent*.
- On external double aluminium doors the gap between doors is to be covered with an aluminium strip fitted to one leaf with anti tamper screws.
- Electronic card key access system shall be provided only where specifically briefed.

#### *4.3.8.15 Door Hardware*

- Handles that turn are used only where the handle must be turned to open the door. The handles should be of a style that the hand of a user who cannot grip well cannot slip from the handle during operation of the latch. *Acceptable product – 'Lockwood Lever 90 handles' or approved equivalent.*
- Door handles and hardware shall be 1000mm above the finished surface of the door to allow all control switches to horizontally align.
- Where a door must be pushed to open it, push plates are to be installed on the side(s) that must be pushed.
- Where a door must be pulled to open it, without the need to turn a handle, non-turning handles are to be installed on the side that must be pulled.
- Unless specified otherwise in the Design Brief, 'bar' type surface mounted panic bars are to be installed on all fire exit doors.

#### *4.3.8.16 Door Closers*

- Except where required to meet universal access requirements, provide door closers to restrain door swings in areas that can cause a danger to students. Refer to Space Room Data Sheets for individual door requirements.

- Where door closers are not specified, generally provide surface mounted door closers to entrance doors, external doors, lecture theatre doors, toilets, air-locks, fire-doors and plant rooms.
- Door closers shall generally be provided to the perimeter doors of all air-conditioned spaces.
- Hold-open function closers shall be provided to all teaching spaces where manual hold back devices are not fitted.
- Provide delay action control closers on all doors on the 'continuous accessible path of travel' for universal access.
- Overhead surface-mounted type with spring strength EN 1 - 5 should be used.
- When mounting door closers in conjunction with acoustic seals, provide suitable mounting packers to keep the arm of the door closer clear of the seal. In all cases screws are not to penetrate glazing beads on acoustic seals.
- Provide mounting plate when mounting door closers on aluminium doors in parallel arm applications.
- All outward opening doors shall have parallel arms and inward opening doors shall be regular arms.
- Where the security systems installed require doors to be automatically closed, ensure that the appropriate door closer types are fitted.
- Prior to Practical Completion (and when mechanical systems are fully operational and balanced), door closers shall be adjusted so that spring strength is adjusted to lowest optimal setting for satisfactory closing action.

#### *4.3.8.17 Kick Plates*

- Kick plates are required in the following locations: toilet doors, teaching spaces, store rooms, cleaner stores, circulation spaces, stairs (where no hold-open provision is provided) and plant rooms.
- Kick plates shall be 150mm high x nominal full door width, 0.9mm thick 304 No 4 satin stainless steel, glued and screw fixed with stainless steel raised head screws to both sides of each door.
- Where timber doors are subject to excessive damage from trolleys or similar impacts, and to doors to sanitary compartments for people with disabilities, the stainless steel kick plates shall extend to a height of 600mm above the floor level.
- Ensure that kickplates and fixings are manufactured and installed to provide smooth surfaces and edges, ensuring no sharp edges or protrusions.

#### *4.3.8.18 Door Stops*

Provide effective and vandal resistant door stops to any door where the door may strike a wall, provide an aluminium and rubber door stop, to floor or wall, in a position that will allow full access clear of door furniture, located so as not to create a hazard in trafficable areas or cause excess force on doors in windy conditions.

#### *4.3.8.19 Acoustic and Smoke Seals*

Where acoustic seals are required to the bottom edge of a door leaf, the seal shall be surface mounted type and not rebated into the face of the door, and threshold fitted across opening. *Acceptable product – RAVEN door seals (or approved equivalent), selected to suit the particular application*.

#### *4.3.8.20 Push Plates and Pull Handles (Toilets and Airlocks)*

- Provide on 1.6mm satin stainless steel push plate (nominally 150mm W x 500mm H) fixed with countersunk stainless steel screws. Provide engraved 'Push' (sentence case) to push plates.
- To pull side, fit 200mm 'D' handle mounted 100mm above lowest edge of the plate. Mount plate to opening edge of door with lowest edge 900mm AFFL. Provide engraved 'Pull' (sentence case) to plates with pull handles.

#### *4.3.8.21 Striker Plates*

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

## 4.4 Internal Finishes

### 4.4.1 Flooring

- Floor coverings shall:
  - Be of commercial/contract grade and able to withstand very high levels of wear
  - Have colours and patterns to reduce the visual impact of minor soiling
  - Be easily cleaned and maintained
  - Have slip resistance to suit the usage of the space in accordance *with AS/NZS 4586:2013 - Slip Resistance Classification of New Pedestrian Surface Materials*, the Building Code of Australia (NCC) and *HB 197:2014 – An introductory guide to the slip resistance of pedestrian surface materials.*
- Junctions between different floor finishes and at exposed edges shall have a commercial quality junction strip. At doorways the junction strip shall be located directly under the door.
- The following sections provide the minimum standard acceptable for floor finish types as briefed:

#### *4.4.1.1 Carpet - Tiles*

**Table 1: Carpet - Tiles**

| **Criteria** | **Minimum Requirements** |
|---|---|
| Description | Tufted loop pile, direct stick carpet tile |
| Australian Carpet Classification Scheme (ACCS) Grading | Contract Extra Heavy Duty and Stairs **(CEHDS)** |
| Face Yarn | 100% Nylon (Polyamide)<br>No polypropylene or polyester |
| Colour and Pattern | Colours to be of the darker range with disruptive patterning |
| Tile Size | Nominal 500mm² |
| Total Pile Mass | Minimum 610g/m² **(18oz/yd²)** |
| Machine Gauge | 1/10$^{th}$ (39.4 needles/100mm) and finer |
| Pile Height | Nominal 4mm but not to exceed 6mm |
| Backing Thickness | Nominal 4mm |
| Dimensional Stability | Less than 0.2% variation to heat and water |
| Anti-static | Less than 3.5Kv at 21ºC and 20% relative humidity |
| Flammability Rating | Critical Radiant Flux (CRF) greater than or equal to 2.2 kW/m²<br>Smoke Development Rate less than 750%-minute |
| Environmental Rating | ACCS Environmental Certification Scheme **(ECS) Level 4** |
| Warranty | Minimum **15** Years Commercial wear |
| Installation | Follow manufacturer's guidelines and relevant Australian Standards<br>Ensure concrete floors are tested for moisture and pH levels<br>Adhesive to be low-VOC, 'cross linked' water-based acrylic<br>Supply 5% area additional over for replacement purposes |

***Note:*** See also *Section 2.1 Compliance with Mandatory Design Requirements: Legislation, Regulations, the National Construction Code, Local Government Laws and the Australian Standards.*

#### *4.4.1.2 Carpet - Broadloom*

**Table 2: Carpet - Broadloom**

| Criteria | Minimum Requirements |
|---|---|
| Description | Interlocking tufted loop pile, direct stick carpet |
| Australian Carpet Classification Scheme (ACCS) Grading | Contract Extra Heavy Duty and Stairs **(CEHDS)** |
| Face Yarn | 100% Nylon (Polyamide)<br>No polypropylene or polyester |
| Colour and Pattern | Colours to be of the darker range with disruptive patterning |
| Width | Nominal 3660mm |
| Total Pile Mass | Minimum 745g/m² **(22oz/yd²)** |
| Machine Gauge | 1/10th (39.4 needles/100mm) and finer |
| Pile Height | Nominal 4mm but not to exceed 6mm |
| Pirmary Backing | Minimum 100g/m² synthetic backing |
| Secondary Backing | Minimum 90g/m² synthetic backing |
| Bonding | Direct to substrate or dual bonding over underlay |
| Anti-static | Less than 3.5Kv at 21ºC and 20% relative humidity |
| Flammability Rating | Critical Radiant Flux (CRF) greater than or equal to 2.2 kW/m²<br>Smoke Development Rate less than 750%-minute |
| Environmental Rating | ACCS Environmental Certification Scheme **(ECS) Level 4** |
| Warranty | Minimum **10** Years Commercial wear |
| Installation | Follow manufacturer's guidelines and AS/NZS 2455-Part 1<br>Ensure concrete floors are tested for moisture and pH levels<br>Adhesive to be low-VOC, 'cross linked' water-based acrylic<br>Supply 5% area additional over for replacement purposes |

***Note:*** See also *Section 2.1 Compliance with Mandatory Design Requirements: Legislation, Regulations, the National Construction Code, Local Government Laws and the Australian Standards.*

#### *4.4.1.3 Sheet Vinyl Flooring*

**Table 3: Sheet Vinyl Flooring**

| Criteria | Requirements |
|---|---|
| Grade | Fully flexible heavy public/ commercial use quality |
| Surface finish | A surface treatment to give a 'low maintenance' finish, not requiring sealers or polish for the life of the sheet with written guarantee to this effect |
| Maintenance requirements | Limited to damp mopping, neutral cleaners, machine cleaning and dry buffing |
| Construction Type | Either homogeneous consolidated vinyl with non-directional pattern or heterogeneous multi-layered vinyl sheet with vinyl chips in transparent wear layer bonded to moisture proof backing |
| Warranty | Minimum - 10 years including 'low maintenance' finish |
| Thickness | Minimum thickness - 2mm |
| Joints | All joints shall be heat or chemically welded to achieve a water proof joint |
| Flexibility | Ability to form sheeting into a continuous surface from floor to walls with a 25mm radius coving with suitable fillet backing |
| Adhesive | Adhesive suitable for wet areas and have low VOC emission |

| | |
|---|---|
| Colour | Mid to darker colours and disruptive patterns to disguise marks (not plain charcoal or black) |
| Slip resistance | Vinyl floors as briefed and scheduled below shall comply with AS 4586-2013 Slip resistance classification of new pedestrian surface materials be one of the following types: |
| **Type A** | **General use vinyl** (e.g. Resource Prep Rooms, Store Rooms etc)<br>AS/NZS4586: 2013<br>Appendix A Wet Pendulum – Y<br>Appendix D Oil-wet ramp R9 |
| **Type B** | **Slip Resistance vinyl** (e.g. Canteen Prep and Serving Areas , HE Food & Catering Kitchens, Science Labs, Art Studios, Practical learning Areas etc.)<br>AS/NZS4586: 2013<br>Appendix A Wet Pendulum – X<br>Appendix C Wet/ barefoot ramp – A<br>Appendix D Oil-wet ramp R10 |
| **Type C** | **Barefoot/ Wet-area Vinyl** (e.g. Staff Amenities, Shower Rooms, PWD shower/ toilets)<br>AS/NZS4586:2013<br>Appendix A Wet Pendulum – X<br>Appendix C Wet/ barefoot ramp – B<br>Appendix D Oil-wet ramp R10 |

***Note:*** See also *Section 2.1 Compliance with Mandatory Design Requirements: Legislation, Regulations, the National Construction Code, Local Government Laws and the Australian Standards.*

#### *4.4.1.4 Special Flooring - Industrial Technology (Manual Arts) workshops and Student Amenities*

- To avoid possible incidents of ill-health due to the fumes from coatings used on floors, only coatings approved as complying with the Australian Paint Approval Scheme's (APAS) specification AP-VS0209L may be applied to floors in buildings owned by, or being built for, the Queensland Government. These requirements apply to surface coatings only. They do not apply to coatings such as waterproofing that will be covered by a concrete topping pad.
- Contractors applying these coatings must be suitably qualified in terms of knowledge and quality assurance, so it is also a requirement that they be accredited under the Painting Contractors Certification Program (PCCP) for the application of Class 18 floor coatings to qualify for work on Queensland Government building projects.
- For more information on the list of products that comply and the list of contractors with the required PCCP accreditation, please refer to the Department of Housing and Public Works website (see *Section 2.1* for details).
- Non-slip epoxy flooring shall be self-levelling, low VOC emission, with slip resistance in accordance with AS 4586-2013 Slip resistance classification of new pedestrian surface materials Appendix D - Oil Wet Ramp R10.

#### *4.4.1.5 Special Flooring - Dance, Drama, Halls & Indoor Sports Courts*

- **Timber "area-elastic' flooring** shall be prefinished 'no-sand' in accordance with manufacturer's specifications and with a minimum 5 year manufacturer's warranty for the installed floor.
  *Acceptable products equal to:*
  - *'Aura/ Haro Helsinki 15'*

- *'ASF Horner PR 2'*

*Note:* For schools located in high rainfall and high humidity regions of the State, timber flooring shall be designed and finished to resist damage from moisture. Schools located in high rainfall and high humidity regions of the State should consider the selection of a synthetic flooring system as opposed to a timber flooring system where practicable for the intended use of the space. DETE requires a minimum 5 year manufacturer's warranty for the installed floor and all floors must have the same performance and maintenance requirements as the above acceptable products.

- **Synthetic "point-elastic' flooring** shall be in accordance with manufacturers specifications. *Acceptable product equal to:*
  - *'Aura Pulastic 2000'*
  - *'Taraflex Sport'*

#### *4.4.1.6 Special Flooring - Special Education Spaces*

- Non-slip cushion backed vinyl shall be ultra-low maintenance surface and anti-bacterial and anti-fungal treated.

#### *4.4.1.7 Special Flooring - Covered Areas, Covered Walkways and External Paths*

- Non-slip concrete shall have 'light broomed' surface finish to achieve slip resistance rating in accordance with AS 4586-2013 Slip resistance classification of new pedestrian surface materials Appendix D - Oil Wet Ramp R10.

#### *4.4.1.8 Skirtings*

- Skirtings shall be provided to all walls unless briefed otherwise.
- Skirting shall generally be minimum 10mm thick proprietary pre-finished pine timber, 100 mm high, dark colour with tapered, bull-nosed edges.
- In wet areas where an impervious sealed joint between the floor and the wall is required, flooring shall be coved up walls and kickboards with impervious joints at corners. Refer also to *Section 4.4.2 Internal Wall Finishes (*below).
- In food preparation areas, flooring shall be coved up walls and kickboards with impervious joints at corners, to comply with '*Food premises: Design, construction and fit-out guide*' (see also *Section 2.1*).

### 4.4.2 Internal Wall Finishes

- Paint finish shall comply with relevant Australian Standards. Refer also to *Section 4.4.4 Paint Finishes* below.
- Wall finish in wet areas and shower areas shall be an impervious, easily cleaned sheet material (e.g. smooth vinyl or sheet laminate (sheet laminate shall be a minimum 2.7mm thick)) up to minimum 2100mm above floor level, fully sealed or heat welded to floor vinyl sheeting with coved backing to corners.
- Walls in food preparation areas shall be finished to comply with '*Food premises: Design, construction and fit-out guide*' (see also *Section 2.1*). Where specifically briefed (such as in Performing Arts auditoriums), provide acoustic absorption wall surfaces to achieve the briefed absorption level. Refer also to *Section 4.9 Acoustic Performance.*
- Chair rub rail shall be provided to walls in waiting areas where briefed, from 700 to 900 mm above floor level.
- External corners to all internal walls shall be provided with a replaceable corner protection angle from floor skirting to 1800 mm in all student accessible spaces.
- Skirting boards are to be painted in gloss.

### 4.4.3 Ceiling Finishes

- Flush ceilings shall be painted matt white in colour to ensure adequate light reflection unless briefed otherwise.

- Ceiling tiles shall be pre-finished matt white colour unless briefed otherwise.
- Ceiling grid shall be two (2) directional, white powder coated finish matt white colour.

### 4.4.4 Paint Finishes

#### *4.4.4.1 General*

- Paint finishes:
  - Shall comply with the Australian Paint Approval Scheme (APAS). Refer to www.apas.gov.au.
  - Shall comply with relevant Australian Standards (see also *Section 2.1*)
  - Shall be ultra-low VOC emission
  - Shall be washable and able to be scrubbed
- Only high quality lines from approved manufacturers shall be used.
- The proposed brand(s) of paints and paint lines shall be specified in the tender. Neither the brand nor the paint line may be changed without approval. Paints and/or colours from different manufacturers shall not be combined in a paint system.
- Colour tinting shall be by the manufacturer unless otherwise approved. Colours shall be from manufacturer's standard range. Add tinters or stainers only if approved, and only if in accordance with the manufacturer's recommendations as to type, quality and tinting formula, and provided the tinting produces the required colour without detriment to the durability or aesthetic performance of the product.
- *The identifying fire door tag on the stile of a fire door is not to be removed or painted over at anytime.*

#### *4.4.4.2 Primers, Sealers, Undercoats*

- Ensure that primers, sealers and undercoats are suitable for the substrate and compatible with the finish coat and each other. Except for stains and other clear or translucent finishes each coating shall be of a noticeably different tint from the preceding coat.

#### *4.4.4.3 Workmanship*

- All blast cleaning and painting contractors must have valid PCCP accreditation.
- Any accessories or surfaces that are damaged directly or indirectly as a result of painting shall be repaired or replaced.

#### *4.4.4.4 Application – External Painting*

The following tables provide a guideline to painting DETE infrastructure:

**Table 4: Application – External Painting – Solvent Borne Paints**

| Application | Details |
|---|---|
| **1. Painting Systems – unless otherwise specified the following painting systems will apply:** | **a) Previously painted surfaces**:<br>• Two (2) coats of paint consisting of:<br>- one (1) coat undercoat<br>- one (1) coat finish coat<br>*Note:* Where surfaces are bare of paint, one (1) coat of sealer or primer is required prior to applying the above coats.<br>**b) Unpainted surfaces**:<br>• Three (3) coats of paint consisting of:<br>- one (1) coat primer or sealer<br>- one (1) coat undercoat<br>- one (1) coat finish coat |
| **2. Galvanised Iron – Zincalume Roofs** | • This solvent-based system is only to be used when specified, eg. High moisture areas.<br>• Iron roofing that has been previously painted shall be water pressure cleaned and sanded to a sound surface:<br>- Bare areas to be coated with approved primer APAS 0134<br>- Apply one (1) coat of oil based undercoat APAS 0016/1<br>- Apply two (2) coats of roof enamel APAS 0011<br>• New iron roofing to be degreased, inspected and approved prior to application of above paint system.<br>• Where the substrate is rust affected the surface is to be treated with an approved rust inhibitor and a metal primer to APAS 0162 used in lieu of APAS 0134. |
| **3. Pipes and Battens** | • Pipes previously coated with tar or bituminous compositions shall receive one (1) coat of aluminium or bleed sealer and afterwards shall be painted in two (2) coats of paint to APAS Schedule 0016/1 and 0015/1 to match other surfaces. |
| **4. Varnish (where surfaces are to be revarnished)** | • All surfaces that have been stripped off shall be recoated to manufacturer's specification to suit specified finish. |
| **5. Steps, Landings and Ramps** | • All step treads, stringers, landings, handrails, balustrades, ramps etc are to be painted on all visible surfaces with two (2) coats of acrylic APAS 0280/5.<br>• Top face of treads, landings and ramps to have non-slip additive applied with final coat, eg washed clean sifted sand. |
| **6. Drying** | • One clear day for drying shall be allowed to elapse between the application of each coat of paint. |

**Table 5: Application – External Painting – Water Based Paints**

| Application | Details |
|---|---|
| **1. Painting Systems – unless otherwise specified the following painting systems will apply:** | **a) Previously painted surfaces (where existing coatings are solvent borne)**:<br>• Three (3) coats of paint consisting of:<br>- one (1) coat oil based undercoat<br>- two (2) coats finish coat<br>**b) Previously painted surfaces (where existing coatings are water based)**:<br>• Two (2) coats of paint consisting of:<br>- finish coat<br>*Note:* Where surfaces are bare of paint one (1) coat of oil based or acrylic sealer is required prior to applying the above systems.<br>**c) Unpainted surfaces**:<br>- Three (3) coats of paint consisting of:<br>• one (1) coat primer or sealer<br>• two (2) coats finish coat |
| **2. Galvanised Iron – Zincalume Roofs** | • Galvanised iron roofing that has been previously painted shall be water pressure cleaned and sanded to a sound surface:<br>- Bare areas to be coated with approved primer APAS 0134<br>- Apply two (2) coats of acrylic gloss, satin or low sheen as required.<br>• New galvanised roofing to be degreased, inspected and approved prior to application of above paint system.<br>• Where the substrate is rust affected the surface is to be treated with an approved rust inhibitor and a metal primer to APAS 0162 used in lieu of APAS 0134. |
| **3. Pipes and Battens** | • Pipes previously coated with tar or bituminous compositions shall receive two (2) coats of acrylic to APAS 0280/5 to match other surfaces. |
| **4. Steps, Landings and Ramps** | • All step treads, stringers, landings, handrails, balustrades, ramps etc are to be painted on all visible surfaces with two (2) coats of acrylic APAS 0280/5.<br>• Top face of treads, landings and ramps to have non-slip additive applied with final coat, eg washed clean sifted sand. |
| **5. Drying** | • The manufacturer's specification for application is to be strictly adhered to. |

***Note:*** Where existing coatings are solvent borne, a barrier coat of 'white' oil based undercoat (APAS 0016/1) will be applied prior to application of water based systems.

#### *4.4.4.5 Application – Internal Painting*

The following tables provide a guideline to painting DETE infrastructure:

**Table 6: Application – Internal Painting – Solvent Borne Paints**

| Application | Details |
|---|---|
| **1. Painting Systems – unless otherwise specified the following painting systems will apply:** | **a) Previously painted surfaces** :<br>- Two (2) coats of paint consisting of:<br>• one (1) coat undercoat<br>• one (1) coat) finish coat<br>Or<br>- Two (2) coats semi-gloss enamel<br>*Note:* Where surfaces are bare of paint, one (1) coat of sealer or primer is required prior to applying the above coats.<br>**b) Unpainted surfaces**:<br>- Three (3) coats of paint consisting of:<br>• one (1) coat primer or sealer<br>• one (1) coat undercoat<br>• one (1) coat finish coat<br>Or<br>- Two (2) coats semi-closs enamel |
| **2. Blackboards, Whiteboards and Pinboards** | • Blackboards are to be prepared and repainted with an approved resurfacer to the manufacturer's specification. Painting of wooden surrounds for blackboards, whiteboards and pinboards is required. |
| **3. Frosting** | • Where frosting is perished or defective, strip and reforest the entire windowpane. |
| **4. Drying** | • One full day between coats of sealer, undercoat and enamelised paint. |

**Table 7: Application – Internal Painting – Water Based Paints**

| Application | Details |
|---|---|
| **1. Painting Systems – unless otherwise specified the following painting systems will apply:** | **a) Previously painted surfaces (where existing coatings are solvent borne)**:<br>- Three (3) coats of paint consisting of:<br>• one (1) coat oil based undercoat<br>• two (2) coats finish coat<br>**b) Previously painted surfaces (where existing coatings are water based)**:<br>- Two (2) coats of paint consisting of:<br>• finish coat<br>**c) Unpainted surfaces**:<br>- Three (3) coats of paint consisting of:<br>• one (1) coat primer or sealer<br>• two (2) coats finish coat |
| **2. Drying** | • The manufacturer's specification for application is to be strictly adhered to. |

***Note:*** Where existing coatings are solvent borne, a barrier coat of 'white' oil based undercoat (APAS 0016/1) will be applied prior to application of water based systems.

# 4.5 Roof-Water, Run-Off and Collection

## 4.5.1 Gutters

### *4.5.1.1 General*

- Eaves gutters shall be provided to all roofs unless specifically briefed otherwise and designed to the relevant Australian Standard (see also *Section 2.1*).
- Gutters shall be designed for rainfall and storm events of Average Recurrence Interval (ARI) 20 year, in accordance with all relevant Australian Standards.
- Overflow relief shall be provided at the front of the gutter to prevent overflow at the back of the gutter.
- High front gutters with overflow slots are not acceptable due to clogging of slots and subsequent overflow at the back.
- Box gutters shall be avoided unless specifically approved otherwise.
- Valley gutters shall be avoided unless specifically briefed otherwise.
- Gutters shall be securely fixed at minimum 2400mm above ground level.
- Gutters shall be located above 2400mm above ground level in trafficable areas. Where specifically approved to be fitted below 2400mm, they shall have fixings of a standard in excess of normal manufacturer's requirements to withstand swinging on by students.
- Where the location, type and height of trees indicate that there is likelihood that leaves may clog gutters provide leaf guards to all gutters. Leaf guards shall be removable for gutter cleaning.
- All eaves gutters and valleys shall be fabricated to ensure that joints are not subject to crevice corrosion.
- Continuous lengths of gutter shall have expansion joints. Expansion joints shall comprise stop ends with a saddle over flashing.
- All gutters shall have adequate falls to outlets. Suitable-sized overflows are to be provided to all gutters.

### *4.5.1.2 Rain Water Heads*

- Where necessary, rain water heads shall be in type 304 stainless steel, and shall include overflow spitters. *Note:* zinc coated steel roof and stainless are not a compatible dissimilar metal.

## 4.5.2 Downpipes

- Downpipes shall be minimum 150mm internal diameter and designed (sufficient number, spacing and size) for rainfall and storm events of Average Recurrence Interval (ARI) 20 year, in accordance with all relevant Australian Standards. The designer is to provide on the plans all calculations for the sizing and spacing's of the gutters and downpipes. Minor roof structures shall have their downpipes sized as per the Australian Standards.
- All downpipes below 2100mm shall be robust, heavy duty and constructed of material strong enough to withstand abuse (e.g. fibre reinforced concrete, hot dipped galvanised CHS steel (***Note:*** PVC material is **not** acceptable as a robust material).
- All joints, fixings and brackets shall have adequate strength to resist damage by students and shall be free of sharp protrusions and edges.
- Where the location, type and height of trees indicate that there is likelihood that leaves may clog gutters provide leaf guards to the top of all downpipes and sumps.
- The base of each downpipe shall be separated from the stormwater drainage via a minimum of 25mm gap between the pipe end and the grated inlet to prevent back-up and to provide an access opening sufficient to remove the grate for cleaning and unblocking.
- All downpipes shall discharge cleanly into grated stormwater inlets, without spilling on to paths or walkways.

- Insulation shall be provided to any internal downpipe where water noise may create an acoustic problem.
- Where condensation on the exterior surface of downpipes is likely to occur and cause nuisance, consideration shall be given to insulating downpipes

### 4.5.3 Storage Tanks

- The piped rain water system connecting to the storage tanks is not to hold water (Wet System). A First Flush Device is not to be used as a method of draining pipes that are designed to hold water (Wet System).
- Water tanks for the storage of overland flow for use in sports field irrigation, shall have capacity as nominated in the brief.
- Above ground tanks shall be a suitable colour, suitably located and, where required, screened to reduce visual intrusion on neighbouring properties.
- Below ground tanks shall be located away from future building zones, and have loading capacity to ensure that tank structure can withstand vehicular traffic.
- Where roof water is collected for human consumption, roof surfaces shall be of a suitable and safe material and have a 'first flush' device fitted to the inlet of tanks to enable the initial rainfall to flush the roof surface. Suitable sterilisation shall be provided.
- Tank intakes shall be screened with fine stainless steel wire mesh against entry of foliage, insects and vermin. Screen intakes shall be designed to effectively shed leaf debris so as not to hold material in the intake that could breed insects and allow eggs and larvae to penetrate the screen and enter the tank.
- Intakes shall be securely fixed with vandal resistant fixings, to prevent unauthorised access.
- Overflow outlets shall be piped to the stormwater system via downpipes complying with Section *4.5.2 Down-pipes* above. Overflow outlets are to discharge through Frog Flaps into grated stormwater pits. Grates are to be secured in place with vandal-resistant fasteners and shall have the same sized openings and trafficable qualities as flush grates (see also *Section 3.2.5 Stormwater Drainage*). 1mm (one) mesh gauze normally provided in the tank outlet is to be removed.

## 4.6 Health and Safety

### 4.6.1 General

- Design and construction of school buildings shall comply with relevant Australian Standards and legislative requirements including the *Work Health and Safety Act 2011*.
- Designers of buildings and facilities have an obligation to ensure the design of the structure does not affect the workplace health and safety of persons during construction, after completion and in use for the purpose for which it was designed. This includes an obligation owed to people working in a completed building and to those who repair or maintain it.

### 4.6.2 Circulation and Access

- Egress paths of travel shall be in accordance with statutory requirements.
- Access clearance distances between walls, fixed joinery, fixed benches, fixtures etc. shall be as follows in accordance with all relevant Australian Standards, including *AS/NZS 2982: 2010 Laboratory Design and Construction*.
  - User access one side with no through traffic – 1000 mm clear
  - User access one side with through traffic – 1200 mm clear
  - User access on two sides with no through traffic – 1400 mm clear
  - User access on two side with through traffic – 1800 mm clear
  - No user access, through traffic at cross aisles – 1500 mm clear

- Junctions between different floor surfaces shall be flush to prevent trip hazards. Where a difference in levels is unavoidable it shall comply with relevant Australian Standards and be delineated by a change in the colour or texture.
- Columns, fittings etc. shall not protrude into run-off areas adjacent to sports courts. Removable posts for goals and net supports shall be padded in accordance with manufacturers' recommendations.
- To minimise the number of columns that students need to avoid, covered walkways shall have minimum 4800mm spacing between support columns (along length of walkway) except where briefed otherwise.
- Columns located at intersections between covered walkways shall be set back minimum 1200mm from walkway corners.
- Intersections between covered walkways and uncovered paths shall have a truncated infill to minimise erosion when pedestrians cut the corners.
- Overhead structures, fittings, windows (hopper or casement windows) shall not intrude into pedestrian paths of travel or trafficable areas.

### 4.6.3 Projections, Protrusions, Pinch and Entrapment Hazards

- Exposed corners, edges, protrusions, fixtures, brackets etc. shall have rounded shape with no sharp edges and shall not intrude into pedestrian paths of travel or trafficable areas.
- Sheet metal fixtures (such as flashings, benches, sinks, basins and troughs) shall be free of sharp edges and corners that could cause injury.
- Holes, openings or slots (e.g. drainage gratings, grille screens, balustrades, fences, open steps) shall not constitute an entrapment hazard for feet, hands, fingers and head.
- Drain covers, grates, manhole covers etc. shall be securely fixed to prevent opening by students.
- Areas with low head height (such as under floor and roof spaces) shall be secured to prevent access by students yet allow authorised access for maintenance. Refer also to *Section 4.2.4 Substructure.*

### 4.6.4 Floor Slip Hazards

- All non-carpeted floors and ramps (such as vinyl, concrete, epoxy) shall have a slip resistant finish with the rating as briefed. Refer also to *Section 4.4 Internal Finishes.*

### 4.6.5 Stairs and Ramps

- Step dimensions shall comply with statutory requirements. In addition 'riser' height shall be maximum 175mm and 'going' shall be a minimum 270mm.
- All stair treads shall have contrasting coloured, non-slip nosing edge strips.
- Balustrades and handrails to all ramps and stairs shall comply with statutory requirements and relevant Australian Standards.
- Floor tactile indicators and handrail tactile buttons to all stairs shall be in accordance with statutory requirements.

### 4.6.6 Hazardous Substances

- Any construction work that involves any excavation of ground material or any demolition or disturbance of existing buildings, shall assume that asbestos containing materials may be present and shall comply with relevant legislation and the DETE Policy *for the Management of Asbestos-containing Materials in DETE Facilities* (see also *Section 2.1*).
- Any materials or finished product (such as fixed joinery or loose furniture) that contains formaldehyde-based compounds, including glues in reconstructed wood based material (such as particle board, MDF, pin board, cork board) shall comply with emissions class 'E0' (E-zero) in accordance with the relevant Australian Standards for reconstituted wood-based panels (particleboard and dry-processed fibreboards) (see also *Section 2.1*).

- Materials and products (including paints) shall be low or zero VOC emission unless approved otherwise. Any material that emits VOCs shall complete off-gassing to a safe level prior to occupation.
- Timber treated with copper-chrome-arsenate (CCA) preservative is **not** permitted in schools.
- Air conditioning systems with water cooled condenser type plants are **not** to be used due to the risk of Legionnaire's Disease.
- Storage facilities for hazardous substances shall comply with relevant Australian Standards (see also *Section 2.1*).
- The Science Chemicals Storeroom for storage of science chemicals shall be secure, exhaust ventilated (refer also to *Section 4.8.5 Mechanical Ventilation*) and fire rated.
- Separate cabinets for storage of hazardous science chemicals shall comply with relevant Australian Standards as follows:
  - corrosive substances (class 8), max 100 litre capacity
  - flammable liquids (class 3), max 100 litre capacity
  - oxidising substances (class 5.1), max 50 litre capacity
- The oxidising substance cabinet shall be located in the science preparation room at least 3m away from flammables and corrosives storage cabinets (not located in the chemical store).
- Flammables and corrosives cabinets shall be located within the Science Chemical Store with a minimum of 300mm space between and shall not be located one above the other.
- Additional flammable liquids cabinets for storage of flammable liquids used for building maintenance such as paints, aerosols, solvents, glues and lubricants, etc. shall comply with relevant Australian Standards as follows:
  - flammable substances (class 3), max 250 litre capacity
- A self-contained store for storage of tractor and mower fuel shall be a separate building detached from other school buildings.
- All cleaner's cupboards/ stores shall be fitted with locks.
- Any external sources of pollution sources such as road or train traffic, trade training facilities, or nearby industrial activities should be identified, and if necessary mitigation options should be considered as a part of the design process.

### 4.6.7 Hygiene

- Hand washing facilities located in food preparation and serving areas shall have adjustable hot and cold water mixer and be capable of hands-free operation (knee or foot operated).
- Finishes to joinery, floors, walls and ceilings in food preparation and serving areas shall comply with '*Food premises: Design, construction and fit-out guide*' (see also *Section 2.1*).

### 4.6.8 Ventilation

- Natural ventilation systems refer to *Section 4.8.3 Natural Ventilation.*
- Mechanical extraction to science fume cupboards, finishing and fibreglass alcoves, spray paint booths, chemical stores, kiln enclosures and any other areas where noxious fumes may be generated shall be in accordance with relevant Australian Standards. Refer also to *Section 4.8.5 Mechanical Exhaust Ventilation*.

### 4.6.9 Eye Wash and Safety Showers

- Eye/ face wash and hand-held shower or overhead drench facilities shall comply with all relevant Australian Standards. Refer also to *Section 2.1* and *Section 4.13 Plumbing Fixtures.*
- The waste from each eye/ face wash or shower facility shall be connected directly into the sewer drain via a waste trap.
- Floor surface drainage with falls to a floor waste shall be provided under each eye/ face wash or shower facility (or fall to an external area for fixtures located in the Grounds Store).
- Water supply to each eye wash/shower facility shall be potable cold water.

- Cold water supply pipes shall not be located in a ceiling space or be exposed to direct sunlight which could result in uncontrolled high water temperature.

### 4.6.10 Machinery Safety

- Equipment and fittings shall be located in a manner that ensures safe use and adequate circulation.
- Safe operation areas around each machine in Industrial Technology Workshops shall be delineated on the floor by yellow safety line markings, 50mm wide.
- Floor safety lines shall be located generally 700mm out from working face & 300mm from non-working face or as determined by the DETE Workplace Health and Safety Officer in conjunction with the school staff.
- Windows near machinery that may produce high speed projectiles shall have suitable safety glass to withstand impact.

### 4.6.11 Electrical Safety

- Refer also to *Section 4.10 Electrical Power and Lighting.*
- All power outlets and lighting circuits shall be protected by residual current devices (earth leakage safety switching).
- Emergency shut-off buttons to power supply shall be provided in workshops and practical classrooms where briefed. Refer to *Section 4.10.5 Isolation and Emergency shut-off switches.*

### 4.6.12 Gas Safety

- Refer also to *Section 4.12.5 Gas Services.*
- Emergency shut-off buttons and gas leakage detection sensor devices shall be provided in all rooms with gas appliances and/ or gas turrets (such as Science Labs, Science Prep Rooms, Food and Catering Kitchens, Canteen Preparation Areas).
- Gas cook-tops shall have flame-failure cut-out systems.
- Control knobs shall be designed to be tamper proof e.g. fixed to the spindle with Allen key grub screws.
- Cook-tops shall have fully sealed hobs, fixed and sealed into the bench top to prevent gas leaking into any under bench components.
- Domestic gas stoves which have gas ovens and gas grillers shall **not** be provided. Only commercial type gas stoves/ ovens are permitted.

## 4.7 Security

*Refer to:* ***DETE Security Design Requirements*** **and related documents** (see *Section 2.1* for links to the Design Standards suite of documentation)

*Prepared by:* ***School Security Program Asset Maintenance Unit, Infrastructure Operations***

## 4.8 Thermal Performance, Ventilation, Cooling and Heating

### 4.8.1 Thermal Insulation

- Thermal insulation shall be provided to walls, ceilings, roofs and floor in accordance with the National Construction Code: Building Code of Australia, Section J, Energy Efficiency and relevant Australian Standards.
- Higher levels of thermal insulation shall be provided where briefed to ensure internal comfort conditions are achieved when optimal building design solutions are not feasible due to specific site constraints.

- Foil/ blanket insulation (reflective foil vapour barrier on the underside of the blanket) shall be provided directly under roof sheeting to all ceiled spaces to provide a primary thermal barrier, to minimise condensation and to dampen rain noise.
- Design of buildings to utilise 'thermal mass' shall only be considered as an option in the designated DETE 'Cold' and 'Very Cold' Zones.

### 4.8.2 Shade

- To minimise solar heat gain into buildings, direct sun penetration shall be excluded from entering windows and skylights in:
  - All Learning spaces
    - From 1st February to 30th November – exclude sun between 9am and 3pm
  - All Staff, Administration and Library spaces
    - From 1st February to 30 May and from 1st August to 30th November – exclude sun between 8am and 5pm
    - From 1st June to 31st July – exclude sun between 9am and 4pm.
- Sun exclusion shall be achieved either by eaves overhangs or external sun-shading devices (horizontal, vertical or angled).
- External sun-shading devices shall be designed to effectively exclude direct sun while maintaining a minimum area of 50% clear view horizontally between 1000 to 1800 mm above floor level. *Acceptable product - equal to 'Hi-Lite' anodised aluminium grating type screens (with dimensions and spacing of louvre bars to achieve the required sun angle exclusion)*.
- To prevent collision hazard, external sunscreens that project below 2100 mm clear height above ground level, shall be protected with barriers or framing.

### 4.8.3 Natural Ventilation

- To promote natural cross ventilation, habitable rooms designed for use by more than 15 occupants shall have external windows/ doors/ skylights with a minimum open-able area of 10% of floor area.
- If open-able area of 10% of floor area cannot be achieved practically through windows and doors, airflow shall be assisted by mechanical ventilation systems.
- All other habitable rooms (i.e. rooms with fewer than 15 occupants) shall have open-able ventilation at a minimum of 5% of floor area.
- Open-able windows and doors shall be located, wherever possible, on opposite sides of a room (or open-able windows on one side with high level open-able clerestory or skylights on the opposite side of the room).
- Non-habitable rooms such as store rooms, cleaner's cupboards and data rooms shall have natural ventilation via fixed grilled vents.
- Automatic or timed controlled opening of high level windows/ vents (for afterhours/ night time cooling) shall only be provided where specifically briefed. Vent openings shall be screened to prevent entry of insects or animals that would set off after-hours electronic security.
- Creating air movement at a low level through low level louvres is preferred as it allows occupants to benefit more directly from external breezes.
- The chimney effect (also known as the stack effect) is often used as a passive technique to drive natural ventilation. The principle is to use low and high-level windows (such as clerestory windows) in combination, allowing warmer air to rise and escape through the upper openings and be replaced by fresh air at the lower level. This technique is particularly effective when there is a large vertical distance between the lower and upper windows (which can sometimes be difficult to achieve in a school environment). Also, this strategy necessitates a raked ceiling against the roof line, which removes the ability to provide the additional insulating capacity of a ventilated roof space. Therefore the insulation value of the raked roof/ ceiling needs to be designed to achieve the required R value.

### 4.8.4 Ceiling and Wall Fans

- All habitable rooms unless briefed otherwise shall have ceiling or wall fans to assist in air movement.
- Ceiling fans shall have the following minimum requirements:
  - 1400mm diameter, statically and dynamically balanced, minimum four (4) blades, all metal construction with aluminium blades, corrosion resistant finish, white colour unless briefed otherwise, 3 year warranty
  - Each fan shall be controlled by minimum three (3) speed settings or a variable speed control, with tamper proof controls (infra-red remote controllers are not to be provided)
  - All fan controllers for the fans in each room shall be located together mounted adjacent to light switches
- Ceiling fans shall be mounted from ceilings with a minimum ceiling height of 2700mm and fan blades at minimum of 2400mm above floor level and clear of lights, display wires and other fixtures.
- Rooms with ceiling heights less than 2700mm shall have oscillating wall fans mounted on walls at 2100mm minimum height.

### 4.8.5 Mechanical Exhaust Ventilation

#### *4.8.5.1 General Requirements for Learning Spaces (Classrooms, Studios, Workshops, Laboratories etc.)*

- Mechanical exhaust ventilation systems shall be provided to habitable rooms designed for use by more than 15 occupants only where the area of open-able windows/ doors does not achieve 10% of floor area, unless briefed otherwise.
- Mechanical exhaust ventilation systems shall be designed to achieve indoor air quality via air changes in accordance with statutory requirements and relevant Australian Standards (AS1668.2 - 1991 Appendix A). *Note:* BCA refers to the 1991 edition, not the later 2002 edition.
- In addition mechanical exhaust ventilation systems shall comply with the DETE Design Standard *Schools Standard Air-conditioning Specification (Section 3 Sub-section 2.5 - Mechanical Ventilation.*
- Mechanical exhaust ventilation systems shall by installed by installers specifically recommended by the mechanical system equipment manufacturer/ supplier.
- Systems shall exhaust rising hot air at ceiling level and draw in fresh cooler air at low level through windows or vents.
- Rooms utilising mechanical exhaust ventilation shall also utilise ceiling or wall fans as specified in *Section 4.8.4 Ceiling and Wall Fans.*

#### *4.8.5.2 Performing Arts and Presentation Auditoriums*

- Mechanical exhaust ventilation systems shall be designed to be suitable for the total occupancy of the space during performances or presentations in accordance with relevant Australian Standards.

#### *4.8.5.3 Canteen Preparation and Commercial Kitchen areas*

- Provide where briefed, commercial exhaust extraction hood over cooking appliances in accordance with relevant Australian Standards.
- The exhaust hood system shall have the following minimum requirements:
  - Stainless steel hood sized to cover cooking equipment with min 150mm overhang
  - Internal perimeter gutters with threaded cap drain points
  - Vapour proof fluorescent luminaires to provide 320 lux at work surface switched separate from room lighting

- Removable/ washable grease filters with integral frame handles, sufficient to maintain design air quantity
- Fans control switch with three (3) speeds, located adjacent to hood complete with LED run indicator

- Where commercial cooking appliances are located back-to-back in the centre of a kitchen, each side shall have separate exhaust hood systems.

#### *4.8.5.4 Art Kiln Rooms*

- Mechanical exhaust ventilation systems for kilns shall comply with:
  - *Mechanical Services for School Art Kiln Extraction Systems – Basset Consulting Engineers – July 2004*
  - Kiln manufacturer's recommendations
  - Refer also to *Section 4.14.2 Fixed equipment – Art Kilns*

#### *4.8.5.5 Science Chemical Store Room*

- Mechanical exhaust ventilation systems for science chemical store room shall comply with the following minimum requirements:
  - Both high and low level exhaust grilles within the store room (to draw both light and heavier than air fumes)
  - Fans designed to achieve 40 air changes per hour
  - Discharge above roof through a weatherproof stack
  - Door or wall air inlet grilles to provide relief fresh air
  - Corrosion resistant fan unit, fittings and ductwork
  - 2 speed fan controller to allow for (a) continuous low speed exhaust or (b) short periods of high speed for purging of fumes prior to staff entering the room

#### *4.8.5.6 Science Fume Cupboards, Spray Painting Room, Fibreglass Resin Fume Alcove*

- Each fume cupboard, spray booth and fume alcove shall have a fixed ducted exhaust system and shall:
  - Comply with relevant Australian Standards
  - Maintain required face velocity through the access opening
  - Maintain adequate make up of exhaust air quantities
  - Supply air system shall not to interfere with airflow patterns
  - Fan on/off and speed controller located outside and adjacent to the canopy

#### *4.8.5.7 Science Preparation and Arc Welding Fume Snorkels*

- Articulated snorkel type fume exhaust units to each electric arc-welding booth shall comply with relevant Australian Standards. *Acceptable product –'Nederman Arm Original 3m' or equal approved.*
- Articulated snorkel type fume exhaust units over science prep benches shall comply with relevant Australian Standards. *Acceptable product – 'Extech Equip' – CZ 09004-10 with wall bracket, or equal approved.*

### 4.8.6 Wood Dust/ Waste Capture and Extraction

- Wood waste and wood dust extraction system shall be a 'cyclone' type system complete with inlet cones at each machine, ductwork, exhaust fan and motor, cyclone separator unit, final filter damper system, waste storage system. *Acceptable product – Gregory's Machinery Cyclone Dust Extraction system, or equal approved.*
- Wood waste and wood dust extraction systems shall be sized to suit the number and type of woodwork machinery and be capable of being expanded to accommodate future equipment shown on plans.
- Automatic gate-dampening system shall be provided in the duct at each machine.

- Cyclone unit shall be housed in an acoustically treated enclosure to control noise levels. Refer also to *Section 4.9 Acoustics.*
- The enclosure shall allow access for removal and replacement of bulk waste and dust collection bins and filters.
- Air capture velocity at each woodwork machine gate shall not be less than 21 metres/second.
- Ductwork prior to final filters shall be internally insulated to assist in attenuating noise.
- Prior to handover, the cyclone system shall be fully operational, including commissioning and testing by the manufacturer, training of staff, operation and maintenance manuals handover.
- Cassette type recirculating dust filtration units shall be provided in each workshop that generated wood dust.

### 4.8.7 Air Conditioning and Evaporative Cooling

- Where schools are located in the DETE Cooling Zones, the thermal performance of school buildings shall be designed using passive cooling design principles, to operate for the majority of the cooler parts of the school year without artificial cooling and for the hottest part of the year be capable of operating efficiently with artificial cooling.
- Refrigerated air-conditioning and evaporative cooling systems shall comply with the DETE Design Standard *Schools Standard Air-conditioning Specification* (see also *Section 2.1*).
- Split systems shall be used with a single external condenser unit per building, connected to multiple indoor units for reasons of lower energy consumption, ease of maintenance and aesthetic reasons, unless approved otherwise.
- Condenser units shall be located externally in vandal proof enclosures and at a level not below indoor floor level (500mm above Q100 level), clear of pedestrian circulation.

#### *4.8.7.1 Refrigerated Air-conditioning - DETE Air-conditioning Zone*

- Refrigerated air conditioning systems shall be provided to all buildings in schools located within the 'Schools Air-conditioning Zone' as shown on the DETE zoning maps. Within each building, air-conditioning shall only be provided to habitable rooms (storage areas toilets and services are not included).

#### *4.8.7.2 Refrigerated Air-conditioning - Specialist areas within all Cooling Zones*

- Air-conditioning shall be provided to the following specialist spaces located in all cooling zones:
  - Music Practice rooms
  - Canteen and Tuckshop Preparation areas
  - Special Education facilities
  - Audio-visual Recording Studios and Editing Annexes that require doors and windows to be kept closed to achieve suitable acoustic conditions
  - Main data network/telecommunications room for the whole school (24 hour/ 7 day operation)
  - Performing Arts auditorium spaces where mechanical ventilation systems are not cost effective

#### *4.8.7.3 Evaporative Cooling or Air Conditioning - Western Cooling Zone*

- Evaporative cooling (or refrigerated air conditioning) systems shall be provided to all buildings in schools located within the 'Western Cooling Zone' as shown on the DETE zoning maps. Within each building, evaporative cooling shall only be provided to habitable rooms (storage areas toilets and services are not included).
- Evaporative cooling systems shall comply with the following minimum requirements:
  - Minimum 40 air changes of room volume per hour
  - Suitable water supply (water treatment may be required in some hard water areas)
  - Automatic water sump bleed and dump valve operation to flush out concentrated salts, piped to nearest stormwater down pipe or to holding tanks or irrigation system

- All components including duct insulation and support frame shall be corrosion resistant and suitable for operation in a moist environment
- Preferably located at ground level, clear of pedestrian circulation, above flood level, mounted on support frame bolted to concrete plinth with supply air ducted to rooms
- Noise levels from cooling systems shall comply with relevant Australian Standards
- Variable or multiple fan speed controller and On/Off pump controller

### 4.8.8 Heating

- Heating shall be provided to all buildings in schools located within the portion of the state designated 'Cold Zone' and the 'Very Cold Zone' as shown on the DETE zoning maps. Within each building, heating shall only be provided to habitable rooms (storage areas toilets and services are not included).
- Provide heating to Special Education facilities located in all zones, where briefed.
- Heating units shall be reverse cycle (heating/ cooling) air-conditioning unless specifically briefed otherwise.
- Reverse cycle air-conditioning shall comply with the DETE Design Standard *Schools Standard Air-conditioning Specification* (see also *Section 2.1*).

### 4.8.9 Natural Lighting

- Refer also to *Section 4.3.7 Windows, Glazing and Sky-lighting.*
- To achieve reasonable natural light, windows and/ or skylights shall be provided to all habitable rooms and the glazed area shall be minimum 10% of floor area of the room.
- Areas of a habitable room greater than 6m from a window shall have additional natural lighting via clerestory windows or skylights.
- Skylights design, location and spacing shall achieve illuminance without solar heat gain. *Note:* All roof penetration designs must be approved by DETE.

## 4.9 Acoustic Performance

### 4.9.1 Planning for Acoustic Control

- Factors affecting acoustic performance that need to be considered include:
  - Site location in relation to noise sources e.g. roads, aircraft, railways, industry etc., in accordance with the relevant Australian Standards (see also *Section 2.1*)
  - Relationship between noise producing buildings within the site e.g. library, music, sport centre, workshops
  - Relationship between noise producing activities and spaces within buildings
  - Activity and equipment noise within spaces e.g. music, playground activities in covered area, machinery noise in workshop
  - Impact and vibration noise from foot traffic and machinery from rooms above in multi-level buildings
  - Impact noise from rain and hail on roof sheeting
  - Impact noise, vibration and resonances in light weight metal framed structures from student movement and foot traffic
  - Sound travel paths through openings, joints or gaps between walls, floors and ceilings and open-able joints in operable walls, doors and view panels
  - Sound travel between rooms over the partitions via the ceiling space (where the ceiling is acoustically transparent and where partitions do not extend full height)
  - Noise reflection and reverberation within internal spaces larger than 100sqm and in large roofed covered areas
  - Noise from mechanical ventilation fans and air-conditioning fans
  - Where noise reduction cannot be achieved by distance from the noise source, appropriate noise reduction strategies, such as double glazing and noise barriers, shall be provided

- Where the requirement for a noise engineering report is warranted, a suitably qualified acoustic professional is to be engaged to provide the report

### 4.9.2 Acoustic Isolation

- Unwanted airborne noise can travel into a room from external sources and from adjacent rooms through walls, windows, ceiling, and doors and through gaps and joints between them. In addition impact noise can travel through the building structure.
- Acoustic isolation achieved by each barrier is the measure of reduction of sound and is defined as a weighted sound reduction index (Rw) in accordance with the relevant Australian Standards, including the rating of sound insulation in buildings and building elements for airborne sound (see also *Section 2.1*).
- The following acoustic isolation performance categories shall be applied to each room where briefed. Please note that exceptions may be approved by DETE for non-teaching spaces. Each category defines the minimum sound isolation levels (Rw) that shall be achieved:

#### *4.9.2.1 Very High Isolation (Category VH)*

- Rw 50 – from adjoining rooms (including walls, ceiling, doors and view panels including joints and seals).
- Rw 35 – from adjoining internal circulation corridors and from external areas including roof rain noise.

#### *4.9.2.2 High Isolation: (Category H)*

- Rw 45 – from adjoining rooms (including walls, ceiling, doors and view panels including joints and seals)
- Rw 30 – from adjoining internal circulation corridors and from external areas including roof rain noise.

#### *4.9.2.3 Moderate Isolation: (Category M)*

- Rw 45 – from adjoining rooms (including walls, ceiling, doors and view panels including joints and seals)
- Rw 25 – from adjoining internal circulation corridors and from external areas including roof rain noise.

### 4.9.3 Acoustic Absorption

- Sound absorption properties within a room are based on the design, ambient sound levels and reverberation times shown for educational buildings in Table 1 of *AS 2107-2000 Acoustics - Recommended design sound levels and reverberation times for building interiors*.
- The acoustic absorption within a room is achieved by a combination of the absorption properties of all internal surfaces (floor, ceiling, walls, furniture and people). Acoustic absorption is defined in terms of Noise Reduction Coefficient (NRC) measured over a range of sound frequencies from 250 to 2000Hz in accordance with *AS ISO 354-2006 Acoustics - Measurement of sound absorption in a reverberation room*, *AS 2107-2000 (2000) Acoustics - Recommended design sound levels and reverberation times for building interiors*, and *AS/NZS 1935.1:1998 Acoustics - Determination of sound absorption coefficient and impedance in impedance tubes - Method using standing wave ratio*.
- Where specifically briefed, teaching spaces for students with special hearing needs, learning difficulties and students with English as a second language, shall have reverberation times lower than the nominated minimum level and shall have sound-field augmentation systems.
- Learning spaces larger than 100sqm where projection of voice and music is critical, (such as open plan learning spaces, presentation/ performance auditorium), shall be subject to specialist advice from an acoustic consultant and may require sound augmentation (PA) systems.
- In very large spaces such as sports halls a maximum reverberation time shall be 1.5 seconds.

- External covered play areas shall have roof noise damping and acoustic absorption ceilings to achieve absorption category as briefed.
- Traffic noise in classrooms should not exceed 48 dB(A) L10 (1hr) when measured or calculated (in the centre of the room) as an indoor level, during school hours.
- See also 4.12.4 Mechanical Services for acoustic requirements on noise generating equipment.
- The following acoustic absorption categories shall be applied within each room as briefed. Each category defines minimum sound absorption levels (NRC) that shall be achieved:

#### *4.9.3.1 High Absorption: (Category H)*

- To achieve an ambient sound level range of 35 to 40 dB(A) and a reverberation time of maximum 0.4 seconds
  - ceiling - minimum NRC 0.7 *Acceptable product – Armstrong Ultima or approved equal*
  - floor - carpet minimum NRC 0.5
  - walls - absorptive pin boards/ panels minimum NRC 0.3 to 0.5 where wall space allows

#### *4.9.3.2 Moderate Absorption: (Category M)*

- To achieve an ambient sound level of 40 to 45 dB(A) and a reverberation time of maximum 0.6 seconds.

***Rooms with carpeted floors***

- floor - carpet minimum NRC 0.5
- ceiling - minimum NRC 0.5
- walls – no absorption required

***Rooms with vinyl, epoxy or concrete floors***

- floor - non sound absorbing
- ceiling - minimum NRC 0.7. *Acceptable product – Armstrong Ultima or approved equal*.
- Note - Ceilings in Food Preparation Areas – NRC 0.7 washable hygienic finish. *Acceptable product - ECOphon Hygiene Foodtec AC3 or equal approved.*

#### *4.9.3.3 Low Absorption: (Category L)*

- To achieve an ambient sound level of 45 to 48 dB(A) and a reverberation time of maximum 0.8 seconds.

***Rooms and Covered Areas with vinyl, epoxy or concrete floors***

- floor - non sound absorbing
- ceiling - minimum NRC 0.5

### 4.9.4 Acoustic Enhancement

- Supply sound field amplification system in all new classrooms

## 4.10 Electrical Power and Lighting

### 4.10.1 General

- Main Switchboard (MSB) shall be located as central as possible to electrical loads served, to minimise consumer mains cable length, to allow access for maintenance without undue disruption to school operations and for easy access for meter reading.
- To minimise exposure of building occupants to electromagnetic fields, main switchboards and building distribution switchboards shall not be located in close proximity to occupied areas.
- Materials and components shall comply with statutory requirements and relevant Australian Standards.

- Unless specifically briefed otherwise, all switchboards and electrical appliances (including air-conditioning condensers) shall be located a minimum level of 500mm above Q100 flood level.

### 4.10.2 Main and Distribution Switchboards

- Externally located MSB shall be housed in a weather proof cabinet either freestanding or preferably located against a blank building wall, mounted on concrete plinth.
- MSB shall have minimum 25% spare capacity in ratings of main incoming busbar and main switch/ isolator and 25% spare capacity for extra sub-circuits and circuit breakers, after allowing for future buildings and allowance for future air-conditioning capacity.
- Front panels on external MSBs shall be either fixed so that they cannot be undone from front or require a specialised tool. Fixings shall be vandal proof and access doors shall be lockable with *Lowe & Fletcher 92268* lock or equal.
- Equipment and conductors shall have short circuit rating, not less than the maximum prospective symmetrical RMS short circuit current values on the incoming terminals at the operational voltage and to withstand fault currents for a minimum of 1 second.
- Protection to be IP42 for internal installations and a minimum of IP54W for external or plant room installations.
- Undertake a risk assessment to the relevant Australian Standard for lightning protection to determine the need for lightning protection measures. Where risk index is 12 or greater, provide a lightning protection system.
- Ensure continuity of conductors and suitability of connection where structural elements are used to provide lightning protection.
- Commercial grade lightning surge arrester shall be provided on General Supply Tariff section of the main switchboard with visual indication where it has failed.
- Lightning surge protection shall be provided on all distribution switchboards (excepting those in amenities and sheds) on each phase and neutral, with indication where it is no longer functioning.
- A distribution switchboard shall be provided in each block, with smaller type switchboards for amenities blocks and external stores/ sheds.
- Distribution switchboards shall have circuit breakers for at least a three phase fault current rating of 6KA with spare capacity of 50% and allowance for likely high fault currents when site is fully developed.
- Circuit protection devices and residual current device (RCD) protection shall be provided within distribution board for protection of all socket power outlets and lighting outlets. Refer to *Section 4.10.5 Isolation and Emergency Shut-off Switches*.

### 4.10.3 Conduits, Pits, Mains and Wiring

- Sizing of conduits shall allow for future cabling as indicated in the school Master Plan.
- Underground conduits between pits and containing mains or sub-mains shall be minimum 100mm diameter. Minimum size of other underground conduits shall be 50mm diameter.
- Maximum distance between pits shall be 50 metres and pits shall be provided at all changes in direction.
- Pit systems shall be drained to stormwater system or to adequate grave soakage pits.
- Buried entries to conduits shall be sealed with pliable non-setting waterproof compound.
- Sub-mains cables to switchboards in all individual blocks shall be sized to have 50% spare capacity.
- All permanently connected equipment shall be wired via an isolator.
- All cables shall be double insulated and sheathed.
- Copper conductors shall be multi-strand not less than 1.5mm² for lighting and 2.5mm² for power final sub circuits.
- Cables shall be sized to carry intended electrical load taking into account maximum demand, installation methods, short circuit capacity and voltage drop.

- Where surface mounted conduits are specifically approved, they shall be fully supported by fixing to solid structure. Across any air gaps wider than 100mm, provide additional rectangular zinc annealed steel channel supporting structure. Surface run conduits must not be able to be easily grabbed and pulled down by students (e.g. covered walkways).
- Where specifically approved, cables rising up external walls or covered links from underground pipes shall be protected from 300mm below ground level to 3000mm above ground level with minimum 1.6mm thick galvanised steel duct or pipe, painted to match the surrounds.

### 4.10.4 Power Outlets and Switches

- Single phase outlets shall be provided in the number, quantity and location as briefed.
- Provide power outlets for the security system, expander panels, telephone system, telecommunications system, future installation of air conditioning systems etc. as briefed.
- GPOs shall be either single or double outlet, have a rocker operated switch with 3-pin plug base with flat earth pin, and incorporate a safety shutter over the active pin suitable for use by two or three pin plugs.
- External power outlets shall be weatherproof rated to IP56 and lockable in the 'OFF' position.
- Wall mounted GPOs shall be located 500mm above floor level unless briefed otherwise.
- Power outlets located to serve PWD adjustable height benches shall be mounted at 1000mm high within reach of a seated person.
- Power outlets that serve the centre of a room shall be located, unless briefed otherwise, in approved recessed floor boxes (together with data outlets). Refer DETE *Network Infrastructure Procedures and Standards* (see also *Sections 2.1* and *4.11 Data, Telecommunications and Alarms*).
- Unless briefed otherwise, power outlets located on walls above fixed benches shall be located to have the top edge of the face plate at 1000mm above floor level (to ensure the bottom edge of the face plate is clear of a 900mm high bench surface).
- Power outlets shall be separated a minimum of 600mm distance from any water outlet, the edge of a sink/ tub or a gas outlet.
- A maximum of six 10 amp double socket power outlets shall be wired per circuit.
- In Tuckshop/ Canteen food preparation areas, each double power outlet shall be on a separate circuit.
- In Home Economics, food and catering kitchens, a maximum of two double power outlets shall be on a separate circuit (this is to allow for use of an electric frying pan by each student).
- Switch plates for all power outlets and switches shall be vandal/ tamper resistant and not have any removable surround or cover.
- Three phase outlets shall be surface or semi-recess mounted and incorporate rotating switch mechanism, 5 pin plug base, spring loaded flap and screw neck to plug base.

### 4.10.5 Isolation and Emergency Shut-off Switches

- Provide an isolating switch for each permanently connected machine or appliance, unless briefed otherwise.
- The isolation switch shall be rated at not less than the circuit protective device, mounted adjacent to each item of equipment, flush mounted for internal installations and weatherproof IP56 for external installations.
- Where briefed, isolation switches shall be key lockable in the 'OFF' position.
- Emergency power shut-off buttons shall be located generally close to the main entry doorway or near the teacher demonstration area but not next to entry doorways where they can be easily bumped and tampered with.
- A reset switch for the emergency power shut-off circuit shall be located in the nearest staff accessible only room to enable staff to reset the power supply without having to access a switchboard.

### 4.10.6 Earthing, Overload and Residual Current Devices Protection

- Protection to all power and lighting circuits shall be provided using combined overload/ RCD circuit breakers.
- The combined overload/ RCD circuit breakers shall be highly resistant to transients to minimise nuisance tripping.
- M.E.N. underground earthing system shall be provided so that there is only a bond between neutral and earth to occur within site main switchboard.
- Main earthing conductor shall be bonded to electrode/s at or close to the main switchboard.
- Each sub main shall have an earth conductor run with it.
- Additional earthing electrode at each sub-switchboard shall be provided to ensure that surge protection devices in 'remote' blocks have good local connection to earth.
- *Note:* Under no circumstances are the neutral and earth bars to be bonded together in the sub-switchboards. This is to prevent neutral current flowing via metal-framed covered links.

### 4.10.7 Lighting: General

- Minimum artificial illuminance levels for each room shall be in accordance with AS1680.2.3.
- Maximum illuminance levels in each room shall be no more than 25% above the levels recommended in the relevant Australian Standards for interior and workplace lighting in the specific application educational and training facilities for 95% of the nominated floor area.
- Unless briefed otherwise (see below), lighting shall be surface mounted fluorescent lighting system with high efficiency reflectors and prismatic diffusers (recessed lighting is not the preferred option in learning environments).
- In food areas only provide recessed fluorescent fittings in accordance with '*Food premises: Design, construction and fit-out guide*' (see also *Section 2.1* and *Section 4.1.10.4 Food Facilities – Cafeterias/ Canteens/ Tuckshops*).
- Fluorescent tube lamps shall comply with the Minimum Energy Performance Standard contained in *AS/NZS4782.1:2004 Double-capped fluorescent lamps - Performance specifications – General* and shall be 'high efficiency' T5 tri-phosphor tubes unless briefed otherwise. The tubes shall have a rated life of at least 20,000 hours.
- Fluorescent lighting shall incorporate low loss, high frequency electronic ballasts (EEI A1 or A2), capable of dimming.
- In rooms with ceilings higher than 2700mm provide suspended light fitting hung on adjustable SS wire hangers. Cabling to suspended fittings shall be white in colour and clipped to wires with colour matched clips at max 600mm centres.
- Lights mounted on the wall adjacent to mirrors in Dressing/ Make-up rooms shall have protective covers over lights to prevent unsafe practice of hanging clothes over lights.
- Minimum clear height of ceiling mounted light fittings shall be 2300mm in habitable rooms.
- Banks of lights shall be switched to allow zoning to suit room use and promote energy saving taking into account location of natural light from windows and skylights.
- Switches shall be located near the most commonly used entry door on the handle side jamb of door at 1100mm above finished floor level.

### 4.10.8 Special Lighting

- Enhanced or local task lighting where briefed (for specific tasks such as entry foyers, over reception counters in administration and resource centre) may be recessed reflector down-lights with compact fluorescent bulbs unless briefed otherwise.
- In plant rooms provide industrial type switches and light fittings rated to IP56.
- Provide 2-way switching at both doors in large rooms with more than one door.
- Light fittings and switches in Kiln Rooms, Spray Painting Rooms and Science Chemical Store Rooms, and as briefed, shall be suitable for explosive environments, rated to IP66 and IECEx certification.

### 4.10.9 Access Lighting

- Provide access lighting to verandas, stairs, covered access ways and paths to staff and visitors car parks to comply with relevant Australian Standards.
- External and after hours lighting must be controlled from the schools central access lighting control system.
- Access light fittings shall be vandal resistant, waterproof and insect proof.
- Access lighting from major pedestrian entry gate to entry to main Administration block shall be pole-mounted and located along main paths and roadways to achieve light levels recommended in the relevant Australian Standards for lighting in these areas.
- All external lighting shall have a light source efficacy of at least 50 lumens/watt.
- To assist in energy savings, access lighting shall have timer controlled switching and photo-electric sensor switching configured in series, with manual over-ride switch in parallel.
- Where possible, the use of solar-powered pole-mounted access lighting should be considered. This can significantly lower after hours energy consumption, as well as reduce the need for laying external electricity lines.

### 4.10.10 Emergency Lighting

- Emergency luminaires and exit signs shall comply with the requirements of *AS2293.3:2005 Emergency escape lighting and exit signs for buildings - Emergency escape luminaires and exit signs*. All emergency luminaires and illuminated exit signs shall:
  - Be of the self-contained type
  - Provide a charge indicator LED (Light Emitting Diode) showing mains supply available and charging circuit status
  - Be adequately ventilated
  - Have weatherproof, heavy duty or vandal resistant covers and fixings where applicable
  - Include integral batteries, inverter, charger and change-over device. Individual test switches, LED indicators and markings in accordance with *AS2293.3*
  - The emergency luminaire or exit sign must be designed for a minimum 10 year expected lifetime including the LED/Lamp driver and the LED/lamps at a cell temperature of 45°C.
  - Incorporate Lithium Iron Phosphate cells with a minimum expected life of ten (10) years and a guaranteed life of 4 years when operated in accordance with manufacturer's directions in the proposed emergency or exit luminaire
  - Be classified by an approved Authority in accordance with *AS2293.3*. The classification shall be clearly marked on the luminaire label
  - Emergency and Exit lighting units must have a written guarantee providing for two year fitting replacement from the date of supply
- Exit Signs – emergency exit luminaires shall:
  - Be the permanently maintained type utilising LED lamps with expected lifetime of 100,000 hours in line with the LED manufacturers' data
  - Incorporate Pictograph and/or 'EXIT' lettering and directional arrows as required
  - Have screen printed legends, including arrows where required, and shall be green and white pictograph (or green letters on black background when used in lecture theatres)
- Testing for Emergency & Exit Lighting:
  - Provide a manual discharge test facility on the switchboard in each building as per *AS2293.1 Emergency escape lighting and exit signs for buildings - System design, installation and operation*

### 4.10.11 Solar Photovoltaic and Energy Saving Systems

- Where briefed, a photovoltaic solar electricity feed-in system shall be provided, equivalent to 2 kW generation capacity with associated solar data monitoring system. Solar photovoltaic systems shall comply with the *Department of Education, Training and Employment Solar Photovoltaic Specification*. The solar data monitoring system shall be supplied by iWeb under

the terms of DETE-100499 to allow integration with the data display website *eq.solarschools.net*.

- 'Smart meters' shall be provided on the main switch board for monitoring energy use.
- If the school utilises more than one electricity supply point, at least 65% of a school's energy consumption shall be metered through one or more smart meters.
- Where briefed, timers/ sensor control system shall be provided to achieve energy savings.
- Where briefed, automatic dimming with daylight sensors on lighting circuits shall be provided adjacent to windows to achieve energy savings.

## 4.11 Telecommunications

Refer to: ***The Department of Education, Training and Employment Network Infrastructure Procedures and Standards (DNIPS)***:

- **DNIPS Part A** details the procedures necessary to ensure all ICT cabling and supporting infrastructure in DETE environments are installed in accordance with the Departmental standard. The DNIPS Part A document has been prepared to ensure that ICT cabling infrastructure within DETE is procured and installed to a consistent standard.
- **DNIPS Part B** sets the standards to which all network cabling and supporting infrastructure in DETE environments shall be installed. This document is intended for those personnel directly involved with the installation of ICT cabling on DETE premises. DNIPS Part B is a practical working specification intended to ensure the ICT infrastructure remains functional throughout the intended life cycle.
  **Note:** DNIPS Part A and Part B are prepared by: Information and Technologies Branch, DETE. See *Section 2.1* for links to the Design Standards suite of documentation.

## 4.12 Services

### 4.12.1 Hydraulic Services – General

- Hydraulic services (Sewer and Stormwater Drainage and Water Services) shall comply with relevant Australian Standards and shall be designed for the following:
  - Type of function and usage pattern for each building
  - Flexibility for adaptation and extensions in the future
  - Access for maintenance and inspection
  - Ground and site conditions
  - Trade waste facilities
  - Life expectancy of 30-50 years dependent upon accessibility and type of component

### 4.12.2 Water Supply

#### *4.12.2.1 General*

- Provide potable and non-potable water supply and services, as briefed, to points of usage including fittings, fixtures and connection points in accordance with all relevant Australian Standards and statutory requirements.
- Hot and cold water supply shall comply with all relevant Australian Standards, for velocity up to a maximum of 2 m/s and static pressure of between 350 and 500 kPa.
- Provide water saving fittings to all outlets to meet WELS rating as briefed. Refer also to *Section 4.13 Plumbing Fixtures.*
- Alternative water sources (i.e. rainwater) may be provided for toilet flushing where requested.

#### *4.12.2.2 Pipes and fittings*

- Pipe work within buildings shall be copper unless briefed otherwise.

- Pipe work cast in slabs shall be protected with an integral protective sleeve.
- All supply pipe work, both internal and external shall be concealed in internal walls and ceiling unless approved otherwise.
- External pipe work where approved to be exposed shall be securely fixed and covered by heavy duty vandal resistant covers or ducts.

#### *4.12.2.3 Valves*

- Provide master isolation valve systems on main water supply lines into the site and to each major building zone where briefed.
- Provide isolation valves on the supply line to each building, each area to be serviced (e.g. each toilet area, group of fixtures) and any fixtures where briefed. Refer *Section 4.13 Plumbing Fixtures.*
- Within buildings, locate isolation valves in service ducts for ease of access and not in ceilings unless specifically approved.
- Provide backflow prevention devices with suitable vandal resistant protection, in accordance with relevant statutory requirements and the relevant Australian Standards for plumbing and drainage (see also *Section 2.1*).

#### *4.12.2.4 Tapware*

- Tapware shall be the type and configuration as briefed and as scheduled. Refer to *Section 4.13 Plumbing Fixtures*.
- Tapware shall be chrome finish with vandal resistant, star pattern design handles.
- Handles shall be colour coded ‘blue’ for all cold and ‘red’ for all hot.
- Cold water handles/taps shall be on right hand side and hot water handles/taps on left hand side.
- External hose cocks shall be a vandal resistant design with removable handles.

#### *4.12.2.5 Hot Water Units & Piping*

- Hot water units to service all hot water fixtures shall comply with the relevant Australian Standards for plumbing and drainage (see also *Section 2.1*).
- Hot water units shall be located centrally to main usage areas to minimise pipe runs.
- The size and type of hot water system shall suit the required demand pattern.
- Instantaneous hot water systems rather than storage systems shall be used for low usage applications.
- Storage type applications shall use energy efficient systems either solar or heat pump where applicable in conjunction efficient booster systems.
- Units shall have safe tray and discharge overflows to an independent waste inlet.
- Hot water pipes shall be lagged.
- Isolating valves shall be fitted to the cold supply inlet.
- Hot water storage temperature shall be set at a minimum of 60ºC.
- Hot water supply to basins, where they are installed in conjunction with showers, and showers in both student and staff locations shall be have temperature limiting devices set at 45ºC in accordance with relevant Australian Standards for plumbing and drainage (see also *Section 2.1*).
- Local hot water temperature mixing valves shall be fitted to facilities for persons with disabilities (access toilets/showers).
- Recirculating pumps shall be provided in hot water lines where they exceed code requirements for length of system run.
- Solar hot water is generally preferred in northern latitudes, and in regions powered by diesel electricity grids. In other situations, heat pumps are generally preferred as they have lower capital cost while still achieving good energy efficiency.

#### *4.12.2.6 Boiling and Chilled Water Units*

- Combined boiling water and chilled dispenser units shall comply with the relevant Australian Standard for plumbing and drainage and shall be an under-bench type with capacity to meet the expected usage as briefed.
- Water shall be delivered at a nominal 95ºC.
- Units shall be fitted with a 24hr and 7 day timer switch to enable switching off after hours, on weekends and school holidays.

### 4.12.3 Sewer Drainage and Sanitary Plumbing

- Toilet amenity blocks are to be designed so that the toilet on the upstream end of the drain has the flush adjusted from 4.5 litres to a 6 litre flush. This will provide additional water to flush the drain. The consultant is to note this requirement on the design drawings.
- Provide drainage systems to comply with relevant Australian Standards.
- Design the system for ease of maintenance and servicing.
- Allow for connection to future buildings and additions.
- Provide inspection openings on all bend and junctions on pipes up to 65mm diameter.
- Provide inspection pits on all drainage branch junctions which service individual buildings in accordance with relevant Australian Standards. Provide inspection pit at the connection to sewer infrastructure.
- Acoustically lag all pipe work located in ceilings above offices or in locations where noise may impact on habitable rooms.
- Floor waste gully grates shall be removable, 100mm diameter, chrome plated metal.
- Provide falls in floors to floor wastes at minimum of 1:80 generally, and, 1:60 for PWD shower/ toilets.
- Provide connection of air conditioning condensation outlets to the drainage system.
- All concealed drainage pipe work shall be PVC unless briefed otherwise.
- Waste traps on fixtures that accept corrosive wastes shall be polypropylene, stainless steel or other approved material.
- All internal exposed drainage pipe work shall be chrome plated copper unless briefed otherwise.
- All external exposed drainage pipe work shall be protected by vandal resistant covers with suitable tamper proof fixings to enable removal for maintenance only.
- Shower wastes are to be connected to the drainage through floor waste gullies. These gullies are also required to have the basin connected to them.
- Provide, where briefed or as required by the trade waste requirements of the local water authority:
  - Acid neutralising tanks
  - Grease traps
  - Plaster and clay traps
  - Settling tanks
- Refer to Section *4.6.9 Eye Wash and Safety Showers* for drainage and connection requirements.

### 4.12.4 Mechanical Services

#### *4.12.4.1 General*

- All mechanical services are to conform to current statutory requirements and relevant Australian Standards.
- Noise generating equipment shall be attenuated and isolated to achieve maximum 40dBA in adjacent habitable rooms and at site boundaries (see also *Section 4.9 Acoustic Performance*).

#### *4.12.4.2 Mechanical Ventilation*

- Refer to *Section 4.8.5 Mechanical Exhaust Ventilation.*

### 4.12.5 Gas Services

#### *4.12.5.1 General*

- Gas services shall comply with statutory requirements and relevant Australian Standards.
- Natural gas or LP gas supply systems shall be provided to suit available supply.
- LP gas supply system shall be from a gas cylinder installation unless briefed otherwise, in accordance with the following:
  - A double cylinder installation shall be connected in parallel with two sets of valves/ regulators
  - A secure mesh or vented enclosure shall be provided, sized to suit the gas cylinders with lockable gates/ doors
  - The gas cylinder enclosure shall be located as close as possible to high usage rooms and in close proximity to service road for ease of access for bottle replacement or on-site refilling
  - The gas bottle enclosure shall be mounted on a concrete plinth above adjacent garden beds, with hard paving access
  - Appropriate hazardous material signage shall be provided
  - The gas cylinder enclosures shall be mounted against a blank, fire proof wall, not on any wall facing an adjacent building which could be a fire source
- All above ground pipe work shall be type B copper tube.
- All pipe work shall be concealed in suitable joinery or ducts.
- All exposed pipe work shall be protected from mechanical damage through the use of aluminium ducting with removable access covers.
- Permanent ventilation shall be provided to enclosed pipe risers.
- Pipe work shall not be installed in wall cavities or concealed voids.
- Pipe work may be run in ventilated roof spaces provided it is accessible.
- Allow 10% of spare capacity in pipe work sizing for future upgrades.
- Gas turrets for laboratory bench top use, shall be 2-way 90º outlets with push-turn or lift-turn taps.
- Gas turrets shall be located where shown in brief or layout and be minimum 600mm from power outlets. Refer also *Section 4.13 Plumbing Fixtures*.

#### *4.12.5.2 Gas Controls and Isolation Systems*

For each building containing a central gas supply system:

- A fail-safe gas security and safety control system shall be provided to each building to effectively isolate supply at the gas source using Master Gas Control located in a staff only accessible area.
- Keypad operated Master Control Panel with 24 hr/ 7 day digital timer control switch shall be provided to each building to allow the flow of gas only within hours set by staff.

For each room served with gas outlets or gas cooking appliances (Science Labs, Science Prep Room, Food Kitchens, and Catering Kitchens):

- A room solenoid shut-off valve shall be operated by a room control panel using a key pad. Acceptable product – *Kromschroder SK32 control panel and Laboratory Shut-off Valve (LSV) or approved equal.*
- The solenoid isolation valve shall be located in an accessible but concealed location such as a service duct, lockable cupboard or in clearly labelled stainless steel enclosure.
- An emergency gas shut-off button with twist reset shall be provided to activate the solenoid isolation valve.

- Shut-off buttons shall be wall mounted located generally close to the main entry door or near the teacher demonstration areas but not next to entry doorways or on the teacher's demonstration bench where they can be easily bumped and tampered with. (*Note:* gas and power shut-off buttons shall be combined into one shut-off button unless briefed otherwise).
- A gas leakage detection sensor shall be provided to shut-off the solenoid isolation valve if there is a gas leak in the room, located 300mm above floor level for LPG installations and 300mm below the ceiling for NG installations.

#### *4.12.5.3 Compressed Air*

- Compressed air supply systems shall comply with relevant Australian Standards.
- The compressor shall be located in a room or enclosure with appropriate acoustic control measures to maintain acceptable noise levels for adjacent habitable rooms.
- Compressed air receivers shall be sized to maintain required design supply pressure for the number of outlets through start/stop cycles.
- Compressor shall have a dial pressure gauge, valved drain point, automatic condensate drain and pressure relief valve.
- The filtration system shall be capable of removing water droplets and particulate material to 1.0gm.
- Separated liquids shall be automatically drained away from filter material.
- Exposed pipe work shall be concealed or covered to protect from mechanical damage.
- Size all pipe work to ensure that pressure loss does not exceed 10% of the design supply pressure.
- Low pressure compressed air installation shall operate between 21-28kPa via an adjustable pressure reduction valve located to be accessible by staff only.

#### *4.12.5.4 Science Fume Cupboards*

- Fume cupboards shall comply with relevant Australian Standards and shall be installed in accordance with the manufacturer's instructions. *Acceptable product - 'Hamilton H12S' or equal approved.*
- All parts shall be corrosion resistant.
- The cupboard shell and work surface shall be constructed in one piece, chemical resistant material such as UPVC.
- Fixed viewing panels and sliding sashes shall be toughened glass unless briefed otherwise.
- Lighting to provide minimum 320 lux at the bench level.
- Sink shall be nominally 300 x 300 x 200mm deep, stainless steel 316 grade with gooseneck cold water supply outlet.
- Gas service shall be by a single gas turret operated by an external remote control handle located on the front external face of the cabinet.
- Fan and exhaust volume shall maintain the required face velocity through the open sash area with adequate make up of exhaust air quantities.
- Supply air system not to interfere with air flow patterns.
- A double power outlet shall be mounted on the front external face.
- Separate fan control and light switch shall be located on the external face.
- Cold water tap (refer to *Section 4.13 Plumbing Fixtures)* shall be controlled by remote control handle located on the front external face.

### 4.12.6 Fire Services

#### *4.12.6.1 General*

- Refer also to *Section 3.2.3 Water Supply for Fire Services* and *Section 3.6.6 Fire Evacuation Plans and Signage*.
- Fire Engineering Performance Design Solution:

- The fire safety provisions of the building shall comply with the deemed to satisfy provision of the Queensland Building Act. Performance based alternate building solutions may be provided in lieu of the deemed to satisfy requirements of the BCA provided it has no impact on the function of the building. The alternative solutions must comply with all performance requirements of the BCA and prepared by a competent person, acceptable to the building certifier.
- Before proceeding with the alternate building solution, provide all assumptions, building occupants' responsibilities, and restrictions on the use of the building imposed as the result of the alternative solution must be stated, clearly explained, and accepted by the building owner.
- The report and the engineering analysis must be reviewed by an independent third party acceptable to the building certifier. Any deficiencies identified must be addressed and resolved before submission to the building certifier.
- Install an engraved sign stating the alternate building solutions used in the building adjacent to the FIP.

- Provide hydrants, fire hose reels, wall mounted portable extinguishers and fire blankets in accordance with relevant Australian Standards and statutory requirements.
- All valves, gauges, switchboards, panels, switches and detectors shall be labelled. All functions and settings of adjustable devices shall be clearly marked on the label. Labels shall be fabricated from traffolyte or approved equal.

#### *4.12.6.2 Fire Hose Reels*

- Provide fire hose reels as per the Building Fire Safety Regulation 2008, the relevant Australian Standards and the National Construction Code.
- Fire hose reels shall be preferably located inside a building to avoid vandalism risk and shall be fitted with a flow switch connected to the School Electronic Security System.
- The fire hose reels shall be positioned in enclosures/ cabinets or exposed on walls as required by the particular location.
- Fire Hose Reels (FHR) shall be connected to the domestic supply at a single point in a building in preference to the fire main. Provide back flow prevention devices as required by the Authority. Limit BFP devices to one per building block.
- Where fire hose reels are located externally, they shall be in a secure padlockable cabinet fitted with a 003 fire key.
- Fire Hose Reels are **NOT** to be provided to classrooms and associated corridors in accordance with Clause E1.4 (a) of the NCC.
- The hose nozzle shall be of a non-ferrous corrosion resistant construction with an adjustable Jet, Spray and Close type movement.

#### *4.12.6.3 Fire Extinguishers*

- Fire extinguishers:
  - Shall be 4.5 kg dry chemical tri-class.
  - Provide portable fire extinguishers in accordance with The Building Act, 1975 and AS 2444. In addition to the portable extinguishers and blankets required to meet statutory requirements, portable extinguishers and blankets shall also be provided where briefed, typically where activities of staff and students may involve the risks of injury from fire (e.g. Food and Catering Kitchens, Science Labs, Art Studios, Industrial Technology and Design Workshops etc.).
- Fire blankets shall be 1800mm x 1200mm woven glass fibre fire blankets in quick release red container.

#### *4.12.6.4 Fire Detection System*

- Provide fire detection systems in school buildings where required by the National Construction Code (NCC) and where required as per the following table:

**Table 8: Locations for Fire Detection Devices**

| Block | Function | Typical Fire Detection Device |
|---|---|---|
| **Administration** | Corridors | Smoke detection |
| | Computer/SMS Rooms | Smoke detection |
| | Duplicating Rooms | Smoke detection |
| **Resource (Library) Blocks** | Book Shelving | Smoke detection |
| | Computer Areas | Smoke detection |
| | Audio/Visual Rooms | Smoke detection |
| | Work Rooms | Smoke detection |
| **Practical Studies Blocks** | Workshops | Smoke detection |
| | Spray Paint Booths | Thermal detection |
| | Flammable Liquid Stores | Thermal detection |
| | Kitchens & Food Preparation areas | Thermal Detection |

**Note:**

1. Excepting where required by the NCC or the above table, no other fire detectors are to be installed.
2. Irrespective of the detector type indicated, provide detectors of a type that will be maximally effective in the location and avoid false alarms.

- The fire detection and alarm system provided is to be in accordance with AS 1670 part 1 and comprise the following features:
  - An analogue addressable main Fire Indication Panel (FIP) utilising micro-processor technology and providing full drive functions for the Occupant warning system, MIMIC panels etc (as applicable). The main FIP shall generally be located in the front entrance foyer of the Administration Block. The Fire detection and alarm system shall allow for, or be capable of expansion to meet, the requirements of the entire site including all known future expansion plus 25%. Instruction for the operation of the FIP shall be clearly indicated adjacent to the main FIP.
  - Fire detectors only as required by the above table. These fire detectors are to be analogue addressable type. Space the fire detectors provided, in accordance with AS1670 requirements. The detectors used must be suitable for the climatic conditions.
  - Provide MIMIC panels when required by the NCC and the fire authority having jurisdiction. A MIMIC panel shall be provided if the main FIP is not located in front entrance foyer of the Administration Block.
  - A compatible analogue addressable sub-fire indicator panel at each Block requiring fire detectors (excluding the Block containing the main FIP)
  - Connection of a single, common alarm output from the main FIP and each sub-FIP to an individual and separate input of the electronic security system for remote system monitoring.
  - Grouping of the detectors in each building to a separate zone or zones. The maximum number of devices per alarm zone/group shall not exceed 30.
  - A plastic laminated machine engraved fire zone diagram, permanently fixed adjacent to the main FIP, each Sub-FIP, and any mimic panels
  - A copy of the FIP configuration program on CD shall be provided with the FIP

#### *4.12.6.5 Occupant Warning System*

- Provide an AS1670.4 compliant emergency Occupant Warning System (OWS) to provide emergency tone generation, public address ability and other functionality, as detailed below, for

the school buildings and external grounds spaces. The OWS system shall include the following features:

- A master emergency control point (MECP) located next to the main Fire Indicator Panel (FIP), generally in the Administration Block. The OWS system shall allow for, or be capable of expansion to meet, the requirements of the entire site including all known future expansion plus 25%.
- Zoning that is the same as the fire detection system (at least one zone per Block). For Blocks with no fire detection system, allocate at least one separate OWS zone to each Block.
- A separate amplifier for each OWS zone, all of the same size.
- Connection to the fire detection system. The OWS is to provide fire alarm alert and evacuation tones and evacuation Public Address (PA) ability to individual zones, selectable groups of zones, or the entire school.
- Provision of background music, such that music is able to be played throughout the entire school.
- Provision of a 7 day, 24 hour (+ public holiday exclusion) timer controlled 'end of period' tone to selected Blocks, or throughout the entire school.
- Provision of the ability to initiate an 'evacuation' tone throughout the entire school.
- Provision of the ability to initiate a 'Lockdown' tone or song (as preferred by the School) throughout the entire school.
- External weatherproof IP66 rated horn speakers, with a frequency response suitable for speech and music. External speakers are to be provided throughout the site so that in all areas announcements and tones generated can be easily heard. To reduce the opportunity for vandalism, all speakers shall be located out of reach from any adjacent ground, floor or support structure.
- Internal ceiling mounted speakers throughout all buildings. Internal speakers are to be provided throughout the buildings so that the tone and PA sound levels in all areas of the buildings, comply with the requirements of AS1670.4. To reduce the opportunity for vandalism, all speakers shall be located out of reach from any adjacent ground, floor or support structure.
- Strobe lights in locations where enunciation speakers are undesirable or ineffective. Such locations include but may not be limited to:
  - A/V production and recording Studios
  - Manual arts workshops and construction courts
  - Rooms housing hearing impaired persons

- Provide also strobe lights in general public areas such lift foyers, lobbies and passageways, etc, to alert members of the general public with hearing impairment of an emergency whilst they are visiting the school.
- Provision of a remote secondary OWS control switch panel in an approved position in the Administration Office for trained personnel to operate. This is to enable, at that location, the use of the Public Address (via a desk microphone) with zone selection, and/or initiation of an 'evacuation' tone or a 'lockdown' song or tone, and the ability to play music throughout the school. The type, location, construction and installation of switches shall prevent accidental operation.
- All components of the OWS including the PA, music and tone generation must operate in the event of power failure. 2 hour battery backup is to be provided.
- In Blocks with a sub-FIP, the OWS speakers in those Blocks are to be connected to the sub-FIP and then connected back to the main OWS control panel.
- Speaker cabling must be installed in accordance with AS1670 requirements. Ensure appropriate fire rating is provided as per the standards and cable segregation is maintained.
- For new buildings in an existing school, the intent is to provide a system as close as possible to provide the above functionality. Provide a report to DETE which indicates the current systems

at the school and provides options to upgrade to meet these requirements if approved by DETE.

### 4.12.7 Lift Services

- Provide a Part 2 lift to *AS 1735 Lifts, escalators and moving walks (SAA Lift Code)* that is suitable for access for persons with a disability including access for a wheelchair, occupant and/or carer. The lift shall comply with all statutory requirements and relevant authorities.
  - Lift to be a Machine room-less Gearless traction passenger/ goods lift with capacity – minimum 1000kg. Drive type – variable voltage variable frequency AC drive with selective collective control system
  - Lift speed to be minimum 1.0 metre per second
  - Lift car minimum dimensions to be 1400mm Wide x 1600mm Deep x 2200 High
  - Lift doorway clearance to be minimum 900mm wide x 2100mm high.
  - Door to be minimum 900mm x 2100mm high, automatic single speed bi parting
  - Lift car doors to be fitted with door protection device (Infrared or similar light beams)
  - Landing doors, frames and car door finish shall be stainless steel
  - Car back, side and front walls to be stainless steel with Handrails in accordance with AS 1735 Part 12
  - Car ceiling to be drop down type with energy efficient globes or LED's which are easy to replace
  - Provide external on/off key isolator to secure the lift (recessed and vandal resistant) in single or multiple locations. Discuss with school to determine number of key isolators that are needed to suit the proposed lift operational requirements.
  - Car control panels to be vandal resistant, and compliant to AS 1735 Part 12
  - Car Indicators to be coloured screen compliant to AS 1735 Part 12
  - Provide audible tone and voice annunciation in accordance with AS1735 Part 12 for all lifts regardless of the number of floors served
  - Landing buttons and hall position indicators to be screw fixed, vandal resistant
  - In the event of power loss car will return to the nearest level and open doors (or to Ground floor if required by relevant Australian Standards)
  - The lift system shall not require any proprietary equipment tooling passwords or codes to maintain repair and make adjustments to the lift
  - Ensure that all lift shafts are protected from the ingress of wind rain and inclement weather
  - Lift telephone:
    - Provide cabling from the lift to the building telephone distributor and campus distributor for the lift telephone to be provided. Additional tie cabling may be required to the location of the school telephone system if in a separate block to the Campus distributor.
    - The lift contractor is to provide the lift telephone which is to be programmed to call State Government Security in the event of an emergency. The contact number for State Government Security will be provided upon request.
    - A remote lift alarm is to be installed in the Administration building by the building contractor to indicate when the emergency phone has been activated.
  - Lift registrations:
    - All lifts in QLD are required to be registered with Workplace Health & Safety Queensland (WHSQ)
    - The lift installer is to provide DETE with the *Form 8 – Application for registration of registrable plant* (the lift installer is to complete Sections 2, 3 & 4) at the completion of the lift installation
    - DETE complete the *Form 8* and lodge it with WHSQ

## 4.13 Plumbing Fixtures

- All plumbing fixtures shall be in accordance with relevant Australian Standards.
- Plumbing fixtures and fittings are to be chosen to meet the needs of the facility whilst minimising excessive potable water consumption.
- Fixtures that are briefed according to the Australian Standards as scheduled below, shall be in accordance with the following minimum standards (suppliers across the fixture types include aquaBUBBLER, Britex, Broen, Caroma, Clark, Enware, Galvin, Hygenex, RBA, Stoddard, Zip, or equal, as per Table 8 (below):

**Table 9: Plumbing Fixtures**

| Code | Description |
|---|---|
| S1 | *Science Gas Turret* |
| | • Dual outlet gas turret, 90º, with push-turn or lift-turn handles, bench mounted generally 100mm from splashback and 600mm distance from GPOs. |
| S2 | *Lab Bench Sink (student side bench)* |
| | • Single bowl, inset type, 300 x 300 x 200 nom deep, stainless steel 316 grade (or approved resin type), acid resistant grated outlet and waste.<br>• Bench mounted lab type tap, gooseneck spout with tube nozzle outlet, chrome plated, 5 star WELS rated, cold water only, backflow prevention valve, concealed trap and waste pipe with screw off drain plug. |
| S2h | *Lab Bench Sink (demonstration bench)* |
| | • Sink as for S2<br>• Bench mounted lab type combination tap set, gooseneck spout with barbed tube nozzle outlet, chrome plated, 5 star WELS rated, hot & cold water, backflow prevention valve. |
| S3 | *Emergency Eyewash & Hand-held hose Unit* |
| | • Stainless steel bowl with lever operated twin aerated eye/ face wash nozzles and hand held aerated hose, cold water only. |
| S4 | *Fume Cupboard Sink* |
| | • Sink and tap as for S2 (refer *Section 4.12.4 Fume cupboard* for requirements). |
| S5h | *Preparation Glassware Wash-up Sink* |
| | • Double bowl sink unit, nom 2700 long with one 725 x 350 x 300 deep bowl and one 725 x 350 x 170 deep bowl, with 450 long drainers both ends and integral lip at back for splashback, stainless steel 316 grade (or approved resin type), acid resistant grated outlet and waste, SS lid for one bowl.<br>• 2 x lab combination tap sets (1 per bowl), swivel gooseneck spout with barbed tube nozzle outlet, hot and cold bib cocks with barbed tube nozzle outlets, chrome plated, 5 star WELS rated, hot and cold water, backflow prevention valve, concealed trap and waste pipe with screw off drain plug. |
| S6h | *Preparation Chemical/ Biology Bench Sink* |
| | • Double bowl sink unit, 450 x 350 x 170 deep bowls, stainless steel 316 grade (or approved resin type), acid resistant grated outlet and waste with 450 long drainers both ends and integral lip at back for splashback.<br>• Lab combination tap set, gooseneck spout with barbed tube nozzle outlet, hot and cold bib cocks with barbed tube nozzle outlets, chrome plated, 5 star WELS rated, hot and cold water, backflow prevention valve, concealed trap and waste pipe with screw off drain plug. |

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| S7 | *Cleaners Sink* |
| | • Stainless steel cleaners sink nom 560 x 475 x 200 deep with swing grate, chrome plated brass grated waste outlet, mounted on SS SHS frame with adjustable feet, nom 500 x 600 stainless steel splashback.<br>• Wall mounted hose cock chrome plated, 5 star WELS rated, cold water only. |
| S8 | *Sink – student practical learning areas* |
| | • Single, double or 1 ½ bowl (refer brief or layout) sink unit, in-set type, nom 1500 long with nom 390 x 390 x 170 deep bowls, 450 long drainers both ends, single hole for mixer tap, chrome plated brass grated waste outlet.<br>• Lever handle tap, swivel gooseneck aerated spout, (3 star WELS rated, cold water only, concealed trap and waste pipe with screw off drain plug. |
| S8h | *Kitchen Sink – staff areas and student food kitchens* |
| | • Double or 1 ½ bowl (refer brief or layout) sink unit, in-set type, nom 1500 long with nom 390 x 390 x 170 deep bowls, 450 long drainers both ends, single hole for mixer tap and hole for auto boiler tap where required, chrome plated brass grated waste outlet, Flick mixer tap, 5 star WELS rated, hot and cold water. |
| S9h | *Commercial Pot Sink – canteens and student catering kitchens* |
| | • Single or double bowl (refer brief or layout) pot sink unit, nom 500 x 400 x 300 deep bowls, 450 long drainers both ends integral with SS bench, integral 300 high splashback, chrome plated brass grated waste outlet, spring action pre-rinse spray hose (6 star WELS rated) and combination pot filler, swivel spout, lever handles (3 star WELS rated), hot and cold water. |
| S10 | *Art Sink* |
| | • Double bowl sink unit, nom 2400 long with nom 2 x 550 x 400 x 300 deep bowls, 450 long drainers both ends, integral splashback, inset into bench top, chrome plated brass grated waste outlet,<br>• Lever handle taps, swivel gooseneck aerated spouts (one per bowl), (3 star WELS rated, cold water only.<br>• CP copper or concealed waste pipes to nom 40L paint/ clay trap under sink. |
| S11 | *Sculpture/ Printmaking Sink* |
| | • Single bowl sink unit, nom 2400 long with nom 1200 x 400 x 300 deep bowl, 450 long drainers both ends, integral splashback, chrome plated brass grated waste outlet,<br>• Spring return, pre-rinse spray hose (5 star WELS rated) and combination pot filler, swivel aerated spout, lever handles (3 star WELS rated, cold water only.<br>• CP copper or concealed waste pipes to nom 40L paint/ clay trap under sink. |
| S12 | *Soap Dispenser* |
| | • Wall or splashback mounted Stainless steel, vandal resistant, lockable. |
| S13 | *Paper Towel dispenser* |
| | • Wall or splashback mounted stainless steel, vandal resistant, lockable. |
| S14h | *Vanity Basin* |
| | • Vitreous china basin, white semi-recessed type chrome plated brass grated waste outlet (not plastic)<br>• Flick mixer tap 5 star WELS rated, cold water |
| S15 | *Toilet & in-duct/ in-wall cistern* |
| | • Vitreous china pan white with wall faced concealed trap, white closed front seat with |

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| | flap<br>• In-duct mounted (or in-wall with vandal resistant cover plate) 4.5/ 3 litre dual smart flush cistern with cp stopcock, cold water. Push buttons mounted at max 1200H. |
| S16h | *Food Rinse/ Wash sink* |
| | • Single bowl (refer brief or layout) sink unit, nom 390 x 390 x 170 deep bowl, 450 long drainers both ends integral with SS bench, integral 300 high splashback, single hole for mixer tap, chrome plated brass grated waste outlet, Flick mixer tap, 5 star WELS rated, hot and cold water. |
| S17 | *Auto Boiler & Chilled Water Unit* |
| | • Under bench commercial filtered boiling and chilled water unit, with hob combination tap on sink, sized to suit usage, cold water supply. |
| S19 | *Hand basin - cold water* |
| | • Vitreous china wall mounted white basin, chrome plated brass grated waste outlet (not plastic),<br>• Flick mixer tap, 5 star WELS rated, cold water only<br>• Alternative for PWD/ access basin (Enware SLM606D or equal) |
| S19h | *Hand basin – hot & cold water* |
| | • Basin as for S19<br>• Flick mixer tap, 5 star WELS rated, hot and cold water. Alternative tap for food areas – knee operated. |
| S20 | *Drinking Fountain* |
| | • Floor mounted stainless steel nom 200mm diameter top bowl, with separate side bottle refill station, to conceal fixings & pipework, mounting height 700mm high for years P-3 and 800mm high for years 4-12.<br>• Chrome finish shielded bubbler with self closing push button valve, cold water only. |
| S21 | *Wash Basin/s - Student Amenities* |
| | • Wall basin unit (single, double, triple or quadruple bowls - number of bowls as per brief) 304 grade stainless steel, bowl/s integral with countertop, splashback,; trap covers to conceal pipework and fixings.<br>• Single tap per bowl, timed flow pillar cock, 5 star WELS rated, cold water only. |
| S 28 | *Toilet Suite – Persons with disabilities* |
| | • Vitreous china pan, white, with wall faced concealed trap (for easy cleaning),<br>• In-wall/ in-duct 6 litre dual smart flush cistern, push buttons at max 1000 mm above floor, with cp stopcock, cold water supply.<br>• Comply with the relevant Australian Standards (see also *Section 2.1*). |
| | *Shower* |
| | • Shower installation to comply with AS1428.1. Provide 1500mm hose. Mechanical hose retraction device is NOT to be used. |
| S30 | *Wash/ Quench Trough* |
| | • Wall mounted stainless steel trough, nom 1200 x 300 x 200 deep with 600 high SS splashback, mounted on heavy duty stainless steel frame. 3 cp hose cocks at 600 above trough bottom, cold water only. |
| S33 | *Utility Tub* |
| | • Single bowl sink unit, inset type, nom 1200 long with nom 48 L bowl, drainer one end, chrome plated brass grated waste outlet (not plastic),<br>• Lever handle tap, swivel gooseneck aerated spout, (3 star WELS rated, cold water |

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| | only, cold water only.<br>• Waste to nom 40L paint/ clay trap under sink (where applicable). |
| S39 | *Laundry Tub – inset type* |
| | • Single SS 70 litre chrome plated brass grated waste outlet (not plastic),<br>• Lever handle tap, swivel gooseneck aerated spout, (3 star WELS rated, cold water only. |
| S40 | *Pot Filler Laundry Arm* |
| | • Splashback mounted telescopic laundry arm (for filling large pots insitu on stove, Cold water only |
| S57A | *Urinal – wall mounted* |
| | • Wall hung vitreous china urinal stall, white, concealed trap, cold water only. |
| S57B | *Urinal waterless– wall mounted* |
| | • Wall hung vitreous china urinal stall, white, concealed trap. |
| S58 | *Safety Drench Shower with Eye Wash* |
| | • Combination overhead drench shower and eye/face wash, hand and foot operated, cold water only. |

# 4.14 Fit-Out, Fixed Equipment

## 4.14.1 Fixed Joinery

### *4.14.1.1 General*

- All joinery shall be in accordance with relevant Australian Standards.
- Reconstituted wood-based products including glues used for construction of joinery, furniture and fittings (MDF, particle board, cork-board, pin-board etc.) shall comply with formaldehyde emissions class 'E0' (E-zero) in accordance with the relevant Australian Standard for reconstituted wood-based panels (see also *Section 2.1*). MDF or particle board shall be high performance moisture resistant.
- High pressure laminate (HPL) sheet shall be in accordance with the relevant Australian Standards for high pressure decorative laminates (see also *Section 2.1*).
- Bench-tops, where briefed for standard joinery applications, shall be nominal 33mm thick, high performance moisture resistance particleboard or MDF with nominal 0.8mm thick high pressure laminate (HPL) to both faces.
- Front and exposed ends of standard joinery bench-tops shall have HPL full wrapped (post formed) around top and bottom edges with nominal 10mm radius. Internal corners shall have mason mitres and external corners shall have 45º truncated rounded profile.
- Cupboard gables, interiors and doors for standard joinery applications, shall be minimum 16mm thick MDF, low pressure melamine (LPM) finished with edges finished with 2mm PVC hot resin glued edging.
- Shelves for standard joinery applications shall be minimum 18mm thick MDF, low pressure melamine (LPM) finished both sides with edges finished with 2mm PVC hot resin glued edging. Shelves with longitudinal span greater than 600mm shall be edge stiffened to prevent sagging/ deflection.
- Hinges shall be commercial quality, self-closing, and 170º opening. *Acceptable product - 'Blum - Modul 170 deg' or equal approved.*
- Bench-tops, splashbacks, gables, drawers and shelves etc. where briefed in specialist spaces that require high durability surface, resistant to heat, chemicals and moisture (e.g. Food

Kitchens, Science Laboratories & Prep Rooms, Art Studios and Workshops) shall be 'compact' laminate, unless briefed otherwise.

- Stainless steel sheet bench tops, splashbacks and shelves where briefed in food preparation areas (e.g. Commercial Catering Kitchens, Canteens etc.) shall be 304 grade, commercial quality construction and detailing, to comply with '*Food premises: Design, construction and fit-out guide*' (see also *Section 2.1*). Refer also to *Section 4.1.11.*
- Polymer resin bench-tops, including integral sinks, splashbacks etc., where specifically briefed, shall be *Broen SPF Lite of equal approved.*

#### *4.14.1.2 Compact Laminate*

- Compact laminate bench tops, shall be minimum 10mm thick, shall have a fine stippled textured surface finish or a smooth finish that is easily cleaned, or as briefed.
- Colours may be either a colour and pattern combination to hide marks and stains or a single, solid colour (except black or white) dependant on the intended location and use of the bench top. ***Note:*** Single, solid colours, (including black and white) without pattern are **not** permitted for use in amenities blocks or laboratories.
- The following compact laminate products, colours and finishes are acceptable for bench tops for use in the appropriate locations within DETE facilities:

| **Manufacturer** | **Acceptable Product or equal approved** |
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| Abet Laminati | 10mm, compact laminate<br>Finish - Zodia (fine, stippled finish)<br>Colours – Asphalt 9809; Reef Blue 9035; Coral Grey 9030; or as noted in dot point in *Section 4.14.1.2 Compact Laminate*. |
| | 10mm, exterior grade, compact laminate<br>Colours – As noted in dot point in *Section 4.14.1.2 Compact Laminate*. |
| Duropal | 10mm/13mm, chemical grade, compact laminate<br>Finish – TC - Crystal<br>Colours – White Ottowa; Astral Quartz; or as noted in dot point in *Section 4.14.1.2 Compact Laminate*. |
| Lamicolor | 10mm/13mm, chemical grade, compact laminate<br>Finish - Wraky (WR) (scratch resistant finish) or Crystal (C) (Smooth Finish)<br>Colours – C6060 Composite White; C596 Phartenon Grigio; 6054 Porfido; 6064 Furlo; 6062 Vesuvio; or as noted in dot point in *Section 4.14.1.2 Compact Laminate*. |
| Laminex | 13mm, XR grade, compact laminate<br>Finish - Dimensions (fine stipple) or Natural Finish (smooth, carbide finish)<br>Colours – Astro; Lunar Dust; or as noted in dot point in *Section 4.14.1.2 Compact Laminate*. |
| | 13mm, exterior grade, alfresco compact laminate<br>Colours – Bespeckled Grey; or as noted in dot point in *Section 4.14.1.2 Compact Laminate*. |
| Polyrey | 12.5mm, compact laminate<br>Finish - Surf<br>Colours – As noted in dot point in *Section 4.14.1.2 Compact Laminate*. |

- Where compact laminate has been briefed for shelving, gables, drawers and other joinery, the same material as the bench tops shall be used. Only the colour and finish of these components may be varied from the approved products and colour range for bench tops.
- Construction of compact laminate bench tops (including all wall mounted, fixed peninsular, mobile peninsular and adjustable height benches), splashbacks, shelving, gables, drawers and other joinery, where briefed shall comply with the following:
  - Exposed edges and corners shall have bull nose profile with a minimum 10mm radius
  - Where peninsular benches are fixed to perimeter benches, exposed edges shall have 2mm, 45º, arris edges or the joint shall have a 'mason mitre' with bull nose edges
  - Exposed corners shall have minimum 10mm radius
  - Horizontal surface joints in bench tops shall be adhesive butt jointed with compact laminate 'biscuit' joiner or other approved joint system
  - Fixings shall be stainless steel metal thread screws concealed from exposed faces
  - Support brackets shall be either compact laminate or powder coated steel flat sheet/ tubing
  - Support brackets shall be cantilevered from the wall (without legs) fixed effectively to wall structure (or to backing support panel)
  - The bench top system, including sheet thickness, longitudinal support framing and the size and spacing of support brackets, shall be designed so that the bench top deflection does not exceed 5mm when loaded with 80kg per linear metre
  - Supports bracket ends and any longitudinal stiffening framing shall be set back 50mm from front edge of bench top
  - Support brackets shall have suitable openings at the wall to allow loose cabling (e.g. power and data cables) to be installed along wall under the bench
  - Proprietary circular cable port inserts shall be provided in bench-tops at spacing as shown on plans
  - Adjustable height benches where briefed, shall be as above, mounted on manual wind up frame, height adjustable from 680mm to 900mm high, 160kg lift rated. *Acceptable product: – 'Er-T-Go1' or equal approved.* Electric operated adjustable system shall be provided only where specifically briefed.
  - Fixed peninsular benches shall be open under and supported at the outer end by a 'T' or narrow 'H' leg frame and shall be stiffened and braced with a suitable longitudinal support frame under bench top (not near floor level)
  - Mobile peninsular benches shall have a compact laminate top, mounted on a powder coated steel frame with lockable 100mm dia heavy duty castors (*Fallshaw or equal)*, height shall match perimeter benches
  - Under bench fascia rail for mounting of power and data outlets, shall be compact laminate of suitable size and construction
  - Splashbacks shall match the bench top material and shall be fixed to the bench top with an effective mechanical fixing such as an aluminium joiner strip and the joint shall be effectively sealed
  - Where splashbacks are located under windows, the splashback material shall be extended to include the window sill so as to provide an effective moisture seal to the splashback and to the window frame
  - All shelves (either open wall mounted or in cupboards) unless briefed otherwise, shall have front edge upturned stiffening of minimum 10mm thick (in addition to the shelf thickness) Shelves shall be capable of being installed with an upturned edge (for science chemical container storage) or down turned edge for general storage
  - All shelves shall be supported on suitable wall brackets or pins at spacing to ensure maximum 5mm deflection when loaded with 10 kg per linear metre

#### *4.14.1.3 Bag-racks*

- Typical bag rack configuration per learning space – 500mm deep x 3000 long x 3 shelves high with top shelf at 900mm high, mid shelf at 525mm high and bottom shelf 150mm high.
- Bag racks shall be constructed of heavy duty, durable materials, such as exterior grade, compact laminate.
- Where specifically briefed, bag storage using hooks shall be provided. Hooks shall be protected by a suitable pelmet for safety.
- Bag racks shall be located to be protected from rain and direct sun (e.g. under veranda roofs against the building wall).
- Bag racks shall be located away from edges of balconies unless protected by full height screen walls.

#### *4.14.1.4 Student Lockers*

- Lockers shall be located in recessed alcoves as shown on briefing plans.
- A secure roller door shall be provided to the front of locker alcove.
- Locker alcove shall be 750mm depth x height to accommodate lockers 4 tiers high x width to suit number of lockers briefed for lockers nominally 375mm wide.

#### *4.14.1.5 Whiteboards and Music Whiteboards*

- Whiteboards shall be white vitreous enamel surface on steel sheet bonded to suitable backing sheet, with edge framing all sides and with pen rail along bottom edge and concealed fixing to wall. *Acceptable product: 'Tims Omniplate' 402P with UB 3000 edge frame, or equal approved.*
- Music whiteboards shall be as above with black music lines permanently marked. *Acceptable product: 'Tims Ominiplate' 402P with music lines and UB 3000 edge framing, or equal approved.*
- Whiteboards shall be generally 1200mm high, mounted at 900mm above floor, length as briefed or shown on plans.

#### *4.14.1.6 Pinboards*

- Pinboards shall be dense foam substrate with 'velcro' compatible fabric surface finish, with total thickness minimum 8mm, glued to suitable backing sheet, with suitable perimeter edge framing and concealed fixing to wall. *Acceptable product: 'Melded Fabrics – Noticeboard Prelude', or equal approved.*
- Pinboards shall be generally 1200mm high, mounted at 900mm above floor, length as briefed or shown on plans.

#### *4.14.1.7 Mirrors*

- Mirrors (including those in Dance Studio and student amenities) shall be grade A safety glass with vinyl backing in accordance with the relevant Australian Standards (see also *Section 2.1*).

#### *4.14.1.8 Overhead display wires*

- Overhead display wires shall be 3mm galvanised wire with white PVC covering to give nominal 5mm diameter wire.
- Wires shall be mounted generally at 2200mm above floor level with suitable eye bolts fixed into strong points in walls and window framing.
- Wires shall have thimble eyes at both ends with a 10kg tension spring at one end.
- Display wires shall be located so as not to conflict with ceiling fans and light fittings.

#### *4.14.1.9 Privacy Blinds*

- Acceptable product- *'Hunter Douglas/ Luxaflex' micro perforated venetian blinds, or Sheer view roller blinds or equal approved.*

## 4.14.2 Fixed Equipment

### *4.14.2.1 Electric Stove and Cook tops*

- All electric appliances shall be in accordance with relevant Australian Standards.
- Electric stoves and cook tops shall be constructed and fitted to minimise risk of danger to equipment users including anti-tilt fixings where required.
- Each oven shall be provided with isolation switch located near the appliance. The isolation switch shall be lockable only where specifically briefed.
- Electric cook tops shall have hob inset and fixed into bench top that cannot be lifted to expose electrical wiring.
- The list of appliances to be provided in each space shall be as defined in the project brief.

### *4.14.2.2 Commercial Gas Stoves and Gas Cook tops*

- Gas cooking appliances shall comply with relevant Australian Standards.
- To minimise tampering by students, gas appliances shall have controls knobs that cannot be easily removed or turned to an incorrect indicator position. Control knobs shall be designed to be tamper proof, e.g. fixed to the spindle with allen key grub screws.
- Appliances shall be designed to prevent gas building up prior to lighting. Bench fitted cook-tops shall have fully sealed hobs, fixed and sealed into the bench top to prevent gas leaking into any under bench components. *Note:* Domestic type upright gas stoves which have gas ovens and gas grillers shall **not** be provided.
- Bench fitted cook-top burners shall have flame-failure cut-out systems and lit via an electronic ignition.
- Commercial gas stoves shall have cook-top and oven burners with flame-failure cut-out systems.
- Commercial gas stoves shall have the cook-top burners lit via piezo ignition and the oven burner lit via a pilot light with piezo ignition.
- Commercial gas ovens shall have automatic cut off of both the fan and the burner when the oven door is open.
- Commercial gas stoves that are movable shall be connected to gas supply with a flexible hose (nominally 1.2m long) with restraining chains not exceeding 80% of the length of flexible hose and fixed to ensure the hose does not touch floor in the installed position.
- A gas isolation stop cock shall be provided to each commercial gas stove and to each group of two cook-tops.
- Anti-tilt mechanism shall be provided to commercial gas stoves where recommended by the manufacturer.
- Warning signage outlining the manufacturers recommended lighting and shut down procedure, shall be posted in prominent position for attention of teaching staff and students.
- Refer also to *Section 4.12.5 Gas Services & Section 4.6 Health and Safety.*
- The list of appliances to be provided in each space shall be as defined in the project brief.

### *4.14.2.3 Industrial Technology (Manual Arts) Machinery*

- All fixed machinery shall comply with DETE preferred supplier arrangement for machines and equipment to be used in state secondary schools industrial technology workshops.
- The list of machines to be provided in each space shall be as defined in the project brief.
- Machines shall be located to ensure safe use and adequate circulation with yellow safety lines painted on floor to define each machine workspace.
- The proposed layout of machines shall be subject to approval by DETE Workplace Health and Safety officers in consultation with school staff where possible, prior to fixing in position and painting safety lines.

#### *4.14.2.4 Art Kilns*

- Pottery kilns are provided in schools for the firing of students' clay work. Since raku, earthenware and stoneware clays are the most commonly used, the kiln needs to reach temperatures of up to 1300º C to allow for proper maturity. Both bisque and glaze firings will occur.
- Kilns shall be installed in a purpose built kiln house which has a powered environmental control mechanism (mechanical exhaust system) for kiln emissions. Refer to *Section 4.8.5 Mechanical Exhaust Ventilation.*
- Locate the kiln house external to art classrooms as a detached stand alone installation where there is no possibility of exhaust fumes entering the buildings or adjacent buildings through open windows, with no direct entry from the adjacent classroom (personnel must exit the Art block before being able to enter the Kiln Room).
- The kiln shall be free standing, front loading, and electric for connection to 415V three phase supply.
- The kiln shall be fitted with an exhaust range hood or flues appropriate to the specifications of the kiln.
- Kiln shall be insulated with either a sealed ceramic fibre lining or a fire brick lining.
- The metal frame and body shall have substantial resistance to the corrosive emissions from the firing process and where metals of different types are used in construction, must together be resistant to corrosion.
- Kiln shall be suitable for installation under all relevant Australian Standards for electrical installations, approval and test specifications for electrical equipment, and compliant with all relevant legislative requirements, such as Work Health and Safety and Electrical Safety (see also *Section 2.1*).
- The kiln operating controller shall have the following:
  - A commercially available kiln controller and pyrometer which can be maintained and repaired
  - Secure enclosure and protected by a lockable cover
  - On-off switch
  - Soak timer 60 minute
  - Indicating lamps showing:
    - power on
    - elements energised
    - cycle completed
  - Automatic cut-off switch fitted to door
  - Safety heat fuse for thermal runaway shutdown protection
- The element shall be Kanthal 'A1' rated for continuous element temperatures of approximately 1300°C. The wire element must have a melting point of over 1400°C. Individual elements must be easily replaceable.
- The insulation temperature rating of the hot face lining shall be approximately 1350°C and the temperature of the external casing during firing shall not to exceed 130°C.
- The door shall have a key lockable securing mechanism and shall have robust, corrosion resistant fittings, such as hinges etc.
- The kiln shall be provided with a spy hole and refractory bung/s or damper system.
- Opening the door shall de-energise the heating element and the cycle shall continue upon closing the door.
- Corrosion resistant metal labels shall be securely fixed to the kiln in a prominent position. These include:
  - A robust plaque or plate attached to the front or side of the kiln stating suppliers and or manufacturer's name and contact details as well as contact name and telephone number of service agent for the item.

  - A warning label, adjacent to the spy hole shall contain information referring to:
    - Radiant heat emitted from the open spy hole
    - Possible eye damage
    - Protective eyewear to be worn when looking inside the kiln
  - A general operational label is to be displayed indicating:
    - General operating instructions
    - Pertinent warnings
    - Thermocouple details such as type at exit point on casing
- All kilns shall include: 1 shelf, 2 half shelves and 8 of each 25, 50, 75 and 130mm props. Shelves to be a minimum of 19mm. All furniture supplied with and for the kilns must be rated for continuous operation of approximately 1300°C.
- Kiln capacity shall be as shown in the project brief.
- Each kiln shall be supplied with a User Operational Manual which will include a list of components with sources of supply for repair or replacement.
- In addition, the kiln supplier shall supply written basic operational parameters for common firing situations. Advice as to maximum temperature that the kiln door can be opened slightly at the end of the cycle and possible consequences of such action. Format shall be suitable for laminating and displaying near the kiln. This information is in addition to the user manuals for the controller and any associated equipment.
- Information relating to the composition of insulating materials used in kilns must be obtained from the manufacturer and supplied with a Material Safety Data Sheets (MSDS).
- Installation shall be certified that it is installed in compliance with the relevant Australian Standards and in accordance with all relevant legislation (see also *Section 2.1*).
- The kiln supplier/ installer shall demonstrate and certify that the system operates to allow:
  - The ventilation system to be able to run independently of the kiln for testing the ventilation system
  - The ventilation system to be turned on when the firing cycle is started by the controller set to auto and will continue for 1 hour after the firing cycle is completed
- Manufacturer's warranties shall be a minimum of twelve (12) months on equipment and parts from date of installation.
- All electrical works is to be certified by a suitable qualified electrician who shall complete essential approved test on installation and issue a written certification report to the school.

### 4.14.3 Loose Furniture

- Furniture selection shall be of a quality and durability suitable for use in schools and shall be in accordance with DETE supply arrangements in accordance with the DETE Purchasing and Procurement Policy.
- Preference shall be given to products which have environmental certification complying with AFRDI 'green tick'.
- Fixed height school desks and chairs shall have the following nominal range of heights:

#### *4.14.3.1 Desk Height*

- Size 2 - 510mm; Size 3 - 540mm; Size 4 - 580mm; Size 5 - 630mm; Size 6 - 680mm; Size 7 - 725mm.

#### *4.14.3.2 Chair Height*

- Size 2 - 325mm; Size 3 - 345mm; Size 4 - 370mm; Size 5 - 400mm; Size 6 - 450mm; (no size 7).

***Recommended sizing mix of School Chairs and Desks – Years Prep to 7:***

- Provide sized desks and chairs to each year group in approximately the following ratios:

Prep: 80% x size 2, 20% x size 3
Year 1: 20% x size 2, 80% x size 3
Year 2: 40% x size 3, 60% x size 4
Year 3: 40% x size 4, 60% x size 5
Year 4: 50% x size 5, 50% x size 6
Year 5: 33% x size 5, 67% x size 6
Year 6: Desks: 33% x size 5, 67% x size 6
Chairs: 33% x size 5, 67% x size 6
Year 7: Desks: 50% x size 6, 50% x size 7
Chairs: 100% x size 7

***Recommended Sizing mix of School Chairs and Desks – Years 8-12:***

- Provide sized desks and chairs:
  Desks: 100% Size 7
  Chairs: 100% Size 6

### 4.14.4 Plug-in Appliances

- Appliance selection shall be of a quality and durability suitable for use in schools and
- Appliances shall have an energy efficiency rating of 3 stars or better.